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MICRO PHOTO DIVISION

BELL & HOWELL

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February 7, 1978 Volume 967 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

National Inventors Day

The Patent and Trademark Office will be sponsoring National Inventors Day in the Public Search Room on Saturday, February 11, from 1:00 p.m. to 5:00 p.m. and Sunday February 12, 1978 from 10:00 a.m. to 5:00 p.m. The public is invited to view the exhibits on these days and to attend a formal program at 2:00 p.m. on Sunday.

In order to accommodate the exhibits, it will be necessary to close the Public Search Room at 5:00 p.m. on Friday, February 10, 1978.

We would appreciate the cooperation of all users of the Search Room facilities in removing all personal items and belongings in order to permit the early closing time.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

Dec. 7, 1977

Availability of Consolidated Listing

The "Consolidated Listing of Recent Official Gazette Notices—Re Patent and Trademark Office Practices and Procedures," which appeared in the OFFICIAL GAZETTE of January 3, 1978, is available from the Superintendent of Documents, Washington, D.C. 20402. Please include the following information when ordering:

Stock No. 003-004-005-49-1, cost $2.20.

RICHARD J. SHAKMAN,
Assistant Commissioner for Administration.

Jan. 11, 1978.

Abstract of the Disclosure

This notice is intended to announce a change in the examining practice concerning review of the abstract for compliance with the guidelines set forth in MPEP 608.01(b).

At present, the examiner is instructed to review the abstract for compliance with the guidelines when passing the case to issue, making any necessary revisions by examiner's amendment. This policy has led to the necessity for many changes by the examiner which could have and should have been made at an earlier point in the prosecution. For example, abstracts in excess of the 250 word limit require cancellation and/or rewriting of portions thereof. This 250 word limit is strictly enforced since it represents a requirement of the printing process and the printed patent format designed to present a maximum amount of information concerning a patent on a single page.

Effective immediately, examiners are to require correction of the abstract at the earliest point in the prosecution that non-compliance with the guidelines is detected. Applicants are expected to observe the guidelines in drafting the abstract and correct any defect that is identified in an Office action. Applicants are encouraged to make the necessary corrections not only to relieve the examiner of this burden, but also to help avoid any potential conflict with respect to altering the scope of the enabling disclosure. In this regard, it should be noted that the abstract of the disclosure has been interpreted to be a part of the specification for the purposes of compliance with paragraph 1 of 35 USC 112. *In re Armbruster*, 512 F2d 676, 185 USPQ 152 (CCPA 1975) However, although it is preferable for applicant to make any necessary changes, the examiner will retain the authority and responsibility for reviewing, editing and revising the abstract of the disclosure at the time of allowance of the application to assure compliance with the guidelines.

Section 608.01(b) of the Manual of Patent Examining Procedures will be amended appropriately.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

Dec. 30, 1977.

Graphical Illustrations in the Specification

For convenience many applicants have been including graphs or other types of graphical illustrations in the text portion of the specification. These illustrations do not come within the purview of 37 C.F.R. 1.58 which permits tables and chemical and mathematical formulas in the specification in lieu of formal drawings. Frequently, these graphical illustrations do not have satisfactory reproduction characteristics. Moreover, these reproductions are generally less than satisfactory due to the fact that the illustrations are usually reduced in size in order to fit a column of the printed patent page. Accordingly, effective immediately, graphs and graphical type illustrations in the specification will be objected to under 37 C.F.R. 1.58(a) and drawings pursuant to 37 C.F.R. 1.81 will be required.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

Jan. 12, 1978.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,193,404, Re. S.N. 850,027, Filed Nov. 9, 1977, Cl. 427/38, ASSOCIATED DYE SALTS AND METHOD OF FORMING COLORED INDICIA THEREWITH, Chester Davis, Owner of Record: *S. D. Warren Company, Boston, Mass.*, Attorney or Agent: Rudolf E. Hutz, et al., Ex. Gp.: 162

3,260,106, Re. S.N. 856,197, Filed Nov. 30, 1977, Cl. 73/144, WEB TENSION METER, Richard D. Hull, et al., Owner of Record: *Cleveland Machine Controls, Inc., Cleveland, Ohio*, Attorney or Agent: James H. Tilberry, et al., Ex. Gp.: 244

3,622,318, Re. S.N. 846,241, Filed Oct. 27, 1977, Cl. 96/22, PHOTOGRAPHIC MATERIALS AND PROCESSES, Francis J. Evans, Owner of Record: *Eastman Kodak Company, Rochester, N.Y.*, Attorney or Agent: Carl O. Thomas, et al., Ex. Gp.: 166

3,829,348, Re. S.N. 855,113, Filed Nov. 25, 1977, Cl. 428/11, DECORATIVE THREE-DIMENSIONAL OBJECTS, Jacob Spiegel, et al., Owner of Record: *Gilbreth International Corporation, Philadelphia, Pa.*, Attorney or Agent: A. D. Caesar, et al., Ex. Gp.: 164

3,836,767, Re. S.N. 847,432, Filed Nov. 1, 1977, Cl. 240/25, LIGHTING FIXTURES, Martin L. Lasker, Owner of Record: *Wylain, Inc., Dallas, Tex.*, Attorney or Agent: Joseph M. Lane, et al., Ex. Gp.: 212

3,978,953, Re. S.N. 855,119, Filed Nov. 28, 1977, Cl. 192/84 C, RESILIENT CONNECTION BETWEEN INNER AND OUTER POLES ON ELECTROMAGNETIC CLUTCH, Donald Leroy Miller, Owner of Record: *Facet Enterprises, Inc., Tulsa, Okla.*, Attorney or Agent: Remy J. Van Ophem, Ex. Gp.: 345

4,010,261, Re. S.N. 853,790, Filed Nov. 21, 1977, Cl. 424/177, METHOD TO PREVENT REPRODUCTION WITH [DES-GLY]^{10}-GN-RH NONAPEPTIDE AMIDE ANALOGS IN POSITION 6, Edwin Samuel Johnson, et al., Owner of Record: *Abbott Laboratories, North Chicago, Ill.*, Attorney or Agent: Paul D. Burgauer, et al., Ex. Gp.: 124

PATENT NOTICES

Certificates of Correction for the Week of Feb. 7, 1978

Re. 28,990	4,036,608	4,046,522	4,052,175
3,491,787	4,037,370	4,046,610	4,052,198
3,860,787	4,037,960	4,046,901	4,052,209
3,870,777	4,038,036	4,046,903	4,052,269
3,871,003	4,038,199	4,047,294	4,052,277
3,878,163	4,038,284	4,047,517	4,052,290
3,928,418	4,038,636	4,047,866	4,052,385
3,946,242	4,039,138	4,047,870	4,052,479
3,953,790	4,039,925	4,047,961	4,052,608
3,967,975	4,040,328	4,048,020	4,052,611
3,976,546	4,040,503	4,048,296	4,052,683
3,977,191	4,040,613	4,048,302	4,053,311
3,980,691	4,040,633	4,048,526	4,053,376
3,981,880	4,040,719	4,048,842	4,053,682
3,983,153	4,041,474	4,049,197	4,053,725
3,983,154	4,041,696	4,049,239	4,053,802
3,987,083	4,041,756	4,049,488	4,053,808
3,995,643	4,041,995	4,049,528	4,053,864
3,997,551	4,042,077	4,049,608	4,053,973
3,997,552	4,042,137	4,049,676	4,053,979
3,997,587	4,042,335	4,049,835	4,054,057
4,003,966	4,042,608	4,049,971	4,054,066
4,005,115	4,042,780	4,050,109	4,054,138
4,005,606	4,043,499	4,050,121	4,054,211
4,007,448	4,043,592	4,050,151	4,054,264
4,011,133	4,043,724	4,050,210	4,054,282
4,014,707	4,043,926	4,050,223	4,054,350
4,021,502	4,044,007	4,050,250	4,054,472
4,023,612	4,044,025	4,050,486	4,054,511
4,025,521	4,044,057	4,050,575	4,054,552
4,026,989	4,044,059	4,050,724	4,054,745
4,027,230	4,044,103	4,050,928	4,055,178
4,027,555	4,044,180	4,050,950	4,055,462
4,028,387	4,044,227	4,051,076	4,055,670
4,028,467	4,044,249	4,051,130	4,055,677
4,032,491	4,044,604	4,051,169	4,055,715
4,032,762	4,044,691	4,051,236	4,055,927
4,032,876	4,044,699	4,051,508	4,055,976
4,033,439	4,044,718	4,051,623	4,056,002
4,033,652	4,045,498	4,051,631	4,056,155
4,034,972	4,045,607	4,051,723	4,056,571
4,035,623	4,045,703	4,052,028	4,056,585
4,035,872	4,046,347	4,052,080	4,057,226
4,036,241	4,046,369	4,052,103	4,060,848

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 14, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-9-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	2-11-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	7-14-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	1-10-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	3-7-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	9-13-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	8-2-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	2-7-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	5-20-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-3-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	5-6-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-3-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	4-4-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	1-3-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-6-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	4-22-77

Expiration of patents: The patents within the range of numbers indicated below expire during January 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,966,681 to 2,970,312, inclusive
Plant Patents... Numbers 2,009 to 2,018, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED FEBRUARY 7, 1978

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T967,001
AUSTENITIC Ni-Fe BASE WELD MATERIAL

Robert S. Brown, Leesport, and Joseph B. Koch, Sinking Spring, both of Pa., assignors to Carpenter Technology Corporation, Reading, Pa.

Filed Apr. 28, 1977, Ser. No. 791,786
Int. Cl.[2] C22C *30/02*
U.S. Cl. 75—122
No Drawing. 11 Pages Specification

Weld-filler material particularly useful in providing enhanced freedom from weld cracking in fully austenitic Fe—Ni—Cr—Mo—Cu material in which the elements P, Cb, Ce + La, C, Si, S, N and O are controlled to low levels and in which the level of manganese is increased to at least 1% and preferably to at least 1.5%. The weld-filler material in weight percent contains:

Carbon—0.035 Max.
Manganese—1–4.0
Silicon—0.20 Max.
Phosphorus—0.020 Max.
Sulfur—0.005 Max.
Chromium—19.0–26.0
Nickel—32.5–38
Molybdenum—2–9
Copper—3.0–4.0
Columbium—0.35 Max.
Cerium—0.01 Max.
Boron—0.0035 Max.

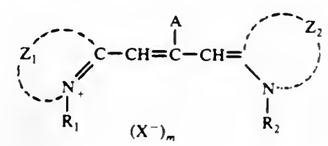
the balance being iron and in which cerium includes cerium plus lanthanum or misch metal.

T967,002
SPECTRALLY SENSITIZED SILVER HALIDE PHOTOGRAPHIC EMULSIONS

Yuji Mihara; Takeo Sakai; Hideki Ohmatsu, and Akira Sato, all of No. 210, Nakanuma, Minami-ashigara, Kanagawa, Japan

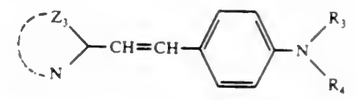
Filed July 14, 1977, Ser. No. 815,751
Claims priority, application Japan, July 14, 1976, 51-84320
Int. Cl.[2] G03C *5/24*
U.S. Cl. 96—64
1 Sheets Drawing. 62 Pages Specification

An internal latent image type silver halide photographic emulsion suitable for use in a light-sensitive material for the diffusion transfer process and which provides a direct positive image by surface development in the presence of a fogging agent, which emulsion is spectrally sensitized with a supersensitizing combination of at least on sensitizing dye represented by the following general formula (I)



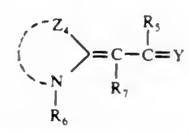
(I)

werein Z_1 represents a non-metallic atomic group necessary to complete a benzoxazole ring, a naphthoxazole ring, a benzothiazole ring, a naphthothiazole ring, a benzoselenazole ring or a benzimidazole ring; Z_2 represents a non-metallic atomic group necessary to complete a benzothiazole ring, a naphthothiazole ring or a benzoselenazole ring; A represents a hydrogen atom or an alkyl group; R_1 and R_2, which may be the same or different, each represents an alkyl group or a substituted alkyl group; X represents an acid anion; and m represents 0 or 1, and at least one sensitizing dye represented by the following general formula (II), (III) or (IV):



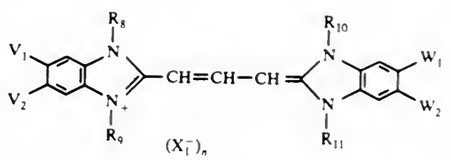
(II)

wherein Z_3 represents a non-metallic atomic group necessary to complete a 5- or 6-membered heterocyclic ring; and R_3 and R_4, which may be the same or different, each represents an alkyl group;



(III)

wherein Z_4 represents a non-metallic atomic group necessary to complete a 5- or 6-membered heterocyclic ring; and R_5 represents an alkyl group; R_6 represents an alkyl group or a substituted alkyl group; R_7 represents a hydrogen atom or R_6 and R_7 can combine and form a ring and Y represents an oxygen atom or =N—R_8, wherein R_8 represents a hydrogen atom, an alkyl group or an aryl group,



(IV)

wherein V_1, V_2, W_1 and W_2, which may be the same or different, each represents a hydrogen atom, a halogen atom, a trifluoromethyl group, a cyano group, a carboxy group, an alkoxycarbonyl group, an aminosulfonyl group or an alkylsulfonyl group; R_8, R_9, R_{10} and R_{11}, which may be the same or different, each represents an alkyl group or a substituted alkyl group; X_1 represents an acid anion; and *n* represents 0 or 1.

T967,003
FLOORING OF WOOD-PLASTIC COMPOSITE

Alvin E. Witt, 300 Steeplechase Drive, Media, Pa. 19063, and Homer Breault, Pine Glen, Pa. 16845

Continuation of Ser. No. 684,514, May 7, 1976, abandoned. This application Apr. 4, 1977, Ser. No. 784,009
Int. Cl.[2] B32B *5/12, 7/02, 27/40*
U.S. Cl. 428—113
No Drawing. 15 Pages Specification

Wood is disintegrated to prepare a mass of wood fibers which are formed into a mat. A unique hardboard is prepared by compressing a preformed mat comprising thermoplastic resins, wood fibers and wood fibers coated with such resins. The hardboard has a resin content of from about 37% to about 39% and a wood fiber content from about 53% to about 57%. The moisture content of the hardboard is ordinarily within a range

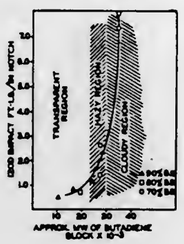
from about 4% to about 10%, but such moisture content has the range expected for wood products under a wide range of temperatures, humidities, pressures and related variables. The thickness of the hardboard must be within the range from 790 to 850 microns and the density of the hardboard must be within the range from 690 to 750 milligrams per cubic centimeter. Heretofore such hardboard has been proposed for use as a facing lamina in multilamina composites for covering up various irregularities in the surface of the adjacent lamina while preserving a smooth facing surface.

This hardboard having said 790 to 850 micron thickness is cut into tiles suitable for flooring and a plurality of tiles are directed through a coating zone in which an upper surface of each tile is coated with a precursor for a polyurethane. The thus coated tiles are advanced into a curing zone in which the coating is transformed into an attrition resistant polyurethane layer having a thickness which is within a range from about 110 to 300 microns, which corresponds to from about 1/7 to about $\frac{1}{3}$ of the thickness of the hardboard. Such curing zone suitable for the plastic can employ infrared, or ultraviolet, or equivalent radiation effective in promoting such polymerization to the polyurethane attrition resistant top layer of the multilaminar tile.

T967,004
TRANSPARENT IMPACT POLYSTYRENE PLASTICS OF DI-BLOCK COPOLYMERS

Robert Clarence Smith, Warren, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 636,198, Nov. 28, 1975, abandoned, which is a continuation of Ser. No. 483,191, June 26, 1974, abandoned. This application Aug. 2, 1976, Ser. No. 710,839
Int. Cl.[2] C08F *236/10, 4/48*
U.S. Cl. 526—173
No Drawing. 13 Pages Specification



A transparent di-block copolymer of styrene and butadiene is produced which contains 70 to 90 percent of block styrene, or preferably 75 to 85 percent of block styrene. The copolymer is suitable for use in the manufacture of packaging films and molded items, including egg cartons, boxes of various types, window panes, etc.

T967,005
CELLULOSE REAGENTS INCORPORATING T-AMINO GROUPS

Clinton P. Wade, Jefferson, and Stanley P. Rowland, New Orleans, both of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

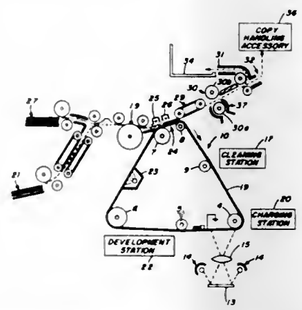
Division of Ser. No. 625,722, Oct. 24, 1975, Pat. No. 4,017,259. This application Feb. 15, 1977, Ser. No. 768,809
Int. Cl.[2] C07D *251/08*; C07C *125/06*
U.S. Cl. 544—220
No Drawing. 28 Pages Specification

Durable press properties are imparted to cellulosic fabrics by reacting with either of two new tertiary amino-N-methylol reagents. Autocatalysis was shown by these reagents when applied as the free bases or as hydrochlorides to cotton fabric by conventional methods. Resilience, recurability, improved scorch resistance, and enhanced dye and brightener sorptions are realized.

T967,006
THERMAL CONSERVATION ASSEMBLY FOR ROLLER FUSER

Edwin Clarence Hoffman, 901 Elmgrove Road, Rochester, N.Y. 14650

Filed July 25, 1977, Ser. No. 818,372
Int. Cl.[2] H05B *1/00*; G03G *15/20*
U.S. Cl. 219—216
2 Sheets Drawing. 9 Pages Specification



In an electrophotographic copier including a fuser having a heated fuser roller, a thermal conservation assembly for minimizing thermal losses and facilitating roller maintenance and removal. The assembly includes first and second heat reflective members which are mounted for pivotal movement between a first position wherein the members are in close proximity with the fuser roller in order to minimize thermal losses and a second position wherein said members are out of proximity with said roller in order to facilitate access to the roller for maintenance and removal. In roller fusers having a pair of heated fuser rollers such as for duplex copy fusing, each roller is provided with a movable thermal conservation assembly.

T967,007
COMPOSITIONS OF POLYESTERS HAVING FINE PARTICLES OF POLY (1,4-CYCLOHEXYLENE-DIMETHYLENE TEREPHTHALATE) DISPERSED THEREIN

David R. Fagerburg, 3812 Cimarron Drive; Burns Davis, 2019 Bruce St., both of Kingsport, Tenn. 37664, and Willis C. Wooten, 521 Lakewood Rd., Kingsport, Tenn. 37660

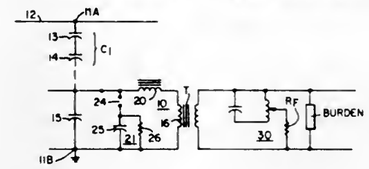
Continuation of Ser. No. 664,842, March 8, 1976, abandoned. This application Oct. 13, 1976, Ser. No. 731,877
Int. Cl.[2] C08L *67/02*
U.S. Cl. 260—860
No Drawing. 22 Pages Specification

Disclosed are compositions comprised of fine particles of unannealed poly(1,4-cyclohexylenedimethylene terephthalate) dispersed in a poly(tetramethylene terephthalate) type polyester, a poly(pentamethyleneterephthalate) type polyester, a poly(hexamethylene terephthalate) type polyester, a poly(1,4-cyclohexylenedimethylene terephthalate/isophthalate) type polyester, a poly(tetramethylene terephthalate) type polyester modified with poly(alkylene oxide)glycol, a poly(1,4-cyclohexylenedimethylene terephthalate) type polyester modified with poly(alkylene oxide) glycol or a polyester prepared from 1,4-cyclohexanedicarboxylic acid, dimer acid, and 1,4-cyclohexanedimethanol.

T967,008
CAPACITIVE VOLTAGE TRANSFORMER WITH IMPROVED FERRORESONANCE PROTECTION DEVICE

Andrew S. Sweetana, Jr., Bloomington; Frederick J. Brown, Ellettsville, and Gerald B. Boyette, Bloomington, all of Ind., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 631,298, Jan. 12, 1975, abandoned. This application Apr. 7, 1977, Ser. No. 785,380
Int. Cl.[2] G05F *3/06*
U.S. Cl. 323—61
1 Sheets Drawing. 7 Pages Specification



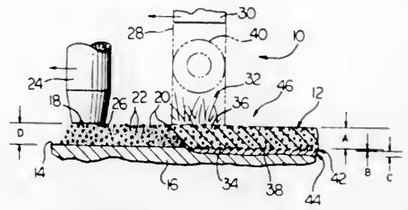
A coupling capacitor protection device with a voltage limiter connected across the tap capacitor feeding the induction transformer primary winding. The suppressor is a ceramic oxide nonlinear resistor changing from high to low resistance, thereby limiting the tap voltage to less than that at which the induction transformer core saturates in order to minimize ferroresonance in the circuit. Also, the limiter gives voltage protection to the tap capacitor circuit.

T967,009
METHOD OF APPLYING A WEAR-RESISTANT COMPOSITE COATING TO AN ARTICLE

Preston L. Gale, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 643,546, Dec. 22, 1975, abandoned. This application Apr. 7, 1977, Ser. No. 785,631
Int. Cl.[2] C21D *1/34*
U.S. Cl. 427—53
1 Sheets Drawing. 17 Pages Specification

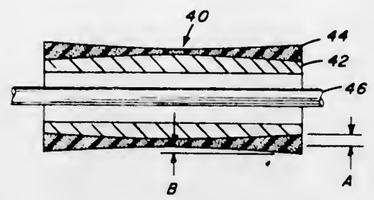
A method of applying a wear-resistant composite coating to an article is disclosed which includes the steps of depositing a plurality of wear-resistant particles having a predetermined melting point along with a lower melting point element in solid form onto the surface of the article, focusably directing a coherent beam of electromagnetic energy thereon at a power density level sufficient to melt the element and a limited surface portion of the article while retaining the particles in substantially solid form, and removing the beam therefrom to allow solidification of the melted portion thereof into a matrix in which the wear-resistant particles are embedded. Advantageously this method provides a thin diffusion zone and a hardened zone underneath it to better support the coating.



T967,010
FUSER ROLLER

Walter Anthony Stryjewski, 901 Elmgrove Road, Hilton, N.Y. 14650

Filed June 27, 1977, Ser. No. 810,258
Int. Cl.[2] G03G *5/00*
U.S. Cl. 432—60
1 Sheets Drawing. 9 Pages Specification



In an electrophotographic copier a fuser roller for fusing images to a copy. The fuser roller includes an inner rigid core of heat transmissive or heat conductive material having an outer surface of generally dome-shaped longitudinal profile and an outer resilient cover having an inner surface generally conforming to the outer surface of said core and having an outer surface of generally hour-glassed shaped longitudinal profile. The fuser roller is provided with a heating element internal to the inner core. In a duplex copier, identical fusing rollers forming a roller pair are provided to fuse images to both sides of a copy.

REISSUES

FEBRUARY 7, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,531
GRINDING MACHINE

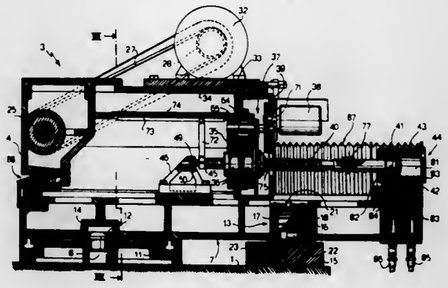
Elio Pagella, and Carlo Guerci, both of Ivrea, Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Original No. 3,932,961, dated Jan. 20, 1976, Ser. No. 417,904, Nov. 21, 1973. Division of Ser. No. 194,325, Nov. 1, 1971, Pat. No. 3,818,643. Application for reissue Jan. 4, 1977, Ser. No. 756,691

Claims priority, application Italy, Oct. 30, 1970, 70613/70; Oct. 30, 1970, 70614/70

Int. Cl.[2] **B24B** *49/18*

U.S. Cl. 51—165.8 **7 Claims**



1. In a grinding machine having a frame, a wheelhead mounted on said frame, a wheel spindle rotatably mounted on said wheelhead, and a grinding wheel having a grinding surface secured to said spindle, a workhead adjustably mounted on said frame, said workhead comprising:

a work spindle for holding a workpiece carried by said workhead, said work spindle being carried by bearings mounted on said workhead,

means for mounting said work spindle for rotatable and axial movement with respect to said grinding surface whereby said workpiece can be oriented with respect to said grinding surface and brought into contact with said grinding surface,

power means for rotating said work spindle,

a screw element having threadably mounted thereon a nut element, said nut element and said screw element being mounted for relatively rotatable movement with respect to one another to displace said elements axially with respect to one another, said nut element having outer teeth and being rotatably mounted on said workhead and fixed against axial movement with respect to said workhead, said work spindle being coaxial with said nut element and passing through said nut element, said screw element comprising the outer surface of a first ring movable axially,

a second ring attached to said work spindle and rotatably and axially movable therewith, said second ring being engageable by said first ring to cause axial movement of said work spindle, and

means for rotating said screw element and said nut element with respect to one another comprising a step-by-step reversible electric motor carried by said workhead and having an output shaft means rotatable by a predetermined number of electric pulses, said output shaft means directly rotatably engaging said outer teeth of said nut element whereby rotation of said nut element by said output shaft means results in axial movement of said work spindle with respect to said workhead.

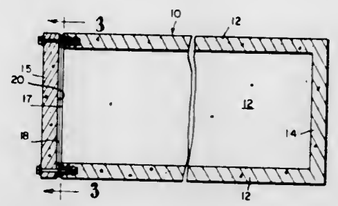
Re. 29,532
VAULT

William H. Zwick, 415 N. Second St., Decatur, Ind. 46733

Original No. 3,983,667, dated Oct. 5, 1976, Ser. No. 540,979, Jan. 14, 1975. Application for reissue Feb. 8, 1977, Ser. No. 766,713

Int. Cl.[2] **E04H** *13/00*

U.S. Cl. 52—140 **5 Claims**



1. [A burial] *A* vault, comprising an elongated hollow chamber having at least one open end, an end plate closing said open end, [an annular] *a* resilient seal interposed between said chamber and end plate for sealing the space therebetween, said seal having a pair of opposed side faces in engagement with said end plate and chamber and inner and outer faces extending between said side faces, said inner and outer faces having opposed grooves formed therein and extending the lengths of said inner and outer faces, means in said seal for retaining said seal in its [annular] configuration, connecting means for rigidly connecting said end plate to said chamber, and means for fixedly mounting said seal on said end plate.

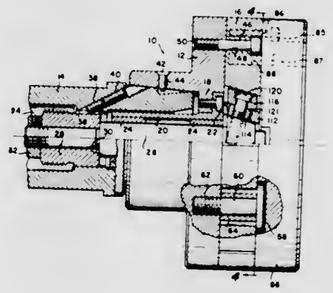
Re. 29,533
SELF-CENTERING JAW CHUCK

Hubert J. Parsons, Belleair Beach, Fla., assignor to Hardinge Brothers, Inc., Elmira, N.Y.

Original No. 3,834,720, dated Sept. 10, 1974, Ser. No. 330,437, Feb. 7, 1973. Application for reissue Mar. 14, 1975, Ser. No. 558,298

Int. Cl.[2] **B23B** *31/10*

U.S. Cl. 279—1 L **14 Claims**



1. A radially reciprocating jaw chuck for machine tools and the like comprising:

a. a chuck body member,

b. a plurality of master jaws,

c. each of said master jaws *being symmetrical about a radial line pasing through the center thereof and* further having a [pair of circumferentially spaced] fixed [portions]

portion rigidly secured to said body member and a radially reciprocable portion [positioned circumferentially between said fixed portions],

d. *a pair of leaf members* resilient [means] integral with and connecting said fixed [portions] *portion* and said radially reciprocable portion *and chordally disposed with respect to said body member,*

e. work gripping members secured to each of said radially reciprocable portions,

f. cam means axially reciprocable in said body member [for] *operable to* radially [reciprocating] *reciprocate* said radially reciprocable portions and associated work gripping members between work gripping and release positions,

g. whereby the flexure of said resilient [means provides] *leaf members provide* a self-centering action of said work gripping members with respect to the longitudinal axes of the chuck and the work.

Re. 29,534

PURIFICATION OF PERFLUOROSULFONYL FLUORIDE PERFLUOROVINYL ETHERS BY THERMAL DECOMPOSITION OF UNSTABLE ISOMERS

Paul Raphael Resnick, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Original No. 3,821,297, dated June 28, 1974, Ser. No. 281,988, Aug. 18, 1972. Continuation-in-part of Ser. No. 44,111, June 8, 1970, abandoned. Application for reissue June 28, 1976, Ser. No. 700,068

Int. Cl.² C07C *143/08, 143/70*

U.S. Cl. 260—543 F **3 Claims**

3. In the process for the preparation of perfluorosulfonyl fluoride perfluorovinyl ethers having the formula $ROCF=CF_2$, where R is a sulfonyl fluoride containing fluorocarbon group of three to 15 carbon atoms which may optionally contain one or more ether linkages or chlorogroups with the proviso that the carbon atom of R bonded to the oxygen is also bonded only to atoms from the class consisting of carbon and fluorine, wherein mixtures of the primary isomer and other isomer thereof having the same number of fluorine and oxygen atoms per molecule as the primary isomer are present, the improvement comprising an additional heating of said mixture consisting essentially of said isomers at a temperature of between 250°-350° to selectively destroy said other isomer and separating the purified primary isomer from the products of the destroyed isomer, the $—OCF=CH_1$ group of the primary isomer being connected to a CF_2 group in R and the $—OCF=CF_2$ group of said other isomer being connected to a secondary or tertiary carbon atom.

Re. 29,535

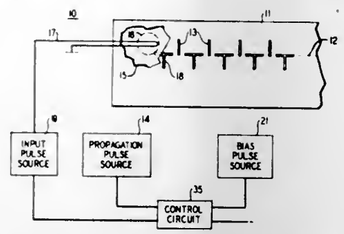
SINGLE WALL DOMAIN NUCLEATOR

Yu-Ssu Chen, New Providence; Joseph Edward Geusic, Berkeley Heights; Terence John Nelson, New Providence, and Herbert Meyer Shapiro, Bridgewater, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Original No. 3,789,375, dated Jan. 29, 1974, Ser. No. 303,327, Nov. 3, 1972. Application for reissue Mar. 13, 1975, Ser. No. 558,140

Int. Cl.² G11C *19/08*

U.S. Cl. 365—11 **16 Claims**



12. A device for generating magnetic bubbles in a wafer of a magnetic material, said device comprising:

a plurality of elements of a highly permeable magnetic material overlayed on the wafer of a magnetic material and outwardly extending from a localized region of the wafer in which magnetic bubbles are to be generated, the elements operating in response to an applied rotating magnetic field to provide a first magnetic field in the localized region of the wafer,

the magnitude of this first magnetic field being insufficient to induce a reversal of the direction of the magnetization in the wafer, and

a current line overlayed on the wafer and positioned so that a portion of the current line forms a loop-like segment around said localized region of the wafer, for providing a second magnetic field in said localized region of the wafer whenever a current is pulsed through the current line,

the combined magnitudes of the first and second magnetic fields being sufficient to induce a reversal of the direction of the magnetization in said localized region of the wafer.

PLANT PATENTS

GRANTED FEBRUARY 7, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,206

CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Grantsville, W. Va., and William E. Duffett, Salinas, Calif., assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Feb. 4, 1977, Ser. No. 765,431

Int. Cl.² A01H *5/00*

U.S. Cl. Plt.—75 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat. known by the cultivar name Popcorn and characterized particularly as to uniqueness by the combined characteristics of flat capitulum form, reflexing at maturity; pompon capitulum type; white ray floret color, tinging pink with finishing temperatures below 56° F; diameter across face of capitulum up to 50 mm; permanence of inflorescence ranging from 14 to 21 days;medium plant height; spreading branching pattern; good tolerance of inflorescence to frost damage; average natural season flowering date of September 25; and average flowering response of 7 weeks in photoperiodic controlled flowering programs.

4,207

KALANCHOE PLANT

James C. Mikkelsen, Ashtabula, OH, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Feb. 8, 1977, Ser. No. 766,579

Int. Cl.² A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of kalanchoe plant known by the cultivar name Nugget and characterized particularly as to novelty by the combined characteristics of vigorous, strong, upright growth; excellent branching; capable of superior cutting production, and fast and uniform propagation; sharp, golden orange flower color, with the flowers being supported on strong stems; and compact and small foliage.

4,208

AFRICAN VIOLET PLANT

Reinhold Holtkamp, Wertherstrasse 112, 4294 Isselburg, Germany

Filed Feb. 8, 1977, Ser. No. 766,580

Int. Cl.² A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet plant known by the cultivar name Florida and particularly characterized as to uniqueness by the combined characteristics of compact and floriferous flower bouquet, with the flower being supported on strong, upright flower stems; fast and vigorous growth; uniform blooming; non-dropping flowers, and the bouquet being above the leaves which spread radially outward from the center of the plant.

4,209

KALANCHOE PLANT

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Feb. 8, 1977, Ser. No. 766,737

Int. Cl.² A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of kalanchoe known by the cultivar name Pixie and particularly characterized as to uniqueness by the combined characteristics of slow, compact growth and excellent branching habits; highly floriferous, with well clustered, relatively small orange flowers; eight to nine week flowering time after flower initiation, and superior flower and foliage keeping qualities.

4,210

BEGONIA PLANT

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Feb. 17, 1977, Ser. No. 769,690

Int. Cl.² A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of begonia plant known by the cultivar name Flambeau and particularly characterized as to uniqueness by the combined characteristics of bright red flower color, dark green foliage having thick blades and heavy texture; consistent propagation by leaf cuttings; relatively large flower size and tepal quantity with the tepal edges being ruffled; vigorous and upright growth habit, and by its resistance to powdery mildew.

4,211

BEGONIA PLANT

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Feb. 17, 1977, Ser. No. 769,843

Int. Cl.² A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of begonia plant known by the cultivar name Pink Fantasy and particularly characterized as to uniqueness by the combined characteristics of light pink flower color, excellent keeping qualities; upright, compact and relatively slow growth habit; excellent appearance due to flower form and placement against the foliage background; good propagation from leaf cuttings, and by its resistance to disease.

4,212

BEGONIA PLANT

Leslie Woodriff, McKinleyville, Calif., assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Mar. 1, 1977, Ser. No. 773,317

Int. Cl.² A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of begonia plant known by the cultivar name Leprechaun and particularly characterized as to uniqueness by the combined characteristics of leaf coloration and color pattern, with the leaves having clear brown areas surrounding the veins and bright green areas between the veins; leaves having spirals at the base and short petioles; short growth habit and relatively slow propagation time and growth rate; superior hardiness, and generally insignificant flowering from a commercial standpoint.

PATENTS

GRANTED FEBRUARY 7, 1978

ERRATA

For CLASS	See PATENT NO.
250-445 T	4,072,289
366-337	4,072,296
366-287	4,072,297
219-121 EB	4,072,356
339-125 R	4,072,401
339-136 M	4,072,402
051-215 H	4,072,476
062-131	4,072,486
062-244	4,072,487
062-282	4,072,488
429-070	4,072,540
424-308	4,072,705
358-284	4,072,818
219-137.31	4,072,828
364-424	4,072,850
364-487	4,072,851
235-312	4,072,853
362-101	4,072,855
362-002	4,072,856
362-123	4,072,857
365-233	4,072,932

PATENTS

GRANTED FEBRUARY 7, 1978

NOTE—Cross reference listings of applications published under the first and second Trial Voluntary Protest Programs are located in the back of this Issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

4,071,912

LIGHT FILTER FOR WELDER'S MASK

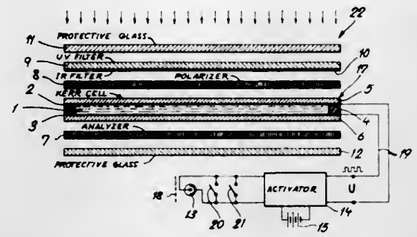
Hermann Budmiger, Seewen, Solothurn, Switzerland, assignor to Revue Thommen AG, Waldenburg, Switzerland

Filed Dec. 2, 1975, Ser. No. 637,000

Claims priority, application Switzerland, Dec. 2, 1974, 16064/74; July 14, 1975, 9265/75

Int. Cl.[2] A61F *9/06*

U.S. Cl. 2—8 **1 Claim**



1. A welder's eyeshield comprising:
a headpiece;
a window on said headpiece alignable with the eyes of a person wearing same;
an infrared filter in said window;
an ultraviolet filter in said window in line with said infrared filter;
a polarizer in said window in line with said filters;
an analyzer in said window in line with and behind said polarizer;
means including an optoelectric element in said window between said polarizer and said analyzer electrically energizable for rotating the plane of polarization of light passing from said polarizer toward said analyzer;
a photocell on said headpiece for generating an output on detection of strong ultraviolet radiation;
an acoustical device on said headpiece responsive to sound;
circuit means between said element and said photocell for operating same to reduce light passage through said window on generation of said output, said circuit means including means responsive to said acoustic device for operating said element to reduce light passage through said window upon detection of a sound by said device attributable to the striking of a welding arc; and
a battery on said headpiece for powering said circuit means.

4,071,913

PROTECTIVE GLOVES

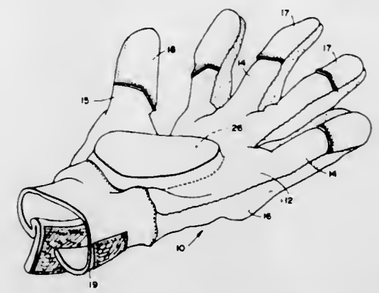
Michael H. Rector, Santa Rosa, Calif., assignor to Rector & Wolfe Incorporated, Santa Rosa, Calif.

Continuation-in-part of Ser. No. 648,250, Jan. 13, 1976, abandoned. This application Mar. 21, 1977, Ser. No. 779,734

Int. Cl.[2] A41D *13/10*

U.S. Cl. 2—20 **3 Claims**

1. A protective glove for wear in skateboard activities and the like wherein the risk of falling on hard surfaces is great, comprising:
a front body portion for covering the palms and sides of the hand:
said front body portion being of a wear and tear resistant material and terminating in a lower edge thereof to be disposed below the heel of the palm of the hand;
a thick, impact-absorbing resilient pad secured inside said front body portion to cover a substantial part of the palm including said heel thereof;
a liner of flexible material fully covering said pad and surrounding portion of the inner surface of said body portion and being secured around its outer portions to said inner surface;
a back body portion for covering the back hand of a soft pliant material;
a wide heavy elastic wristband secured along said lower edge to encircle and fully cover the wrist joint; and



means for securing the ends of said wristband together in overlapping relationship to hold said glove front body portion pulled tightly toward the back of the wrist with the pad pressed against the palm so that impact forces are distributed through said pad and body portions to said wristband.

4,071,914

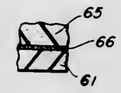
MASTECTOMY PAD

Abe Silverman, Chicago, Ill., assignor to Silveco Products, Inc., Chicago, Ill.

Filed Jan. 26, 1977, Ser. No. 762,940

Int. Cl.[2] A61F *1/00;* **A41C** *3/10*

U.S. Cl. 3—36 **10 Claims**



1. A mastectomy pad comprising
a. a seamless molded outer casing molded of high-loft bonded polyester non-woven fibrous material and having
1. an outer marginal edge portion;
2. an inner or body side panel;
3. a front or outer panel including
a. a generally conical-shaped body portion;
b. the said seamless molded outer casing being adapted to fit into and to be worn in and to fill out the breast cup of a brassiere or garment by a woman who has had a mastectomy operation, and having therein
1. a hollow generally conical-shaped internal cavity and including
4. a tongue portion projecting laterally from the said body portion and which in use is adapted to extend outwardly over the underarm area of the user from which tissue has been removed as an incident to a mastectomy operation;
b. a closed and generally conical-shaped foam rubber internal casing arranged in and enclosed within the said internal cavity in the said seamless molded fibrous material outer casing and including
1. an outer marginal edge portion; and having therein
2. a generally conical-shaped internal cavity;
c. weight means in the form of a body of filler material

arranged in the said generally conical-shaped internal cavity in the said closed foam rubber internal casing; and

d. a protective fabric outer cover arranged over and outwardly of and enclosing the said seamless molded outer casing of fibrous material and having

1. an outer marginal edge portion;

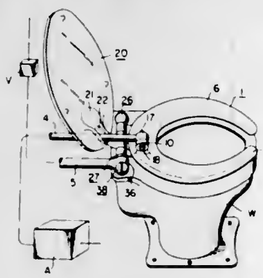
e. the said seamless molded outer casing of high-loft bonded polyester non-woven fibrous material and the said protective outer fabric cover being stitched together along their said outer marginal edge portions outwardly of the said outer marginal edge portion of the said closed and generally conical-shaped foam rubber internal casing.

4,071,915

WATER CLOSET SEAT WARMER AND VENTILATOR

Kuze Kurataro, No. 37-5, 1-chome, Sasazuka, Shibuya, Tokyo, Japan

Filed Aug. 16, 1976, Ser. No. 714,836
Claims priority, application Japan, Jan. 9, 1975, 50-105010
Int. Cl.[2] E03O *9/04*; A47K *13/00*
U.S. Cl. 4—217 **1 Claim**



1. A water closet comprising a closet chamber and a closet seat having wings, said wings having front tip portions and rear portions, said rear portions joined together forming an integral closet seat, said water closet further including right and left mounting means for attaching the rear portion of said wings to said closet chamber, said water closet also including a cover for said closet seat, said mounting means pivotally mounting said cover thereupon, said improvement comprising:

a warm air source;

a vacuum source;

suction passageway means for connecting a plurality of suction ports along said wings, between said tip and said rear portions, with said mounting means;

suction connecting means for connecting, through said mounting means, said suction passageway means with said vacuum source;

closet seat warming means comprising at least one passageway in each wing, from the rear portion of the wing to the front tip thereof, said passageway connected to said suction passageway means at said tip; and

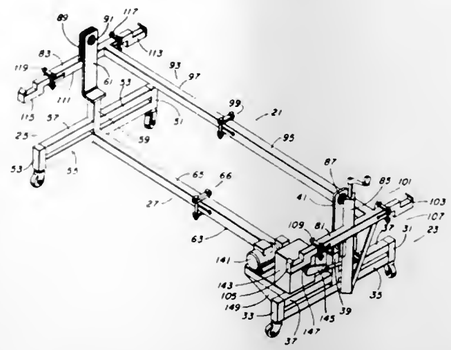
warm connection means for connecting said seat warming means with said warm air source, said warm connection means comprising a pivotal connection between said warm air source and said seat warming means permitting the flow of warm air therethrough regardless of the position of said seat allowing said seat to be quickly warmed while at the same time conducting odors and foul air associated therewith from said water closet chamber through said suction ports and into said vacuum source.

4,071,916

APPARATUS FOR ROCKING A BED

Yvette E. Nelson, Rte. 4, Box 78, Burleson, Tex. 76028

Filed Mar. 17, 1977, Ser. No. 778,687
Int. Cl.[2] A61G *7/00*; A47D *9/02*
U.S. Cl. 5—62 **7 Claims**



1. An apparatus for supporting and rocking a bed or the like, comprising:

base means,

support means having structure for supporting a bed,

said support means being pivotally coupled to said base means for rocking motion about a first axis,

crank means,

drive means coupled to said crank means for rotating said crank means,

guide means pivotally coupled to said base means for rocking motion about a second axis spaced from said first axis,

arm means having a first end pivotally coupled to said crank means,

said arm means having a second end pivotally coupled to said guide means for rocking said guide means about said second axis as said crank means is rotated by said drive means,

coupling means having a first portion coupled to said guide means and a second portion coupled to said support means for rocking said support means about said first axis as said guide means is rocked about said second axis, and

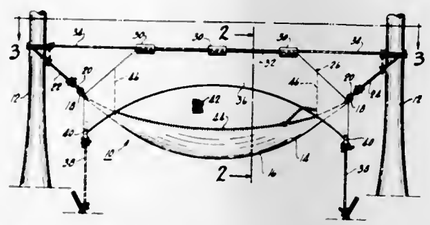
adjusting means for adjusting the position of said coupling means relative to said support means and to said guide means to adjust the angle through which said support means may be rocked about said first axis.

4,071,917

HAMMOCK HAVING CANOPY

Hector Mojica, 831 W. Lincoln Ave., Milwaukee, Wis. 53215

Filed Apr. 12, 1976, Ser. No. 676,110
Int. Cl.[2] A47K *11/02*; E04F *10/00*
U.S. Cl. 5—121 **9 Claims**



1. A hammock comprising:

a rectangular sheet of fabric suitable for supporting a person in the reclining position, said sheet having a first dimension extending between ends of said sheet and a second dimension transverse to, and shorter than, said first dimension, said second dimension extending between sides of said sheet, said supporting sheet being gathered at each of said ends and joinable to ropes for suspending the sheet between spaced anchors;

a canopy over said supporting sheet, said canopy comprising a second sheet of waterproof fabric material, said second sheet having a first dimension extending between ends of said sheet and approximating that of said supporting sheet and a second, transverse dimension exceeding the second dimension of said supporting sheet, said second dimension extending between sides of said second sheet, said second sheet having portions of its ends fastened to said ends of said supporting sheet and similarly gathered, one entire side of said second sheet being attached to one entire side of said supporting sheet, said second sheet having a medial portion supportable above the center of said supporting sheet, and the free side of said second sheet formable, with the portions of said ends of said second sheet not fastened to said ends of said supporting sheet, into an extendable fly; and

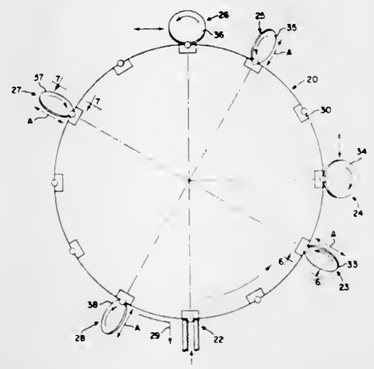
netting joined to said medial portion of said second sheet and selectively joinable to the unattached side of said supporting sheet for permitting access to the hammock.

4,071,918

METHOD OF PRODUCING DRILL SCREWS

Martin Alfred Baer, Niles, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Nov. 8, 1976, Ser. No. 739,897
Int. Cl.[2] B23G *9/00*
U.S. Cl. 10—10 R **6 Claims**



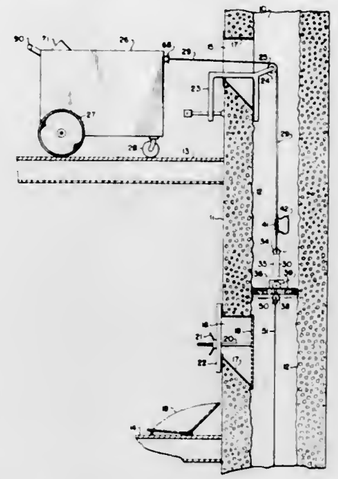
1. In a method of producing screws of the self-drilling variety which includes a pair of oppositely disposed and inclined, relatively long flutes, by intermittently conveying successive screw blanks from a loading station along a single generally circular path for predetermined positioning at successive work stations where rotary cutting operations are performed on selected regions of exposed shank tip portions, including the steps of engaging rotary cutting means, at a work station adjacent the circular path, against a predetermined region of the shank adjacent the tip and forming a first slot portion in the shank, engaging rotary cutting means at another work station adjacent the circular path, against a second predetermined region spaced axially from said first predetermined region and forming a second slot portion in the shank merging with the first slot portion and thereby configuring a single substantially continuous flute in one side of the shank tip of the screw blank.

4,071,919

WASTE CHUTE CLEANING APPARATUS

Cary Lynn Fields, New York, N.Y. 10021; John Anthony Fernandez, 21 Joludow Drive, Massapequa, N.Y. 11762, and Salvatore Cortese, 7809-97th Ave., Queens, N.Y. 11416

Filed Feb. 22, 1977, Ser. No. 770,325
Int. Cl.[2] A46B *13/04*
U.S. Cl. 15—21 R **9 Claims**



1. An apparatus for cleaning waste chutes comprising, in combination, at least a first tank for a cleaning solution, a second tank for an insecticide, a hose containing first and second fluid paths and electric wires, means introducing cleaning solution from said first tank into said first fluid path of said hose, means introducing insecticide from said second tank into said second fluid path of said hose, a current source connected to said wires of said hose, a cleaning head attached to said hose, said cleaning head having an upper spray head connected to said second fluid path of said hose, peripheral brushes below said upper spray head, a vibrator fixed to said spray head and connected to said wires of said hose, and a lower spray head below said brushes connected to said first fluid path of said hose, and means lowering said cleaning head down a waste chute, said lower spray head spraying the waste chute with a cleaning solution as said cleaning head is lowered, said brushes being oscillated by said vibrator cleaning the sprayed chute, and said upper spray head spraying the cleaned chute with insecticide.

4,071,920

SWEEPER

Thomas S. Block, Muskegon, Mich., assignor to Clarke-Gravely Corporation, Muskegon, Mich.

Filed Feb. 4, 1976, Ser. No. 655,060
Int. Cl.[2] A47L *11/22*; E01H *1/04*
U.S. Cl. 15—49 C **17 Claims**

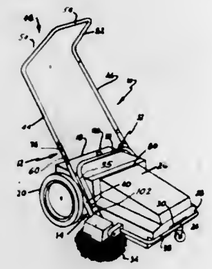
1. A sweeper comprising:

a brush housing;

a generally continuous, tubular member constituting a combined tubular frame and handle, said tubular member including a generally U-shaped integral tubular forward portion having a forwardly located base and rearwardly extending leg portions, said leg portions extending generally horizontally for a portion of their lengths and then being angled upwardly and rearwardly and being joined to said brush housing at said upward and rearward angled portion; said integral tubular forward portion terminating at the ends of said upwardly and rearwardly extending leg portions, at a point generally adjacent said brush housing and joining and blending into an upwardly and rearwardly

extending tubular handle portion, said handle being articulated at said terminating point of said integral tubular forward portion, generally adjacent said brush housing, said handle portion having a lower portion and an upper operator gripping and control portion and further including releasable detent means at said point of articulation whereby said handle can be maintained in a rearwardly extending operable position, but can be released and folded over the top of said brush housing and said dust bin into a stored position, whereby said sweeper can be tipped up and stored on end;

a brush housing secured on each end to said tubular member generally at said juncture of said frame and handle portion of said tubular member;



a pair of ground engaging wheels;

means for rotatably mounting said wheels to said brush housing;

a brush rotatably supported within said brush housing;

forward support means secured to said frame portion of said tubular member for supporting the forward end of said frame portion; and

a dust bin removably supported by resting only on said frame portion of said tubular member and on said brush housing and having an opening at one end and being positioned with said opening adjacent said brush and said brush housing so as to receive debris swept up by said brush.

4,071,921

DISPOSABLE GREASE ABSORBING MITT

Daniel E. Jury, Ulysses, Kans., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Feb. 9, 1977, Ser. No. 766,868

Int. Cl.[2] A41D *19/01*; A47L *13/18*

U.S. Cl. 15—227 **2 Claims**



1. A disposable grease absorbing device, comprising

a pad of grease absorbent material having a pair of spaced opposite surfaces and a bordering edge therearound;

a sheet of liquid-impervious material affixed to the grease absorbent material and covering one of the surfaces thereof;

a sheet of wrapping material larger than approximately half the area of a surface of the pad affixed to approximately half the bordering edge and next-adjacent the liquid-impervious material to form a main pocket leaving an unattached rear portion, said unattached portion being folded over on itself to form a flap having a free line and a strip extending across the liquid-impervious material along the free line of the wrapping material between said liquid-impervious material and the attached portion, said flap being affixed at its ends to the liquid-impervious material along the bordering edge of said liquid-impervious material thereby forming an inner pocket opening into the main pocket formed by the wrapping material and the liquid-impervious material, whereby when placed in grease the grease absorbent material of the device absorbs the grease and the device is then disposable with complete constraint of the grease by folding the pad in half over on itself with half the grease absorbent material abutting the other half thereof, then twisting the main pocket so that it covers the half of the liquid-impervious material previously uncovered thereby and the inner pocket is on the outside and spaced from the liquid-impervious material by said wrapping material at the foldover line of the liquid-impervious material, and then twisting the inner pocket so that it covers a strip of liquid-impervious material along said foldover line and restrains the device in folded condition.

4,071,922

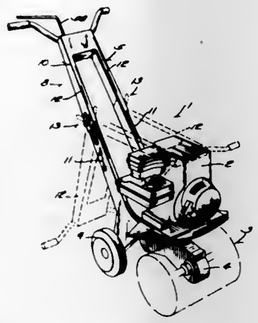
FOLDABLE HANDLE

John W. Davies, III, Plymouth; Edward W. Enters, Fredonia, and Eugene A. DuPas, Plymouth, all of Wis., assignors to Gilson Brothers Company, Plymouth, Wis.

Division of Ser. No. 660,127, Feb. 23, 1976, Pat. No. 4,011,913. This application Mar. 11, 1977, Ser. No. 776,516

Int. Cl.[2] A01B *33/02, 33/08*; B62D *51/04*

U.S. Cl. 16—112 **8 Claims**



1. A foldable handle assembly comprising

a fixed elongated handle portion having a first free end portion;

a movable elongated handle portion having a second free end portion; and

connecting means joining said fixed and movable handle portions and operative to selectively clamp said fixed and movable handle portions against relative pivotal movement in a normal position where the longitudinal axis of said fixed and movable handle portions are aligned and further operative to release said movable handle portion for limited longitudinal movement relative to said fixed handle portion sufficient to release said movable handle portion for pivotal movement relative to said fixed handle portion from the normal position to a folded position, said connecting means including

a blade extension formed as part of one of said first and second free end portions,

an elongated slot in said one of said first and second free end portions and extending parallel to the longitudinal axis of the respective of said fixed and movable handle portions,

a strap on the other of said first and second free end portions and spaced outwardly therefrom for slidably receiving said blade extension thereunder when said movable handle portion is in the normal position,

a lock opening in said other of said first and second free end portions, said slot and said lock opening being aligned when said blade extension is positioned under said strap, and

fastening means extending through said lock opening and said slot and selectively operative to clamp said fixed and movable handle portions in the normal position against longitudinal movement and to free said movable handle portion for sufficient longitudinal movement relative to said fixed handle portion to withdraw said blade extension from said strap while maintaining a connection between said fixed and movable handle portions to afford pivotal movement of said movable handle portion relative to said fixed handle portion from the normal position to a folded position.

4,071,923

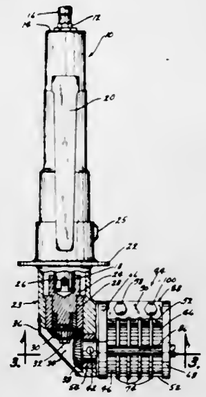
HAND-HELD MEAT SKINNING DEVICE

David W. Smith, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Filed Aug. 4, 1976, Ser. No. 711,584

Int. Cl.[2] A22B *5/16*

U.S. Cl. 17—21 **9 Claims**



1. A hand-held meat skinning device comprising,

an elongated housing having first and second ends,

a motor positioned in said housing,

a skinning blade mounted at said second end of said housing,

a rotatable gripping roll positioned above said skinning blade for gripping the skin being removed from the meat,

means connecting said motor and said gripping roll for causing rotation of said roll,

actuation means on said housing connected to said motor to permit the operator to actuate said motor,

said actuation means comprising a lever pivotally connected to said housing,

and a guard ring extending outwardly from said housing adjacent said second end to prevent actuation of said lever when the device is laid upon a supporting surface.

4,071,924

APPARATUS FOR REMOVING A FOWL FROM A CONVEYOR

Pieter Meyn, Noordeinde 72, Oostzaan, Netherlands

Filed Feb. 9, 1976, Ser. No. 656,827

Int. Cl.[2] A22B *5/00*

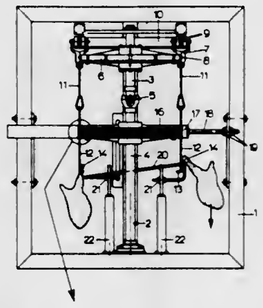
U.S. Cl. 17—24 **4 Claims**

1. An apparatus for removing a fowl from an overhead conveyor traveling along a path which is part of a circle, said conveyor including at least one generally U-shaped conveyor hanger having legs with hooks at its lower end for gripping the fowl's ankle joints, said apparatus comprising a stationary frame;

a stationary guide rail attached to said frame and positioned relative to the path of said conveyor in such a manner that the legs of the fowl carried by said conveyor hanger abut against said guide rail;

clamping means operationally connected with said frame for gripping the legs of said conveyor hanger, and means for moving said clamping means along said path in synchronism with said conveyor;

said guide rail being shaped in such manner that, while being moved along said guide rail, the fowl is tilted away from said conveyor hanger which is gripped by said clamping means, so that the ankle joints of the fowl are lifted out of



said hooks one after the other, said clamping means comprising a horizontal clamping wheel mounted in said frame for rotation about a vertical axis and provided with a toothed outer periphery, and a stationary clamping rail attached to said frame and cooperating with said toothed outer edge for locking the legs of the conveyor hanger therebetween, said clamping rail being concentric with the clamping wheel and extending along a portion of the circumference of said clamping wheel so that the legs of said conveyor hanger can enter between the circumference of said clamping wheel and said clamping rail and be gripped between the teeth at the outer periphery of said clamping wheel and said clamping rail to be held against vertical and radial movement relative to said stationary guide rail.

4,071,925

APPARATUS FOR FORMING TEXTILE LAP

Craig L. Folk, New Orleans, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 25, 1976, Ser. No. 689,772

Int. Cl.[2] D04H *1/00*

U.S. Cl. 19—296 **7 Claims**

1. Apparatus for pressing textile fibers and tufts into lap comprising:

a. means to lodge textile fibers and tufts between two flexible belts;

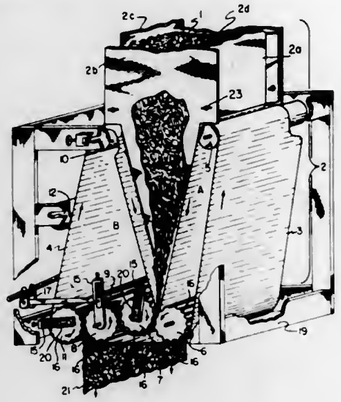
b. means to thereafter pass said belts between first and second fluted rollers, then partially around said second roller, then between said second roller and a third flutted roller, then partially around said third roller, and then between said third roller and a fourth fluted roller,

c. a fifth roller, which is parallel to and adjacent said third roller at a location where said belts pass partially around said third roller, so that said belts pass between said third and fifth rollers,

d. a means to oscillate said fifth roller across the upper periphery of said third roller,

e. means to maintain compression between said second and first rollers,

f. and to maintain compression between said second and third rollers,



g. means to maintain compression between said third and fourth rollers.

4,071,926

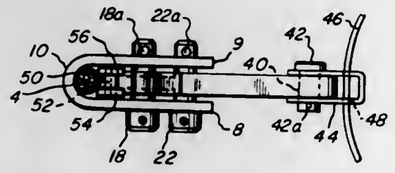
SAFETY DEVICE FOR LADDER CLIMBERS

Robert P. Sweet, and Daniel L. Stember, both of Red Wing, Minn., assignors to D. B. Enterprises, Inc., Red Wing, Minn

Continuation-in-part of Ser. No. 468,568, May 9, 1974, Pat. No. 3,979,797. This application Apr. 26, 1976, Ser. No. 680,281

Int. Cl.² F16G *11/00*

U.S. Cl. 24—136 R **11 Claims**



1. An improved safety device adapted to be secured to a person working at an elevated level and having means to releasably engage an elongated, vertically extending safety carrier such as a cable or rod, if the person falls, comprising:

a clamping bracket having an elongated clamping surface on one side thereof constructed and arranged to bear against one side of an elongated safety carrier on which said bracket is adapted to be slidably mounted in an upright position with said clamping surface extending generally parallel to the safety carrier;

a wedge plate shiftably supported on said bracket and having an elongated clamping side extending substantially parallel to said clamping surface of said bracket in spaced apart relation thereto for the extension of an elongated safety carrier therebetween, the lower end of said wedge plate being freely mounted with respect to said upper end;

a cam follower surface on the upper end of said wedge plate disposed in coacting engagement with a camming member secured to said clamping bracket, with said cam follower surface positioned between said camming member and said bracket clamping surface, and said cam follower surface extending generally upwardly and inwardly towards said bracket clamping surface;

an actuating arm pivotally attached to said clamping bracket for pivotal movement about a horizontal axis and projecting outwardly therefrom away from said bracket clamping surface, the outer, free end of said arm having means thereon for attachment to a workman, and the inner end of said arm being drivingly associated with said wedge plate with the point of pivotal attachment of said actuating arm to said clamping bracket being between the outer, free end of said arm and the location of driving association of the inner end of said arm with said wedge plate whereby the upward pivotal movement of said arm inner end imparts upward movement to said wedge plate, and said cam follower surface being on a portion of said wedge plate above said location of driving association of the inner end of said arm with said wedge plate; and

a camming element on the inner end portion of said actuating arm normally bearing against the lower end portion of said wedge plate at a location outwardly from said clamping side thereof, and below said location of driving association of the inner end of said arm with said wedge plate whereby a downward force generated on the outer end of said actuating arm will pivot the inner end of said arm upwardly, and the driving association of the inner end of said arm with said wedge plate will carry said wedge plate upwardly against said camming member to urge said wedge plate inwardly against a safety carrier, with said camming element serving to simultaneously urge the lower end of said wedge plate inwardly against the safety carrier as the inner end of said arm pivots upwardly.

4,071,927

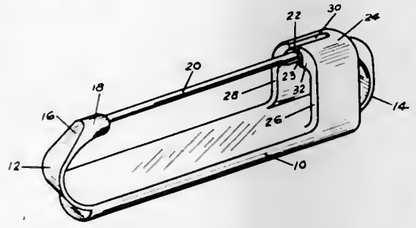
MOLDED SAFETY PIN

Dante Victor Bagnasco, 70 Harbor Hills Drive, Port Washington, N.Y. 11050

Filed Aug. 27, 1976, Ser. No. 718,359

Int. Cl.² A44B *9/10*

U.S. Cl. 24—156 **5 Claims**



1. A safety pin of the character described comprising an elongated strip-like molded base member composed of resilient plastic material having sufficient thickness to provide a comparatively rigid base, said base member at one end merging into a comparatively thin web-like flexible extension tapered in width toward the outer end thereof, a pin extending longitudinally from the tapered end of said extension so that it can be readily biased back over the base member, and a detent extending in a reverse loop from the opposite end of said base member for retaining said pin in closed position when it is moved beneath the detent, said base member also including as a molded part thereof wing-like pin guiding structure extending transversely from the base at opposite sides of the detent to partly enclose and overlie said detent.

4,071,928

SLIDER FOR A CONCEALED SLIDE FASTENER

Kiyoshi Oda, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Japan

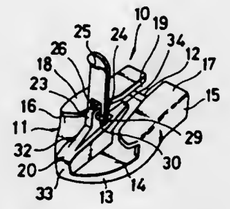
Filed Oct. 22, 1976, Ser. No. 735,053

Claims priority, application Japan, Oct. 31, 1975, 50-149841[U]

Int. Cl.² A44B *19/26*

U.S. Cl. 24—205.1 R **6 Claims**

1. A slider for a concealed slide fastener comprising: a body including a flared front end and a contracted rear end, and having a bottom wall, a pair of side flanges formed on said bottom wall, and a pair of inturned lips extending from said side flanges; an element guide island formed centrally on said bottom wall near the flared front end and cooperating with said side flanges in providing a substantially Y-shaped guide channel for the passage therethrough of a pair of rows of interlocking fastener elements, said island extending in the longitudinal direction of the slide fastener: a support lug provided on said island at one end thereof remote from the flared front end; a one-piece pull tab pivotally supported on said lug



and having means held in engagement with the sides of said support lug and a pull tab rest provided on said island and having a top surface extending longitudinally from said support lug toward the flared front end of said slider body, said top surface being sloped downwardly toward the front end of said island, said pull tab having a flat surface engageable flatwise with the top surface of said pull tab rest when said pull tab is pivoted about said lug downwardly toward the flared front end.

4,071,929

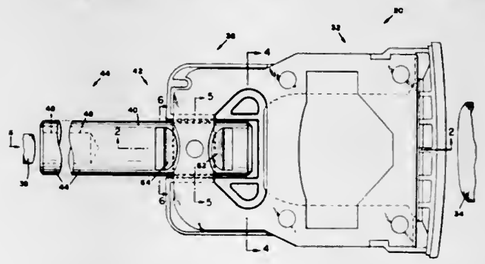
MOUNTING FOR BUCKLE

Yogendra Singh Loomba, Washington, Mich., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed Oct. 14, 1975, Ser. No. 621,971

Int. Cl.² A44B *11/26*

U.S. Cl. 24—230 A **8 Claims**



1. In an apparatus comprising a buckle and a stiff member for anchoring the buckle to a structure, wherein the buckle includes a housing within the buckle, the housing comprising a plurality of laminate plates secured together, including a first plate, a second plate and a third plate; the second plate arranged between the first plate and the third plate; said laminate plates each having an interior opening adjacent a mounting end of said plates; said buckle, housing, first plate, second plate and third plate each having a tongue end at which a tongue is inserted into the buckle and housing a mounting end, an improvement for connecting the buckle to the stiff member comprising:

a ferrule having an elongated shape, a buckle end and a mounting end; means at said buckle end of said ferrule for attaching said buckle end of said ferrule to said buckle; and means at said mounting end of said ferrule for attaching said mounting end of said ferrule to said stiff member;

said means at said mounting end of said ferrule for attaching said mounting end of said ferrule to said stiff member comprising a swagable material at the mounting end of said ferrule, said mounting end of said ferrule having a bore therein for receiving said stiff member, said bore having a cross-sectional configuration which conforms to a cross-sectional configuration of a portion of said stiff member to be positioned in said bore, said bore extending along a central longitudinal axis of said ferrule from said mounting end of said ferrule to a point along the longitudinal axis of said ferrule between said buckle end and said tongue end;

said means at said buckle end of said ferrule comprises: a first flange, a second flange, a first planar surface and a second planar surface; and said first planar surface and said second planar surface are disposed between said first flange and said second flange; said second plate having a slot extending along a longitudinal axis of said second plate from the mounting end to the interior opening of said second plate, said first flange of said ferrule disposed within said interior opening of said plates, said second flange of said ferrule disposed at said mounting end of said plates, said planar surfaces of said ferrule disposed within said slot of said second plate, and said planar surfaces of said ferrule disposed between said first plate and said third plate;

a first portion of said first flange extending into said interior opening of said first plate and a second portion of said first flange extending into said interior opening of said third plate; a first portion of said second flange extending adjacent to said mounting end of said first plate and a second portion of said second flange extending adjacent to said mounting end of said third plate; said first plate and said third plate each having a mounting portion located between their mounting ends and their interior openings; said first portion of said first flange and said first portion of said second flange are each bent toward each other, engaging said mounting portion of said first plate; and said second portion of said first flange and said second portion of said second flange each bent toward each other, engaging said mounting portion of said third plate.

4,071,930

PINCHING CLIP

Toshie Tanaka, Machida, Japan, assignor to Nifco Inc. and Nichiei Bussan Co., Ltd., both of Tokyo, Japan

Filed July 27, 1976, Ser. No. 709,061

Int. Cl.² A44B *27/00*

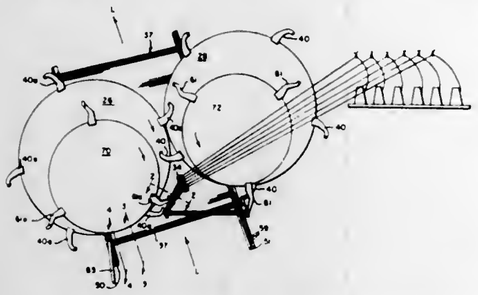
U.S. Cl. 24—252 R **5 Claims**



1. A one-piece plastic pinching clip including a pair of arcuate arms each having a predetermined width and interconnected along adjacent first ends through a hinge portion with the concave sides of said arms facing toward each other, an elastic overcenter spring brace disposed astraddle said hinge portion and integrally connected at each extremity thereof with one of the rear convex sides of said arms, pinching means disposed within said concave sides of said arms, an elongated damping piece extending substantially tangentially from the convex side of each arm along a line positioned intermediate the ends of said arms, operating means extending outwardly from the free end of each arm opposite the adjacent hinged ends whereby an operator can embrace the clip and grasp the operating means between his thumb and forefinger and apply pressure thereto to close said arms against the action of said

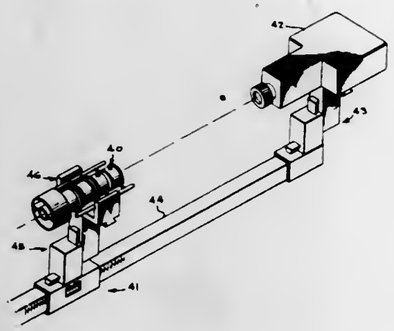
spring brace with the damping pieces riding on the interior of the operator's finger and thumb.

4,071,931
WEB FORMING METHOD
Donald Olcott Niederhauser, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Mar. 31, 1977, Ser. No. 783,455
Int. Cl.² D04H 3/04, 3/05
U.S. Cl. 28—101 **7 Claims**



1. In a method for traversing a strand between two spaced rows of strand-restraining elements moving together in the same direction in the same plane to form a web, each traverse including the steps of feeding the strand from a supply to a location out of the plane of the rows of strand-restraining elements and between them, and thence toward one of the rows, engaging the strand between said location and said strand-restraining elements and moving the strand toward the other row of strand-restraining elements in a transverse plane angled to the plane of the strand-restraining elements while simultaneously moving the strand away from said transverse plane to form a loop in the strand defined by sides and an end, and bringing said loop into a plane substantially parallel to the plane of the strand-restraining elements, the improvement comprising: bringing the end of the loop substantially parallel to said other row and depositing said loop on said other row of strand-restraining elements as soon as the end of the loop moves beyond said other row.

4,071,932
METHOD OF MAKING ELECTRON GUNS FOR CATHODE RAY TUBES AND THE LIKE
Adrian W. Standaart, deceased, late of Winston-Salem, N.C., and by Josephine Benson Standaart, administratrix, 5 Bonbrook Circle, Winston-Salem, N.C. 27106
Filed Oct. 28, 1976, Ser. No. 736,717
Int. Cl.² H01J 9/02
U.S. Cl. 29—25.14 **20 Claims**



1. The method of processing elements of an electron gun assembly for cathode ray tubes and the like to provide precision-shaped, sized, and aligned beam-control apertures in elements thereof, the electron gun assembly in completed form including a cathode, control grid, first anode, focus anode, and accelerating anode elements rigidly assembled in predetermined alignment along a longitudinal reference axis paralleling the axis of one or more electron beams to be generated, shaped, controlled, focused and accelerated thereby and the control grid and first anode elements each comprising a substrate having a substrate aperture therethrough for each electron beam to be formed and including a flat face substantially perpendicular to the beam axis covered with a thin layer of metal overlying at least the portions of said flat face immediately adjacent each said substrate aperture and having a beam-controlling aperture through said layer at each said substrate aperture, comprising the steps of:

a. preforming the substrate aperture in substrates shaped to form said control grid and first anode as oversized apertures relative to the beam-control apertures to be formed in their associated metal layers,

b. forming the metal layers on said substrates as flat metal layers of uniform thickness extending over predetermined areas of a flat face portion of each substrate and uninterruptedly spanning the preformed substrate apertures without any beam-control apertures therein,

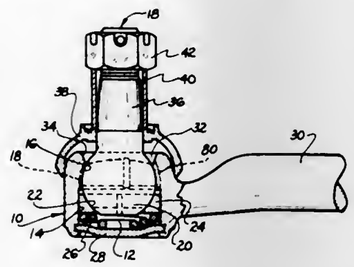
c. assembling such substrates of step (b) for a control grid and first anode on a supporting frame member of the electron gun assembly together with focus anode and accelerating anode elements and without any cathode element assembled therewith to form a skeleton subassembly,

d. mounting the electron gun skeleton subassembly of step (c) on a laser bench assembly having a laser beam source and means for adjusting the position of the electron gun skeleton subassembly with respect to the laser beam two-dimensionally in a plane perpendicular to the laser beam axis and lengthwise along the bench assembly,

e. focusing the laser beam in the metal layer zones spanning the substrate apertures of the control grid and first anode substrates of said skeleton subassembly and directing the laser beam along a predetermined axis to strike such metal layer zones and concurrently form beam-control apertures of desired size, shape and alignment in said layer zones, and

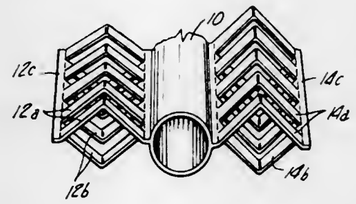
f. assembling the cathode thereon to form the completed electron gun assembly.

4,071,933
METHOD OF FORMING PIVOT JOINT HOUSING
Victor R. McEowen, 379 Pittsfield Drive, Worthington, Ohio 43085
Filed Mar. 3, 1976, Ser. No. 663,273
Int. Cl.² B21D 53/10
U.S. Cl. 29—149.5 B **6 Claims**



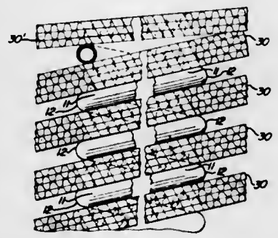
1. The method of making housings for pivot joints comprising in combination, forging an electrically conductive workpiece of carbon steel to form a cup-shaped housing portion including a cavity provided with an inner wall having a bearing wall portion that includes a surface layer of decarbonized metal resulting from said forging; machining said bearing wall portion to remove said layer of decarbonized metal and form a finished bearing surface having a carbon content compatible to induction hardening; mounting said workpiece in a locating fixture means including an inductor electrode disposed in said cavity in close proximity to said bearing surface; and energizing said electrode to heat in a controlled manner to concentrate the heating effect of said electrode on said bearing surface and thereby harden an annular zone at said bearing surface, the metal in the balance of the housing surrounding said zone remaining none hardened, tough and fatigue resistant.

4,071,934
CFT BOX FIN
Junior O. Zolman, and Carl O. Griewahn, both of Adrian, Mich., assignors to Brazeway, Inc., Adrian, Mich.
Filed Oct. 17, 1975, Ser. No. 623,241
Int. Cl.² B23P 15/26
U.S. Cl. 29—157.3 A **7 Claims**



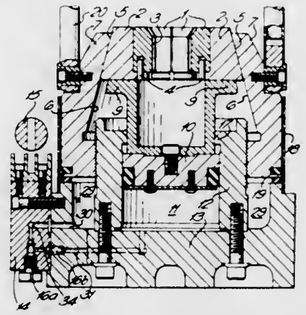
1. A method of manufacturing an integral extruded fin/tube combination wherein the tube forms a fluid conduit and the fin effects a thermal exchange between fluid in the tube and the surrounding environment comprising the steps of: extruding a relatively thin-walled tubular body having at least one radially extending and relatively thin-walled fin integral with the body, and thereafter splitting the fin over its entire length into a plurality of narrow and radially parallel strips which are integral only at the radial extremity thereof and alternately bent into reversely similar peaked configurations exhibiting substantial radial compliance as well as axial bunching and spreading capability whereby the tube/fin combination is both radially dimensionally conformable and easily bent.

4,071,935
METHOD OF MAKING HEAT EXCHANGES
Victor D. Molitor, Denver, Colo., assignor to Stainless Equipment Company, Englewood, Colo.
Continuation-in-part of Ser. No. 602,685, Aug. 7, 1975, abandoned, and a continuation-in-part of Ser. No. 768,152, Feb. 14, 1977. This application Oct. 10, 1975, Ser. No. 621,284
Int. Cl.² B23P 15/26
U.S. Cl. 29—157.3 R **11 Claims**



1. A method of making a heat exchanger, comprising:
inserting layers of deformable mesh having strands between adjacent turns and across the space encompassed by the turns of spaced, connected and generally parallel hollow coils through which a heat exchange liquid is to be passed;
exerting a compression force on said mesh layers toward said coils until the distance between adjacent coils diminishes, and said mesh layers are compressed between said coils and against each other and are deformed into contact with said coils; and
restraining said mesh to maintain the deformed and compressed condition thereof and the compression contact of the deformed strands with the coils to permit conduction of heat along the strands between the coils and the space encompassed by the turns through which a gas is to be passed in a direction transverse to the planes of the respective coils.

4,071,936
CRIMPING APPARATUS
John Lionel Smith, Bedford, England, assignor to Imperial-Eastman (UK) Limited, St. Neots, United Kingdom
Filed Apr. 12, 1976, Ser. No. 675,793
Claims priority, application United Kingdom, Apr. 16, 1975, 15626/75
Int. Cl.² B23P 19/04
U.S. Cl. 29—237 **4 Claims**



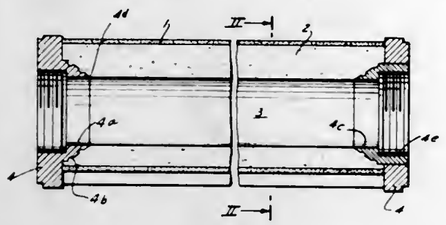
1. An apparatus for crimping a coupling to a hose end which comprises a crimping ring having its inner wall formed as a tapered camming surface, a plurality of circumferentially-disposed crimping dies each having an outer die member having an opposed tapered camming surface for cooperation with the camming surface of the crimping ring and an inner die member releasibly mounted on said outer die member and having a crimping surface for crimping a coupling to a hose end, hydraulic piston and cylinder means for moving the crimping ring or the crimping dies axially relative to one another from a start position to an end position so that cooperation between the camming surfaces causes a transverse movement of the crimping dies inwardly of the crimping ring and parallel to the plane thereof to provide a crimping action, said cylinder having a stop against which said piston will bear during the operation of the apparatus whereby the movable one of the crimping ring and the dies are moved through the same axial distance each time of operation irrespective of the extent of crimp desired, and means for adjusting the relative axial position between the crimping ring and the dies at said start position so as to provide adjustment for the extent of the crimp by a corresponding adjustment of the relative axial position between the crimping ring and dies at said end position.

4,071,937

FILTER CARTRIDGE WITH FOLDED FILTER SHEATH

Rainer Röhlig, Radevormwald, Germany, assignor to Sintermetallwerk Krebsoge GmbH, Radevormwald, Germany

Filed Aug. 10, 1976, Ser. No. 713,226
Claims priority, application Germany, Aug. 14, 1975, 2536276
Int. Cl.² B22F 3/24
U.S. Cl. 29—420 1 Claim



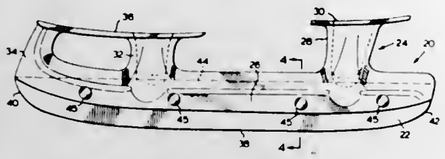
1. A method of making a filter cartridge comprising the steps of:
isostatically pressing sinterable material against a smooth core to form a tubular support body having a plurality of support ribs extending therealong;
isostatically pressing a sinterable filter sheath substantially of constant wall thickness against said support body;
pressing a headpiece onto said support body; and
sintering said sheath, said support body and said headpiece simultaneously to bond them together.

4,071,938

METHOD OF MAKING COMPOSITE SKATE ASSEMBLY

Alan F. Chambers, Agincourt, Canada, assignor to Nylite Skate Company of Canada Ltd., Markham, Canada

Continuation-in-part of Ser. No. 677,577, April 16, 1976, abandoned, which is a division of Ser. No. 608,499, Aug. 28, 1975, abandoned. This application Dec. 20, 1976, Ser. No. 752,055
Int. Cl.² B23P 17/00
U.S. Cl. 29—423 13 Claims



1. A method of forming an ice skate assembly of the type including an elongated steel blade having an upper portion, a lower portion including a skating edge, and ends, and a blade-supporting body of a synthetic plastic material and comprising the steps:
forming a plurality of transverse holes in longitudinal alignment along the length of said blade;
heat treating to harden said blade;
temporarily plugging the transverse holes in said blade;
moulding a blade-supporting body of synthetic plastic material about said upper portion of the blade including said holes such that at least one of said ends of the blade is not covered by the blade-supporting body;
allowing said body and blade to cool after moulding whereby said plastic body may shrink relative to said blade;
unplugging the blade holes so as to provide transverse passages through said body and said blade; and
inserting means in said transverse passages to mechanically interlock said blade and said body.

4,071,939

METHOD OF MOUNTING A HANDLE ON A PAIL

Erik Bock, Slangerup, Denmark, assignor to Superfos Emballage A/S, Denmark

Division of Ser. No. 313,658, Dec. 11, 1972, abandoned. This application Sept. 16, 1976, Ser. No. 723,721
Int. Cl.² B23P 19/00
U.S. Cl. 29—434 2 Claims



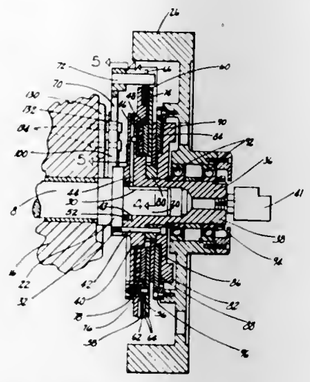
1. The method of mounting the handle into a plurality of pails, said pails comprising means for mounting the handles, said means comprising recesses diametrically opposite to each other at the upper edge of said pails, said recesses being key-hole shaped slots transverse with respect to the axis of the pails, said handles being provided with pins and heads at the ends thereof, said slots comprising a circular section for pivotally mounting the heads of the pins and a tail, which comprises the steps of stacking the pails telescopically, and advancing the handles in a direction transverse to the vertical axis of the pails whereby the pins enter the tail section of said slots and the heads of the pins remain pivotally mounted in the circular section of the slots.

4,071,940

CLUTCH-BRAKE UNIT FOR A PRESS AND METHOD AND JIG FOR INSTALLING THE SAME

Burton W. Hazelton, Kirkwood, Mo., assignor to Hazelton Products, Inc., Valley Park, Mo.

Filed Oct. 29, 1976, Ser. No. 736,898
Int. Cl.² P23Q 3/00
U.S. Cl. 29—468 19 Claims



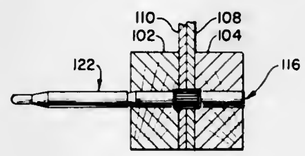
1. A method for installing an air-operated clutchbrake unit on the spindle of a shaft which rotates in a press frame having a boss provided with a flat machined surface that is perpendicular to the axis of the spindle and is located near the spindle, the clutch-brake unit including a mounting hub configured to fit over the spindle and adapted to rotate with the spindle, a brake element located adjacent to the hub, a flywheel adapted to rotate relative to the hub and spindle about an axis coincident to the hub axis, means for coupling the flywheel with the hub, means for urging the brake element against the hub, and a brake anchor having a base and a pin projected from the base and capable of fitting into the brake element; said method comprising: placing a jig over the spindle of the shaft; attaching the brake anchor to the jig, the jig locating the brake anchor in the proper radial position and in the proper angular orientation with respect to the axis of the spindle such as to enable the pin of the brake anchor to project into the brake element; attaching the base of the brake anchor to the frame at the flat machined surface of the boss in said proper radial and angular position determined by the jig; removing the jig from the brake anchor and spindle; installing the mounting hub on the spindle of the shaft; installing the brake element over the hub and fitting it over the pin of the brake anchor; and mounting the flywheel so that it will rotate about the hub axis.

4,071,941

METHOD FOR ASSEMBLYING IMPROVED TRUSS JOIST

LaVern E. Sweet, 6561 Arthur St., Chino, Calif. 91710

Continuation-in-part of Ser. No. 703,040, July 6, 1976, abandoned. This application July 11, 1977, Ser. No. 814,258
Int. Cl.² E04C 3/292; B23Q 3/00
U.S. Cl. 29—468 5 Claims



1. The method of assemblying an improved truss joist comprising the steps of:
first, placing in general alignment apertures in the ends of at least two web elements and an aperture in at least one chord element;
directly driving through all of the aforesaid apertures a cylindrical guide pin with a tapered guiding end and having a flat end opposite its tapered guide end to already force said apertures into complete alignment, the cylindrical portion of said guide pin having approximately the same diameter as that of said apertures;
thereafter, placing a structural pin in a flat, unattached, abutting relationship with the flat untapered end of said guide pin, said structural pin having approximately the same general diameter as that of said apertures and as that of the cylindrical portion of said guide pin; and
subsequently, indirectly driving the guide pin completely out of the aforesaid apertures to that said unattached guide pin moves free of said apertures and said structural pin by directly driving through the aforesaid apertures behind the guide pin said flatly abutting structural pin for permanently securing the web elements to the chord element, the equality of the respective diameters of said apertures, said guide pin, and said structural pin serving to maintain the complete alignment of said apertures during the fastening operation without damaging said web elements or said chord element, and without deforming said apertures.

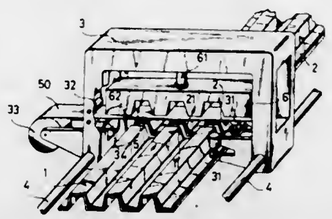
4,071,942

METHOD OF AND DEVICE FOR INTER-CONNECTING INDIVIDUAL PROFILED PLATES TO BE CONNECTED TO EACH OTHER END-TO-END, AND A STRUCTURAL CONNECTION EFFECTED THEREBY

Josef Kowallik, Freudenberg, Germany, assignor to Hoesch Werke Aktiengesellschaft, Dortmund, Germany

Filed Mar. 22, 1976, Ser. No. 668,933
Claims priority, application Germany, Mar. 22, 1975, P 2512759
Int. Cl.² B23P 19/00
U.S. Cl. 29—469.5 4 Claims

1. A method of interconnecting individual longitudinally and identically transversely profiled plates, which includes in combination the steps of: longitudinally aligning end to end two longitudinally and identically transversely profiled plates to be interconnected so that their adjacent end faces at least nearly abut each other and their profiles are in longitudinal alignment with each other, applying a sheet metal piece profiled according to the profile of the plates to be interconnected



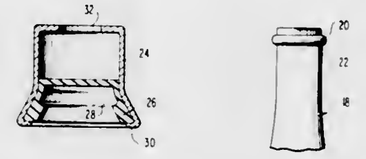
to and across said plates over the area where said plates at least nearly abut each other, pressing said profiled sheet metal piece entirely and vertically into the corresponding profile of the plates to be interconnected transversely, and cementing said profiled sheet metal piece to said plates to be sealingly interconnected by fusion adhesive.

4,071,943

WAX CONTAINER MATERIAL

Larry E. Urbani, Van Cleave, Miss. 39564

Filed Sept. 1, 1976, Ser. No. 719,360
Int. Cl.² C08L 91/00
U.S. Cl. 29—525 4 Claims



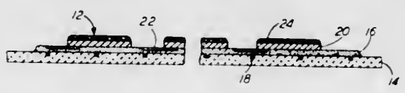
1. A process for providing an abrasion resistant, disposable container for materials comprising the steps of
providing a petroleum wax having a melting point of at least about 160° F., heating said wax above its melting point and blending therewith a resin polymer selected from the group consisting of ethylene-vinyl acetate, polyethylene, and polypropylene, said polymer being present in a concentration of no more than about 10% of said blend; molding said blend to form said container.

4,071,944

ADHESIVELY AND MAGNETICALLY HOLDING AN ARTICLE

John T. Chuss, Whitehall; Henry H. Krechel, Kunkletown, and Joseph R. Purvis, Whitehall, all of Pa., assignors to Western Electric Co., Inc., New York, N.Y.

Filed Oct. 20, 1975, Ser. No. 624,137
Int. Cl.² B01J 17/00
U.S. Cl. 29—574 4 Claims



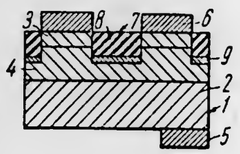
1. A method of holding a wafer of semiconductor material having an array of semiconductor devices formed therein, which comprises the steps of:
adhering the wafer to a magnetized carrier with an adhesive,

the carrier having intersecting sets of parallel grooves and material selected from the group consisting of barrium ferrite, strontium ferrite, alnico, or a mixture of barrium and strontium ferrite;
separating the wafer into individual devices;
screening magnetic ink on the individual devices;
partially curing the ink;
electrically testing the devices;
completing the curing of the ink; and
placing the carrier in trichlorethylene solvent vapor and condensing the vapor to form the liquid solvent thereon, the solvent flowing over the surface and through the grooves in the carrier to rapidly and completely remove the adhesive from beneath the devices while the magnetic forces maintain the location and orientation of the devices on the carrier.

4,071,945
METHOD FOR MANUFACTURING A SEMICONDUCTOR DISPLAY DEVICE

Anatoly Prokofievich Karatsjuba, Zeleny pereulok 3, kv. 56, Ljubertsy-1, Moskovskoi oblasti; Tatyana Georgievna Kmita, Odesskaya ulitsa, 17, kv. 63, Moscow; Igor Ivanovich Kruglov, 15 Parkovaya ulitsa, 46, korpus 1, kv. 35, Moscow; Vladimir Ivanovich Kurinny, ulitsa Vavilova, 58, korpus 2, kv. 90, Moscow; Anatoly Ivanovich Kurnosov, prospekt Mira, 190a, kv. 20, Moscow; Igor Veniaminovich Ryzhikov, 9 Parkovaya ulitsa, 49, korpus 1, kv. 67, Moscow, and Vladimir Vasilievich Judin, Schelkovskoe shosse, 87, korpus 1, kv. 195, Moscow, all of U.S.S.R.

Division of Ser. No. 461,718, April 17, 1974, Pat. No. 3,982,262.
This application July 27, 1976, Ser. No. 709,195
Int. Cl.² B01J *17/00*
U.S. Cl. 29—578 **11 Claims**



1. A method for manufacturing a semiconductor display device, comprising the steps of: forming in an n-type silicon-carbide crystal a diffused p-type region and a diffused region with a luminescence activator disposed between an n-type region and the newly formed p-type region; the formation being effected by way of introducing an impurity into the crystal, followed by the formation of a first ohmic contact attached to the n-type region, and at least one second ohmic contact attached to the p-type region; thereafter bombarding the p-type region with ions of an inert gas in order to produce an additional region of silicon carbide, incorporating clusters of structural radiation defects with a concentration of 10^{19} cm^{-3} to 10^{22} cm^{-3}, at an ion-flow density of $3.1 \cdot 10^{13}$ ion/cm^2·sec to $1.25 \cdot 10^{14}$ ion/cm^2·sec, an ion energy of 10 to 400 keV, and an irradiation dose of $1.2 \cdot 10^{16}$ ion/cm^2 to $6.2 \cdot 10^{17}$ ion/cm^2.

4,071,946
PRODUCTION OF LEAD POWDER FOR TUBE ELECTRODES

Ove Nilsson, Nol, Sweden, assignor to Aktiebolaget Tudor, Sundbyberg, Sweden

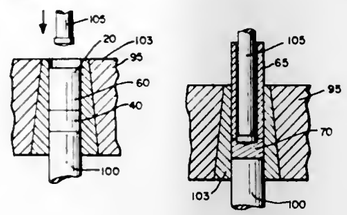
Filed Dec. 17, 1976, Ser. No. 751,886
Claims priority, application Sweden, Dec. 29, 1975, 7514664
Int. Cl.² H01M *4/04*
U.S. Cl. 29—623.1 **2 Claims**

1. In a process for the production of tube electrodes for use in lead storage batteries wherein a sheath is provided about a conductive rod and a dry lead powder is introduced between the sheath and the rod, the improvement which comprises making the lead powder by forming a mixture of lead powder which normally is at least 70% oxidized and from 0.1 to 3 percent by weight of polytetrafluoroethylene, heating the mixture and applying shear stresses to said powder mixture sufficient to convert a substantial portion of said polytetrofluoroethylene into fibrous form.

4,071,947
BIMETAL RESISTANCE WELDING ELECTRODE AND METHOD FOR MAKING

Russell A. Nippert, Delaware, Ohio, assignor to The Nippert Company, Delaware, Ohio

Filed Dec. 13, 1976, Ser. No. 749,983
Int. Cl.² B21C *23/20*; B23K *35/40, 35/22*
U.S. Cl. 29—624 **5 Claims**



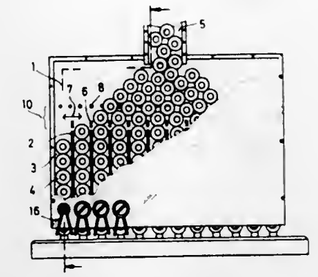
2. A method of making a bimetal resistive welding electrode having a tip portion formed of a dispersion strengthened copper and a shank portion formed of a high conductivity copper, comprising the steps of:
forming a first cylindrical billet of dispersion strengthened copper,
forming a second cylindrical billet of high conductivity copper,
brazing together said first and second cylindrical billets at a temperature which does not anneal said dispersion strengthened copper to form a bimetal cylinder having a first cylindrical portion formed of dispersion strengthened copper and a second cylindrical portion formed of annealed high conductivity copper, and
then extruding said second cylindrical portion of said bimetal cylinder into a hardened shank portion while only partially extruding said first cylindrical portion of said bimetal cylinder thereby forming a full hard bimetal electrode.

4,071,948
APPARATUS FOR DISTRIBUTING ANNULAR WORKPIECES

Klaus Deutzmann, Langenfeld, Germany, assignor to Goetzewerke Friedrich Goetze AG, Burscheid, Germany

Filed Apr. 2, 1976, Ser. No. 672,972
Claims priority, application Germany, Apr. 2, 1975, 2514297
Int. Cl.² B23Q *7/10*
U.S. Cl. 29—809 **5 Claims**

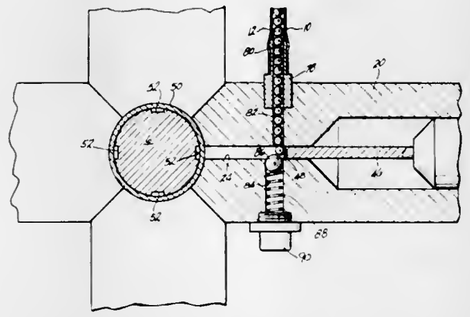
1. Apparatus for distributing annular workpieces onto a plate provided with a plurality of bolts protruding from one surface of the plate, each bolt being arranged to arrest and hold a respective workpiece in proper position, said apparatus comprising: a drop magazine composed of a plurality of individual magazines each for accommodating a plurality of the workpieces with adjacent workpieces in contact with one another at their peripheral surfaces, said individual magazines each having a workpiece inlet end and a workpiece outlet end and all being arranged adjacent one another in a common plane, said drop magazine being oriented at an angle to the one plate surface, and being displaceable relative to the plate in that direction parallel to the one plate surface which corresponds to the direction of inclination of said magazine away from the one plate surface, said drop magazine further including partition means delimiting said individual magazines and separating said individual magazines from one another, said partition means including, at the workpiece inlet ends of said individual magazines, partition members which are pivotal and movable laterally of the length of said individual magazines; and resilient holding means mounted at the end of said drop magazine adjacent the one plate surface for effecting individual release of successive workpieces onto successive bolts.



4,071,949
APPARATUS FUR SECURIN A SPHERICAL BODY TO A SUPPORTING MEMBER

Cecil Jack Ross, and John Fred Thompson, both of El Paso, Tex., assignors to W. R. Weaver, El Paso, Tex.

Filed Dec. 9, 1976, Ser. No. 748,792
Int. Cl.² B23Q *7/10*
U.S. Cl. 29—818 **2 Claims**



1. An apparatus for securing a ball to a relatively thin-walled telescopic sight erector tube, said apparatus comprising:
a. a mandrel for telescopingly receiving and supporting the erector tube during the securing operation, said mandrel having a free end over which the erector tube is moved when mounting and removing the erector tube from said mandrel, said mandrel being provided with at least one longitudinally extending groove formed in its outer surface, said groove extending to said free end of said mandrel;
b. a housing having a first bore therein which opens therefrom at a location directly opposite said mandrel groove, said housing having a second bore for receiving a stack of the balls, said second bore opening into said first bore;
c. means for feeding a succession of balls to said second bore;
d. means in said first bore for allowing only a single ball at a time to enter said first bore from said second bore;
e. moveable ball-setting means disposed in said first bore for reciprocal movement wherein a ball is picked up by said ball-setting means, advanced through said first bore and embeddedly fixed in the erector tube outer surface by said ball-setting means to an extent wherein the erector tube is locally deformed and bent inwardly into said mandrel groove; and
f. actuator means for moving said moveable means through its reciprocal movement cycle.

4,071,950
SCORING TOOL FOR FRANKFURTERS

George O. Telesio, 3760 Hermosa Place, Fullerton, Calif. 92635

Filed Nov. 11, 1976, Ser. No. 741,064
Int. Cl.² A22C *9/00*
U.S. Cl. 30—124 **8 Claims**

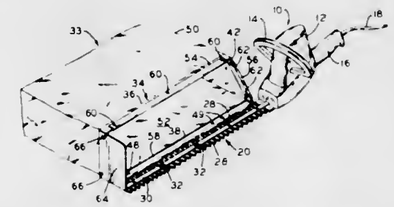


1. A tool for scoring the skin of a frankfurter or the like comprising: a flat plate having a pair of spaced parallel turned down edges spaced a distance at least substantially equal to the circumference of a frankfurter and the like, cutter means secured to and projecting from the surface of the plate and extending between said pair of edges, and handle means attached to the opposite side of the plate from the cutter means.

4,071,951
CLIPPINGS CATCHER FOR A HEDGE TRIMMER

Thagrus A. Burns, 8710 Maravilla Drive, Fort Wayne, Ind. 46805

Filed Apr. 18, 1977, Ser. No. 788,225
Int. Cl.² B26B *19/48*; A01G *3/04*
U.S. Cl. 30—132 **7 Claims**



4. In combination with a hedge trimmer having handle means and a motor driven elongated sickle blade assembly extending in one direction from said handle means, a clippings catcher comprising:
a rigid frame having spaced upper and lower sections and a pair of spaced side sections extending between said upper and lower sections, said frame sections defining a central opening,
said lower section being secured to said blade assembly and being substantially coextensive lengthwise therewith, and
a flexible bag having an opening, said bag being engaged by said frame perimetrically of said bag opening.

4,071,952
KNIFE AND SAFETY CAP

Avram Meshulam, Edison, N.J., and Jerome I. Rebold, Timonium, Md., assignors to CBS Inc., New York, N.Y.

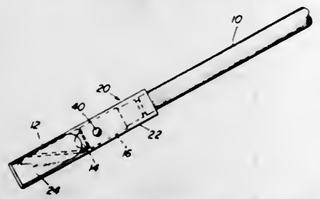
Filed Dec. 17, 1976, Ser. No. 751,906
Int. Cl.² B26B *29/04*
U.S. Cl. 30—151 **5 Claims**

1. In a cutting device having a rod-like handle of substantially uniform diameter for most of its length, and a cutting blade slightly wider than the diameter of the handle secured to one end of said handle by a chuck which includes a knurled sleeve having an outer diameter slightly larger than the diameter of the handle, the improvement consisting of a safety cap

adapted to be firmly held either over the cutting blade or to the other end of the handle, said safety cap comprising:

an elongated tubular housing having a circular cross-section for about one-half its length of a diameter slightly larger than the diameter of said handle and a rectangular cross-section for the remainder of its length, said housing being open at its circular cross-section end and closed at the other end, the width dimension of said rectangular cross-section portion being substantially equal to the diameter of said circular cross-section portion and slightly larger than the width of the cutting blade,

said circular cross-section portion having a plurality of narrow circumferentially spaced inwardly directed longitudi-



nally extending bosses formed on the inner wall thereof, the innermost surfaces of which define a circle having a diameter substantially equal to the diameter of said handle, at least one of which bosses extends radially inward from an elongated flexible tongue formed in and constituting part of the wall of said circular cross-section portion,

said inwardly directed longitudinally extending bosses firmly engaging said knurled sleeve and said rectangular cross-section portion receiving and covering said cutting blade when the safety cap is placed over the cutting blade, and said inwardly extending bosses firmly engaging said other end of the handle when said other end of the handle is inserted in the open end of said circular cross-section portion.

4,071,953

CHAIN SAW GUIDE BAR

Glenn Göran Egon Pantzar, Arsunda, Sweden, assignor to Sandvik Aktiebolaget, Sandviken, Sweden

Filed Jan. 27, 1977, Ser. No. 763,016
Claims priority, application Sweden, Jan. 29, 1976, 7600921
Int. Cl.² B27B *17/04*
U.S. Cl. 30—384 **10 Claims**



1. Chain saw guide bar with a sprocket wheel at its free end and which wheel supports the saw chain and is rotatably journalled on a hub and is surrounded by side plates, the part of the side plates that surrounds the sprocket wheel being formed by embossing of concentric zones (I, II, III), the embossing depth of which provides a gap between the side plate (4, 5) and the sprocket wheel (1), which gap increases with the radial distance from the center (6) of the sprocket wheel.

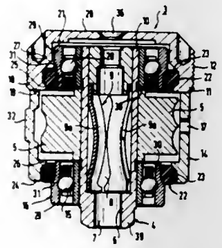
4,071,954

TURBINE INSERT FOR THE HEAD OF A DENTAL TURBINE ELBOW

Eugen Eibofner, Biberach an der Riss, Germany, assignor to Kaltenbach & Voigt, Biberach an der Riss, Germany

Filed Aug. 10, 1976, Ser. No. 713,280
Claims priority, application Germany, Aug. 28, 1976, 2618739
Int. Cl.² A61C *1/10*
U.S. Cl. 32—27 **11 Claims**

1. A turbine insert for insertion into a head-housing of a turbine elbow for dental use comprising: a rotatable axle having two ends and a plurality turbine blades disposed thereon, one of the axle-ends being adapted to receive a dental tool; a threaded cap attachable to the head-housing; support means for receiving said rotatable axle, the other of the axle-ends being rotatably supported in said threaded cap through said support means; and a protective sleeve surrounding said tur-



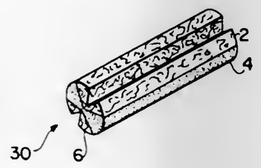
bine blades, formed with an opening for the passage of compressed air for driving the turbine, and at least partially surrounding and rotatably supporting the dental-tool receiving axle-end through said support means, said threaded cap, said rotatable axle and said support means for said axle being combined into a single unit before insertion into said head housing.

4,071,955

HIGHLY ABSORBENT SPONGE

Robert P. Julius, New York, N.Y., assignor to Nice-Pak Products, Inc., Mount Vernon, N.Y.

Filed Apr. 22, 1976, Ser. No. 679,175
Int. Cl.² A61C *5/12*
U.S. Cl. 32—34 **4 Claims**



1. A highly absorbent sponge for use as a dental sponge in oral cavities comprising:

means so less storage space than normal is required when in non-use and yet is greatly expandable during use so as to absorb three to five times the fluid and also to provide greater separation of oral tissues including;

a layer of highly absorbent cellulose sponge material of elongated shape and of sufficient smallness to easily fit within a person's mouth,

means for attachment of at least one layer of woven fabric-like outer material to a plane surface of said sponge material along a longitudinally extending center line thereof,

said layer of woven fabric-like material being substantially lint free so lint will not be left in the oral cavity when in use as a dental sponge,

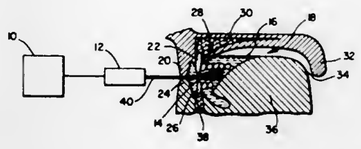
and said longitudinal center attachment means permitting great expansion along the outer edges of both said sponge material thereby providing and said woven-like material for greater separation of the soft oral tissues during use as a dental sponge than the normal cotton roll.

4,071,956

METHOD AND MEANS FOR REMOVING DENTAL PLAQUE BY ULTRASONIC VIBRATIONS

John Barney Andress, 2 Altamira, Borger, Tex. 79007

Continuation of Ser. No. 412,571, Nov. 5, 1973, abandoned. This application Mar. 19, 1976, Ser. No. 668,680
Int. Cl.² A61H *9/00*
U.S. Cl. 32—58 **1 Claim**



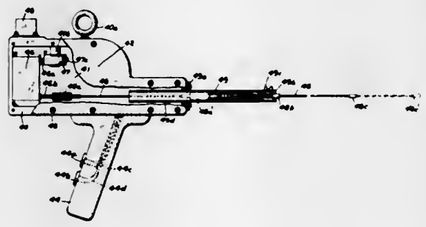
1. A device for removing dental plaque from and from between teeth by employing the oral cavity substantially filled with sufficient liquid to cover and surround said teeth as a resonance chamber for applied ultrasonic vibrations comprising: means for producing electromagnetic signal oscillations in excess of 15,000 Hz (cycles per second); means for transducing said electromagnetic signal oscillations to an ultrasonic frequency vibration; and means for applying said ultrasonic frequency vibrations to said liquid within said oral cavity to induce thereby ultrasonic frequency vibrations and cavitation within said liquid and within said oral cavity whereby said dental plaque may be removed from and from between said teeth by the said ultrasonic frequency vibrations and cavitation induced within said oral cavity and said liquid by said applied ultrasonic frequency vibrations, wherein the said means for applying said ultrasonic frequency vibrations to said liquid within said oral cavity to induce thereby ultrasonic frequency vibrations and cavitation within said liquid and with said oral cavity comprises vibrating means having a parabolic configuration in the horizontal plan corresponding to the general array of teeth in the oral cavity and a radius of curvature in the vertical plane corresponding to the Curve of Spee, and the said vibrating means is adjustable by virtue of having each of the arms of the parabolic configuration pivotable annd rotatable substantially in the horizontal plane about a point at the vertex of said parabolic configuration.

4,071,957

METHOD AND APPARATUS FOR MEASURING CARCASSES

Richard F. Sumption, Portsmouth, and Charles H. Wallace, Carrollton, both of Va., assignors to International Telephone & Telegraph Corporation, Nutley, N.J.

Continuation of Ser. No. 551,879, Feb. 21, 1975, abandoned, which is a continuation of Ser. No. 455,168, March 27, 1974, abandoned. This application Mar. 15, 1976, Ser. No. 666,846
Int. Cl.² G01B *7/02*
U.S. Cl. 33—174 L **10 Claims**



1. Apparatus for measuring carcasses comprising:

a handheld measuring tool for sequentially making length and circumference measurements on a carcass and producing a signal representative of each measurement, said tool including

a tool body and guide nozzle mounted to said body,

a transducer mounted in said body,

a spring biased extendable output cable operatively connected to said transducer on one end and extending through said body passing through said nozzle and having a portion extending to the exterior of said body, said transducer producing a signal proportional to the extension of said cable, end means on said exterior portion of said cable having a cross sectional dimension that is larger than said cable,

means positioned at the outer end portion of said nozzle for engaging and positioning said end means when said cable is extended around a portion of said carcass for determining a circumference measurement;

terminal means coupled to said tool for receiving each said signal and storing a valve representing each measurement; and

said tool having switch control means for controlling sequentially the storage of each said signal in said terminal means when each measurement has been made.

3. A handheld measuring tool for making length and circumference measurements comprising:

a tool body having a cavity therein;

a guide nozzle mounted to said body with a passage into said cavity;

a hand grip mounted to said body for holding said tool in one hand;

a transducer mounted within said cavity and having a biased output cable operatively connected to said transducer on one end, said cable extends from said transducer through said passage in said nozzle and terminating in an end means having a cross sectional dimension that is larger than said cable outside said nozzle, said transducer producing a signal proportionate to the extension of said cable;

the terminal portion of said nozzle including an engagement member positioned and adapted for engaging the end means when said tool is making the circumference measurement; and

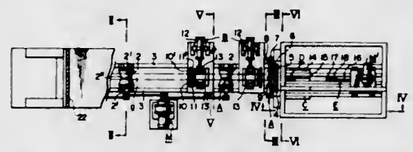
switch means operatively interconnecting said transducer and an output terminal means on said tool positioned for being activated by said one hand when the cable has been extended the amount corresponding to the length or circumference measurement.

4,071,958

DEVICE FOR INSPECTING INNER DIAMETER AND BENDING OF PIPE

Kazuo Morita, Aichi; Seiichi Asano, and Shigeharu Masuma, both of Handa, all of Japan, assignors to Aichi Steel Works, Limited and Kawasaki Steel Corporation, Kobe, both of, Japan

Filed Apr. 2, 1976, Ser. No. 672,956
Claims priority, application Japan, Apr. 4, 1975, 50-45416; Mar. 8, 1976, 51-27246
Int. Cl.² G01B *3/46, 5/12*
U.S. Cl. 33—178 B **9 Claims**



1. A pipe inspection device for inspecting the inner diameter and bending of a pipe by forcing a gauge through the pipe from one end thereof to the other end under the driving force of fluid under pressure, said device comprising

a stopper means swingably movable about an axis into and out of its pipe positioning position,

means for moving said stopper means about said axis,

pipe positioning means including a plurality of rollers, adjacent said stopper means which are driven to displace the pipe placed thereupon so as to bring the pipe into a predetermined inspection position in which one end of the pipe is brought into engagement with said stopper means,

pipe clamping means for clamping securely the pipe in said predetermined inspection position,

a gauge placed on a gauge positioning means near one end of the pipe

gauge firing means including

nozzle means for emitting fluid under pressure mounted for movement toward or away from one end of the pipe in said predetermined inspection position,

said movement of said nozzle means being coaxial of the pipe in said predetermined inspection position,

said nozzle means having such a longitudinal cross sectional configuration that when it moves toward said one end of the pipe, it may insert into the pipe said gauge placed on said gauge positioning means and when it is further moved, it may be brought into fluid-tight contact with said one end of the pipe, whereby the fluid under pressure may be admitted through said nozzle means behind said gauge in the pipe, thereby forcing said gauge through the pipe toward the other end thereof, and

stopper plate means disposed adjacent to the other end of the pipe in said predetermined inspection position for stopping said gauge discharged out of the other end of the pipe and preventing further flying of said gauge beyond said stopper plate means.

7. A pipe inspection device for inspecting the inner diameter and bending of a pipe by forcing a gauge through the pipe from one end thereof to the other end under the driving force of fluid under pressure, said device comprising

a fixed stopper means,

pipe positioning means including a plurality of rollers, adjacent said stopper means which are driven to displace the pipe placed thereupon so as to bring the pipe into a predetermined position in which one end of the pipe is brought into engagement with said stopper means,

carriage means including at least two carriages having a plurality of wheels and a pair of guide rails, said carriages being movable on said guide rails in either direction of the longitudinal axis of the pipe to be adjustable depending upon the length of the pipe,

pipe clamping means for clamping securely the pipe in a predetermined inspection position, said pipe clamping means being mounted on said carriage means,

shift means having at least one shift arm displaced transversely in a plane perpendicular to the longitudinal axis of the pipe on said pipe positioning means and cross feeding the pipe to said predetermined inspection position,

a gauge placed on a gauge positioning means near one end of the pipe,

gauge firing means including nozzle means for emitting fluid under pressure mounted for movement toward or away from one end of the pipe clamped by said clamping means on said carriage means,

said nozzle means having such a longitudinal cross sectional configuration that when it moves toward said one end of the pipe, it may insert into the pipe said gauge placed on said gauge positioning means and when it is further moved, it may be brought into fluid-tight contact with said one end of the pipe, whereby the fluid under pressure may be admitted through said nozzle means behind said gauge in the pipe, thereby forcing said gauge through the pipe toward the other end thereof, and

stopper plate means disposed adjacent to the other end of the pipe in said predetermined inspection position for stopping said gauge discharged out of the other end of the pipe and preventing further flying of said gauge beyond said stopper plate means.

4,071,959

GYRO-STABILIZED SINGLE-AXIS PLATFORM

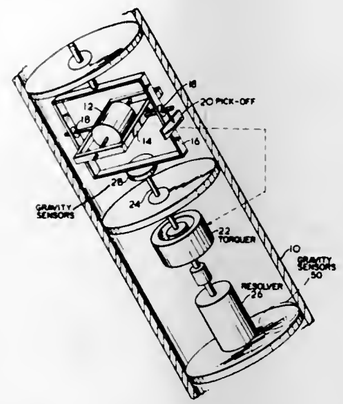
Michael King Russell, Lynworth House, Prestbury, and Anthony William Russell, The Bittams, Crippetts Road, Leckhampton, both of Cheltenham, England

Filed Mar. 23, 1976, Ser. No. 669,518

Claims priority, application United Kingdom, Mar. 26, 1975, 12456/75

Int. Cl.[2] G01C *9/06, 19/00*

U.S. Cl. 33—312 **8 Claims**



1. An instrument for measuring the direction of a borehole comprising a case having a longitudinal axis coincident, in use, with the axis of the borehole, a single-degree-of-freedom gyro comprising an outer gimbal mounted in the case with its axis coincident with the longitudinal axis thereof, an inner gimbal mounted in the outer gimbal with its axis coincident with the outer gimbal axis, a gyro rotor mounted in the inner gimbal, means for sensing angular movement of the inner gimbal relative to the outer gimbal and applying a torque to the outer gimbal to rotate it about its axis so that the inner gimbal precesses back to its initial position, means for measuring the angle of rotation of the case about its longitudinal axis relative to the outer gimbal and a gravity sensor unit for measuring three components of gravity in three non-coplanar directions.

4,071,960

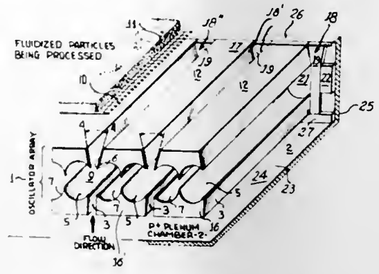
SYSTEM FOR ARTICULATE DRYING AND TRANSPORT

Romald E. Bowles, 2105 Sondra Court, Silver Spring, Md. 20904

Continuation-in-part of Ser. No. 535,118, Dec. 20, 1974, abandoned. This application Nov. 26, 1975, Ser. No. 635,420

Int. Cl.[2] F26B *17/04*

U.S. Cl. 34—57 A **21 Claims**



1. In combination for treating a bed of particulate material, a support for said bed of particulate material, said support being pervious to jets of gas, an array of jet sources underlying said support and directing jets of said gas against said bed, said array comprising plural oscillators, means applying said gas under pressure to all said plural oscillators, each of said oscillators including an interaction region, a discharge nozzle, a power nozzle for issuing a stream of fluid through said interaction region toward said discharge nozzle and at least one resonant chamber located along one side of said interaction region between said nozzles, and phasing means intercoupling said resonant chambers to produce phase coordinated sonic oscillations in said chambers.

4,071,961

DRYING DRUM FOR FLUID MATERIALS

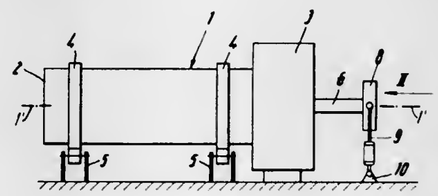
Walter Dietzel, and Siegfried Matusch, both of Braunschweig, Germany, assignors to Braunschweigische Maschinenbauanstalt, Braunschweig, Germany

Filed July 21, 1972, Ser. No. 273,854

Claims priority, application Germany, July 23, 1971, 2136831

Int. Cl.[2] F27B *7/26;* **F26B** *11/02*

U.S. Cl. 34—108 **9 Claims**



1. A drying drum comprising a drum jacket having a rotational axis, roller bearing means for substantially horizontally supporting said drum jacket for location at at least two positions along its length, a drive shaft extending coaxially with the rotational axis of said drying drum, means for securing said drum jacket to said drive shaft, gear drive means coupled to said shaft and mounted to follow non-rotational movements of said shaft whereby said drum and drive means form an integral operational unit, a fixed abutment means, elastically expandable linking rod means connected between said abutment means and said gear drive means for inhibiting rotation of said gear drive means with said shaft while enabling said gear drive means to follow other movements of said shaft, and fixedly mounted motor means and flexible shaft means coupling said motor means to said gear drive means.

4,071,962

ROTARY DRYERS

Walter C. Saeman, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Filed Mar. 29, 1976, Ser. No. 671,173

Int. Cl.[2] F26B *11/04*

U.S. Cl. 34—135 **22 Claims**

1. A rotary dryer for solid material, comprising:

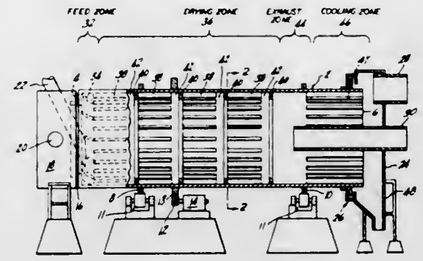
a. a hollow cylindrical shell having an upstream feed end and a downstream discharge end;

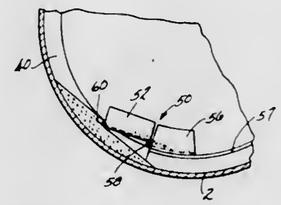
b. at least one set of circumferentially spaced flights;

c. an annular dam ring means, attached to the interior of said shell and projecting inwardly from said shell, said dam ring being spaced from said flights toward the discharge end of said shell, for forcing limited accumulation of a bed of material upstream from and adjacent to said dam ring;

d. a flight-free area in said shell between said flights and said dam ring; and

e. bed depth regulator means, attached to said dryer, for regulating the depth of said bed by transporting a selected portion of said bed of material from said flight-free area





over said dam ring to the downstream side thereof upon rotation of said shell.

4,071,963

VENTILATED FOOTWEAR

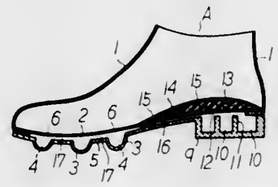
Sadao Fukuoka, No. 3-4, 2-Chome, Shinminamifukushima Tokushima, Tokushima, Japan

Filed Dec. 15, 1976, Ser. No. 750,602

Claims priority, application Japan, Apr. 14, 1976, 51-46240

Int. Cl.[2] A43B *7/06*

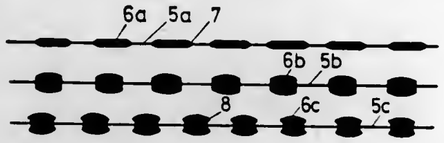
U.S. Cl. 36—3 B **11 Claims**



1. Ventilated footwear comprising: an outer sole having a hollow portion forming an air pumping chamber at the heel portion thereof; an inner sole having a plurality of ventilation holes communicating with said air pumping chamber; a cushion made of resiliently deformable material having continuous air cells of a selected thickness mounted on the upper surface of said inner sole at least at the heel portion thereof; a sheet envelope enclosing said cushion having a plurality of ventilation perforations therein; an outer sole made of resiliently deformable material at the tread surface thereof and having at least one hollow projection extending therefrom forming an internal cavity between the internal surface of said outer sole and the bottom surface of said inner sole, operative as an air distributing chamber; at least one elongated air duct communicating at one end thereof with said air pumping chamber and at the other end thereof with said air distribution chamber, said upper sole having a plurality of ventilation holes respectively facing said projection; whereby the weight of the wearer when applied to said heel portion is operative to close said ventilation perforations and depress said cushion to thereby forcibly propel air from said air pumping chamber through said air duct

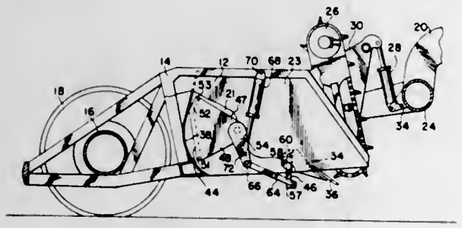
and the weight of the wearer when thereafter applied to the forward area of said inner sole is operative to depress and deform said projection to thereby force air through said ventilation holes into the interior of said footwear.

4,071,964
FOOTWEAR FASTENING SYSTEM
Constantinos Vogiatzis, Flat 1, 92 Lipsett Terrace, Brooklyn Park, S.A. 5032, Australia
Filed May 12, 1976, Ser. No. 685,889
Claims priority, application Australia, June 12, 1975, 13277/76
Int. Cl.[2] A43B *23/00*; A43C *7/00*
U.S. Cl. 36—50 **5 Claims**



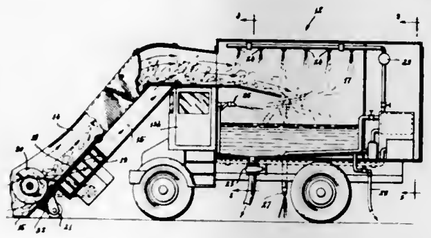
1. A shoe or similar footwear having holes for a lace to fasten the shoe, the lace having over at least the end portions thereof spaced knobs or protrusions adapted to engage in shaped holes or eyelets carried by the footwear to receive the lace with the knobs or protrusions preventing the lace moving through the hole, characterized in that each protrusion on the lace has a resilient lip surrounding that portion of the lace connecting each protrusion, whereby the lip engages around the hole so that the lace is resiliently held even though the tension of the lace varies during flexing of the shoe.

4,071,965
PIVOTED EJECTOR WITH HINGED DOOR FOR EARTHMOVING SCRAPERS
Emil B. Lee, Morton, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Apr. 28, 1975, Ser. No. 572,247
Int. Cl.[2] E02F *3/82*
U.S. Cl. 37—4 **3 Claims**



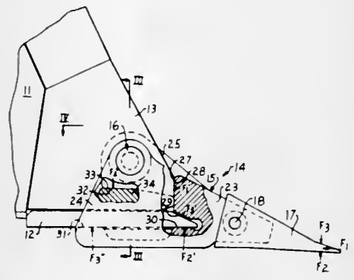
1. In a self-loading scraper having a frame, a bowl supported on said frame and having spaced side walls defining an open front and an open bottom, a cutting blade extending between said side walls and carried on said bowl forward of said open bottom, wheels on said frame, means for raising and lowering the forward part of said bowl to engage or disengage said cutting blade with a layer of soil and a movable bottom on said bowl covering said open bottom and being movable to an open position to dump the soil collected in said bowl, said bottom comprising a first platform and a second platform which platforms when aligned in the closed position lie in a common substantially horizontal plane, means mounting the first platform such that the weight of a portion of the contents in the bowl bearing on said first platform aids in moving both the first and second platforms from the closed to the open position, said means comprising first pivot means carried by the bowl and being connected to said first platform at a forward location on said first platform, said first pivot means being located in a horizontal plane spaced a short distance above said common substantially horizontal plane, whereby said first platform is pivotally mounted offcenter, second pivot means carried by said bowl and being connected to said second platform, said second pivot means being located in a horizontal plane spaced above said common substantially horizontal plane a distance several orders of magnitude greater than the distance between said common substantially horizontal plane and said horizontal plane containing said first pivot means, first link means pivotally connected to said first platform at a rearward location on said first platform, said location of said pivotal connection of said first link means being remote from said first pivot means on said first platform and on the opposite side of the midportion of the first platform from said first pivot means, second link means fixedly attached to said second platform in the vicinity of said second pivot means, said first and second link means being pivotally connected together, and power means mounted on the frame and connected to said second link means whereby actuation of said power means creates a force on the links which when added to the force created by the weight of a portion of the contents of the bowl bearing on the offcenter mounted first platform is sufficient to pivot the first link and first platform downward and out of supporting relationship with said portion of the contents and simultaneously pivot the second link means and the second platform about the second pivot means to pivot the second platform in an arcuate path out of supporting relationship with the remaining contents of the bowl.

4,071,966
APPARATUS FOR REMOVING SNOW FROM ROADWAY
Nathan Cohen, 89 Bradley St., North Haven, Conn. 06473
Filed Nov. 23, 1976, Ser. No. 744,441
Int. Cl.[2] E01H *5/10*
U.S. Cl. 37—12 **1 Claim**



1. In a road vehicle apparatus for removing snow and the like from the surface of a roadway as the apparatus advances along the roadway wherein the apparatus includes a storage chamber for holding the snow taken up by the apparatus advancing on the roadway, the improvement in means for removing the snow from the surface of the road and depositing the removed snow in the storage chamber, said improvement comprising
(a) an elongated first conduit having an intake first opening at one end for receiving the snow from the roadway and a discharge second opening at its opposite end directed to discharge into the storage chamber;
(b) an elongated second conduit mounted on the first conduit having its intake opening connected into the first conduit adjacent the intake opening of the first conduit and its discharge opening adjacent the discharge opening of the first conduit; and
(c) damper means at its intake opening regulating the amount of snow material received from the first conduit.

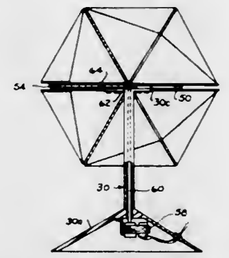
4,071,967
QUICK CHANGE CORNER TOOTH ASSEMBLY FOR LOADER BUCKETS
Gene R. Klett, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Jan. 21, 1977, Ser. No. 761,102
Int. Cl.[2] E02F *9/28*
U.S. Cl. 37—141 T **10 Claims**



1. A work implement comprising
a pair of laterally spaced end walls each defining a surface on a forward edge thereof,
a horizontally disposed cutting edge having a forward edge and extending between said end walls and secured forwardly on said work implement,
a corner tooth assembly detachably mounted on each of said end walls comprising
an adapter having a forwardly extending adapter portion,
an earthworking tip detachably mounted on said adapter portion,
a pair of laterally spaced outer and inner mounting portions formed integrally with said adapter and defining a first slot therebetween and straddling said end wall, whereby said end wall is accommodated in said first slot,
a bottom portion integrally secured to said outer portion and spaced vertically downwardly from said inner portion to define a second slot therebetween, said cutting edge disposed in said second slot,
first force transmitting means, formed rearwardly on said adapter portion, abutting at least one of the forward edges of said end wall and said cutting edge in bearing contact therewith,
second force transmitting means formed on said outer portion and abutting an underside of said cutting edge in bearing contact therewith, and
third force transmitting means formed on an underside of said inner mounting portion and abutting a bearing pad formed integrally on an inboard side of said end wall in bearing contact therewith, and
fastening means extending transversely through said inner and outer mounting portions and through said end wall for detachably mounting said adapter on said end wall.

4,071,968
HEXAGONALLY SHAPED ROTATING DISPLAY WITH TETRAHEDRAL ELEMENTS
Charles J. Polizzi, 3219 Lees Ave., Long Beach, Calif. 90808, and Charles R. DeCola, 10913 National Blvd., West Los Angeles, Calif. 90805
Continuation of Ser. No. 359,347, May 11, 1973, abandoned, which is a continuation-in-part of Ser. No. 182,099, Sept. 20, 1971, abandoned. This application Aug. 3, 1976, Ser. No. 711,290
Int. Cl.[2] G09F *11/02*
U.S. Cl. 40—473 **1 Claim**

1. A mobile substantially hexagonal display comprising, in combination:
a) two groups of three tetrahedran elements each, the faces of each element having substantially the shape of an isosceles triangle, the elements in each group being flexibly hinged together along opposite edges thereof, and the free edges of the outer elements of each group which are substantially at right angles to the hinged edge of their respective element, including at the center thereof, a further hinge defining and rotation receiving means;
b) a supporting bracket having two stationary, spaced apart, arms each with a free end, said arms lying in a common plane and directly engaging, at their free end, the two groups of elements for supporting the elements for relative motion;
c) the six elements presenting, during the course of their relative motion, a changing substantially hexagonal shaped and substantially continuous display surface collectively formed by one face of each of the elements, with adjacent faces of corresponding outer elements in each group lying in a plane each substantially parallel to said common plane when the substantially continuous display surface is formed;

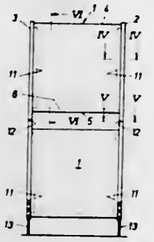


d) pivot means mounted at the free end of each arm, said pivot means being engageable with the further hinge defining and rotation receiving means of the outer elements of each group for effecting thereby the engagement of the arms to the two groups of elements; and
e) drive means engaging the pivot means on one arm for imparting to said pivot means a rotation which is transmitted by said pivot means and through the corresponding further hinge defining and rotation receiving means to one outer element of each group, with the rotation being transmitted by these outer elements to the other elements in each group and to the other pivot means through the further hinge defining and rotation receiving means of the other outer elements, whereby the visible faces of said elements are collectively changed to form said substantially hexagon shaped and substantially continuous display surface.

4,071,969
COLLAPSIBLE DISPLAY ELEMENTS
Harry L. Tonhäuser, Pilgramstrasse 2, 7100 Heilbronn, Germany
Filed June 17, 1975, Ser. No. 587,659
Claims priority, application Germany, Oct. 15, 1974, 7434417[U]
Int. Cl.[2] G09F *1/00*
U.S. Cl. 40—610 **20 Claims**

1. A collapsible display device comprising at least one display carrier means for visibly supporting a displayed article, and at least a pair of separate support means, each arranged at opposite sides of said display carrier means for supporting said display carrier means on a surface, said display carrier means being a tubular member of a flat material, said tubular member having vertical walls defining at least one display surface and having an open end adjacent each of said pair of support means at respective sides of said vertical walls, each of said supporting means including at least one connecting tongue arranged laterally of said tubular open end at respective sides of said

vertical walls, and each of said connecting tongues hingedly connecting said support means to said display carrier means to



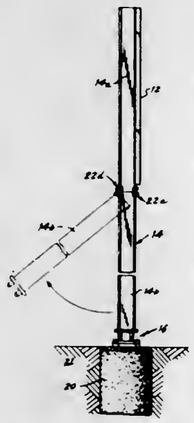
define a foldable connection of each of said support means with said display carrier means.

4,071,970

HINGE PLATE FOR ROADSIDE POST SAFETY BREAKAWAY SYSTEM FOR SIGN PANELS AND THE LIKE

Richard A. Strizki, Ringoes, N.J., assignor to Transpo-Safety, Inc., New Rochelle, N.Y.

Filed Apr. 27, 1976, Ser. No. 680,753
Int. Cl.² G09F *7/18*
U.S. Cl. 40—607 **18 Claims**



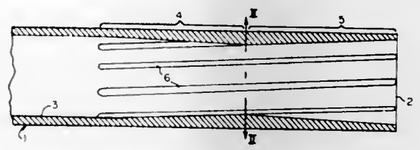
1. A roadside post safety breakaway system for sign panels and the like, comprising a plurality of posts each having upper and lower post portions joined at post cut lines, the sign panel or the like being mounted on the upper post portions proximate to and above said post cut lines; breakaway means for removably connecting said lower post portions to footings embedded in the ground or other supporting surface and for releasing said lower post portions from the footings upon impact therewith by a moving vehicle; and a plurality of hinge plates of substantially planar configuration associated with each post, at least one pair of plates being spaced from each other and disposed on opposite sides of said posts each of said plates being independently fixedly connected to its respective side of said posts and bridging said post cut lines, each hinge plate having a first hinge portion fixedly connected to a respective upper post portion and a second hinge portion fixedly connected to an associated lower post portion to connect associated upper and lower post portions of each post to each other, said first and second hinge portions of each hinge plate being separated by a weakened line portion, the material and configuration of said hinge plate and weakened line portion being selected to cause the hinge plates mounted on the impact side of said posts to rupture substantially in tension only at said weakened line portion while causing the hinge plates mounted on the side of said posts opposite to said impact side to bend, whereby impact by a moving vehicle with a post and severance of said breakaway means severs some of said hinge plates and permits the vehicle to deflect the impacted post about the remaining hinge plates while the post remains attached to the associated upper post portion on the sign panel or the like to prevent secondary collisions with the advancing vehicle or other objects or persons in the immediate collision area.

4,071,971

DEVICE FOR INCREASING AND STANDARDIZING THE SCATTER OF SHOTGUNS, PARTICULARLY FOR SKEET SHOOTING

Olle Tornas, Berghallavagen 8, Jonkoping, Sweden

Filed Apr. 29, 1976, Ser. No. 681,564
Claims priority, application Sweden, May 5, 1975, 7505163
Int. Cl.² F41C *21/00*
U.S. Cl. 42—79 **14 Claims**



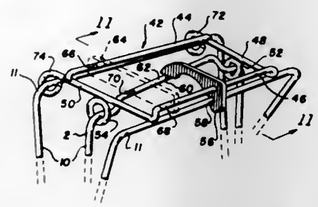
1. A device for increasing and standardizing the scatter of shot pellets discharged from the muzzle of a shotgun barrel having at its breech end a substantially cylindrical contour, comprising converging interior wall means adjacent the muzzle of the gun barrel, a number of grooves in said wall means set at a small angle relative to the geometric axis of the barrel, characterized in that the bottoms of the grooves are on a circle coaxial with and conforming to said cylindrical contour, and the depth of said grooves is greater than the radius of said shot pellets.

4,071,972

FRAME AND FILAMENT TRIGGER FOR ANIMAL TRAPS

Frank Conibear, Victoria, Canada, assignor to Woodstream Corporation, Lititz, Pa.

Continuation-in-part of Ser. No. 479,082, June 13, 1974, abandoned. This application May 6, 1976, Ser. No. 683,655
Claims priority, application Canada, June 12, 1975, 229239
Int. Cl.² A01M *23/26*
U.S. Cl. 43—92 **11 Claims**



1. In an animal trap of the type having similar first and second frames, each frame having sides serving as jaws and ends extending therebetween and which are pivotally connected through adjacent ends for relative rotation between set and closed positions about a common axis, an actuator capable of rapidly and forcefully effecting such rotation, and a mechanism for releasably maintaining the jaws in open, set position, an improved trigger comprising:

a generally U-shaped three-sided trigger frame rotatably mounted at the base thereof to one of said trap frame sides, said trigger frame circumscribing an area equal to a substantial portion of the total area of the passageway through the open, set trap;

a filament having an extremely thin cross-section attached to and spanning the inner area of said trigger frame such that an animal sought to be caught cannot pass through or around said trigger frame without nudging the trigger frame or filament to activate the release mechanism, said filament having a cross-section such that said filament is from substantially invisible to having a cobweb-like appearance;

attachment means for rotatably connecting the trigger frame to one of said trap frame sides, the trigger frame being disposed within the open jaws of the trap for activating said release mechanism to enable the jaws of the trap to close, said attachment means comprising:

a trigger-bearing frame attached to one jaw of one frame of the trap and extending, when the trap is in the open, set position toward the other frame of the trap;

pivotal mounting means for the generally U-shaped, three-sided trigger frame on the trigger-bearing frame, the generally U-shaped, three-sided trigger frame pivoting around a pivotal axis;

a catch pivotally mounted on the trigger-bearing frame remote from the jaw to which the trigger-bearing frame is attached, the catch being adapted to engage the jaw of the trap remote from the jaw to which the trigger-bearing frame is attached and having means to abut the generally U-shaped, three-sided trigger frame; and

abutment means on the generally U-shaped, three-sided trigger frame extending out of the pivotal axis to abut the abutment means on the catch.

4,071,973

METHOD OF ARTIFICIALLY GROWING EDIBLE FUNGI

Chiyokichi Iizuka, 121 Shimizu, and Masaru Takeuchi, 254 Shimizu, both of Noda, Chiba, Japan

Continuation-in-part of Ser. No. 577,006, May 13, 1975, abandoned. This application Mar. 15, 1977, Ser. No. 777,841
Int. Cl.² A01G *1/04*
U.S. Cl. 47—1.1 **4 Claims**



1. A method for artificially growing shiitake or hiratake comprising the steps of setting the edible fungus sporiferous source in a nutrient medium, culturing the inoculated original hypha in a cultivation room at a temperature of from 18° to 20° C and 60% relative humidity wherein the surface of the nutrient medium is illuminated at a luminous intensity of 30 to 50 lux until the hypha become prevalent over the nutrient medium surface, and subjecting the prevalent hypha to a high temperature treatment at between 25° to 32° C for 24 to 48 hours and then to a low temperature treatment at between 5° to 8° for 3 to 5 days, wherein during the high and low temperature treatments of the prevalent hypha the surface of the nutrient medium were illuminated at a luminous intensity of 100 to 120 lux and oxygen is forcibly supplied into a polyethylene sack accomodating the nutrient medium when the medium is taken out together with the sack from a cultivation vessel and dipping the nutrient medium into water at a temperature of from 3° to 6° C for 24 to 48 hours and then placing the hypha in a room at 10° to 16° C having a relative humidity of 90% and recovering the fungus.

4,071,974

THERMAL RETAINING GARDEN WATER BLANKET

Ralph N. Tripp, Jr., 775 Fairacres Ave., Westfield, N.J. 07090

Filed Aug. 2, 1976, Ser. No. 710,560
Int. Cl.² A01G *13/00*
U.S. Cl. 47—2 **4 Claims**



1. In a thermal energy retaining means for use in covering soil adjacent growing plants and having a water tight elongated tubular sleeve enclosure of plastic film with open ends and with support means at opposed ends thereof and being further characterized in that:

a. said support means comprising hanger means at opposed ends of said elongated tubular sleeve and comprising a generally inverted "U" shaped bracket with a pair of generally parallelly disposed spaced apart legs with a first cross-member extending between said legs at the top thereof;

b. a second cross-member slidably coupled to the spaced apart legs of said "U" shaped bracket and extending generally parallel to said first cross-member to form a jaw with said first member when adjacent thereto to receive said elongated tubular sleeve therebetween; and

c. the length of said cross-members being at least equal to the width of said elongated tubular sleeve and being arranged to form a winding core for the opposed open ends of said tubular sleeve for sealing the ends and adjusting the axial length thereof.

4,071,975

METHOD OF PROMOTING THE GROWTH OF PLANTS

Kazunobu Tanaka; Masahiko Kusumoto, and Shoji Watanabe, all of Ohimachi, Japan, assignors to Daicel Ltd., Tokyo, Japan

Division of Ser. No. 561,282, March 24, 1975, Pat. No. 3,991,138. This application Apr. 12, 1976, Ser. No. 676,321
Claims priority, application Japan, Mar. 30, 1974, 49-36402
Int. Cl.² A01G *7/00*
U.S. Cl. 47—9 **10 Claims**

1. A method of promoting the growth of plants which comprises applying to the surface of a plant growth medium to be exposed to a source of ultraviolet radiation a pre-formed light-degradable mulching film for agricultural use, said film being made of a resin composition whose resin components consist essentially of

(1) from 5 to 50 percent by weight of polyisobutylene oxide resin having a reduced specific viscosity of at least about 0.8 dl/g. determined at 120° C in o-dichlorobenzene,

(2) the balance is a second resin component selected from the group consisting of (a) at least one polyolefin resin and (b) a mixture of at least one polyolefin resin and at least one polydiene resin,

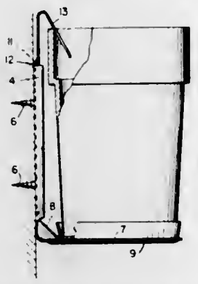
said film being capable of being transformed to a friable or pulverized form by the action of sunlight in from 15 to 90 days.

4,071,976

HOLDING DEVICE

Albert J. Chernewski, Brooklyn, N.Y., assignor to House of Hints Corporation, Brooklyn, N.Y.

Continuation of Ser. No. 556,228, March 7, 1975, abandoned.
This application Apr. 15, 1977, Ser. No. 787,871
Int. Cl.[2] A47G *7/00*
U.S. Cl. 47—39 **3 Claims**



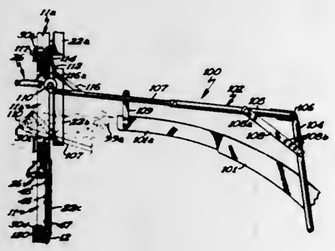
1. A device for mounting and holding a flower pot or the like in spaced relationship to a wall or other vertical surface, said device comprising an L-shaped unit having a vertically extending portion adapted to be secured to the wall or vertical surface through spaced holes arranged centrally thereof and through which screws or the like can pass, the vertically extending portion having its edges inturned to form U-shaped channels of a width leaving said holes exposed, ribs extending along the vertically extending portion underlying the inturned edges and substantially coextensive in length therewith and a horizontally extending portion integral with the said vertically extending portion and provided with ribs on which the flower pot or the like rests, the juncture formed between the vertically and horizontally extending portions having an angularly disposed protuberance strengthening the juncture against downward movement of the horizontally extending portion under the weight of the flower pot or the like and said ribs providing airspace below the bottom of the flower pot or the like, said device also comprising a separate holding member slidable in said channels, having ribs matching with the ribs in the vertically extending portion and an angularly downturned upper end adapted to extend over the top of the flower pot or the like in stabilizing contact therewith, the lowermost edge of the slidable member having a central inverted V-shaped notch for reception of the angularly disposed protuberance and for limiting downward movement of the slidable member.

4,071,977

AUTOMATIC SILO DOOR CONSTRUCTION

Raymond R. Price, Rochester, Minn., assignor to Rochester Silo, Inc., Rochester, Minn.

Filed July 29, 1976, Ser. No. 709,935
Int. Cl.[2] E06B *7/00*; B65G *65/34*; E05C *15/00*; E05F *1/10*
U.S. Cl. 49—70 **41 Claims**



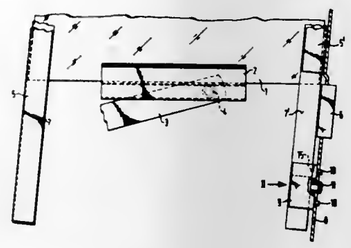
1. Silo door apparatus adapted to be mounted on a silo, said silo comprising at least one silage discharge orifice, said door apparatus comprising:
a door member for selectively blocking a first pre-defined silo door orifice;
door hinge means for revolvably mounting said door member to said silo whereby said door may be moved between closed and open positions;
retractable gun means for selectively opening said door member, said gun means comprising:
a first rigid elongated member;
a second rigid elongated member coupled to said first elongated member and axially movable with respect thereto;
means coupling one of said first and second elongated members to said door member; and
means for biasing one of said first and second elongated members outwardly with respect to the other of said first and second elongated members, thereby urging said door member toward an open position; and
trigger means for selectively activating said gun means when desired to open said door member; and
gun hinge means for revolvably securing said gun means to said silo, said gun hinge means facilitating pivoting of said gun means against a portion of said silo in response to retraction of said gun means whereby said door member is wedged into a closed position firmly abutting said silo door orifice.

4,071,978

WINDOW ARRANGEMENT WITH SLIDING PANE

Hans Rampel, Eicha; Peter Hess, and Herbert Becker, both of Coburg, all of Germany, assignors to Metallwerk Max Brose & Co., Coburg, Germany

Filed July 21, 1976, Ser. No. 707,385
Claims priority, application Germany, Aug. 22, 1975, 2537536
Int. Cl.[2] E05F *11/48*
U.S. Cl. 49—348 **2 Claims**



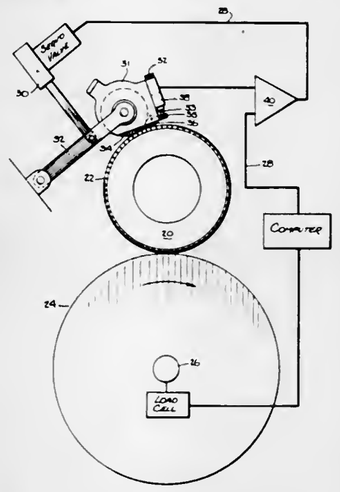
1. A window arrangement comprising:
a. a support;
b. first and second channel members mounted on said support,
1. said channel members being elongated in a common direction and spaced transversely of said direction,
2. a portion of said first channel member projecting beyond said second channel member in said direction;
c. a guide member mounted on said support and defining a guide groove spacedly aligned with said second channel member in said direction and coextensive in said direction with said portion of said first channel member;
d. a compressible, elongated liner member, respective longitudinal sections of said linear member being received in said second channel member and in said groove;
e. barb means projecting from said guide member into said guide groove and engaging said liner member for impeding movement of the liner member toward said second channel member with greater force than movement of the liner member away from said second channel member;
f. a window pane simultaneously received in said channel members; and
g. operating means for moving said window pane in said direction into and out of said guide groove, one of said sections of said liner member being interposed between the window pane and said second channel member and the other section being interposed between said window pane and said guide member when said window pane is in said guide groove.

4,071,979

SENSOR SHOE FOR TIRE GRINDING MACHINE

John Walter Ugo, Warren, Mich., assignor to Uniroyal, Inc., New York, N.Y.

Continuation of Ser. No. 596,868, July 17, 1975, abandoned.
This application Feb. 23, 1977, Ser. No. 771,213
Int. Cl.[2] B24B *5/00*
U.S. Cl. 51—106 R **12 Claims**



1. In a machine for grinding the surface of the tread of a rotating pneumatic tire, said machine having a grinding wheel and a sensor shoe adjacent said wheel for tracking said tread surface and for positioning said grinding wheel substantially adjacent said tread surface, and said tread having a plurality of spaced apart projections forming recesses therebetween, the combination comprising:
a sensor shoe having a tracking surface for contacting said tread surface and for bridging said recesses during rotation of the tire, said tracking surface having a length curved toward said tire whereby greater than one point contact between the tread surface and the tracking surface may be effected; and
means connected to the sensor shoe for positioning said shoe such that optimum contact between the tread surface and tracking surface may be attained.

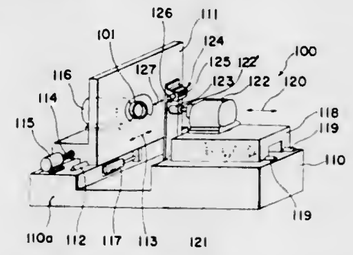
4,071,980

HONING MACHINE PROVIDED WITH A POWER CONTROLLER

Yoshiki Kubo, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Japan

Filed Feb. 28, 1977, Ser. No. 773,117
Claims priority, application Japan, Mar. 1, 1976, 51-22449
Int. Cl.[2] B24B *49/18*
U.S. Cl. 51—165.87 **14 Claims**

1. A honing machine for grinding and polishing a work piece by a grinding wheel slidingly passing along a surface of the work piece to be worked on, said grinding wheel being connected to a grinding wheel driving motor and being sharpened, after predetermined number of grinding operations, through dressing, said honing machine comprising;
(a) a grinding unit including the grinding wheel for carrying out a grinding operation;
(b) the grinding wheel driving motor connected to said grinding wheel;
(c) power adjusting means including power establishing means for establishing a power necessary to run the grinding unit and for producing a first signal indicative of said established power and power detecting means for detecting power consumed in the grinding wheel driving motor and for producing a second signal indicative of the detected power;
(d) a comparator for comparing said first signal with said second signal and for producing a third signal to be fed to grinding unit; and



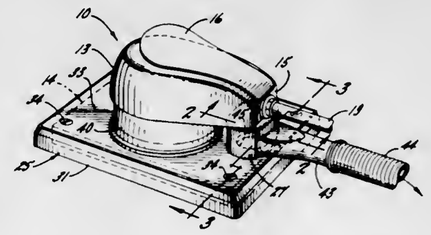
(e) correcting means including diameter detecting means for detecting a degree of change of the grinding wheel diameter and for producing a fourth signal indicative of the detected value, initial diameter setting means for setting the initial diameter of the grinding wheel and for producing a fifth signal indicative of the initial diameter of the grinding wheel and calculation means for calculating, upon receipt of said fourth and fifth signals, a correction value which is in relation to a rate of change of grinding wheel diameter and for producing a correcting signal indicative of the calculated correction value, said correcting signal being provided to said power adjusting means for varying said third signal for controlling said power to be consumed in said grinding unit.

4,071,981

PORTABLE ABRADING MACHINE WITH DUST COLLECTING SYSTEM

Roy J. Champayne, c/o National-Detroit, Inc., 2810 Auburn St., Rockford, Ill. 61103

Filed Dec. 3, 1976, Ser. No. 747,406
Int. Cl.[2] B24B *23/00*
U.S. Cl. 51—170 MT **3 Claims**



1. An abrading machine comprising a hollow case, a rotary motor within said case, an abrading shoe located beneath said case, drive mechanism within said case and connected between said motor and said shoe to cause the latter to move with non-rotary motion relative to said case and said motor, a dust shroud connected to said shoe to move in unison with the shoe, said shroud comprising a top wall located above and spaced

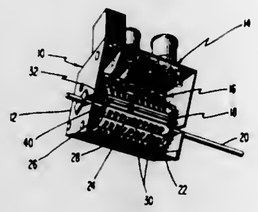
upwardly from the top of said shoe and further comprising a skirt depending from said top wall and extending around the outer periphery of said shoe, said skirt being spaced outwardly from the periphery of said shoe whereby abrading dust may pass into said shroud between said skirt and the periphery of said shoe, a hole extending through said top wall of said shroud, a hollow, downwardly opening fitting rigid with and located outside of said case and communicating with said hole, said fitting being sufficiently large to remain in communication with said hole in all positions of said shoe and said shroud, and means on said fitting for receiving a line for creating suction in said fitting and said shroud whereby abrading dust may be sucked into said shroud and passes through said hole and into said fitting and said suction line.

4,071,982

METHOD AND IMPLEMENT FOR CLEANING SPRING-CONTACTS OF A TUNER

Marvin Linn, 150 Marine Ave., Brooklyn, N.Y. 11209

Filed Dec. 28, 1976, Ser. No. 755,024
Int. Cl.² B24B *19/00, 1/00;* **H03J** *5/00*
U.S. Cl. 51—241 S **4 Claims**



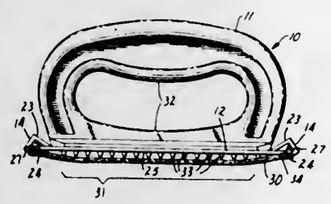
1. A cleaning implement for cleaning fixed spring-contacts of a cylindrical, drum-type tuner having replaceable contact-carrying strips arranged about the circumference of a rotatable drum, comprising:
- a support element in the form of a substantially rectangular sheet of material;
- means on said support element for removably attaching said element to the drum over a contact-carrying strip of the tuner; and
- cleaning means in the form of a layer of abrasive material on said support sheet for engaging and cleaning the fixed spring-contacts of the tuner upon rotation of said drum;
- said attaching means including tabs on said sheet at each end thereof for snap-on engagement with opposite ends of the tuner drum whereby said support element can be snapped over a contact-carrying strip for cleaning.

4,071,983

GRIDDLE CLEANING PAD HOLDER

James E. Thielen, New Brighton, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 21, 1977, Ser. No. 761,250
Int. Cl.² A47L *13/34, 13/46;* **B24D** *15/00*
U.S. Cl. 51—393 **3 Claims**



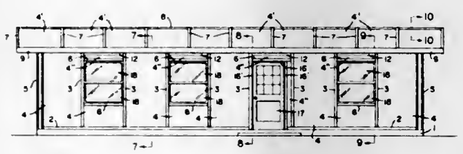
1. A griddle cleaning pad holder for hand use for holding a stiff but resilient griddle cleaning pad, comprising, in combination:
- an elongated flat base plate having an upper face, a lower face, parallel sides, opposite intermediate end portions, and end tab portions on either side of said intermediate end portions projecting from the line defining the extension of said intermediate end portions to said sides and having outer edges defined by the extension of said parallel sides;
- a handle member secured to the upper face of said base plate; and
- a pair of rigid hooks, each of said hooks having a mouth and a shank, one of said shanks being secured to and projecting from each of said opposite intermediate end portions of said base plate, the shanks of said hooks projecting above the plane of said plate toward said handle at an angle between about 20° and 60° with respect to said plate, the mouths of said hooks facing generally inwardly and toward said lower face and being dimensioned to receive and hold opposed edges of a griddle cleaning pad of a size adapted to be accomodated with said opposed edges within said mouths and with intermediate portion of said pad disposed against the lower face of said base plate, and such that, when the exposed face of an engaged pad contacts a griddle surface for use, no part of said hooks contact said griddle surface.

4,071,984

HOUSE ASSEMBLY WITH PREFABRICATED ELEMENTS

Kenneth Larrow, 13100 Belcher Road, Largo, Fla. 33540

Filed Sept. 16, 1976, Ser. No. 723,809
Int. Cl.² E04C *1/00*
U.S. Cl. 52—79.1 **14 Claims**



1. Prefabricated structural materials, comprising in combination:
- a plurality of panels each having an inner core of an insulating material interposed between two sheet materials laminated to said inner core;
- said inner core of insulating material being at least a major portion of the thickness of said panel;
- a plurality of supporting pillars each having one or more linear grooves therein of an appropriate width and depth to embrace and hold the edge portions of said panels;
- first means establishing said plurality of pillars to be spaced relative to adjacent pillars such that the distance between the bases of facing grooves of adjacent pillars is commensurate with the width of said panel;
- a plurality of joists each having one or more linear grooves therein of an appropriate width and depth to embrace and hold the edge portions of said panels;
- said plurality of joists being spaced relative to adjacent joists such that the distance between the bases of facing groove of adjacent joists is commensurate with the length of said panels;
- said plurality of panels being insertable into adjacent facing grooves of said pillars and joists to form a building structure;
- window means including a plurality of window joists extending between first selected adjacent pillars;
- said window means including a plurality of window splines cooperating with said grooves of said window joists and said first selected adjacent pillars;

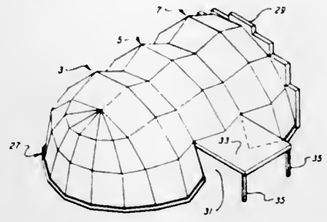
- door means including a door joist extending between second selected adjacent pillars; and
- said door means including a plurality of door splines cooperating with said grooves of said door joist and said second selected adjacent pillars.

4,071,985

ARCH AND BUILDING CONSTRUCTION

Chester F. Wickwire, 90 S. Main St., Homer, N.Y. 13077

Filed Mar. 17, 1976, Ser. No. 667,628
Int. Cl.² E04B *1/32*
U.S. Cl. 52—86 **4 Claims**



1. A building structure comprising a plurality of rigid arches, wherein:
- the arches comprise pairs of wooden panels;
- the pairs of panels each including first and second wooden trapezoidal panels; each of said first and second panels comprising a flat sheet of substantially rigid material having a trapezoidal configuration and including one long parallel side, one short parallel side opposite the long parallel side, and non-parallel sides connecting the ends of said long parallel side with the corresponding ends of the short parallel side, and a plurality of support members extending along the borders of the panel and being substantially perpendicular to the panel; the first and second panels of each pair of panels being contiguous, with the long parallel sides of the first and second panels being in an opposed, abutting relationship; and reinforcing means disposed between said first and second panels; and
- each pair of panels being in an abutting relationship with another of said pairs of panels, with the non-parallel sides of each of said abutting pairs of panels being in an opposed, abutting relationship with each other; the abutting pairs of panels collectively forming the arch; the arch being bounded on its sides by the short parallel sides of the panels forming the arch; and
- said arches being juxtaposed in a side-by-side relationship with the short parallel sides of the arches abutting corresponding short parallel sides in adjacent arches, said arches collectively forming said building structure.

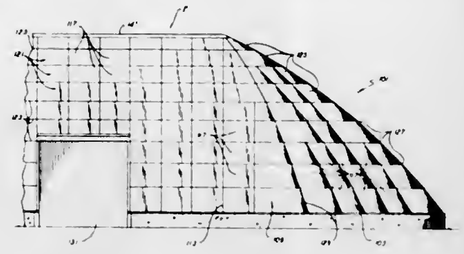
4,071,986

BUILDING STRUCTURE

Chester F. Wickwire, 90 S. Main St., Homer, N.Y. 13077

Filed June 21, 1976, Ser. No. 697,713
Int. Cl.² E04B *1/32*
U.S. Cl. 52—86 **7 Claims**

1. An elongated building structure comprising:
- a pair of flank members disposed in an opposing relationship and being generally identical in configuration and orientation, the flank members having opposing base edges spaced from each other and defining the base span of the structure, upper edges meeting to define a peak of the structure, convex contours each approximately the shape of a segment of a cylinder whose radius of curvature exceeds one half of said base span, and being symmetrical about a central plane including said peak and being perpendicular to ground, and having co-planar end surfaces defining an open end to said flank members, said flank members each comprising:
- a plurality of generally rectangular panels, the panels being disposed in edgewise abutment with adjacent panels at junctures parallel to each other and to ground, the abutting surfaces being bevelled to cause the abutting panels to collectively define an outward convexity in the flanks; said panels including rigid, planar face plate members defining exterior and interior surfaces of said structure, and support walls perpendicular to and bordering the interior surfaces of the face plate members, said support walls having heights at least sufficient to withstand tensile and compressive stresses existing at the respective support walls; and
- an end structure closing the open end of said flank members, said end structure comprising:



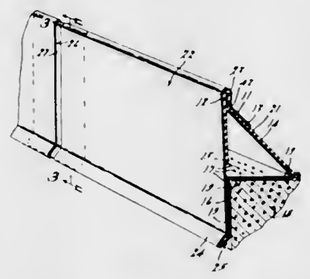
- a set of sections collectively approximating one half of a polyhedron whose cross section is one half of a regular polygon, two of said sections having exterior surfaces extending from the exterior surfaces of said elongated building at said open end towards said central plane, all of said sections being juxtaposed collectively forming a continuous surface connecting the exterior surfaces of said flanks; each of said sections extending from a common juncture at an end of said peak to a base at the ground, and comprising trapezoidal panels and a plurality of rectangular panels, the rectangular panels having generally side walls bevelled to abut corresponding side walls of adjacent panels to provide each section with a convexity generally equal to the convexity of said arches.

4,071,987

GRAVEL STOP

John B. Hickman, Asheville, N.C., assignor to W. P. Hickman Company, Inc., Asheville, N.C.

Filed June 18, 1976, Ser. No. 697,436
Int. Cl.² E04D *13/5*
U.S. Cl. 52—94 **12 Claims**



1. In a spring unit forming a gravel stop at the edge of a roof made of a sheet of spring material having vertical, horizontal and angular portions forming a spring unit with top and bottom edges, means for supporting the unit along the edge of a roof on the horizontal portion with the vertical portion extending downwardly therefrom, the top of the angular portion being moved downwardly when the angular portion is deflected, and

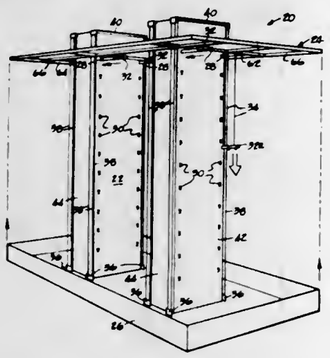
flat fascia members having channel elements along the top and bottom edges which face in opposite directions toward each other, the top and bottom edges of the spring unit extend within said channel elements when the angular portion of the spring unit is deflected downwardly and released to have the top and bottom edges thereof enter the facing channel elements at the top and bottom edges of the fascia members which are supported thereby.

4,071,988

CORE AND BEAM SUSPENSION SYSTEM FOR A BUILDING CONSTRUCTION AND METHOD OF CONSTRUCTION

Peter Bowes, 1700 Civic Center Drive, No. 601, Santa Clara, Calif. 95051

Filed Mar. 29, 1974, Ser. No. 456,004
Int. Cl.[2] E04B *1/34, 1/35*
U.S. Cl. 52—127 **4 Claims**



1. A suspension system for a building construction of the kind in which floors are suspended from a central support, said system comprising,

at least one core support means formed with a plurality of vertically spaced openings for individual floor support beam means,

floor lifting means for lifting each floor from a ground level build-up to the desired height on the core support means, and

floor support beam means associated with related openings in the core support means for supporting a floor directly from the core support means and independently of all the other floors after the floor has been lifted to the desired height, and

wherein the floor lifting means include at least one jack rod support beam on top of the core support means, a plurality of jack rods connected down from the jack rod support beam and lifting jacks associated with the jack rods and connectable to the top of the floor to be raised, and

wherein the core support means include a hollow concrete tower formed by slip forming and having laterally spaced sidewalls with horizontally aligned openings in each sidewall, and

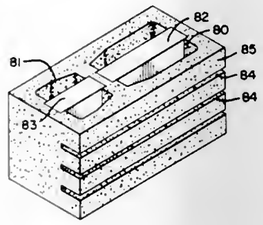
wherein the floor support beam means include a plurality of support beams each longer than the width between the tower side walls and including conveyor beam means for lifting each support beam to a position in alignment with a pair of horizontally aligned openings in the sidewalls and operable to permit the support beam to be pulled from the conveyor beam means and inserted through the aligned openings with outwardly projecting ends for supporting the floor above the installed support beam.

4,071,989

SOUND INSULATIVE MASONRY BLOCK

Millard R. Warren, Knoxville, Tenn., assignor to Warren Insulated Bloc, Inc., Knoxville, Tenn.

Filed Jan. 19, 1976, Ser. No. 650,029
Int. Cl.[2] E04B *1/82*
U.S. Cl. 52—145 **4 Claims**



1. An acoustic construction block comprising:

pairs of opposed side masonry walls and opposed end web walls of masonry forming a cavity therebetween;

an intermediate web wall of masonry disposed parallel to said end web walls and located closer to one end web than the other to divide said cavity into-side-by-side cavity portions of unequal volume;

each cavity portion being bounded at front and rear sides by one of said side walls, with the dimension of each cavity portion from one side wall to the other being substantially equal;

one of said side walls containing apertures extending completely therethrough and opening into said cavity portions so as to transmit sound waves into said cavity portions;

each end wall including an upright channel in its inner surface and said web wall comprising upright channels on both sides thereof; said channels being situated approximately midway between said side walls; and

a first panel of sound insulative material disposed within a larger of said cavity portions, the ends of said first panel being uprightly arranged in said channel of one end wall and one channel of said web wall;

each panel disposed parallel to said side walls and spaced from both of said side walls to form damping chambers on opposite sides of each panel;

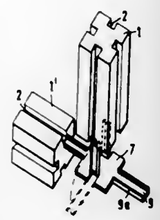
said panels being operable to absorb sound waves and conduct sound waves from one damping chamber to the other.

4,071,990

DEMOUNTABLE FRAME AND PANEL

Fritz Traber, Oberviechtacher Str. 29, 8000 Munich 90, Germany

Filed Jan. 26, 1976, Ser. No. 652,595
Claims priority, application Germany, Jan. 29, 1975, 2503669; Jan. 29, 1975, 2503643
Int. Cl.[2] F16B *7/04*
U.S. Cl. 52—155 **11 Claims**



1. A device for providing erectable and demountable, wall-like structures, using a

mountable and removable arresting device for a foil or a similar thin covering material for making temporary or permanent coverings, encasings, spatial partitions, and the like, comprising:

a plurality of self-supporting, elongated, longitudinally-extending clamping bars, each having a generally rectangular cross-section and having defined therein at least one, open-ended groove, extending in a direction of a longitudinal axis thereof and having ends, said grooves have a generally dove-tailed cross-section which widens in the direction toward the interior of said clamping bar;

a foil of thin covering material;

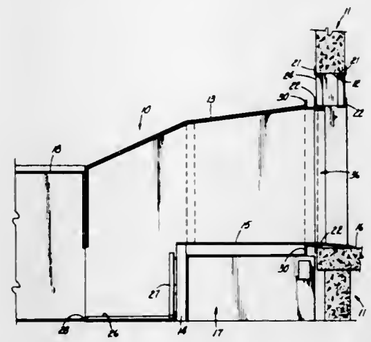
an arresting device including an elastic band over which an end of said foil may be wrapped and which is pressed into said at least one groove of said clamping bars for connecting said foil with said clamping bars, said elastic band being pressed into said groove in a transverse direction to its longitudinal axis, but parallel thereto for holding said foil in tight engagement with said clamping bars; and at least one connection clamping element, including a generally rectangular base plate and at least two self-retaining, elongated strips having bent, lateral edges extending from and connected to said base plate, which are inserted into the ends of said at least one groove for frictional engagement therewith and for connecting said plurality of clamping bars sesurely together, said strips being receivable within said groove generally below said band also received in said groove.

4,071,991

SLIP JOINT FOR DISPOSAL CHUTE

Jeffrey A. Hulligan, North Olmsted, Ohio, assignor to J. P. Suggins Mobile Welding, Cleveland, Ohio

Filed Mar. 28, 1977, Ser. No. 781,638
Int. Cl.[2] B65D *91/00*
U.S. Cl. 52—204 **9 Claims**



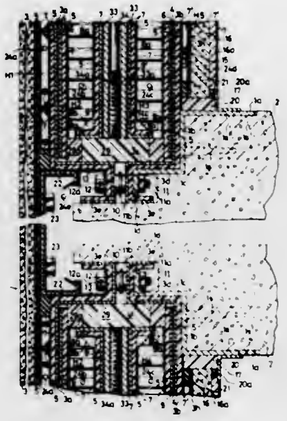
1. In a system for collection of waste materials including a container having a truck engaging means for removing, replacing and emptying the container, said container having an opening, a building having an opening, a chute, and support means for said chute positioned in spaced relation to said building, said building and said support supporting said chute in such a way as to allow slight axial movement of said chute during removal and replacement of said container, an improvement comprising said chute having a first open end, said opening of said container connected to said first open end of said chute, said chute having a second open end substantially smaller than said building opening, said second open end of said chute and said building opening arranged in spaced apart relationship, and seal means enclosing said building opening to said second open end of said chute, said seal means having slip joint means allowing said axial relative movement between said chute and said building opening.

4,071,992

CONSTRUCTION UNIT

Otto Alfred Becker, Robert Koch-Str. 59, D 6600 Saarbrucken, Germany

Filed June 30, 1976, Ser. No. 701,180
Claims priority, application Germany, July 1, 1975, 2529173; Nov. 24, 1975, 2552586; Dec. 31, 1975, 2559342
Int. Cl.[2] E04C *2/36*
U.S. Cl. 52—223 R **26 Claims**



1. A construction unit comprising

(a) outer shell members defining therebetween a cavity,

(b) a support core disposed in said cavity and adapted to subject said shells to tensile stress within the planes of said shells, said support core comprising:

(1) tubular support elements positioned interiorly of said support core and extending parallel to said shells,

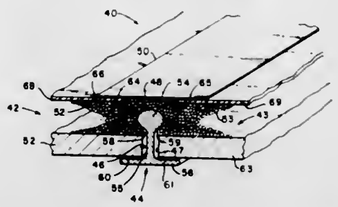
(2) means disposed within and operatively connected to said tubular support elements, said means being adjustable to place said tubular support elements under substantial tensile stress, said stress being transferred to said outer shells through said support core thereby to prestress said shells in the planes thereof.

4,071,993

CONSTRUCTION MATERIAL IN SHEET FORM AND METHOD OF JOINING SHEETS EDGE-TO-EDGE

Sherman A. Stewart, Palos Verdes Peninsula, Calif., and Estel Ray Snyder, La Grange, Ill., assignors to Grefco, Inc., Bala Cynwyd, Pa.

Filed July 6, 1976, Ser. No. 702,966
Int. Cl.[2] E04C *2/10*; E04B *7/00*
U.S. Cl. 52—309.5 **8 Claims**



1. A method of joining and spacing preformed sheets of a construction material each of said sheets having a water-impermeable intermediate foamed layer, a mineral-based interior-facing layer, and a water-impermeable exterior-facing layer, and said sheets also having mitered edges for forming a joint cavity when abutted, each of said mitered edges having an unmitered face and a first mitered face both perpendicular to the plane of said sheets and a second mitered face parallel to

the plane of said sheets, said second mitered face connecting said unmitered face with said first mitered face, said foamed layer being exposed for bonding at said first and second mitered faces, said method comprising the steps of:

a. positioning said sheets with said mitered edges abutting on opposite sides of the stem and bulb of a bulb-T rafter, said sheets being supported by the cross-member of said bulb-T rafter, the corners formed by the intersection of said unmitered and said second mitered faces contacting the lower surfaces of the ball of said bulb-T rafter to space said unmitered faces a predetermined distance from the stem;

b. forming a resilient water-impermeable foamed resinous filler in said joint cavity, said foamed filler filling said joint cavity and substantially capturing the bulb portion of said bulb-T rafter, said foamed material having at least a 30% expansion and contraction capacity, said foamed filler also firmly adhering to, and forming a water-impermeable bond with, said foamed layers of said abutted sheets; and

c. sealing said filled joint cavity with weatherable tape, said sealing tape being of a water-impermeable resilient material and having at least a 30% expansion and contraction capacity, and said tape firmly adhering to, and forming a water-impermeable bond with, said exterior-facing layers of said abutted sheets and with said foamed filler.

4,071,994

EXPANSION JOINT FOR ROOFS AND THE LIKE

Ernst Ammann, Baltenswilerstr. 127, CH-Wallenwil, Switzerland (CH-8360)

Filed July 9, 1976, Ser. No. 704,099

Claims priority, application Switzerland, July 10, 1975, 9057/75

Int. Cl.² E04B *1/62, 1/68*

U.S. Cl. 52—573 **8 Claims**



1. An expansion joint for structures adapted to be exposed to the ambient environment, comprising:

a pair of first sheet-metal strips having confronting longitudinal edges defining a gap between them, said strips having outwardly turned faces on a side of the joint exposed to the environment and inwardly turned faces;

an elastomeric sealing band spanning said gap bonded continuously to both of said strips along the inwardly turned faces thereof and alongside said longitudinal edges, said band forming with said first strips a water-tight seal; and

a second sheet-metal strip bridging said gap and retained by said band against said first strips with freedom of sliding movement between said second strip and said first strips along said longitudinal edges and covering said band along said side of said joint, thereby shielding said band from the environment, said sealing band being vulcanized to said first strips along regions spaced from but parallel to said longitudinal edges, said second strip overlapping each of said first strips along said longitudinal edges.

4,071,995

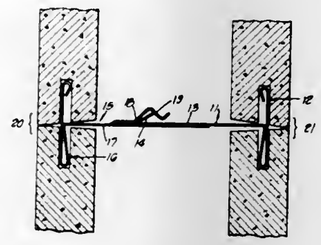
WALL CONSTRUCTION MEMBER

Melville E. Farmer, 2551 Crestview Drive, Newport Beach, Calif. 92660

Continuation of Ser. No. 296,126, Oct. 10, 1972, abandoned. This application Mar. 21, 1974, Ser. No. 453,496

Int. Cl.² E04C *3/32*

U.S. Cl. 52—729 **6 Claims**



1. A wall construction member comprising:

a first generally T-shaped runner having a spline and first and second flanges extending outwardly from the plane of said spline from one end of said spline in opposite directions therefrom;

a second generally T-shaped runner having a spline and first and second flanges extending outwardly from the plane of said spline from one end of said spline in opposite directions therefrom; and

a clip means for securing said spline of said first runner to said spline of said second runner such that said runners are capable of being readily assembled in the vertical assembly direction and also in the horizontal assembly direction, and capable of being readily disassembled in the vertical disassembly direction, and prevented from being readily disassembled in the horizontal disassembly direction,

and wherein said clip means comprises:

a plurality of resilient snap members on said spline of said first runner, spaced along the length of said spline, each of said snap members being attached to said spline along a line substantially parallel to the plane of said first and second flanges of said first runner and being displaced from said spline, extending in a direction generally away from said flanges of said first runner such that said snap member has three edges unattached to said spline, two substantially perpendicular to said attachment line and one substantially parallel thereto, with said snap member having a lip element near its one unattached edge which is substantially parallel to said attachment line, said lip element being adapted to receive and secure a tab member; and

a plurality of tab members on said spline of said second runner and spaced along the length of said spline, each of said tab members corresponding to a different one of said snap members and being attached to said spline along a line substantially parallel to the plane of said flanges of said second runner and being displaced from said spline, extending in a direction generally toward said flanges of said second runner such that said tab member has three edges unattached to said spline, two substantially perpendicular to said attachment line and one substantially parallel thereto, and thereby forms a projection capable of being received by each of said snap members, said projection capable of preventing said first and second runners from being readily disassembled in the horizontal disassembly direction, each of said snap members and corresponding tab members forming an interconnecting clip when said first runner and said second runner are assembled, said first and second runners capable of being readily assembled in the horizontal and vertical assembly directions, and capable of being readily disassembled in the vertical disassembly direction.

4,071,996

PROCESS FOR REINFORCING REINFORCED CONCRETE POST

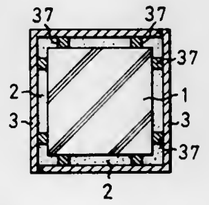
Kiyoshi Muto; Toshihiko Hisada, both of Tokyo; Nobutsugu Ohmori, Chofu; Satoshi Bessho, Tokyo; Naoharu Mori, Yokohama, and Katsuhiko Ishikawa, Tokyo, all of Japan, assignors to Kajima Kensetsu Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 501,995, Aug. 30, 1974, abandoned, which is a continuation of Ser. No. 303,199, Nov. 2, 1972, abandoned. This application Sept. 10, 1975, Ser. No. 612,225

Claims priority, application Japan, Nov. 2, 1971, 46-87488; Nov. 2, 1971, 46-87490; Oct. 6, 1972, 47-101023

Int. Cl.² E04H *9/02*

U.S. Cl. 52—741 **1 Claim**



1. In a pre-existing structurally sound load bearing reinforced concrete post, the method of maintaining the load bearing capacity of said post with bands during earthquake tremors, comprising the steps of:

(a) providing a plurality of band segments,

(b) bonding spacers to said band segments,

(c) securing said segments around said post, thus fitting the spacers to said post,

(d) fastening the segments together, thus completely forming said bands,

(e) vertically spacing apart said bands one from the other along the longitudinal axis of said post,

(f) interposing a hardenable bonding agent between said post and said bands, and

(g) permitting said bonding agent to harden sufficiently to convert said post, bonding agent and bands into an integral structure,

whereby decrease of load bearing capacity of said post is minimized by said bonded bands when said post is subjected to the attrition of flexing and shear due to earthquake tremors.

4,071,997

MECHANISM AND METHOD OF MAKING AN ENVELOPE

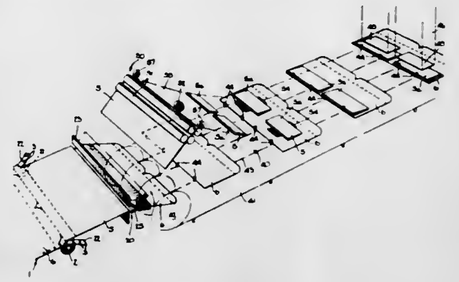
William H. Gunther, Jr., Guilford; Roman M. Golicz, Clinton, and James W. Hough, Madison, all of Conn., assignors to Gunther Business Systems, Inc., Essex, Conn.

Filed Apr. 27, 1976, Ser. No. 680,788

Int. Cl.² B65B *11/48*

U.S. Cl. 53—31 **41 Claims**

29. A method for forming an envelope from a composite sheet which includes an envelope assembly and a letter insert assembly connected together in lengthwise relationship to each other comprising moving said composite sheet in a lengthwise direction, severing said composite sheet widthwise between said letter assembly and said envelope assembly to separate the two assemblies, moving the envelope assembly along one path and moving the letter assembly along another path, positioning the insert assembly in superimposed relationship to the envelope assembly, causing the insert assembly to be deposited on said moving envelope assembly, folding the



envelope assembly around the insert assembly and sealing the edges of the envelope assembly.

4,071,998

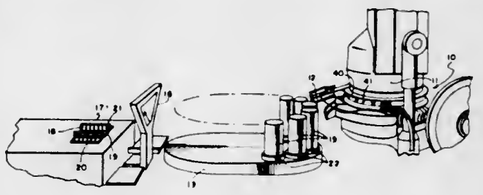
APPARATUS FOR CONTROLLING DISPENSING OF ARTICLES

Floyd G. Meadows, Rte. 2, Box 199A, Mena, Ark. 71953

Filed Nov. 29, 1976, Ser. No. 745,771

Int. Cl.² B65B *57/20*

U.S. Cl. 53—59 R **13 Claims**



1. A system for dispensing a plurality of articles into a plurality of containers comprising, in combination:

a dispensing apparatus including a delivery chute and a rotating member from which a plurality of articles are dispensed in sequence into said delivery chute;

a rotary table adapted to support a plurality of article containers for selective movement pass said delivery chute so that dispensed articles may fall from said delivery chute into said containers;

a movable gate for selectively interrupting the flow of articles from said delivery chute;

means for rotating said rotary table;

count means for counting the number of articles dispensed by said dispensing apparatus in response to the rotational position of said rotating member to provide an electrical control signal when the count of articles dispensed reaches a predetermined number;

means responsive to said electrical control signal to cause said gate to close to interrupt the flow of articles from said delivery chute, and to cause said means for rotating said rotary table to be actuated, and

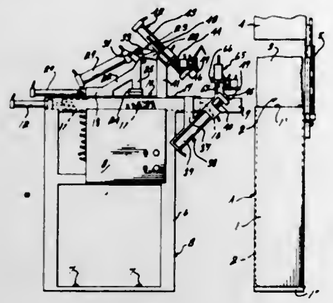
means responsive to the rotational position of said rotary table to stop the rotation thereof when a container is in position to receive articles from said chute, and to cause said gate to open to permit dispensed articles to fall into said container.

4,071,999

MACHINE FOR BAG CLOSING AND SEALING

Jean-Yves Nolet, 70 Dubois Street - R.R. 2, St. Nicephore, Drummond, Canada

Filed Dec. 29, 1976, Ser. No. 755,429
Int. Cl.² B65B *7/06, 51/14*
U.S. Cl. 53—373 **7 Claims**



1. A machine for closing the open mouth of a bag filled with material and supported in an upright position at a bag-closing station, with the walls of the bag mouth extending upwardly from the material filling the bag and defining two opposite end walls and two opposite side walls, said machine comprising a carriage movable in a substantially horizontal path towards and away from the bag-closing station between an advanced and a retracted position, respectively, and including two spaced substantially parallel supports positioned on opposite sides of an upstanding bag at said bag-closing station in the advanced position of said carriage, a pair of hooking means and a pushing means carried by each of said supports, with the pushing means located intermediate the hooking means of the pair and all located on opposite sides of the bag in the advanced position of the carriage and clearing said bag in the retracted position of said carriage, means operable when said carriage is in advanced position to cause said hooking means to engage the four corners of the bag mouth, said pushing means operable to engage the opposite end walls of the bag mouth intermediate the hooking means of each pair to form center folding of said end walls, and means to move the hooking means of each pair downwardly along converging inclined paths in a vertical plane substantially parallel to the associated end wall of the bag mouth to thus lower said hooking means and simultaneously approach the same towards the respective pushing means to allow said side walls to overlie the material filling the bag and to bring said side walls together in bag-closing position while allowing said pushing means to lengthen said center folds as said side walls approach each other.

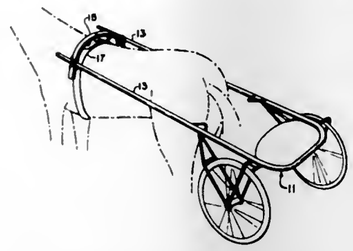
4,072,000

HARNESS RACING HITCH

John E. Clemens, 1460 U.S. 35 East, Xenia, Ohio 45385

Filed Jan. 13, 1976, Ser. No. 648,719
Int. Cl.² B68B *1/00*
U.S. Cl. 54—2 **2 Claims**

1. In a hitch for a racing sulky having a single transverse axle and two forwardly extending shafts for connection to the horse wherein the driver is situated behind the axle, whereby the shafts exert an upward force on the horse, a harness saddle adapted to be positioned on the back of and secured about the body of the horse, a rigid U-shaped yoke overlaying said saddle, said yoke being rigidly connected to both shafts adjacent the ends thereof, and pivotal means for connecting the underside portion of the apex of said yoke to the top of said saddle,



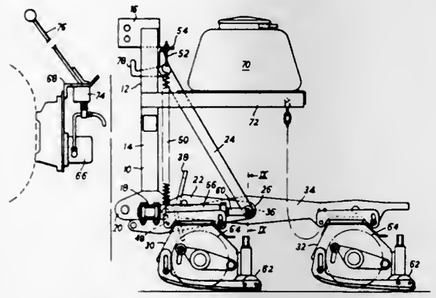
whereby the shafts are secured to the horse only through said yoke.

4,072,001

MOWING MACHINES

Edward John Aldred, Ipswich, England, assignor to Ransomes Sims & Jefferies Limited, England

Filed July 20, 1976, Ser. No. 707,095
Claims priority, application United Kingdom, July 28, 1975, 31513/75
Int. Cl.² A01D *75/30*
U.S. Cl. 56—7 **13 Claims**



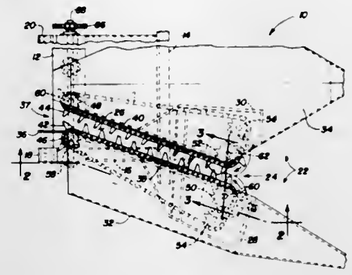
1. A mowing machine comprising a frame adapted to be mounted on a tractor three-point linkage, and a plurality of cutting units connected to said frame, so that in use said cutting units are lifted to a transport position as said frame is raised by the tractor three-point linkage, including at least two laterally spaced side cutting units and a center cutting unit positioned so as, in use, to cut a swath between two swaths cut by said side cutting units, said side cutting units being mounted directly on said frame, so that in use part of the weight of said frame is supported by said side cutting units, and wherein said center cutting unit is mounted on an end of a mounting arm connected to said frame and pivotal at least about a horizontal axis transverse to the direction of travel of the machine, and wherein resilient biassing means are connected between said frame and said mounting arm for increasing the pressure exerted on the ground in use by the center cutting unit and for decreasing the pressure exerted on the ground in use by said side cutting units.

4,072,002

ROTARY SEVERING MECHANISM FOR A ROW CROP HEADER

Larry E. Heller, New Holland; Joe E. Shriver, East Earl, and Curtis H. Lindblom, New Holland, all of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Aug. 11, 1976, Ser. No. 713,469
Int. Cl.² A01D *45/02*
U.S. Cl. 56—53 **4 Claims**



1. An improved rotary severing mechanism for a harvesting machine row crop header including at least one row crop unit having at least one elongated crop passageway for receiving a row of crop, said improved severing mechanism comprising:

(a) first and second rotatably driven shafts disposed on opposite sides of said elongated passageway,

(b) first and second severing elements respectively supported on said first and second shafts, said first and second severing elements extending outwardly from said respective shafts into said passageway to define a severing zone and being operable to sever crop within said severing zone upon predetermined counter-rotation of said shafts,

(c) said first and second severing elements comprising discs having confronting shearing surfaces defined by beveled edge portions disposed for cooperative engagement in said severing zone to sever said crop under conditions where said first and second shafts are counter-rotated, and

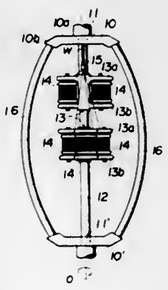
(d) a flat guide element supported on said first shaft below said first and second element, coaxial with said first element and overlapping with said second severing element for promoting orientation of said crop within said severing zone.

4,072,003

DOUBLE TWISTING MACHINE OF FLYER TYPE

Kazuhiko Mino, Iwakuni, Japan, assignor to Teijin Seiki Company Limited, Osaka, Japan

Filed Feb. 1, 1977, Ser. No. 764,733
Claims priority, application Japan, July 19, 1976, 51-95971
Int. Cl.² D01H *7/86, 7/24*
U.S. Cl. 57—58.52 **5 Claims**



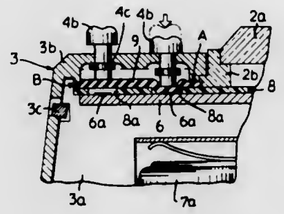
1. A double twisting machine comprising a pair of rotatable fliers, a pair of bow guides formed with a through bore for allowing wire elements to pass therethrough, two pair of guide holders each retained in one end of each of said fliers for holding one end of each of said bow guides, and two pair of shock-absorbing elastic members each interposed between each of said fliers and each of said bow guides through the corresponding one of said guide holders, said guide holders being universally movably connected at an extreme end of each of said elastic members with said fliers to assure smooth swinging motions of said bow guides.

4,072,004

SWITCHING CONSTRUCTION FOR A HANDY ELECTRONIC DEVICE

Kojiro Tanaka, Yachiyo, and Kenjiro Yagi, Tokyo, both of Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Feb. 11, 1976, Ser. No. 657,312
Claims priority, application Japan, Feb. 14, 1975, 50-19230
Int. Cl.² G04C *3/00*
U.S. Cl. 58—23 R **4 Claims**



1. In an electronic timepiece of the type having a digital display device, and electronic circuitry including a printed circuit board having a pattern of printed conductors thereon connected to drive said digital display device: a timepiece casing having said digital display device and electronic circuitry mounted therein; a cover member disposed atop and connected to said timepiece casing; a plurality of depressable key switches mounted on a portion of said cover member at a location overlying and spaced from said pattern of printed conductors; and means coacting with said cover member for both sealing in a water proof manner the region between the cover member interior and the timepiece casing interior and effecting electrical connection between individual ones of said key switches and said pattern of printed conductors when said key switches are depressed.

4,072,005

CLOCK DEVICE

Toru Teshima, Hatano; Takuhisa Ehara, Tokyo, and Kaname Nakanishi, Hatano, all of Japan, assignors to Stanley Electric Co., Ltd., Japan

Filed Jan. 16, 1976, Ser. No. 649,856
Claims priority, application Japan, June 27, 1975, 50-79791
Int. Cl.² G04B *19/22*; G04C *3/00*
U.S. Cl. 58—42.5 **4 Claims**

1. A clock device comprising:

clock means for generating clock signals representative of time;

means for selecting a selected time zone;

a time zone selection circuit for providing signals representative of the selected time zone;

a reference time zone circuit for providing signals representative of a reference time zone;

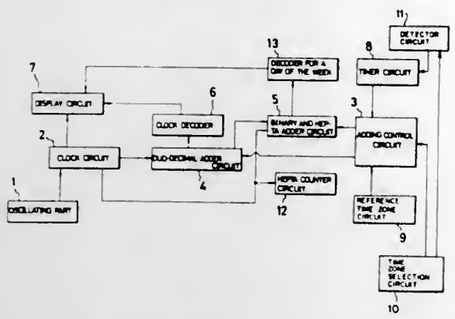
detector means for detecting the selecting of a time zone and for producing an output signal in response thereto;

timer means responsive to the output signal from the detector means for producing an output signal pulse of a predetermined duration;

control means responsive to the output signal from the timer means for selecting between the signals from the time zone

selection circuit and the signals from the reference time zone circuit;

adder means for adding the clock signals and the signals selected by the control means selectively to selectively produce output signals representative of correct time in



the selected time zone and the reference time zone, in accordance with the output signal from the timer means; and

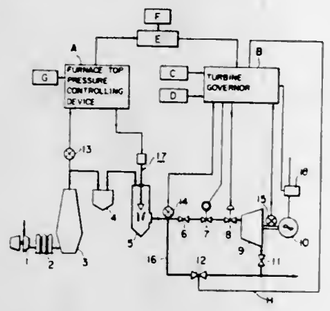
display means responsive to said adder means output signal for displaying the correct time.

4,072,006

CHEMICAL REACTION FURNACE SYSTEM

Masanobu Inubushi; Hajime Yamamoto, and Osamu Nagata, all of Kobe, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed July 16, 1976, Ser. No. 706,108
Claims priority, application Japan, July 19, 1975, 50-88559
Int. Cl.² F02C *9/02*; F02G *3/00*
U.S. Cl. 60—39.25 **6 Claims**



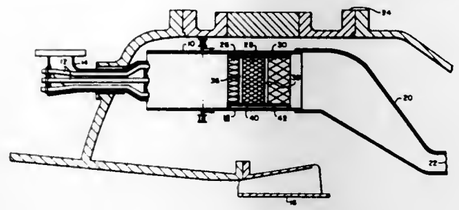
1. A chemical reaction furnace apparatus having a reaction furnace (3), a reaction gas main flowpath for conducting reaction gas away from the top of the reaction furnace, and a reaction gas scrubbing device (5) installed in said main flowpath and being adapted to control the presence of the reaction gas in the top of the reaction furnace, said apparatus comprising: an expansion turbine (9) provided in the gas main flowpath downstream from said scrubbing device (5) and being operable to utilize energy in the reaction gas; a gas bypass flowpath (16) branched from said main flowpath at a point between said scrubbing device (5) and said turbine (9) and bypassing the turbine; a bypass valve (12) disposed in said bypass flowpath; a turbine inlet pressure detector (14) for detecting inlet gas pressure of the turbine; a turbine speed regulating valve (8) installed in said main flowpath between said detector (14) and said turbine (9); and a turbine governor (B) receiving a signal from said detector (14) to control said turbine speed regulating valve (8) for maintaining the inlet gas pressure of the turbine at the highest possible value at which the scrubbing performance of said scrubbing device (5) can be maintained.

4,072,007

GAS TURBINE COMBUSTOR EMPLOYING PLURAL CATALYTIC STAGES

Santiago C. Sanday, Swarthmore, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 3, 1976, Ser. No. 663,338
Int. Cl.² F02C *7/22*
U.S. Cl. 60—39.69 A **5 Claims**



1. In a gas turbine including a combustor of the catalytic reactor type having a shell containing catalytic element means intermediate the upstream part of the shell to which combustion air and fuel is admitted, and the downstream part of the shell which joins a transition section to pass combustion gas to the turbine, wherein the improvement lies in:

the catalytic element means comprising at least two cross-flow honeycomb type structures having a multiplicity of catalyst coated flow passages, one series of flow passages extending in crossing relation to another alternating series of flow passages, and both series of flow passages extending in oblique relation to the longitudinal axis of said shell, so that the combustion gas from different radial locations in a cross section upstream from said catalytic element means is shifted to other radial locations in passing downstream, to promote temperature uniformity of the gas in a radial direction throughout the cross section of the combustor, successive ones of said cross-flow catalytic element means are provided in axially-spaced relation in said shell, with the transverse cross section of the shell between said successive ones being unobstructed in the sense of accommodating axial flow throughout a cross sectional area at least equal to the cross sectional area of said catalytic element means, and being devoid of means for transferring heat out of said shell.

4,072,008

VARIABLE AREA BYPASS INJECTOR SYSTEM

Milton James Kenworthy, Cincinnati, and Ivan Elmer Woltmann, West Chester, both of Ohio, assignors to General Electric Company, Lynn, Mass.

Filed May 4, 1976, Ser. No. 682,951
Int. Cl.² F02K *3/08, 3/06*; F02C *3/06*
U.S. Cl. 60—261 **11 Claims**



1. An improved gas turbine engine of the type having an inlet for supplying a gas flow to a core engine, duct means for bypassing a portion of the inlet gas flow around the core engine, a mixer for injecting the bypass stream into the core engine exhaust stream, an augmentor for receiving the mixed streams and directing them to an exhaust nozzle and an annular passage circumscribing the augmentor to provide cooling flow thereto wherein the improvement comprises:

a Variable Area Bypass Injector (VABI) including means for varying the cross-sectional area through which the bypass stream is injected into the core engine exhaust stream whereby the static pressure of the bypass stream may be matched to the static pressure of the core engine exhaust stream prior to mixing the two streams and further including means for selectively obtruding cooling flow to the augmentor, and

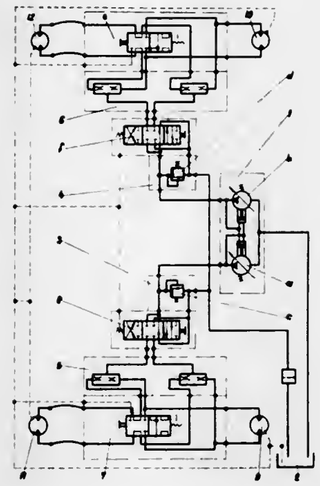
wherein said means for selectively obtruding cooling flow to the augmentor is formed as a structural part of, and moves concurrently with, the means for varying the cross-sectional area through which the bypass stream is injected into the core engine exhaust stream.

4,072,009

PRESSURE SYSTEM FOR DRIVING THE WHEELS OF A VEHICLE

Stefan Daschievici, and Cezar Ferat, both of Braila, Romania, assignors to Institutul de Cercetari si Proiectari Pentru Utilaje de Constructii de Drumuri(I.C.P.U.C.) Braila, Braila, Romania

Filed Oct. 21, 1976, Ser. No. 734,597
Int. Cl.² F15B *13/06, 13/09*
U.S. Cl. 60—484 **2 Claims**



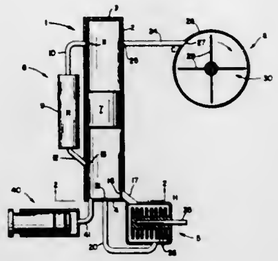
1. Apparatus for driving wheels of a vehicle in which the wheels are arranged in pairs on opposite sides of the vehicle, said apparatus comprising a duplex pump assembly including two pumps connected in parallel, a hydraulic supply, said pumps being connected to said supply, and means connecting each pump in open circuit relation with a respective pair of wheel driving motors, said means comprising distributors connected in series to respective pumps, a pair of flow dividers connected in series to respective distributors, and switch control means connected to respective pairs of flow dividers and to respective wheel driving motors of the associated wheel pair for selectively feeding pressure fluid to said driving motors for selecting one of two distinct travel speeds of the vehicle, one corresponding to drive of all four wheel motors, the other corresponding to drive of the two wheel motors of the rear wheels, the front wheel motors then being connected in short circuit to said supply.

4,072,010

THERMALLY DRIVEN PISTON APPARATUS

Mark Schuman, 101 G St., SW. Apt. 516, Washington, D.C. 20024

Continuation of Ser. No. 592,895, July 3, 1975, Pat. No. 4,012,910. This application Nov. 10, 1976, Ser. No. 740,486
Int. Cl.² F02G *1/04*
U.S. Cl. 60—520 **42 Claims**



1. An energy converter comprising:

a cylinder fitted with a free piston sized to form a sliding seal with the cylinder as the piston oscillates between and separates hot and cold ends of the cylinder;

a cylinder bypass bypassing a portion of the cylinder so as to allow a compressible fluid to alternately flow back and forth between said hot and cold ends of the cylinder as the piston coasts in alternate directions between said cylinder ends;

means for cooling the fluid flowing into the cold cylinder end and for heating the fluid flowing into the hot cylinder end thereby producing a cyclical fluid pressure variation utilizable for driving a load;

said heating means including a heating chamber disposed outside of the bypass and communicating with the hot end of the cylinder via a heating chamber inlet conduit, said inlet conduit communicating with the hot end of the cylinder via a heating chamber inlet port defined in the hot end of the cylinder;

said bypass including, in seriatim, a cold bypass port defined in said cold end of the cylinder, a hot bypass conduit, and a hot bypass port defined in the sidewall of the cylinder in said hot end of the cylinder, whereby the fluid exiting the hot end of the bypass via said hot bypass port flows into the hot end of the cylinder in a substantially defined stream during a first coasting portion of the oscillatory cycle while the piston is coasting in the bypass region of the cylinder toward the cold end of the cylinder;

means for positioning and aligning said hot bypass conduit and said heating chamber inlet port with respect to each other and with respect to the hot end of the cylinder so as to augment passage of said fluid in said stream into said heating chamber via said inlet port and said inlet conduit for heating fluid in the heating chamber during said first coasting portion of the cycle;

said piston during a hot rebound portion of the oscillatory cycle blocking said hot bypass port and compressing and forcing fluid from the hot end of the cylinder into said heating chamber for heating therein for expanding and driving said piston toward the cold cylinder end with a greater piston kinetic energy at the end of the hot rebound cycle portion than the kinetic energy of the piston at the beginning of the hot rebound cycle portion; and

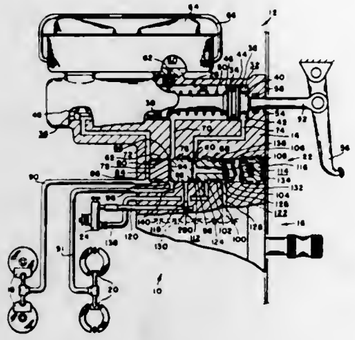
means for reversing the piston motion at the cold cylinder end.

4,072,011

HYDRAULIC BRAKE BOOSTER

Jerome T. Ewald, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Mar. 24, 1976, Ser. No. 670,513
Int. Cl.² B60T *13/20*
U.S. Cl. 60—555 **9 Claims**



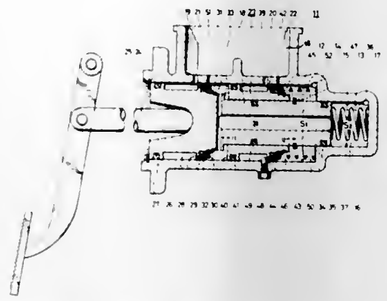
1. A combined wheel brake actuator and power steering mechanism for a vehicle comprising:
- a housing having a first bore, a second bore and a third bore located therein;
- a first piston located in said first bore for establishing a first pressurizing chamber and a power chamber therein;
- a second piston located in said first bore for establishing a second pressurizing chamber therein;
- a first plunger located in said second bore for establishing a first flow through chamber, a distribution chamber and a control chamber, said first flow through chamber being connected to said first pressurizing chamber by a first passage and to a first outlet port, said first outlet port being connected by a first conduit to a first set of wheel brakes on the vehicle, said distribution chamber being connected to said power chamber by a distribution passage and to a reservoir by a relief conduit, said control chamber being connected by a first supply conduit to receive the fluid output of a pump and to said third bore through a second supply conduit;
- a second plunger located in said second bore for establishing a second flow through chamber therein, said second flow through chamber being connected to said second pressurizing chamber by a second passage and to a second outlet port, said second outlet port being connected by a second conduit to a second set of wheel brakes on the vehicle;
- resilient means located in said second bore for urging said first plunger into engagement with said second plunger to permit the fluid output of the pump to freely flow through said control chamber;
- a rotary valve located in said third bore for controlling the communication of the fluid output of the pump in said second supply conduit to a steering gear in response to an operator steering input to aid in turning the wheels of the vehicle, said third bore being connected to said relief conduit by a relief passage to permit the fluid output in the third bore to be returned to the reservoir of the pump;
- actuator means responsive to an operator brake input force for moving said first piston to create a first fluid actuation pressure in said first pressurizing chamber, said first fluid actuation pressure being communicated through said first passage, said first flow through chamber, said first outlet port, and said first conduit to initiate operation of said first set of wheel brakes, said first fluid actuation pressure in said first flow through chamber moving said first plunger in opposition to said resilient means to interrupt communication between said distribution chamber and said relief passage and thereafter restrict the flow of the fluid output of the pump through the control chamber and proportionally allow a portion of the fluid output of the pump in the control chamber to flow into said distribution chamber for communication to said power chamber, said portion of the fluid output of the pump in the power chamber acting on said first piston to provide an auxiliary input force for moving said first piston in the first pressurizing chamber to create an operational brake fluid pressure; and
- stop means located in said second bore for limiting the movement of said first plunger and correspondingly that portion of the fluid output of the pump diverted from said control chamber to assure that minimal fluid output from the pump is continually available to operate said steering gear.

4,072,012

DUAL-SYSTEM MASTER CYLINDER

Susumu Kawakami, Toyodashi, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Sept. 13, 1976, Ser. No. 722,504
Claims priority, application Japan, Oct. 3, 1975, 50-119485; Oct. 3, 1975, 50-119486
Int. Cl.² B60T *11/20*
U.S. Cl. 60—562 **7 Claims**



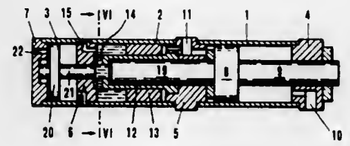
1. A dual-system master cylinder assembly comprising, in combination:
- a cylinder having a large-diameter cylinder portion and a small-diameter cylinder portion, said small-diameter cylinder portion having a head and said small-diameter cylinder portion being disposed in front of said large-diameter cylinder portion;
- a piston body having a front face and being positioned within said cylinder, said piston body having a diameter corresponding to that of said small-diameter cylinder portion and being slidably arranged for actuating pressure therein;
- a front pressure chamber defined between said head and said front face of said piston body;
- a rear pressure chamber;
- said piston body having means thereon for cooperating with a first compensation port to control communication between a fluid reservoir and one of said front and rear pressure chambers;
- a large piston slidably mounted around said piston body so as to be relatively movable thereon, said large piston having a front surface and a rear surface and means on said large piston adjacent said front surface for cooperating with a second compensation port to control communication between said fluid reservoir and a brake fluid operating chamber defined between said large-diameter cylinder portion, piston body, large piston front surface and a land between said large-diameter cylinder portion and small-diameter cylinder portion, said piston body including a bore extending axially therethrough providing continuous fluid communication from said front pressure chamber, defined between said head and said front face of said piston body, to said rear pressure chamber, said rear pressure chamber being defined by the wall of said large-diameter cylinder portion, surface of said piston body and said rear surface of said large piston.

4,072,013

FLUID PRESSURE ACTUATED OPERATOR CYLINDER WITH INCORPORATED STRESS CONVERTER

Aldo Barbareschi, Via Portofino 15, Turin, Italy

Filed Oct. 1, 1975, Ser. No. 618,372
Claims priority, application Italy, Oct. 10, 1974, 70022/74
Int. Cl.² B60T *13/58*
U.S. Cl. 60—563 **6 Claims**



1. An operator cylinder comprising a casing, said casing comprising three adjacent and successive coaxial sections, two end heads at opposite ends of said casing, two intermediate walls separating said sections, a first pneumatic piston movable in a cylinder comprised by said first section, said first piston having a piston rod comprising an operator stem thereon that extends through and beyond the adjacent said end head, said first piston having a hydraulic plunger thereon that extends into said second section, an annular idle hydro-pneumatic piston that slides within a cylinder comprised by said second section, said annular piston sealingly surrounding a hydraulic cylinder within said second section, said hydraulic plunger sealingly sliding within said hydraulic cylinder, a second pneumatic piston disposed in a cylinder comprised by said third section, feed passages formed in said heads and in said intermediate walls to supply air under pressure to opposite sides of said first and second pneumatic pistons and to the same side of said annular piston as said first piston and to supply hydraulic fluid under pressure to said second section on the opposite side of said annular piston and to the interior of said hydraulic cylinder, means establishing hydraulic communication between the interior of said hydraulic cylinder and said other side of said annular piston, means actuated by said second pneumatic piston for transmitting to said hydraulic fluid in said hydraulic cylinder a pressure higher than the air pressure to which said first piston is subjected, and cutting off means cooperating with said transmitting means in order to cut-off said communication between said hydraulic cylinder and said annular piston during operation of said transmitting means.

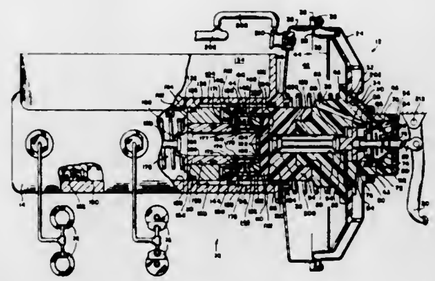
4,072,014

CONTROL MEANS FOR A TWO STAGE SERVOMOTOR

Delbert J. Gardner, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Mar. 22, 1976, Ser. No. 669,133
Int. Cl.² B60T *11/08*; F15B *7/04*
U.S. Cl. 60—575 **16 Claims**

1. In a two stage servomotor for energizing the wheel brakes of a vehicle in a first stage with a fluid pressure created by moving a piston means in a pressurizing chamber of an actuator bore by a first input force and in a second stage by moving said piston means in the pressurizing chamber through a combined forced of a second input force and pressure force created by the fluid pressure acting on the piston means in an input chamber, actuation means for shifting the operation of said two stages servomotor from said first stage to said second stage, comprising:
- cylindrical means associated with said piston means in said actuator bore for establishing said input chamber and a reservoir chamber, said cylindrical means having a passageway for connecting said input chamber with said pressurizing chamber and said reservoir chamber, said cylindrical means being responsive to said first and second input forces;
- deformable means for transmitting said first and second input forces from the cylindrical means to said piston means, said first and second input forces and the fluid pressure in the pressurizing chamber causing said deformable means to change shape; and
- valve means located in said bore and responsive to said change in shape of said deformable means for preventing fluid communication through said passageway from said pressurizing chamber to said reservoir chamber and said input chamber while allowing fluid to be communicated from said reservoir chamber to said input chamber in said first stage of operation and for preventing fluid communication from said reservoir chamber to said pressurizing chamber and said input chamber when said fluid pressure in the pressurizing chamber reaches a predetermined value and thereafter allows fluid communication between said pressurizing and input chambers to initiate said second stage of operation, said fluid pressure communicated to said input chamber acting on a portion of said cylindrical means which in turn abuts the piston means to aid in the movement thereof.

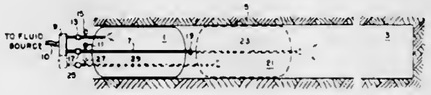


4,072,015

BOREHOLE AEROSTATIC GROUND SUPPORT SYSTEM

Roger J. Morrell, Bloomington; Jerome A. Gunn, and Richard J. Wilson, both of Minneapolis, all of Minn., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Dec. 30, 1976, Ser. No. 755,917
Int. Cl.² E21D *5/00*
U.S. Cl. 61—35 **5 Claims**



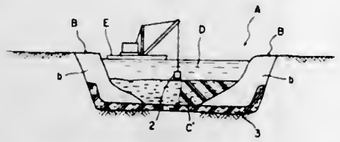
1. A method for providing temporary ground support to an underground auger mining area comprising the steps of:
- (a) drilling a series of aligned auger holes into the working face of a mine;
- (b) inserting an inflatable container lengthwise into each of the drilled auger holes;
- (c) connecting a source of pressurized fluid to each of the containers at a specific time to cause it to expand to the borehole's size to provide a pressure tight plug therein;
- (d) forcing a fluid at a predetermined pressure through each of said inflated containers to fill the borehole's cavity located more remote from the mine face; and
- (e) sequentially deflating the boreholes supported by the pressurized fluids of steps (c) and (d) to allow the drilled auger holes to collaspe in a controlled manner.

4,072,016

METHOD OF RECONSTRUCTING AND RECLAMATION OF RIVER CHANNELS

Kiyoshi Seki, 2-15 Komitsu-cho, Ashiya, Hyogo; Ichiro Tomioka, 630-3 Kitabatake, Motoyama-cho, Higashinada, Kobe, and Yoshihiko Sawa, 6-22, 1-chome, Higashinoda-cho, Miyakojima, Osaka, all of Japan

Filed Nov. 17, 1976, Ser. No. 742,540
Int. Cl.[2] E02B 3/04, 3/00
U.S. Cl. 61—35 8 Claims



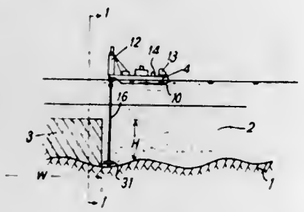
1. A method of improving river, harbor or other waterway channels having large deposits of soft sediment in a fluidized state therein, by contouring and stablizing the channel, comprising the steps of:
1. delineating a portion of the waterway by forming a watertight compartment (A) by means of partition walls;
2. depositing a stable fill material (b) such as sand or soil on at least two opposite sides adjacent the boundaries of said compartment causing said stable fill to mix with said fluidized sediment and to force out water from a portion of said sediment thereby causing a portion of said sediment to attain sufficient bearing strength and whereby said stable fill causes the remainder of said sediment in the bottom of said channel to be displaced from the areas adjacent the boundaries of said compartment to the midportion of said compartment in a consolidated mass (C); and said stablized material is deposited in sufficient quantity to form a stable surface (B) upon which earth machines may work in carrying out further process steps; and
3. hardening said entire remaining consolidated fluidized mass (C) into a hardened mass (C') by agitating said fluidized mass (C) and introducing a hardening agent into said fluidized mass (C) while said mass (C) and hardened mass (C') are covered by a layer of water (D).

4,072,017

TREATING SOIL

Hisashi Shiraki, 241-31 Hirotani-cho, Fuchu, Hiroshima, Japan

Continuation of Ser. No. 622,281, Oct. 10, 1975, abandoned.
This application Feb. 22, 1977, Ser. No. 770,324
Claims priority, application Japan, Oct. 11, 1974, 49-117565
Int. Cl.[2] E02D 3/12
U.S. Cl. 61—35 1 Claim



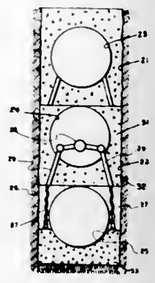
1. The method of treating a weak soil layer above a foundation layer, to form a stabilized mass based on said foundation layer and of predetermined height, width and length, which comprises the steps of:
i. agitating said weak soil layer by moving through it a plurality of rotating agitator impellers, arranged closely spaced in a row, the agitator impellers being reciprocated vertically and simultaneously translated horizontally through the weak soil layer in a direction transversely to the row, each agitator impeller being moved in its vertical movement independently of the other agitator impellers through a vertical stroke of which the lower end point is determined by contacting of the foundation layer by the respective agitator impeller, and of which the upper end point is predetermined as the upper boundary of the stabilized mass and is the same for all of the agitator impellers, and
ii. injecting a solidifier agent from the rotating agitator impellers into the weak soil layer during the rotation and vertical and translatory movement of the agitator impellers.

4,072,018

TUNNEL SUPPORT STRUCTURE AND METHOD

Alberto Alvarez-Calderon, 1560 Castilleja St., Palo Alto, Calif. 94306

Filed Oct. 31, 1975, Ser. No. 627,685
Claims priority, application Sweden, Apr. 30, 1975, 7505069; France, Apr. 30, 1975, 75 13654
Int. Cl.[2] E21F 15/00, 13/00
U.S. Cl. 61—35 22 Claims



1. A method for constructing a chamber within backfill material placed in a mining excavation comprising the steps of
a. placing space-occupying means in said excavation, with said space-occupying means having the general shape of said chamber,
b. maintaining the shape of said space-occupying means through the use of fluid pressure maintained therein,
c. placing a mixture of solids and liquids into said mining excavation around said space-occupying means, with said mixture having a structurally setting ingredient,
d. setting said mixture around said space-occupying means to thus form a chamber whose shape is defined by said space-occupying means.

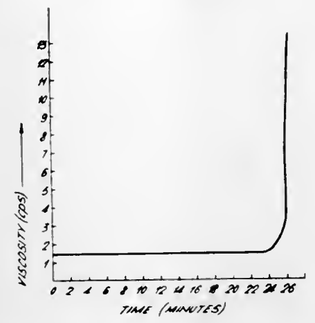
4,072,019

SOIL CONSOLIDATION METHOD

Leonard Louis Pearson, Slough, England, assignor to Fosroc International Limited, London, England

Continuation-in-part of Ser. No. 415,472, Nov. 13, 1973, abandoned. This application June 10, 1975, Ser. No. 585,624
Int. Cl.[2] E02D 3/14
U.S. Cl. 61—36 C 7 Claims

1. A method of using a composition to consolidate a friable St. Peter Sandstone soil comprising providing a composition consisting essentially of an aqueous solution of an alkali metal silicate and a gelling agent therefor, the alkali metal silicate having a silica to alkali metal oxide weight ratio of from 2.3 :1 to 3.4:1, the gelling agent consisting of a tripartite blend of the mono-, di-, and tri-acetate acid esters of glycerol having a saponification value of about 590 - 670 mg KOH/g, and the composition having a viscosity of about 1 or 2 cps, applying said composition to percolate into said soil for at least about 20 minutes, wherein the composition remains at low viscosity



while percolating into the soil, and wherein the composition then gels.

4,072,020

SOIL TREATMENT METHOD

Richard T. Bishop, Durban, South Africa, assignor to Revertex (South Africa) (Proprietary) Limited, Jacobs, South Africa

Filed Mar. 10, 1976, Ser. No. 665,566
Int. Cl.[2] E04D 3/12
U.S. Cl. 61—36 C 1 Claim

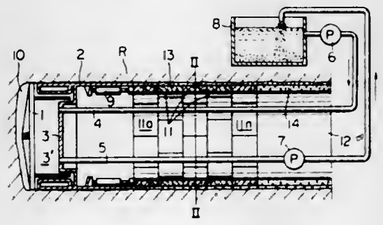
1. A method of aggregating sands to a depth of at least 3 cm to form a consolidated load-bearing crust, comprising flooding the surface of the sand with more than about 5 liters per square meter of sand, with water containing an effective amount less than about 3% by dry weight of a water-insoluble polymer emulsion selected from the group consisting of polyvinylacetate, vinylacetate-acrylic copolymer and acrylic-acrylic copolymer, which polymer has been polymerized with a colloid stabilizer as the main stabilizer in the polymer chain, said colloid stabilizer being selected from the group consisting of cellulose, polyvinyl alcohol, gum acacia and gum arabic, said amount being effective to aggregate the sand to said depth, the composition of the polymer emulsion being such that the polymer is distributed throughout the desired depth and does not migrate as the water evaporates, thereby forming bonds between adjacent sand particles.

4,072,021

METHOD OF DRIVING AND FORMING A TUNNEL WITH HYDRAULIC BORING MACHINE

Hironobu Yamazaki, Kashiwa, Japan, assignor to Tekken Construction Co. Ltd., Tokyo, Japan

Filed Nov. 2, 1976, Ser. No. 738,271
Int. Cl.[2] E01G 5/04
U.S. Cl. 61—42 6 Claims



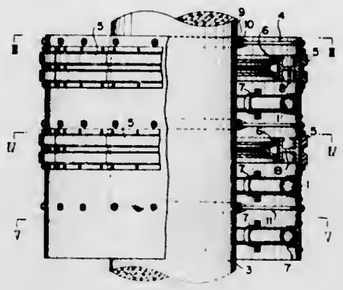
1. A tunnel driving and forming method with hydraulic boring machine through mixed ground of stable and unstable layers comprising steps of driving said machine into said ground to bore a tunnel therein, installing segments sequentially against bored tunnel wall right behind the machine as the same advances, impregnating a back-filling agent between said bored tunnel wall and outer periphery of said segments installed, removing the rearmost one of a plurality of sets of said installed segments behind the machine as long as the ground is stable, reinforcing the bored tunnel wall with respect to exposed surface of said back-filling agent impregnated and set, and repeating respective said steps responsive to advances of the machine, said step of removing the rearmost set of installed segments being suspended during an interval when an unstable layer in the ground is being bored and until next stable layer is reached so that the installed segments at the position facing said unstable layer remain for reinforcing the tunnel wall of said position.

4,072,022

APPARATUS FOR PROTECTING BRIDGE PILLARS

Soichiro Shimizu, Tokyo, Japan, assignor to Tokyo Fabric Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 12, 1976, Ser. No. 731,685
Claims priority, application Japan, Nov. 25, 1975, 50-158446[U]; Oct. 11, 1975, 50-122776
Int. Cl.[2] E02B 3/22
U.S. Cl. 61—48 8 Claims



1. An apparatus for protecting a bridge pillar comprising a protecting cylinder adapted to be mounted outside of said bridge pillar so as to surround the latter;
a plurality of circumferentially spaced elastic connecting rods for interconnecting said bridge pillar and said protecting cylinder, said connecting rods being connected to said bridge pillar as well as to said protecting cylinder so that they may be pivoted in every direction and being extended at right angles to said bridge pillar and said protecting cylinder;
an outer cushion pad adhered to the outside of said protecting cylinder;
an inner cushion pad adhered to the inside of said protecting cylinder; and
means for floating said protecting cylinder in water in such a manner that at least half of said protecting cylinder is immersed in water.

4,072,023

AIR-RECTIFICATION PROCESS AND APPARATUS

Helmut Springmann, Geretsried, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

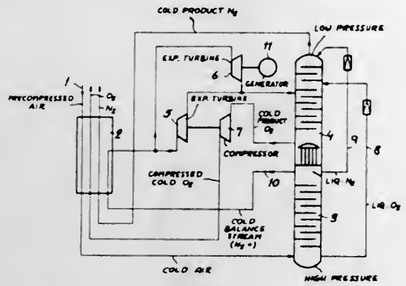
Filed Feb. 17, 1976, Ser. No. 658,661
Claims priority, application Germany, Oct. 3, 1975, 2544340
Int. Cl.[2] F25J 3/04
U.S. Cl. 62—13 9 Claims

1. A method of separating air comprising the steps of:
cooling precompressed and prepurified air in a main heat exchanger to produce a first cold air stream;
rectifying said first cold airstream to separate it into an oxygen-containing liquid and a nitrogen-containing liquid in a high-pressure stage of a LINDE double column, said liquids being introduced into a low-pressure stage of said

column producing a cold gas stream consisting predominantly of nitrogen and a cold gas stream consisting predominantly of oxygen;

passing said cold gas streams through said heat exchanger from the cold end thereof to the warm end thereof;

drawing a balance cold gas stream from said column between ends of said column and passing it through at least



part of said heat exchanger from said cold end of said heat exchanger;

expanding at least part of one of said cold gas streams in an expansion turbine; and

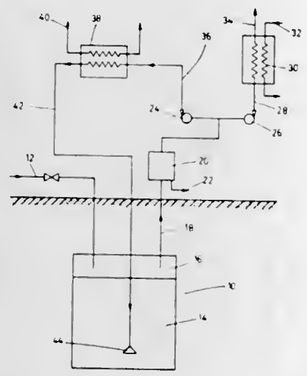
compressing another of said streams between said column and said cold end of said heat exchanger in a compressor driven by said expansion turbine, said other cold stream being said third cold stream.

4,072,024

RECOVERY OF AMMONIA FROM UNDERGROUND STORAGE

John Tyson Higgins, Trail, Canada, assignor to Cominco Ltd., Vancouver, Canada

Filed Oct. 12, 1976, Ser. No. 731,243
Int. Cl.² F17C *9/02*
U.S. Cl. 62—50 **6 Claims**



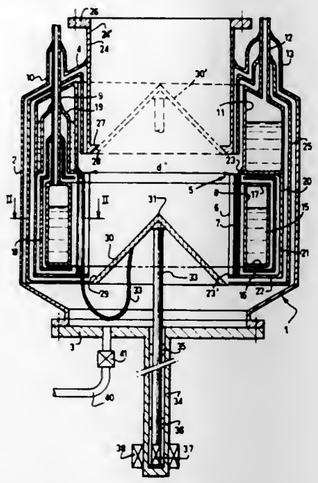
1. A process for recovering gaseous ammonia from liquefied ammonia stored in an underground cavern, comprising heating gaseous ammonia to a temperature below that at which decomposition occurs, feeding said heated gaseous ammonia into the liquefied ammonia in the cavern and releasing the heated gaseous ammonia in said liquefied ammonia to cause conversion of some of the liquid into gaseous form, and withdrawing gaseous ammonia from the cavern.

4,072,025

REGENERATION-TYPE CRYOPUMP

Jean-Jacques Thibault, Saint Martin d'Uriage, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Aug. 9, 1976, Ser. No. 712,916
Claims priority, application France, Aug. 22, 1975, 75 25970
Int. Cl.² B01D *5/00*
U.S. Cl. 62—55.5 **3 Claims**



1. A cryopump comprising a housing having a single pumping duct with a flange located at the outside end and adapted to connect said cryopump to an enclosure to be evacuated, a valve seating located inwardly in respect of said flange, annular cryogenic trapping means coaxial with said pumping duct, said cryogenic trapping means comprising helium refrigerated trapping means which are located in prolongation of said pumping duct, the radial extent of the central opening in said annular helium refrigerated trapping means being at least as great as that of said pumping duct, and a valve member which extends substantially radially and is mounted to slide axially in said opening in said trapping structure, the axial sliding travel of said valve being at least the axial length of said helium refrigerated trapping means.

4,072,026

METHOD OF COOLING OF ARTICLES AND MATERIALS

Jakob Oberpriller, Baierbrunn, and Dolf Dieter Hofmann, Munich, both of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Jan. 12, 1976, Ser. No. 648,100
Claims priority, application Germany, Dec. 10, 1975, 2555578
Int. Cl.² F25D *13/06*
U.S. Cl. 62—63 **6 Claims**

1. In a method of chilling articles or materials wherein a cooling gas stream is produced from a deep-cooling liquefied gas, and the cooling gas stream is passed into direct contact with the articles or materials to chill the same, the improvement which comprises:

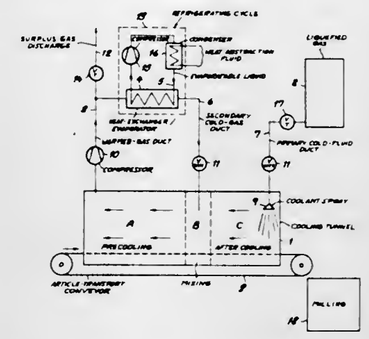
a. evaporating said liquefied gas to produce a first cold gas stream;

b. passing a further gas stream, independent of said first cold gas stream, into direct heat exchange with an evaporating fluid to cool said further gas stream and generate therefrom a second cold gas stream;

c. mixing said first and said second cold gas streams to form a mixture thereof which is brought into direct contact with said articles or materials in the cooling thereof

d. circulating said second cold gas stream at least in part

through a cooling zone traversed by said articles or materials and having a cold end and a warm end, said cold gas streams being mixed in step (c) within said cooling zone, said first cold gas stream being introduced into said cooling zone at a cold end thereof, said second cold gas stream being introduced into said cooling zone at an intermediate location therealong at a temperature greater than the



temperature at which said first cold gas stream is introduced into said cooling zone whereby said second cold gas stream is subjected to heat exchange with said articles or materials;

e. passing said articles or materials through said zone from said warm end to said cold end in countermovement to the gases traversing said zone; and

f. removing the mixed gases at said warm end.

4,072,027

STABILIZED HEAT ACTIVATED HEAT EXCHANGE ABSORPTION PAIR

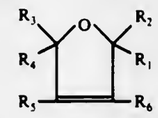
Morris B. Berenbaum, Summit, N.J.; Francis E. Evans, Hamburg, N.Y.; Richard E. Eibeck, Orchard Park, N.Y., and Martin A. Robinson, East Amherst, N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Jan. 19, 1977, Ser. No. 760,489
Int. Cl.² C09K *5/04*; F25B *15/02*
U.S. Cl. 62—112 **24 Claims**

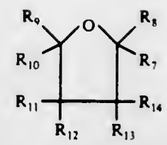
1. A stabilized absorption composition comprising

a. a fluorocarbon as refrigerant selected from the group consisting of monochlorodifluoromethane, dichloromonofluoromethane, trifluoromethane, monochloromonofluoromethane, dichlorotrifluoroethane, monochlorotetrafluoroethane, monochlorotrifluoroethane and mixtures thereof;

b. an asymetrical furan derivative as absorbent of the formula:



where R_1, R_2, R_3, R_4, R_5 and R_6 are each independently H, alkyl having 1–5 carbons, alkoxy having 1–5 carbons, phenyl, alkylene phenyl having 7–11 carbons, hydroxy alkyl having 1–5 carbons, alkoxy alkyl having 2–6 carbons, alkyl carboxylate having 2–6 carbons, fluorine or chlorine, provided that at least one of R_1, R_2, R_3, R_4, R_5 and R_6 has an oxygen atom which has a single bond to a carbon atom; or of the formula



where R_7, R_8, R_9, R_{10}, R_{11}, R_{12}, R_{13} and R_{14} are each independently as defined above for R_1, R_2, R_3, R_4, R_5, and R_6, provided at least one of R_7, R_8, R_9, R_{10}, R_{11}, R_{12}, R_{13} and R_{14} has an oxygen atom which has a single bond to a carbon atom; and

an effective amount of a stabilizer of the formula $(R_1'O)(R_2'O)(R_3'O)P$ wherein R_1', R_2' and R_3' are each independently alkyl, alkenyl, phenyl, alkylene phenyl, alkylene alkylphenyl, or alkylphenyl.

15. A method of absorption heating which comprises

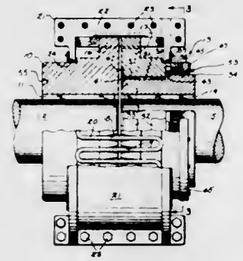
a. releasing heat of solution in the vicinity of an area to be heated by absorbing a fluorocarbon in an asymmetrical furan derivative containing a stabilizer to form the composition of claim 1, heating the resultant solution to release said fluorocarbon from said furan derivative, condensing released fluorocarbon in the vicinity of the area to be heated to form liquid fluorocarbon, evaporating the liquid fluorocarbon at a location removed from the vicinity of the area to be heated and returning the evaporated fluorocarbon to the vicinity of the area to be heated for reabsorption into said solvent furan derivative.

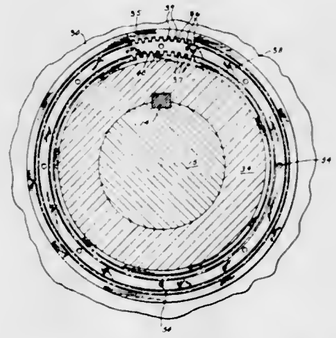
4,072,028

INDEXING COUPLING

David G. Connell, Milwaukee, Wis., assignor to The Falk Corporation, Milwaukee, Wis.

Filed Aug. 19, 1976, Ser. No. 715,682
Int. Cl.² F16D *3/66*
U.S. Cl. 64—24 **1 Claim**





1. In a flexible coupling for connecting a pair of axially aligned shafts, which coupling includes a pair of hubs each

adapted to be mounted on one of said shafts and each including axially directed slots which receive a flexible grid element which couples the hubs together, the improvement wherein one of said hubs comprises:

an inner hub member adapted to be secured to one of said shafts and including a circular cylindrical mounting portion extending from its axially innermost end, and a first series of axially extending gear teeth formed on an external periphery;

an outer hub member which includes said axially directed slots engaged by said grid element, said outer hub member having a central bore extending from its axially innermost end and a sleeve portion projecting axially from its opposite end, said mounting portion of said inner hub member being journaled within said central bore and said sleeve portion having a second series of axially extending gear teeth formed on an internal periphery and which are spaced from and radially aligned with said first series, the number of teeth in said second series being different from the number of teeth in said first series;

an indexing ring axially slidable between said inner and outer hub members and having internal and external gear teeth which mate with said first and second series of gear teeth;

an end ring connectable to the end of said sleeve portion and overlying the ends of the mating series of gear teeth to prevent removal of said indexing ring;

a keeper plate secured to the axially innermost end of said inner hub member and overlying said axially innermost end of said outer hub member, and

an annular spacer disposed in an annular space defined between an intermediate radial wall of said outer hub member and the inner ends of said second series of gear teeth.

4,072,029

RACKING MECHANISMS

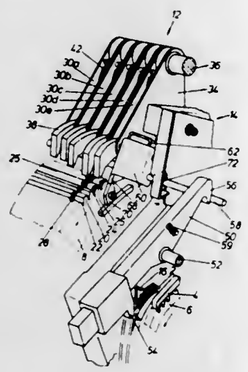
David Arthur Harlow, Coalville, and Gillies Wood, Evington, both of England, assignors to The Bentley Engineering Company Limited, Leicester, England

Filed Apr. 30, 1976, Ser. No. 681,904

Claims priority, application United Kingdom, May 14, 1975, 20257/75

Int. Cl.² D04B *15/66*

U.S. Cl. 66—154 R **6 Claims**



1. A racking mechanism for a circular knitting machine which includes a pair of first pawls and a plurality of second pawls, drive means for advancing the first and second pawls over the same distance in a continuous sequence, said drive means including first rotary cam means for advancing the first pawls alternately and second rotary cam means for advancing the second pawls at twice the frequency of the first pawls, a rack wheel evenly cut around its entire periphery and removable elements mounted in the rack wheel for conjoint rotation therewith for causing some of the pawls but not others to engage the rack wheel during a racking sequence.

4,072,030

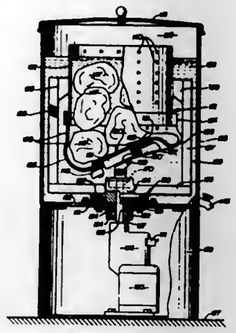
MACHINE FOR CONTROLLED CONDITIONING OF LIQUIDS AND MIXTURE

Leslie H. Garlinghouse, 2415 E. Washington Blvd., Los Angeles, Calif. 90053

Division of Ser. No. 364,881, May 29, 1973, Pat. No. 3,962,892. This application May 7, 1975, Ser. No. 575,437

Int. Cl.² D06F *35/00*

U.S. Cl. 68—23 R **4 Claims**



1. A conditioner for liquid-like charges comprising a frame,

a closed housing on the frame,

said housing having a lower, side and top wall structures and a removable closure on one of said structures.

a composite container for said charges comprising a lower flexible section located within said housing and an upper rigid section,

a wobble plate mounted on the bottom of the flexible section,

a wobble drive rotatably journaled in a lower wall structure of said housing and having a driving relationship with said wobble plate,

a motor on said frame at a location below and exterior relative to said housing,

said motor having a one direction driving connection with the wobble drive whereby to impart an oscillatory motion to the flexible section and liquid-like charge therein, a rotatable drive connection between said upper rigid section and the housing, said rotatable drive connection comprising a supporting structure for said container located in said housing, a lower portion of said supporting structure being rotatably mounted on said housing and said rigid section being mounted on and carried by said supporting structure.

4,072,031

SECURITY APPARATUS FOR VEHICLE COMMUNICATIONS ACCESSORY

David W. Kent, 2512 Yonge St., Rockford, Ill. 61103

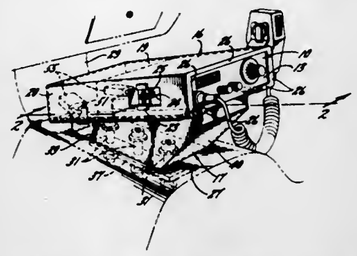
Filed Feb. 8, 1977, Ser. No. 766,571

Int. Cl.² E05B *73/00*

U.S. Cl. 70—58 **5 Claims**

1. Security apparatus for a vehicle communications accessory havinfg a case shaped generally as a parallelepiped and defined by top, bottom, front, rear and side walls, said apparatus comprising a box having a top wall and having first and second side walls sized and shaped to telescopically receive said case, the rear of said box being open to permit said case to be telescoped into said box from the rear thereof, lip means on the front of said box and engageable with the front wall of said case to prevent said case from being removed out of the front of said box, first and second flanges projecting inwardly from said first and second side walls, respectively, of said box and underlying the bottom wall of said case, a mounting bracket having front and rear sides, means for anchoring said mounting

bracket to the floor of a vehicle, said mounting bracket having first and second shelves underlying said first and second flanges, respectively, and having first and second plates overlying said first and second flanges, respectively, each shelf and its overlying plate defining a forwardly and outwardly opening channel for receiving the respective flange with said flanges being adapted to be slid into said channels from the front side of said mounting bracket, a first pin extending removably through said first shelf, said first flange and said first plate, a



second pin extending removably through said second shelf, said second flange and said second plate, said pins being engageable with the rear wall of said case to prevent said case from being removed from the rear of said box, and first and second security locks connected to said first and second pins, respectively, and preventing unauthorized removal of said pins from said shelves, flanges and plates whereby said pins connect said box to said mounting bracket while said locks prevent unauthorized removal of said box from said bracket.

4,072,032

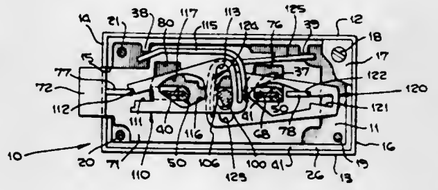
KEY CHANGEABLE LOCK

Peter J. Phillips, Redondo Beach, Calif., assignor to Klaus Gartner, La Palma and Tim Uyeda, South San Gabriel, both of, Calif.

Filed June 1, 1976, Ser. No. 691,454

Int. Cl.² E05B *35/12*

U.S. Cl. 70—339 **20 Claims**



1. In a changeable key lock having a bolt, a plurality of gated tumbler levers and means for operating the bolt only when the tumbler levers are placed in predeterminable positions by manipulation of a selectable key in the lock, the improvement comprising the provision of:

pivot means on one or more of said levers for providing a plurality of individually selectable pivots about which the associated lever may pivot whereby the pivotal axis of each such lever may be varied to provide for different combinations of lever movements required to open the lock; and

releasable fulcrum means for engaging with said lever pivots to restrict each levers movement about a selectable one of said pivots when engaged therewith and being releasable therefrom to allow for the selection of another of said pivots to be engaged thereby, wherein:

said pivot means on each such lever comprises a rack of saw tooth-like teeth formed on an inner surface of an arcuate slot whose radius of curvature intersects the associated lever gate; and

said fulcrum means comprises a fulcrum member and means for mounting said member in said arcuate slot for releasing and re-engaging said pivot means teeth.

4,072,033

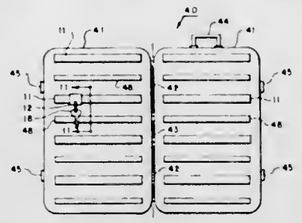
KEY HOLDER

George H. Eckerdt, 948 Culver Road, Rochester, N.Y. 14609

Continuation-in-part of Ser. No. 583,047, June 2, 1975, abandoned. This application May 28, 1976, Ser. No. 690,983

Int. Cl.² A47G *29/10*

U.S. Cl. 70—456 B **19 Claims**



1. A key holder comprising:

a. a base sheet;

b. means for supporting said base sheet to display keys, said support means comprising a ring binder having rings releasably holding said base sheet by a plurality of holes in said base sheet registering with said rings of said ring binder;

c. said base sheet having a strip formed of one part of a two-part hook-and-loop pile fastener material;

d. a plurality of key tags;

e. a piece of the other part of said two-part hook-and-loop pile fastener secured to a rear face of each of said key tags for removably fastening each of said key tags anywhere along said strip;

f. each of said key tags having a hole; and

g. a key ring in said hole in each of said key tags for connecting a key to each of said key tags for suspending said keys from said key tags when said key tags are fastened to said strip.

4,072,034

METHOD AND APPARATUS FOR FORMING MATERIAL BY FORCING THROUGH A DIE ORIFICE

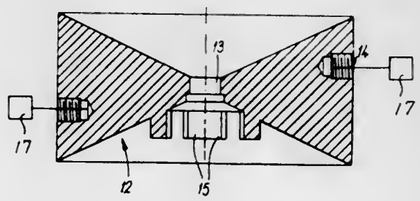
Graham Robert Dawson, Bewdley, and Dennis Hugh Sansome, Sutton Coldfield, both of England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 358,391, May 8, 1973, abandoned. This application July 24, 1975, Ser. No. 598,876

Claims priority, application United Kingdom, May 9, 1972, 21614/72

Int. Cl.² B21C *3/00*

U.S. Cl. 72—56 **7 Claims**



1. Apparatus for substantially deforming a section of a workpiece, said apparatus comprising:

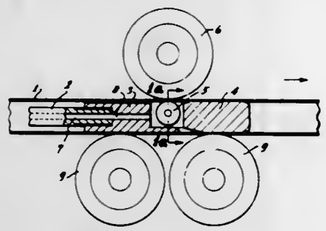
a. a circumferentially continuous die with an orifice therein defining a deforming axis;

b. power means for forcing the workpiece through said die orifice to effect said deformation;
c. a die holding member assembled with said die;
d. means for supporting said die holding member, said supporting means being disposed with substantially symmetry relative to said deforming axis when viewed in projection onto a plane normal to said axis, so that said axis is held stationary, and
e. vibrator means tuned to the assembly of said workpiece, die and die holding member for vibrating said assembly to cause said assembly as a whole to resonate in a mode in which the die expands and contracts radially, so that a swaging action is effected upon the workpiece to perform positive deformation work upon it, and thereby reduce the proportion of the total of said deformation that said power means are required to effect, said vibrator means comprising at least one vibrator device assembled with said die holding member, said vibrator means being disposed with substantial symmetry relative to said deforming axis when viewed in projection onto a plane lying normal to said axis.

4,072,035
STRENGTHENING OF A WELDING SEAM

Gerhard Ziemek, and Friedrich Schatz, both of Langenhagen, Germany, assignors to Kabel-und Metallwerke, Hannover, Germany

Filed Apr. 15, 1976, Ser. No. 677,172
Claims priority, application Germany, Apr. 18, 1975, 2517248
Int. Cl.² B23K *37/00, 31/06*
U.S. Cl. 72—209 **9 Claims**



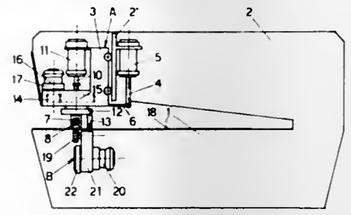
1. Method of strengthening the welding seam of a longitudinally seam welded, thin-walled, nonferrous metal tube comprising the steps of cold rolling the seam and adjacent zones of the tube which did also soften during the welding, by at least one pair of cylindrical rolls acting on the seam from the inside and the outside of the tube respectively on a flattened portion thereof, including the seam and the adjacent zones and acting in lines of engagement with the seam extending transversely to the welding seam, the rolling progressing transversely to the tube in a length direction of propagation of the tube, thereby strengthening the seam and the adjacent zones by at least 10%; and sizing the tube immediately following the cold rolling.

4,072,036
BENDING MACHINE

Marcello Del Fabro, Villaggio Morena 2, Reana Del Rojale (Udine), Italy (33010)

Filed Jan. 7, 1977, Ser. No. 757,666
Claims priority, application Italy, Jan. 8, 1976, 83302/76
Int. Cl.² B21D *7/02*; B21F *1/00*
U.S. Cl. 72—217 **12 Claims**

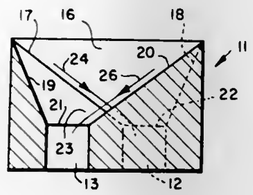
1. A rod and wire bending machine comprising, in combination:
at least one bending unit including a fork member with two opposed extremities having a pair of facing side edges for laterally guiding a rod or wire therebetween and at least one pair of projecting ends extending outwardly from each side edge of each extremity, and a bending pin spaced from said fork member and mounted on a disc which is rotatable about said fork member and
at least one feeding unit including a first roller mounted on said fork member and positioned between the facing side edges of said extremities, said first roller being dimensioned to extend within said projecting ends, and an opposed second roller mounted in alignment with and opposite to said first roller and rotatable in either direction for clamping and feeding a rod or wire in either a forward or backward direction between said rollers and said facing side edges of said opposing extremities and beyond said pairs of projecting ends whereby said bending pin may be rotated in either direction to bend a rod or wire around a preselected projecting end of either extremity of said fork member.



4,072,037
APPARATUS AND METHODS FOR FORMING A PLURALITY OF ELONGATED MEMBERS

Francis Joseph Fuchs, Jr., Princeton Junction, N.J., assignor to Western Electric Co., Inc., New York, N.Y.

Continuation-in-part of Ser. No. 638,495, Dec. 8, 1975, abandoned. This application Mar. 14, 1977, Ser. No. 777,244
Int. Cl.² B21C *33/00, 25/02, 23/00*
U.S. Cl. 72—261 **18 Claims**

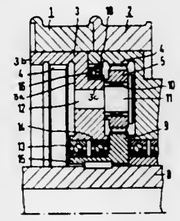


1. Apparatus for deforming a single metallic workpiece to produce simultaneously a plurality of elongated, metallic members, said apparatus comprising:
a die having an entry wall at one end thereof, and having first and second apertures extending longitudinally therethrough with an entrance end of each aperture located along said entry wall;
said entry wall including first and second entry surfaces, the first entry surface being positioned laterally adjacent to the entrance end of the second aperture while sloping past the entrance end of the second aperture and toward the entrance end of the first aperture, and the second entry surface being positioned laterally adjacent to the entrance end of the first aperture while sloping past the entrance end of the first aperture and toward the entrance end of the second aperture, such that a substantial part of the flow of the metallic material in a single metallic workpiece, forced against the entry wall, will be directed along two neighboring flow paths following said first and second entry surfaces, with the first entry surface directing a first portion of the metallic material past the second aperture and into the first aperture, and with the second entry surface directing a second portion of the metallic material past the first aperture and into the second aperture, so as to introduce a pattern of cross-shear stresses into the metallic material as said single metallic workpiece is forced against said entry wall; and
means for forcing the single metallic workpiece against said entry wall with sufficient pressure to cause said first and second portions of the metallic workpiece to pass, respectively, through the first and second apertures simultaneously as the metallic material of the workpiece separates under the influence of said cross-shear stresses, such that a plurality of elongated, metallic members are formed.

4,072,038
WIRE DRAWING MACHINES

Egon Braun, Haag near Schwabach, Germany, assignor to Maschinenfabrik Niehoff KG, Schwabach, Germany

Filed Oct. 26, 1976, Ser. No. 735,187
Claims priority, application Germany, Nov. 10, 1975, 2550373
Int. Cl.² B21C *1/02*
U.S. Cl. 72—289 **11 Claims**



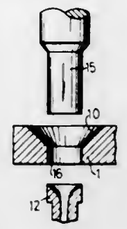
1. A drum for a multiple wire drawing machine comprising an arrangement of at least two adjacently located capstan assemblies operatively connected to each other at least one of which is driven by a central drive shaft, each of said capstan assemblies comprising an annular drawing ring and a wheel member located within said drawing ring and connected thereto for conjoint rotation, at least one said driven capstan assembly having a planet member engaging the associated wheel member, and an annular sun member secured to a supporting shaft, means connecting said planet member to the wheel member of the next adjacent capstan assembly to operatively interconnect said adjacent capstans, and permit said planet member to revolve about said sun member and rotate about the central axis, each of said wheel members having a circumferential recess forming an axial shoulder and provided with an annular seal seated thereon slidably engaging a surface of the adjacent capstan assembly.

4,072,039
METHOD FOR FORMING COUNTER-SUNK HOLE IN A BASE MATERIAL AND AN APPARATUS FOR CARRYING OUT THE SAME

Yoshitaka Nakanishi, 12-9, Yawata 5-chome, Ichikawa, Chiba, Japan

Filed Dec. 3, 1976, Ser. No. 747,187
Claims priority, application Japan, Apr. 30, 1976, 51-48516
Int. Cl.² B21D *28/26*
U.S. Cl. 72—334 **10 Claims**

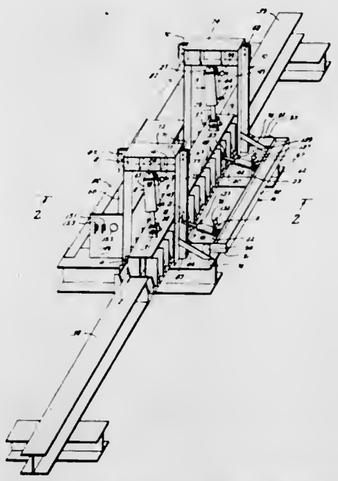
1. A method of producing counter-sunk holes in a plate-like base, comprising the steps of; punching preliminary holes through a plate-like base; counter-sinking a seat around one end of and coaxially with each preliminary hole by compressing base material surrounding said end of the preliminary hole to force portions of said material into the preliminary hole and out of another end of the preliminary hole while keeping the base plate-like and otherwise avoiding deformation of surfaces of the plate-like base; and punching a finishing hole coaxially with the countersunk seat and preliminary hole to remove portions of base material forced into the preliminary hole.



4,072,040
PILE STRAIGHTENER

Robert Alan Seyle, Houston, Tex., assignor to Bate & Ramey, Inc., Bellaire, Tex.

Filed Aug. 5, 1976, Ser. No. 711,841
Int. Cl.² B21D *1/06*
U.S. Cl. 72—406 **39 Claims**



1. An apparatus for straightening bends in sheet pile at ambient temperature, such sheet pile used for shoring in excavations, for reuse for shoring in excavations, comprising:
a frame;
jig means mounted on said frame for straightening such bent sheet pile, said jig means including a moveable portion; and
means mounted on said frame and connected to said jig means for moving said portion of said jig means in two nonparallel directions.

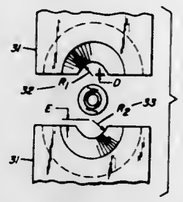
4,072,041
SHORT-CRIMP SURGICAL NEEDLE

John Ronald Hoffman, New Milford, and Peter John Marsland, Monroe, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 691,102, May 28, 1976. This application Dec. 16, 1976, Ser. No. 751,768
Int. Cl.² B21D *37/10*
U.S. Cl. 72—416 **1 Claim**

1. A two-piece suymmetrical swaging die for swaging a narrow crimp in a surgical needle having a coaxial cylindrical blind hole in the blunt end to hold a surgical suture therein

comprising: a swaging die having a land having a lap radius the center of which is about 0.0005 to 0.0015 inch outboard of the ends of said die, said lap radius being slightly less than the



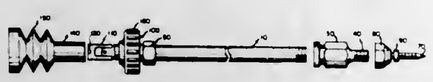
needle radius, said die having a width along the axis of the needle less than about half the blind hole depth, and an overlap radius the center of which is about 0.004 to 0.009 inch outboard of the face of said die to permit metal displacement.

4,072,042

AUTOMATIC METAL PULLER

Arturo Servin, and Jose Servin, both of Los Angeles, Calif., assignors to Roger D. Camp and Mattias J. Randall-Ford, part interest to each

Filed Apr. 12, 1976, Ser. No. 654,805
Int. Cl.² B21D *1/12*; B25D *17/00*; B25B *19/00*
U.S. Cl. 72—457 **2 Claims**



1. A slap hammer designed for being driven by a pneumatic wrench and the like, comprising:

a conventional slap hammer with an elongated body having a self-tapping screw at the bottom;

a coupling detachably securing the top of the body to an output shaft of a pneumatic wrench whereby the wrench can rotate the body about its axis, said coupling including a universal joint for receiving the shaft and a flexible compressible hollow boot covering the joint when the shaft is secured to the joint;

a harness detachably securing the slap hammer to the housing of said wrench; and

a race of roller bearings secured to said body below the coupling, said harness encircling the race in a manner at which the race and harness are kept from separating and the race is allowed to rotate within the harness.

4,072,043

METHOD AND SYSTEM FOR DETECTING HYDROGEN IN AN INERT GAS STREAM

Kenneth C. Naizer, Nederland, and Jesse K. DuBose, Beaumont, both of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 20, 1976, Ser. No. 752,048
Int. Cl.² G01N *31/00*
U.S. Cl. 73—23 **5 Claims**

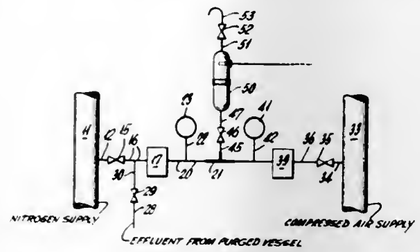
1. A system for monitoring an inert gas stream in order to detect hydrogen therein, comprising in combination

a chamber for passing at least a portion of said gas stream therethrough and having an inlet and an outlet,

said chamber inlet having a reduced cross sectional area relative to said chamber,

means associated with said inlet for diffusing mixed gas streams and for collecting any moisture therefrom,

said diffusing means comprising a pair of perforated diffusion plates mounted on a common support and extending transversely across said inlet and said chamber adjacent to said inlet,



means for mounting a hydrogen detector in said chamber down stream from said diffusing means, and

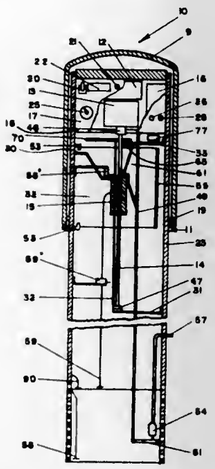
means for preventing moisture from entering said outlet.

4,072,044

LIQUID LEVEL CONTROLLER AND SOIL TEST INSTRUMENT

Allen C. Farwell; Dale E. Farwell, and Duane C. Farwell, all of Rte. 1, Cottage Grove, Wis. 53527

Filed Mar. 5, 1976, Ser. No. 664,190
Int. Cl.² G01F *23/10*; G01N *15/08*
U.S. Cl. 73—38 **6 Claims**



1. A liquid level controller comprising in combination:

a. a reversibly drivable electric motor,

b. an output shaft for said electric motor,

c. an electrode mounted to be traversed longitudinally of said output shaft by operation of said electric motor rotating said shaft,

d. a reversing switch for said electric motor wherein said reversing switch is actuated by said elctrode coming into contact with a body of electrically conductive liquid to establish an electric current path therethrough,

e. a supply valve for electrically conductive liquid,

f. valve biasing means for said supply valve actuated by traverse of said electrode,

g. a timer controlled switch for energizing said electric motor,

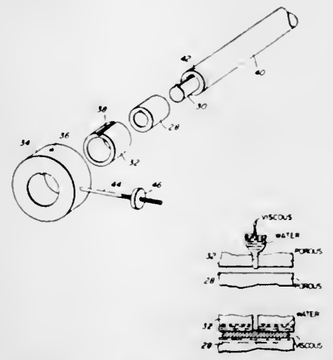
h. a motor de-energizing switch actuated by traverse of said electrode, said controller functioning in repetitive cycles wherein said conductive liquid may issue from said supply valve to fill a confined space, which is traversed by said electrode driven by said timer controlled switch operated motor for periodically sensing liquid elevation in the confined space, a motor reversing circuit being completed by said electrode making contact with conducting liquid to actuate retrival of said probe and replenishment of liquid to datum level in the confined space.

4,072,045

VISCOMETER FOR INDICATING RHEOLOGICAL PROPERTIES OF FLUIDS HAVING HIGH AND LOW VISCOSITY COMPONENTS

Louis Kopito, Brookline, Mass., assignor to Ovutime, Inc., Brookline, Mass.

Filed Sept. 10, 1976, Ser. No. 722,229
Int. Cl.² G01N *33/16*
U.S. Cl. 73—54 **16 Claims**



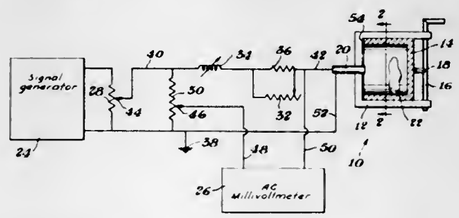
9. A process for tesing a fluid sample having at least a high viscosity component and at least a low viscosity component, said process comprising the steps of interposing a fluid sample between a first bearing means and a second bearing means, at least one of said bearing means presenting a porous surface, absorbing said low viscosity component into said porous surface, biasing said first bearing means and said second bearing means with respect to each other, and means for indicating the relative motion of said first bearing means with respect to said second bearing means as an indication of the characteristics of said fluid sample.

4,072,046

ACOUSTIC PYCNOMETER

Binneg Yanbing Lao, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sept. 3, 1976, Ser. No. 720,480
Int. Cl.² G01M *17/00*
U.S. Cl. 73—574 **4 Claims**



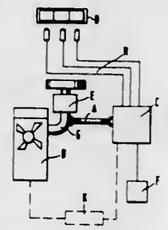
1. Pycnometer apparatus comprising an enclosable chamber for receiving a sample whose volume is to be measured, an electro-acoustical transducer coupled to the interior of said chamber, electronic signal generator means for electrically energizing said transducer at a predetermined frequency having a wave length at least four times the longest dimension of said chamber, electrical bridge circuit means coupled between said means for electrically energizing and said electro-mechanical transducer, said bridge circuit including means for nulling the signal across said bridge circuit when said chamber is empty, and means for reading the signal across said bridge when a sample is disposed in said chamber, the magnitude of said signal being a function of the volume of the sample.

4,072,047

METHOD AND APPARATUS FOR MONITORING INTAKE MANIFOLD VACUUM

Anton Reismüller, Goppingen, Germany, assignor to Remesta GmbH, Heiningen, Germany

Filed Nov. 15, 1976, Ser. No. 742,129
Claims priority, application Germany, Nov. 15, 1975, 2551359
Int. Cl.² G01L *23/24*
U.S. Cl. 73—115 **7 Claims**



1. A method for continuously monitoring and telemetering the momentary operating condition of a motor vehicle engine with respect to the vacuum created in the intake manifold of the engine as output and reference quantity, comprising the steps of:

1. continuously sampling the vacuum in the intake manifold of the engine;

2. utilizing changes in the vacuum pressure to produce an electrical signal having a plurality of stages representing different successive levels of vacuum pressure;

3. feeding this electrical signal to an electronic switching station linked with the electrical power supply of the vehicle; and

4. utilizing electricity from said electrical power supply as directed by said electronic switching station to actuate a signal that can be sensed by the operator, said signal informing the operator as to the state of the vacuum in the intake manifold at that particular instant.

4,072,048

INDICATING APPARATUS FOR MEASURING THE PRESSURE OF A FLUID WITHIN A CONTAINER

John Arvan, 61 S. Regent St., Port Chester, N.Y. 10573

Filed Apr. 1, 1976, Ser. No. 672,657
Int. Cl.² B60C *23/02*
U.S. Cl. 73—146.8 **9 Claims**

1. An indicating apparatus for measuring the pressure of a fluid within a container, said apparatus comprising:

a. a housing one end adapted to be mounted on a valve assembly communicating with the container, said housing further having a range of scale indicia from a minimum value to a maximum value representative of the pressure of the fluid within said container between a predetermined range of pressures;

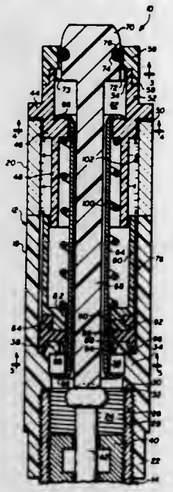
b. a collar having a through-opening mounted to another end of said housing;

c. a sleeve supported within said housing, the opposite ends of said sleeve extending outwardly in overlying and clamping relationship to portions of said housing and said collar, respectively, to secure said collar in nested relation to said housing;

c. a plunger reciprocally supported within said sleeve for movement between an inoperable position wherein the valve of the container is closed and an operate position wherein said plunger engages and opens said valve to

provide a path for the flow of the fluid from the container into said housing, said plunger having an end accessible through the opening in said collar;

d. indicator means supported within said housing for movement by the fluid from a non-indicating position to an indicating position when the pressure of said fluid is above a predetermined amount, said indicator means being movable relative to said scale indicia to provide a reading



between said minimum and maximum values representative of the pressure of the fluid within said container when said pressure is within said predetermined range of pressures;

e. said having a passage for directing the fluid to said indicator means when said plunger is in its operate position; and

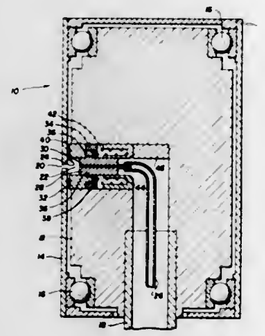
f. said housing having means for viewing the indicator means in its indicating position.

4,072,049

APPARATUS FOR MEASURING SURFACE PRESSURES ON SPINNING AERODYNAMIC BODIES

Miles C. Miller, Joppatowne, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 15, 1977, Ser. No. 788,067
Int. Cl.² G01M *9/00*; G01L *7/00*
U.S. Cl. 73—147 **10 Claims**



1. Apparatus for measuring surface pressure on a spinning body in an aerodynamic chamber comprising:

a shell means having the configuration of said body and at least one aperture through the surface of said shell means;

first positioning means connected to said shell means for rotating said shell means about the shell means' longitudinal axis;

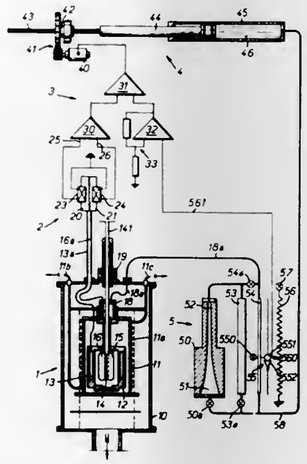
sensor means having a cavity in the interior of said shell means and aligned along said longitudinal axis with said aperture and a pressure transducer connected to said cavity, said sensor means measure the pressure at the point on the shell means surface defined by the radial alignment of said cavity and aperture.

4,072,050

ISOTHERMAL CALORIMETRY PROCESS AND CALORIMETER FOR CARRYING OUT THE PROCESS

Leon Ter-Minassian, Fresnes, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Hauts-de-Seine, France

Filed Mar. 23, 1977, Ser. No. 780,482
Claims priority, application France, Mar. 26, 1976, 76 08792
Int. Cl.² G01K *17/00*
U.S. Cl. 73—190 R **11 Claims**



1. A calorimetry process for determining the quantity of thermal energy given out or taken up by a sample during an isothermal change of state between two physico-chemical states, wherein said sample is maintained at a constant temperature during said change of state by varying the pressure of a gas contained in a control chamber which is in thermal contact with said sample, the quantity of thermal energy given out or taken up being determined by measuring the variation of the pressure of said gas.

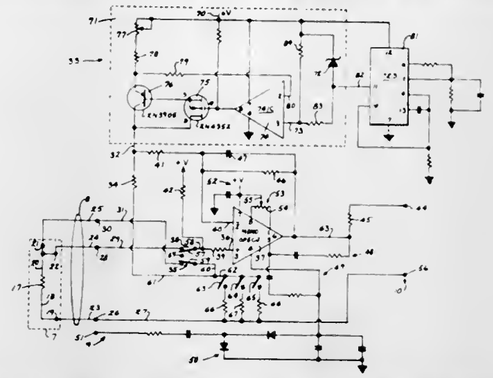
4,072,051

PARAMETER COMPENSATING SYSTEM FOR A FLOWMETER

Jerry R. Peterson, Erie, Pa., assignor to Geosource, Inc., Houston, Tex.

Filed Apr. 28, 1976, Ser. No. 680,919
Int. Cl.² G01F *1/12, 1/86*; G01K *7/20*
U.S. Cl. 73—194 M **35 Claims**

1. A fluid flowmeter compensating system, comprising a flowmeter providing a metered output in response to fluid flow, a transducer including a probe providing an output in response to a sensed parameter of the fluid, a converter connected to said transducer through means providing a connecting curcuit and providing an output varying in response to the relative difference between the sensed parameter of the fluid and a preselected reference parameter for the fluid, said converter including means providing a source operatively connected to supply a constant signal through a series connected circuit including said probe provided by said transducer and a reference impedance having a preselected magnitude corresponding to said preselected reference parameter and means responding to the signal variations across said series connected circuit and providing a variation responsive signal continually tracking the change in the sensed parameter with respect to the



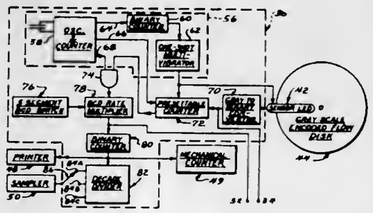
reference parameter to said converter output, and utilization means connected to said converter and to said flowmeter and providing a compensated metered output relating to said preselected reference parameter in response to said converter output.

4,072,052

FLOW PROPORTIONER

Louis Franklin Lederer, Raymond, Nebr., assignor to Instrumentation Specialties Company, Lincoln, Nebr.

Filed Aug. 18, 1976, Ser. No. 715,320
Int. Cl.² G01F *1/52*
U.S. Cl. 73—215 **27 Claims**



1. An apparatus for measuring the rate of flow of a fluid comprising:

means for measuring a fluid level to represent a non-linear function of a rate of flow of a fluid;

electronic means responsive to the measured fluid level for generating an electrical output signal representing the rate of flow of the fluid;

said electronic means including a function generator disc having a digital code recorded thereon representing the non-linear flow rate and an sensor assembly to sense the digital code to provide the electrical output signal representing the rate of flow of the fluid; and

positioning means operatively connected to said measuring means for positioning said function generator disc with respect to said sensor assembly;

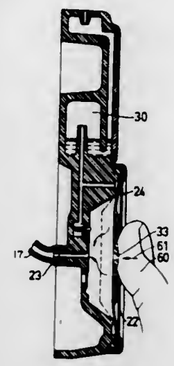
said measuring means comprising a bubbler system having a pressure transducer for converting the measured fluid pressure corresponding to the fluid level to an electronic signal proportional to the fluid level.

4,072,053

APPARATUS FOR INDICATING LIQUID LEVEL IN A RECEPTACLE

Stig Lennart Anderson, 4 Naverlursgatan, Vastra Frolunda, Sweden (S-421 44)

Filed Nov. 4, 1976, Ser. No. 738,895
Claims priority, application Sweden, Nov. 5, 1975, 7512363
Int. Cl.² G01F *23/16*; G01L *7/08*
U.S. Cl. 73—303 **8 Claims**



1. Apparatus for indicating the liquid level in a receptacle, more particularly the oil level in the crankcase of an internal combustion engine, said apparatus comprising:

a measure tube extending downwards into the crankcase below the lowermost design oil level;

an indicating member connected to said measure tube by means of a slender flexible tube;

means defining an air chamber in the indicating member, said air chamber being in air communication with said measure tube through the slender flexible tube;

means defining a liquid chamber in the indicating member, said liquid chamber containing a quantity of liquid trapped therein below a column of air;

an indicating tube in said indicating member having fluid communication with the liquid in said liquid chamber, said indicating tube having a transparent vertical wall and adapted to receive liquid from the liquid chamber to a height corresponding to the oil level in the crank case;

means in said indicating member defining a narrow passage connecting said air chamber and the air above the liquid in said liquid chamber and including means connecting said air above the liquid and the ambient air for communication of air therebetween and between said measure tube and said liquid chamber;

a pump member in the form of a wall defining one side of said air chamber and including means oepratlonal for separating said air chamber from the ambient air, said pump member being formed at least partly of a resilient diaphragm around a central wall portion and being manually pushable inwardly of said air chamber to a home position against a bottom wall thereof, the resilient diaphragm portion of said pump member being effective to first close said narrow passage to thereby close off air communication between said air chamber and the ambient air and the air above the liquid in said liquid chamber upon initial movement inwardly of the resilient diaphragm when said pump member is pushed inwardly of the air chamber; and

a normally closed valve member located in said indicating member in an alternate passage connected to said narrow passage between said air chamber and the air above the liquid in said liquid chamber, said valve member being operable on pushing said pump member inwardly and fully home to thereby open air communication between said measure tube and the air above the liquid in said liquid chamber after closeoff of said air chamber and ambient air

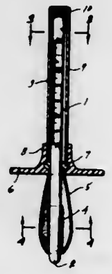
therefrom to enable indicating liquid to rise in said indicating tube to a height corresponding to the oil level in the crank case by air pressure being transmitted therethrough to said liquid chamber from said measure tube.

4,072,054

COMBINED PACIFYING NIPPLE AND MOUTH THERMOMETER DEVICE

Michel Blouin, 2815 des Pruches St., Orsainville, Canada (GEG 2B2), and Leo Mercier, 1778 Bergemont St., Quebec, Canada (3)

Filed Mar. 9, 1976, Ser. No. 665,241
Int. Cl.² G01K *5/04, 1/14*
U.S. Cl. 73—343 R **1 Claim**



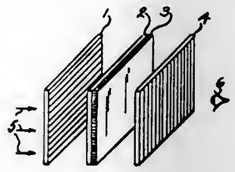
1. A combined pacifying nipple and mouth thermometer device comprising a liquid thermometer tube including a temperature displaying main portion and a liquid bulb portion at one end of the main portion, a flexible pacifying nipple including a flexible tubular mouth-piece portion having an outer end and an inner end, a lip abutment flange fixed to said inner end and surrounding the same, the outer end and the inner end of said mouthpiece portion both having apertures aligned longitudinally of the pacifying nipple, the liquid thermometer tube having a part of its main portion extending through said mouth-piece portion and frictionally extending through both apertures such that said liquid bulb portion is located exteriorly of said mouth-piece portion adjacent said outer end and the remaining part of said main portion of said thermometer tube extends exteriorly from the inner end of said mouthpiece portion, an elastic sleeve tightly engages over a substantial portion of the part of said thermometer tube extending within said mouthpiece portion, said elastic sleeve having an outer end disposed short of said liquid bulb portion, the marginal portion of the aperture at the outer end of said mouthpiece portion abutting against said outer end of said sleeve, and a transparent protector tube having an open end removably secured to said abutment flange and surrounding the temperature displaying main portion of said thermometer tube and having a closed end at its outer end engaged over the other end of the thermometer tube and wherein the aperture at the inner end of said mouthpiece portion forms an annular external bead, said inner end engages in a recess made in the aperture of said lip abutment flange, the latter being further integrally formed with an internally threaded sleeve portion axially projecting away from said mouthpiece portion and said protector tube is removably screwed within said internally threaded sleeve portion and abuts said bead and axially compresses the latter to cause the same to tightly engage said thermometer tube to prevent sliding of the thermometer tube relative to said lip abutment flange.

4,072,055

VISUAL-TYPE TEMPERATURE-RESPONSIVE DEVICE

Stanley B. Elliott, 7125 Conelly Blvd., Bedford, Ohio 44146

Continuation of Ser. No. 559,066, March 17, 1975, abandoned.
This application Jan. 14, 1977, Ser. No. 759,483
Int. Cl.² G01K *11/12*
U.S. Cl. 73—356 **33 Claims**



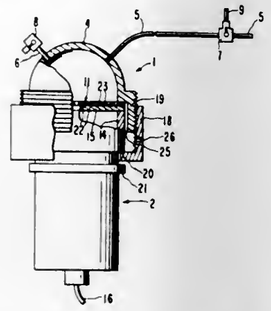
1. An optical-type thermometer comprising (1) a source of illumination providing a light-beam, (2) means for providing observable changes in temperature comprising a layer on a substantially isotropic transparent substrate of a solid chemical composition of constant melting point that of itself senses changes in temperature, the composition being abruptly triggered at a predetermined temperature from an anisotropic solid transmission state characteristic of the first temperature immediately contiguous to the predetermined temperature to an isotropic liquid state characteristic of the second temperature, (3) means to intensify observable changes in the brightness and intensity of the light coming from the composition when the light-beam contacts the composition comprising a polarizer for polarizing the light-beam and an analyzer for analyzing the beam, the light-beam traveling through the composition that doubly refracts the beam when birefringent at the first temperature to pass the beam on through the analyzer, (4) light detecting means for detecting observable changes in the brightness and intensity of the light coming from the composition when the light-beam contacts the composition, the light from the composition at the first temperature being of sufficient brightness and intensity to provide an optical signal at the first temperature but not at the second temperature.

4,072,056

FLUID CONTAINMENT STRUCTURE FOR TRANSDUCER SYSTEM

Arnold St. Jacques Lee, Portola Valley, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed June 28, 1976, Ser. No. 700,269
Int. Cl.² G01L *7/08*
U.S. Cl. 73—706 **8 Claims**



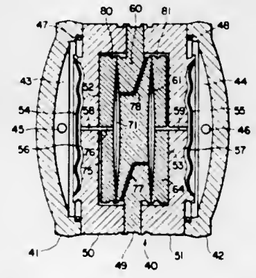
1. In pressure transducer apparatus comprising a pressure transducer having a pressure transducing wall and means for providing an electrical output representative of pressure exerted against said wall, wall means forming a structure for containing fluid for pressure interaction with said transducer wall without direct contact between the fluid and said transducer wall, said fluid containment structure having a diaphragm wall positioned for contact with said transducer wall, said diaphragm wall being sufficiently compliant to provide transmission between fluid pressure in said containment structure and said transducer wall; the improvement wherein means are provided for venting gas from between said diaphragm wall and said transducer wall.

4,072,057

DIFFERENTIAL PRESSURE CELL WITH DIAPHRAGM TENSION AND OVERPRESSURE PROTECTION

Takeshi Yasuhara; Mitsuru Tamai, and Tadanori Yuhara, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Sept. 8, 1976, Ser. No. 721,635
Claims priority, application Japan, Sept. 9, 1975, 50-109112
Int. Cl.² G01L *7/08*
U.S. Cl. 73—718 **8 Claims**



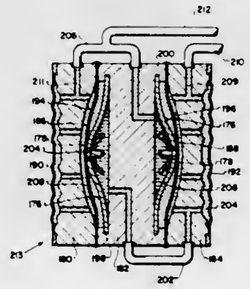
1. A differential pressure sensing cell, comprising:
a) a measuring chamber having electrically insulating walls,
b) a measuring diaphragm mounted within the measuring chamber and dividing it into first and second closed chambers,
c) measuring diaphragm displacement sensing elements mounted on the insulating walls,
d) an auxilliary chamber,
e) an auxilliary diaphragm mounted within the auxilliary chamber and dividing it into third and fourth closed chambers, the auxilliary diaphragm being more flexible than the measuring diaphragm,
f) casing means surrounding and mounting the measuring chamber and the auxilliary chamber, and defining a first recess surrounding the auxilliary chamber and a second recess surrounding the measuring chamber,
g) a first pressure-receiving diaphragm movably responsive to a first input pressure and mounted within the casing means to define a first pressure-receiving chamber,
h) a second pressure-receiving diaphragm movably responsive to a second input pressure and mounted within the casing means to define a second pressure-receiving chamber,
i) fluid sealed within and filling the measuring and auxilliary chambers, the first and second recesses, and the first and second pressure-receiving chambers,
j) first fluid passage means interconnecting the first pressure-receiving chamber, the first recess, and the first and third closed chambers, and
k) second fluid passage means interconnecting the second pressure-receiving chamber, the second recess, and the second and fourth closed chambers, whereby radial tension of the measuring diaphragm due to static differential pressure between the interior and exterior of the measuring chamber is minimized by substantially equalizing the interior and exterior pressures through said first and second fluid passage means, and over-pressure protection of the measuring diaphragm when the pressure differential between the first and second pressure-receiving chambers becomes too large as attained by causing the first or second pressure-receiving diaphragm to contact the casing before the measuring diaphragm contacts the casing before the measuring diaphragm contacts the casing while absorbing the change in volume of the first or second pressure-receiving chamber by the action of the auxilliary diaphragm through the first or second fluid passage means, respectively.

4,072,058

DIFFERENTIAL PRESSURE TRANSMITTER WITH PRESSURE SENSOR PROTECTION

Robert C. Whitehead, Jr., Oreland, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 3, 1976, Ser. No. 682,280
Int. Cl.² G01L *7/08*
U.S. Cl. 73—720 **5 Claims**



1. A differential pressure to electrical signal transmitter comprising
a head structure having a plurality of surfaces,
a first barrier diaphragm mounted in spaced and sealed relationship to a first one of said surfaces to form a first fluid chamber between one face of said first diaphragm and said first surface,
a second barrier diaphragm mounted in spaced and sealed relationship to a second one of said surfaces to form a second fluid chamber between one face of said second diaphragm and said second surface,
means for applying a first force to the other face of said first diaphragm which is representative of a first fluid pressure and which urges said first diaphragm toward said first surface,
means for applying a second force to the other face of said second diaphragm which is representative of a second fluid pressure and which urges said second diaphragm toward said second surface,
control diaphragm means mounted in spaced and sealed relationship to third and fourth ones of said surfaces to form a third fluid chamber between one face of said diaphragm means and said third surface, and to form a fourth fluid chamber between another face of said diaphragm means and said fourth surface,
differential pressure sensor means located at a position remote from said head structure and including a sensing element having first and second element portions and an electrical output connection and operative to produce in said output connection a signal representative of the difference between the pressures of two fluids acting, respectively, on said first and second element portions, said element experiencing only a minute displacement as said pressure difference traverses its normal operating range,
first passage means interconnecting said first chamber and said third chamber,
second passage means interconnecting said second chamber and said fourth chamber,
a first length of capillary tubing extending between said head

structure and said sensor means and constituting a fluid connection between said first element portion and said first and third chambers,

a first substantially incompressible fill fluid completely filling said first and third chambers, said first passage means, and said first length of capillary tubing and acting on said first element portion by way of said first length of capillary tubing,

a second length of capillary tubing extending between said head structure and said sensor means and constituting a fluid connection between said second element portion and said second and fourth chambers, and

a second substantially incompressible fill fluid completely filling said second and fourth chambers, said second passage means, and said second length of capillary tubing and acting on said second element portion by way of said second length of capillary tubing, the dimensions of said first and second lengths of capillary tubing being such as to minimize the transfer of sensor-damaging heat and pulses through said fill fluids from said head structure to said element,

the relative stiffness of said diaphragm means and said barrier diaphragms being made such that an excessive value of either of said first and second fluid pressures causes the corresponding one of said barrier diaphragms to bottom-out on the corresponding one of said first and second surfaces, and causes said diaphragm means to deflect away from the corresponding one of said third and fourth surfaces, thereby preventing said pressure difference on said element from exceeding said normal operating range and adversely displacing said element, wherein

said control diaphragm means consists of first and second control diaphragms,

said one face of said diaphragm means is one face of said first control diaphragm,

said another face of said diaphragm means is one face of said second control diaphragm,

said head structure has fifth and sixth surfaces,

said first control diaphragm is mounted in spaced and sealed relationship to said fifth surface to form a fifth fluid chamber between the other face of said first control diaphragm and said fifth surface,

said second control diaphragm is mounted in spaced and sealed relationship to said sixth surface to form a sixth fluid chamber between the other face of said second control diaphragm and said sixth surface,

said first passage means includes an interconnection to said sixth chamber,

said second passage means includes an interconnection to said fifth chamber,

said first fill fluid completely fills said sixth chamber, and

said second fill fluid completely fills said fifth chamber.

4,072,059

GRAIN PROBE

James T. Hamilton, Decatur, Ill., assignor to Jaham Mfg. Co., Inc., Warrensburg, Ill.

Filed Feb. 10, 1977, Ser. No. 767,540
Int. Cl.² G01N *1/14*
U.S. Cl. 73—423 R **7 Claims**

1. A sampling device for insertion into a body of confined grain, including in combination:

a tubular probe member having a closed lower end with an opening therein and a plurality of vertical spaced openings extending the length thereof,

gate means having a plurality of sectional spaced openings therein, said gate means being engageable with said tubular probe member and movable from a closed position wherein said gate means substantially closes said plurality of vertical spaced openings in said probe member to an open position wherein said vertical openings on said gate means are in alignment with said vertical spaced opening on said tubular probe member,

bracket means mounted on the end of said tubular probe member opposite the closed lower end,

probe mounting means attached to said bracket means to hold said tubular probe member in substantially a vertical position,

suction means operatively connected to said opening on said closed lower end of said probe member, and



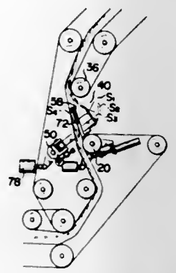
control means for operating said probe mounting means in positioning said probe member in the body of the confined grain, said control means further moving said gate means between a closed and an open position to permit grain to fill said tubular probe member and actuating said suction means to withdraw the collected grain from said probe when the same has been withdrawn from the body of the confined grain.

4,072,060

APPARATUS FOR SAMPLING PRINTED SHEETS FROM A CONTINUOUS STREAM OF SUCH SHEETS

Mitsuo Kitai, Kawasaki, and Koichi Yamashita, Yokohama, both of Japan, assignors to Kabushiki Kaisha Tokyo Kikai Seisakusho, Tokyo, Japan

Filed Mar. 11, 1977, Ser. No. 776,897
Claims priority, application Japan, Mar. 22, 1976, 51-29848
Int. Cl.² G01N *1/04*
U.S. Cl. 73—423 R **7 Claims**



1. Apparatus for taking samples from a continuous row of printed sheets travelling in overlapping relationship along a predetermined path, comprising in combination:

divider means movable between a first and a second position with respect to the predetermined path, said divider means when moved to said second position being disposed in the predetermined path so as to cause some consecutive ones of the printed sheets to travel on one side thereof and the succeeding printed sheets to travel on the other side thereof;

first actuator means for moving said divider means between said first and said second positions;

extractor means movable between a third and a fourth position past the predetermined path, said extractor means being moved, following the movement of said divider means from said first to said second position, from said third to said fourth position for traversing the predetermined path from said other to said one side of said divider means and thus for extracting at least the last of said some consecutive printed sheets from the predetermined path; and

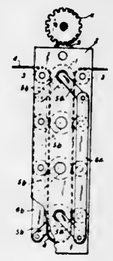
second actuator means for moving said extractor means between said third and said fourth positions.

4,072,061

ROLLER DRIVE ASSEMBLY FOR PHOTOGRAPHIC PROCESSORS

Jerry A. Caflisch, Minneapolis, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Feb. 17, 1976, Ser. No. 658,540
Int. Cl.² F16H *21/14*
U.S. Cl. 74—67 **4 Claims**



1. In a photographic processor unit, a roller assembly for conveying photographic sheet material through the photographic processor unit at an essentially uniform speed without slippage and with generally constant tension along the photographic sheet material's entire length, said assembly comprising

a plurality of transport rollers positioned to define a predetermined path for engaging and transporting photographic sheet material through the processor unit, certain of said rollers having their axes disposed in parallel coplanar relation,

one set of crank arms respectively fixed to corresponding ends of said coplanar rollers and disposed in parallel relation to each other.

a second set of crank arms respectively fixed to the opposite ends of said coplanar rollers and disposed in parallel relation to each other,

a pair of connecting bars respectively pivotally connected to said two sets of crank arms for driving said coplanar rollers,

said two sets of crank arms being disposed in sufficiently out-of-phase relation with respect to the other set of crank arms to prevent an over center reversal of the driving direction of said coplanar rollers, and

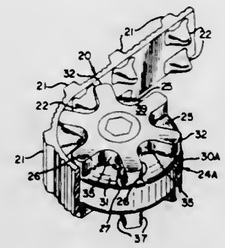
means for supplying rotary driving power to one of said rollers, whereby the photographic sheet material is transported through the photographic processor unit along the predetermined path.

4,072,062

SELF-CLEANING SPROCKET

Roy W. Morling, Elmhurst; Robert J. Mackert, and Elmer M. Keal, both of Downers Grove, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Dec. 27, 1976, Ser. No. 754,711
Int. Cl.² F16H *55/30, 7/00*
U.S. Cl. 74—243 R **23 Claims**



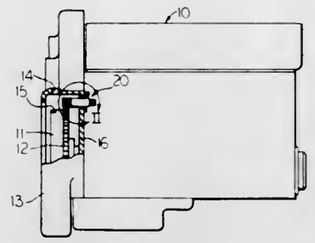
1. A self-cleaning sprocket for use with an endless belt having internal lugs for engaging the sprocket comprising a body of material having a disk-like base portion having an outer periphery, a plurality of radial circumferentially spaced ribs extending axially from said base portion, said ribs converging to a center hub and defining, with said base portion, a plurality of lug receiving pockets therebetween having open axial ends opposite said base portion, the surface of said base portion in said pockets sloping toward said open ends from said periphery to said hub and the surface of said hub in said pocket sloping radially inwardly from the base portion toward said open axial ends, the intersection of said base portion and said hub portion being filletted such that the flow of debris from said base portion surface to said hub surface is facilitated.

4,072,063

ENGINE CRANKING ADAPTER

Harold Joseph Nauman, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 14, 1977, Ser. No. 768,122
Int. Cl.² F16H *1/06*
U.S. Cl. 74—405 **10 Claims**



1. In an engine structure having a flywheel, a ring gear mounted for rotation with the flywheel, a wall adjacent the ring gear, and starter motor mounting means on said wall for mounting of a starter motor thereon to have driving engagement with the teeth of the ring gear, the improvement comprising:

a cranking adapter having a midportion, a first pinion at one end, and a second pinion at the opposite end, said first pinion being adapted to mesh with ring gears having a first preselected configuration and said second pinion being adapted to mesh with ring gears having a second, different preselected configuration;

adapter mounting means for readily removably, rotatably mounting said midportion of the adapter to said wall with

a selected one of said pinions meshing with said ring gear; and

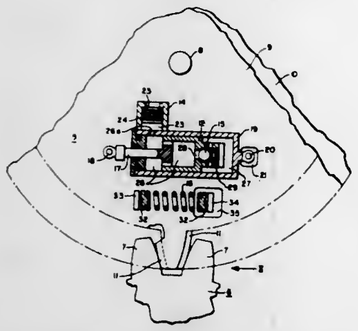
means for transmitting a rotational force to said pinion for rotating the flywheel through the selected meshed pinion.

4,072,064

ANTI-BACKLASH GEAR ASSEMBLY

Wayne B. Lloyd, Baltimore, and John H. Staehlin, Lutherville, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 2, 1977, Ser. No. 765,031
Int. Cl.² F16H *55/18*
U.S. Cl. 74—409 **4 Claims**



1. An anti-backlash gear assembly comprising,

mating gears having interengaging teeth for effecting a driving relationship therebetween,

geartooth clearance adjusting means for said mating gears,

hydraulic piston means operatively connected to said gear-tooth clearance adjusting means,

an accumulator storing hydraulic fluid for supply to said piston means,

check valve means for retaining hydraulic fluid supplied to said piston means, and

bias means for urging hydraulic fluid to flow from said accumulator to said piston means via said check valve means upon existence of any backlash-inducing clearance during relaxation of driving effort between said interengaging gear teeth.

4,072,065

ADJUSTMENT MECHANISM FOR DAY/NIGHT OUTSIDE MIRROR

Guido Perrella, 28 Senneville Road, Senneville, Quebec, Canada

Continuation of Ser. No. 430,262, Jan. 2, 1974, abandoned. This application Apr. 19, 1976, Ser. No. 677,937
Claims priority, application United Kingdom, Nov. 6, 1973, 51480/73
Int. Cl.² F16C *1/10*
U.S. Cl. 74—502 **4 Claims**



1. Apparatus for providing selective positioning of an article on an article support means by movement of a vertical actuator and a horizontal actuator on an actuator support means, comprising,

a reference wire of fixed length connecting the actuator support means with the article support means,

a pair of movable input lever elements supported for pivotal movement with respect to the actuator support means and each being operatively connected to a respective one of said actuators,

a pair of longitudinally movable wires ech having a first end connected to one of said movable input lever elements, said wires being movable independently of each other,

a pair of movable remote lever elements supported for pivotal movement with respect to the article support means, said remote lever elements being operatively connected to said article to effect respective vertical and horizontal movement thereof,

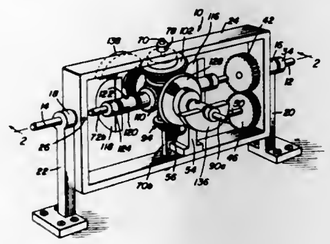
said longitudinally movable wires each having a second end connected to one of said movable remote lever elements to permit independent vertical and horizontal movement of said article by respective movement of said vertical actuator and said horizontal actuator.

4,072,066

CENTRIFUGAL FORCE CONTROLLED TRANSMISSION

Donald L. Mount, Rte. 1 - Box 188, Memphis, Mo. 63555

Filed June 22, 1976, Ser. No. 698,701
Int. Cl.² F16H *3/74*
U.S. Cl. 74—752 F **11 Claims**



1. A variable drive ratio transmission, comprising input and output elements, a carrier frame connected to one of said elements for rotation about a fixed axis, a spindle, means mounting the spindle in the carrier frame for rotation about a first movable axis, eccentric rotor means of variable unbalance rotatably mounted on the spindle for rotation about a second movable axis intersecting the first movable axis on said fixed axis, planet gear means drivingly connecting the other of the elements to the spindle for rotation thereof relative to the carrier frame about said first movable axis, and reaction gear means drivingly connecting the carrier frame to the eccentric rotor means for varying the unbalance thereof in response to relative rotation between the carrier frame and said spindle.

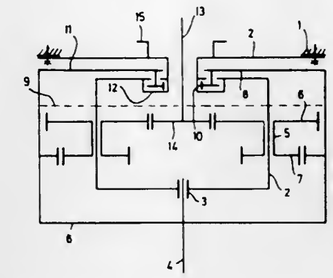
4,072,067

PLANETARY GEARING WITH CLOSED HOUSING

Heinrich Benthake, Mulheim (Ruhr), Germany, assignor to WGW Westdeutsche Getriebe- und Kupplungswerke GmbH, Bochum, Germany

Filed Apr. 23, 1976, Ser. No. 679,678
Claims priority, application Germany, Apr. 24, 1975, 2518113
Int. Cl.² F16H *57/08*
U.S. Cl. 74—789 **4 Claims**

1. Planetary gearing comprising: a stationary support, an outer housing rotatably suspended from said support, said housing including internal gear teeth and being adapted to contain a lubricant, said stationary support including an inner portion extending within said housing, a driving gear rotatably mounted within said inner stationary support portion and housing, satellite gear means rotatably mounted on said inner stationary support portion and coupling said driving gear with the internal gear teeth of said housing, a first bearing rotatably coupling said housing with said stationary support, said first bearing being enclosed within said housing above the level of lubricant to be contained in said housing, and a second bearing mounted on said inner stationary support enclosed within said



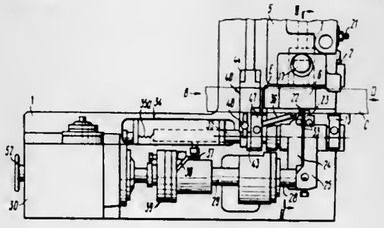
housing, said housing including output coupling means rotatably mounted in said second bearing, said satellite gear means comprising a plurality of satellite gears including a pair of double satellite gears each having a larger diameter gear half meshing with said driving gear and a smaller diameter gear half rotatable with said larger diameter gear half and meshing with said internal gear teeth.

4,072,068

BAND SAW TEETH WORKING MACHINE

Vladimir Viktorovich Idel, ulitsa Kirova, 11, Zakarpatskaya oblast, Mukachevsky raion, selo Kolchino, U.S.S.R.

Filed Feb. 11, 1977, Ser. No. 767,784
Int. Cl.² B23D *63/04*
U.S. Cl. 76—58 **4 Claims**



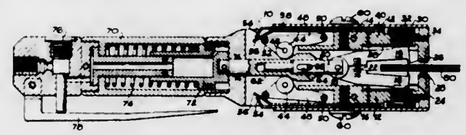
1. A machine for working the teeth of a band saw, comprising: a framework; a device for clamping a band saw by the side surfaces thereof, mounted on said framework; abtument means for the apices of the teeth of the band saw and for the back edge thereof, mounted on said device for clamping the band saw by the side surfaces thereof; a mechanism for advancing the band saw stepwise, mounted on said framework; a component of said stepwise-advancing mechanism, carrying a member adapted to cooperate with the teeth of the band saw being advanced, said component being mounted for reciprocation in a direction parallel with the direction of the advance of the band saw in the course of working the teeth of the band saw; tool means for working the teeth of the band saw, mounted on said framework and arranged after said stepwise-advancing mechanism in the direction of the advance of the band saw; an auxiliary device for clamping the band saw by the side surfaces thereof, mounted on said component of said stepwise-advancing mechanism so that said auxiliary clamping device is arranged in front of said aforementioned clamping device mounted on said framework in the direction of the advance of the band saw, adjacent to said aforementioned clamping device; abutment means for the apices of the teeth of the band saw, mounted on said auxiliary device for clamping the band saw by the side surfaces thereof; driving means for actuating said stepwise-advancing mechanism and said tool means for working the teeth of the band saw.

4,072,069

WIRE STRIPPING TOOLS

Zdzislaw Bieganski, Brushwood, Kingsbourne Green, Harpenden, Hertfordshire, England

Filed Apr. 7, 1976, Ser. No. 674,582
Claims priority, application United Kingdom, Apr. 12, 1975, 15102/75
Int. Cl.² H02G *1/12*
U.S. Cl. 81—9.5 A **2 Claims**



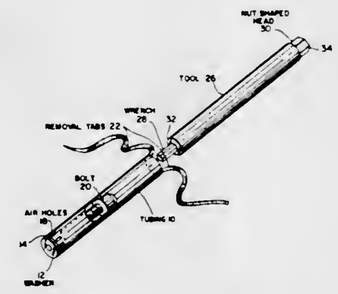
1. A wire stripping device comprising a body having a pair of gripping jaws pivoted thereon, a cylinder fixed to the body having an axially movable piston and piston rod, and a pair of cutting jaws which are pivoted to a member that has a lost motion connection with the piston rod, to permit limited initial motion of the piston rod relative to said member, wherein the improvement comprises a cam mounted on the piston rod and having a first jaw-closing surface, a second dwell surface to hold the gripping jaws closed, and a third jaw-opening surface, the cutting jaws being arranged between and in driving contact with the gripping jaws for actuation by the gripping jaws, cam followers including levers pivoted on the gripping jaws, spring means urging the cutting jaws apart into said driving contact with the gripping jaws, the cam surfaces being arranged to close both pairs of jaws during initial movement of the piston rod relative to said member, to hold the gripping jaws closed during further movement of the piston carrying along said member, and to open both pairs of jaws during still further movement of the piston and member, and resilient means fixed to the gripping jaws providing resistance to said levers during movement of the piston rod.

4,072,070

REMOTE ACCESS WASHER WITH BOLT ALIGNMENT TOOL

Arthur Francis Finn, Vienna, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 17, 1976, Ser. No. 715,037
Int. Cl.² B25B *13/48*
U.S. Cl. 81—71 **3 Claims**



1. Apparatus for aligning and tightening, comprising, in combination:

a bolt;

a washer;

an alignment tube, said washer affixed to one end of said tube, said bolt inserted into said tube, the head of said bolt facing the other end of said tube; and

an extension tool having an outside diameter minutely smaller than the inside diameter of said tube, thereby permitting said tool to be inserted into and rotated within said tube, said tool being shaped at one end so as to mate with said bolt and being nut-shaped at the other end for receiving a wrench;

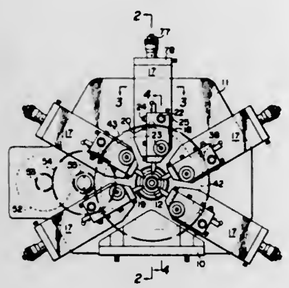
whereby said bolt and said washer may be aligned and tightened in a remote or restricted, normally inaccessible hole.

4,072,071

MECHANICAL-HYDRAULIC RADIAL FEED SYSTEM FOR A LATHE

Yukio Sato; Takeshi Itoh, both of Shizuoka, and Hiromi Izawa, Shimizu, all of Japan, assignors to Star Seimitsu Kabushiki Kaisha, Japan

Filed July 30, 1976, Ser. No. 710,114
Claims priority, application Japan, Aug. 6, 1975, 50-95008
Int. Cl.² B23B 3/00, 21/00
U.S. Cl. 82—2 R **9 Claims**



1. For use in a lathe having a headstock for holding a workpiece in the form of wire or rod for rotation a mechanical-hydraulic radial feed system comprising, a frame, a plurality of tool slides slidably mounted in the frame and in use movable radially of a rotationally and axially driven workpiece in a lathe, the slides each having means for carrying a tool, a plurality of hydraulic cylinder units each associated with a respective one of the tool slides for driving the tool slides from an inoperative position corresponding to a retracted position and toward the workpiece to a maximum advanced position and back to the inoperative position, a hydraulic circuit for controlling the hydraulic cylinder units, a profile cam member mounted for angular movement about an axis coincident with an axis of the workpiece, means for driving the cam member rotationally, connection means normally isolating the tool slides from the cam member, but responsive to an actuation of a particular hydraulic cylinder unit for operatively connecting the associated tool slide with the profile of the cam member to profile-control the radial motion of said tool slide in accordance with the profile of the cam member under the control of the particular hydraulic cylinder unit.

4,072,072

DUAL TIRE CUTTING MACHINE

Mitchell A. Harb, P.O. Box 261, Lexington, N.C. 27292

Filed Mar. 15, 1977, Ser. No. 777,838
Int. Cl.² B23B 3/04, 3/06, 37/00
U.S. Cl. 82—86 **11 Claims**

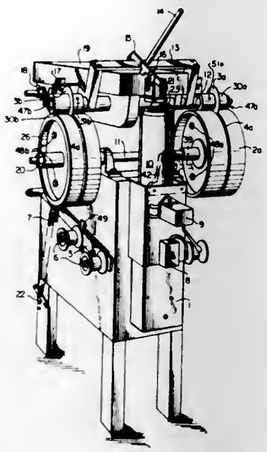
1. A machine for cutting tires into a plurality of pieces which comprises:

A. a frame;

B. a pair of wheels, vertically positioned upon the frame for receiving said tires, said wheels being opposingly positioned relative to each other and circumferentially slotted for the coactive positioning therein of circular cutting blades;

C. circular cutting blades mounted upon a first horizontal shaft, said first horizontal shaft being disposed transversely of the frame and secured to one end of a horizontal overhead beam;

D. an overhead beam, pivotally mounted on a second horizontal shaft which said second shaft is secured to the frame, said overhead beam being further pivotally connected with means, vertically mounted upon the frame for raising and lowering the end of said overhead beam so that said cutting blades may engage the circumferential slots in the cutting wheels when said overhead beam is lowered and raised;



E. horizontal tensioning bar means, pivotally mounted upon the frame at one end and connected with said overhead beam to engage the lower inside bead of a tire with a downward tensioning pressure when said overhead beam is lowered;

F. collar means adjacent either side of each said cutting blade, said collar means being of smaller diameter than said cutting blades for engaging the tread surfaces of said tires when the overhead beam is in the lower position to impart a turning motion thereto; and

G. power means connected to said first horizontal shaft for turning said shaft, collars and cutting blades.

4,072,073

MACHINE FOR CUTTING PIPE AND TUBING

Orville J. Birkestrand, 129A Casuda Canyon Drive, Monterey Park, Calif. 91754

Filed Apr. 8, 1976, Ser. No. 675,200
Int. Cl.² B23B 5/14
U.S. Cl. 82—92 **6 Claims**

1. A machine for cutting pipe, tubing and the like, comprising:

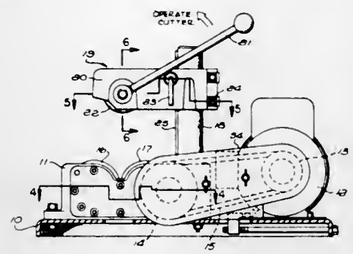
a base member and motive power means mounted thereon;

a pair of generally parallel, driven rollers rotatably mounted from said base member;

a mechanical drive arrangement mounted on said base member for coupling said motive power means to said rollers to cause said rollers to rotate synchronously in opposite rotational senses;

a cutter-head assembly including a free-wheeling cutter wheel rotatable about a shaft within said head assembly and substantially parallel to said rollers, and first means including an eccentric drive and connected hand lever for advancing said cutter against and through the work, said work, cutter and rollers all rotating when said cutter is in work contact;

and second means independent of said first means and mounted from said base member for selectively and rigidly pre-positioning said cutter-head assembly as a unit with respect to said work to provide an initial cutter position appropriate for a particular diameter of work, the range of cutter advancement required of said first means



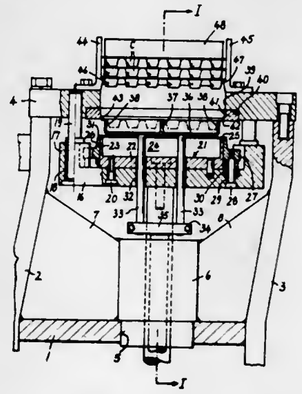
being thereby limited, said second means comprising a gear-toothed rack structurally fixed with respect to said base, and a pinion gear rotatably mounted about a shaft attached to said head assembly and associated with a second hand lever to effect said pre-positioning of said cutter-head assembly by rotation of said second lever.

4,072,074

DEVICE FOR FORMING ORDERLY ARRANGED GROUPS OF PACKAGES FROM A CONTINUOUS WEB OF PACKAGES

Andrea Romagnoli, Via Madonna dei Boschi 18, S. Lazzaro Di Savena (Province of Bologna), Italy

Filed Feb. 14, 1977, Ser. No. 768,508
Claims priority, application Italy, Feb. 13, 1976, 3335/76
Int. Cl.² B26D 7/06
U.S. Cl. 83—85 **4 Claims**



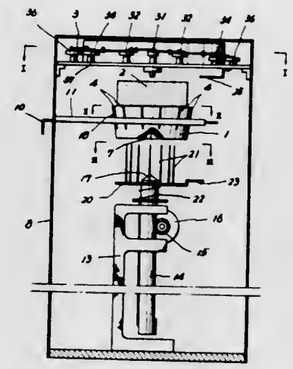
1. A device for forming orderly arranged groups of packages from a continuous web of packages, characterized in that it comprises a first stem slidably guided vertically and driven between a lowered position underlying the web and a raised position overlying the web, a support secured to the top of said stem, a punching member attached to said support and having a sidewall, said sidewall surrounding a cavity and including a border defining externally a cutting edge, a die supported such as to have a lower side substantially adhering to the upper side of the web and having an opening aligned with and complementary to the punching member, such as to permit the insertion thereof through the opening and the punching out of one package from the web during the raising movement of the punching member from said lowered position to said raised position, a second stem slidably guided parallel to the first stem and provided at the top with a plate receivable in said cavity, said stem being driven between a position wherein said plate underlies the web and a position wherein the plate overlies the web after the package punching has been completed, a stacking magazine being provided for the raised packages, said stacking magazine being located above said die and inclusive of a retaining means such that for each raised package there occurs a raising of the packages previously introduced in the magazine and the resting of the package last introduced on said retaining means.

4,072,075

CAKE CUTTER

Norio Ezaki, 3-29, Kohamahonmachi, Sumiyoshi, Osaka, Japan

Filed Apr. 28, 1976, Ser. No. 681,223
Int. Cl.² B26D 7/06, 3/24
U.S. Cl. 83—153 **8 Claims**



1. Apparatus for cutting cake, or the like, comprising a framework, an assembly of horizontally elongated power actuated reciprocatory cutters mounted on said framework, a removable table having an upper surface for supporting a cake and having a series of downwardly directed grooves in said surface corresponding to the arrangement of said cutters to receive said assembly of cutters therein below the level of the supporting surface, slide means mounted on said framework for initially positioning said table with an uncut cake below said cutters, and elevating means to raise said table thus positioned by said slide means to cause a cake on said table to be cut into a plurality of pieces by said cutters, said table and elevating means including registering means to automatically position the table to permit said cutters to be received in said grooves to permit the cake to slide horizontally from the surface of the table after cutting, a series of vertically extending lances mounted on said framework for vertical movement, and means for moving said lances upwardly from an initial position below a table initially positioned by said slide means through a series of aligned openings in said table into the interior of a cake on said table and for further upward movement with said table when a cake is being cut, said means for moving said lances including stop means for limiting said upward movement of the lances to prevent projection of said lances above the level of the supporting surface of the table after a cake has been cut, said means for moving said lances also including a vertically reciprocable element supported by said framework for detachable engagement with the underside of said table for raising said table from said slide means for cutting a cake and for lowering the table to said slide means after a cake has been removed, said series of lances being mounted on said elements for movement with said element.

4,072,076

PUNCHING APPARATUS

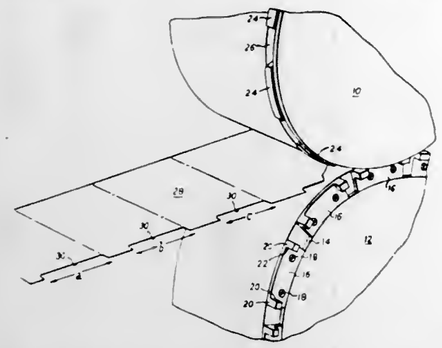
Geoffrey Robert Henry Miles, Kettering, England, assignor to Timsons Limited, Kettering, England

Filed Nov. 10, 1976, Ser. No. 740,545

Claims priority, application United Kingdom, Nov. 11, 1975, 46458/75

Int. Cl.² B26D 1/56

U.S. Cl. 83—300 6 Claims



1. An apparatus for punching out a plurality of notches of predetermined length in an edge portion of at least one travelling web, said apparatus comprising:

a. a pair of rotatable wheels between which said at least one web passes,

b. a plurality of segmental cutting elements arranged in spaced relationship around the periphery of one of the wheels, each cutting element being a bridge-shaped member with a pair of limbs, the space between the pair of limbs of each bridge-shaped member of each of said cutting elements being of successively respectively decreasing lengths, and

c. a plurality of cutting punches arranged in spaced relationship around the periphery of the other wheel, each of the cutting punches being of a size and arranged to fit within the space between a pair of limbs of a respective bridge-shaped member to engage its limbs and to produce a scissor-like action so as, in use, to punch out notches from said at least one web between the wheels.

4,072,077

PRINTED CIRCUIT BOARD PROTECTOR

John H. Morgan, Albuquerque, N. Mex., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed May 24, 1976, Ser. No. 689,444

Int. Cl.² B23D 33/02; B26D 7/06

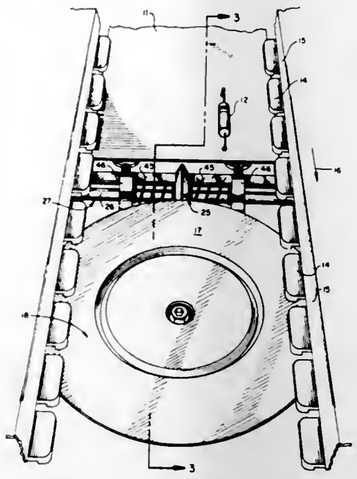
U.S. Cl. 83—418 31 Claims

1. In equipment for trimming component leads protruding from one side of a printed circuit board to a prescribed length when measured from the one side of a flat circuit board that is in a first plane, the equipment including a flat cutting disk arranged for rotation about an axis perpendicular to the first plane and having one surface adjacent to the first plane and being in a second plane that is parallel to and spaced from the first plane a prescribed distance that is equal to the prescribed length, and first means for moving circuit boards over the disk with at least a portion of edges of the one side of the board in the first plane and component leads projecting away from the one side of the circuit board in the direction of the second plane, the IMPROVEMENT comprising:

a wheel having an axis of rotation, a pair of sides, a circumferential outer edge, and having a thickness that is variable and which decreases in magnitude in the direction of the circumference of said wheel over at least a portion of the length of the radius thereof;

means rotatably supporting said wheel in front of the cutting disk in the direction of movement of circuit boards and for rotation in the same direction, said wheel being supported with a point on the circumference thereof located in the first plane, the remainder of said wheel being located on the side of the first plane that is in the direction of the second plane; a transverse force in the direction of the axis of rotation of said wheel being produced thereon when said wheel contacts an obstruction such as a component lead; and

means holding said wheel in a prescribed position along the



axis of rotation thereof when transverse force on said wheel in the direction of the axis thereof is less than a prescribed force and allowing lateral movement of said wheel along its axis of rotation only when a transverse force on said wheel exceeds the prescribed force; moving circuit boards that are bowed from the first plane in the direction of the second plane having the one side thereof contacting said wheel as the board moves over it for causing said wheel to rotate and to raise the one side of a bowed circuit board above the leading edge of the cutting disk.

4,072,078

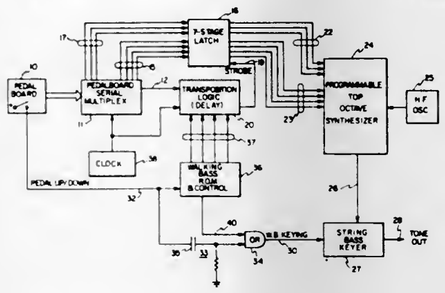
SYSTEM FOR AUTOMATICALLY PRODUCING TONE PATTERNS

Larry R. Shallenberger, Mishawaka, Ind., and James S. Southard, Union, Mich., assignors to C.G. Conn, Ltd., Oak Brook, Ill.

Filed Apr. 19, 1976, Ser. No. 677,975

Int. Cl.² G10H 1/00, 5/00

U.S. Cl. 84—1.03 13 Claims



1. A tone pattern generating system for use with an electronic musical instrument including, in combination:

a continuously running clock means for producing clock output pulses on an output thereof at a predetermined frequency;

rhythm pattern generating circuit means coupled with said clock means for producing at least one predetermined rhythm pattern for use in said musical instrument;

downbeat divider circuit means having an output, and having an input coupled with the output of said clock means and reset by a predetermined rhythm pattern from said rhythm pattern generating means to produce output pulses on the output of said downbeat divider circuit corresponding to downbeat measures synchronized with the operation of said rhythm pattern generating means; and

tone pattern control means coupled with the output of said clock means and with the output of said downbeat divider circuit means for producing predetermined tone patterns in synchronism with the downbeat pulses obtained from said downbeat divider circuit means.

4,072,079

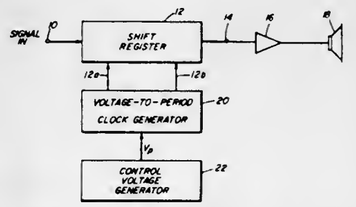
APPARATUS AND METHOD FOR MODIFYING A MUSICAL TONE TO PRODUCE CELESTE AND OTHER EFFECTS

Paul H. Sharp, South Pasadena, Calif., assignor to CBS Inc., New York, N.Y.

Filed Aug. 9, 1976, Ser. No. 713,008

Int. Cl.² G10H 1/04

U.S. Cl. 84—1.24 14 Claims



1. In an electric musical instrument, apparatus for electronically modifying sound derived from a source in which the sound is in the form of an audio frequency electrical signal, the combination of:

shift register means having an input terminal connected to receive an audio frequency electrical signal from said source and an output terminal,

a first clock generator coupled to said shift register means operative to generate a train of clock pulses the period of which is controllable in direct proportion to a control voltage applied to said clock generator, said clock pulses being applied to said shift register means for controlling the shifting of sampled representations of said audio frequency electrical signal through the shift register means to produce at said output terminal a delayed electrical analog representation of said audio frequency electrical signal, and

means for applying a sub-audio frequency control voltage to said first clock generator thereby to vary the period of said train of clock pulses at said sub-audio frequency rate, whereby a delayed frequency-modulated electrical analog representation of said input audio frequency electrical signal differing in frequency therefrom by an amount determined by the rate of change in amplitude of said sub-audio frequency control voltage is produced at said output terminal.

4,072,080

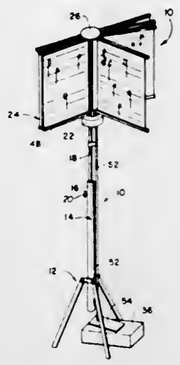
SHEET MUSIC PAGE TURNING DEVICE

Daniel Conlin, 810 Cornwall Ave., P.O. Box No. 5, Fort Frances, Ontario, Canada

Filed Feb. 20, 1976, Ser. No. 659,671

Int. Cl.² G10G 7/00

U.S. Cl. 84—486 6 Claims



1. A sheet music page turning device comprising in combination:

a base support member;

a verticalshaft carried by said base;

an annular guide track comprising a single circumferentially extending inverted U-shaped channel member mounted coaxially upon said vertical shaft and adapted to support a plurality of page holder elements movably thereon;

a plurality of spring-biased sleeve members mounted rotatably in superposed relation on said shaft;

a plurality of page holder elements supported within said channel member for movement therewithin;

a plurality of radial connecting arms secured to consecutively arranged ones of said sleeves and to consecutively arranged ones of said page holder elements whereby rotation of said sleeves serially results in the serial movement of said page holder elements within said channel member;

a foot pedal pivotably mounted on a pedal support member, a generally vertically extending slide rod connected to the free end of said foot pedal and provided with a retainer pin at the upper end thereof dimensioned to project slidably within an aligned aperture in said channel member into the path of movement of said page holder elements;

and spring means for normally biasing said slide rod upwardly such that said retainer pin projects through the said aperture in said channel member to prevent advancement of the formost of said page holder elements.

4,072,081

TENSION INDICATING WASHER UNIT

Gary Martin Curtis, Elgin, and David Prugh Wagner, Geneva, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

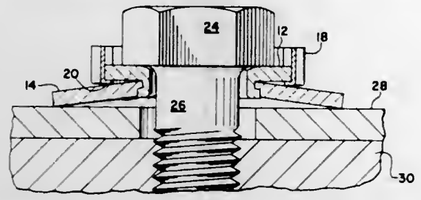
Continuation of Ser. No. 632,135, Nov. 14, 1975, abandoned. This application June 6, 1977, Ser. No. 803,707

Int. Cl.² F16B 31/02

U.S. Cl. 85—62 10 Claims

1. A multipiece, preassembled washer unit comprising at least two superimposed, coaxial washer members, means interconnecting the washer members from relative axial movement, the bottommost of said washer members being a cone-like spring device, a ring gauge member interposed between at least the outer marginal regions of the superimposed washer members, the ring gauge comprising a radially extending flange portion retaining the gauge on the unit and adapted to be pinched between the outer marginal regions of the washer members, the gauge further including side wall portions extending generally perpendicularly of the flange to surround

and locate the gauge relative to the uppermost of the superimposed washer members, the side wall portions comprising vertical corrugations about the entire periphery consisting of a plurality of V-shaped wall sections with the apices of said sections extending substantially parallel to the axis of the fastener and extending from the uppermost edge of the side wall to the flange the apices of said vertical corrugations being closely spaced from each other and contacting the outer periphery of the uppermost washer thereby providing a means for laterally sizing the gauge on the uppermost washer and for eliminating free lateral movement of the radially extending flange of the gauge relative to said washer, said plurality of



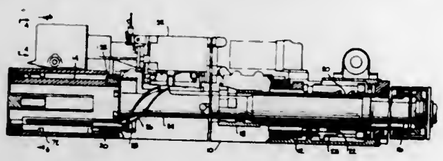
V-shaped wall sections being directly interconnected to one another at apices on the outer surface of said wall, said outer surface thus being provided with external grasping means for said gauge, wherein the unit may be associated with a rotary threaded fastener member in such a manner as to simultaneously provide spring take-up capabilities to a fastened joint while providing an indication of the attainment of a predetermined tension level in the joint when the conical spring member has been compressed an amount directly relatable to the predetermined tension level, said indication being the pinching of the ring gauge between the washer members to restrain the gauge from free rotation relative to the washer members.

4,072,082

RECOIL CONVERTER

P. A. Bates, Essex Junction; L. R. Folsom, Williston, and A. J. Haberstroh, North Hero, all of Vt., assignors to General Electric Company, Burlington, Vt.

Filed Nov. 4, 1974, Ser. No. 520,858
Int. Cl.² F41D *5/02*
U.S. Cl. 89—162 **11 Claims**



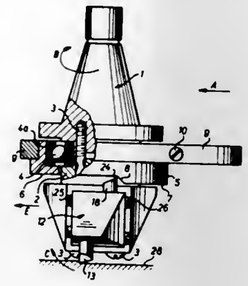
1. A gun comprising:
a stationary gun mount;
a gun housing journaled for reciprocation relative to said gun mount;
an operating mechanism carried by said housing;
an energy absorbtion and return mechanism coupled to said gun mount, said gun housing and said operating mechanism for absorbing and storing energy from the recoil movement of said housing relative to said gun mount, and for transmitting energy to said operating mechanism subsequent to said recoil movement;
a gun bolt coupled to said operating mechanism;
a gun barrel coupled to said operating mechanism;
said gun having a gun cycle from 0° to 360°;
said housing recoiling from 0° to 180°, and counter-recoiling from 180° to 360° of said gun cycle;
said gun barrel recoiling from 0° to 90°, and counterrecoiling from 90° to 180° of said gun cycle; and
said energy absorbtion and return mechanism absorbing energy from 0° to 180°, and transmitting energy to said operating mechanism from 180° to 360° of said gun cycle.

4,072,083

MILLING HEAD

Jiri Cesal, Kaiserstuhlstr. 57, Oberglatt, Switzerland (8154)

Filed Oct. 12, 1976, Ser. No. 731,360
Claims priority, application Switzerland, Nov. 6, 1975, 14469/75
Int. Cl.² B23C *5/26*; B23D *5/00*
U.S. Cl. 90—11 A **10 Claims**



1. A milling head comprising a shaft means for attachment to a machine tool, said shaft means defining a rotational axis, a tiltable holder means adapted to retain cutting means and defining a tilting axis extending perpendicularly to said rotational axis of said shaft means and mounting means operatively mounting said holder means relative to said shaft means so as to swivel said holder means along a portion of each revolution of the milling head means whereby the cutting means is lifted off from the surface to be machined, and in another portion of each revolution of the milling head means is engaging the surface to be machined, said mounting means further comprising camming means operatively associated with said holder means and with said mounting means, said camming means comprising a cam plate, and a cam follower means mounted relative to said cam plate for imparting said swivel motion of said holder means relative to said mounting means.

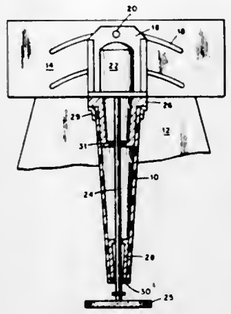
4,072,084

GRAPHITE FIBER REINFORCED STRUCTURE FOR SUPPORTING MACHINE TOOLS

Charles E. Knight, Jr., Knoxville; Louis Kovach, Oak Ridge, and John S. Hurst, Knoxville, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 17, 1976, Ser. No. 751,622
Int. Cl.² B23B *47/00*; B23C *5/28*; B24B *45/00*
U.S. Cl. 90—11 A **6 Claims**

1. In combination with a machine tool comprising a machine tool housing and a tool support carried by said housing for supporting a tool in a desired working relationship with a workpiece, said tool support comprising a hollow elongated tubular body formed of a plurality of layers of graphite fibers with the layers and fibers in each layer bonded together with a resin binder, the fibers in the majority of said layers being disposed in a side-by-side relationship and oriented so as to extend along a plane projecting between opposite ends of the tubular body, the fibers in the minority layers being wound about the tubular body in a side-by-side relationship and projecting in a plane orthogonal to the fibers in the first-mentioned



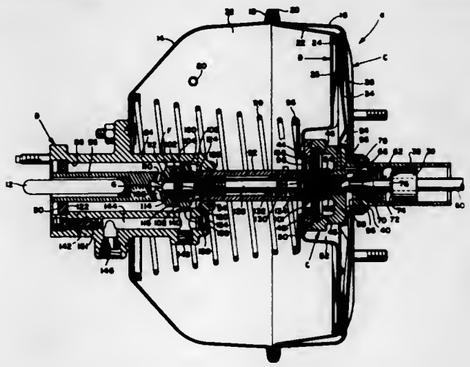
plane, each of the minority of the layers being separated from one another by a plurality of the majority of the layers.

4,072,085

COMBINED HYDRAULIC AND VACUUM BOOSTER

Thomas R. Soupal, Owosso, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Sept. 26, 1975, Ser. No. 617,199
Int. Cl.² F15B *11/20, 13/07*
U.S. Cl. 91—413 **5 Claims**



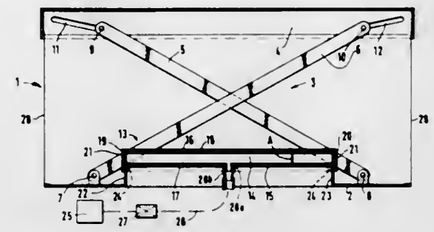
1. A combined hydraulic and vacuum booster comprising; series connected hydraulic and vacuum boosters having valve means for operating same and including a common force output member, common operating means for operating said valve means and energizing said boosters in sequence for first applying substantially the full force of said hydraulic booster to said output member while said vacuum booster is substantially inoperative and then applying the force of said vacuum booster to said output member, said hydraulic booster including a piston and said valve means including a normally open hydraulic valve for bypassing hydraulic fluid from one side to the other of said piston, said operating means being operative to first close said hydraulic valve and then momentarily operate said valve means to energize said vacuum booster with substantially less than its full force potential so that said vacuum booster simply follows said hydraulic booster without supplying any significant force to said force output member until substantially the full force of said hydraulic booster is applied to said force output member whereupon said valve means is operated to energize said vacuum booster to substantially its full force potential.

4,072,086

DRIVING ASSEMBLY

Karl Signar Nordlund, Bjarsbog, 212 90 Malmo, and Kjell Berglund, Revingevagen 4, 240 35 Harlosa, both of Sweden

Filed Feb. 10, 1976, Ser. No. 656,792
Claims priority, application Sweden, Feb. 10, 1975, 7501416
Int. Cl.² F15B *11/08*; F01B *19/00*
U.S. Cl. 91—418 **11 Claims**



1. A driving assembly comprising:
a. a first unit having a portion with the form of a first open container, a bottom wall of which defines a first bladder bearing surface, said first container having a first container side wall extending from the peripheral portion of said bottom wall, said side wall, together with said first container bottom wall, defines a first cavity, said first container being open on the end opposite said first container bottom wall;
b. a second unit having a portion with the form of a second, open container, a bottom wall of which defines a second bladder bearing surface, said second container having a second container side wall extending from the peripheral portion of said second unit bottom wall, said second container side wall together with said second container bottom wall defines a second cavity, said second container being open on the end opposite said second container bottom wall, said second container being disposed within the cavity of said first container in telescopic, nested relationship therewith so that said first and second bearing surfaces are in opposed, spaced relationship, said first unit being movable relative to said second unit;
c. an expansible bladder engaging said first and second units and disposed therebetween, said bladder having an outer surface area and an inner expansible chamber; said bladder having a pair of opposite end wall portions comprising the major portion of said outer surface area of said bladder; the remaining outer surface area being defined by a side wall portion of said bladder at least when said container is in a pressurized condition;
d. means connected with said bladder for effecting communication with a pressure source, the shape of said bladder being changeable in response to a change in fluid pressure in said bladder to move said first unit with respect to said second unit, said communication means passing through said second bearing surface of said second unit and into said second container cavity, whereby said second container provides space for and protection for said communication means;
e. said first container side wall and said first and second container bottom walls defining an enclosed area within which said bladder is entirely disposed;
f. said bladder fully engaging the side of said second container bottom wall which faces away from said second container cavity, said bladder being disposed entirely outside said second container cavity, said bladder fully engaging the side of said first container bottom wall which faces toward said first container cavity of said first container, said bladder being disposed entirely within said first container cavity;
g. the entirety of said first container side wall being disposed in parallel relationship with the entirety of said second

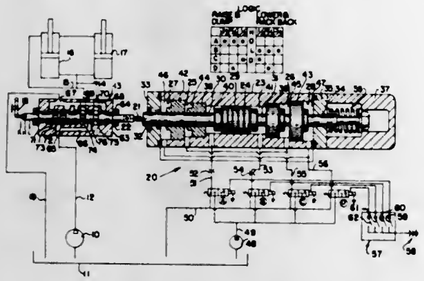
container side wall, the major portions of the first and second container side walls overlapping each other in face-to-face relationship when said bladder is in the depressurized condition, said first and second container side walls being movable relative to each other when the pressure in said bladder increases, said first and second container side walls cooperating with each other during such movement to guide and stabilize the movement of said first unit relative to said second unit.

4,072,087

DIGITAL POSITIONER FOR REMOTE ACTUATION OF A CONTROL VALVE

James P. Mueller, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 17, 1975, Ser. No. 614,047
Int. Cl.² F15B *11/08, 13/043*
U.S. Cl. 91—461 **5 Claims**



1. A hydraulic system having a remotely controlled positioner for a hydraulic control valve for fluid-operated mechanism, comprising:

an inlet and exhaust hydraulic control valve wherein said valve has a spool reciprocably mounted within a cylindrical valve bore and which is movable to intermediate positions between fully open and fully closed positions for controlling the flow of fluid between an inlet and an outlet of said valve;

a positioner housing having a cylindrical bore, said bore having a central region and a pair of intermediate regions each adjacent an opposite end of said central region and further having a pair of outer regions each adjacent a separate one of said intermediate regions;

a double acting piston reciprocably mounted in said central region of said bore and having a rod extending axially from said bore through said opposite regions of said positioner housing and spring means associated with said positioner for biasing said piston towards a central position in said central region of said bore;

a first pair of movable fluid-controlled stop means each being disposed in a separate one of said intermediate regions of said bore for axial movement therein, and a second pair of movable fluid controlled stop means, each being disposed in a separate one of said outer regions of said bore for axial movement therein wherein the face areas of each of said stop means exceed the face area of said double-acting piston;

a first pair of abutment means each being situated between said central region of said bore and a separate one of said intermediate regions thereof for limiting movement of said first pair of stop means towards said central region of said bore, and a second pair of abutment means each being situated between a separate one of said outer regions of said bore and the adjacent one of said intermediate regions thereof for limiting movement of said second pair of stop means towards said intermediate regions of said bore;

a source of pilot fluid;

a first pilot valve means for selectively directing fluid from said source to one end of said central region of said bore for moving said piston towards the other end thereof, a second pilot valve means for selctively directing fluid from said source to said other end of said central region of said bore for moving said piston towards said one end thereof, a third pilot valve means for selectively directing fluid from said source to both of said intermediate regions of said bore to move said first pair of stop means against said first pair of abutment means, and a fourth pilot valve means for selectively directing fluid from said source to both of said outer regions of said bore to move said second pair of stop means against said second pair of abutment means, and

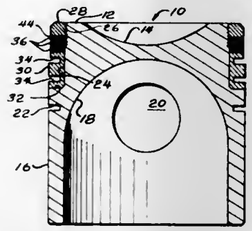
means external of said housing for connecting said rod to said valve spool for moving said valve to said positions.

4,072,088

LIGHT-WEIGHT PISTON ASSEMBLIES

Alexander Goloff, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 25, 1976, Ser. No. 699,759
Int. Cl.² F16J *1/00*
U.S. Cl. 92—220 **4 Claims**



1. A light-weight piston assembly comprising:

a piston body formed of a light-weight metal and having a crown and a depending skirt;

an annular recess about the end of the body adjacent the crown and opening toward the crown, the portion of said recess immediately adjacent the crown being threaded;

a hard metal ring groove protection band having a peripheral, radially outwardly opening ring receiving groove disposed with a press fit in said recess;

at least one annular wavy spring in said recess; and a nut threaded on said threaded portion securing said band and said spring(s) within said recess such that said spring(s) is compressed to store energy to tightly hold said band against movement relative to said body during various piston operating conditions;

said spring(s) being defined by an elongated, narrow, metallic strip having its ends butt welded together to form an annular structure.

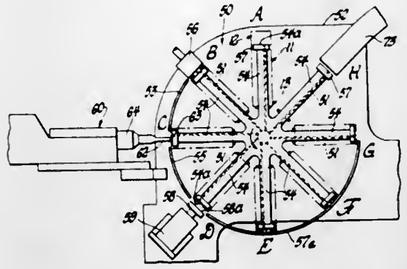
4,072,089

TWO STATION SONIC SEALING APPARATUS AND METHOD

Eugene R. Bosche, Plymouth, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed May 26, 1976, Ser. No. 690,221
Int. Cl.² B31B *1/66*
U.S. Cl. 93—44.1 GT **26 Claims**

14. A method of forming a seal between layers of thermoplastic coated paperboard material and the like, said method comprising the steps of: clamping the layers between the opposed work surfaces of a vibrating horn and a back-up means for a predetermined period of time sufficient to cause the thermoplastic material to be thermally activated by the frictional heat generated by the vibrating horn; unclamping the layers from between the work surfaces of said horn and back-up means while the thermoplastic material is still in its activated state; moving the layers with the activated thermoplastic material to another location; and clamping the layers between opposed work surfaces at said another location for a predetermined period of time sufficient to permit the thermoplastic material to cool and set and form a seal between the layers.



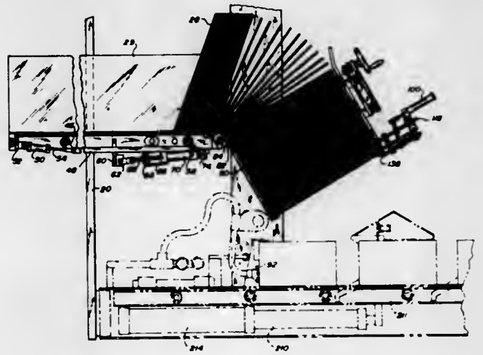
26. Apparatus as claimed in claim 1 including preclosing means spaced from said activating station for pressing the layers to be sealed to their closed condition prior to movement of the layers to said activating station.

4,072,090

APPARATUS AND METHOD FOR AUTOMATICALLY FEEDING AND ERECTING FOLDED CARTONS

Raymond A. Heisler, 657 Dakota Trail, Franklin Lakes, N.J. 07417

Filed June 21, 1976, Ser. No. 698,401
Int. Cl.² B31B *1/80*
U.S. Cl. 93—53 M **20 Claims**



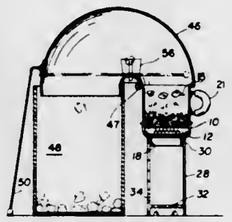
1. Apparatus for receiving, transporting and presenting for withdrawal and the erection of folded cartons for use in case packing apparatus and the like, said apparatus including: (a) a fixed frame including side guides providing a support surface for receiving and maintaining folded cartons in a substantially side-by-side condition; (b) a reciprocating frame movable in a rectangular pattern and within the fixed frame, the movement including a vertically movable portion bringing the frame into a lifting engagement of at least one-eighth of an inch of the reciprocating frame above the fixed frame with at least a substantial portion of the folded cartons carried forwardly with a forward movement of the reciprocable frame, the movement pattern further including a lowering of the frame, of at least one-eighth of an inch of the reciprocating frame below the fixed frame to bring the frame below the support surface of the fixed frame and during this lowered movement the reciprocable frame is moved rearwardly, the reciprocating frame carried by a pair of axles having eccentrically formed ends which provide an eccentric motion of at least one-eighth inch throw and with antifriction rollers mounted on these ends, said rollers carrying the reciprocable frame on portions of the fixed frame so that when movable therealong the movable frame is moved in a path substantially parallel to the carton support surface provided by the fixed frame, and there is additionally provided means for simultaneously rotating the axles so that the eccentric ends at one limit of rotation of the axles are raised sufficiently to cause the rollers to lift the reciprocable frame and its carton support surface and at the other limit of rotation the axles are repositioned so that the eccentrically mounted rollers lower the carton support surface of the reciprocable frame below the carton support surface of the fixed frame; (c) means for moving the reciprocable frame forwardly and rearwardly with and by actuation of a hydraulic cylinder and there is provided limiting means on the hydraulic force whereby on the forward stroke a chute filled with folded cartons overcomes the propulsive force of the cylinder which is inhibited to the extent that a forward transport of the cartons does not occur as and until a sufficient amount of cartons has been withdrawn to permit other folded cartons to be moved forwardly to take the place of those withdrawn; (d) means for delivering the folded cartons from their vertically supported condition to a generally horizontal condition in said delivery chute; (e) a carton escapement apparatus in association with the delivery chute and having a carton stop reciprocably actuated by a single means whereat in one limit of movement this stop supports an outer edge of the lowermost carton in the horizontally disposed stack of folded cartons and when this carton stop is moved to and near its other limit of movement the engaged edge of the lowermost carton is released for removing from the stack and in a timed association with this movement of the carton stop there is provided an intermediate wedge-shaped entering blade which is moved counterflow to the movement of the carton stop, said blade movably disposed to enter that space between the lowermost carton and the next above carton as and with a sufficient time interval occurring before the carton stop is withdrawn from the stack supporting condition, and during the time the carton stop is withdrawn from supporting condition to support this immediately above and those additional above folded cartons, and (f) means for advancing the wedge-shaped entering blade a determined distance in from the edge of the folded carton to insure that the variations in carton construction are overcome and the entering blade positively engages the edge of the folded carton.

4,072,091

PORTABLE ELECTRIC HEATING DEVICE FOR POPPING CORN

Victor M. Richardson, Brocton, N.Y., assignor to The Raymond Lee Organization, Inc., a part interest

Filed Aug. 31, 1976, Ser. No. 719,173
Int. Cl.² A23L *1/18*
U.S. Cl. 99—323.5 **6 Claims**



1. A portable heating device for popping corn comprising:

a cup shaped member containing an electric heating element disposed intermediate a top relatively large diameter round open end having an internal thread and a bottom relatively small diameter round closed end having an external thread, the element being insulated from the member;

an electrical connector secured to the outside of the cup and connected electrically to said element;

a vertical cylindrical shaped sleeve, open at its top end and having a bottom end threadedly engaging the top end of the member;

a vertically flexible hollow cylinder disposed along side of the member and sleeve, the bottom end of the cylinder being closed, the top end being open; and

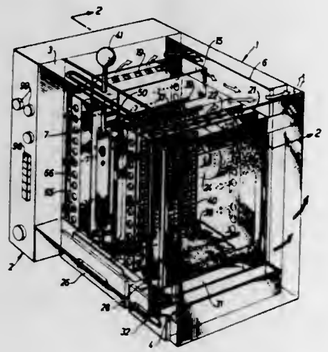
a hollow deflector chute extending between the sleeve and the cylinder, the chute having two spaced open ends, one open end of the chute being connected to the top end of the sleeve, the other open end of the chute being connected to the top end of the cylinder whereby when the sleeve is filled with popcorn and the element is heated, corn is popped and passes through the chute into the container.

4,072,092

METHOD OF AND AN APPARATUS FOR PREPARING A FOOD PRODUCT

Martti Ilmari Köhli, Stenhamra; Fjalar Ernst Erik Eklund, Danderyd, and Bo Allan Callerhorn, Upplands Vasby, all of Sweden, assignors to Concordia Development AB, Sollentuna, Sweden

Filed Mar. 23, 1976, Ser. No. 669,628
Claims priority, application Sweden, Mar. 25, 1975, 75034744
Int. Cl.² A47J *37/08; A23L 3/00*
U.S. Cl. 99—389 **12 Claims**



1. An apparatus for cooking a food product of meat, fish or the like comprising an oven defining an oven space and including holding means for holding the product to be cooked in the oven space, and IR-radiating means for IR-radiation of the product in this oven space, said holding means including means for holding the product vertically in the oven space, said IR-radiating means being arranged at two opposite sides of the oven space on opposite sides of the holding means for simultaneous two-sided irradiation of the product, said IR-radiating means including a plurality of generally horizontally extending vertically spaced separate tubular electric IR-elements arranged on said opposite sides of the oven space for emitting IR-radiation with wavelengths within the range of 0.7 to 5 μm, and fan means for providing a controlled air flow directed downwards around the product during its radiation in the oven space.

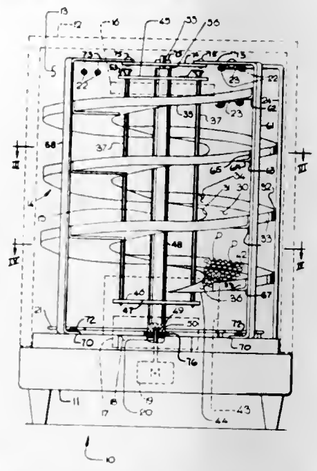
4,072,093

ROTARY FOOD OVEN

Elvis Simon Zimmer, Cedar, and David Allen Hassell, Coon Rapids, both of Minn., assignors to Jeno F. Paulucci, Duluth, Minn.

Filed Apr. 2, 1976, Ser. No. 672,849
Int. Cl.² A47J *37/06*
U.S. Cl. 99—443 R **41 Claims**

1. A rotary food heating oven comprising:
a. an insulated base;
b. an insulated cover removably sitting upon the base and forming together with the base a heatable oven chamber;
c. an upright vertical axis annular trackway in the oven chamber for supporting food packages thereon, the trackway having an open center section and being secured to the base;
d. a motor mounted in the base and having a drive coupling portion operatively accessible from within the trackway center section;
e. a drive reel positioned within the trackway center section and having
1. a lower end coupling portion operatively complemental and connectable to the motor coupling portion for connection of the reel to the motor for rotational movement of the reel within the trackway,
2. a journal at its upper end, and



3. means for engaging and advancing food packages around the trackway; and
f. a bearing engaging the reel journal and aligning the reel with respect to the trackway, the bearing being removably secured to the trackway; and in which
1. the cover is liftably removable from the base,
2. the bearing is removable fromthe trackway when the cover is removed, and
3. the reel is disconnectable from the motor and removable upwardly out of the trackway, and is also installable in the trackway and connectable to the motor, when the bearing is removed, for assembly and service of the oven.

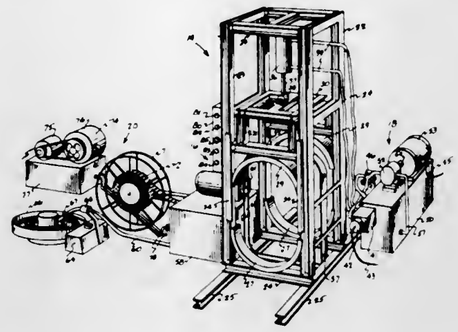
4,072,094

METHOD FOR BUNDLING FIREWOOD

Stephen N. Smitherman, Loveland, and Lemuel A. Dougherty, Longmont, both of Colo., assignors to Big Elk Wood Corporation, Steamboat Village, Colo.

Division of Ser. No. 513,006, Oct. 7, 1974, Pat. No. 3,939,762. This application Jan. 12, 1976, Ser. No. 648,618
Int. Cl.² B65B *13/04*
U.S. Cl. 100—3 **12 Claims**

1. A method for bundling firewood, said method comprising:
providing an assembly having first and second sections at a predetermined work area with one of said sections being movable toward and away from the other of said sections, each of said sections having spaced portions engageable with only the outer portions of pieces of firewood to be bundled at said work area;
placing a plurality of pieces of firewood between said first and second sections at said predetermined work area;
providing a control system including an electrical system;
providing actuating means controlled by said control system for causing movement of said one section toward and away from said other section;
applying a multi-ton pressure to only the outer end portions of said pieces of firewood while at said work area by said actuating means causing movement of said one section toward said other section to compress said work pieces into a bundle having a predetermined configuration;
providing a strapping means at said work area controlled by said control system;
applying a strap by said strapping means to the middle portion of said firewood bundle while maintaining said multi-ton pressure on the outer end portions of said bundle; and



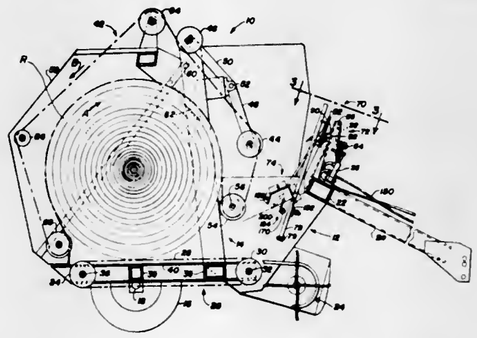
releasing the pressure on the outer end portions of said bundle by said actuating means causing movement of said one section away from said other section after said strap has been applied to said bundle so that the bundle is thereafter maintained compressed by only the strap in a tight bundle.

4,072,095

TWINE WRAPPING MECHANISM FOR A ROLL FORMING MACHINE

Willis R. Campbell, Ephrata, and Thomas W. Waldrop, New Holland, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Aug. 30, 1976, Ser. No. 718,711
Int. Cl.² B65B *13/20*
U.S. Cl. 100—5 **9 Claims**



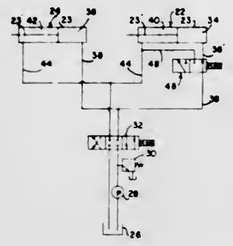
1. A roll forming machine for crop materials comprising:
a. a mobile frame;
b. means on said frame defining a roll forming region;
c. a dispensing mechanism for feeding wrapping material in a predetermined path across said roll forming region, said dispensing mechanism including a dispensing tube;
d. a support means rigidly fixed to said frame; and
e. mounting means selectively movably connecting said dispensing mechanism to said support means, said mounting means including a gear segmented plate rigidly supporting said dispensing tube, and a shaft member interconnecting said plate and said support means whereby upon rotation of said plate by the movement of said gear segment by either a manually actuated component or rotation of said shaft by a power motor component said dispensing tube moves in a predetermined path to dispense the wrapping material across said roll forming region.

4,072,096

BALER GATE HYDRAULIC LOCK

Carmen S. Phillips, Memphis, Tenn., assignor to International Harvester Company, Chicago, Ill.

Filed Aug. 2, 1976, Ser. No. 710,944
Int. Cl.² B30B *15/28, 5/06*
U.S. Cl. 100—53 **4 Claims**



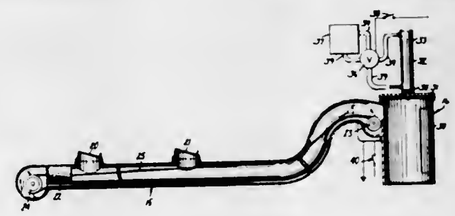
1. In a baler including a gate hydraulically raisable to release a bale, a hydraulic system for actuating and selectively locking the gate comprising:
a source of hydraulic pressure fluid;
a hydraulic cylinder on the baler operable upon actuation to raise the gate;
conduit means hydraulically interconnecting said source with said cylinder;
a flow control valve in said conduit means manually operable to direct pressure fluid into said system to selectively raise the gate;
and a manual selector valve in said conduit means interposed between said cylinder and said control valve operable to block actuating fluid flow to and from said cylinder, whereby said gate may be hydraulically locked in a raised position, said selector valve including means for permitting pressure fluid to flow therethrough back to said source when disposed in said flow-blocking relation, whereby inadvertent operation of said control valve will not cause the gate to move from its locked position.

4,072,097

LITTER DISPOSAL DEVICE FOR AUTOMOBILES

Arthur H. Seibel, Rte. No. 3, Red Lake Falls, Minn. 56750

Filed June 18, 1976, Ser. No. 697,471
Int. Cl.² B30B *15/30*
U.S. Cl. 100—100 **3 Claims**



1. A litter disposal system for vehicles, comprising:
a. a conveyor conduit carried by said automobile along the underside thereof which includes at least one access port thereon for communication between the interior of said automobile and the interior of said conduit;
b. a pulley wheel mounted at the forward end of said conduit, said pulley wheel being axially rotational therein;

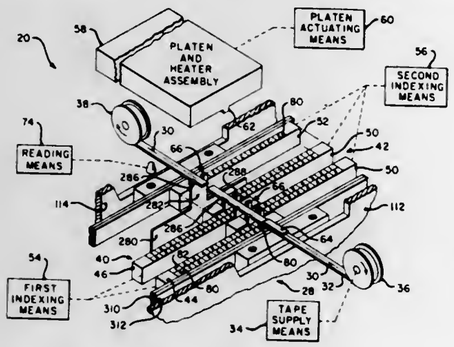
c. a motor means operably engageable with said conduit at the rear thereof, said motor means being an automatically reversible type electrical motor, and which includes a rotationally operable wheel means thereon;
d. a tension cable which is operably engageable with said wheel means on said motor and said pulley wheel at forward end of said conduit, said tension cable being formed of a relatively flexible material;
e. a wiper plug carried by said cable within said conduit and being sized such that it substantially covers the internal cross-sectional area of said conduit, said wiper plug thereby being movable from the forward end of said conduit to the rearward end of said conduit in response to operation of said motor and being movable from the rearward portion of said conduit to the forward portion of said conduit in response to reverse operation of said motor;
f. a litter accumulation receptacle attached to the rearward portion of said conduit, said receptacle including:
i. a compactor means thereon which is independently operable; and
ii. an access door on said receptacle for removal of said litter from within said receptacle.

4,072,098

METHOD AND APPARATUS FOR EMBOSSING DIFFRACTION GRATINGS ON A RECORD MEDIUM

Robert H. Granzow, Miamisburg, and Richard P. Marvin, West Carrollton, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Sept. 27, 1976, Ser. No. 727,111
Int. Cl.² B44C *1/24*
U.S. Cl. 101—32 **12 Claims**



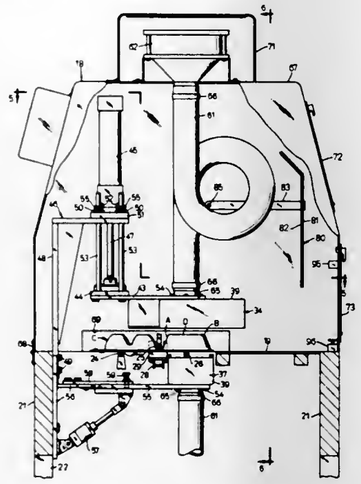
1. An apparatus for producing diffraction gratings on a length of reflective deformable material in conformance with a predetermined code, said diffraction gratings including data gratings and control gratings, said apparatus comprising:
an embossing station having an embossing line thereat;
a plurality of bar means, with each said bar means having grating masters thereon;
each said bar means having a length which is long in relation to its width and having the associated grating masters oriented thereon in a predetermined direction;
said plurality of bar means including first and second groups of said bar means in which said grating masters on each said bar means comprise data grating masters and control grating masters which are aligned along the length of the associated bar means with one control grating master being in side by side relationship with each said data grating master;
means for indexing said first and second groups of bar means in opposed advancing and receding relationship to each other and in a direction which is perpendicular to said embossing line so as to position selected ones of said grating masters at said embossing line so that one of said control grating masters is positioned between each two successive said data grating masters at said embossing line;
means for indexing a length of said reflective deformable material along said embossing line; and
platen means including a platen for each said bar means for forcing said length of reflective deformable material into engagement with the grating masters which are selectively positioned at said embossing line to form said diffraction gratings on said length of reflective deformable material in conformance with said code.

4,072,099

APPARATUS FOR APPLYING AND DRYING INK ON CONTAINERS

Thomas R. Martin, Milwaukee, Wis., assignor to Condes Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 640,012, Dec. 12, 1975, abandoned. This application Nov. 24, 1976, Ser. No. 744,812
Int. Cl.² B41F *17/00*
U.S. Cl. 101—44 **13 Claims**



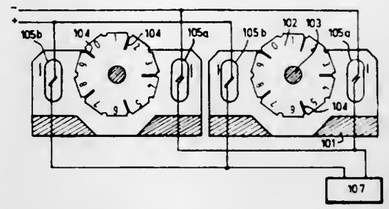
1. Apparatus for applying ultraviolet light reactive ink to articles susceptible to damage from excessive heat and for drying the ink thereon comprising:
conveyor means for moving said articles along a path at a predetermined speed;
printing means for applying ultraviolet light reactive ink to said articles moving along said path;
drying means including a heat-emitting ultraviolet lamp for emitting ultraviolet light toward said articles moving along said path to dry said ink thereon, said drying means comprising a housing wherein said lamp is disposed, said housing having an access door thereon and a deflector mounted therein, said deflector being selectively movable between one position wherein it is disposed between said lamp and said path of movement and another position wherein it is removed from between said lamp and said path;
lamp moving means for moving said lamp between a position near said articles and a position farther away from said articles, said lamp remaining illuminated and effecting drying of ink in both positions;
and control means responsive to the speed of said articles past said lamp to operate said lamp moving means to maintain said lamp in said near position to effect drying of said ink without effecting heat damage to said articles when said articles are moving at said predetermined rate of speed and to move said lamp toward said position farther away from said articles to effect drying of said ink without effecting heat damage to said articles when said articles are moving at a speed less than said predetermined speed, said control means comprising a first switch responsive to opening movement of said door to move said lamp from said position near said articles toward said position farther away from said articles as said deflector is moved toward said one position wherein said deflector is disposed between said lamp and said path.

4,072,100

NUMBERING MACHINE ASSEMBLY ESPECIALLY ADAPTED FOR USE WITH PRINTING MACHINERY

Francois Polo, 7, rue Jean Jaures, 93140 Bondy, France

Filed Aug. 2, 1976, Ser. No. 710,868
Claims priority, application France, Aug. 7, 1975, 75 24617; July 6, 1976, 76 20642
Int. Cl.² B41L *45/00*
U.S. Cl. 101—79 **16 Claims**



1. In a numbering assembly adapted to be inserted in a printing machine, said assembly comprising at least one numbering machine the operation of which is to be checked, said at least one numbering machine having a plurality of rotatably mounted printing discs, each disc having a plurality of printing faces, adapted to be brought successively into a printing position as said disc rotates, the improvement according to which said assembly also comprises
at least one monitoring numbering machine having printing discs connected to rotate in synchronism with those of said at least one numbering machine to be checked, each printing disc of said monitoring machine having the same number of printing faces as the discs of said numbering machine to be checked, and each disc of each machine being connected to produce a signal when a printing face is in printing position,
and indicating means responsive to said signals for producing an error signal when at least one of the discs of the machine to be checked occupies an angular position different from that of the corresponding disc of said monitoring machine.

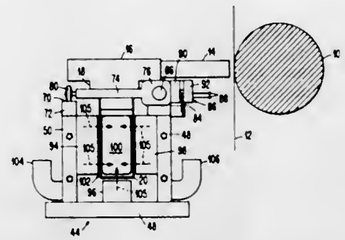
4,072,101

LINEAR ACTUATOR PRINTER CARRIAGE

Joe La Garcia, Arvada, Colo.; Brandt Mead Griffing, Arcadia, Fla.; Paul Yu-Fei Hu, Boulder, and Richard George Millington, Longmont, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 27, 1976, Ser. No. 690,770
Int. Cl.² B41J *9/04*
U.S. Cl. 101—93.15 **3 Claims**

1. Linear actuator comprising in combination:
a single rectangular magnetic flux return path; said magnetic flux return path being stationary and centrally located;
a magnetic structure being positioned in spaced relation with only three sides of said return path; said magnetic structure having only three pieces of rectangular slab magnetts being arranged so that each piece of the slab magnets faces one of the sides of said magnetic flux return path to supply flux lines perpendicular to said return path;
an air gap operably positioned between the magnetic flux return path and the slab magnets;



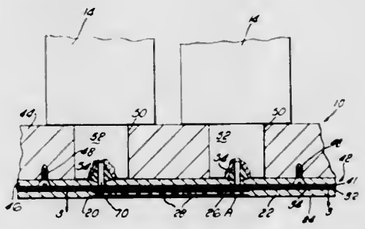
a coil bobbin means operably positioned to move within said air gap; and means operable for supplying electrical energy to said coil bobbin.

4,072,102

FLUID APPLYING PLATE

Harold Frederick Farrow, Hitchin, England, assignor to Colorflo Limited, Hitchin, England

Filed Oct. 28, 1976, Ser. No. 736,568
Claims priority, application United Kingdom, Nov. 20, 1975, 47832/75
Int. Cl.² B41F *3/36, 1/40*
U.S. Cl. 101—151 **9 Claims**



1. Apparatus for depositing fluid on a substrate in a predetermined design comprising:
a die plate having a recess in a first surface thereof corresponding with said design;
a first passage means in said die plate connecting a second surface of said die plate with said recess to deliver fluid into said recess, said second surface being the opposite and parallel surface from said first surface of said die plate;
a planar, rigid feed plate having a first surface thereof which is free of any projections therefrom and which is adherently bonded to said second surface of said die plate to form a two-part die assembly;
a second passage means in said feed plate connecting a second surface opposite and parallel to said first surface of said feed plate to deliver fluid therethrough to said first passage means in said die plate without contacting said second surface of said feed plate;
a plurality of fluid injector units adapted for directing fluid into said second passage means in said feed plate for transmission into said recess;
support means for supporting said plurality of fluid injector units having a first surface thereof which is detachably bonded to said two-part die assembly and which is provided with a third passage means through which fluid flows from certain of said injectors; and
at least one lateral fluid distribution channel formed in said two-part die assembly, each lateral fluid distribution channel being formed between said adherently bonded die and

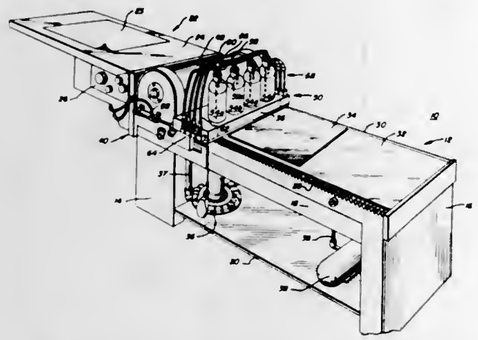
feed plates with said second surface of said feed plate blocking fluid flow back into other of said injectors.

4,072,103

GRAVURE PRESS FOR MAKING MULTICOLOR PROOFS

C. Hugh Fletcher, Rolling Meadows; Raymond G. Bogdan, Glenview; Robert W. Wright, Des Plaines, and Robert M. Cheuvront, Maywood, all of Ill., assignors to Vandersons Corporation, Chicago, Ill.

Filed Oct. 26, 1976, Ser. No. 735,264
Int. Cl.[2] B41F *3/36, 3/38, 3/28*
U.S. Cl. 101—151 **5 Claims**



1. A gravure press for making proofs using a printing plate comprising:
- a press bed for holding said printing plate;
- a control system for regulating the operation of said press; and,
- a carriage assembly responsive to said control for moving relative to said plate and including:
  - an ink distribution system responsive to said control for dispensing a predetermined quantity of ink upon said plate and comprising:
    - a plurality of reservoirs for containing ink;
    - a plurality of retaining cylinders each having a longitudinal receiving channel recessed from the surface for temporarily holding ink;
    - a housing holding said retaining cylinders for rotational movement about the axis of said cylinder;
    - a plurality of transfer devices each connected to one of said reservoirs and one of said retaining cylinders and responsive to said control for filling said channel of one of said retaining cylinders with ink; and,
    - a plurality of actuators each connected to one of said cylinders for rotating said cylinder to dispense ink;
  - spreading means responsive to said control for uniformly moving said dispensed ink across said plate; and,
  - a cleaning unit responsive to said control for removing said dispensed ink after printing.

4,072,104

PRINTING UNIT DRIVE SYSTEM

Robert H. Schaffer, Mystic, Conn., assignor to Harris-Intertype Corporation, Cleveland, Ohio

Continuation of Ser. No. 384,403, Aug. 1, 1973, abandoned. This application Nov. 3, 1975, Ser. No. 628,056
Int. Cl.[2] B41F *13/12*
U.S. Cl. 101—248 **5 Claims**

1. A printing press comprising,

first and second blanket cylinders defining a printing nip and having a first position in which said blanket cylinders are cooperable to print on opposite sides of sheet material advanced through the nip and a second position in which said blanket cylinders are ineffective to print on the sheet material,

a first bearer fixedly connected with said first blanket cylinder and having a circular outer surface,

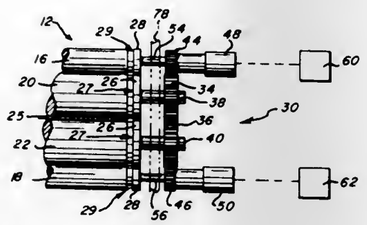
a second bearer fixedly connected with said second blanket cylinder and having a circular outer surface of the same diameter as the diameter of the circular outer surface of said first bearer, said outer surfaces of said first and second bearers being disposed in rolling engagement when said blanket cylinders are in said first position, said first and second bearers forming a set of blanket cylinder bearers,

first and second plate cylinders which engage said blanket cylinders when the blanket cylinders are in the first position, each of said plate cylinders being spaced apart from and ineffective to transfer an image to the associated blanket cylinder when the blanket cylinders are in the second position,

a third bearer fixedly connected with said first plate cylinder and having a circular outer surface disposed in rolling engagement with the circular outer surface of said first bearer when said blanket cylinders are in said first position,

a fourth bearer fixedly connected with said second plate cylinder and having a circular outer surface disposed in rolling engagement with the circular outer surface of said second bearer when said blanket cylinders are in said first position, said third and fourth bearers having circular outer surfaces of the same diameter and forming a set of plate cylinder bearers,

throw-off means for effecting relative movement between



said first and second blanket cylinders from the first position to the second position in which said blanket cylinders are ineffective to print on sheet material and are spaced apart from said plate cylinders, said throw-off means being effective to relatively move said blanket cylinders from the second position to the first position in which said blanket cylinders are effective to print on sheet material and are in engagement with said plate cylinders,

means for drivingly interconnecting said first and second blanket cylinders when in their first and second positions, said means for drivingly interconnecting said first and second blanket cylinders comprising,

first and second gears having equal numbers of teeth and having design pitch circles of the same diameters as said first and second bearers,

said first and second gears being different from standard gears in that said first and second gears each have a design pitch diameter which is greater than the number of teeth on the gear divided by the diametral pitch of the gear,

means for connecting said first gear to said first blanket cylinder in a coaxial relationship with said first bearer, and

means for connecting said second gear to said second blanket cylinder in a coaxial relationship with said second bearer,

said first and second gears having gear teeth which are disposed in meshing engagement when said blanket cylinders are in their first and second positions,

said design pitch circles of said first and second gears having a single point of intersection when said blanket cylinders are in said first position,

said first and second gears forming a set of blanket cylinder gears which is associated with said set of blanket cylinder bearers,

a third gear having gear teeth disposed in meshing engagement with gear teeth of said first gear when said first and second blanket cylinders are in their first and second positions,

a fourth gear having gear teeth disposed in meshing engagement with gear teeth of said second gear when said first and second blanket cylinders are in their first and second positions,

means drivingly connecting said third gear with said first plate cylinder in a coaxial relationship with said third bearer,

said third gear having a design pitch circle of a diameter which is greater than the diameter of said third bearer, said design pitch circle of said third gear overlapping and having two points of intersection with the design pitch circle of said first gear when said blanket cylinders are in said first position,

said third gear having a working pitch circle which is of a smaller diameter than its design pitch circle, the working pitch circle of said third gear being tangent to the working pitch circle of said first gear when said blanket cylinders are in said first position,

the number of gear teeth on said first gear meshing with the gear teeth of said third gear being less than that required to rotate the surface of said first plate cylinder at the surface speed of said first blanket cylinder,

said means drivingly connecting said third gear with said first plate cylinder including means for effecting rotation of said first plate cylinder relative to said third gear to effect rotation of the surface of said first plate cylinder at the surface speed of said first blanket cylinder,

means drivingly connecting said fourth gear with said second plate cylinder in a coaxial relationship with said fourth bearer,

said fourth gear having a design pitch circle of a diameter which is greater than the diameter of said fourth bearer, said design pitch circle of said fourth gear overlapping and having two points of intersection with the design pitch circle of said second gear when said blanket cylinders are in said first position,

said fourth gear having a working pitch circle which is of a smaller diameter than its design pitch circle, the working pitch circle of said fourth gear being tangent to the working pitch circle of said second gear when said blanket cylinders are in said first position,

the number of gear teeth on said second gear meshing with gear teeth of said fourth gear being less than required to rotate the surface of said second plate cylinder at the surface speed of said second blanket cylinder,

said third and fourth gears each being different from standard gears in that said third and fourth gears each have a design pitch diameter which is greater than the number of teeth on the gear divided by the diametrical pitch of the gear,

said third and fourth gears forming a set of plate cylindrical gears which is associated with said set of plate cylinder bearers,

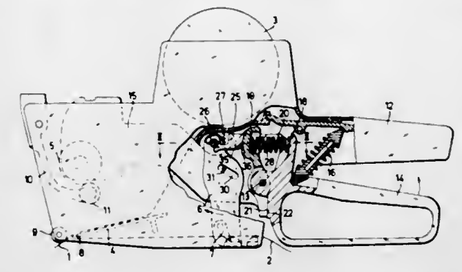
said means for drivingly connecting said fourth gear with said second plate cylinder including means for effecting rotation of said second plate cylinder relative to said fourth gear to effect rotation of the surface of said second plate cylinder at the surface speed of said second blanket cylinder.

4,072,105

LABEL PRINTING AND DISPENSING APPARATUS

Werner Becker, Hauptstrasse 26, and Kurt Schrotz, Brentanostrasse 29, both of Hirschhorn, Germany (6932)

Filed July 14, 1976, Ser. No. 705,162
Claims priority, application Germany, July 8, 1975, 2530346
Int. Cl.[2] B41F *1/08;* B65C *11/00*
U.S. Cl. 101—288 **5 Claims**



1. Apparatus for printing and dispensing labels carried on a label ribbon for indexing step-by-step along a path of travel through the apparatus, the labels being printed with a prescribed minimum printing pressure, said apparatus comprising:
- a hand lever movable between a rest position and a depressed position;
- a return spring biasing the hand lever toward the rest position;
- a transport mechanism for moving the label ribbon along said path of travel through increments of advancement corresponding to the spacing of the labels on the label ribbon in response to movement of the hand lever;
- a second lever movable between a first position and a second position, the second lever having first and second ends;
- a printing table located along said path of travel such that each indexed label is delivered to the printing table;
- a printing device carried by the second lever at the first end thereof for movement toward and away from the printing table and the label thereat, in response to movement of the second lever, the printing device being away from the printing table when the second lever is in the first position and being at the printing table when the second lever is at the second position;
- an inking device urged against the printing device with a given inking force when the second lever is at the first position, and movable away from the printing device in response to overcoming the given inking force;
- coupling means coupling the hand lever with the second end of the second lever, said coupling means including
- a drive spring between the hand lever and the second end of the second lever, the drive spring being capable of compression in response to movement of the hand lever from the rest position toward the depressed position, relative to the second lever;
- a pawl movable between a locking position, wherein the pawl holds the second lever captive in the first position thereof against the force of compression of the drive spring and independent of the inking force during said movement of the hand lever relative to the second lever, and a disengaged position, wherein the second lever is released for immediate movement of the printing device toward the printing table in response to the force of the compressed drive spring;
- biasing means urging the pawl into the locking position to maintain the second lever stationary in the first position thereof as the hand lever is moved from the rest position toward the depressed position and the drive spring is compressed; and
- tripping means on the hand lever for intercepting the pawl during movement of the hand lever from the rest position

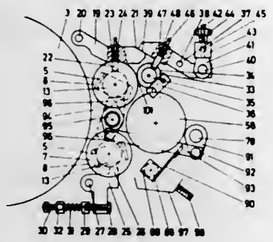
toward the depressed position, said tripping means moving the pawl from the locking position to the disengaged position when the drive spring has been compressed sufficiently to provide a predetermined force capable of overcoming the given inking force and driving the printing device toward the printing table with sufficient momentum to establish said prescribed minimum printing pressure upon arrival of said printing device at the printing table whereby said prescribed minimum printing pressure is established independent of said inking force.

4,072,106

WASHING DEVICE FOR CLEANING THE BLANKET CYLINDER OF AN OFFSET PRINTING PRESS

Rudi Junghans, Wilhelmsfeld, and Hermann Beisel, Walldorf, both of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Germany

Filed Nov. 13, 1975, Ser. No. 631,677
Claims priority, application Germany, May 10, 1975, 2520919
Int. Cl.² B41F *35/06*
U.S. Cl. 101—425 **7 Claims**



1. In a washing device for an offset printing press having a blanket cylinder, the washing device being adjustable with respect to the blanket cylinder and including a rotary washing roller having a soft covering and being in frictional driving engagement with the blanket cylinder, a doctor roller having a surface located in engagement with the washing roller, a distributor roller having a firm surface engaging the soft covering of the washing roller at a location upstream of the doctor roller in the rotary direction of the washing roller, means for feeding and controllably applying fresh washing solution to said distributor roller, a collecting vessel located below said doctor roller, and a doctor blade operatively connected with the doctor roller for guiding therefrom into the collecting vessel ink washed off the blanket cylinder with the wash solution, the improvement therein which comprises a second washing roller in frictional driving engagement with the blanket cylinder, means for effecting traversal of the blanket cylinder by both of said washing rollers, said washing rollers being additionally drivable by said doctor roller, both said washing rollers simultaneously being respectively connectible to and disconnectible from said blanket cylinder and said doctor roller.

4,072,107

MISSILE CONTROL MEANS

Frederick E. Saxe, Sparta, and Seymour K. Einbinder, Wayne, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 7, 1967, Ser. No. 645,101
Int. Cl.² F42B *25/16, 13/48*
U.S. Cl. 102—4 **6 Claims**

1. An anti-material missile comprising
a tubular housing member,
anti-material sub-missiles retained in said housing member and adapted to be dispersed by centrifugal force when said housing member is rotated,
a plurality of control fins for slowing and rotating said housing member, and
means for mounting said fins on said housing member and for moving said fins into operative positions, comprising
a plurality of tubular mounting means mounted on said housing member for rotation about a first axis normal to the longitudinal axis of said member,
a plurality of arm means each attached to one of said fins and mounted on one of said tubular means for pivotal movement about a second axis normal to said first axis,



means for pivoting said arm means to orient said fins in radial planes parallel to said longitudinal axis, and
means for independently rotating said tubular means to re-orient said fins in radial planes canted with respect to said longitudinal axis, to cause rotation of said missile during flight

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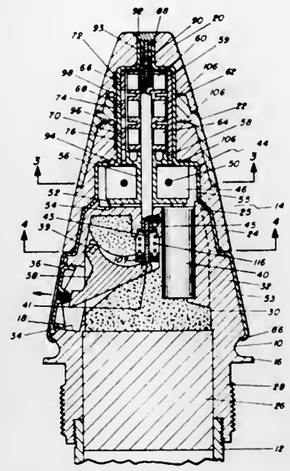
4,072,108

FUZE ENCODER DEVICE

William Lewis, Andover, Mass.; Peter J. Weldon, Blairstown; Henry Hagedorn, Jr., North Haledon, both of N.J.; Thomas E. Hayes, Newton, N.J., and Sylvan H. Israels, Morris Plains, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 7, 1976, Ser. No. 730,402
Int. Cl.² F42C *11/06, 17/00*
U.S. Cl. 102—70.2 R **7 Claims**

1. A fuze encoder device for a spin stabilized shell which comprises:
shell housing means for supporting said encoder device which includes;
a cup shaped intrusion section, having a forward end and a rear end, threadedly supported on said shell housing means;
a stepped shaped cup stakedly disposed on and sealed to the forward end of said intrusion section, said stepped cup having a shoulder section having a plurality of circularly disposed hemispherically shaped lower detent ball seats therein;
a setback generator positioned in said aft end of said shell housing means for providing electrical energy for said encoder device;
electronic counting means, disposed in said forward end of said intrusion section, for generating an output fuzing signal;
a magnetic encoding sensor, positioned in said forward end of said intrusion section, being electrically coupled to said electronic counting means for generating pulses for setting said electronic counting means;
encoding disc means, rotatably disposed in said forward end of said stepped shaped cup and adjacent to said magnetic encoding sensor, for inducing voltage pulses in said magnetic encoding sensor;
setback detented despin weight means biasedly coupled to said encoding disc for providing relative rotation of said encoding disc means with respect to said magnetic encoding sensor when the setback forces of launch of said spin stabilized shell decrease;
indexing ring means, rotatably detented and slidably disposed on said shell housing means, for forming an ogive contour for said spin stabilized shell and for indicating a time for firing said shell, and for rotatably positioning a plurality of localized magnetic fields therein;



stop coil-pole means fixedly attached to rotate in unison with said encoding disc means and rotatably axially supported within said indexing ring means in the forward end of said intrusion section, for generating a plurality of stop pulse signals, in response to the passage of said coil-pole means in the proximity of said localized magnetic fields said plurality of stop pulse signals controlling said electronic counting means to initiate said output fuzing signal as a function of time set by said indexing ring means; and
lock button detent release means, operatively disposed in said shell housing means, for releasing said indexing ring means to permit rotation therebetween to change the time set for firing said shell after launch and for preventing inadvertent movement of said indexing ring means.

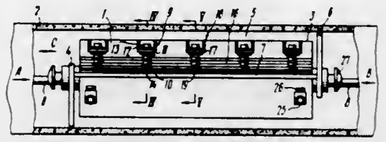
4,072,109

PNEUMATICALLY CONVEYED CONTAINER WITH AIR TIGHT SEALING AND GUIDE MEANS

Pavel Vasilievich Kovanov, B. Bronnaya ulitsa, 19/21, kv. 23; Ivan Mikhailovich Torochkov, ulitsa Gorkogo, 41, kv. 99; Ivan Timofeevich Zonenko, Saperny proezd, 8, korpus 3, kv. 72; Adolf Moritsovich Alexandrov, Federativny prospekt, 6, korpus 3, kv. 8; Vladimir Efimovich Aglitsky, Zatsepsky val, 6/13, kv. 61; Jury Abramovich Tsimbler, Sojuzny prospekt, 10, kv. 261; Ilya Solomonovich Kantor, Malo-Moskovskaya ulitsa, 31, kv. 45; Jury Arnoldovich Topolyansky, Matveevskaya ulitsa, 10, korpus 4, kv. 233, and Mikhail Vladimirovich Lurie, Veernaya ulitsa, 40, korpus 3, kv. 43, all of Moscow, U.S.S.R.

Filed Mar. 19, 1976, Ser. No. 668,444
Int. Cl.² B61B *13/10*
U.S. Cl. 104—138 R **4 Claims**

1. A container for pneumatic transportation of loads through a pipeline wherein the internal surface of the pipeline has guides located opposite each other throughout the pipeline length, said container comprising: a body; a front cup means mounted on the front end face of said body in the direction of movement of said body for sealing off the lower half only of the gap between said body and the pipeline; a rear cup means mounted on the rear end face or said body for sealing off the upper half only of the gap between said body and pipeline; longitudinal cup means located on the sides of said body and extending between said front and rear cup means, said longitudinal cup means resting on said guides located in said pipeline and serving as sliding supports for the container during movement; said longitudinal cup means installed at a certain distance



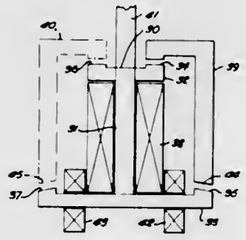
from the sides of said body; means for resilient pressing of said longitudinal cup means against said guides and for connecting said longitudinal cup means with said body; a plurality of partitions located along the sides of said body, each partition secured to said body at one side and secured to the corresponding longitudinal cup means at the other side; said partitions permitting vertical motion of said body relative to said longitudinal cup means and for sealing the gap between said body and said longitudinal cup means.

4,072,110

ELECTROMAGNETIC SUSPENSION ASSEMBLY

Bhalchandra Vinayak Jayawant, Kingston, near Lewes, England, assignor to The University of Sussex, Sussex, England

Filed Sept. 3, 1976, Ser. No. 720,447
Claims priority, application United Kingdom, Sept. 5, 1975, 36652/75
Int. Cl.² B61B *13/08*
U.S. Cl. 104—148 MS **8 Claims**



1. An electromagnetic suspension system for a vehicle to be levitated by magnetic attraction comprising an electromagnetic core on the vehicle having an upright core portion with upper arms extending outwardly from the top of said upright core portion and lower arms extending outwardly from the bottom of said upright core portion, the lower arms being longer than the upper arms, the upper arms having, at their outer ends, horizontal upwardly facing pole faces, and the lower arms, at their outer ends, each having a pole face sloping at an angle to the horizontal; and, for supporting the vehicle, a ferro-magnetic reaction rail on at least one side of said core and having a horizontal top portion extending inwardly from the upper end of a vertical side portion, thereby forming an inverted L-shaped structure when considered in transverse section, said horizontal top portion extending inwardly towards said core from the upper end of said vertical side portion, said horizontal top portion having, at its inner end, a downwardly facing horizontal pole face which, with one of said upwardly facing pole faces, defines a first air gap, said vertical side portion having, at its lower end, a pole face sloping at an angle to the horizontal which pole face, with the aforesaid pole face on one of said lower arms, defines a second air gap; a main lift

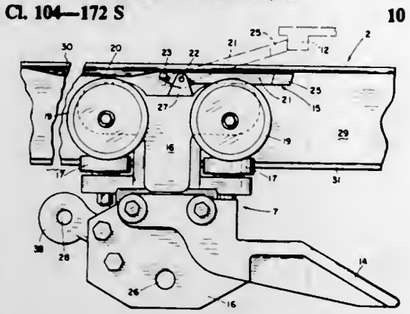
winding on said upright portion of the core, means for energising said main lift winding to provide magnetic flux across said first air gap for giving a vertical support force on said core, lateral guidance windings on each of said lower arms of the core and means for selectively energizing said lateral guidance windings.

4,072,111

CONVEYOR CARRIER WITH ACTUATED DOG

Robert A. Hoehn, Lenexa, Kans., assignor to Mid-West Conveyor Company, Inc., Kansas City, Kans.

Filed Oct. 26, 1976, Ser. No. 735,831
Int. Cl.² B61B *10/02*
U.S. Cl. 104—172 S **10 Claims**



1. In a power and free conveyor system having a load supporting track with a hollow interior, a leading trolley, and an interconnected following trolley that are conveyed on said track by engagement of a driving dog on said leading trolley with a power dog on a first conveyor chain, the improved means for transferring the conveying of said trolleys by said first chain to a second conveyor chain, comprising:

a. a cam having an actuating surface substantially entirely located within the hollow interior of said track; and

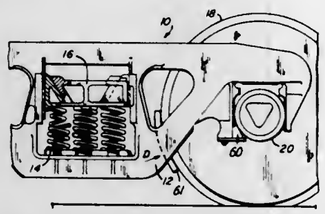
b. a transfer dog attached to said following trolley, said transfer dog having a pivotable arm and a cam follower thereon, said arm being pivoted by engagement of said follower with said cam surface, and wherein said transfer dog is fully retracted within the interior of said track and out of contact therewith when said cam follower is disengaged from said cam surface, and said pivotable arm of the transfer dog is extended out of the track when the cam follower is engaged with said cam surface.

4,072,112

RESILIENTLY BIASING TRUCK PEDESTAL BEARING RETENTION ASSEMBLY

Donald Wiebe, Sewickley, Pa., assignor to A. Stucki Company, Pittsburgh, Pa.

Filed May 24, 1976, Ser. No. 688,942
Int. Cl.² B61F *5/34, 5/52, 15/06, 15/20*
U.S. Cl. 105—221 K **13 Claims**



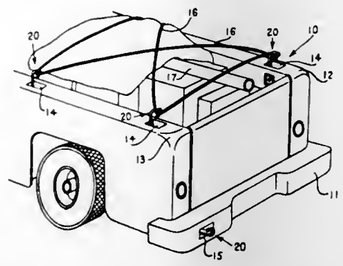
1. A side frame bracket assembly for positively retaining an axle bearing carrier assembly within the pedestal opening of a narrow pedestal type side frame of a railway truck assembly comprising: a retaining bracket adapted to be carried by a pedestal jaw of such a pedestal opening adjacent a lower end portion thereof; biasing means adapted to be carried by said bracket and disposed intermediate such a pedestal jaw and such a bearing carrier assembly and operative to bias such a bearing carrier assembly out of communication with such a pedestal jaw and into communication with the other pedestal jaw of such a pedestal opening continuously during all normal moving operation of such a railway truck assembly.

4,072,113

SHIFTABLE ANCHOR ASSEMBLY

Harold H. Thurston, P.O. Box 57, Yerington, Nev. 89447

Filed July 28, 1976, Ser. No. 704,732
Int. Cl.² B60P *7/04, 7/08;* B61D *45/00;* F16B *45/00*
U.S. Cl. 105—484 **12 Claims**



1. A slideably extendable and retractable anchoring device comprising:

1. An housing comprising a rectangular hollow member;

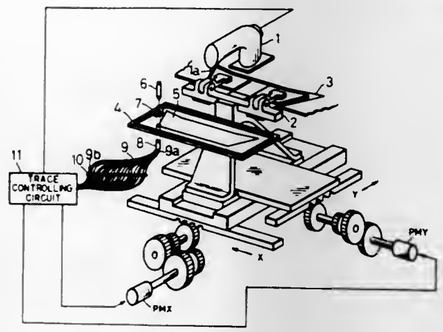
2. An elongated anchoring element slideably located within said housing, said anchoring element comprising a hook extending outside of said housing, with an extension on said hook having a closed ended slot located within said extension slideably mounted within said housing; and (3) Means to affix the said housing to a desired location, said means comprising a fastening member passing through said housing and said slot in such manner that the fastening member limits the extent of movement of the anchoring element.

4,072,114

CONTOUR TRACING SEWING MACHINE

Akira Sugiyama, Nagoya; Yoshikazu Yamamoto, Toyoake, and Shiro Yamada, Kasugai, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed June 21, 1976, Ser. No. 697,877
Claims priority, application Japan, July 1, 1975, 50-81662
Int. Cl.² D05B *21/00*
U.S. Cl. 112—121.12 **7 Claims**



7. A contour tracing sewing machine for controlling the movement of a workpiece holder, which is connected to each of X, Y pulse motors for transferring a workpiece along X, Y axis perpendicular to each other, by tracing the contour of a prearranged templet in order to form a seam conformable to said contour on said workpiece by sewing instrumentalities, said sewing machine comprising:

a. a light source;

b. a plurality of light transmitting fibers each having a first end portion and a second end portion, said first end portions being opposite to said light source and successively arranged in a circle the radius of which is equal to the distance (P) between stitches to be produced on said workpiece;

c. a mounting plate made of a transparent material and attached to said workpiece holder so as to be movable transversely between said light source and said first end portions;

d. said templet being made of a light-shielding material and positioned on said mounting plate;

e. a plurality of photoelectric sensors each connected to said second end portion for generating electric signals representative of the presence or absence of said templet according to the transmission or the untransmission of light rays emitted by said light source;

f. one of multiple mid points between respective neighboring two first end portions being predetermined as a reference point;

g. means for storing multiple sets of X, Y pulse numbers which each is corresponding to the mid point between said neighboring two first end portions and predetermined on the basis of the radius of said circle and the angle formed by the reference segment joining the center of said circle to said reference point and the segment joining the center to said mid point;

h. means for generating pulses at a high frequency in relationship with the position of the needle of said sewing instrumentalities;

i. state searching means responsive to said electric signals for sequentially searching the state of said mid point from the state of said reference point in a predetermined circumferential direction of said circle synchronously with each of the pulses generated by said generating means, and for thereby detecting the first transitional state of said mid point from said presence to said absence or the second transitional state of said mid point from absence to said presence;

j. a counter for counting the number of the pulses generated by said generating means and extracting said set of X, Y pulse numbers from said storing means;

k. a logic circuit for interrupting said generating means from generating said pulses when said state searching means has detected said first transitional state or said second transitional state;

l. means for changing the transitional state to be detected by said state searching means either from said first transitional state to said second transitional state or from said second transitional state to said first transitional state; and,

m. driving means for generating X, Y pulse signals, the X, Y pulse numbers of which are respectively equal to the X, Y pulse numbers extracted according to the output signal of said counter at the stoppage of the generation of said pulses, and for driving said X, Y pulse motors.

4,072,115

SEWING MACHINE FOR FORMING SHAPED FABRIC BELTS

Nerino Marforio, Milan, Italy, assignor to Rockwell-Rimoldi S.p.A., Milan, Italy

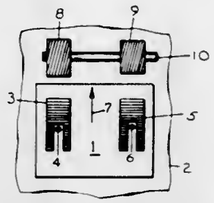
Filed Sept. 29, 1976, Ser. No. 727,887
Claims priority, application Italy, Oct. 3, 1975, 27913/75
Int. Cl.² D05B *27/00*
U.S. Cl. 112—205 **2 Claims**

1. An apparatus for forming shaped fabric belts in a sewing machine having a work bed plate with a throat plate mounted thereon in operative association with a pair of needles cooperating with the machines lower stitching instrumentalities to form upper and lower parallel lines of stitching in a belt, said apparatus comprising:

(a) a first feeding mechanism including:

(i) a first feed dog (3) mounted in operative association with the throat plate for stroke movements of a preselected length;

(ii) a first roller (8) carried by the machine adjacent said



first feed dog (3) and rotatably indexed to define an advancement stroke equivalent to that of the latter;

(b) a second feeding mechanism including:

(i) a second feed dog (5) mounted in operative association with the throat plate for stroke movements of a length different from said first feed dog (3); and

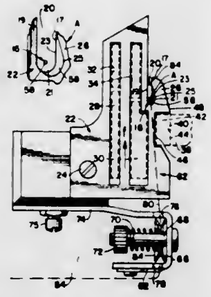
(ii) a second roller (9) operatively connected to said first roller (8) adjacent said second feed dog (5) and rotatably indexed to define an advancement stroke equivalent to that of the latter.

4,072,116

OVEREDGE STITCH SEWING MACHINE

Joseph Nagy, St. Andre-les-Vergers, France, assignor to Union Special Corporation, Chicago, Ill.

Continuation of Ser. No. 589,302, June 23, 1975, abandoned.
This application Feb. 28, 1977, Ser. No. 772,702
Claims priority, application France, Feb. 24, 1975, 75 05653
Int. Cl.² D05B *65/00, 53/00*
U.S. Cl. 112—286 **5 Claims**



5. A sewing machine capable of producing a thread chain having a thread chain positioning means for guiding the thread chain in a predetermined manner comprising:

a throat plate means;

a throat slot means in said throat plate means, said throat slot means being located along the needle center line of said sewing machine and having a front section means and right and left side section means;

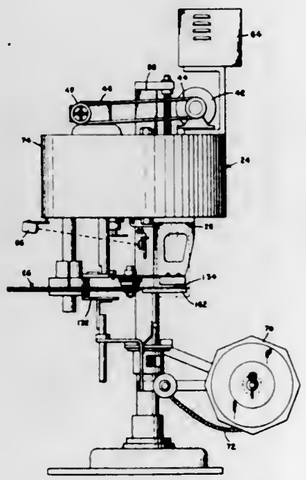
the front section means of said throat slot means having a forwardly sloping groove means capable of carrying a thread chain; and

a thread retainer means positioned in front of said throat slot means generally in line with said groove means.

4,072,117
CANISTER INDEXING SPOUT-INSERTING MACHINE

Frederick August Plaessmann, Edison, N.J., assignor to Seal-Spout Corporation, Liberty Corner, N.J.

Filed Sept. 15, 1976, Ser. No. 723,476
Int. Cl.² B21D *39/00*
U.S. Cl. 113—1 H 20 Claims



1. A machine for mounting a pouring spout at a predetermined position on the wall of a canister comprising:

carriage means for intermittently moving in one direction a canister on a continuous path having a plurality of work stations;

first holding means for releasably holding said canister on said carriage, said holding means operable between an open position and a closed position;

detection means for sensing an indexing mark and for providing a control signal in response thereto, said detection means disposed adjacent a first one of said work stations;

registration means for rotation of a canister with first holding means at said open position, said rotation at said first work station to present an indexing mark on a canister to said detection means, said registration means responsive to said control signal by stopping said rotation of said canisters;

a carrier adjacent a second one of said work stations for supporting a pouring spout and for sequentially presenting a spout to a predetermined portion of a canister wall; and

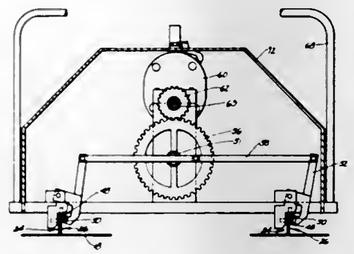
a ram reciprocally operable toward and away from a canister wall to push a spout portion through said canister wall and withdraw from the spout respectively; and

said sequencing means coacting with said first holding means to open said first holding means to receive said canister, to close said first holding means for transporting said canister to said first work station, to open said canister at said first work station for rotation of said canister, to close said first holding means after rotation of said canister for movement of said canister through the remainder of said plurality of work stations while holding said canister in a fixed angular orientation with relation to said plurality of work stations, and opening said first holding means to release said canister at the end of said continuous path having a plurality of work stations.

4,072,118
SEAM CRIMPING APPARATUS

Adrian Schultheiss, Hamilton, Ohio, assignor to Armco Steel Corporation, Middletown, Ohio

Filed Dec. 15, 1976, Ser. No. 750,599
Int. Cl.² B21D *19/00*
U.S. Cl. 113—57 5 Claims



1. A seam crimping apparatus for crimping standing seams of roofing panels of the type having a surface portion and an upstanding rib along each longitudinal edge thereof, each rib being configured to mate with the corresponding rib of an adjacent panel and having a substantially vertical upstanding member, a substantially horizontal upper flange portion and a deformable flange hook portion extending downwardly from the upper portion toward the surface portion, to form a standing seam, which comprises:

a. a frame sized to span two parallel standing seams, said frame carrying a first pair of spaced, coplanar, horizontal abutment surfaces for each standing seam adapted to overlie said horizontal flange portion of said standing seams and a second pair of spaced, coplanar, substantially vertical abutment surfaces for each seam adapted to abut the vertical upstanding member of said seams, and wheels retractably mounted in at least said horizontal abutment surfaces to guide and support said seam crimping apparatus along the standing seams;

b. at least one crimping blade for each standing seam pivotally mounted and connected to levers carried on said frame for swinging movement between an open position and a closed position, each said crimping blade being substantially parallel to its respective seam when said apparatus is in work crimping position and lying on the opposite side of its respective seam from its respective pair of vertical abutment surfaces and parallel to the flange portion of its respective seam, each said crimping blade being backed by said abutment surfaces and being of a length sufficient to span its respective pairs of vertical and horizontal abutment surfaces, each said blade being shiftable between an open position wherein it is parallel and out of contact with its respective deformable flange hook portion of said seam, and a closed position wherein it is in contact with its respective deformable flange hood portion and has crimped said hook portion as desired; and

c. means to shift said crimping blades between their open and closed positions simultaneously.

4,072,119
VERTICAL RISING BOAT LIFT

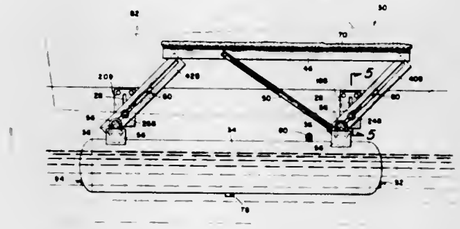
Barney V. Williams, 418 "C" SW. St., Miami, Okla. 74354

Filed Mar. 21, 1977, Ser. No. 781,769
Int. Cl.² B63C *1/02*
U.S. Cl. 114—45 7 Claims

1. For mounting in a boat well having opposed parallel vertical sides spaced above the surface of a body of water, the spacing between the sides of the boat well being dimensioned to receive a boat therein floating on the water, an apparatus to lift a boat within the boat well above the water surface, comprising:

a forward pair of trunnion members supported to said boat well side wells in horizontal axial alignment and a rearward pair of trunnion members supported to said boat well sidewalls in horizontal axial alignment, the axii of the forward and rearward pairs of trunnion members being parallel and spaced apart from each other;

a frame adapted to be lowered to receive a boat floating in the water thereon and to be raised with a boat thereon to lift the boat thereon above the water surface, the frame having a forward pair of guide members and a rearward pair of guide members, the four guide members each being in vertical planes and each having an elongated slot therein which slidably receives a said trunnion member,



the slots in each of said four guide members being of the same angle relative to vertical of between 15° and 75°, the frame having means thereon to engage the bottom of a boat when the frame is lowered to a lowermost position with a portion thereon below the water surface;

a pontoon secured to the lower portion of said frame;

means for admitting water into the pontoon to sink the pontoon and a portion of said frame below the water surface; and

means to evacuate water from said pontoon to float the frame upwardly to support a boat thereon above the water.

4,072,120
MARINE TRANSPORT

John J. Bylo, 7272 Willoughby Ave., Los Angeles, Calif. 90046

Division of Ser. No. 439,375, Feb. 4, 1974, Pat. No. 3,934,532, which is a continuation-in-part of Ser. No. 187,537, Oct. 7, 1971, Pat. No. 3,793,974, which is a continuation-in-part of Ser. No. 794,938, Jan. 29, 1969, abandoned. This application Jan. 16, 1976, Ser. No. 649,645
Int. Cl.² B63B *27/00*
U.S. Cl. 114—72 13 Claims

1. A method of transporting cargo by water comprising the steps of

(a) providing a plurality of modular cargo hold units of generally uniform external configuration and dimension over at least the lower portions thereof,

(b) establishing an overall route over which cargo is to be moved so that the route includes at least three ports, and subdividing the route into subroutes which connect each adjacent pair of ports in the overall route so that at least one port is the terminus for two adjacent subroutes,

(c) providing for each subroute a self-propelled shuttle vessel configured to mate with and to support at least any one of the hold units, each shuttle vessel being sized relative to a hold unit such that a loaded hold unit constitutes a substantial fraction of the load-carrying capacity of the vessel and each vessel being configured and arranged for operation along its subroute,

(d) providing in each port a dock facility arranged for receiving and supporting a hold unit independently of any of the vessels,

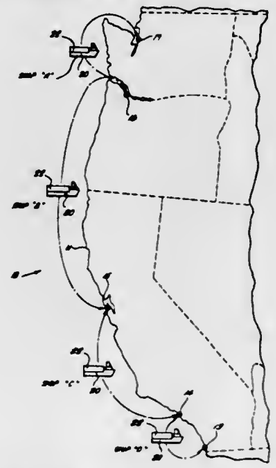
(e) loading into a hold unit at an originating port only cargo destined for a given different non-adjacent destination port in the overall route,

(f) moving a loaded hold unit between the originating port and the destination port on the route via one or more intermediate ports by

(i) moving the hold unit by a first shuttle vessel along a first subroute from the originating port to a first intermediate port,

(ii) transferring the hold unit from the first shuttle vessel to the dock facility in the first intermediate port,

(iii) transferring the hold unit from the dock facility in the first intermediate port to a second shuttle vessel for the subroute which is adjacent the first subroute, and



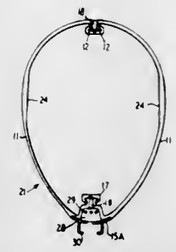
(iv) moving the hold unit toward the destination port by operating the second vessel along its subroute and by repeating steps (ii) and (iii) above in each intermediate port between the first intermediate port and the destination port so that the hold unit is moved along each subroute between the originating and destination ports by the shuttle vessel for each subroute, and

(g) removing from a hold unit cargo contained therein only on arrival of the hold unit at the destination port for which all cargo in the hold unit is destined.

4,072,121
YACHT MAST

Warren Malcolm Anderson, Beacon Hill, and Clifford John Shaffran, Paddington, both of Australia, assignors to Clifford Industries PTY., Ltd., Sydney, Australia

Filed Sept. 20, 1976, Ser. No. 725,024
Claims priority, application Australia, Sept. 25, 1975, 3334/75
Int. Cl.² B63B *27/14*; G63B *35/00*
U.S. Cl. 114—90 10 Claims



1. An elongate mast section adapted for joining to a second similar mast section to form a yacht mast without use of rivets or weldments, each said mast section comprising:

an elongate shell having a curved cross-section and opposite ends, each said end having along each longitudinal side an

integral inwardly turned web, which joins a flange to said shell;

each said flange being inwardly turned towards said shell with respect to said web such that the transverse cross-section of the flange, web and the adjacent portion of the side form a substantially U-shaped portion; and,

the outer surface of the base of said U-shaped portion being bevelled such that when said second similar mast section with a complementary bevel is brought into opposing side-by-side relationship with said first section, each of the corresponding bevelled surfaces of said second section forms a substantially V-shaped gap with the corresponding bevelled surfaces of said first section such that the apex of each of said V-shaped gaps is innermost.

4,072,122

MOORING AND RELEASE DEVICE

John C. Balston, San Rafael, Calif., assignor to The Rucker Company, Oakland, Calif.

Filed Dec. 13, 1976, Ser. No. 749,720
Int. Cl.[2] B63B *21/06, 21/56*
U.S. Cl. 114—230 **7 Claims**



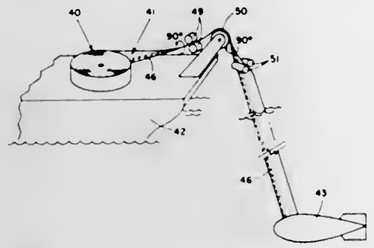
1. A mooring and release device comprising a frame, a carriage movable upon said frame, means involving fluid flow for affording resistance to movement of said carriage into a predetermined position on said frame, means for controlling said fluid flow to reduce said resistance, means on said carriage for mooring a line, means for actuating said mooring means to release said line, means responsive to the presence of said carriage in said predetermined position for operating said actuating means, and means for locking said carriage to said frame in said predetermined position.

4,072,123

DEEP TOWING CABLE AND HANDLING SYSTEM

Jimmy F. Byers, Rte. 1, Box 56, Georgetown, Tex. 78626

Filed Mar. 16, 1976, Ser. No. 667,315
Int. Cl.[2] B63B *21/00*
U.S. Cl. 114—254 **15 Claims**



10. A method of achieving deeper towing depths of towed submersibles and reducing the upsetting moment caused by towing equipment carried on the decks of surface vessels comprising:

deploying internal components of a flat tow cable in a linear arrangement and presenting the narrow dimension of the cable to the environment;

storing the cable in a horizontally disposed flat drum on the deck of the vessel so as to reduce the upsetting moment of the assembly;

deploying the cable from the horizontally disposed drum by rotating the cable 90° so as to pass over the stern in a horizontal attitude and reverse rotating the cable 90° so as to enter the medium in a fore and aft towing attitude; and

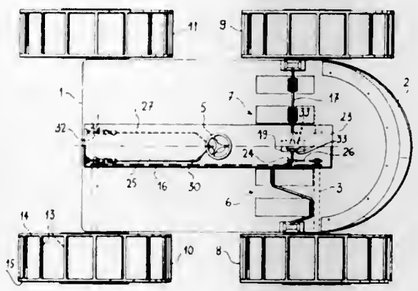
isolating electrical conductors in said cable from strain by strengthening the leading portion of the cable and placing the electrical conductors in the trailing portion of the cable.

4,072,124

NAUTICAL VEHICLE

Paul Meyrin, Lausanne, Switzerland, assignor to Gemeines Forchungsinstitut Anstalt, Liechtenstein, Liechtenstein

Filed Oct. 14, 1975, Ser. No. 621,790
Int. Cl.[2] B63H *1/38, 16/12*
U.S. Cl. 115—19 **4 Claims**



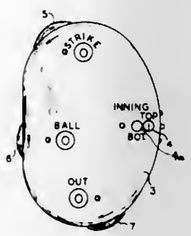
1. A nautical vehicle adapted to be operated by at least one user, comprising two identical sets of at least one inflatable wheel on each side of said vehicle, driving means comprising a pedal-like system and means for transmitting the motion of the pedal system to all of said wheels, and steering means comprising essentially means for selective braking of one set of said wheels and wherein said driving means comprises a differential gear comprising an input shaft coupled to said pedal-like system and two output shafts respectively coupled to said two sets of wheels.

4,072,125

UMPIRE'S COUNTER

Thomas W. Spalla, 607 Arbor Lane, Pittsburgh, Pa. 15236

Filed June 17, 1976, Ser. No. 697,052
Int. Cl.[2] A63B *71/06*
U.S. Cl. 116—120 **2 Claims**



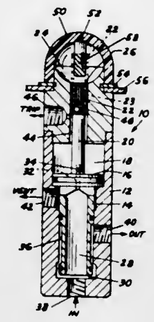
1. In an umpire's counter comprising a top cover plate and a bottom cover plate in closely spaced parallel relationship and "strike," "ball" and "out" indicating dials rotatably mounted therebetween with indicia visible from the outside of the top plate; the improvement comprising an "inning" indicating dial rotatably mounted between said cover plates and visible through opening means in said top plate and geared to said "out" indicating dial such that for each three outs, said "inning" indicating dial will be turned and advanced to denote another half inning.

4,072,126

VISUAL INDICATOR FOR SAFETY SYSTEMS

Willard E. Kemp, Houston, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed July 15, 1976, Ser. No. 705,746
Int. Cl.[2] F16K *37/00*
U.S. Cl. 116—125 **11 Claims**



1. A visual indicator, comprising:

(a) a housing having an exterior reflecting surface defining a reflecting zone, and an aperture through said housing located at said reflecting surface,

(b) valve means mounted within said housing to control fluid flow between inlet, outlet, and exhaust valve ports and having a movable indicator member operably connected thereto, said indicator member positioned within the aperture and mounted for longitudinal movement between extended and retracted positions relative to the reflecting zone, and

(c) a transparent generally cup-shaped enclosure mounted in an inverted relation over said reflecting surface in spaced relation thereto, said enclosure having an elongated fixed indicator member secured centrally to the inner surface thereof and extending inwardly therefrom in longitudinal axial alignment with the movable indicator member,

(d) one of said indicator members being hollow and receiving the other indicator member in an overlapped relation when the movable indicator means is in an extended position outwardly of the reflecting surface, the movable indicator member being retracted from the overlapping position outwardly of the reflecting surface when the movable indicator means is in a retracted position, said movable indicator member and said fixed indicator member being of external contrasting colors at least for the lapped portions thereof,

(e) said valve means maintaining under normal operating conditions the movable indicator means in its retracted position with said fixed indicator member only being in the reflecting zone, said valve means upon receipt of a signal from an associated system permitting movement of the movable indicator means to the extended position with said movable indicator member being in the reflecting zone and in said overlapped relation with said fixed indicator member.

4,072,127

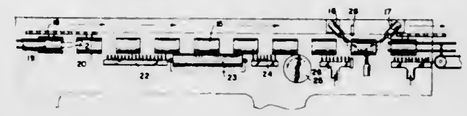
INSIDE STRIPE BY INTERMITTENT EXTERIOR SPRAY GUNS

Larry V. Cernauskas, Chicago, and Harry B. Foss, Oak Lawn, both of Ill., assignors to The Continental Group, Inc., New York, N.Y.

Division of Ser. No. 461,838, April 18, 1974, Pat. No. 3,995,075. This application Sept. 17, 1976, Ser. No. 724,234
Int. Cl.[2] B05C *7/02*
U.S. Cl. 118—2 **8 Claims**

1. An apparatus for spraying the inside of the can bodies having side seams and which can bodies pass end to end down a can body line from a can body side seamer with each can body spaced a distance from each other can body, said apparatus comprising in combination with said can body line;

a detector positioned alongside said can body line for sensing the presence of a can body as it passes, spray means fixedly positioned alongside said can body line out of the path of can bodies passing therealong and directed towards said can body line downstream thereof for successively spraying side stripe material through the space between can



bodies into an open end of each can body moving along said can body line and unto the interior of moving can bodies, and

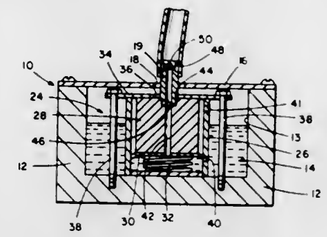
control means connected to said detector and to said spray means for causing said spray means to intermittently spray side striping material beginning at a time each can body has passed said spray means and for a period of time after each can body has passed said spray means but during such time as the interior of the respective can body is in the path of spray from said spray means.

4,072,128

LIQUID APPLYING DEVICE

Warren Phillip Frederick, McHenry, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jan. 28, 1976, Ser. No. 652,914
Int. Cl.[2] B05C *7/00*
U.S. Cl. 118—3 **5 Claims**



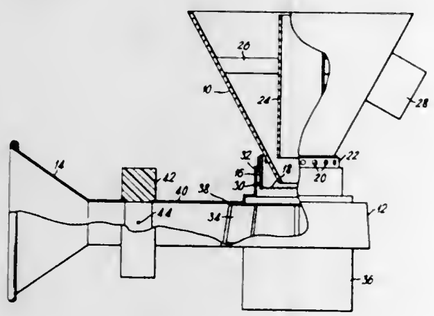
1. Device for applying liquid solvent to the interior surface of the end portion of a piece of plastic tubing of constant interior diameter, said device comprising a reservoir, at least one applicator post sized to receive the tubing end portion in a close sleeve fit and supported above said reservoir, and means which are associated with said reservoir, which mount said applicator post and which are manually operable, when the tubing end portion is first placed in a sleeve fit on said post, the tubing and post are moved inwardly of said device and then the tubing end portion is removed from the post, for applying liquid to the interior surface of the constant interior diameter of the tubing end portion, said applicator post having a generally axially extending bore extending into said post from one end thereof, but not through said post, having an annular groove on the periphery thereof adjacent the other end of said post and having at least one passageway between said generally axially extending bore and said annular groove, and said liquid applying means including pump means which, when pressed inwardly of said device, supplies a metered amount of liquid to said applicator post, said pump means comprising a cylinder having one end which is closed off and which is positioned in the liquid solvent in said reservoir, said cylinder having a hole therein spaced a predetermined distance from said closed end, but below the level of liquid solvent in said

reservoir, a piston in said cylinder having an axially extending passageway therethrough and means for mounting said applicator post on the outer end thereof with the axially extending passageway in said post being in communication with said passageway in said piston, spring means in said cylinder between said inner end of said piston and said closed end of said cylinder for biasing said piston outwardly of said cylinder, and stop means fixed in a position adjacent to and in engagement with the outer end of said piston to limit outward movement of said piston, the metered amount of liquid being substantially equal to the volume in said cylinder between a first position of said piston where it closes off said hole and bears against said stop means and a second position of said piston where it is pushed into said cylinder and compresses said spring means.

4,072,129
ELECTROSTATIC POWDER DEPOSITION

Alfred William Bright, Southampton, England; Michael Anthony Mersham Overton, Stavanger, Norway, and Ian Frederick Parker, Fareham, England, assignors to National Research Development Corporation, London, England

Filed Apr. 27, 1976, Ser. No. 680,878
Int. Cl.² B05B 5/02
U.S. Cl. 118—629 **10 Claims**

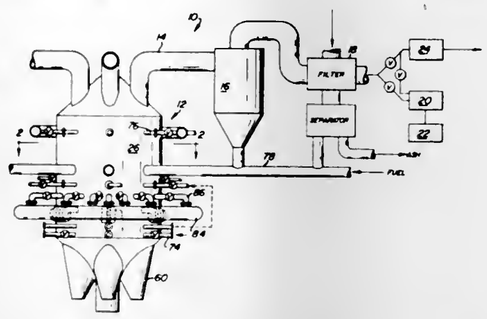


1. Apparatus for electrostatically depositing powder on an object comprising:
a housing;
means for producing a stream of air through said housing;
means for admitting powder to said housing at a predetermined rate and means for admitting air at a selectable rate for admixture with said powder to produce a predetermined density of suspension of said powder in said stream of air;
charging means contained within said housing including a rotor having a number of blades, each blade being adapted to intercept said stream of air on rotation of the rotor the blades and the housing having surface so disposed and constructed of such material as to cause triboelectric charging of the powder suspended in said stream of air on impact of said powder with said surfaces, said charging being sufficient to enable electrostatic deposition to be carried out under the influence of the electric field arising from such charge;
conduit means for conveying said stream of air from said charging means to a powder output position; and
output nozzle means situated at said output position for directing said stream of air in which said powder is suspended towards an object to be sprayed.

4,072,130
APPARATUS AND METHOD FOR GENERATING STEAM

Frederick A. Zenz, Garrison, N.Y., assignor to The Ducon Company, Inc., Mineola, N.Y.

Filed Dec. 1, 1976, Ser. No. 746,364
Int. Cl.² F22B 1/02
U.S. Cl. 122—4 D **11 Claims**



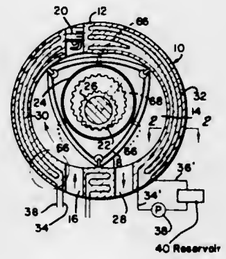
1. A method of generating steam comprising:
a. providing a combustor housing with a plurality of discrete chambers side by side and separated by upright walls,
b. flowing water upwardly through a separate vertically disposed tube bundle in each chamber, collecting the steam output from the upper end portion of said tube bundles for distribution,
c. fluidizing a fuel bed in each of said chambers to a height so that at least the lower end of the tube bundle in each chamber is disposed in its respective bed,
d. introducing fluidizing air to the bed of each chamber through a discrete independently operable downshot grid, the number of grids corresponding to the number of chambers and with each grid being adjacent the lower end of its respective chamber,
e. using a gbod heat conductive material for said walls, maintaining the temperature of any slumped bed in excess of the flashpoint of the fuel,
f. using at least one draw-off hopper below the elevation of the grids with the hopper being tapered to the angle of friction of the ash solids so that ash solids therein descend as a mass,
g. igniting the fluidized beds,
h. modulating at least one of the following as the amount of said collected steam and/or the demand for steam changes to thereby change the rate of production of steam in said tube bundles:
i. controlling fluidization of said beds whereby one or more non-adjacent beds are slumped,
ii. changing the height of fuel in one or more of said fluidized beds.

8. Apparatus for generating steam comprising:
a. a combustor housing having a plurality of discrete chambers side by side and separated by upright walls of good heat conductive material,
b. a discrete vertically disposed tube bundle in each chamber, conduit means for supplying water to each tube bundle, conduit means for collecting steam from the upper end of each tube bundle,
c. a discrete independently operable downshot air fluidizing grid in each chamber for fluidizing a fuel bed thereabove, means for feeding fuel to each chamber,
d. at least one draw-off hopper below the elevation of said grids with the hopper being tapered to the angle of friction of ash solids so that the solids descend as a mass,
e. means for separately igniting the fluidized bed in each chamber, and
f. means for modulating the amount of steam collected and the steam demand changes to thereby change the rate of production of steam in said steam bundles in a manner so that one or more nonadjacent beds may be slumped and/or the height of fuel in one or more of said beds may be changed.

4,072,131
SPARK IGNITION DEVICE AND FUEL INSECTION MEANS FOR INTERNAL COMBUSTION ENGINES

Jerry Pentel, 11 Glenn Drive, Flanders, N.J. 07836

Filed Sept. 14, 1976, Ser. No. 722,879
Int. Cl.² F02B 53/10, 53/12, 3/02
U.S. Cl. 123—8.09 **11 Claims**



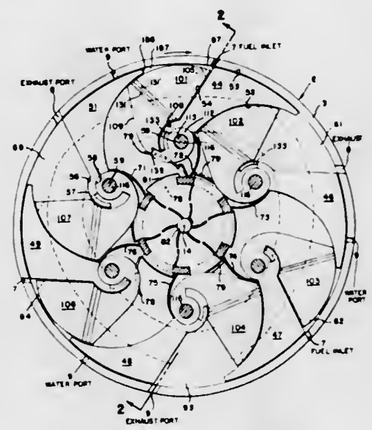
1. An internal combustion engine, comprising:
a housing having an arcuate wall;
said housing defining a combustion chamber therewithin;
a piston supported within said housing for movement in at least one direction;
means formed in said housing for evacuating exhaust product from said combustion chamber;
first means for supplying fuel to, and for igniting said fuel in, said combustion chamber; wherein
said first means comprise a first plurality of longitudinal passageways formed within said housing wall, each passageway of said plurality thereof having a given opening which opens internally of said wall onto said combustion chamber; and
said given openings of at least one pair of said passageways open onto said combustion chamber, within a prescribed location in said wall, in adjcency to each other; further including
an electrical conduit, with a spark-gap interruption formed therein, disposed in at least one passageway of said pair;
means for supplying electrical potential to said conduit; and
means for supplying fuel to at least one passageway of said pair.

4,072,132
ROTARY INTERNAL COMBUSTION ENGINE

Chester A. Lindros, San Francisco, Calif., assignor to Mighty-Mini Rotary Engine, Limited, San Francisco, Calif.

Filed Aug. 27, 1976, Ser. No. 718,346
Int. Cl.² F02B 53/04
U.S. Cl. 123—8.13 **27 Claims**

1. A rotary internal combustion engine, comprising:
a) an outer housing having a circular inner periphery;
b) a rotor mounted for rotation within said housing, said rotor including
1) a rotor shaft coaxially arranged within said housing and rotatable thereon,
2) a radially extending rotor portion mounted on the rotor shaft and including cavities that extend between the outer periphery of said rotor and the rotor shaft;
c) a piston pivotally mounted in each cavity in said rotor for movement between a position adjacent the outer periphery of said rotor and a position adjacent said rotor shaft, said piston dividing said cavity into a pair of air compression chambers, one of said chambers being a combustion chamber;
d) means cooperatively engaging said rotor, said pistons, and said housing whereby rotation of said rotor in relation to said housing causes said pivotal movement of each said piston in its respective cavity;
e) means for injecting water into one of said air compressed chambers;

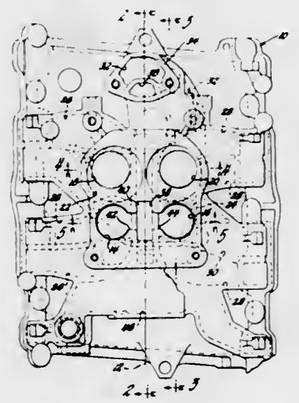


f) means for injecting fuel into one of said air compression chambers, the injection of said fuel following the injection of said water and being effected in each chamber at a time correlated to the positions of the other pistons in their respective cavities whereby combustion of the air-fuel charge in said chamber effects vaporization of the water contained therein and rotation of said rotor.

4,072,133
INTAKE MANIFOLD WITH INTERNAL PASSAGES ARRANGED TO SIMPLIFY CORING

Ralph A. McWhirter, Mount Morris, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 22, 1976, Ser. No. 679,452
Int. Cl.² F02M 25/06; F02B 27/00
U.S. Cl. 123—52 MV **5 Claims**



1. A single level intake manifold for supplying air and exhaust gas to a V-type internal combustion engine having combustion chambers disposed along opposite sides of a longitudinal centerline, said manifold comprising a casting having a pair of generally vertical riser passages transversely spaced on opposite sides of said centerline, a pair of generally horizontal

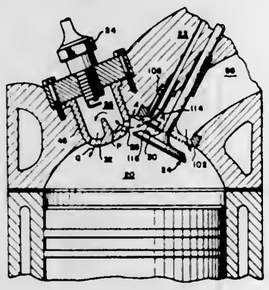
plenum chambers transversely spaced on opposite sides of said centerline and extending longitudinally at a common level, each connecting with the bottom of one of said riser passages, runner passages extending from said plenum chambers laterally away from said centerline, a metered exhaust gas recirculation passage extending longitudinally along said centerline and between said plenum chambers and their connecting riser passages, said metered exhaust gas recirculation passage being joined laterally with said riser passages by short lateral passages therebetween, said plenum chambers and said passages all being formed by coring and being joined with no unconnected portions extending in vertical overlapping relation with one another whereby such chambers and passages may be formed by a single monolevel core.

4,072,134

APPARATUS FOR SUPPLYING RICH AIR/FUEL MIXTURE IN AN INTERNAL COMBUSTION ENGINE

Masaaki Noguchi, Nagoya; Yukiyasu Tanaka, Okazaki; Setsuro Sekiya, and Katsuhiko Motosugi, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 6, 1975, Ser. No. 629,230
Claims priority, application Japan, Nov. 13, 1974, 49-130015
Int. Cl.² F02B *23/00*
U.S. Cl. 123—75 B **7 Claims**



1. In an internal combustion engine having a cylinder, a piston, a cylinder head associated with said cylinder and piston to define a combustion chamber, an intake passage for supplying a lean air/fuel mixture into the combustion chamber, an auxiliary passage for supplying a rich air/fuel mixture which opens into said intake passage, a short tube communicating with the auxiliary passage for supplying the rich air/fuel mixture into the intake of the intake passage, an intake valve for controlling the flow of the air/fuel mixture into the combustion chamber and an ignition spark plug for igniting the air/fuel mixture whereby a stratified combustion of the rich air/fuel mixture and the lean air/fuel mixture is ensured in the combustion chamber, the improvement wherein the outlet end of said tube is opened and closed by the back surface of the intake valve and is specially shaped for directing the rich air/fuel mixture only into the vicinity of the electrode of the ignition spark plug by deflection by the back surface of the intake valve.

4,072,135

APPARATUS FOR SUPPLYING A RICH AIR/FUEL MIXTURE IN AN INTERNAL COMBUSTION ENGINE

Masaaki Noguchi, Nagoya; Yukiyasu Tanaka, Okazaki; Setsuro Sekiya, and Katsuhiko Motosugi, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 6, 1975, Ser. No. 629,231
Claims priority, application Japan, Nov. 13, 1974, 49-130016
Int. Cl.² F02B *23/00*
U.S. Cl. 123—75 B **6 Claims**

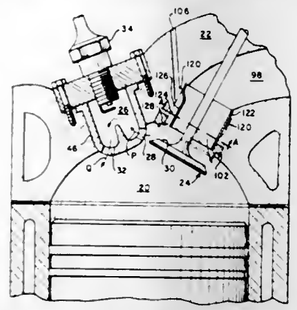
1. An apparatus for supplying a rich air/fuel mixture in an internal combustion engine having at least one combustion chamber comprising:

a cylinder head having an inner surface defining part of the combustion chamber and also having an air/fuel intake passageway communicating with the combustion chamber at the air/fuel mixture intake;

a spark plug having its spark gap protruding into the combustion chamber;

an intake valve positioned in the cylinder head for controlling the flow through the air/fuel mixture intake;

a rich air/fuel mixture passage through the cylinder head;



an annular channel formed in the wall of the air/fuel intake passageway, said rich air/fuel mixture passage opening into said annular channel; and

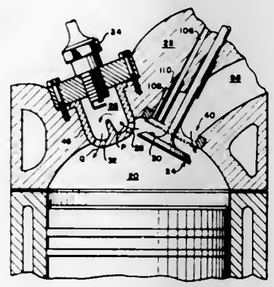
a sleeve inserted in the air/fuel mixture intake passageway, said sleeve having an indented portion for defining a rich air/fuel mixture intercommunication between said channel and the air/fuel mixture intake and for directing the flow of said rich air/fuel mixture toward the spark plug gap, said directed flow being substantially in the plane determined by the valve axis and the spark plug gap, said sleeve cooperating with said annular channel to form a closed annular passage opening into said indented portion.

4,072,136

APPARATUS FOR SUPPLYING RICH AIR/FUEL MIXTURE IN AN INTERNAL COMBUSTION ENGINE

Masaaki Noguchi, Nagoya; Yukiyasu Tanaka, Okazaki; Setsuro Sekiya, and Katsuhiko Motosugi, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 6, 1975, Ser. No. 629,232
Claims priority, application Japan, Nov. 13, 1974, 49-130013
Int. Cl.² F02M *23/00*
U.S. Cl. 123—75 B **3 Claims**



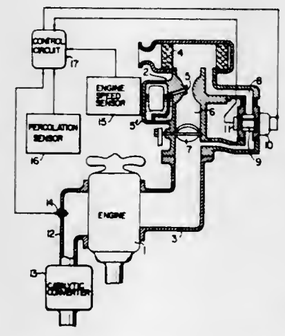
1. In an internal combustion engine having a cylinder, a piston, a cylinder head associated with said cylinder and piston to define a combustion chamber, an intake passage for supplying a lean air/fuel mixture into the combustion chamber, an auxiliary passage for supplying a rich air/fuel mixture which opens in said intake passage, an intake valve for controlling the flow of the air/fuel mixture into the combustion chamber and an ignition spark plug provided in the combustion chamber, the rich air/fuel mixture supplied from said auxiliary passage being deflected by the back surface of the intake valve and thereafter supplied only into the vicinity of the electrode of the ignition spark plug whereby a stratified combustion of the rich air/fuel mixture and the lean air/fuel mixture is ensured in the combustion chamber, the improvement wherein the auxiliary passage for supplying a rich air/fuel mixture is provided in the cylinder head opening into the inner wall of the lean air/fuel mixture passage, and wherein said auxiliary passage includes an individual, straight tube communicating between the opening in said inner wall and the combustion chamber, said tube terminating at the back surface of the intake valve in the closed position of the valve.

4,072,137

AIR-TO-FUEL RATIO ADJUSTING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Tadashi Hattori, Okazaki; Akira Takada, Toyota; Takamichi Nakase, Gamagori, and Fumio Sugi, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Apr. 22, 1976, Ser. No. 679,495
Claims priority, application Japan, May 6, 1975, 50-53989
Int. Cl.² F02M *33/00, 7/00*
U.S. Cl. 123—119 DB **10 Claims**



1. An air-to-fuel ratio adjusting system for an internal combustion engine comprising:

a. a carburetor connected to an intake pipe of an internal combustion engine for supplying an air-fuel mixture to said engine, said carburetor including a main passage for passing said air-fuel mixture therethrough and a throttle valve disposed in said main passage to control the amount of said air-fuel mixture;

b. a bypass passage for introducing additional air into said main passage;

c. a control valve disposed in said bypass passage for varying the amount of additional air therethrough to compensate the air-to-fuel ratio of said air-fuel mixture;

d. a driving motor connected to said control valve to operate said control valve;

e. air-to-fuel ratio sensing means disposed in an exhaust system of said engine for detecting the composition of exhaust gases emitted from said engine to detect the air-to-fuel ratio of the air-fuel mixture supplied to said engine and generate an air-to-fuel ratio signal;

f. engine speed sensing means for detecting the rotational speed of said engine to generate an engine speed signal;

g. an actuating circuit, connected to said air-to-fuel ratio sensing means and said driving motor, for actuating the driving motor in accordance with said air-to-fuel ratio signal from said air-to-fuel ratio sensing means;

h. percolation sensing means for detecting percolation of the fuel in said carburetor to generate a percolation signal; and

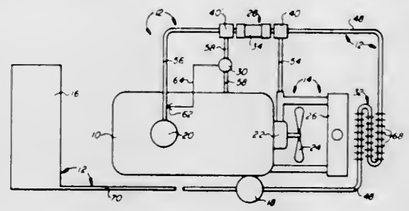
i. an idling control circuit, connected to said actuating circuit, said engine speed sensing means and said percolation sensing means, for stopping the actuation of said driving motor by said actuating circuit when said engine is at an idling operation and percolation of the fuel is not occurring.

4,072,138

FUEL SYSTEM

Clyde C. Hawkins, Greensboro, and Jesse R. Hawkins, Pleasant Garden, both of N.C., assignors to Hawkins Enterprises, Inc., Greensboro, N.C.

Filed July 22, 1976, Ser. No. 707,804
Int. Cl.² F02M *31/00*
U.S. Cl. 123—122 E **11 Claims**



1. In combination with a vehicle having an internal combustion engine; and a fuel system for supplying liquid fuel to said engine; said fuel system including a fuel tank, a carburator, and a fuel pump for directing fuel from said tank to said carburator; the improvement comprising:

fuel heating means interposed within said fuel system intermediate said fuel pump and said carburator for heating fuel conducted therethrough during its passage from said fuel pump to said carburator;

control means for regulating the operation of said fuel heating means in accordance with the temperature of the fuel passing downstream from said fuel heating means to said carburator;

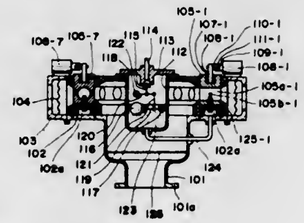
and cooling means within that part of said fuel system intermediate said fuel heating means and said fuel pump for minimizing heat-transfer in an upstream direction through said system from said fuel heating means to said fuel pump.

4,072,139

CARBURETOR

Kuniaki Miyazawa, 1548, Nishioizumi-cho, Nerimaku, Tokyo, Japan

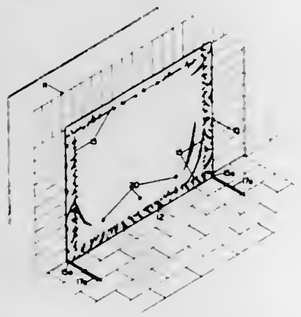
Filed May 5, 1975, Ser. No. 574,813
Claims priority, application Japan, May 24, 1974, 49-057912; July 18, 1974, 49-081701; July 18, 1974, 49-081702; Aug. 27, 1974, 49-097574; Mar. 17, 1975, 50-031116; May 31, 1974, 49-060887
Int. Cl.² F02M *13/04*
U.S. Cl. 123—127 **54 Claims**



1. A carburetor comprising

a plurality of cell carburetors,
each cell carburetor having a conduit with an air inlet at one end, a fuel-air outlet at the other end, means for supplying fuel to the air flowing through the conduit, and airflow control means for providing only two sizes of air passageways through the conduit,
manifold means for combining the fuel-air mixtures from said outlets, and
controller means which keeps the internal pressure of said manifold means at a desired value, said controller means including means for controlling said pressure by operating said air-flow control means of the cells to provide the desired pressure.

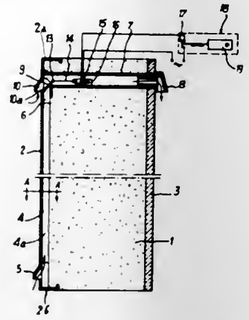
4,072,140
FIREPLACE HEAT LOSS SHIELD
John F. Gallagher, 4109 Hiawatha Drive, Madison, Wis. 54303
Filed Dec. 10, 1976, Ser. No. 749,359
Int. Cl.² F24C *15/10*
U.S. Cl. 126—140 **6 Claims**



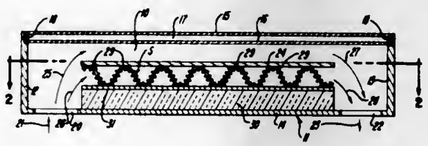
1. A fireplace heat loss shield for closing off the opening of the fireplace to prevent substantial introduction of air therein, comprising:
a. a substantially rectangular fireplace opening cover, said cover being formed of a fire resistant flexible woven fabric material which will substantially inhibit the passage of air therethrough; and
b. a rigid frame adapted to engage said cover at the edges thereof to maintain said cover in its generally rectangular shape and to provide vertical support thereto, said cover being unsupported within said frame at the edges of said cover, said frame including legs extending out horizontally from the bottom of said cover which are adapted to provide lateral support to said frame and cover when the heat loss shield is placed against the opening of a fireplace such that the drafting of air into the fireplace will draw said flexible cover firmly against the edges of the fireplace opening to thereby provide a substantially air tight seal over the opening.

4,072,141
PREFABRICATED VENTILATING PANEL INCLUDING HEAT TRANSFER MEANS
Jean-Pierre Fillios, and Joseph Kergueno, both of Saint Germain-en-Laye, France, assignors to Multifluid-Energie, Societe Anonyme, Les Mureaux, France
Filed May 21, 1976, Ser. No. 688,684
Claims priority, application France, May 22, 1975, 75 15904
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **8 Claims**

1. A prefabricated ventilating panel for supplying temperature modified air to an enclosure, comprising
a. a vertical core member (1) formed of heat-insulating material;
b. a vertical planar outer facing member (2) formed of heat conducting material, said facing member being connected in parallel spaced relation with said core member;
c. mean defining at least one generally vertical passage (4) between said facing and core members;
d. means defining an air inlet opening (5) for supplying ambient air to the lower end of said vertical passage;
e. means (7) defining a generally horizontal passage which communicates at one end with the upper end of said vertical passage, said horizontal passage means extending rearwardly completely through said core member and terminating in an air discharge opening, whereby air introduced in said vertical passage via said inlet opening flows successively upwardly through said vertical passage in heat transfer relation with said outer facing panel and through said horizontal passage means for discharge into the enclosure; and
f. means defining a by-pass opening (10) in said outer facing member adjacent the upper end of said vertical passage for introducing ambient air directly into said one end of said horizontal passage means.

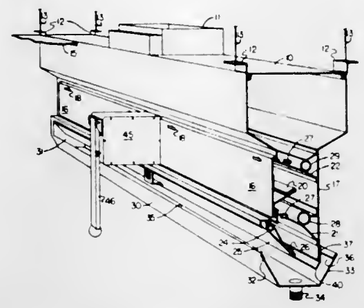


4,072,142
HEAT ABSORBER FOR SOLAR ENERGY
George Lof, Englewood, Colo., assignor to Solaron Corporation, Denver, Colo.
Filed Sept. 2, 1975, Ser. No. 609,230
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **3 Claims**



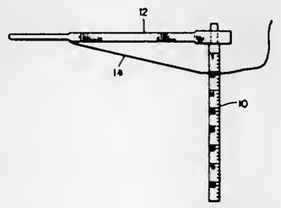
1. In a solar heat collector:
a housing having a cover transparent to solar radiant energy;
a heat absorbing and radiating plate disposed in generally parallel spaced relation to said cover;
foraminous means attached to the underside of said heat absorbing plate in heat conductive and supporting relationship; and
insulation means disposed beneath said absorber plate and said foraminous means for supporting said absorber plate and said foraminous means; and
means for guiding a gas to be heated into engagement with the top surface of said heat absorbing plate and into turbulent engagement with the bottom surface of said absorbing plate and with said foraminous means, for conducting heat from said absorbing plate to said gas.

4,072,143
DOUBLE INLET KITCHEN VENTILATOR
Edson C. Gaylord, Wilsonville, Oreg., assignor to Gaylord Industries, Inc., Lake Oswego, Oreg.
Filed Sept. 27, 1976, Ser. No. 726,844
Int. Cl.² F24C *15/20*
U.S. Cl. 126—299 D **8 Claims**



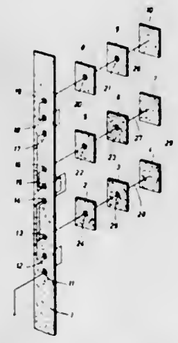
1. A ceiling mounted kitchen ventilator having a double inlet for opposed confluent flows of gases and vapors from underlying cooking equipment, comprising a vertical exhaust duct suspended from said ceiling, grease extracting baffles projecting into said duct from opposite vertical side walls thereof, a grease trough above said cooking equipment suspended beneath the lower end of said exhaust duct, side walls on said trough having upper edges disposed outward from said duct side walls, a damper baffle hinged at the lower edge of one of said duct side walls, said damper baffle having an open position with its lower edge extending into said trough in spaced relation to one of said trough side walls to form an inlet opening for a flow of said gases and vapors on one side of said trough, said damper baffle having a closed position engaging one of said grease extracting baffles on the opposite side of the duct to close the lower end of the duct, and a lower edge on the opposite side wall of the duct extending into said trough in spaced relation to the opposite side wall of the trough to form a second inlet opening for a confluent flow of said gases and vapors from the opposite side of the trough when said damper baffle is in said open position, the closing of said damper baffle shutting off both of said inlet flows of said gases and vapors.

4,072,144
INSTRUMENT AND METHOD FOR MEASURING URETHRAL DEFECTS IN PATIENTS WITH URINARY STRESS INCONTINENCE
Marco Antonio Pelosi, 182 Springfield Ave., Berkeley Heights, N.J. 07922, and Joseph J. Apuzzio, 1005 Fanny St., Elizabeth, N.J. 07201
Filed Jan. 21, 1976, Ser. No. 651,210
Int. Cl.² A61B *5/10*
U.S. Cl. 128—2 S **3 Claims**



1. An instrument for measuring urethral defects, comprising:
a. a urethral probe having a taper toward one end thereof;
b. a flexible thread anchored near the area of commencement of said tapered end to permit a positive connection forming a unitary device; and
c. a straight calibrated measuring rod having, at one end thereof, a means for transverse securement of said rod to the end of said probe opposite to the tapered end,
wherein said thread, when held by the examiner during insertion of the probe into the urethra to the opening of the bladder, represents a continuation of the unstrained urethral axis and, further wherein, any deflection of said thread which may occur upon a urethral straining by the patient, corresponds to the degree of deformity of the urethrovesical angle.

4,072,145
BRAIN WAVE SIGNAL SENSOR HEADBAND ASSEMBLY
Jose R. Silva, P.O. Box 1149, Laredo, Tex. 78040
Filed July 19, 1976, Ser. No. 706,446
Int. Cl.² A61B *5/04*
U.S. Cl. 128—2.1 E **3 Claims**

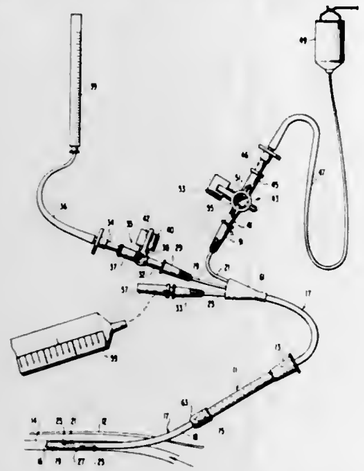


1. A headband for sensing human physiological characteristics and the like, comprising:
an elongated strip of adherent material having a hook surface and a loop surface on opposite sides thereof, said strip being of a length sufficient to encircle the head of the wearer,
at least one electrode of adherent material having a hook surface and a loop surface on opposite sides thereof,
at least one spacer of adherent material having a hook surface and a loop surface on opposite sides thereof,
one of said hook surface and said loop surface of the electrode being plated with an electrically conductive material,
the other of said hook surface and said loop surface of the electrode being pressed against the mating one of the hook surface and the loop surface of said spacer, the other of said hook surface and said loop surface of the spacer being pressed against the mating one of the hook surface and the loop surface of said strip and being shiftable along the length of said strip, and
means for electrically interconnecting said plated surface of said electrode with a measuring and a correlating system.

4,072,146
VENOUS CATHETER DEVICE
Randolph M. Howes, 1529 McElderry St., Baltimore, Md. 21205
Filed Sept. 8, 1976, Ser. No. 721,215
Int. Cl.² A61B *5/02*; A61M *25/00*
U.S. Cl. 128—2.05 D **10 Claims**

5. A venous catheter device including an elongated, integral flexible catheter tube provided with a distal end portion generally circular in cross-section and having a uniform outer diameter constructed for insertion into and capable of being fed longitudinally of a vein, a plurality of independent lumens

extending through said catheter tube, each of said lumens having a distal terminus adjacent the distal terminus of the catheter tube and defining an opening to the outside of said catheter tube, the distal terminus of said lumens being spaced from each other and all of said lumen termini being within no



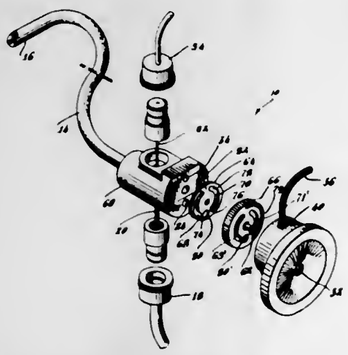
more than about twelve centimeters from the distal terminus of the catheter tube, the proximate ends of the lumens extending beyond the proximate end of said catheter tube and being fitted with a lumen adapter for connection to independent fluid devices.

4,072,147

RADIATION ENDOSCOPE

John H. Hett, Bradenton, Fla., assignor to American Cystoscope Makers Inc., Stamford, Conn.

Filed Mar. 4, 1976, Ser. No. 663,683
Int. Cl.[2] A61B *1/06*
U.S. Cl. 128—006 **7 Claims**



1. A radiation endoscope comprising

an endoscopic sheath having a proximal end and a distal end and sized to investigate a body cavity, said endoscopic sheath enclosing

a. an optical image transmitter extending from the proximal end of the endoscope sheath to its distal end to enable visual observation of a segment of the internal body cavity,

b. a therapeutic energy carrying optical path in the form of a fiber optical bundle selected to transmit radiation energy of a predetermined therapeutic wavelength and a therapeutic power, said optical fiber bundle extending between the proximal and distal ends of the endoscopic sheath, the therapeutic energy carrying optical fiber bundle being selected and sized to enable a therapeutic radiation beam to emerge from the distal end, said therapeutic energy carrying optical fiber bundle further being selected to direct the emerging therapeutic radiation beam for incidence at a predetermined location relative to the distal end for treatment of the visually observable segment of the body cavity, and

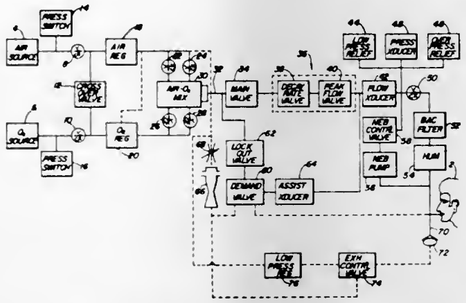
c. a spotter light path in the form of a light carrying rod extending between the proximal and distal ends of the endoscope sheath, with said rod terminating at a generally central location of the distal end of the therapeutic energy carrying optical fiber bundle, said spotter light path being oriented at the distal end to produce a visible spotter beam into the body cavity for illumination of a real light spot which is generally coincident with the predetermined location of the therapeutic radiation beam to visually locate the area of incidence of the therapeutic radiation beam in the body cavity.

4,072,148

MULTISTAGE MIXING VALVE FOR A MEDICAL RESPIRATOR

Ramon Jon Munson, Rialto; Claude Calvert Hurd, and James Weigl, both of Riverside, all of Calif., assignors to Bourns, Inc., Riverside, Calif.

Filed Jan. 3, 1977, Ser. No. 756,448
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—142.2 **9 Claims**



4. In a medical respirator having nominally constant-pressure air and oxygen sources, conduit means for delivering gas from said sources to a patient, and control means controlling the supply of gas from said sources to said conduit means, wherein the improvement comprises a two-stage mixing valve for accurately setting the air/oxygen mixture of breathing gas delivered to the patient over a range of volumetric flow rates, despite fluctuations in the actual pressures of said sources, said two-stage valve comprising:

first and second mixing valves, each of said mixing valves including air and oxygen inlet ports adapted to receive gas from said sources, an outlet port adapted to be connected to said conduit means, and means for controlling the air/oxygen mixing ratio, said first mixing valve having a greater absolute mixing accuracy but lower volumetric flow capacity than said second mixing valve,

means for adjusting the mixing ratios of each of said mixing valves, and

means between said second mixing valve outlet port and said conduit adapted to sense the pressure in said conduit means and interrupt gas flow through said second mixing valve when the sensed pressure exceeds a predetermined threshold level indicative of a low gas flow condition,

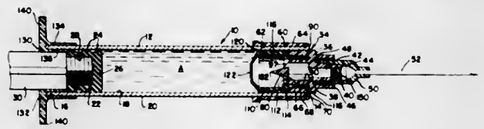
whereby said first mixing valve acts alone during low flow rate conditions to achieve a high absolute mixing accuracy when the pressure differential across said mixing valves is relatively small, and said first and second mixing valves act together during high flow rate conditions to achieve a lower absolute but comparable relative mixing accuracy when said pressure differential is relatively high.

4,072,149

NOSE CAP AND DIAPHRAGM ASSEMBLY FOR INJECTOR

Edward A. Tischlinger, 7 Froghollow Road, East Lyme, Conn. 06333

Filed Aug. 9, 1976, Ser. No. 712,855
Int. Cl.[2] A61M *5/28*
U.S. Cl. 128—218 NV **8 Claims**



1. A nose cap and diaphragm assembly for use in an injector including a cylindrical barrel closed at its rearward end by a slidable plunger and at its forward end by the nose cap and diaphragm assembly, said assembly comprising:

a nose cap, said nose cap having a body portion, said body portion having a central bore therethrough which aligns with the longitudinal axis of the barrel when the nose cap is assembled on the forward end of said barrel, the body portion having a forward and a rearward face, means extending forwardly from the body and in fluid communication with the aforesaid bore adapted to removably receive and mount an injection needle, means extending rearwardly from the body adapted to receive the forward end of the cylindrical barrel, a spike distinct from any injection needle that might be mounted on the forward needle mounting means on the rearward side of the body axially aligned with the body bore and having its point directed rearwardly, means for mounting the spike in such axial alignment, and

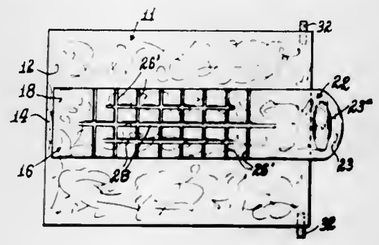
a diaphragm fitted on the rearward side of the body portion and adapted to seal off the forward end of the cylindrical barrel, said diaphragm comprising a cylindrical body having one open end, a flexible and pierceable member attached to and closing off the other end of this cylindrical body, the diaphragm being fitted into the nose cap on the rearward side so that the cylindrical body fits around the spike and the closed end is spaced rearwardly therefrom.

4,072,150

DOUBLE-DUTY DIAPER AND INSERT THEREFOR

Jacob A. Glassman, 1680 Michigan Ave., Miami Beach, Fla. 33139

Filed Nov. 15, 1976, Ser. No. 741,949
Int. Cl.[2] A61F *13/16*
U.S. Cl. 128—284 **16 Claims**



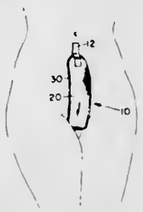
1. A double-duty diaper comprising, in combination, a main diaper including at least one relatively thick substantially rectangular layer of highly moisture absorbent material having a longitudinal central portion, an insert strip of less width than the main diaper also of highly moisture absorbent material super-imposed on said longitudinal central portion, a thin layer of moisture impervious material underlying the absorbent material of the insert strip, means lightly adhering the insert strip to the inner surface of said one layer, means embodied in the insert strip to facilitate at least one end thereof to be folded inwardly to overly an adjacent portion of said insert strip, and means for removing said insert strip from the main diaper without corresponding removal of or impairment of the diapering potential of said main diaper comprising the said insert strip having a size such that at least a portion thereof extends as a pull tab beyond a related edge of the main diaper.

4,072,151

SANITARY NAPKIN

Faye E. Levine, 257 Main St., Eagle Pass, Tex. 78852

Continuation-in-part of Ser. No. 556,195, March 31, 1975, abandoned. This application Mar. 9, 1977, Ser. No. 775,964
Int. Cl.[2] A61F *13/16*
U.S. Cl. 128—290 R **3 Claims**



1. A sanitary napkin for controlling the dischage of body fluid exudate comprising:

pad element having a top absorption means and a bottom absorption means;

backing means attached to the bottom of said pad element, said backing means being an impervious material, said bottom absorption means being a layer of absorptive material in direct contact with said backing means, said top absorption means being a layer of absorptive material in fluid communication with said bottom absorption means;

means for dispersing and preventing localized body fluid exudate saturation of said top absorption layer means and even exudate distribution to said bottom absorption layer means comprising sheet means of an impervious material between said bottom absorption means and said top absorption means, said sheet means separating said entire top absorption means from said entire bottom absorption means, said sheet means being perforated to allow for rapid and even transfer of fluids from said entire top absorption means to said entire bottom absorption means;

adherring means attached to the longitudinal ends of said pad element, said adherring means being a non-irritating adhesive adapted for attachment to the body of the wearer; and

facing means attached to the top of said pad element, said facing means being a fluid pervious gauze-like material, said bottom absorption means and said top absorption means extending essentially the full width and length of said sanitary napkin.

4,072,152

ORTHOPEDIC CRYOSURGICAL APPARATUS

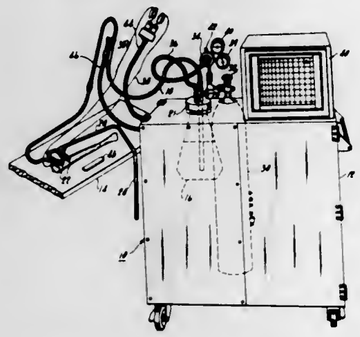
John H. Linehan, 6028 N. Santa Monica Blvd., Whitefish Bay, Wis. 53217

Filed Feb. 23, 1976, Ser. No. 660,157
Int. Cl.[2] A61B *17/36*
U.S. Cl. 128—303.1 **8 Claims**

1. Apparatus for performing cryosurgical procedures on bone tumors comprising:

a source of a cryogenic liquid;

probe means comprising a deformable U-shaped conduit having a pair of parallel, close-spaced arms and an intermediate bent joinder section, one of said arms having an inlet port on the end thereof, the other of said arms having an outlet port on the end thereof, said arms and joinder section having a uniform rectangular cross-sectional configuration along substantially their entire length between said ports, said rectangular cross-section having a minor dimension parallel to the axis of bending of said joinder section and a major dimension normal thereto, said probe means having a pair of U-shaped flattened planar heat transfer surfaces along said major dimension and spaced



apart by said minor dimension, said probe means being formed of lead for being capable of gross configuration changes in said U-shaped flattened heat transfer surfaces out of the planar condition through deformation by hand and for retaining such configuration after deformation;

a supply tube connected to said cryogenic liquid source and to said inlet port of said probe means for supplying the cryogenic liquid through said probe means;

a discharge tube connected to said outlet port of said probe means for discharging the cryogenic liquid; and

temperature monitoring means connectable to the bone tumor for monitoring the temperatures obtained in the bone tumor by the application of said probe means.

4,072,153

POST HYSTERECTOMY FLUID DRAINAGE TUBE

William H. Swartz, 8335 Sagarman Drive, La Jolla, Calif. 92037

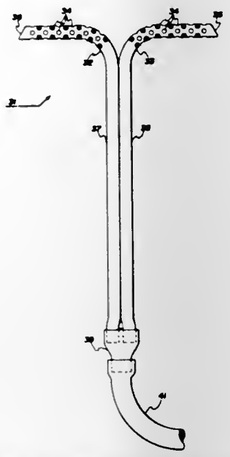
Filed Mar. 3, 1976, Ser. No. 663,460

Int. Cl.² A61M *27/00*

U.S. Cl. 128—350 R **1 Claim**

1. A flexible surgical T tube for insertion into the retroperitoneal space of a patient following hysterectomy for removing fluid and debris therefrom, comprising;

a pair of independent tubes connected together in parallel defining a double lumen tube, said tubes diverging at one end and each terminating in an arm thereby defining a pair of independent substantially colinear divergent arms of approximately 1 ½ inches in length generally forming an overall T configuration;



a plurality of drainage ports formed in and disposed around the periphery of each of said arms; and

each of said arms terminating in an open port.

4,072,154

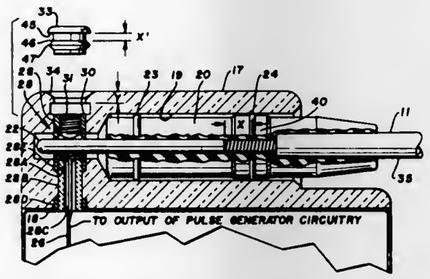
SEALING ARRANGEMENT FOR HEART PACER ELECTRODE LEADS

Jon A. Anderson, New Brighton, and Wendell R. Malin, Edina, both of Minn., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.

Filed May 28, 1976, Ser. No. 691,032

Int. Cl.² A61N *1/36*

U.S. Cl. 128—419 P **1 Claim**



1. In combination, a lead assembly and an implantable pulse generator forming a cardiac pacer apparatus:

a. said lead assembly comprising an elongated generally tubular lead having a conductive element disposed therewithin, with electrode means coupled to said conductive element and disposed at the distal end of said lead assembly, and electrical and mechanical connector means at the proximate end thereof for coupling said lead assembly to said pulse generator;

b. said pulse generator comprising an enclosure having a bore formed therewithin for receiving said connector means in sealed relationship within said bore, connector block means disposed within said bore for securing the proximal end of said conductive element to said pulse generator and sealing means disposed about the periphery of said lead assembly at a point adjacent said proximal end and normally disposed within said bore when said lead is coupled to said connector means;

c. said sealing means including a generally closed cylindrical resilient segment arranged generally coaxially of said conductive element with a resilient peripheral sleeve extending outwardly of said cylindrical segment and with a first raised resilient ring disposed about the periphery of said cylindrical segment and disposed between the base of said cylindrical segment at the proximal end thereof and the proximal end of said peripheral sleeve and with a second raised resilient ring extending continuously about the outer periphery of said peripheral sleeve, said resilient peripheral sleeve having axially extending portions arranged in oppositely disposed relationship of said second raised resilient ring; and

d. a rigid terminal pin member disposed generally coaxially thereof, with one end of said pin being lockingly received within a bore formed in said connector block means and with the other end of said rigid terminal pin being spaced axially inwardly of said resilient peripheral sleeve and outwardly of said first raised resilient ring.

4,072,155

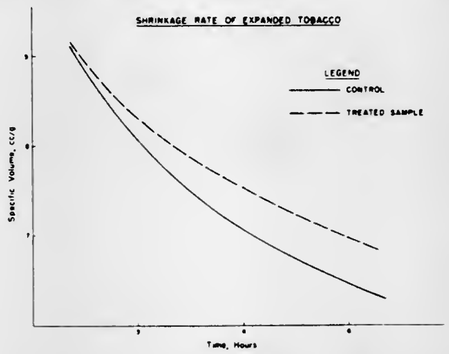
STIFFENING OF TOBACCO WITH DIALDEHYDE

JaYong C. Mc Geady, Brown Summit, and Claude I. Lewis, Greensboro, both of N.C., assignors to Lorillard, New York, N.Y.

Filed July 15, 1976, Ser. No. 705,522

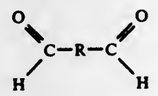
Int. Cl.² A24B *3/18*

U.S. Cl. 131—140 P **2 Claims**



1. A process for treating whole tobacco which comprises the steps of

a. impregnating whole tobacco with an aqueous solution containing from 5 to 60% by weight of a dialdehyde of the formula



wherein R is an unsubstituted straight or branched chain alkylene radical of the formula $(CH_2)_n$, n being from 0 to 6;

b. causing said dialdehyde to react with said tobacco in the presence of a catalyst effective to promote reactions with amino acids present in said tobacco, thereby to stiffen and increase the filling capacity of the tobacco; and

c. thereafter drying said tobacco.

4,072,156

COIN SORTING DEVICE

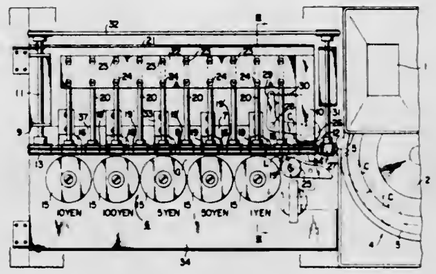
Masahiro Abe, Himeji, Japan, assignor to Glory Kogyo Kabushiki Kaisha, Japan

Filed July 20, 1976, Ser. No. 707,003

Claims priority, application Japan, July 25, 1975, 50-90164; July 31, 1975, 50-93454; Apr. 15, 1976, 51-42948

Int. Cl.² G07D *3/02*

U.S. Cl. 133—3 F **7 Claims**



1. A coin sorting device for use in a coin sorting machine wherein a mixture of several kinds of coins are sorted and classified, said coin sorting device comprising a coin passage having a floor and upstream and downstream ends for aligning the coins fed thereinto in a row; at least one coin propelling belt having large elasticity and a frictional surface for engaging the coins and propelling them along said coin passage from the upstream end to the downstream end thereof; said coin passage floor having sorting hole defining means defining sorting holes at intervals along said coin passage which holes have successively larger dimensions transversely of the coin passage through which coins of different diameters can pass as said coins are propelled past sorting holes with lateral dimensions corresponding to the diameters of the coins; a coin passage lateral perimeter defining means projecting laterally into the coin passage at each sorting hole to a point just short of the edge of the corresponding sorting hole for engaging the peripheral edges of the coins being propelled along the coin passage and displacing said coins in a direction transverse to the coin propelling direction, thereby to cause elastic lateral deformation of the coin propelling belt and to position said coins at positions for passing through corresponding sorting holes; belt holding members on opposite sides of each sorting hole in the direction of the length of the belt for holding the coin propelling belt against displacement laterally from the normal position at last between the sorting holes; and belt pressing members provided at points along the coin passage between said belt members and adjacent said sorting holes for pressing said belt downward at respective positions of the sorting holes; whereby the coin propelling belt is deformed when the coins are displaced laterally by the perimeter defining means due to the friction between the coin propelling belt and the coins and the restoration force generated in the coin propelling belt due to the deformation urges said coins toward said perimeter defining means and said coins are forcedly urged through the corresponding sorting hole by the force of the coin propelling belt on the coins urging the coins against the bottom of the coin passage by the action of the belt pressing members.

4,072,157

PORTABLE NURSING DEVICE

Roy Layton Wines, Jr., and Roy Layton Wines, III, both of Southampton, N.Y., assignors to Roy L. Wines & Son, Inc., Southampton, N.Y.

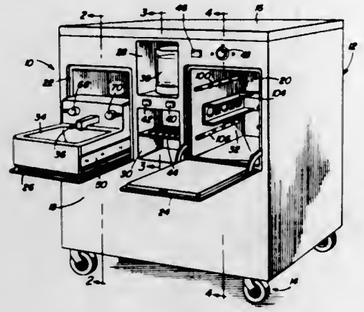
Filed Apr. 29, 1976, Ser. No. 681,493

Int. Cl.² B08B *3/02*

U.S. Cl. 134—58 R **19 Claims**

1. In a portable nursing unit having a plurality of liquid

receiving receptacles and a plurality of flexible conduits connected thereto through which liquid is conducted to and from said receptacles, a mobile cabinet enclosing the conduits and said receptacles, closure means mounted on the cabinet for alternately concealing and exposing at least one of said receptacles when displaced between closed and open positions, control valve means connected to at least one of said conduits



for selectively supplying liquid to said one of the receptacles, means connecting another of the conduits to each of the receptacles for draining waste liquid therefrom, cleaning means mounted within said one of the receptacles and connected to the valve means for cleaning articles loaded into said one of the receptacles, and programming control means connected to the valve means for effecting a cleaning operational cycle within said one of the receptacles.

4,072,158

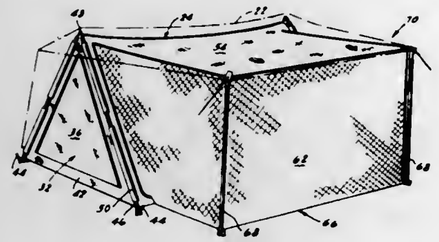
TENT HAVING VERANDA-STYLE EXTENSION

Thomas J. O'Brien, 4919 N. Magnolia, Chicago, Ill. 60640; David A. Parsons, 4647 W. 47th Place, Hometown, Ill. 60456, and Virginia Ruth Harger, Rte. No. 1, Olympia Drive, Byron, Ill. 61010, assignors to Thomas J. O'Brien, Chicago, Ill.

Filed Mar. 28, 1977, Ser. No. 781,738

Int. Cl.² A45F *1/00*

U.S. Cl. 135—1 R **5 Claims**



1. In a portable shelter apparatus of the type including interconnected end walls, a floor and side walls and where at least one of the side or end walls can be elevated to a substantially horizontal position, the improvement comprising: a veranda extension comprising an extendable floor portion connected adjacent the shelter's floor along one edge portion thereof, operable to be unrolled from a storage position to a fully extended position exteriorly of the shelter; and a side wall portion characterized as being respectively attached along the exterior perimeters of said extendable floor portion, an elevated wall of the portable shelter, and the adjacent walls of the shelter, whereby said extendable floor and side wall portion cooperate with said elevated side wall to provide the portable shelter with an insect-proof living area of increased size.

4,072,159

EMERGENCY VALVE INCORPORATING THERMAL FOAMABLE PLASTIC MATERIAL

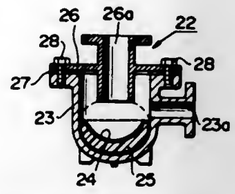
Toyoki Kurosawa, No. 22-1-201, 3-chome, Unoki, Ootaku, Tokyo, Japan (145)

Filed Dec. 19, 1975, Ser. No. 642,522

Claims priority, application Japan, Feb. 22, 1975, 50-21462

Int. Cl.² F16K *17/38*; A62C *37/06*

U.S. Cl. 137—67 **3 Claims**



1. An emergency shut-off valve for irreversibly stopping the flow of material in a conduit when an excessive temperature external to the valve is sensed by the valve, said valve comprising a valve casing defining a chamber which communicates with said conduit, and a thermally foamable heat-resistant plastic element residing in said chamber in an amount sufficient to irreversibly expand into said conduit and shut off the flow of material therein, said element in unexpanded condition allowing the flow of material through said conduit; and wherein said thermally foamable heat-resistant plastic element located in said chamber is packed in a stretchable membrane which comprises a shell-like expandable can of a material that will spring into an inflated condition closing off flow upon expansion of said plastic element.

4,072,160

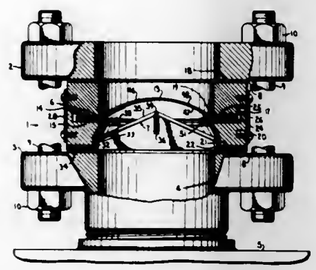
SCORED REVERSE BUCKLING RUPTURE DISC ASSEMBLY

Franklin A. Hansen, Raytown, Mo., assignor to Continental Disc Corporation, Riverside, Mo.

Filed Oct. 26, 1976, Ser. No. 735,830

Int. Cl.² F16K *17/16*

U.S. Cl. 137—68 R **12 Claims**



1. In a safety pressure relief device including a reverse buckling disc having a retaining flange portion and a central bulged portion connected thereto by a transition portion, said bulged portion having a convex and a concave surface, and said disc having a rated pressure on said convex side at which said bulged portion reverses itself for cutting on an adjacently positioned puncturing element, the improvement comprising:

a. a score line formed on the flange portion of said disc; said score line creating a line of weakness in said flange portion whereby pressure applied to said bulged portion which fails to produce cutting on said puncturing element causes said disc to tear along said score line.

4,072,161

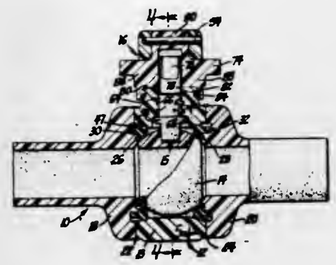
SEALING MEMBER FOR VALVE STEMS

E. Frederick Schoeneweis, Coraopolis, and Leonard J. Stephens, Pittsburgh, both of Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 614,207, Sept. 17, 1975, abandoned. This application Aug. 16, 1976, Ser. No. 714,460

Int. Cl.² F16K *5/00*

U.S. Cl. 137—68 R **1 Claim**



1. A valve assembly comprising:

a valve body having a flow passage for conveying a fluid therethrough;

a valving element in said valve body rotatable about a valve axis between first and second positions for opening and closing said flow passage;

an annular boss on said valve body having a frustoconical outer surface which terminates at an extended portion of said boss and a central opening therethrough;

a valve stem operatively connected to said valving element and extending through said opening to terminate at an extended end thereof outwardly of said valve body, said stem and a wall of said opening defining a potential leakage path therebetween;

a cap mounted on said extended end of said stem to be capable of transmitting rotational force thereto, said cap including an inwardly extending circumferential lip which overlies an outwardly extending collar on a terminal end of said extended portion of said boss to retain said cap thereon, said cap being capable of rotation relative to said boss;

said lip including an exterior surface thereon to define with said frusto-conical surface of said boss a converging space therebetween, said space being in fluid communication with said leakage path through a gap between said lip and said collar;

an O-ring being located within said space and in sealing engagement with said exterior surface and said frusto-conical surface to prevent ingress to said leakage path of contaminant fluids or particles while allowing venting of said fluid at a predetermined pressure if said fluid escapes from said valve body through said leakage path;

a cylindrical sleeve extending from said lip adjacent said frusto-conical surface to define a predetermined distance therebetween to retain said O-ring within said space throughout operation of said valve assembly;

a valve operating fitting including means for mounting said fitting on said cap, such fitting having surfaces thereon capable of receiving a tool for applying a torque through said fitting to said cap for rotation of said valving element; and

said means for mounting said fitting including a shearable portion thereof capable of shearing when a predetermined torque is applied to said fitting to prevent damage to said valve assembly.

4,072,162

VALVE STRUCTURE FOR A SPRAYING CONTAINER

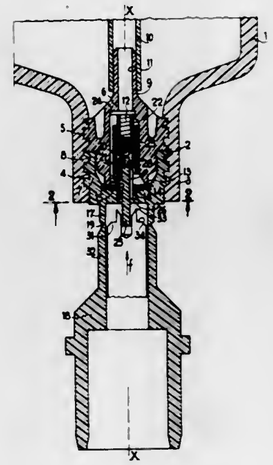
Pierre Bellehache, Sainte-Adresse, and Yves Le Troadec, Rouen, both of France, assignors to Pont-A-Mousson S.A., Nancy, France

Filed Feb. 20, 1976, Ser. No. 659,877

Claims priority, application France, Mar. 13, 1975, 75 07913

Int. Cl.² B65B *3/04, 31/00*; F16K *13/04*

U.S. Cl. 137—71 **5 Claims**



1. In a valve for assembling with a container and thereby forming a spraying container structure, the valve comprising a housing, a cover which is provided with a temporary sleeve and is combined with said housing to form a valve body, the housing and the cover defining therebetween a chamber and each defining an axial aperture opening into said chamber, the aperture of the housing being for putting the chamber in communication with the interior of the container and the aperture of the cover communicating with the interior of the sleeve, a sealing element mounted in the chamber, a closure member mounted in said chamber to be movable between an inoperative position spaced away from the sealing element and providing for communication between the chamber and the interior of the sleeve through said cover aperture and an operative position in which it is in sealing engagement with the sealing element for sealing off the cover aperture from the chamber, elastically yieldable means interposed between the valve body and the closure member for applying the closure member against the sealing element in said operative position; the improvement comprising abutment means for temporarily maintaining the closure member in said inoperative position and destructible fixing means for temporarily fixing the abutment means to the valve body.

4,072,163

TAMPERPROOF LOCK WITH SHOCK ABSORBER

Francis R. Byrnes, c/o CCL Co. Inc., P.O. Box 12251, 5250 Belfield Ave., Philadelphia, Pa. 19144

Continuation-in-part of Ser. No. 697,581, June 18, 1976. This application Apr. 19, 1977, Ser. No. 788,710

Int. Cl.² E03B *9/06*; F16K *35/06, 31/48*

U.S. Cl. 137—296 **11 Claims**

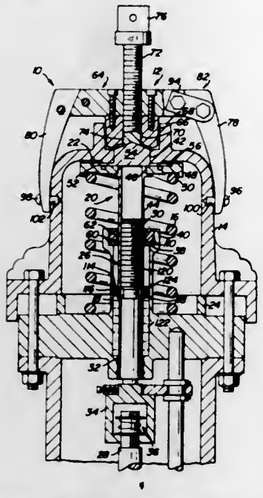
1. In a fire hydrant including a bonnet having an aperture, a housing having an internal chamber, a threaded operating rod extending within the housing chamber coupled to a yoke, and a plunger coupled to the yoke for opening and closing a valve, a tamperproof lock comprising:

a spring mounted at one end on a housing;

power transmitting means threadedly mounted on a threaded operating rod extending within a housing cham-

ber for transmitting power to said threaded rod against said spring;

hydraulic means operatively associated with said power transmitting means for preventing sudden closing of the hydrant valve; and



a swivel plate freely mounted on said power transmitting means for rotational movement thereon, said swivel plate having a contoured hub portion adapted to fit within a bonnet aperture, said hub portion being exposed to the exterior of the bonnet.

4,072,164

DIAPHRAGM OPERATED FLOAT CONTROLLED VALVE

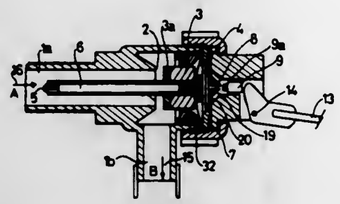
Walter Erich Kaden, 1525, General Hertzog Road, Vereeniging, Transvaal, South Africa

Filed May 13, 1976, Ser. No. 686,247

Claims priority, application South Africa, May 13, 1975, 75/3061

Int. Cl. F16K *31/18*

U.S. Cl. 137—414 **3 Claims**



1. A float valve which comprises a conduit for liquid, a valve seat located at an intermediate position of the conduit, a valve closure member movable when actuated onto the valve seat to close the valve and off the valve seat to open the valve, a passage whose entrance is located upstream of the valve seat and whose entrance is pointed upstream, a control chamber, the passage leading to the control chamber, the walls of which are formed in part by a first diaphragm and a second diaphragm, the first diaphragm being connected with the closure member so as to actuate it, the surface of the first diaphragm being of larger area than the cross sectional area of the conduit encompassed by the valve seat, the second diaphragm carrying a bleed off passage having a seat at its outer end, a bleed off passage closure bung, a float, a float connection linkage providing a mechanical connection between the float and the bung, the linkage adapted to cause the bung to move onto the bleed-off passage seat when the level of the float rises, and the linkage adapted to depress the float below the level of the liquid body if the second diaphragm is deflected outwardly and hence the bleed off passage moves outwardly, while the bung is on the bleed off passage.

4,072,165

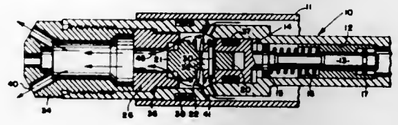
POPPET RELIEF VALVE

Charles Duane Bradley, Jr., Kalamazoo, Mich., assignor to Pneumo Corporation, Boston, Mass.

Filed May 3, 1976, Ser. No. 682,712

Int. Cl.² F16K *17/18*

U.S. Cl. 137—493 **14 Claims**



1. A poppet type relief valve comprising a seat and poppet, means responsive to pressure on one side of said poppet to open said poppet at a predetermined pressure to provide flow through said valve in one direction, and means responsive to pressure on the opposite side of said poppet to open said poppet at a predetermined pressure to provide flow through said valve in the opposite direction, including an actuator for said poppet operative to pull said poppet from said seat at a predetermined pressure, and a lost motion connection between said actuator and poppet, said lost motion connection comprising a pin and slot.

4,072,166

VALVE APPARATUS FOR DEEP DRILLING

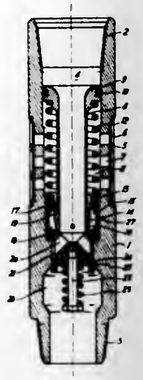
Wladimir Tiraspolsky, 69 avenue Victor Cresson, 92130 Issy-les-Moulineaux, and Roger Francois Rouviere, Quartier les Ribas, 13770 Venelles, both of France

Filed Mar. 23, 1976, Ser. No. 669,523

Claims priority, application France, Mar. 27, 1975, 75 09608

Int. Cl.² E21B *41/00*

U.S. Cl. 137—496 **10 Claims**



1. A valve apparatus adapted for connection in a drill stem comprising a body having a longitudinal fluid passage and lateral openings communicating said longitudinal passage with the exterior of said body; a sleeve member slidably mounted within said body between a first position in which fluid may flow between an upper portion of said longitudinal passage and said lateral openings, and a second position in which said fluid is prevented to flow between said passage and said lateral openings, said sleeve member being movable from said first to said second position in response to an increase of the flow from said passage to said lateral openings above a predetermined flowrate; biasing means between said body and said sleeve member for urging said sleeve member towards said first position; valve means connected to said sleeve member for preventing flow of said fluid between upper and lower portions of said longitudinal passage when said sleeve member is in said first position while allowing substantially unrestricted flow when said sleeve member is in said second position; and piston means on said sleeve member sensitive to the difference between the pressure in said passage and the pressure outside said body when said sleeve member is in said second position for maintaining said sleeve member in said second position when said difference exceeds a predetermined value.

4,072,167

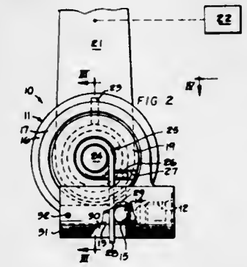
CHECK VALVE WITH TORSION SPRING AND METHOD OF ASSEMBLY

Cyril W. Habiger, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 19, 1975, Ser. No. 633,350

Int. Cl.² F16K *15/04*

U.S. Cl. 137—535 **19 Claims**



17. In a valve of the type comprising a housing having an inlet and an outlet defined therein, a seat defined in said housing between said inlet and said outlet, a ball loosely mounted in said housing and normally disposed on said seat for preventing fluid flow from said inlet to said outlet, torsion spring means having a first end thereof extending transversely relative to a longitudinal axis thereof and operatively engaging the periphery of said ball but otherwise unattached therewith for biasing the same against said seat under a predetermined closing force and for permitting unseating thereof from said seat to permit said inlet to communicate with said outlet when the force of said fluid in said inlet exceeds said predetermined closing force and stop means independent of said spring means secured to said housing and disposed in blocking relationship across said outlet on a downstream side of said ball for preventing said ball from moving therepast and for limiting movement of the first end of said spring means.

4,072,168

DUAL STANDPIPE ARRANGEMENT SUPPLEMENTING A WATER SUPPLY SYSTEM

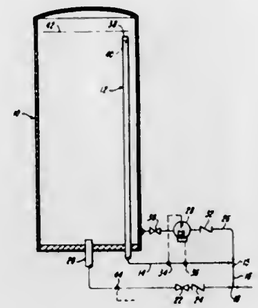
James D. Wittenmyer, 853 Granada Drive, Greenwood, Ind. 46142

Filed Nov. 10, 1976, Ser. No. 740,535

Int. Cl.² E03B *5/00*

U.S. Cl. 137—567 **12 Claims**

1. For use in connection with a water supply system wherein pumping means draws water from a source and supplies it to various consumers by way of a main and branch lines from a main, a supplement to said supply system including a tank forming a first large standpipe for storage of water, a second smaller standpipe, said second standpipe being positioned within said first standpipe to project upwardly from its bottom to a level approaching but spaced from the top of said first standpipe, a distribution line one end of which opens into the bottom of said first standpipe and the other end of which is arranged to connect to said main, the lower end of said second standpipe, which opens from the bottom of said tank, having coupled thereto one end of a first flow line the opposite end of which is arranged to connect to said main, said second standpipe providing means through which water may be delivered to fill or replenish the supply of water in the interior of said first standpipe, said distribution line providing means for the



delivery of water from said first standpipe when the water therein reaches a predetermined level, and said second standpipe having in operative connection therewith means responding to the sensing of the water pressure in the related main, as represented by the level thereof in the second standpipe, to induce the delivery of water from said first standpipe to said main in a manner and under conditions to maintain the supply in said main and at a predetermined level of pressure such as required to satisfy the various consumers.

4,072,169

HYDRAULIC CONTROL SYSTEM

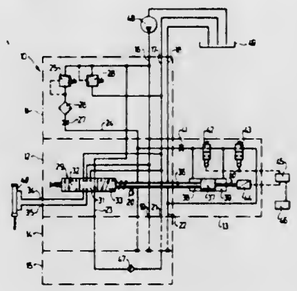
Joachim Heiser, Stuttgart; Rainer Hoheisel, Aldingen; Heinz Flaschar, Asperg; Heinz Gand; Heinz Kleinschmidt, both of Stuttgart; Konrad Bräunlinger, Schwieberdingen; Klaus Sopha, Stuttgart; Roland Schempp, Abstatt, and Hermann Sanzenbacher, Heimsheim, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed July 6, 1976, Ser. No. 702,860

Claims priority, application Germany, July 29, 1975, 2533829

Int. Cl.² F15B *13/043;* **F16K** *11/07*

U.S. Cl. 137—596.13 **7 Claims**



1. A hydraulic control system connectible to a pair of output lines, said system comprising:

a source of fluid having a high-pressure side and a low-pressure side;

means including a low-pressure limiting valve for maintaining a predetermined low-pressure differential between its input and output sides;

means including a main valve connected to said lines, said sides, and said low-pressure valve and having a valve body displaceable from an end position for connecting each of said lines to a respective one of said sides and disconnecting said low-pressure valve from one of said sides and another position for disconnecting said lines from said sides and connecting said low-pressure valve across said sides;

means including a medium-pressure limiting valve having an input connected to said high-pressure side and an output for maintaining pressure at its output below a predetermined medium-pressure level greater than said low-pressure differential and smaller than the pressure differential between said sides, said low-pressure valve and said medium-pressure valve being connected in parallel across said sides in said other position of said valve body;

a differential pilot piston connected to said valve body and jointly displaceable therewith; and

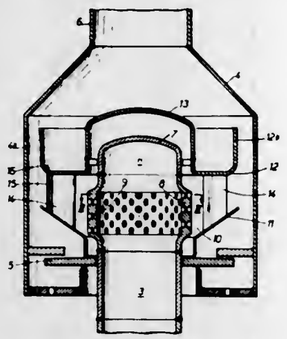
pilot-valve means connected between said output of said medium-pressure valve and said pilot piston for hydraulically actuating same and thereby displacing said body between its said positions, said pilot-valve means including a chamber at the smaller face of said piston and connected to said output of said medium-pressure valve, a pair of pilot valves, and a chamber at the larger face of said piston connectable through one of said pilot valves to said low-pressure side and through the other of said pilot valves to the other chamber of said piston.

4,072,170

PRESSURE-RELIEVING DEVICE FOR STEAM GENERATORS AND THE LIKE

Max Sagner, Paris, and Jacques Souquet, Le Chesnay, both of France, assignors to Bertin & Cie, Plaisir, France

Filed June 3, 1976, Ser. No. 692,517
Claims priority, application France, June 3, 1975, 75 17249
Int. Cl.² F01N *1/14*; F15D *1/08*
U.S. Cl. 137—599 **7 Claims**



1. A fluid discharge system for relieving pressure in a high-pressure steam boiler or like reservoir, of the kind comprising a discharge fluid collecting flue hood and a valve-controlled exhaust conduit having an upstream end connected to said reservoir and a downstream end opening into said hood, said conduit and hood being mechanically separate from each other by a break in continuity to allow some relative movement upon fluid action thereon,

wherein the improvement comprises the provision of an air ejector assembly overridden by said hood and fluidically associating the same to said exhaust conduit, said assembly comprising

a nozzle device fitted at said exhaust conduit downstream end and designed to issue pressure fluid therefrom in thrust-balanced high-velocity jet form, and

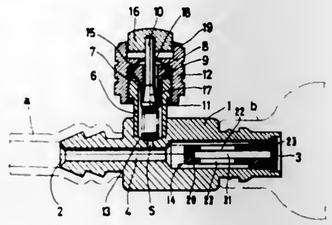
a duct device opening inside said hood and registering with said nozzle device, whereby the high-velocity jet issuing therefrom entrains air through said duct device and thence through said hood.

4,072,171

PRESSURE CONTROL VALVE FOR A SPHYGMOMANOMETER

Shizumasa Nakazawa, 2-10-26, Toneri, Adachi, Tokyo, Japan

Filed Sept. 14, 1976, Ser. No. 723,169
Int. Cl.² A61B *5/02*
U.S. Cl. 137—599.2 **7 Claims**



1. A pressure control valve for a sphygmomanometer comprising a housing provided with an air passage having one end adapted for connection to an arm cuff and another end for connection with an air supply, a tubular body secured to said housing and having a hollow interior with a first end communicating with said air passage intermediate the ends thereof and a second open end, first valve means for closing said open end of the tubular body, said first valve means having a bore therein constituting an air passage having a first end in communication with ambient atmosphere and a second end in communication with the hollow interior of the tubular body, a second valve means loosely and slidably mounted in said bore in said first valve means for selectively opening and closing said second end of the air passage in said first valve means, external actuator means coupled to said second valve means and slidably actuated to displace the second valve means in said first valve means, spring means acting on said second valve means for closing said second end of the air passage in said first valve means, and a threaded member screwed on said tubular body for engaging said first valve means to hold the same in closed position against the open end of the tubular body, said second valve means including a portion bearing against said first valve means in the closed position of said second end of the air passage in said first valve means, said spring means acting on said first valve means through said portion on said second valve means to urge the first valve means in a direction tending to open said second end of the tubular body.

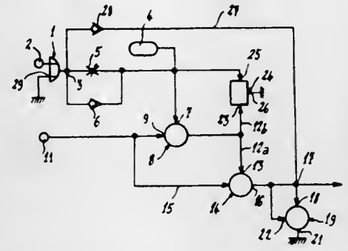
4,072,172

PNEUMATIC TIMING DEVICE

Jean Gachot, 26 bis, Avenue de Paris, Soisy-Sous-Montmorency, Val d'Oise, and Siméon Lekarski, 138, Boulevard de la Republique, Saint-Cloud, Hauts-de-Seine, both of France

Filed Feb. 17, 1976, Ser. No. 658,864
Claims priority, application France, Feb. 27, 1975, 75 06151
Int. Cl.² G05B *11/44*
U.S. Cl. 137—624.2 **6 Claims**

1. In a pneumatic timing device comprising an inlet for receiving an instantaneous signal, an outlet for delivering a time-delay signal, a restrictor mounted in series with the inlet and a capacitance for receiving the instantaneous signal aforesaid through said restrictor in order to ensure that the pressure within said capacitance attains a predetermined threshold value at the end of a predetermined time interval in order to initiate the appearance of the time-delay signal at the outlet; the improvement comprising a reference inlet in parallel with the first-mentioned inlet and restrictor and capacitance and adapted to receive an adjustable-level signal and connected to the outlet through first blocking means, means for comparing the pressure existing within the capacitance with the adjustable-level signal of said reference inlet and for changing stage so as to deliver a comparison signal when said pressure becomes higher than said adjustable-level signal, means for applying said comparison signal to the first blocking means for releasing said first blocking means thereby to permit said adjustable-level signal to proceed to said outlet to produce said time-delay signal, the comparator being so arranged as to ensure that its output signal passes from a high level to a low level at the moment of reversal, and a controlled leakage stage for cooperating in the production of said low-level signal, said stage being so arranged as to ensure that the leakage flow rate is sufficiently high to permit a practically instantaneous appearance of the low-level signal and sufficiently low to ensure that said signal remains prior to reversal at a sufficiently high level to maintain the first blocking means in the locked condition, the controlled leakage stage comprising a differential valve which is subjected on the one hand to the pressure prevailing within the capacitance and on the other hand to the reference pressure and which is adapted to move when the first pressure aforesaid exceeds a predetermined fraction of the second pressure whereupon a leakage is opened in the outlet circuit of the comparator prior to said moment of reversal.

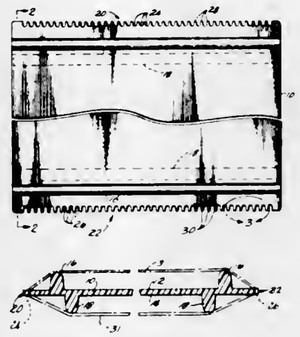


4,072,173

WEAVING BOARD

Allan H. Markowitz, 2650 Country Club Drive, Glendora, Calif. 91740, and Matilda Macknin, 9514 E. Kennerly St., Temple City, Calif. 91780

Filed Mar. 30, 1977, Ser. No. 782,777
Int. Cl.² D03D *29/00*
U.S. Cl. 139—34 **20 Claims**



1. A weaving board comprising:

a generally planar base having opposed first and second surfaces, the base having longitudinally spaced apart first and second edges extending across the width of the base;

a pair of first ridges spaced apart longitudinally and projecting from the first surface of the base;

a pair of second ridges spaced apart longitudinally and projecting from the second surface of the base;

the first and second ridges being substantially continuous across the width of the base;

a first series of laterally spaced apart grooves formed in the first edge of the base;

a second series of laterally spaced apart grooves formed in the second edge of the base;

the width of each groove being greater than the spacing between adjacent grooves in each series;

a pair of laterally spaced apart elongated first flanges extending longitudinally along opposite edges of the base and projecting from the first surface thereof beyond the remote edges of the first ridges; and

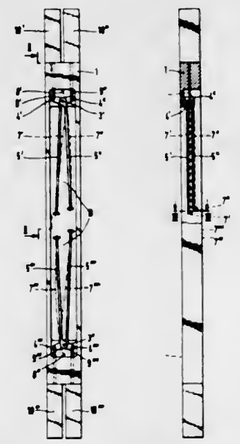
a pair of laterally spaced apart second flanges extending along opposite edges of the base and projecting from the second surface thereof beyond the remote edges of the second ridges.

4,072,174

ARRANGEMENT FOR PRODUCING SELVAGE IN WOVEN FABRICS

Theodor Wagner, Reutlingen, Germany, assignor to Firma C.C. Egelhaaf, Reutlingen, Germany

Filed June 22, 1976, Ser. No. 698,712
Claims priority, application Germany, June 25, 1975, 2528246
Int. Cl.² D03D *47/40*
U.S. Cl. 139—54 **3 Claims**



1. In a weaving machine having a plurality of healds operatively mounted therein, an arrangement for producing selvages for woven fabrics, comprising in combination,

a frame having an upper and a lower transverse beam,

means for feeding a plurality of selvage threads,

a plurality of guide needles arranged in pairs,

a pivot shaft mounted in the frame for each pair of guide needles, the needles of each pair being of different lengths and being respectively pivotally mounted via their corresponding pivot shaft on said frame, at respective upper and lower locations thereon,

a lever projecting from each guide needle,

each needle having an eye through which a selvage thread is adapted to pass, so that a selvage thread is received from said selvage thread feeding means and is independently guided by each guide needle,

the needles of each pair being mounted in staggered fashion on said transverse beams so that the selvage threads positively guided and swung out by said needles do not interfere with each other during the weaving process,

a plurality of individual electromagnetic means respectively mounted on said upper and lower transverse beams, and means operatively connecting each electromagnetic

means to the lever of its respective needle for controlling the pivotal movement thereof.

4,072,175

LOOM WITH MEANS FOR SHED FORMING

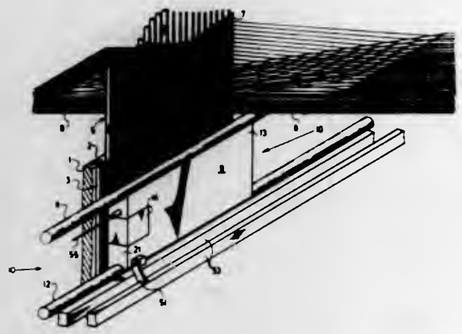
Vojtech Buran, and Vladimir Horn, both of Brno, Czechoslovakia, assignors to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi, Brno, Czechoslovakia

Filed Mar. 29, 1976, Ser. No. 671,588

Claims priority, application Czechoslovakia, Mar. 28, 1975, 2147/75

Int. Cl.[2] D03C *13/00, 17/06;* D03D *47/26*

U.S. Cl. 139—455 25 Claims



1. In a loom having means for forming and progressively feeding a sheath of warp threads, means for forming sheds in the warp threads, said last-named means comprising a bed extending across the width of the loom, a plurality of parallel guiding grooves formed in the bed, a plurality of healds having carrier parts, at least the carrier parts of the healds being displaceably mounted in the guiding grooves in the bed, a mechanism for controlling the carrier parts of the heald, a guideway disposed parallel to the bed, and means for displaceably mounting the control mechanism in the guideway, the improvement wherein the control mechanism comprises a selecting magnet supported directly therein for movement therewith, the selecting magnet being cooperable with the carrier parts of successive healds disposed in the path of movement of the selecting magnet during the movement of the control mechanism in the guideway for selectively displacing the carrier parts of such healds.

4,072,176

AUTOMATIC WIRE HANDLING AND WRAPPING APPARATUS

Lindsay Carlton Friend, Camp Hill, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jan. 24, 1977, Ser. No. 761,696

Int. Cl.[2] B21F *15/00*

U.S. Cl. 140—93 R 34 Claims

1. A wire wrapping apparatus for interconnecting electrical terminals comprising:

a rotary wire wrapping tool;

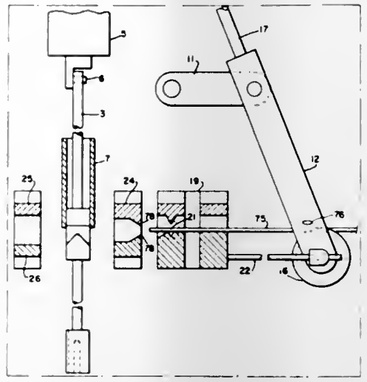
a means for feeding insulated wire of an indeterminate length to said tool;

means for receiving and loading said wire on said tool including clamp means separate from but adjacent said tool;

stripping means separate from but adjacent said tool for removing the wire insulation;

cutting and gripping means for cutting to length and securing sequentially alternate ends of the wire; and

said cutting and gripping means is mounted for rotation about an axis offset from and adjacent to said rotary wire



wrapping tool and is rotated separately from said rotary wire wrapping tool.

4,072,177

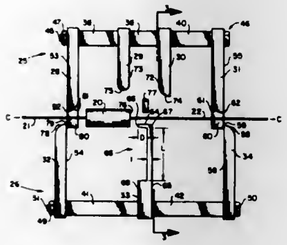
DIE SET FOR FORMING AXIAL LEADS OF ELECTRICAL COMPONENT INTO HAIRPIN LEAD PATTERN

Donald H. Daebler, Huntsville, Ala., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 20, 1976, Ser. No. 752,507

Int. Cl.[2] B21F *1/00*

U.S. Cl. 140—105 3 Claims



1. An improved die set for a machine for forming component leads which extend in substantially opposite directions from the body of a component into a pattern; the machine including structure for holding the dies spaced apart in a first plane on opposite sides of the component axis through component leads in the first plane and facing each other for subsequent movement and engagement in the first plane to form the component leads, structure for contacting one lead of a component located between the dies for aiding in temporarily fixedly securing the position of the one lead and the component body, and means for providing relative movement of the dies in the first plane such that they engage each other in an extended position to form the component leads; the improved die set being adapted for forming the component leads into a hairpin lead pattern, and comprising:

a first die comprising first and second elongated finger members having one end held by the holding structure so as to be in a substantially parallel spaced apart relationship in the first plane, the other ends thereof for contacting a component body and the one lead thereof, respectively, being curved convexly toward the component axis in the first plane; and

a second die comprising a third elongated finger member which is a forming anvil that is held on one end by the holding structure so as to be substantially parallel to said

first and second members, the other end thereof being adjacent the component axis, said anvil having in the first plane portions of first and second opposite surfaces that are adjacent the other end thereof, said first opposite surface having an opening formed in said anvil that is spaced a prescribed distance from said other end thereof and being dimensioned for receiving therein a portion of the component body spaced toward the other end of said anvil from a second plane that is orthogonal to the first plane through the component axis;

the contacting structure of the machine pressing the one lead against the other end of said anvil with one point on the perimeter of the component body being in the first plane and being spaced away from said first and second members with one end of the component body being adjacent said first opposite surface of said anvil and being spaced in the first plane from said first opposite surface a distance which is greater than the prescribed distance; the component body being aligned with the other end of said first member in the first plane and at least a portion of the one lead extending past said second opposite surface of said anvil being aligned with the other end of said second member in the first plane;

relative movement of the dies in the first plane causing the other ends of said first and second members to contact the component body and the one lead, respectively, and to move beyond the other end of said anvil on opposite sides of the latter such that said first and second members press a portion of the component body into said opening in said anvil and the one lead adjacent to said second opposite surface of said anvil, respectively, to form the component leads into a hairpin lead pattern in which the leads are substantially parallel to each other adjacent to the other end of the component.

4,072,178

DEVICE USED FOR DETACHING THE BEADS OF A TIRE FROM THE WHEEL RIM

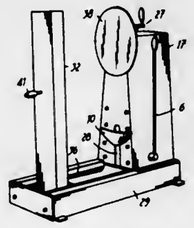
Francis Du Quesne, Gemzenstraat 13, 2610 Wilrijk, Belgium

Filed Dec. 29, 1976, Ser. No. 755,418

Claims priority, application Belgium, Jan. 16, 1976, 254758

Int. Cl.[2] B60C *25/08*

U.S. Cl. 157—1.17 7 Claims



1. Device for detaching the beads of a tire from a wheel rim, comprising a base, on one end of this base an upright fixed frame, on the other end of this base an upright mobile backing support against which one side of the wheel bears and slideable towards said fixed frame, means for blocking said support on said base, a pressure cylinder pivotally suspended in a vertical plane in a slide adjustable in height and mounted in the fixed frame, means to limit the tumble movement of said pressure cylinder, a pressure plate fixed to the free end of the pistonrod of said pressure cylinder and capable of moving towards said support in order to detach the adjacent bead of the tire, means to displace in height said slide with the pressure cylinder in order always to locate the pressure plate as close as possible against the peripheral edge of the wheel rim whatever the diameter of the wheel, whereby the pressure plate may follow the shape of the wheel rim, a stabilizer shield facing said fixed frame and destined to support the upper part of the other side of the wheel, and means to move said shield towards said backing support

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4,072,179

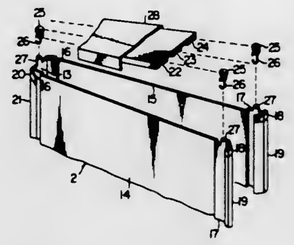
STRUCTURE ADAPTED TO BE SUCCESSIVELY DRAWN AND TELESCOPED

Han-Ichiro Naito, 15-1002, Wakaba-1-chome, Shinjuku, Tokyo, Japan

Filed Dec. 23, 1976, Ser. No. 754,057

Int. Cl.[2] E05D *15/06*

U.S. Cl. 160—197 14 Claims



1. A telescopable paritition comprising:

a plurality of partition members all of substantially the same size and configuration and each in sheet form and each having a pair of spaced opposing partition faces joined together along one respective side of each and unjoined at their other sides,

each said partition member having the spacing between its opposed faces increasing gradually from its joined edges toward its unconnected edges to thereby permit telescoping of one of said member into the next,

guide means for supporting said partition members and permitting movement of said members between a first drawn position in which the joined sides of one said member lie adjacent to the unconnected sides of an adjoining member to a second telescoped position in which said joined sides of said one member lie adjacent to said joined sides of said adjoining member,

and means for limiting the distance between said joined sides of a pair of adjoining members to a predetermined amount when said members are telescoped one into the other.

4,072,180

PROCESS AND MOULD FOR CASTING MULTIPLE ARTICLES

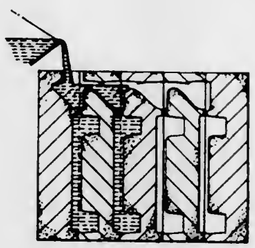
Frederick Herbert Hoult, Sheffield, England, assignor to W. H. Booth & Co. Limited, Great Britain

Filed Feb. 17, 1976, Ser. No. 658,542

Claims priority, application United Kingdom, Feb. 22, 1975, 7528/75

Int. Cl.[2] B22C *9/02, 9/20;* B22D *35/04*

U.S. Cl. 164—130 10 Claims



1. A process of casting molten metal, comprising the steps of securing in side-by-side relationship a number of mould sec-

tions to form a mould, each formed with generally vertically disposed cavity means having ingate means communicating with an integral part of the mould section adapted to form part of a runner-feeder having a horizontally disposed axis throughout its length, and the generally vertical mould cavities are disposed in side-by-side relationship in the horizontal direction, providing a weir in the runner-feeder between longitudinally adjacent mould cavity means, side walls of of longitudinally adjacent weirs facing each other and combining to form a well in the runner-feeder above said ingate means and in close proximity to the top of the cavity means so that the depth of the mould material between the well and the cavity means is as small as possible thereby ensuring vertical feeding of said cavity means, each weir being set at a height so that it is above the uppermost part of said mould cavity means and such that the minimum cross-sectional area of said runner-feeder above the weir is not less than the cross-sectional area of the ingate means of one mould, providing a downstream side wall of each weir with a slope large enough to provide a significant venturi effect to molten metal flowing over said weirs to minimize turbulence in the molten metal as it flows into said wells, and pouring molten metal into the runner-feeder such that molten metal flows into a well associated with a first mould cavity, from where it flows through said ingate means into the cavity means including filling molten metal in the well until it flows with minimum turbulence over the weir and into the well associated with the second mould cavity, and whereby incoming molten metal is supplied across a longitudinally preceeding well as a longitudinally succeeding well and cavity means is being filled, and so on until all the successive wells and cavities have been filled with molten metal, a pool of molten metal being maintained in said wells above said ingate means during filling and solidification of molten metal in said cavity means.

4,072,181

APPARATUS FOR REGULATING THE TEMPERATURE OF A CASTING MOLD

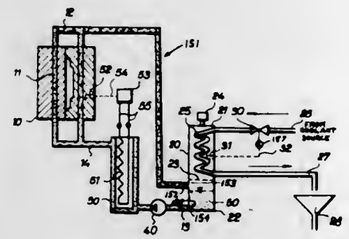
Michal Kostura; Jan Pandula; Absolon Harmansky; Slavomir Smiga, and Stefan Kepic, all of Snina, Czechoslovakia, assignors to Vihorlat, narodny podnik, Snina, Czechoslovakia

Filed Oct. 26, 1976, Ser. No. 735,808

Claims priority, application Czechoslovakia, Oct. 24, 1975, 7193/75

Int. Cl.² B22D *17/32*

U.S. Cl. 164—154 **5 Claims**



1. In an arrangement for regulating the temperature of a casting mold, a casting mold having a wall, first conduit means having upstream and downstream ends and a first portion and extending through the wall of the casting mold for conveying a first volatile fluid to remove heat from the mold wall at a rate related to the then-occurring boiling point of the first fluid, condenser means including a hollow chamber having an upper portion and a lower portion in fluid communication, the upstream end of the first conduit means terminating in a first relatively low point of the lower portion of the condenser means and the downstream end of the first conduit means terminating in a second relatively high point of the lower portion, second conduit means extending into the upper portion of the condenser means for conveying a second cooling fluid through said upper portion, regulatable heater means associated with a first portion of the first conduit means between the upstream end thereof and the casting mold for selectively heating the associated first portion, and pump means serially disposed in the path of the first conduit means for maintaining a serial flow of the first fluid through the first conduit means and the lower portion of the condenser means.

4,072,182

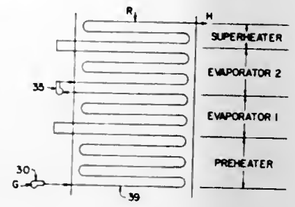
PRESSURE STAGED HEAT EXCHANGER

Dah Yu Cheng, Palo Alto, Calif., assignor to International Power Technology, Inc., Palo Alto, Calif.

Filed Jan. 5, 1977, Ser. No. 756,891

Int. Cl.² F22B *1/00*

U.S. Cl. 165—1 **16 Claims**



13. A method of improving the transfer of energy in a countercurrent heat exchanger from a first fluid to a second fluid, wherein said first fluid is at a higher temperature than said second fluid, said method comprising:

A. preheating the second fluid to a thermodynamic transition point at a pressure substantially below the exit pressure of said second fluid from the heat exchanger,

B. causing the second fluid to enter a low pressure evaporator wherein said second fluid enters a state of partial thermodynamic transition,

C. increasing the pressure of the second fluid to a point which substantially equals the final exit pressure of said second fluid, and

D. causing the second fluid to enter a high-pressure evaporator wherein said second fluid continues thermodynamic transition.

4,072,183

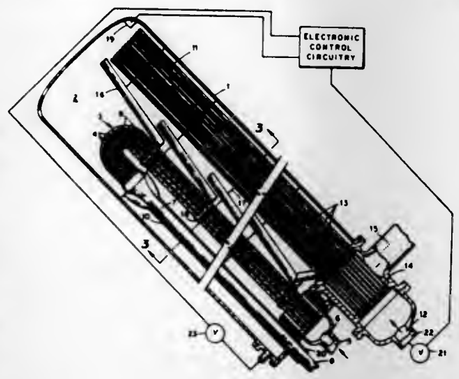
HEAT EXCHANGER WITH INTERMEDIATE EVAPORATING AND CONDENSING FLUID

Arthur P. Fraas, Knoxville, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 29, 1976, Ser. No. 745,941

Int. Cl.² F28D *15/00*

U.S. Cl. 165—11 **10 Claims**



1. A heat exchanger comprising:

a. a shell defining an interior cavity;

b. a first tube bundle disposed within said interior cavity for carrying high temperature primary fluid;

c. A second tube bundle disposed within said interior cavity generally parallel to and at a higher elevation than said first tube bundle, for carrying low temperature secondary fluid;

d. an intermediate fluid having a boiling point between the temperature of tubes in said first tube bundle and tubes in said second tube bundle disposed within said interior cavity such that during operation of said heat exchanger said intermediate fluid vaporizes at the surfaces of tubes in said first tube bundle and condenses at surfaces of tubes in said second tube bundle;

e. a liquid-conducting baffle disposed within said interior cavity in a region between said first and second tube bundles and extending in a direction parallel to said bundles for preventing the direct impingement of secondary fluid onto said first tube bundle in the event of a leak in said second tube bundle, said baffle being adapted for conducting condensed intermediate fluid from said second bundle to said first bundle; and

f. a transverse baffle disposed within said housing and extending in a direction perpendicular to said tube bundles substantially to the periphery of said interior cavity for dividing said heat exchanger into regions of different temperature.

4,072,184

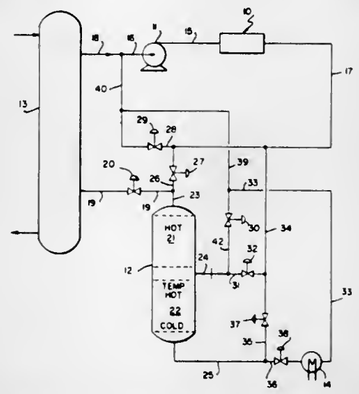
PROCESS AND APPARATUS FOR THE CYCLIC HEATING AND COOLING OF PROCESSING EQUIPMENT

Richard E. Hinkle, Bayshore, N.Y., assignor to American Hydrotherm Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 690,166, May 26, 1976. This application June 14, 1976, Ser. No. 695,808

Int. Cl. F25b *13/00*

U.S. Cl. 165—18 **8 Claims**



1. An apparatus for heating and cooling user equipment utilizing pressurized water as a heat transfer fluid in a closed system wherein said system includes heating and cooling means for heating and cooling said heat transfer fluid and wherein said apparatus includes at least two storage vessels for storing heat transfer fluid at intermediate temperature levels which comprises:

(a) pump means for passing said heat transfer fluid through said apparatus;

(b) first conduit means for introducing heat transfer fluid from an upper portion of a first heat transfer zone of a storage vessel into said user equipment during a first stage of a heating cycle and for passing heat transfer fluid from a second heat transfer zone of said storge vessel to said user equipment during a first stage of a cooling cycle;

(c) a second conduit means for introducing heat transfer fluid withdrawn from said user equipment into a lower portion of said first heat transfer zone of a storage vessel;

(d) third conduit means for introducing heat transfer fluid from said heating means into said user equipment during a second stage of said heating cycle;

(e) fourth conduit means for introducing heat transfer fluid withdrawn from said user equipment during said second stage of said heating cycle into a lower portion of said heat transfer zone of said second storage vessel and for introducing heat transfer fluid withdrawn from said user equipment into said upper portion of said first heat transfer zone of said storage vessel during a second stage of said cooling cycle;

(f) fifth conduit means for passing heat transfer fluid from said second heat transfer zone of said storage vessel to said heating means;

(g) sixth conduit means for passing heat transfer fluid withdrawn from said user equipment to said heating means during a final stage of said heating cycle;

(h) seventh conduit means for introducing heat transfer fluid withdrawn from said user equipment into said upper portion of said heat transfer zone of said second storage vessel during a first stage of a cooling cycle;

(i) eight conduit means for introducing heat transfer fluid from said cooling means into said user equipment during said second stage of said cooling cycle;

(j) ninth conduit means for passing heat transfer fluid from said first heat transfer zone of said storage vessel to said cooling vessel; and

(k) tenth conduit means for passing heat transfer fluid withdrawn from said user equipment to said cooling means.

4,072,185

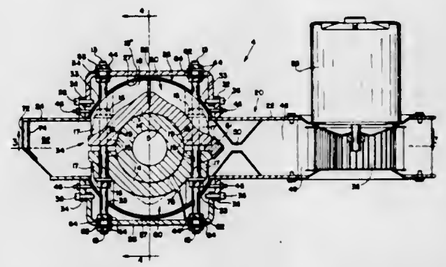
AIR COOLING APPARATUS FOR VERTICAL EXTRUDERS

Alden W. Nelson, West Mystic, Conn., assignor to Crompton & Knowles Corporation, New York, N.Y.

Filed Oct. 17, 1975, Ser. No. 623,514

Int. Cl.² F25B *29/00*

U.S. Cl. 165—30 **7 Claims**



1. In extrusion apparatus having an extruder barrel, the central longitudinal axis of which is vertical and an annular heat-exchange jacket surrounding the outside of said barrel and comprising heat-exchange fins on its outer periphery lying in spaced parallel planes substantially normal to said axis, wherein the uppermost and lowermost of said fins extend further from said axis than the remaining fins, air cooling means for said jacket comprising:

(a) a hood supported on and surrounding said jacket and comprising:

(1) an inlet portion at one side of said jacket which contains a plenum chamber and an inlet opening between said jacket and said plenum chamber and which extends along the length of said jacket, the horizontal dimension of said inlet opening being substantially less than that of said plenum chamber;

(2) an outlet portion at the opposite side of said jacket which contains an outlet chamber and an outlet opening

between said jacket and said outlet chamber and extending along the length of said jacket; and

(3) a central portion connecting said inlet and outlet portions and being in abutting contact with the outermost of said heat-exchange fins to provide a continuous passage between said inlet and outlet openings; and

(b) means for forcing air into said plenum chamber to create a super-atmospheric pressure therein sufficient for providing a uniform flow of air past said heat exchange fins from one end of the heat-exchange jacket to the other.

4,072,186

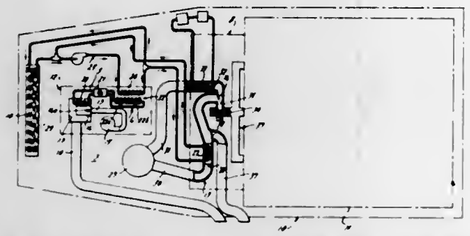
DUAL FUNCTION HEATER CORE

David W. Barton, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 5, 1976, Ser. No. 674,011

Int. Cl.[2] F01B *29/10*; F02G *1/04*; B60H *3/00*; B61D *27/00*

U.S. Cl. 165—43 **3 Claims**



1. In an automotive vehicle having a passenger compartment and a Stirling engine outside said compartment, said engine having a closed working fluid circuit, an integrated heat transfer system for both said Stirling engine and compartment, comprising:

(a) an air flow system having a passage in which air is conditioned and conducted to said compartment,

(b) heat rejecting means for said Stirling engine effective to cool a selective zone of said closed working fluid circuit, one portion of said means being disposed to continuously impart rejected heat to the air flowing in said passage, and another portion being disposed to impart rejected heat to ambient air conditions, and

(c) control means effective to either communicate the air flow in said passage conditioned by said one portion with said compartment or dump the air in said passage conditioned by said one portion to ambient conditions.

4,072,187

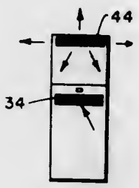
COMPACT HEATING AND COOLING SYSTEM

Robert H. Lodge, Los Angeles, Calif., assignor to Advance Machine Corporation, Los Angeles, Calif.

Filed May 10, 1976, Ser. No. 684,999

Int. Cl.[2] F24D *13/04*; F24F *1/02, 11/02*; F24H *9/08*

U.S. Cl. 165—48 **5 Claims**



1. A compact indoor environmental control system comprising:

an elongate thin cabinet,

a removable modular air heating and circulating means slideably supported in said cabinet,

a removable modular air cooling and circulating means slideably supported in said cabinet,

an electric control module removably mounted in said cabinet adjacent to said heating and cooling modules, including plug means for quick connecting and disconnecting of said cooling and heating modules,

said heating and cooling modules being slideably supported to provide air intake and exhaust plenums in the top, bottom, and center of said cabinet whereby said system may be installed to provide air outlet vents in any side or end of said cabinet.

4,072,188

FLUID COOLING SYSTEMS FOR ELECTRONIC SYSTEMS

Edward A. Wilson, and James D. Fredenberg, both of Phoenix, Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed July 2, 1975, Ser. No. 592,578

Int. Cl.[2] H01L *23/34*

U.S. Cl. 165—80 **12 Claims**



1. A cooling system for an electronic system comprising:

a panel,

a connector mounted on said panel,

a micropackage adapted to be removably mounted on said connector,

a heat exchanger having a flexible wall made of heat conductive material and provided with inlet and outlet means for a liquid coolant to permit said coolant to flow through said heat exchanger and in contact with said flexible wall,

mounting means for removably mounting the micropackage and heat exchanger to said connector with the flexible wall of the heat exchanger in close proximity to said micropackage, and

means for supplying liquid coolant under pressure to the inlet means of the heat exchanger and for removing the coolant from the outlet means, the pressure of the liquid coolant in the heat exchanger being in the range of from 1 to 10 pounds per square inch, which causes the flexible wall of the heat exchanger to establish and maintain a heat transfer relationship between said micropackage and the liquid coolant in the heat exchanger.

4,072,189

IMMERSION-TUBE HEAT EXCHANGER

Jean Edmond Chaix, Manosque; Maurice Fajeau, Pertuis; Edmond Le Borgne, Aix en Provence, and Aime Zerouki, Manosque, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

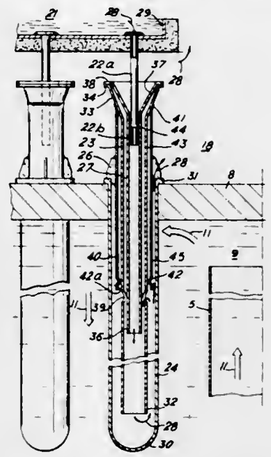
Filed Apr. 9, 1976, Ser. No. 675,251

Claims priority, application France, Apr. 18, 1975, 75 12213

Int. Cl.[2] F28D *7/12*

U.S. Cl. 165—142 **7 Claims**

1. A heat exchanger of the immersion-tube type comprising an outer vessel fitted with a duct for the supply of a primary fluid, a duct for the discharge of said primary fluid after circulation within the vessel, a partition plate for dividing the interior of the vessel into two regions consisting of a lower region at the pressure of the primary fluid and an upper region at the pressure of a secondary fluid to be vaporized by heat transfer with the primary fluid, said partition plate being pierced by holes for the insertion of vertical immersion tubes carried by the plate and reserved for the circulation of the secondary fluid, said immersion tubes being each provided with a pressure tube which is open at the upper end of providing a communication with the region in which the vaporized secondary fluid is collected and closed at the lower end which penetrates into the primary fluid region, in which each immersion tube is provided with an axial duct for supplying secondary fluid in liquid phase within the interior of the pressure tube, wherein said heat exchanger comprises an intermediate tube which is coaxial with the admission duct and a screen mounted within the annular space delimited between the intermediate tube and



the pressure tube, said screen being constituted by a sleeve which is coaxial with the two tubes, the upper end of said sleeve being rigidly fixed to the intermediate tube and the lower end of said sleeve being open so as to delimit up to the full height of the sleeve with the intermediate tube an annular zone filled with stagnant vapor which forms a thermal insulation, said coaxial sleeve which forms a screen having in the vicinity of its lower end a projecting annular flange centering said sleeve by bearing on the external surface of the intermediate tube.

4,072,190

MOTION COMPENSATOR

George M. Raulins, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed July 30, 1976, Ser. No. 709,959

Int. Cl.[2] E21B *7/12*

U.S. Cl. 166—.5 **27 Claims**

1. A motion compensator comprising:

telescoping mandrel means including interconnected concentric outer tubular housing means and inner sleeve means;

tubular mandrel means disposed between said housing means and said sleeve means;

a pressure balancing seal system including:

first seal means between said tubular mandrel means and said sleeve means, and

second seal means between said tubular mandrel means and said housing means;

said first and second seal means in conjunction with said telescoping mandrel means and said tubular mandrel means defining a chamber;

an environmental seal system spaced from said pressure balancing seal system including seal means between said tubular mandrel means and said housing means;

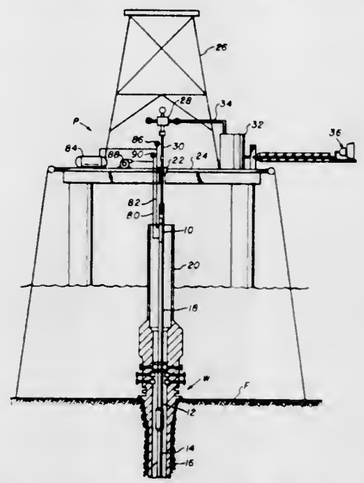
said second seal means and said environmental seal system in conjunction with said housing means and said tubular mandrel means defining an annular cavity;

first port means through said housing means permitting lubricant to be injected to said environmental seal system;

second port means through said housing means to said chamber permitting lubricant to be injected to said pressure balancing seal system; and

communicating means between said annular cavity and the bore of said sleeve means.

26. The method of operating a motion compensator, said motion compensator including tubular mandrel means, tubular housing means telescoped around said tubular mandrel means, a seal system including seal means between said tubular housing means and said tubular mandrel means, and port means



through said housing means opening near said seal means; the method comprising the steps of:

positioning the motion compensator within a well pipe string extending between a stationary underwater wellhead and a floating platform so that the motion compensator can accommodate oscillating movement of the floating platform with respect to the stationary underwater wellhead; and

injecting lubricant through said port means during the operation of said motion compensator.

4,072,191

FIRE FLOOR PROCESS

Richard L. Clampitt, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 586,465, June 12, 1975, abandoned. This application Sept. 21, 1976, Ser. No. 725,305

Int. Cl.[2] E21B *43/24, 33/138*

U.S. Cl. 166—261 **9 Claims**

8. A process for the recovery of valuable products from a carbonaceous deposit having a formation permeability value of 2–20 Darcys in which forward combustion can be effected without further treatment and wherein said deposit is penetrated at spaced points by an injection well and a production well which comprises:

a. bringing said deposit at the face of said injection well at ignition temperatures followed by the injection of air to establish a combustion front at the face of said injection well,

b. propagating the resulting combustion front through said deposit by injecting through said injection well a mixture of air, water, and a surfactant at a ratio of from about 300 to about 15,000 scf air/bbl of water and from about 4 to about 10 weight percent surfactant based on the weight of water injected so that the water upon contacting the hot formation vaporizes creating a condensible foam having steam as its gaseous phase, the amount of foam produced being sufficient to generate a resistance factor of at least 5, thereby improving the volumetric sweep efficiency by retarding the mobility of the steam thus generated and

forcing products of said deposit toward said production well, and

c. recovering fluids resulting from the combustion process through said production well.

4,072,192

SULFOMETHYLATED LIGNITE SALT AS A SACRIFICAL AGENT IN OIL RECOVERY PROCESSES

Mohan V. Kudchadker, Houston, and Walter J. Weiss, Sugarland, both of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Feb. 4, 1976, Ser. No. 655,188
Int. Cl.² E21B *43/22*
U.S. Cl. 166—273 18 Claims

1. A method for recovering oil from a subterranean formation containing oil and having an injection well and a production well wherein flooding water is injected into the subterranean formation comprising:

(a) injecting through an injection well into the formation an aqueous solution of sulfomethylated lignite salt in an amount sufficient to adsorb on and occupy the active sites of the formation matrix and thereby diminish surfactant adsorption on said formation matrix,

(b) subsequently injecting into the formation via the injection well an aqueous anionic surfactant solution effective for enhancing oil displacement efficiency of the flooding water,

(c) subsequently injecting into the formation via the injection well flooding water; and

(d) producing oil from the formation via the production well.

7. In a method for recovering oil from a subterranean formation containing oil and having an injection well and a production well wherein an aqueous ahionic surfactant solution is injected into the injection well in order to drive the oil to the production well wherein it is produced the improvement which comprises:

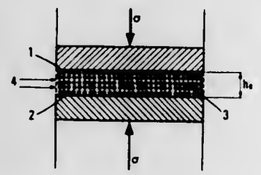
injecting into the injection well in admixture with the surfactant sulfomethylated lignite salt in an amount sufficient to adsorb on and occupy the active sites of the formation matrix and thereby diminish surfactant adsorption on said formation matrix.

4,072,193

PROPPING AGENT AND METHOD OF PROPPING OPEN FRACTURES IN THE WALLS OF A BORED WELL

Jean-Paul Sarda, and Pierre Le Tirant, both of Rueil-Malmaison, France, assignors to Institut Francais du Petrole and Societe Europeene de Produits Refractaires, France

Filed Mar. 19, 1976, Ser. No. 668,480
Claims priority, application France, Mar. 19, 1975, 75 08827
Int. Cl.² E21B *43/26*
U.S. Cl. 166—280 15 Claims



1. A propping agent for fractures produced in the walls of a bored well, comprising a manufactured product in granular form containing crystallized zirconium oxide embedded in an amorphous mineral binding material, the product containing, on an oxide basis, up to 85% by weight zirconium oxide ZrO_2, silica SiO_2 in a quantity such that the weight ratio (ZrO_2/SiO_2) is at least equal to 1.5, a quantity of alumina Al_2O_3 such that the weight ratio (Al_2O_3/SiO_2) is from 0 to 1.5, and a quantity of sodium oxide Na_2O such that the weight ratio (Na_2O/SiO_2) is from 0 to 0.04.

4,072,194

PUMPABLE EPOXY RESIN COMPOSITION

Robert Clay Cole, Marlow; Ronney R. Koch, and Joseph Ramos, both of Duncan, all of Okla., assignors to Halliburton Company, Duncan, Okla.

Filed June 18, 1973, Ser. No. 371,100
Int. Cl.² E21B *33/14*
U.S. Cl. 166—295 13 Claims

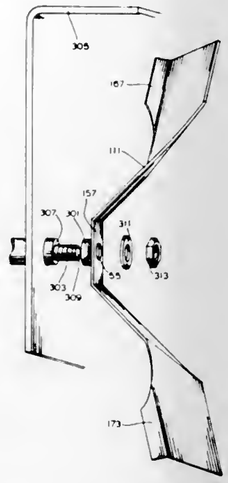
1. A method of completing a well bore penetrating a subterranean formation, comprising the steps of placing in the space between a conduit traversing the well bore penetrating the subterranean formation and the subterranean formation an epoxy composition containing about 20–40 parts by volume of an aromatic diluent composition, wherein said aromatic diluent is selected to prevent premature setting by absorbing heat and to provide a cured epoxy resin composition occupying substantially the same volume as said pumpable epoxy resin; maintaining said epoxy resin composition in said space until said epoxy resin composition cures to a high strength, impermeable matrix with a weight loss of less than about 20 parts per 100 parts by weight of said pumpable epoxy resin composition; said pumpable epoxy resin composition comprising an epoxy resin, a curing agent and said selected aromatic diluent; wherein said selected aromatic diluent is at least one or a mixture containing an aromatic hydrocarbon of the general formula $C_6(R_1)_6$ wherein R_1 is hydrogen, a straight or branched chain alkyl radical, a cycloparaffin radical or a mixture thereof; wherein each alkyl and cycloparaffin radical has about 1-10 carbon atoms; and further wherein at least one R_1 group is said radical.

4,072,195

HOE ATTACHMENT FOR EDGERS

Elmer Carl Carlson, Pearland, Tex., assignor to T & H Mfg. Co., Inc., Pearland, Tex.

Filed July 28, 1976, Ser. No. 709,403
Int. Cl.² A01B *45/00*
U.S. Cl. 172—15 7 Claims



1. A hoe attachment to be rotated by the blade shaft of an edger, such blade shaft extending away from the main body of such edger, comprising:

a unitary elongate blade including

(a) a hub portion at the center of said blade, said hub portion having means for accomodating the shaft such that said blade is positioned to one side of the main body of such edger and such that as the blade shaft rotates about a horizontal axis, said hub portion rotates within a substantially vertical plane,

(b) a hoe portion at either end of said blade, each said hoe portion including a leading edge rotationally in advance of the remainder of the corresponding end of said blade, an end edge at the extreme end of the corresponding end of said blade and forming an acute angle with said leading edge, a hoe face bounded in part by said leading edge and said end edge, and a substantially flat tab portion adjoining said hoe face rotationally at the rear of said hoe face, said hoe face facing to some extent into the direction of rotation such that when said blade is attached to an edger, the junction of said hoe face and said tab portion rotates within a path closer to the main body of such edger than does said leading edge and said tab portion rotates within a path closer to the main body of such edger than does the junction of said hoe face and said tab portion, and

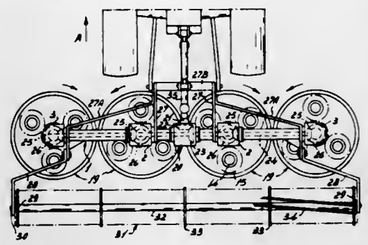
(c) an arm portion intermediate each said hoe portion and said hub portion, each said arm portion forming an angle with said hub portion to the extent that as the blade shaft rotates about a horizontal axis, all parts of both of said hoe portions are to one side of the plane within which said hub portion rotates.

4,072,196

CULTIVATORS

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed May 8, 1975, Ser. No. 575,831
Claims priority, application Netherlands, May 10, 1974, 7406292
Int. Cl.² A01B *33/06*
U.S. Cl. 172—49 11 Claims



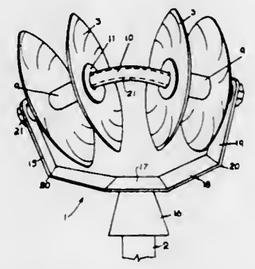
10. A soil cultivator comprising a frame movable over the ground and soil working means supported on said frame, said soil working means including a plurality of rotors mounted on respective, substantially central shafts, said rotors being positioned side-by-side transverse to the direction of normal travel of said cultivator to work adjoining strips of land and the shafts of adjacent rotors being driven in relative opposite directions, each rotor having a common support that is freely rotatable about a first upwardly extending axis defined by the corresponding central shaft on that rotor, driving means comprising a pinion transmission, being connected to said central shaft, a plurality of soil working members being mounted on said common support and positioned around said central shaft, said members being rotatable about corresponding upwardly extending axes defined by further shafts journalled on said common support, said driving means comprising sun and planet gears that drivenly interconnect said further shafts to said central shaft and the latter extending substantially parallel to said further shafts, said soil working members each comprising a substantially horizontal elongated tine support and at least one tine extending downwardly from said support.

4,072,197

DISC CULTIVATOR WITH CURVED SPACER STRUCTURE

Percy Boyd-Dunlop, Seafield, R.D. 1, Howick, Auckland, New Zealand

Filed June 4, 1976, Ser. No. 693,079
Claims priority, application New Zealand, June 13, 1975, 177822
Int. Cl.² A01B *1/10*
U.S. Cl. 172—349 6 Claims



1. A cultivator comprising:

an arched bracket;

a handle connected to the arched bracket at the mid-point thereof and extending away therefrom;

shaft means extending between the two arms of the bracket, said shaft means comprising two shaft portions joined together at an angle at the mid-point of the shaft means;

two groups of discs, each group having a plurality of discs therein, the two groups of discs being mounted to rotate about the two shaft portions respectively, each said plurality of discs being mounted rigidly upon a spacer sleeve which maintains the discs of that group in spaced relation, the two spacer sleeves of the two groups being mounted on the two shaft portions respectively, an additional spacer sleeve being provided on the shaft means between each group of discs and the adjacent arm of the arched bracket; and

a curved spacer provided on the shaft means between the two groups of discs, the curved portion of said spacer being positioned over the angle at the mid-point of the shaft means, said spacer being curved to substantially the same degree and in the same direction as the shaft means is angled, said curved spacer acting to maintain spacing between said groups of discs, said arched bracket constituting the sole connection between the shaft means and the handle.

4,072,198

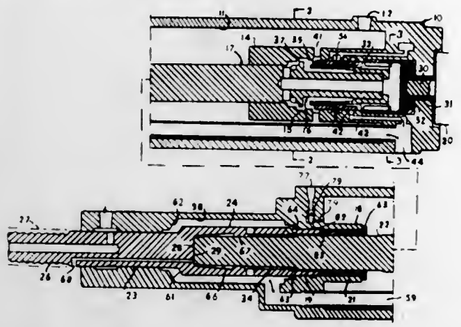
HYDRAULIC ROCK DRILL

Lester A. Amtsberg, Utica, N.Y., assignor to Chicago Pneumatic Tool Company, New York, N.Y.

Filed Apr. 30, 1976, Ser. No. 682,093
Int. Cl.² B23Q *5/00*
U.S. Cl. 173—10 18 Claims

1. A reciprocating hydraulic impact tool including an hydraulically reciprocable piston, a cylinder for the piston, and a sleeve type cycle valve means within the cylinder and periodically engaged by the piston for effecting alternate supply to and discharge of piston operating fluid from the cylinder, wherein hydraulic coupling means is provided to translate reciprocating motion of the piston to the valve to control

acceleration of the valve in either direction in such manner that valve velocity is greater than piston velocity on a return stroke



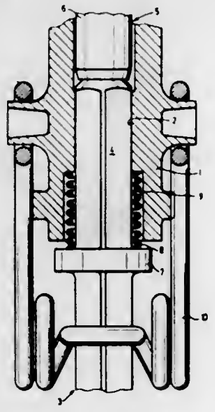
of the piston and is less than piston velocity on a power stroke of the piston.

4,072,199

MOTOR-DRIVEN PORTABLE HAMMER

Karl Wanner, Echterdingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 7, 1973, Ser. No. 330,257
Claims priority, application Germany, Feb. 21, 1972, 2207961
Int. Cl.² B25D *17/04, 17/08*
U.S. Cl. 173—131 **7 Claims**



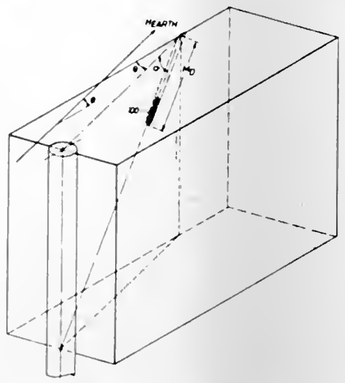
1. In a motor-driven portable impactor, a combination comprising a hammer including a housing; an elongated tool slidably journalled in said housing for lengthwise movement inwardly and outwardly of the same; biasing means biasing said tool outwardly of said housing and being dimensioned to yield when the weight of said hammer bears upon said tool longitudinally thereof; at least one slidable intermediate member interposed between said biasing means and said tool, and having one end portion bearing upon said tool, and an other remote end portion, said biasing means comprising a first spring bearing upon said other end portion; a stronger second spring also bearing upon said other end portion; and abutment means bearing upon said springs remote from said other end portion and being adjustable in direction towards and away from the same.

4,072,200

SURVEYING OF SUBTERRANEAN MAGNETIC BODIES FROM AN ADJACENT OFF-VERTICAL BOREHOLE

Fred J. Morris, Rte. 7, Box 718-E, Austin, Tex. 78703; Robert L. Waters, 11901 Springhill Drive, Austin, Tex. 78753, and George F. Roberts, McMara Road, Austin, Tex. 78758

Filed May 12, 1976, Ser. No. 685,936
Int. Cl.² E21B *47/02*
U.S. Cl. 175—45 **50 Claims**



1. A method of directional subsurface drilling of a first borehole to intersect a second well containing a ferromagnetic target, comprising the steps of:

measuring the components of the earth's magnetic field along orthogonal axes at a first location in the first borehole sufficiently remote from the target to be unaffected by any magnetic field of the target;

measuring components of the total magnetic field along orthogonal axes at a second location in the first borehole sufficiently proximate the target to detect the magnetic field of the target superimposed upon the earth's field;

determining the direction of the superimposed magnetic field of the target from the second location using the measurements of the components of the earth's magnetic field;

measuring the component of the total field in the direction of the axis of the first borehole at a plurality of locations in the first borehole to determine the gradient of the target field in the direction of the axis of the first borehole;

determining the range of the target from one of said plurality of locations using the measurements of the component of the total field in the direction of the axis of the first borehole; and

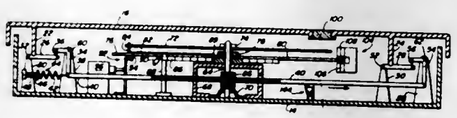
orienting the direction of drilling of the first borehole in the direction of the target magnetic field from a position in the first borehole from which the second well may be conveniently intercepted based upon the target range and direction determinations.

4,072,201

DIGITAL WEIGHING MACHINE

Mordechai Wiesler, 6 Carmel Circle, Lexington, Mass. 02173

Filed May 6, 1976, Ser. No. 683,902
Int. Cl.² G01G *3/00*
U.S. Cl. 177—210 R **13 Claims**



1. A weighing machine comprising:

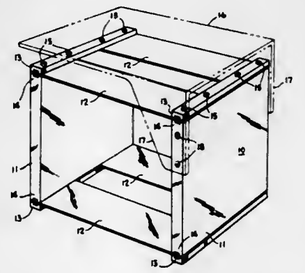
a. base means;
b. platform means constrained for movement on said base means in response to the weight of an object set thereon;
c. first mechanical means constrained for movement on said base means in response to said movement of said platform means;
d. second mechanical means constrained for movement on said base means in response to said movement of said platform means;
e. said movement of said first mechanical means stopping, after the occurrence of any oscillations, at a rest position and providing a first event that is functionally related to said weight;
f. delay means responsive to said movement of said platform means for producing a second event substantially after the termination of any of said oscillations;
g. said movement of said second mechanical means being initiated by said second event and being related to said movement of said first mechanical means;
h. electronic means for presenting indicia representing said movement of said second mechanical means;
i. said electronic means being controlled by a relationship between said first and second members.

4,072,202

ELASTIC-TYPE CLAMP FOR A TWIN LEAF SPRING SCALE

Anthony Storace, Tarrytown, N.Y., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Jan. 3, 1977, Ser. No. 756,485
Int. Cl.² G01G *3/08*
U.S. Cl. 177—229 **4 Claims**



1. An elastic-type clamp for sandwiching a leaf spring to a load support structure of a weighing scale, said clamp comprising two adjacently disposed channel members each having a "U"-shaped cross section with both legs of each "U"-shaped channel member disposed upon said leaf spring, each channel member being on opposite sides of said leaf spring, said channel members being fastened together with said leaf spring disposed therebetween, one leg of each "U"-shaped channel member being relatively much thinner than the other leg of said "U"-shaped channel member, whereby as the leaf spring is caused to deflect, the thinner leg of each "U"-shaped channel member will be caused to elastically deform, thus providing a controlled and predictable deflection characteristic for said leaf spring.

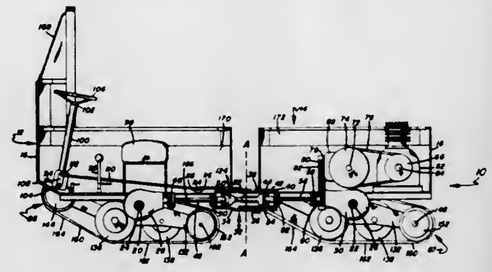
4,072,203

SMALL, PERSONAL, ALL TERRAIN VEHICLE

Neil W. Pierson, P.O. Box 98, Roseau, Minn. 56751

Filed May 14, 1976, Ser. No. 686,592
Int. Cl.² B62D *55/00*
U.S. Cl. 180—9.44 **13 Claims**

1. A small, personal, all terrain vehicle of the articulated, multi-unit type primarily for transporting a single person, comprising, in combination: a first unit including a first axle having a first end and a second end, and a second unit including a second axle having a first end and a second end; a first track member pivotally mounted to the first end of the first axle; a second track member pivotably mounted to the second end of the first axle; a third track member pivotably mounted to the first end of the second axle; a fourth track member pivotably mounted to the second end of the second axle; first means for connecting the second unit to the first unit, for allowing the second unit to rotate about a longitudinal axis parallel to the intended movement direction with respect to the first unit, and for allowing the second unit to pivot about an axis perpendicular to the longitudinal axis with respect to the first unit; means for receiving and allowing the seating of a driver within the first unit; means, located in the first unit, for steering the all terrain vehicle by pivoting the second unit with respect to the first unit about the axis perpendicular to the longitudinal axis of



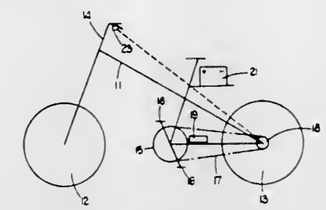
the first means; a motor located in the second unit; power train means for providing movement of the first, second, third, and fourth track members from the power received from the motor, wherein the all terrain vehicle provides advantageous weight distribution in that the weight of the driver of the all terrain vehicle is located in the first unit to provide substantial traction to the first and second track members and the weight of the motor of the all terrain vehicle is located in the second unit to provide substantial traction to the third and fourth track members, and wherein the first means and the pivotable interconnection of the first, second, third, and fourth track members to the first and second axles assure that all four track members engage the travel surface, even if the travel surface is a very rough terrain.

4,072,204

CYCLE GEAR SELECTOR

Peter Watson Leighton, Burnly, and Charles Patrick Duncan Davidson, Droitwich, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Jan. 21, 1976, Ser. No. 650,872
Claims priority, application United Kingdom, Jan. 21, 1975, 2630/75
Int. Cl.² B62M *7/00, 25/04*
U.S. Cl. 180—34 **4 Claims**



1. In combination with a gear selector for a cycle assisted by an electric motor and a gear mechanism wherein rotation of the input member of said gear mechanism is caused to cease during a change of gears caused by manual operation of the gear selector, the gear selector including a body member secured to the frame of the cycle, a manually operable lever

pivotally mounted to the body member and mechanically connected to the gear mechanism whereby movement of the lever relative to the body member causes a change in gear ratio between input and output members of said gear mechanism, a cam movable with the lever relative to the body member, a cam follower engaging the cam and being movable with movement of the lever to first positions whereby gears in the gear mechanism are caused to be engaged in varying gear ratios, the cam follower further being movable with movement of the lever to second positions whereby the gears in the gear mechanism are disengaged from effective mechanical contact with ground-engaging rotary portions of the cycle, an electrical energization circuit including the motor and a source of electrical energy, the improvement comprising:

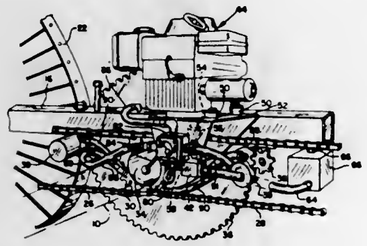
switch means carried by the body member for controlling the flow of electrical current within the energization circuit, the switch means including electrical contact members normally positioned to permit the flow of electrical energy through the energization circuit, at least one of the electrical contact members being displaced by the movement of the cam follower when said cam follower moves into one of said second positions to cause interruption of the flow of electrical energy through the energization circuit, said displaced electrical contact member returning to normal position when the cam follower returns to one of said first positions, movement of the lever effecting a gear ratio change in the gear mechanism and at the same time sequentially interrupting and then re-establishing the flow of electrical energy to the energization circuit.

4,072,205

IRRIGATION SYSTEM

Paul E. Batson, Springfield, Oreg., assignor to Crown American Irrigation, Inc., Eugene, Oreg.

Filed Oct. 18, 1976, Ser. No. 733,179
Int. Cl.² B60K *17/10*
U.S. Cl. 180—66 R **6 Claims**



1. In an irrigation line move,

a cart frame including a tubular beam closed at its ends and forming a hydraulic reservoir,

wheel means supporting the frame,

a tubular bracket secured to one side of the frame,

a vertical shaft engine mounted on the top of the tubular bracket having a drive shaft extending downwardly into the bracket,

a hydraulic pump mounted on the bottom of the tubular bracket and having an input shaft extending upwardly into the bracket and aligned with the drive shaft,

flexible coupling means coupling the shafts,

hydraulic motor means,

torque tube means,

gear means coupling the motor means and the torque tube means,

manually operable valve means for connecting the pump to the motor means,

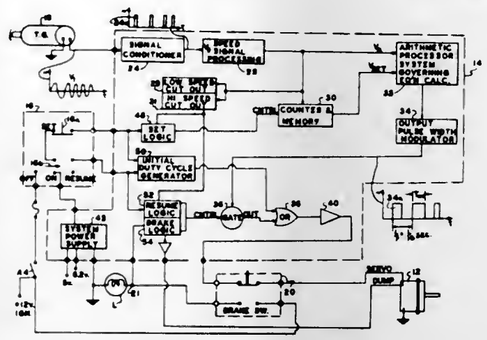
and hose means connecting the beam to the valve means.

4,072,206

DEVICE FOR REGULATING VEHICLE ROAD SPEED

Gerald L. Larson, Battle Creek, Mich.; Alberto Pi, New Orleans, La., and Martin W. Uitvlugt, Battle Creek, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 469,568, May 13, 1974, abandoned. This application Mar. 29, 1976, Ser. No. 671,539
Int. Cl.² B60K *31/00*
U.S. Cl. 180—105 E **10 Claims**



1. A device for maintaining a selected speed in a throttle controlled motor vehicle, said device comprising:

means for sensing the substantially instantaneous value of the actual vehicle speeds;

means for registering a selected value of said sensed vehicle speed to represent said selected speed;

means for producing a control signal, one characteristic of which is varied in accordance with the value of $K_1 + K_2V_{SET} + K_3V_G$ where K_1, K_2 and K_3 are predetermined, non-zero constants with K_2 different from K_3, where V_{SET} is said selected value, and V_G is said substantially instantaneous value; and

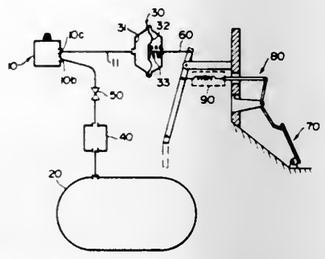
servoactuator means responsive to said varying characteristic to move said throttle for maintaining said selected speed.

4,072,207

AUTOMOTIVE SPEED CONTROL DEVICE

Toshihiro Kokubo, Higashi Matsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 637,667, Dec. 4, 1975, abandoned. This application Dec. 27, 1976, Ser. No. 754,452
Claims priority, application Japan, Dec. 7, 1974, 49-148994; Dec. 7, 1974, 49-148995; Dec. 7, 1974, 49-148996
Int. Cl.² B60K *31/00*
U.S. Cl. 180—108 **9 Claims**



1. A speed control device for an automotive vehicle having an accelerator member selectively movable by a vehicle operator between an accelerating position and a decelerating position, comprising in combination:

speed responsive means having a fluid pressure converter responsive to a vehicle speed to produce an operating fluid pressure when the vehicle speed exceeds a predetermined level;

pressure responsive means operatively connected between the speed responsive means and the accelerator member and responsive to the operating fluid pressure to apply a force of the operating fluid pressure to the acceleration member to hold the same at the decelerating position providing a speed lower than the predetermined level;

relief means operatively connected to the accelerator member to relieve a force applied to the accelerator member by the vehicle operator against the force of the operation fluid pressure applied to the same;

release signal producing means cooperated with an alarm provided in the vehicle to produce a release signal when the alarm is actuated; and,

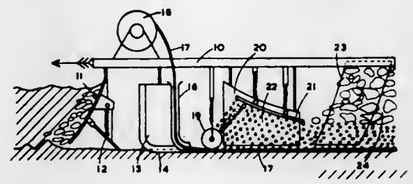
pressure release means provided between the speed responsive means and the pressure responsive means and responsive to the release signal to release the operating fluid pressure whereby the accelerator member is movable to the accelerating position.

4,072,208

METHOD AND APPARATUS FOR SEISMIC PROSPECTING

Rupert Richard Francis Gerard Heron Goodhart, Birmingham, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 208,765, Dec. 16, 1971, abandoned. This application Jan. 22, 1975, Ser. No. 543,221
Claims priority, application United Kingdom, Dec. 29, 1970, 61602/70
Int. Cl.² G01V *1/02, 1/10;* 102 *23*
U.S. Cl. 181—401 **15 Claims**



1. A method of seismic prospecting comprising clearing snow from a strip of hard surface layer which is covered with snow so as to expose said hard layer, laying a line of explosive cord along and in contact with a longitudinal portion of the cleared hard surface, moving snow from along side the cleared strip and covering the line of explosive cord with a layer of said snow, compressing the said snow layer to form a stemming layer around the cord, detonating the explosive and recording the resulting seismic waves after reflection or refraction from subterranean rock layer interfaces.

4,072,209

MECHANIC'S STAND

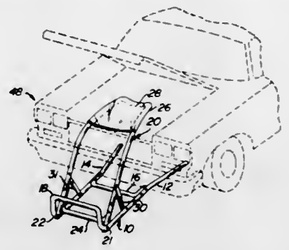
Gary W. Bolis, Box 81, Creamery, Pa. 19430

Filed Oct. 6, 1976, Ser. No. 730,093
Int. Cl.² E04G *1/24*
U.S. Cl. 182—116 **9 Claims**

1. A mechanic's stand, for supporting the body of one working over the engine compartment of motor vehicle or the like, comprising:

a base having substantially horizontal, but flexibly arched legs;

an extended, flexibly arched frame connected to said base and inclined to extend above the engine compartment when said stand is directionally positioned in close proximity to the motor vehicle; 'a step mounted on said stand adjacent to said connection between said base and said extended frame, said step extending upwardly from said base and spaced away from said extended frame; and,



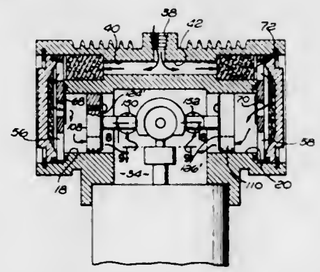
means mounted on said extended frame for supporting the torso of said worker in an inclined working position above the engine compartment.

4,072,210

COMPRESSOR

Chao C. Chien, 1371 Whitehall Place, Westlake Village, Calif. 91361

Filed Jan. 19, 1976, Ser. No. 650,478
Int. Cl.² F16N *1/00*
U.S. Cl. 184—5 **4 Claims**



1. In a Scotch-yoke type of mechanism, having a reciprocating yoke, a slider in said yoke and a bearing hole for a crankpin, the improvement wherein said slider is constructed of lubricant-impregnated porous solid, bearing material and is formed with a cross hole normal to and across said bearing hole, one end of said bearing hole terminating past said cross hole and through said slider, and wherein lubricant-containing wick material is disposed in said cross hole with a portion of said wick material disposed at said bearing hole end for additional lubrication of said slider and yoke thereat.

4,072,211

DRIVING DEVICE FOR A MOVING BODY

Tadayuki Kitajima, Yokohama, and Yoshikuni Tohyama, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed June 17, 1976, Ser. No. 697,127
Claims priority, application Japan, July 1, 1977, 50-81194
Int. Cl.² F03G *1/00*
U.S. Cl. 185—40 R **4 Claims**

1. A driving device for a moving body comprising:

a drive shaft normally rotated in one direction by a drive source;

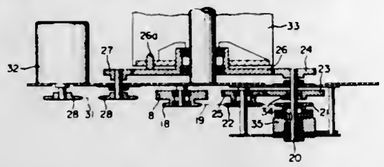
a follower shaft in engagement with said drive shaft to transmit a driving force to the moving body;

first connecting means loosely mounted on said drive shaft to connect and disconnect the driving force of said drive shaft to said follower shaft;

accumulator means for accumulating a backwardly moving

force for said moving body by utilizing the movement of the moving body resulting from the rotation of said follower shaft in a forward direction; and

one-way connecting means loosely mounted on said drive shaft to connect with said drive shaft only when a rotational speed of said follower shaft in the backward direction is greater than that of the drive shaft;



said follower shaft being driven into reverse rotation by said accumulator means upon disconnection of said first connecting means and the speed of the reverse rotation of said follower shaft being controlled by operation of said one-way connecting means so as not to exceed the driving speed of said drive shaft, thereby maintaining a constant rotational speed thereof.

4,072,212

ELEVATOR SPEED CONTROL SYSTEM

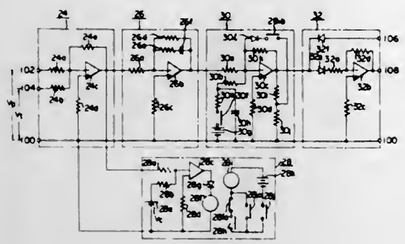
Narihiro Terazono; Hiroshi Kamaike, and Shigehiko Suzuki, all of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 17, 1976, Ser. No. 715,197

Claims priority, application Japan, Aug. 28, 1975, 50-104315; Aug. 28, 1975, 50-104316

Int. Cl.² B66B *1/30*

U.S. Cl. 187—29 R **5 Claims**



1. An elevator speed control system comprising, in combination, an elevator car and a counterweight connected to both ends of a traction rope respectively, a hoist sheave having said traction rope trained thereover, an induction motor for driving said hoist sheave to vertically move said elevator car and said counterweight in the opposite directions, and means for applying to said induction motor a voltage dependent upon a differential signal between a command speed signal for the motor and a speed signal representative of the actual speed of the motor, to accelerate the latter and applying a rated voltage across said motor after the completion of the acceleration of the motor, wherein there is provided a sensor circuit for sensing a negative polarity load on said induction motor to limit a voltage applied across said induction motor through the operation the sensor circuit.

4,072,213

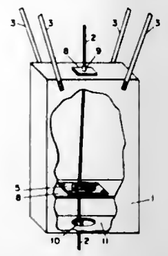
SUSPENDED CABLE APPARATUS

John Keanedy Salmon, Mendham, N.J., assignor to Otis Elevator Company, New York, N.Y.

Filed Aug. 9, 1976, Ser. No. 713,083

Int. Cl.² F16F *7/10*

U.S. Cl. 188—1 B **12 Claims**



1. A suspended cable apparatus for damping vibration of a cable suspended from a structure comprising:

mounting means attached to said structure and extending a given distance from said structure along the length of said cable; and

a mechanism mounted on said mounting means and including cable deflecting means engaging said cable, said cable deflecting means when located in a predetermined position deflecting said cable from the longitudinal path in which it would be suspended in the absence of said cable deflecting means, said cable deflecting means being movable in response to cable vibration and controlling the portion of said cable at its location of engagement with said cable deflecting means to move in response to predetermined cable vibration with more motion than said portion would move in the absence of said cable deflecting means.

4,072,214

DISC BRAKE WITH NON-DEFORMABLE YOKE

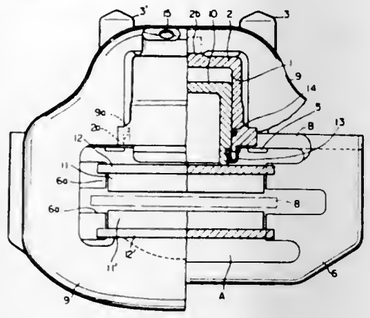
Tetsuo Haraikawa, Funabashi, and Yasuo Karasudani, Yokohama, both of Japan, assignors to Tokico Ltd., Japan

Filed Oct. 21, 1976, Ser. No. 734,513

Claims priority, application Japan, Oct. 23, 1975, 50-127763

Int. Cl.² F16D *55/18*

U.S. Cl. 188—72.4 **7 Claims**



1. A disc brake comprising a bracket for mounting on a non-rotatable part of a vehicle and straddling a rotatable disc, a pair of spaced opposed friction pads slidably mounted on said bracket for movement toward and away from opposite sides of said disc, a housing disposed on one side of the disc, pin means between said bracket and said housing for slidably supporting the housing for movement in a direction parallel to the axis of the disc, said housing having a cylinder therein, a piston in said cylinder engaging one of the friction pads for urging the one friction pad against one surface of the disc and a plate-like yoke straddling the disc and connecting the other friction pad disposed on the opposite side of the disc with the housing, the yoke engaging the housing with an interference fit at least along portions of the yoke extending between the other friction pad and the end of the housing remote from said friction pads.

4,072,215

SPOT TYPE DISC BRAKE FOR A PAIR OF INDEPENDENT YOKE BIASING SPRING ELEMENTS

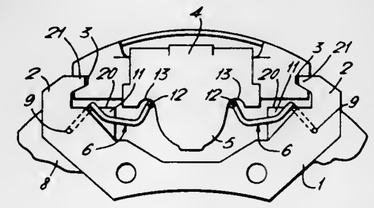
Jochen Burgdorf, Offenbach; Dieter Eikenberg, Frankfurt-Rodelheim; Roberto Stoka, Sulzbach, and Vlod Marianu, Frankfurt-Griesheim, all of Germany, assignors to ITT Industries, Incorporated, New York, N.Y.

Continuation of Ser. No. 655,921, Feb. 6, 1976, abandoned. This application Jan. 7, 1977, Ser. No. 757,525

Claims priority, application Germany, Aug. 29, 1977, 2505879

Int. Cl.² F16D *55/18*

U.S. Cl. 188—72.4 **2 Claims**



1. A spot type disc brake for automotive vehicles including a non-rotating brake carrier to receive brake torque, said brake carrier being fixed in relation to a brake disc, a yoke member positioned to protrude over and embrace said brake disc and slidably guided by said brake carrier in the direction of the brake disc axis including an actuating device arranged on one side of said brake disc, a pair of biasing resilient spring elements, each of said biasing spring elements having a fastening end rotatably carried in a retaining aperture formed in said brake carrier on said one side of said disc, each of said biasing spring elements being positioned wholly on said one side of said disc, said fastening end of each of said spring elements having an insertion portion for positioning in said retaining aperature which extends substantially parallel to the axis of said disc which is of sufficient length to engage said retaining aperture and extends towards said disc, then is bent so as to extend towards said axis, then is bent so as to extend away from said disc forming a U-shaped middle section adapted to embrace a portion of said brake carrier and has a free end portion projecting away from said brake disc arranged to resiliently contact and bias said actuating device for holding said yoke in relation to said carrier without clearance.

4,072,216

DISC BRAKE GUIDING AND SUPPORT STRUCTURE

Tetsuo Haraikawa, Funabashi, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed Aug. 10, 1976, Ser. No. 713,037

Claims priority, application Japan, Aug. 14, 1975, 50-98822; Aug. 14, 1975, 50-98824; Aug. 14, 1975, 50-98825; Aug. 14, 1975, 50-112188[U]; Aug. 14, 1975, 50-112189[U]

Int. Cl.² F16D *55/224*

U.S. Cl. 188—73.3 **9 Claims**

1. In a floating caliper type disc brake including

a pair of brake pads for respectively engaging corresponding zones on opposite sides of a disc to be braked, said pads being subject to wear and typically requiring replacement during the normal life of the remainder of the brake;

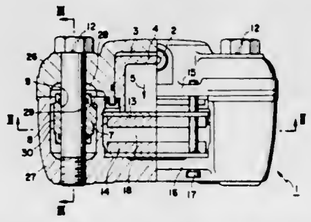
a fixed, bifurcated support disposed adjacent one side of said disc and having a pair of spaced arms extending outwardly beyond the circumference of said disc and providing clearance to one of said zones for one of said pads, said arms being respectively provided with guide holes having parallel axes disposed outwardly of the circumference of said disc;

a housing having a pair of spaced caliper portions and intermediate structure extending between said caliper portions presenting a chamber within said housing for receiving said pads;

means for shiftably mounting said housing on said support with said caliper portions on opposite sides of said disc and said support, said housing mounting means including a pair of spaced, parallel slide bolts each extending in sliding relationship through a correponding of said holes and in tension between said caliper portions;

means for mounting each of said pads upon a corresponding caliper portion within said chamber and in facing relationship to each other and a corresponding of said zones; and

means for shifting said one pad relative to the caliper portion upon which it is mounted and into forceful engagement with said one zone of said disc and for thereby shifting



said housing relative to said support and shifting the other of said pads into opposing forceful engagement with the other of said zones of said disc;

the improvement of which brake comprises:

said intermediate structure of said housing includes a pair of wall portions extending between said caliper portions adjacent each of said bolts respectively, one of said wall portions of each pair thereof being displaced from its bolt in a direction generally away from the other bolt, the other of said wall portions of each pair thereof being displaced from its bolt in a direction generally toward the other bolt, whereby said wall portions prevent distortion of said housing and shifting of the axes of said bolts under the influence of normal tension in said bolts; and

said other wall portions are spaced from each other a distance sufficiently greater than the corresponding dimension of said pads to permit the latter to pass therebetween, whereby an opening is provided from the outer part of said housing to said chamber therewithin for convenient movement of said pads into and out of said chamber during replacement of said pads without disassembly of said housing.

4,072,217

DISCS BRAKE OF FLOATING CALIPER TYPE

Takehisa Inoue, Iwatsuki; Yutaka Ogawa, Tokyo; Hiroaki Sugita, Gyoda, and Namio Watanabe, Kuki, all of Japan, assignors to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Filed Nov. 1, 1976, Ser. No. 737,346

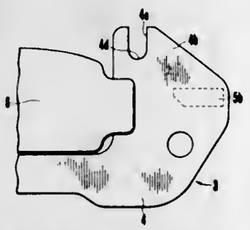
Claims priority, application Japan, Oct. 31, 1975, 50-148669[U]; Oct. 31, 1975, 50-148670[U]

Int. Cl.² F16D *65/02*

U.S. Cl. 188—73.6 **8 Claims**

1. A disc brake of the floating caliper type for a vehicle wheel, comprising a rotor arranged to rotate together with the wheel, a pair of friction pads each positioned on an opposite side of said rotor, a support structure having a hole therein and supporting said pair of friction pads, said support structure having a slotted portion opening from and extending laterally from the hole formed therein, said support structure arranged

to be fixably connected to a vehicle body, a caliper having acting and reacting portions arranged on opposite sides of said rotor for bringing said pair of friction pads into engagement with said disc, said caliper including first and second laterally spaced receptor holes formed therein, a first guide pin secured to said support structure and slidably received in said first receptor hole of said caliper, a single second guide pin, a nut threaded on said second guide pin and rigidly securing one end of said pin within said laterally slotted hole in said support structure and the other end of said pin engaged in the second receptor hole formed in said caliper, said first and second guide



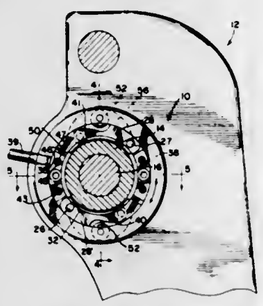
pins slidably guiding said caliper in the axial direction of said rotor, a sealing means secured between said second guide pin and said second receptor hole for sealingly enclosing said other end of said second guide pin, said caliper along with said second guide pin and said sealing means being pivotally rotated about said first guide pin with said second guide pin moving through said slotted portion outwardly from the hole in said support structure toward the lateral periphery of said support structure to expose said pair of friction pads for removal and replacement when the securement of said second guide pin to said support structure is released by loosening said nut.

4,072,218

SPINDLE BRAKE MECHANISM FOR MILLING MACHINES

Thomas F. Specht, Arlington Heights; Juergen W. Trodler, Chicago, and Pavel Vanecek, Lyons, all of Ill., assignors to Union Special Corporation, Chicago, Ill.

Filed Dec. 8, 1976, Ser. No. 748,424
Int. Cl.² F16D *49/00*
U.S. Cl. 188—75 **4 Claims**



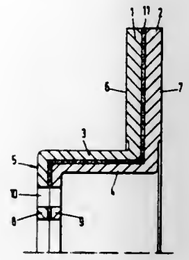
1. A brake mechanism for a milling machine having a rotating spindle means, a tool carried on said spindle means, and means for cooling said tool, said brake mechanism comprising:
- a shiftable ring means;
- a base plate means secured to said machine on one side of said shiftable ring means;
- a top plate means including means for securing said top plate means to said base plate means on the other side of said shiftable ring means whereby forming a chamber means;
- sealing means carried by said top plate means for association with said rotating spindle means for maintaining said coolant means out of said chamber means;
- at least one brake shoe means disposed within said chamber means and being adapted to radially move into and out of contact with said rotating spindle means, said brake shoe means including a camming surface means thereon;
- roller means carried by said shiftable ring means for association with said camming surface means; and
- operator controlled means operatively connected to said ring means for moving said roller means into engagement with said camming surface means whereby forcibly moving said brake shoe means into contact with said rotating spindle means.

4,072,219

MULTI-PART DISC BRAKE

Heinz Guenter Hahm, Frankfurt, and Klaus Neef, Seligenstadt, both of Germany, assignors to ITT Industries, Incorporated, New York, N.Y.

Continuation of Ser. No. 636,345, Nov. 28, 1975, abandoned.
This application Jan. 27, 1977, Ser. No. 762,912
Claims priority, application Germany, Dec. 7, 1974, 2458034
Int. Cl.² F16D *65/12*
U.S. Cl. 188—218 XL **10 Claims**



1. A multi-part brake disc for disc brakes for attachment to a brake carrier on an automotive vehicle comprising:
- at least two juxtaposed brake rings carried by a cup-shaped hub having a bottom, said brake rings being connected with one another at said hub, said cup-shaped hub having side walls extending outwardly from said bottom in one direction and said brake rings extending outwardly from said bottom in a direction opposite from said one direction;
- said cup-shaped hub comprising at least two hub members of substantially the same cup-like shape fitted into one another;
- each of said hub members having an integrally formed brake ring thereon; and
- peripherally spaced openings through said side walls of said hub members for fastening means for interconnecting said hub members and said brake rings and for securing the assembled brake disc to said carrier.

4,072,220

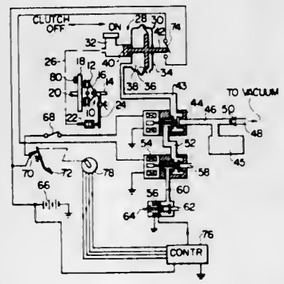
APPARATUS FOR CONTROLLING ACTUATING FLUID PRESSURE ON VEHICULAR FRICTION CLUTCH WITH COMPENSATION FOR DECREASE IN FRICTION COEFFICIENT AT ELEVATED TEMPERATURE

Hideo Hamada, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed June 23, 1976, Ser. No. 699,174
Claims priority, application Japan, June 25, 1975, 50-79583
Int. Cl.² B60K *21/00*
U.S. Cl. 192—.075 **5 Claims**

1. In a motor vehicle having an engine and a fuel supply line for supplying fuel thereto, a throttle valve in the fuel supply line for the vehicular engine, a driving shaft driven from the engine, a clutch of the friction type including a clutch input member mounted on said driving shaft and a clutch output member with friction faces, a driven shaft connected to the

clutch output member and a clutch actuating mechanism including a hydraulic cylinder to apply an actuating force to the clutch, a vacuum chamber to selectively communicate with a vacuum source and the atmosphere such that the displacement of a piston of the hydraulic cylinder is governed by the magnitude of vacuum in the vacuum chamber, a control apparatus for automatically controlling the rate of variation in said magnitude of vacuum and modulating the variation rate when the clutch has a high temperature to compensate for a decrease in the coefficient of friction of the clutch output member, the control apparatus comprising:
- a combination of a plurality of electromagnetic valves arranged to provide fluid communication of said vacuum chamber with the atmosphere selectively through a plurality of orifices respectively having different cross sectional areas; means defining said orifices;
- means for sensing the degree of opening of the throttle valve and producing at least one electrical signal indicating and representing in which of a plurality of ranges is the degree of opening, said ranges being defined by dividing the difference of the maximum opening from the minimum opening into a plurality of successive ranges;
- means for sensing whether the clutch output member is in contact with the clutch input member and producing an electrical signal representing and corresponding to the sensed condition;
- an electrical control circuit to excite one of said electromagnetic valves such that said vacuum chamber communi-



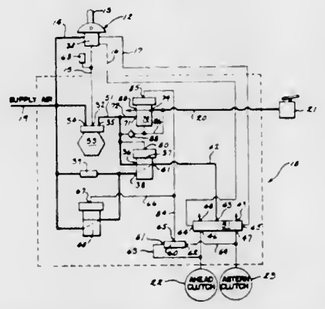
cates with a first one of said orifices for a predetermined period of time when the clutch output member is brought into contact with the clutch input member and the degree of opening of the throttle valve is in the smallest range, said vacuum chamber communicating with a second one of said orifices when said one electromagnetic valve is unexcited, a difference in cross-sectional area between said first and second orifices being such that said magnitude of said vacuum varies at different rates to cause the clutch actuating force to increase at a higher rate when said vacuum chamber communicates with said first orifice;
- a temperature sensor for sensing whether the temperature of the clutch output member is above a predetermined temperature and producing an electrical signal representing and corresponding to the sensed temperature range, the temperature sensor having a reed relay, a stationary member located close to the clutch input member to which said reed relay is attached, a permanent magnet attached to the clutch input member and heat-sensitive means for varying magnetic flux density through said reed relay such that said reed relay is closed at least once per revolution of the clutch input member when the temperature of the clutch output member exceeds said predetermined temperature, means connecting said temperature sensor to said control circuit to supply an electrical signal representing the state of said reed relay, said control circuit having an r-c circuit to prolong said predetermined period of time by a predetermined length after said reed relay is closed.

4,072,221

MARINE CLUTCH AND THROTTLE GOVERNOR CONTROL SYSTEM

John M. Phinney, Milwaukee, Wis., assignor to The Falk Corporation, Milwaukee, Wis.

Filed Aug. 19, 1976, Ser. No. 715,680
Int. Cl.² B60K *29/02*
U.S. Cl. 192—.098 **12 Claims**



1. A pneumatic clutch control system for a marine propulsion drive including a prime mover controlled by a throttle speed governor, a drive train for transmitting power from the prime mover to a propeller drive shaft, an air inflatable clutch for connecting the prime mover to said drive train, and throttle means for actuation of the propulsion system, said control system being adapted for connection to a source of pressurized air and comprising:
- first and second air branches each leading from said air source to a main control valve which is shiftable to connect one or the other of said air branches to said clutch,
- said first air branch including means operatively connected to said throttle means to provide an air output that is responsive to air pressure supplied to said first branch by said throttle means;
- said main control valve being responsive to the air output from said first branch to disconnect said first branch and connect said second branch to said clutch when said air output reaches a first control pressure;
- said second air branch continuing the inflation of said clutch without further control of said throttle means; and
- a throttle governor control means connected to receive the air output of said first air branch and for providing a speed pressure signal to said throttle speed governor which is proportional to said air output, said governor control means comprising a normally closed governor valve responsive to the air pressure in said clutch and adapted to be actuated to connect said first air branch to said governor when the clutch pressure rises to a first piloting pressure, said governor valve being further responsive to said speed pressure signal to have said speed pressure signal oppose the clutch pressure so that said governor valve will close when clutch pressure is less than the combination of said speed pressure signal and said first piloting pressure.

4,072,222

SINGLE STROKE CONTROL SYSTEM

George M. Coon, Hillside House, Saybrook Road, Essex, Conn. 06426

Filed Dec. 22, 1976, Ser. No. 753,596
Int. Cl.² B30B *15/14*; F16D *67/04, 71/00*
U.S. Cl. 192—131 R **20 Claims**

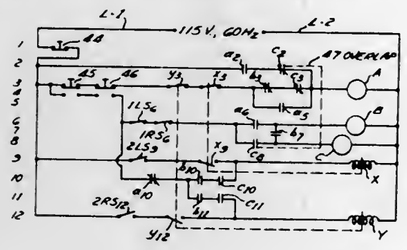
1. In a single cycle control system for a machine in which fluid pressure controls the starting and stopping of the machine and having a downstroke followed by a return upstroke, said system having:
- first and second normally-closed valves connected to con-

trol said fluid pressure such that the machine is stopped if either valve is closed;

first and second solenoids for controlling said valves individually such that each solenoid must be energized to open the corresponding valve;

and a pair of run switches, each having normally-closed contacts which are closed when the switch is released and normally-open contacts which are closed when the switch is operated;

the improvement which comprises three relays operatively connected to said run switches and said solenoids



(1) to energize both solenoids in response to the operation of both run switches, whereby to start the downstroke of the machine,

(2) to de-energize at least one of said solenoids in response to the release of either run switch during substantially the entire downstroke of the machine, whereby to stop the downstroke, and

(3) to maintain said last-mentioned solenoid de-energized until both run switches are released and thereafter both run switches are operated again.

4,072,223

CONTROL SYSTEM OF COIN-OPERATED LOCKER

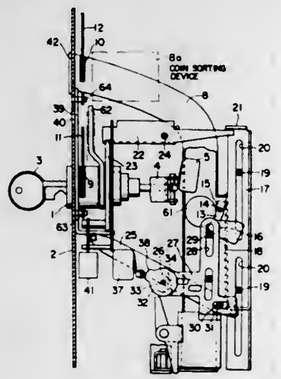
Yoshio Kinoshita, and Masayuki Iguchi, both of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Japan

Filed Oct. 26, 1976, Ser. No. 735,410

Claims priority, application Japan, Oct. 24, 1975, 50-128677; Dec. 18, 1975, 50-151362

Int. Cl.² G07F *17/10*

U.S. Cl. 194—54 **5 Claims**



1. A control system of a coin-operated locker which comprises:

a time-lapse detecting section for producing a time-lapse output signal whenever a predetermined unitary period of time has passed starting from the time instant when said locker is used;

b. a control section for producing a control signal by receiving, as input condition signals, the time lapse output signal from said time-lapse detecting section, and a signal generated by operating a key of a lock provided on said locker;

c. a stepping drive mechanism which under the control of said control section is driven by stepping drive means to advance stepwise in one direction when said lock is unlocked and when an overtime fee charging operation is effected, and to advance stepwise in the opposite direction when a coin is inserted into said locker; and

d. means for stopping, when said stepping drive mechanism is advanced stepwise in the one direction during said overtime fee charging operation, the operation of an opposite direction stepping drive section relating to the drive of said stepping drive mechanism in the opposite direction, so as to continue the drive of said stepping drive mechanism in the one direction.

4,072,224

PRINTING DEVICES

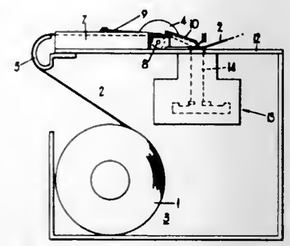
Bernard Sydney Barnaby, Ware; Cyril Walter Coe, Wembley; Godfrey Stephen Hall, and John Harwood Leworthy, both of Newton Aycliffe, all of England, assignors to The General Electric Company Limited, London, England

Continuation-in-part of Ser. No. 362,754, May 22, 1973, abandoned, and Ser. No. 497,530, Aug. 15, 1974, abandoned. This application Oct. 14, 1975, Ser. No. 621,833

Claims priority, application United Kingdom, May 24, 1972, 24431/72; Australia, May 23, 1973, 56056/73; Italy, May 23, 1973, 68511/73; United Kingdom, Aug. 17, 1973, 38970/73

Int. Cl.² B41J *3/04*

U.S. Cl. 197—1 R **2 Claims**



1. A printer for a tape which constitutes an elongated web, said printer comprising:

A. tape transport means to advance the tape through a printing station at which the tape is movable in a plane in a direction parallel to the longitudinal axes of the tape,

B. a single stationary anvil which has a narrow rectilinear edge and which is mounted at the printing station so that said edge lies adjacent and parallel to and to one side of said plane, the length of said edge of said anvil extending in a direction transverse to the direction of tape advancement; and

C. a printer unit which is mounted at the printing station to lie on the opposite side of said plane to the anvil, said printer unit including:

i. a plurality of elongated narrow planar metal strips each having an end portion that constitutes a printing element;

ii. means to mount said strips to lie side-by-side in face-to-face contact in a stack, the dimension of which perpendicular to the planes of the strips extends in a direction parallel to the length of said rectilinear edge of said anvil for limited longitudinal sliding movement relative to one another and with said end portions thereof lying generally parallel to the direction of tape advancement and facing the rectilinear edge of said anvil,

iii. a plurality of electromagnets forming a first group of electromagnets,

iv. a plurality of further electromagnets forming a second group of electromagnets,

v. means to mount said first and second groups of electromagnets so that the two groups are disposed on opposite sides of said stack of strips with the longitudinal axes of the electromagnets of both groups lying parallel to the lengths of said elongated strips, and

vi. a plurality of armatures each having a projecting finger portion and each associated with a different one of said electromagnets of the first and second groups and with one of said strips, each armature lying with its finger portion adjacent the end of the associated strip remote from said end portion thereof so that upon energization of any one of the electromagnets during use of the printer unit, the attraction of the associated armature causes the finger portion of that armature to press against the end of the associated strip remote from said end portion and effect longitudinal movement of the associated strip towards said anvil to print a mark by cooperation of said end portion of that strip and said anvil and a character is printed by selective energization of said electromagnets of the first and second groups as the tape is advanced to cause a plurality of such marks to be printed each by cooperation of the end portion of the appropriate strip and said anvil;

vii. all of said strips cooperating during advance of said tape to form a single character.

4,072,225

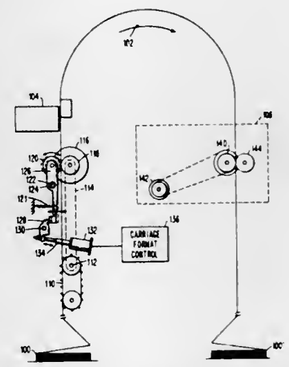
COMBINED PIN FEED AND PRESSURE ROLL FORMS ADVANCEMENT APPARATUS

Donald Franklin Manning, Endicott, and Robert Allan Ryan, Endwell, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 23, 1976, Ser. No. 744,356

Int. Cl.² B41J *15/00*

U.S. Cl. 197—133 R **7 Claims**



1. In a high speed printer, including a print station, apparatus for advancing marginally punched continuous forms comprising in combination:

sprocket drive means for continuously engaging marginal perforations in the continuous forms and advancing sheets thereof to be printed;

pressure roll drive means, located along the direction of continuous forms advancement and intermediate said sprocket drive means and the print station, selectively actuable in response to format control signals, for incrementally advancing each sheet past the print station and independently of said sprocket drive means; and

an incremental motion device for driving in synchronism said sprocket drive means and said pressure roll drive means; whereby each sheet is advanced continuously by said sprocket drive means whenever said pressure roll drive means is not actuated, and past said print station line by line during a printing operation whenever said pressure roll drive means is actuated.

4,072,226

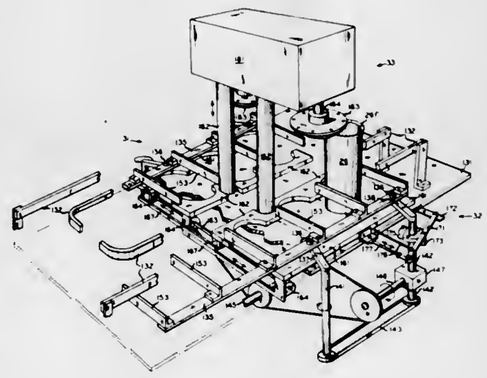
CONVEYOR APPARATUS FOR USE WITH A CONTAINER MANUFACTURING APPARATUS

Frank P. Richards, Prairie Village, Kans., and Raymond C. Taylor, Grandview, Mo., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 10, 1975, Ser. No. 630,555

Int. Cl.² B65G *25/04*

U.S. Cl. 198—345 **15 Claims**



1. Conveyor means for incrementally advancing individual articles in a generally straight line movement to successive conveyor stations, comprising:

support means;

a longitudinal member carried by said support means and oriented generally parallel to the direction of said generally straight line movement and pivotally mounted at a plurality of points, at least two of which are drive points, along its length;

means operably associated with said longitudinal member for moving each said drive point through a circuitous locus, each such locus being in a plane which is generally parallel to said generally parallel straight line movement, and such loci being of substantially equal shape;

a plurality of transverse members, each rigidly affixed to said longitudinal member, spaced at substantially equal distances along said longitudinal member;

a stationary surface underlying said transverse members for accommodating the sliding movement of articles thereon; and

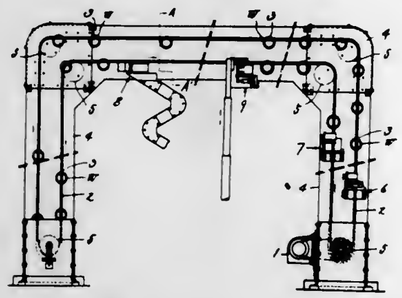
gripping means movably mounted on said support means and positioned adjacent said longitudinal member, said gripping means being operable for selectively engaging an article at one or more stations and preventing advancing movement and rotational movement of the article when said gripping means is in engagement therewith, said gripping means including two generally parallel gripping members, each said gripping member mating with the other to define jaw means for gripping an article with the thus gripped article being located at a respective one of said stations of said conveyor means, said jaw means being sized and shaped to engage a substantial portion of the periphery of the article therein;

means for moving both said gripping members toward each other to grip the bottom of an article and for moving both said gripping members away from each other to release an article.

4,072,227
PIN TYPE TRANSFER APPARATUS FOR APERTURED-WORKPIECES

Motoi Nomura, Takarazuka; Yasuhiro Shirai, Shizuoka; Yoshiaki Yoshinaga, Iwata, and Kouji Yamaizumi, Fukuroi, all of Japan, assignors to NTN Toyo Bearing Co. Ltd., Japan

Filed Jan. 28, 1976, Ser. No. 653,153
Claims priority, application Japan, Jan. 28, 1975, 50-12096; Nov. 13, 1975, 50-137049; Nov. 14, 1975, 137605; Nov. 15, 1975, 50-137414; Nov. 18, 1975, 50-139103; Nov. 26, 1975, 50-142117
Int. Cl.[2] B65G *43/00*
U.S. Cl. 198—370 3 Claims



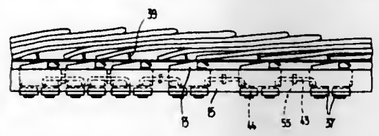
1. A pin type transfer apparatus for apertured workpieces comprising frame means, slot means vertically disposed in said frame means, endless chain means operatively positioned for movement around said frame means in a vertical plane and in vertical alignment with said slot means of said frame means, a plurality of pin means attached at one end to one lateral surface of said chain means at spaced points therealong, and projecting outwardly therefrom and extending through the slot means of said frame means for vertical movement therein, horizontally disposed hand-over dish means operatively associated with said frame means, said dish means having horizontally disposed slot means positioned centrally thereon from one edge thereof and in registry with the vertically disposed slot means of said frame means to permit the pin means to move therethrough, said hand-over dish means including means for moving said dish means back and forth, means to push a workpiece laterally from a loading position onto said hand-over dish means and in registry with the horizontally disposed slot positioned therein, adjusting means positioned rearwardly of said hand-over dish means for positioning a workpiece thereon in a normal position and insertion means mounted on said frame means and positioned above said hand-over dish means, said frame means straddling said chain means and said pin means thereby permitting a workpiece positioned on the hand-over dish means to be firmly caught by the transfer pin means and thereafter transferred upwardly to a predetermined place.

4,072,228
APPARATUS FOR EVENING AN IMBRICATED STREAM OF PRINTED PRODUCTS

Werner Honegger, Ruti, and Erwin Müller, Durnten, both of Switzerland, assignors to Ferag AG, Hinwil, Switzerland

Filed May 13, 1976, Ser. No. 686,143
Claims priority, application Switzerland, May 20, 1975, 6461/75
Int. Cl.[2] B65G *47/28*
U.S. Cl. 198—459 13 Claims

1. An apparatus for evening an imbricated stream of products, especially printed products, comprising a plurality of revolving entrainment members, each entrainment member engaging a trailing end of an associated one of the printed products, means defining a path of travel for the entrainment members, said entrainment members being movable along said path of travel through a conveying-effective path, means providing a drag connection between the entrainment members, means for guiding the entrainment members at the region of their conveying-effective path, thrust drive means for driving the entrainment members at the start of the conveying-effective path and traction drive means for driving the entrainment members at the end of said conveying-effective path, said drive

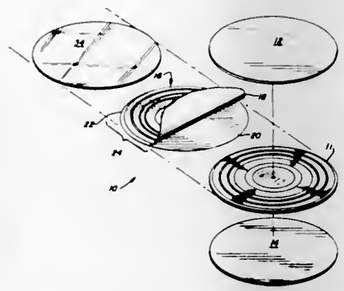


means constituting a first controllable drive means at the start of the conveying-effective path for driving said entrainment members in pushing relationship to one another and a second controllable drive means at the end of the conveying-effective path for driving said entrainment members in pulling relationship to one another.

4,072,229
RECORD ALBUM COVER

Peter Lloyd, 11049 Blix St., North Hollywood, Calif. 91602, and Bob Zoell, 14547 Greenleaf St., Sherman Oaks, Calif. 91403

Filed Feb. 20, 1976, Ser. No. 659,680
Int. Cl.[2] B65D *85/30*
U.S. Cl. 206—309 2 Claims

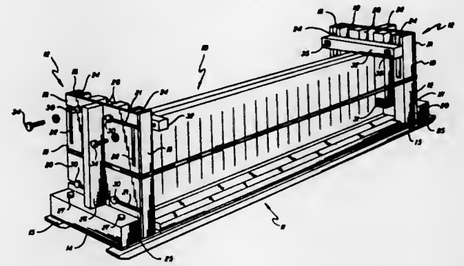


1. A cover for a phonograph record comprising: two circularly shaped discs formed from black, sealable, shiny and flexible polyvinyl chloride, each disc having a diameter greater than the diameter of a phonograph record,
- said discs being continuously sealed together for about one-half their circumference so as to provide an open end into which a phonograph record may be inserted and a closed, pocket-like end for receiving a phonograph record,
- a pair of circular, disc-shaped stiffeners for rigidifying the cover and protecting the phonographic record, the stiffeners being of a diameter less than the diameter of the cover, and
- indicia applied to at least one side of the cover, the indicia including record bands, spacing bands and a concentrically placed record label, the indicia providing a record cover which substantially corresponds to a phonograph record housed within the cover, whereby the cover of the phonograph record simulates the phonograph record itself.

4,072,230
ASSEMBLY FOR SUPPORTING DELICATE EQUIPMENT DURING SHIPPING

Vincent R. Mulligan, Syracuse, N.Y., assignor to L. K. Van Keuren Company, Inc., Marcellus, N.Y.

Filed Apr. 20, 1976, Ser. No. 678,614
Int. Cl.[2] B65D *85/48; A47G 19/08*
U.S. Cl. 206—334 7 Claims

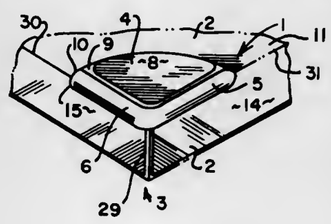


1. A packaging assembly for supporting delicate electronic equipment within an outer carton during shipping, the support assembly comprising a normally horizontal base assembly and a pair of upstanding end braces respectively secured to the base assembly at opposite ends thereof, each end brace having a pair of normally vertical clamping members movable towards or away from one another for engaging and clamping therebetween terminal portions of the equipment being shipped, each end brace also having a normally horizontally disposed member movable towards or away from the base assembly for engaging the equipment being shipped and clamping it between the horizontally disposed member and base assembly.

4,072,231
CORNER PROTECTOR

Hosea W. Helms, 7451 Richmond Place, St. Louis, Mo. 63143

Filed Feb. 17, 1977, Ser. No. 769,514
Int. Cl.[2] B65D *85/48*
U.S. Cl. 206—453 14 Claims

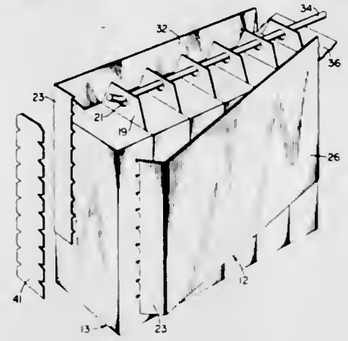


1. A corner protector which is applied to the corners of a second structure, comprising:
- an enclosure including a relatively flat top surface area, and a curved portion terminating in an arcuate edge, a first curved side wall, and a second curved side wall, said first and second side walls extending downwardly from said top surface area and terminating in an edge, each edge of said side walls abutting said second structure in the intermounted position of said protector, said enclosure defining an air pocket with said second structure;
- a suction cup mounted to a bottom side of said top surface area in said air pocket;
- an L-shaped lip outboard of said suction cup in said air pocket;
- at least one vertical lip extending along the height dimension of each of said side walls; and
- double edge adhesive means applied to said L-shaped lip and to each of said vertical lips for ensuring attachment of said corner protector to said second structure.

4,072,232
PACKAGE FOR MULTIPLE CONTAINERS

John W. Marsman, Pokagon Township, Cass County, Mich., and G. Norman Heaton, Elkhart, Ind., assignors to Victor Comptometer Corporation, Chicago, Ill.

Filed Aug. 5, 1976, Ser. No. 712,028
Int. Cl.[2] B65D *5/54, 17/20, 85/54*
U.S. Cl. 206—602 13 Claims



1. In a packing structure for plural elongated containers, each container having a tab projecting from one end thereof and each tab having an opening therethrough and alignable with the openings in the other tabs, the improvement which said structure comprises a first packing sleeve which includes:
- a pair of parallel side walls and a pair of parallel end walls integral with and extending between corresponding lateral edges of said side walls to define a first substantially rectangular compartment with opposed opened ends,
- a pair of short, parallel perforation lines extending inwardly from one free edge of one end wall and adjacent the side walls whereby to form a flap which can be removed or folded sideways to expose the aligned openings in said tabs whereby an elongated element can be extended therethrough, and
- a pair of spaced, parallel perforation lines in one of said end walls, said perforation lines extending between the free edges thereof to define a tear strip which can be readily and manually removed whereby said first packing sleeve can be removed laterally from said containers after they are engaged by said elongated element; and
- said packing structure including a second packing sleeve having interconnected side walls and end walls whereby to form a second, rectangular compartment, said first sleeve with said containers therein being slidably positioned within said second sleeve so that the open ends of said first sleeve face toward the end walls of said second sleeve, and said containers are disposed completely within said second sleeve.

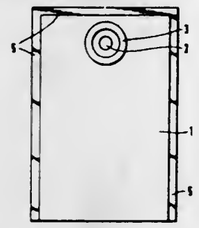
4,072,233
CONTAINER WITH FRANGIBLE PIERCING POINT

Karl Kramer, Wambach, and Karlheinz Durst, Naurod, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 13, 1976, Ser. No. 714,250
Claims priority, application Germany, Aug. 16, 1975, 7526045[U]
Int. Cl.[2] B65D *5/54*
U.S. Cl. 206—634 9 Claims

1. A container comprising:
- a plurality of container walls made of laminated layers of material and defining a closed interior space, one of said

walls having a frangible piercing point thereon arranged to be penetrated by an extraction device or the like, said piercing point being defined by a circumscribing depression formed in the exterior of said wall, and which extends from the outside of said wall toward the inside thereof, but



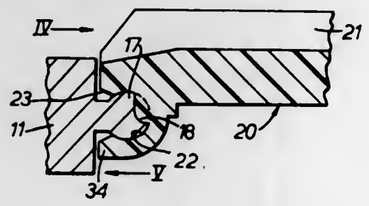
which does not completely pierce the innermost laminate layer of said wall, substantially the entire portion of said wall circumscribed by said depression remaining in place at substantially full thickness until said piercing point is penetrated by said extraction device or the like.

4,072,234

LOCATION OF CARD FRAME GUIDE MEMBERS

James Earle David, Stroud, England, assignor to Critchley Bros. Limited, England

Filed May 10, 1976, Ser. No. 684,845
Claims priority, application United Kingdom, May 8, 1975, 19350/75
Int. Cl.² A47F 7/00
U.S. Cl. 211—41 11 Claims



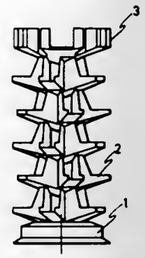
1. An assembly of guide members and support members for a frame construction of the type where the guide members are arranged to lie transversely between a pair of spaced, parallel, elongated support members and are provided with locating means at each end to cooperate with corresponding means on each of the support members, and with a slot to receive an edge of a board, wherein the support members are each provided with a longitudinally extending rib formation which, in cross section, is of rounded form carried by and symmetrically of the axis of a neck portion, and the end of each guide member defines a correspondingly rounded groove formation provided, in cross section, by a pair of flexible arms whose free ends extend towards one another and thus towards the neck portion of the support member so as to create a snap-on connection onto the rounded rib formation of the support member, and wherein complementary locating formations are provided at spaced positions along the rib formation and in each groove formation to prevent relative movement between the rib and groove formations in the longitudinal direction of the rib formation, each locating formation comprising, respectively, a recess defined in the rib formation and opening to one side only of said axis of symmetry of the neck portion and the rib formation and being at least mostly disposed in the part of the rib formation on said one side of said axis of symmetry, and a complementary projection within and extending from the groove formation and disposed at least mostly on said one side of said axis of symmetry, whereby the arms are enabled to flex relative to one another and grip the rib formation even in conditions wherein the locating formations have not already interconnected during assembly operations.

4,072,235

MODULAR DISPLAY DEVICE

Francisco Bermudez Munoz, Cartagena, Spain, assignor to Diego Zamora S.A., San Antonio Abad (Cartagena), Spain

Filed Feb. 23, 1976, Ser. No. 660,404
Int. Cl.² A47G 29/00
U.S. Cl. 211—71 5 Claims



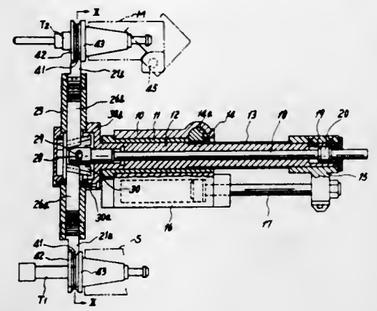
1. A modular display device comprising:
a base member having extending upwardly therefrom a cylindrical projection having therein axial slots defining inwardly deformable projection portions each having at the upper end thereof an outwardly extending flange;
a plurality of modular members stacked vertically above said base member, the lowermost said modular member having therein a central hole of a diameter approximately equal to the outer diameter of said projection, said projection portions being deformable inwardly to enable said lowermost modular member to be assembled onto said base member with said projection extending through said central hole, said projection portions deforming outwardly after said lowermost modular member is assembled onto said base member, said flanges thereafter preventing unintentional removal of said lowermost modular member from said base member;
each said modular member having equally circumferentially spaced therearound a plurality of radially outwardly extending arms, each said arm including a bottom wall and two opposite side walls defining a product receiving space, each side wall forming a dihedral angle with the adjacent side wall of the adjacent arm, each pair of side walls defining a dihedral angle being joined at the tops thereof by a triangular element, each said triangular element having a free edge with a notch therein, each said arm having depending downwardly therefrom a tongue element;
said tongue elements of each said modular member being received in said notches of the next lower modular member, each said modular member being circumferentially angularly displaced with respect to the next lower modular member, said notches being positioned and dimensioned such that the receipt therein of the tongue elements of the next upper modular member rigidly fixes together the respective said modular members; and
an upper member having depending downwardly therefrom a plurality of tongue elements which fit and are received in the notches of the uppermost of said modular members.

4,072,236

ARTICLE TRANSFER APPARATUS

Kenji Nomura, Aichi; Kengo Yoshioka, and Toshihiro Goto, both of Kariya, all of Japan, assignors to Toyoda-Koki Kabushiki-Kaisha, Kariya, Japan

Filed Jan. 26, 1977, Ser. No. 762,668
Claims priority, application Japan, Feb. 25, 1976, 51-20340
Int. Cl.² B65G 47/90
U.S. Cl. 214—1 BB 11 Claims



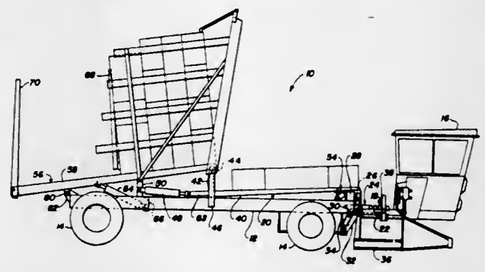
1. An article transfer apparatus comprising in combination:
a main body;
a rotatable shaft rotatably supported by said main body;
first actuation means for rotating said rotatable shaft;
a transfer arm fixedly provided upon one end of said rotatable shaft and extending radially therefrom;
a pair of grippers pivotably provided, respectively, upon each end of said transfer arm so as to simultaneously grip two articles to be transferred;
a wedge member supported at said one end of said rotatable shaft and axially movable relative thereto, said wedge member also being movable floatingly radially of said rotatable shaft;
second actuation means for moving said wedge member axially of said rotatable shaft; and
motion connection means provided upon said transfer arm and mechanically responsive to the axial movement of said wedge member to selectively open and close said pairs of grippers.

4,072,237

TIER COUNTER MEANS RESPONSIVE TO TIER PATTERN STORAGE CAM POSITION

Richard A. Colby, Fresno, Calif., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Aug. 5, 1976, Ser. No. 712,121
Int. Cl.² A01D 87/12; B65G 57/32
U.S. Cl. 214—6 B 10 Claims



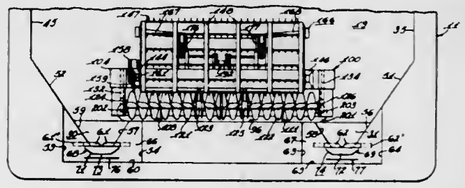
1. In a bale wagon having means for storing a predetermined sequence of a predetermined number of tier patterns, said storing means defining a predetermined number of successive-displaced positions which each represent one of said tier patterns, operable means for forming bales into said predetermined number of tier patterns, said operable means responsive to each of said storing means positions to form the bales into the one of said tier patterns corresponding to each of said storing means positions, a source of electrical power, electrical drive means activatable for rendering said operable means successively responsive to each of said storing means positions, circuitry interconnecting said electrical power source and said drive means which when closed transmits electrical energy from the former to the latter to activate the latter, and means for closing said circuitry after each tier has been formed by said operable means to cause activation of said drive means and render said operable means responsive to the next successive one of said storing means positions, the improvement which comprises:
counting means electrically interconnected to said circuitry and operable to advance one count and register the number of tiers having been previously formed by said operable means each time said operable means is rendered responsive to the next successive one of said storing means positions, said improvement further including a manually actuated switch means electrically interconnected to said circuitry and said counting means operable to selectively advance the count on said counting means.

4,072,238

SELF-UNLOADING SHIP WITH TWO TUNNEL BELTS AND A CENTRAL RECLAIMER

Warren R. Vaughan, Belleville, Canada, assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 24, 1976, Ser. No. 744,516
Int. Cl.² B63B 27/22
U.S. Cl. 214—15 E 8 Claims



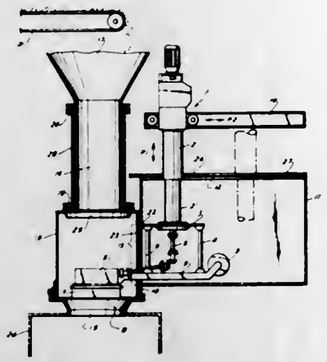
1. In a self-unloading ship for transporting bulk material,
a cargo carrying mid-ship section between the bow and stern of said ship including
walls defining two substantially parallel rows of hoppers in the bottom of said mid-ship section in laterally spaced relation to one another, and
a flat floor between said rows of hoppers, the elevation of said floor being at least as high as said hoppers,
gates at the bottom of said hoppers shiftable between closed and open positions,
walls defining a tunnel below each of said rows of hoppers,
an endless belt conveyor in each of said tunnels, each conveyor having an endless belt with a working run disposed below the gates of the associated row of hoppers, said conveyors being substantially parallel to one another.
a vehicular reclaimer supported on said floor by a plurality of wheels and adapted to operate in a fore and aft direction, said reclaimer being slightly wider than said floor and substantially narrower than said mid-ship section and including auger means rotatable about a transverse axis including oppositely pitched flights for splitting bulk material resting on said floor and simultaneously moving it in opposite lateral outboard directions to said rows of hoppers and
power means for selectively moving said reclaimer in said fore and aft directions.

4,072,239

ARRANGEMENT FOR CHARGING A FURNACE IN A GASTIGHT AND DUST-TIGHT MANNER

Willi Busbach, Essen, Germany, assignor to Bergwerksverband GmbH and Didier Engineering GmbH, both of Essen, Germany

Filed Feb. 7, 1977, Ser. No. 765,893
Claims priority, application Germany, Feb. 10, 1976, 7603726[U]
Int. Cl.² F23K *3/00*
U.S. Cl. 214—35 R 7 Claims



1. In combination with a furnace having a furnace filling inlet normally closed by a removable cover, an arrangement for opening the filling inlet, then filling the interior of the furnace, and then reclosing the inlet all in gas-tight and dust-tight manner in order to prevent the free escape of dust and gases to the ambient atmosphere when the cover is removed from the filling inlet, the arrangement comprising a housing surrounding the filling inlet and having a charging port and a first opening separate from said charging port; filling means for conveying a charge from said charging port through the interior of said housing and into the filling inlet when the latter is opened; and cover-extracting means for removing and subsequently repositioning the cover, including a hood having a second opening and being movable relative to said housing to and from a position in which said openings are juxtaposed in sealing relationship so that the interior of said hood communicates with the interior of said housing, said cover-extracting means also includes means mounted on said hood for engaging the cover so as to open and subsequently reclose the filling inlet, said engaging means being movable from the interior of said hood through said juxtaposed openings to the interior of said housing at a location adjacent the cover for engagement with the latter so that any dust and gas escaping from the filling inlet towards the ambient atmosphere when the cover is removed from the filling inlet are confined within the respective interiors of said housing and said hood.

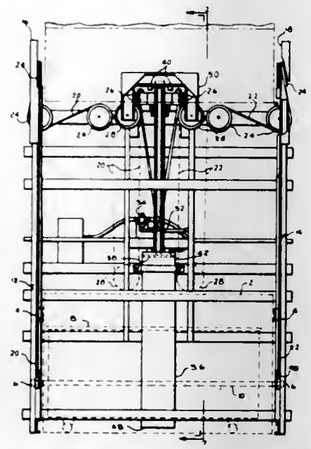
4,072,240

TEXTILE BOBBIN HOIST

Richard Ferguson, and Kenneth W. Troutman, both of Charlotte, N.C., assignors to The Terrell Machine Company, Charlotte, N.C.

Filed Oct. 18, 1976, Ser. No. 733,390
Int. Cl.² B65G *65/04*
U.S. Cl. 214—313 10 Claims

1. A bobbin hoist having a skip for holding a box of bobbins for hoisting, air powered cable means attached to the skip for lifting and lowering thereof, complementary track guide means for separately engaging and guiding top and bottom portions of the skip for generally vertical hoisting thereof followed by tilting thereof to dump the bobbins therefrom, the skip being located for said vertical hoisting generally on the rear side of said track guide means, said track guide means having upper curved portions thereof for causing the skip to turn at least ninety degrees from its original disposition to dump at the front side of said track guide means, said top portion track guiding means guiding said top portion of the skip to initially tilt the skip during hoisting thereof and said bottom portion track guiding means guiding said bottom portion of the skip for completion of said tilting of the skip during hoisting thereof and after said initial tilting thereof the skip being essentially unrestrained in horizontal direction by said top portion track guiding means and thus free to move in essentially horizontal direction as guided by said bottom portion track guiding means, fixed pulley means located on the front side of, and intermediately of the vertical extent of, said



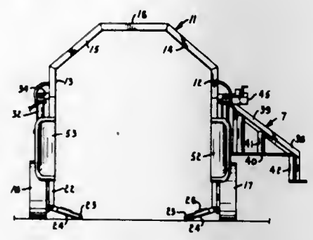
bottom portion track guiding means for guiding said cable means so that the line of pull of said cable means at said skip forms an ever decreasing angle with the normals to said bottom portion track guiding means at the locations where said bottom portion is guided during said completion of said tilting whereby an ever increasing load is applied by said bottom portion of the skip on said bottom portion track guiding means during said completion of said tilting, and said guide means controlling the tilting so that the tilting is effected by substantially constantly increasing cable means pulling force for smoothly controlling the ascent, and conversely the descent of the skip.

4,072,241

AGRICULTURAL VEHICLE FOR TRANSPORTING HAY BALES

Gary D. Parker, 9070 G.P. Inc. Rte. 1, Moran, Kans. 66755, and E. S. Robb, Box 703, Iola, Kans. 66749

Filed Dec. 30, 1976, Ser. No. 755,679
Int. Cl.² B60P *3/00*
U.S. Cl. 214—392 13 Claims



1. An agricultural vehicle for transporting round bales and comprising:

a. a mobile frame for movement over the ground and having a forward end and a trailing end, said frame having longitudinally extending side members and a plurality of transverse members;

b. longitudinally extending bale lifting and supporting members arranged in a laterally opposed pair, each bale supporting member depending from at least one of said members of said frame at a side thereof and movably mounted thereon;

c. means on said frame and operatively connected to said bale supporting members for moving same between a depending position and an inwardly inclined bale supporting position, said bale supporting members respectively including an arm pivotally mounted to said frame at one end thereof for pivotal movement transversally of said frame, an extension engaged with the other end of said arm and adapted to increase the effective length of said arm upon movement of said arm to bale supporting position thereby lifting a bale substantially out of contact with the ground for transport; and

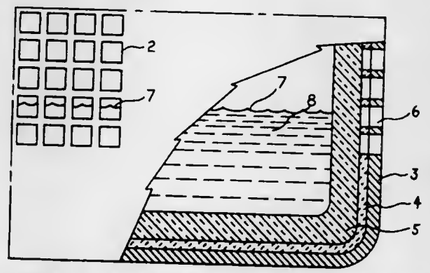
d. means for connecting said frame to a prime mover for propelling said mobile frame.

4,072,242

UNLOADING TAILGATE FOR SELF-UNLOADING FORAGE WAGON

Franklin F. Cook, Rte. 2, Baraboo, Wis. 53913

Filed Apr. 30, 1975, Ser. No. 573,041
Int. Cl.² B60P *1/38*
U.S. Cl. 214—522 3 Claims



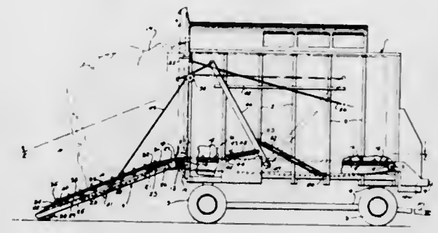
1. An unloading tailgate for a self-unloading chopper wagon to increase the versatility of the wagon which comprises a wagon box having a floor supported on a chassis in turn supported on wheels with the floor of the wagon located above the uppermost extent of the wheels of the wagon and adapted at the forward end to be hitched to a tractor, at least one unloading chain supported by rear and forward shafts disposed in said box and adapted to be driven rearwardly over the floor of the box when the shafts are rotated from the tractor, upstanding members intermittently secured to the chain to engage the bottom of a load of material located in the wagon and unload the material rearwardly when the chain is rotated, a single door at the rear of the wagon consisting of an unloading tailgate hinged at the lower end to the rear of the wagon and extending upwardly completely over the rear opening in the wagon box, a plurality of laterally spaced inverted supporting channels extending longitudinally of the tailgate, reinforcing stringers extending across the top of the channels, an angle iron member secured to the forward end of the channels, hinges secured to the angle iron and pivoted to the rear of the wagon box for pivotal movement of the tailgate, and a flat guide plate secured to the stringers and extending over the angle iron members substantially to the floor of the wagon box to provide a smooth surface for discharging the load of material, means secured to the tailgate and the wagon and actuated from the tractor to pivot the tailgate to a closed position or swing the tailgate so that it gradually slopes from the rear of the box to the ground, and at least one unloading chain revolved rearwardly over the tailgate by the unloading chain in the box and having upstanding means intermittently secured thereto to engage and unload the load of material received from the box onto the ground, the said tailgate having a minimum angle of slope from the rear of the wagon to the ground to unload the stored material without cracking or otherwise damaging the load of material and thereby subject it to disintegration or deterioration by the elements as the tractor pulls the chopper wagon forwardly.

4,072,243

METAL COATED BRITTLE CONTAINERS, CONDUITS AND OTHER OBJECTS FOR LABORATORY AND INDUSTRY

Louis A. Conant; Wilbur Monroe Bolton, both of Rochester, and James Ellsworth Wilson, Livonia, all of N.Y., assignors to Intertec Associates, Inc., Rochester, N.Y.

Continuation-in-part of Ser. No. 568,422, April 21, 1975, abandoned. This application Dec. 23, 1976, Ser. No. 754,036
Int. Cl.² B65D *15/10, 25/14;* B01L *3/00, 11/02*
U.S. Cl. 215—12 R 15 Claims



1. In an armored brittle-ware article selected from the group consisting of laboratory and industrial brittle-ware coated externally with a layer of metal, the improvement which comprises an anti-bonding layer between the natural surface of said brittle-ware and said layer of metal; said anti-bonding layer being selected from the group consisting of thermally stable finely divided particles and thermally stable polymers, and said layer of metal being plated by chemical vapor deposition at an elevated temperature of at least about 150° F over substantially the entire outer surface of said article; the brittle material of said article being under a compressive force at room temperature over the entire inert brittle-ware article, caused by the greater shrinkage of said metal layer than said brittle material when the temperature of said article is lowered from an elevated temperature at which said metal layer was applied to said brittle-ware to room temperature; said coated brittle-ware having shock resistance, substantially increased pressure tolerance and an impact strength of at least about 5 times greater than that of similar uncoated brittle-ware.

4,072,244

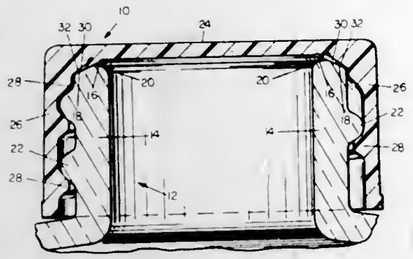
LINERLESS CLOSURE

Bruce M. Mueller, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 4, 1977, Ser. No. 765,501
Int. Cl.² B65D *53/00*
U.S. Cl. 215—344 1 Claim

1. In combination: a container having an externally threaded neck portion terminating at its end in an annular rim defining the periphery of an open mouth, said rim including a sealing surface tapering downwardly and outwardly from said open mouth; and a linerless closure comprising a top panel, an internally threaded skirt depending from said top panel and adapted to engage the threaded neck portion of said container, an annular resilient sealing fin depending downwardly and outwardly from the inside surface of said top panel, said annular sealing fin adapted to sealingly engage said sealing surface on the annular rim of the neck portion of the container, said linerless closure including an annular stop portion formed integral therewith at the interior junction of the top panel and the

depending skirt, said stop portion being inclined downwardly and outwardly from said top panel to stop the upward and outward deflection of said annular sealing fin upon application



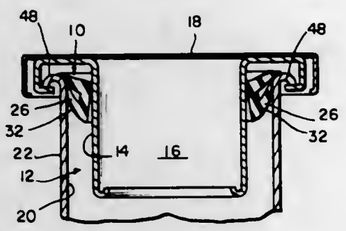
of said closure to said container to thereby cooperate with the sealing surface on the annular rim of the neck portion of the container to firmly bias said sealing fin therebetween to form a seal between said linerless closure and said container.

4,072,245

FILLER NECK CAP WITH O-RING SEAL

Paul H. Sloan, Jr., Sturgis, Mich., assignor to Stant Manufacturing Company, Inc., Connersville, Ind.

Filed July 16, 1976, Ser. No. 706,051
Int. Cl.[2] B65D *41/02*
U.S. Cl. 220—295 **3 Claims**



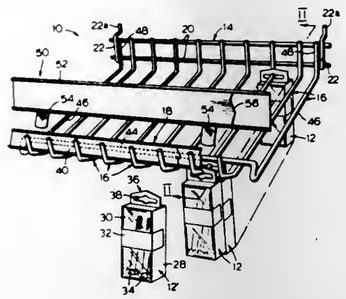
1. For use with a filler neck having an axially outer end and a filler neck cap having a shank portion extending axially into the filler neck when the cap is in its use position, the shank providing a first radially inner surface and the filler neck providing a second radially outer surface, the first and second surfaces defining therebetween an annular space, a resilient annular ring for sealing the annular space, the ring being mounted on the shank, the annular space having a radial width less than the radial dimension of the ring, the ring including an axially inner lip, an axially outer lip, and a connecting radially inner web portion, the lips and web defining an annular, radially outwardly facing groove in the ring, the inner lip including axially inner and outer surfaces, the web portion including a radially inwardly facing surface adjacent the first surface and a radially outwardly facing surface, and the outer lip including axially inner and outer surfaces, the improvement wherein the inner lip inner surface is formed for resilient axially outward wiping movement by the second surface upon axially inward movement of the shank with the ring mounted thereon into the filler neck, the web radially inner surface being resiliently deflected radially outwardly at its axially inner extent and being urged radially inwardly against the radially inner surface at its axially outer extent.

4,072,246

DISPLAY RACK

Arthur Paulin, 7 High Point Road, Don Mills, Canada (M2B 2A3)

Filed Jan. 26, 1977, Ser. No. 762,618
Int. Cl.[2] A47F *1/12*
U.S. Cl. 221—307 **7 Claims**



1. A display rack for packages of hardware and like articles, the rack comprising:

support means;

a plurality of elongate elements from which the packages can be suspended, the elements projecting outwardly from said support means in generally parallel positions and having free outer end portions over which the packages can be slidably fitted onto and removed from the elements, the elements being arranged to incline downwardly to a slight extent away from said support means when the rack is in use, so that packages suspended on the elements tend to slide towards said outer end portions under the action of gravity; and,

an elongate stop member coupled to said support means and extending transversely of and above the package suspension elements adjacent their outer end portions, the elements being normally disposed in contact with said stop member when fully loaded with packages so that the stop member prevents the packages sliding off the elements, and the elements being resiliently deflectable away from the stop member to permit removal of the packages.

4,072,247

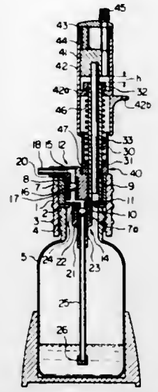
LIQUID DISPENSING DEVICE

Seichi Yamazaki, Kashiwa, Japan, assignor to Nippon Glass Measure Co., Ltd., Tokyo, Japan

Filed June 24, 1976, Ser. No. 699,575
Claims priority, application Japan, Feb. 19, 1976, 51-18597[U]
Int. Cl.[2] B67D *5/22*
U.S. Cl. 222—47 **11 Claims**

1. A liquid dispensing device comprising a cap structure adapted to be mounted on the top of a liquid container, a cylinder extending vertically upward from the cap structure, a manually operable plunger slidably fitted in the cylinder, means for controlling the stroke of the sliding movement of the plunger within the cylinder, a delivery assembly including a one-way delivery valve and a delivery nozzle, and a suction assembly including a one-way suction valve and a suction tube extending into the liquid in the liquid container, said delivery assembly and suction assembly being respectively removably force fitted into respective bores formed in the upper portion and the lower portion of the cap structure, said bores communicate with each other and with the interior of said cylinder, said stroke controlling means comprising a head of increased diameter formed on the upper end of the plunger for engaging with the upper end of the cylinder to prevent the downward movement of the plunger, a sleeve receiving the head of the plunger slidably therein, one or more gauge members being selected from a series of gauge members each having a predetermined thickness and being located and clamped between the

head of the plunger and a cap member closing the upper end of the sleeve, and a projection formed on the inner periphery of



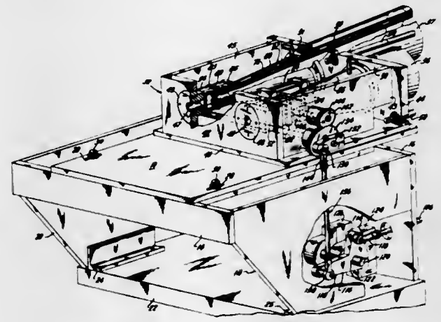
the sleeve for cooperating with a stop member formed on the cylinder to restrict the upward movement of the sleeve relative to the cylinder.

4,072,248

METERING APPARATUS

John E. Murphy, Oradell, and Chester Wolf, Bergenfield, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 522,791, Nov. 11, 1974, abandoned.
This application Feb. 12, 1976, Ser. No. 657,435
Int. Cl.[2] A01J *21/00*
U.S. Cl. 222—56 **5 Claims**



1. A margarine metering apparatus for use in a margarine processing machine comprising:

a. a first and a second positive open and closed valve mechanism communicatively mounted to each other, and having an inlet communicatively mounted between said first valve mechanism and a source of margarine;

b. an expansion tube, the interior cavity of which has the general shape of a frustum, the smaller end of said cavity being communicatively engaged with the exit of said second valve mechanism for the passage of margarine therethrough;

c. a first drive mechanism that is operably connected to and intermittently and synchronously opens and closes said second valve mechanism to continuously meter the passage of margarine therethrough; and

d. a second drive mechanism that is operably connected to said first valve mechanism,

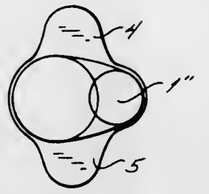
said second drive mechanism maintaining said first valve mechanism in a position to admit the passage of margarine therethrough and being capable of closing said first valve mechanism to the admission of margarine when said first drive mechanism ceases to function.

4,072,249

CONTAINER SUITABLE FOR SMALLER QUANTITIES OF FLUID OR SEMIFLUID SUBSTANCES

Bo Thuresson Af Ekenstam, Molndal, and Erik Gustaf Percy Nordqvist, Saro, both of Sweden, assignors to Landstingens Inkopscentral, Solna, Sweden

Filed Feb. 25, 1976, Ser. No. 661,177
Claims priority, application Sweden, Mar. 3, 1975, 7502318
Int. Cl.[2] B65D *25/38*
U.S. Cl. 222—95 **11 Claims**



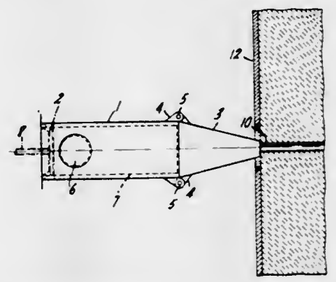
1. A container for dispensing fluid and semi-fluid liquids or pastes, comprising: a top dome having a first closed end and a second open end and made of a flexible material so that said first closed end may be pressed downwardly toward and through said second open end; a bottom dome also made of a flexible material and having a first closed end and a second open end, said second open ends of each of said domes being connected to each other so that when said top dome is pressed downwardly said first closed end of said top dome passes through said second open end of said top dome and said second open end of said bottom dome toward said first closed end of said bottom dome; means located on said bottom dome near said first closed end thereof for allowing the contents in said top and bottom domes to exit thereform to a desired point outside of said container; flange means surrounding said top and bottom domes near said connected second open ends for gripping by fingers so that the contents of the container may be forced outwardly through said means for allowing when a thumb presses downwardly upon said first closed end of said top dome to thereby force said top dome into said bottom dome while at the same time forcing the contents out through said means; and an envelope surrounding said bottom dome and made of a rigid material to thereby support said bottom dome when said top dome is pressed and forced thereinto, said flange means being mounted about said envelope.

4,072,250

APPARATUS FOR PLUGGING HOLES IN AN ELECTRIC SMELTING FURNACE OR THE LIKE

Thor Pedersen, Vagsbygd, and Aksel Erik Kristiansen, Oslo, both of Norway, assignors to Elkem-Spigerverket A/S, Oslo, Norway

Continuation-in-part of Ser. No. 563,200, March 28, 1975. This application July 15, 1976, Ser. No. 705,573
Int. Cl.[2] C21B *7/12*
U.S. Cl. 222—326 **2 Claims**



1. Apparatus for plugging holes in an electric smelting fur-

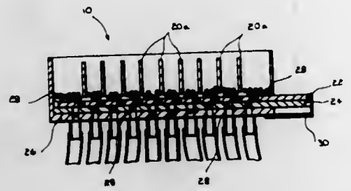
nace or the like comprising a tubular member open at a first end thereof, a piston operatively associated with said tubular member being sized and adapted to be inserted therein and displaced along the longitudinal axis thereof, a second, generally conical member having accessible openings at the axial extremes thereof, a first accessible opening being dimensioned to be urged into contact with the opening of the first end of said tubular member and a second accessible opening being dimensioned according to a predetermined size based on the size of a hole to be plugged, and means joining said tubular member to said conical member with the said first accessible opening and said opening of the first end being in register, said means comprising two hinge means spaced approximately 180° from each other, each said hinge means comprising cooperating leaf members joined by a taper pin, one leaf of each said hinge means being affixed to the tubular member and being mounted on the exterior thereof and the other said leaf member being affixed to the conical member and being mounted on the exterior thereof, each said taper pin being free of threaded engagement with the hinge members and being removable upon the application of one or more sharp blows, the axes of said two taper pins being substantially parallel to each other said axes being substantially vertical, removal of one or the other of said taper pins permitting the conical member to be rotated in a horizontal direction either to the left or to the right about the vertical axis of the other said taper pin to a point where the entire cross-sectional area of the said opening of the first end of the tubular member is exposed and unobstructed by the conical member and removal of both said taper pins permitting separation of the said conical member from the said tubular member.

4,072,251

AUTOMATIC SEED SINGULATING AND DISPENSING APPARATUS

Barney K. Huang, 5108 Kaplan Drive, Raleigh, N.C. 27606

Continuation of Ser. No. 479,618, June 17, 1974, abandoned. This application July 23, 1976, Ser. No. 708,129
Int. Cl.² G01F *11/10*
U.S. Cl. 222—333 **3 Claims**



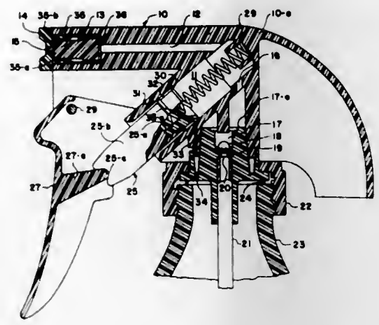
1. A singulating and dispensing apparatus comprising:
(a) a hopper;
(b) a singulating plate slidably mounted within said hopper and generally forming the bottom thereof, said singulating plate having a plurality of receiving openings formed therein;
(c) a buffer structure stationarily mounted within said hopper above said singulating plate;
(d) a transfer plate slidably mounted immediately below said singulating plate, said transfer plate including a plurality of receiving openings spaced apart so as to correspond with the spacing of said receiving openings of said singulating plate such that the receiving openings of said transfer and singulating plates may be aligned;
(e) a stationary dispensing plate disposed below said transfer plate and having receiving openings formed therein that correspond to the spacing of the receiving openings of said transfer plate;
(f) biasing means for biasing said singulating and transfer plates to an initial position where the receiving openings of each are in alignment and offset relative to the receiving openings formed within said stationary dispensing plate;
(g) means for reciprocally sliding said singulating plate back and forth after each transfer from said singulating plate to said dispensing plate; and
(h) control means for selectively shifting said transfer plate from a position where the receiving openings therein are aligned with the receiving openings of said singulating plate to a position where the receiving openings of said transfer plate are in alignment with the receiving openings of said dispensing plate such that a transfer may be made from the receiving openings of said singulating plate to the receiving openings of said dispensing plate, said control means for shifting said transfer plate and said means for reciprocally sliding said singulating plate including a common linkage means operatively connected to and actuated by an electric motor, said common linkage means including means for sliding said transfer plate from its initial position to a second position where the receiving openings thereof align with the receiving openings of said dispensing plate and returning said transfer plate back to said initial position, and wherein said common linkage means is adapted to move said singulating plate from said initial position to a second position in response to said transfer plate being moved back from said second position to said initial position.

4,072,252

HAND OPERATED SPRAYER WITH AUTOMATIC CONTAINER VENT

Emile B. Steyns, Helmond, Netherlands, and Jerry H. Miller, Miami Lakes, Fla., assignors to The AFA Corporation, Miami Lakes, Fla.

Continuation-in-part of Ser. No. 656,547, Feb. 9, 1976, abandoned. This application June 7, 1976, Ser. No. 693,383
Int. Cl.² B67D *5/40*
U.S. Cl. 222—341 **22 Claims**



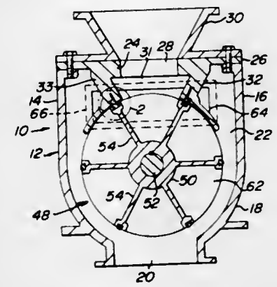
1. A manually operated liquid dispenser adapted to be attached to a container holding a liquid to be dispensed comprising
a. component retaining body means, the bulk of which is located outside of said container when attached thereto,
b. an outwardly opening bore defined within the interior of the component retaining body means,
c. a piston shiftable within the bore and bounding a variable compartment with said bore,
d. inlet and outlet means disposed within the component retaining body means for delivering liquid into and out of the compartment bounded by the piston and bore,
e. operating means, including a trigger normally actuated by the application of substantially horizontal force by the fingers thereto, for shifting the piston within the bore between a normal, non-pumping position and a pumping position,
f. venting means extending through the body means and opening, at one end, into the bore, and
g. a single unit providing seal means for the venting means, the seal means and the compartment, in normal non-pumping position, preventing communication to the ambient air from the venting means and the compartment, thereby forming a positive closure for the container, the seal means in pumping position permitting free communication between the venting means and the ambient air.

4,072,253

ROTARY FEEDER

Thomas Walters, Jr., Primos, Pa., assignor to Ecolaire Incorporated, Philadelphia, Pa.

Filed Jan. 26, 1976, Ser. No. 652,351
Int. Cl.² G01F *11/10*
U.S. Cl. 222—368 **12 Claims**



8. A rotary feeder for feeding abrasive material at temperatures up to about 2300° F. comprising a housing having an inlet and an outlet, a stator having an arcuate surface within said housing, a rotor in said housing for moving material from said inlet to said outlet, said rotor having a plurality of blades, the periphery of each blade being positionable by rotation of the rotor so as to be juxtaposed to said arcuate surface on said stator, a drive shaft for said rotor, said drive shaft extending through an end wall of said housing for connection to a drive motor, the improvement comprising the terminal end portion of each blade having a recess receiving a high temperature refractory insert with a surface of the insert being exposed, said arcuate surface on said stator having a pair of spaced parallel recesses, each of the stator recesses receiving a high temperature refractory insert with an exposed surface on the stator insert juxtaposed to the exposed surface on one of the blade inserts, each of the inserts having a transverse dimension greater than the transverse dimension of its exposed surface.

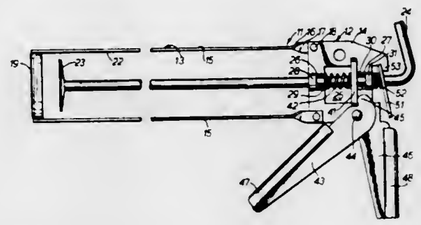
4,072,254

DISPENSING GUNS

John Patrick Anthony Cox, Eddington, England, assignor to P.C. Cox (Mastic Appliances) Limited, Newbury, England

Filed July 7, 1976, Ser. No. 703,262
Int. Cl.² G01F *11/00*
U.S. Cl. 222—391 **6 Claims**

1. A dispensing gun for dispensing viscous material from a generally cylindrical cartridge, the gun comprising:
a generally plate-like stock formed from sheet metal;
a cartridge holder projecting from one edge of said stock;
a rod mounted in said stock by being engaged on one side by a first bridge bounded by edges generally perpendicular to the axis of the rod and by ends which merge into the remainder of said stock and being engaged on the side opposite to said one side by two other bridges, each bounded by edges generally perpendicular to the axis of the rod and by ends which merge into the remainder of said stock, said three bridges being spaced longitudinally along said rod with said first bridge between said two other bridges, said first bridge being displaced from the general plane of the stock in one direction and said two other bridges being displaced from the general plane of the stock in the opposite direction, whereby the rod is



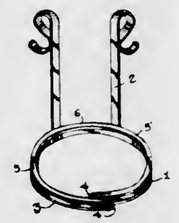
movable longitudinally of itself with its axis extending substantially in or parallel with the plane of said stock; and means for advancing said rod longitudinally of itself.

4,072,255

DEVICE FOR APPLYING OR REMOVING SUPPORT STOCKINGS

Alissa Pam Bogorad, 120 E. 34th St., New York, N.Y. 10016

Filed May 11, 1977, Ser. No. 795,959
Int. Cl.² A47J *51/06*
U.S. Cl. 223—111 **2 Claims**



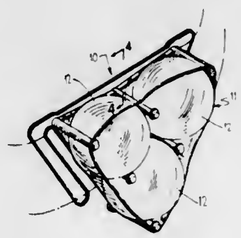
1. A device for applying or removing anti-embolism support stockings comprising
a circular-like band of flexible, polymer impregnated fabric having free ends in close, overlapping relationship whereby the dimensions of the band may be adjusted as desired,
a pair of handles made of said fabric and secured to said band on the side opposite to said overlapping ends,
and separate protective means secured to all fully exposed edges of said band.

4,072,256

GAME BALL HOLDER

Daniel L. Young, 3250 Plumas St. No. 116, Reno, Nev. 89509

Filed June 1, 1976, Ser. No. 691,791
Int. Cl.² A63B *49/00*
U.S. Cl. 224—5 D **12 Claims**



1. A portable device capable of holding a plurality of balls, said device comprising:

a unitary substantially flat base member having a facing surface, a reverse surface, a plurality of elongate projections extending from said facing surface in a direction substantially normal thereto and each terminating in a distal end having an enlarged portion for clenching a ball,

said plurality of projections including a first sub-plurality of projections, each located at a different apex of a first isosceles triangle, and a second sub-plurality of projections located within the perimeter of said first isosceles triangle, each located at a different apex of a second isosceles triangle, each of said second sub-plurality of projections being substantially equi-distant from a pair of adjacent projections of said first sub-plurality, the linear distance between any two of said second sub-plurality of projections being less than the linear distance between the mid-points of each line joining a pair of said projections of said first sub-plurality,

each of said projections of said first sub-plurality and the two of said projections of said second sub-plurality in closest proximity being arranged at points on one of a plurality of circles in a plane parallel to said facing surface, each one of said circles having a radius substantially equal to the radius of a ball, each of said projections of said second sub-plurality being arranged at a point on two of said circles,

a plurality of pairs of reinforcement rib portions extending along said facing surface with each of said pairs associated to a different one of said projections of said first sub-plurality, each one of said rib portions of a given pair extending between the associated projection of said first sub-plurality and a different one of the two projections of said second sub-plurality in closest proximity to said associated projection, and

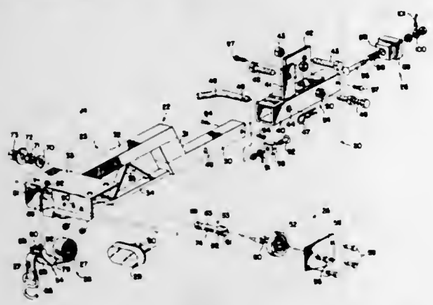
means for attaching said device to a carrying member.

4,072,257

LOAD CARRYING APPARATUS

Robert Eugene Hall, 4187 Mogadore Road, Kent, Ohio 44240

Filed Feb. 17, 1976, Ser. No. 658,409
Int. Cl.² B60R *9/10*
U.S. Cl. 224—29 R **8 Claims**



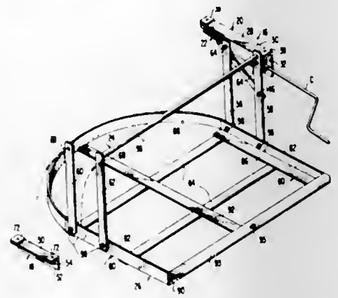
1. A load carrying apparatus selectively attachable to a vehicle for carrying a load on a platform, said apparatus comprising a pair of transversely spaced, longitudinally extending struts carrying said platform, each said strut having an inner portion adapted to be secured to said vehicle by telescopic insertion into a bracket secured to the underside of said vehicle, each said strut being a stepped biplanar element wherein said inner strut portion is longitudinally extending and carries an upwardly directed pedestal portion supporting a longitudinally extending outer portion each said outer strut portion being adapted for mounting said platform thereon, the longitudinal extent of said pedestal portion being substantially twice the transverse cross-section of either the adjacent outer end of said inner strut portion or the adjacent inner end of said outer strut portion, and a longitudinal truss element extends below said outer strut portion from the outer end thereof to said outer end of said inner strut portion, each said truss element comprising a substantially horizontally oriented inner portion and an upwardly inclined outer portion, whereby the under surface of said truss element also functions as a protective rail or skid causing said apparatus to ride up or over a low lying obstacle unintentionally encountered when said vehicle is moving.

4,072,258

RETRACTABLE UNITARY COMPACT SPARE TIRE CARRIER ASSEMBLY FOR UNDERBODY MOUNTING TO A PICKUP TRUCK OR THE LIKE

Doyle D. Cruson, 10713 Hawn Freeway, Dallas, Tex. 75217

Filed Mar. 22, 1976, Ser. No. 668,997
Int. Cl.² B62D *43/04*
U.S. Cl. 224—42.21 **2 Claims**



1. A compact, retractable screw driven spare tire carrier assembly for underbody mounting to a pickup truck or the like, said truck having laterally opposed chassis frame members on respective sides thereof, said assembly comprising: first and second mounting brackets mounted to the underside of respective frame members in laterally opposed positions, said first bracket being of inverted U-shape including inner and outer vertical bracket sidewalls, said second bracket being of inverted L-shape and including a vertical bracket wall corresponding to one of said inner and outer vertical sidewalls of said inverted U-shaped bracket, a flat tire carrier rack comprising laterally spaced upstanding sidewalls at positions underlying vertical sidewalls of respective brackets, laterally opposed pairs of hanger arms, including generally equal length forward and rear hanger arms, each arm being pivoted at one end to a respective bracket vertical wall and to a corresponding carrier rack sidewall to maintain the carrier rack in horizontal position and to define a parallelogram support for said rack, a screw drive mechanism mounted to said first bracket between said inner and outer vertical bracket sidewalls, said first bracket having its outer vertical sidewall extending longitudinally forwardly beyond the inner vertical bracket sidewall, one pair of hanger arms being pivotally coupled at their upper ends respectively to said first bracket inner vertical sidewall at respective ends thereof, said screw drive mechanism comprising an elongated, C-shaped nut guide member, and elongated screw mounted for rotation about its axis within said C-shaped nut guide member with said C-shaped nut guide member having an open side facing away from the first bracket outer vertical sidewall, said screw comprising a threaded shaft rotably mounted at respective ends of said C-shaped guide member, a nut threadably mounted on said screw and being of cubic form and restrained on three faces by contact with right angle walls of said C-shaped guide member and to thereby prevent rotation of the nut and to cause said nut to translate along the screw axis as the screw rotates, an elongated drive lever pivotally coupled at one end to the exposed laterally inside face of said nut at the other end to the adjacent rear hanger arm longitudinally rearwardly beyond the end of said guide member and means for fixedly mounting the respective ends of the guide member to the first bracket outer vertical sidewall facing said first bracket inner sidewall at respective locations both forwardly and rearwardly of the adjacent forward hanger arm

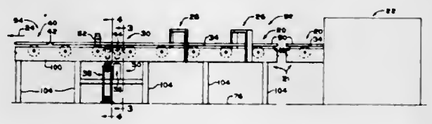
such that said inverted U-shaped first bracket shields said screw mechanism from excessive amounts of dirt and crud and protects that mechanism mechanically against damage during vehicle operation, whereby the rotation of the screw in one direction causes the carrier rack and spare tire to be lifted vertically and retracted beneath the vehicle chassis between the truck underbody and in the other direction to lower the carrier rack and the spare tire and to partially extend the rack and spare tire rearwardly, while maintaining the carrier rack and space tire horizontal during such movement.

4,072,259

METHOD OF AND APPARATUS FOR OPENING SCORES IN A GLASS SHEET

Sanford M. Welton, Mount Holly Springs, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 25, 1977, Ser. No. 772,363
Int. Cl.² B26F *3/00*
U.S. Cl. 225—2 **19 Claims**



1. In a method of severing a glass sheet having two opposed edges in compression relative to center of the glass sheet, wherein the method includes the steps of scoring the sheet between the opposed edges in compression with a score along an intended path of cut, and applying a bending moment at a first position about the score to sever the glass sheet, the improvement comprising:

applying tension to the glass sheet adjacent at least a one of the edges in compression at a second position spaced from the first position; while

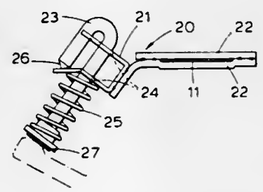
practicing the step of applying a bending moment about the score.

4,072,260

APPARATUS FOR TRANSPORTING AN ELONGATE PIECE OF MATERIAL

Michael David Dove, Cambridgeshire, England, assignor to Wainco Products Limited, England

Filed Oct. 1, 1976, Ser. No. 728,765
Claims priority, application United Kingdom, Jan. 5, 1976, 134/76
Int. Cl.² B65H *5/14, 17/34*
U.S. Cl. 226—173 **6 Claims**



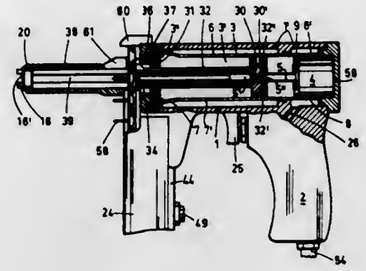
6. An apparatus for transporting an elongate piece of material along a predetermined path comprising a flexible endless belt, a plurality of spaced clips secured to the belt, each engaging a lateral edge region of the material, guide means for guiding the belt along the predetermined path, drive means for applying drive to the belt, each clip including spring means to bias it to a material-engaging position, the material-engaging means being movable by said spring means in a direction to define an obtuse angle with the plane of flexible belt.

4,072,261

PISTOL APPARATUS FOR DRIVING TACKS, NAILS AND THE LIKE INTO MATERIAL

Knut M. A. Livio, Varese, Italy, assignor to Intertack Anstalt, Vaduz, Liechtenstein

Continuation-in-part of Ser. No. 593,459, July 7, 1975, abandoned. This application Nov. 16, 1976, Ser. No. 742,507
Claims priority, application Switzerland, July 22, 1974, 10029/74; May 29, 1975, 6949/75
Int. Cl.² B25C *1/04*
U.S. Cl. 227—130 **7 Claims**



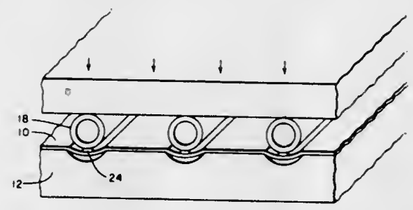
1. Pistol apparatus for driving in tacks, comprising in combination a magazine adapted to receive at least one set of tacks arranged with their stems parallel and attached to one another indirectly by means of a strip of detachably interconnected cylindrical casings each holding a tack, the pistol comprising a barrel having a bore which has the same internal diameter as the external diameter of the casings, plunger means reciprocable in the barrel means to apply compressed air to the plunger means to reciprocate the plunger means relative to the barrel to detach a casing and its tack from the set and to cause both to advance through the bore and to detach the tack from the casing and to drive in the stem of the tack into material to be tacked, means on the plunger means to retract the empty casing to a position in line with said strip, means to feed the strip into the path of said plunger means whereby the advancing strip pushes said empty casing to a position out of alignment with said barrel, and a protuberance on the plunger means to contact and expel the empty casing of the tack previously driven upon advance of the plunger means to drive the next tack.

4,072,262

METHOD OF FABRICATING A SOLAR HEATING UNIT

Joseph A. Godrick, Wellesley, and Joseph Leo Sliney, Lexington, both of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Apr. 4, 1977, Ser. No. 784,239
Int. Cl.² B21D *39/00*; B23K *31/02*; F24J *3/02*
U.S. Cl. 228—265 **8 Claims**



1. A process of fabricating a solar heating unit for heating fluids comprising the steps of

a. placing a thin, soft, annealed sheet having a good thermal conductivity characteristic in an abutting relation to a grooved surface of a self-supporting, thermally conduc-

tive planar plate, the sheet being between one-eight hard and fully annealed,

b. assembling a plurality of cylindrical elongated hard drawn tubular elements in a spaced apart planar relation, the spacing between said elements equal to the spacing between said grooves, and the contour of said grooves substantially conforming to an attachment portion of the contour of said cylindrical elements,

c. connecting headers in a fluid-tight connection to the assembled elements to provide fluid flow paths between said headers and through said elements,

d. applying a thermally conductive paste adhesive along said attachment portion of the elements,

e. positioning said assembled elements in an aligned relation to the grooves in said plate with said attachment portion abutting said thin sheet, and

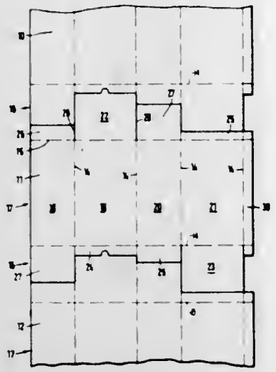
f. pressing said elements against said sheet with sufficient pressure and temperature to creep form said sheet around said attachment portion of said elements, and to simultaneously melt said paste adhesive to thereby provide a good thermally conductive metallurgical bond between the elements and the sheet.

4,072,263

PACK AND BLANK FOR MAKING THE PACK AND WEB OF PACKING MATERIAL FOR MAKING THE BLANKS

Heinz Focke, Verden, Germany, assignor to Focke & Pfuhl, Verden, Germany

Filed Nov. 23, 1976, Ser. No. 744,359
Claims priority, application Germany, Jan. 12, 1976, 2600822
Int. Cl.² B65D *5/02*
U.S. Cl. 229—37 R **6 Claims**



1. In an oblong pack for holding contents conforming to the pack configuration, said pack consisting of a folded blank, said pack having opposed sidewalls and end walls, said end walls comprising end flaps folded against the contents end face, the improvement wherein:

at each end, said end flaps are rectangular and at least partially of unequal length,

only a portion of the end flaps of opposite sidewalls cover one another in the folded condition;

end flaps of a common sidewall constitute outer cover flaps for covering the whole end face of respective ends of said pack, and

the corresponding opposed sidewall includes flaps at both ends constituting narrow connecting strips to thereby permit closing of the pack ends by finally folding the cover flaps over the other end flaps about said common sidewall,

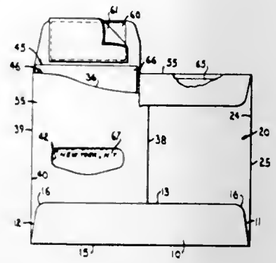
and wherein tooth engagement occurs for the end flaps of said blank with adjacent blanks of a web during blank formation so that the blank may be parted substantially free from waste from a web or the like in forming the pack.

4,072,264

DUPLEX MAILING ENVELOPE

Richard Kranz, Prairie Village, Kans., assignor to Tension Envelope Corporation, Kansas City, Mo.

Filed Mar. 14, 1977, Ser. No. 778,748
Int. Cl.² B65D *27/08*
U.S. Cl. 229—72 **7 Claims**



1. In a mailing envelope having a front and a back superimposed panels forming a first pocket adapted for receiving an enclosure therein, said first pocket having side edges and at least one free end defining a mouth providing access thereinto, the improvement of:

(a) a mouth closure flap having an inner edge and an outer edge, said inner edge having connection with said first pocket one free edge along a fold line;

(b) a perforated line extending from said flap inner edge to said flap outer edge, and laterally dividing said closure flap into two mutually separable portions;

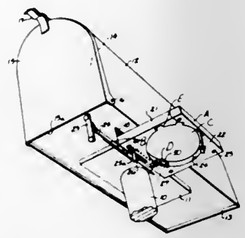
(c) said closure flap portions each having adhesive thereon for sealing contact with one of said panels, only one of said closure flap portions having a release strip covering the adhesive thereon.

4,072,265

SIGNALING DEVICE FOR MAILBOXES

Richard S. Jones, 125 Markboro Drive, Greenville, S.C. 29605

Filed May 6, 1977, Ser. No. 794,381
Int. Cl.² A47G *29/12*
U.S. Cl. 232—35 **3 Claims**



1. A signaling device for use with free standing rural mailboxes, having an open-ended mail receiving compartment and a closure therefor pivoted adjacent a lower end thereof adjacent a lower edge of said compartment for downward pivotal movement of said closure exposing said open end for reception of mail when opened by a postman comprising:

a housing carried adjacent a lower intermediate edge portion of said mail receiving compartment;

a plunger slidably carried by said housing spring biased rearwardly toward said closure having an operator normally adjacent a lower edge of said closure but movable forwardly responsive to downward movement of said closure;

a flag normally carried by said housing in retracted position but pivotable downwardly adjacent one edge thereof; and

a catch member carried by said plunger engagable with said flag maintaining the flag in retracted position when said operator is normally positioned adjacent a lower edge of said closure but releasable therefrom when said operator is moved forwardly;

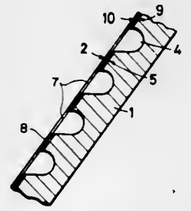
whereby the flag pivots downwardly into signaling position upon opening of said closure by the postman.

4,072,266

CENTRIFUGE, ESPECIALLY FOR THE SUGAR INDUSTRY

Walter Dietzel, Braunschweig, Germany, assignor to Braunschweigische Maschinenbauanstalt, Braunschweig, Germany

Filed May 27, 1976, Ser. No. 690,536
Claims priority, application Germany, June 19, 1975, 2527227; June 19, 1975, 7519445[U]
Int. Cl.² B04B *15/06*
U.S. Cl. 233—2 **14 Claims**



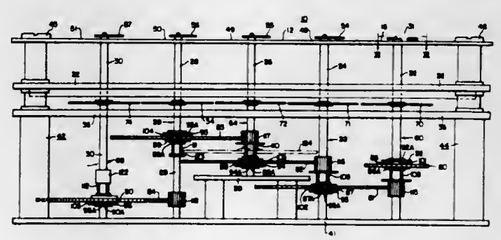
1. In a centrifuge having a rotatable means with liquid flow-off path means on the radially inner surface thereof, and a screen positioned in contact against the radially inner surface of said rotatable means, the improvement comprising a plurality of first roughened surface means on a portion of the radially outwardly facing surface of said screen and a like plurality of second roughened surface means on a corresponding radially inner surface portion of said rotatable means, said first and second roughened surface means contacting each other in a locking manner, thereby providing a frictional resistance under the influence of the centrifugal force, said frictional resistance holding the screen in place substantially uniformly over the entire surface of the screen, whereby relative movement between the screen and the rotatable means is substantially inhibited.

4,072,267

METER ENCODING REGISTER HAVING AN IMPROVED POINTER SHAFT ASSEMBLY

Eugene C. Benbow, Raleigh, N.C., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 23, 1976, Ser. No. 669,547
Int. Cl.² G06C *27/00*
U.S. Cl. 235—112 **4 Claims**



1. A plural dial meter encoding register for a utility meter having a rotating metering movement and including plural pointer shaft assemblies each associated with a separate register dial wherein said plural pointer shaft assemblies comprise:

plural shaft members each having a forward end carrying a pointer for an associated register dial;

plural code patterns each carried in a fixed relationship on a separate shaft member in a fixed encoding relationship with a pointer of the same shaft member;

plural input gears each mounted for rotational and axial movements on a separate one of said plural shaft members, and plural output gears fixedly attached to each of said plural shaft members excepting a last one of the shaft members for continuously meshing with said input gears during the rotational and axial movements thereof, said input and output gears rotationally and progressively interconnecting said plural shaft members with said metering movement for concurrently rotating said plural shaft members at different predetermined rates of rotation in response to rotation of said metering movement;

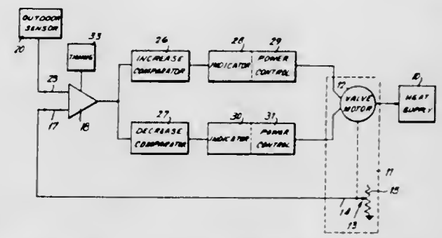
plural clutch members each including a driving portion and a driven portion, each of said driven portions being fixedly mounted to an associated shaft member, each of said driving portions carried on one of said plural input gears, said driving and driven portions having releasably engaging torque transmitting surfaces for coupling and uncoupling rotational movement therebetween when said input gears are axially shifted toward and away from the clutch driven portions respectively, and when the torque on one of the clutch portions is less than and more than a predetermined torque limit, respectively, such that the maximum torque applied from said metering movement during the measuring operation thereof is less than said predetermined torque limit, and further such that an externally applied torque on one of said plural shaft members in excess of said predetermined torque limit effects rotation of the one shaft member and the associated code pattern and pointer independently of any other of said plural shaft members.

4,072,268

HEATING CONTROL SYSTEM

James Perris, Bloomfield, N.J., assignor to The James Perris Co., Inc., Bloomfield, N.J.

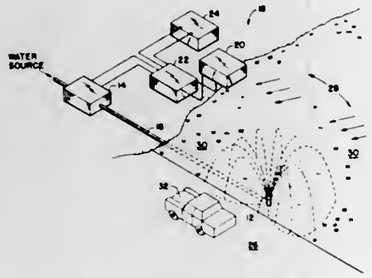
Filed Apr. 14, 1976, Ser. No. 676,789
Int. Cl.² G05B *11/06*
U.S. Cl. 236—78 C **15 Claims**



1. A heating control system for automatically controlling the temperature within a space comprising in combination; temperature sensing means for detecting changes in temperature without the space and in response thereto, producing a control signal having a substantially linearly variable potential, the increase or decrease in potential being linearly varied in response to changes in temperature without the space; heat supply means for supplying heat to the space at a set rate including control valve means adapted to be selectively opened to increase the set rate at which heat is supplied to the space and selectively closed to decrease the set rate at which heat is supplied to the space; rheostat means including a movable contact means coupled to said control valve means and disposably controlled thereby to produce a reference feedback signal having a linearly variable potential, said potential being

linearly varied in response to the selective opening and closing of said control valve; comparator means for comparing the potential of said variable control signal to the potential of said variable reference feedback signal, said comparator means in response to the potential of said variable control signal being greater than the potential of said variable reference signal being adapted to apply a closing signal to said control valve means to effect decreasing of the rate at which same supplies heat to the space, said comparator means being further adapted in response to the potential of said control signal being less than said reference potential to apply an opening signal to said control valve means to effect an increase in the set rate at which heat is supplied to the space.

4,072,269
INHIBITING SPRAY DISPERSION: METHOD AND APPARATUS
Philip R. Berg, 1028 Century Drive, Napa, Calif. 94558
Filed Aug. 5, 1976, Ser. No. 711,939
Int. Cl.² B05B *17/04*
U.S. Cl. 239—1 **12 Claims**



1. A method of regulating the state of wind sensitive means and especially under gusty wind conditions, said means having a first operating state and a second operating state, said method comprising the steps of:

continuously sensing wind speed at a preselected location relative to a preselected wind speed threshold level;

during said first operating state, switching the state of said wind sensitive means only after at least a first minimum period during which wind speed continuously exceeds said threshold level and further inhibiting such state switching for a further variable length period proportional to the percentage of time during which wind speed does not exceed said threshold level; and

during said second operating state, switching the state of said wind sensitive means only after at least a second minimum period during which wind speed continuously falls short of said threshold level, and further inhibiting such state switching for a further variable length period proportional to the percentage of time during which wind speed exceeds said threshold level,

for maximizing the duration of operation in each of said operating states in proportion to variation in wind conditions relative to said wind speed threshold level.

4,072,270
SHOWER HEAD AERATOR
Richard C. Harmony, Tucson, Ariz., assignor to Harmony Emitter Company, Inc., Tucson, Ariz.
Filed Aug. 23, 1976, Ser. No. 716,588
Int. Cl.² E03C *1/084*
U.S. Cl. 239—428.5 **4 Claims**

1. A shower head apparatus for mixing ambient air with water flowing from a source of water under pressure, said apparatus comprising in combination:

a. a cylindrically shaped hollow aerator having an internal concentrically located water outlet in fluid communication with the source of water for introducing air into the water flowing through said aerator, said aerator comprising:

i. at least one inlet for receiving ambient air;

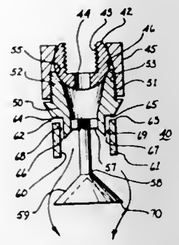
ii. at least one outlet for discharging ambient air into said aerator;

iii. a passageway for interconnecting said inlet and said outlet;

iv. an open ended chamber in communication with each said air outlet and the water outlet for receiving and turbulating both air and water;

v. a further outlet disposed at the downstream open end of said chamber for discharging the water and air flowing into said chamber;

b. cone shaped deflector means for radially deflecting the air and water discharged from said further outlet adjacent the



surface of said cone shaped deflector and developing a converging circular shroud of water and air mixture downstream of said cone shaped deflector means; and

c. a stud extending from a point within said aerator through said chamber to a point downstream of said discharge outlet for supporting the apex of said cone shaped deflector means, said stud being concentrically located with respect to the longitudinal axis of said chamber to position the apex of said cone shaped deflector means at the center of the discharged mixture of air and water;

d. a retainer disposed within said aerator for securing said stud concentric with said aerator;

whereby, the water mixes with the air within said chamber and during subsequent impingement of the flow of water and air discharged from said chamber upon said deflector and is radially distributed along the surface of said cone shaped deflector.

4,072,271
SELF-CLEANING BALL VALVE
Hubert E. Voss, and Ronald W. Roth, both of Picacho, Ariz., assignors to Irrigation Engineering & Specialties, Picacho, Ariz.
Filed Oct. 12, 1972, Ser. No. 296,958
Int. Cl.² B05B *1/32*
U.S. Cl. 239—541 **2 Claims**

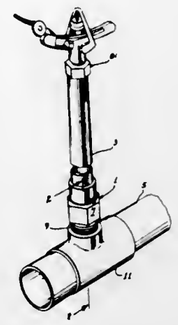
1. In an irrigation pipe system, the improvements operatively associated therewith comprising a riser, a sprinkler head having an aqueduct of predetermined cross section, and a ball valve for controlling the outward flow of water through said system comprising:

a ball valve chamber remote from said sprinkler head;

a throat communicating with and conducting away from the outlet port of said valve chamber;

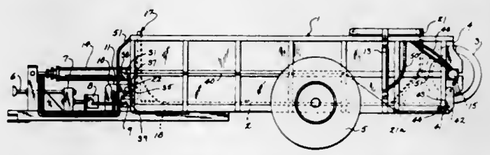
a valve trigger comprising a hollow tube sized to closely fit the inside of said throat, said tube having at one end longitudinally projecting spaced fingers such that when said trigger is inserted in said throat said fingers engage the ball and push it away from its seat, the fingers and ball in cooperation forming apertures individually smaller in cross section than said aqueduct in said sprinkler head to strain particles larger than said aqueduct, said trigger

having an open end whereby upon being removed from said throat the spaces between said fingers are cleaned by



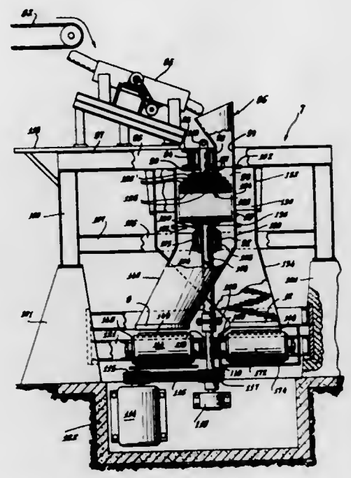
the flow of water therethrough, and means for releasably connecting said trigger in open valve position.

4,072,272
MULTI-PURPOSE SPREADER
Dane Jay Harder, Stratford, Wis., assignor to Harco Products, Inc., Stratford, Wis.
Filed Sept. 3, 1976, Ser. No. 720,354
Int. Cl.² A01C *15/16*
U.S. Cl. 239—676 **5 Claims**



1. A farm material spreader adapted to be mechanically actuated from a power take off of a powered vehicle, which comprises a wagon box having a floor, a frame and confining walls on the front and sides secured to the frame, an upright push gate normally located at the forward end of the wagon box, an end gate pivoted at the rear end of the box to normally seal off the rear end of the spreader, a hydraulic system contained entirely on the spreader including a double acting multistage hydraulic cylinder directly connected to the push gate and adapted to reciprocate the push gate back and forth within the box to move the contents of the box to the rear of the box for discharge therefrom, a second hydraulic cylinder connected to the end gate and adapted to raise and lower the end gate, a beater secured to the box at the rear, a hydraulic motor connected to the beater to rotate the latter, a network of tubing to carry hydraulic fluid to the respective cylinders and to the hydraulic motor, a reservoir for the fluid, a filter, a pump to actuate the fluid, a control valve adapted to control the flow of fluid in the system, and when the pump is set in operation by manual actuation of the control valve and the power take off hydraulic fluid flows through the tubing to supply the fluid to the respective cylinders to automatically actuate the same in a synchronized manner whereby the end gate is pivoted upwardly to a position removed from the push gate when the latter completes its stroke at the rear of the spreader, and the hydraulic motor is simultaneoudly actuated to hydraulically rotate the beater.

4,072,273
PROCESS FOR DRY RECOVERY OF MATERIALS FROM SOLID REFUSE
Haigh McDiarmid Reiniger, Darien, Conn., assignor to Southeast SBIC, Inc., Miami, Fla.
Division of Ser. No. 427,301, Jan. 7, 1974, abandoned, which is a continuation-in-part of Ser. No. 323,147, Jan. 12, 1973, abandoned, which is a continuation of Ser. No. 818,219, April 22, 1969, abandoned. This application Dec. 17, 1976, Ser. No. 752,216
Int. Cl.² B02C *23/14*
U.S. Cl. 241—24 **5 Claims**



1. A method for the treatment of solid municipal garbage and trash for making useful products therefrom, including the recovery and restoration of distinct products which are 100 percent recycled from the garbage and trash, said method comprising the steps of:

(A) preparing a feedstock of solid municipal garbage and trash, said feedstock further essentially comprising dried paper, plastic film, glass, ceramics, grit, non-ferrous metals, hard plastics, and cellulosic garbage and plant materials, whereby said solid municipal garbage and trash is comprised of pieces in the range of approximately one-half to six inches in size, wherein further the moisture content is reduced to a range from **20%** to **50%** of the oven-dried basis weight of the solids comprising said feedstock, and

(B) directly inputting said feedstock into an attrition classification machine, wherein said feedstock is separated into two classified streams, as the result of the following steps:

(i) downwardly impelling said feedstock into an attrition classification zone, said zone being defined by the region between a rotor means having a plurality of cutting elements projecting therefrom and a screen means positioned around said rotor means and having a plurality of openings therein, wherein said attrition classification zone applies a severe cutting, abrading, and thrashing action to said feedstock while propelling and intensely scrubbing said feedstock along the inner surface of said screen means, whereby said attrition step loosens and rejects through said screen openings the loose, soft, decayed and disintegratable matter contained in said feedstock, while also performing the step of ballistically driving through said openings the high density particles of glass, ceramics, grit, non-ferrous metal and hard plastics present in said feedstock as a first classified stream while; propelling fibrous constituents through said attrition classification zone, and along the inner surface of said screen, so as to apply a simultaneous severe chopping, cutting, scrubbing, scraping, and

thrashing action upon fibrous constituents of said feedstock, and impelling said fibrous constitutents as machine cleaned confetti thrashed paper, together with any chopped plastic film and light weight particles not passing through the openings of said screen, downwardly as a second classified stream; and

(C) directly conveying said first classified stream to an air classification means, while subjecting said first classified stream to an air drying step previous to a gravity separation step which further includes a forced air flow, wherein said first classified stream is thereby separated into lighter fractions of fiberized fuel, carried off by said forced air flow, and heavier fractions of aggregate materials and;

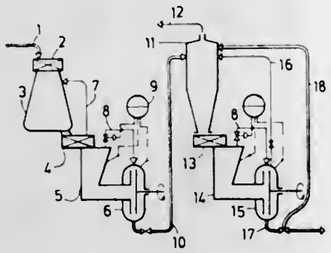
(D) directly conveying said second classified stream to a separate air classification means, while subjecting said second classified stream to an air drying step previous to a ballistic separation step, which further includes a forced air flow, wherein light weight airborne confetti paper and airborne plastic film particles are separated, by said forced air flow, from heavier aggregate constituents present in the second classified stream.

4,072,274

PROCEDURE AND APPARATUS FOR PREPARING HOT GROUNDWOOD

Ahti Syrjanen, Valkeakoski, Finland, assignor to Yhtyneet Paperitehtaat Osakeyhtio Jylhavaara, Valkeakoski, Finland

Filed Feb. 8, 1977, Ser. No. 766,776
Int. Cl.² B27L *11/08*
U.S. Cl. 241—28 **5 Claims**



1. In a process for preparing hot groundwood from wood chips, wherein a chip stream is conducted into a pressurized steaming chamber, where the chips stay a few minutes and are heated to a temperature higher than 100° C, and from the steaming chamber is conducted through a sluice feeder into a hot stage I grinder of enclosed construction, whence the preground groundwood is conducted through a separating cyclone into a stage II grinder, and the groundwood from the stage II grinder is conducted towards further treatment steps, the improvement which comprises the step of conducting the pre-ground groundwood from the steam separating cyclone through a sluice feeder into a hot stage II grinder of enclosed construction and conducting steam generated by the stage II grinder into the steam separating cyclone.

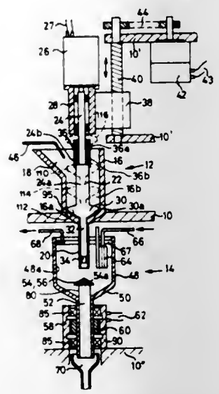
4,072,275

SAMPLE PREPARATION DEVICE

Hermann Bartels, Binningen; Werner Schürmann, Greifensee, and Max Sigg, Weisslingen, all of Switzerland, assignors to Mettler Instruments AG, Greifensee, Switzerland

Filed Oct. 18, 1976, Ser. No. 732,915
Claims priority, application Switzerland, Dec. 5, 1975, 15839/75
Int. Cl.² B02C *23/36*
U.S. Cl. 241—79 **7 Claims**

1. A sample preparation device comprising a wet mill having a lower discharge opening for discharging crushed wet material from the mill, a continuous flow centrifuge arranged at a lower level than the mill, flow means providing a direct communication between said discharge opening and said centrifuge for the direct transfer of the crushed wet material from the mill into the centrifuge, mill drive means, the mill including a mill casing internally provided with a one-piece crushing member



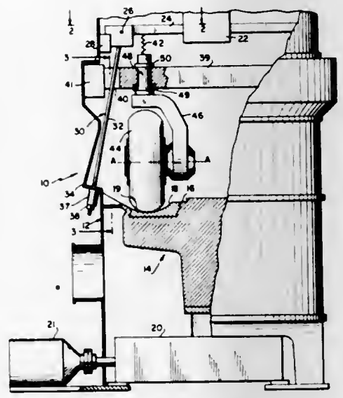
which comprises an upper end portion connected to said mill drive means, a substantially frusto-conical crushing portion, and a lower shaft end portion which is substantially sealingly displaceable in said discharge pipe, and drive means for vertical displacement of the crushing member in said mill casing.

4,072,276

PULVERIZER WITH CASTER ROLLER ASSEMBLY

Chester J. Romanowski, Carteret, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Apr. 7, 1977, Ser. No. 785,394
Int. Cl.² B02C *15/04*
U.S. Cl. 241—117 **8 Claims**



1. Apparatus for pulverizing material including hard material into comminuted particles comprising a housing, a rotatable table mounted within said housing, a grinding ring mounted on said table and defining a circumferential path on said table, means for rotating said table, means for introducing said material into said housing in contact with said grinding ring, at least three rollers disposed in said housing, means for mounting said rollers in said housing for rotation about respective axes of rotation, said mounting means including a supporting ring disposed above said roller, a plurality of brackets, each of said rollers being mounted on a respective one of said brackets, and a plurality of shafts, each one of said shafts being connected between said ring and a respective one of said brackets and defining a swivel axis lying forward of the axis of rotation of its respective roller, and means for absorbing a shock load applied to said roller disposed between said brackets and said mounting ring and adapted to allow said rollers to move about said respective swivel axes.

4,072,277

CUTTER BLADE FOR FOOD PROCESSING

Ludwig Seydelmann, Holderlinstrasse 9, 7 Stuttgart 1, Germany

Filed Oct. 22, 1976, Ser. No. 735,007
Claims priority, application Germany, Nov. 25, 1975, 2552723
Int. Cl.² B02C *18/20*
U.S. Cl. 241—292.1 **8 Claims**



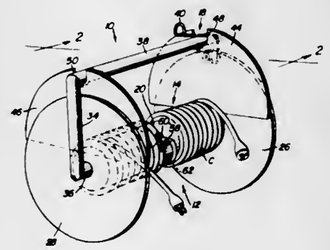
1. A blade for chopping foodstuffs and the like when set in rotation about an axis, comprising a generally flat body with two major surfaces substantially transverse to said axis meeting in a continuous cutting edge leading in the direction of rotation, one of said major surfaces having a marginal zone bounded by said cutting edge, said marginal zone sloping away from the plane of rotation of said cutting edge and merging into at least one flattened land substantially paralleling said plane of rotation, said flattened land terminating at a step rising from said land and forming an ancillary edge inwardly of said cutting edge facing in said direction of rotation.

4,072,278

DROP CORD REEL

Leo D. Petersen, 515 S. Grant Ave., Pocatello, Idaho 83201

Filed Nov. 19, 1976, Ser. No. 743,407
Int. Cl.² B65H *75/40, 75/28*
U.S. Cl. 242—96 **5 Claims**



1. A cord reel, comprising, in combination:

a. spool means including a substantially U-shaped framework, and a spool rotatably mounted on the framework for winding and unwinding a cord; and

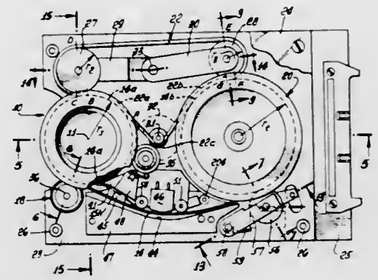
b. rotating means connected to the spool means for rotating the spool, the spool having a pair of spaced ends and a winding surface terminating in and extending between the ends of the spool, a plate mounted on the spool at one of the ends of the spool, and the rotating means including a knob mounted on the plate, the spool having an axis of rotation and the knob being spaced from the axis of rotation so that the plate and knob form a crank for rotating the spool, the spool means further including a further plate similar to the plate on which the knob is mounted and attached to the spool at the other of the ends of the spool, the winding surface, plate and further plate forming an open winding drum, the spool means still further including guides overlapping the plate and further plate and attached to the framework for preventing the cord wound on the winding surface of the spool from rolling over the plates.

4,072,279

BELT DRIVE FOR TAPE TRANSPORT, WITH FLOATING ROTOR DRIVE PRESSURE APPLICATION

Richard A. Lewis, Sherman Oaks, Calif., assignor to Interdyne Company, Van Nuys, Calif.

Filed Apr. 26, 1976, Ser. No. 680,195
Int. Cl.² G11B *15/32, 15/66*
U.S. Cl. 242—192 **16 Claims**



11. In a tape transport assembly, the combination comprising

a. a pair of reels for tape to be transported from a supply roll on one reel to a take-up roll on the other reel,

b. an endless belt located to arcuately engage the tape rolls on the respective reels for rotating the rolls and reels to effect said transport in response to endwise travel of the belt, and

c. support means for the reels and belt, said support means including a frame and belt rollers entraining the belt, the reels supported to freely rotate,

d. said support means including a first arm supporting one belt roller to swing in an arc tending to maintain arcuate engagement of a first section of the belt with the tape roll on one reel during said tape transport,

e. and said support means including a second arm supporting another belt roller to swing in an arc tending to maintain arcuate engagement of a second section of the belt with the tape roll on the other reel during said tape transport,

f. the belt contacting the tape only at said rolls,

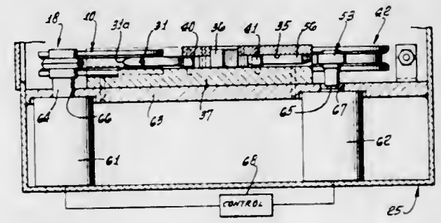
g. said belt rollers located to squeeze the belt between said one belt roller and the tape roll on said one reel, and between said other belt roller and the tape roll on said other reel.

4,072,280

TAPE AND/OR FILM HANDLING MECHANISM

Richard A. Lewis, Sherman Oaks, Calif., assignor to Interdyne Company, Van Nuys, Calif.

Continuation of Ser. No. 563,292, March 31, 1975, abandoned. This application Apr. 29, 1976, Ser. No. 681,467
Int. Cl.² G03B *1/04;* G11B *15/32*
U.S. Cl. 242—195 **32 Claims**



9. In a tape storage unit, the combination comprising

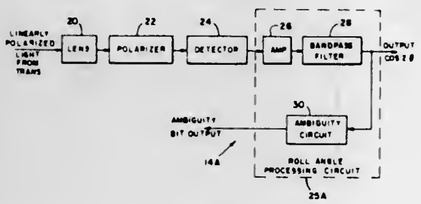
a. a reel having an axis, spaced flanges extending normal to said axis, and a hub about which tape is wound for storage between the flanges,
b. a leader strip connected with the tape, the width of the leader strip being greater than the tape width,
c. the flanges retaining the opposite edges of the leader strip so that the tape becomes protectively confined by the flanges and leader strip,
d. there being multiple rotors at least two of which are in peripheral engagement with said flanges and positioning the reel for rotation,
e. means mounting another of the rotors for movement away from the reel to enable bodily removal of the reel from rotating position and return of the reel to said position, said means also mounting the other rotor for return movement toward the reel in said position,
f. there being a housing for the reel in said position and for said rotors, the housing containing an opening enabling pull out withdrawal of the reel from the housing in a direction generally normal to the reel axis, and said means mounting said other rotor comprising a closure for said opening, the closure carried for movement toward and away from the reel in said position, and in a direction generally normal to the reel axis.

4,072,281

OPTICAL ATTITUDE REFERENCE

Walter E. Miller, Jr., Huntsville; Robert L. Sitton, Tuscumbia, and Anthony D. Blackmon, Huntsville, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 27, 1976, Ser. No. 754,204
Int. Cl.² F42B *15/02*
U.S. Cl. 244—3.16 **7 Claims**



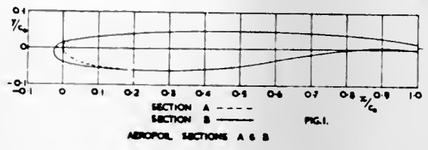
1. Apparatus for providing optical attitude reference for a missile comprising: transmitter means for directing optical energy from a fixed station toward said missile; optical detector means on said missile responsive to optical energy from said transmitter for providing electrical output signals; a prism disposed on said missile adjacent said optical detector means and between said optical detector and said transmitter, said prism having an ordinary ray output and an extraordinary ray output, said prism being disposed for polarizing optical energy from said transmitter prior to said energy being received by said optical detector; said optical detector means comprises first and second detectors disposed to receive said ordinary and extraordinary prism outputs respectively and provide an electronic output signal responsive thereto; first and second amplifiers disposed respectively to receive inputs from said first and second detectors to provide output signals responsive thereto and a differential amplifier coupled to receive said first and second amplifier output signals for providing an output signal; filter means disposed to receive the differential amplifier output for providing an output signal for coupling to indicator or load circuitry; and ambiguity means coupled to the output of said filter means for selectively providing a predetermined output signal; said ambiguity means comprising a limiting amplifier coupled to the output of said differential amplifier, a flip-flop coupled to the output of said limiting amplifier for providing a square wave frequency output at one-half the frequency output of said limiting amplifier, said flip-flop having both an inverted and a non-inverted output; first and second signal channels having inputs coupled respectively to said flip-flop outputs; an OR gate having first and second inputs and an output, said OR gate being coupled to receive output signals from said first and second channels and provide an output signal when said predetermined flip-flop output is present on either channel; each of said channels comprising, in series, a first AND gate, a low pass filter, a comparator, a latching circuit, and a second AND gate, said first AND gate being coupled to respective outputs of said flip-flop and said second AND gate being coupled to provide an input to said OR gate; each of said first AND gates being adapted to receive a reference signal input from an external source; and inhibit means coupled to each of said latching circuits for preventing simultaneous operation of said latches.

4,072,282

SUPERCRITICAL AEROFOILS

John Leslie Fulker, Bedford; David John Hall, Stevenage, and Robert Christopher Lock, West Byfleet, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Mar. 4, 1976, Ser. No. 663,903
Claims priority, application United Kingdom, Mar. 4, 1975, 9017/75
Int. Cl.² B64C *3/14*
U.S. Cl. 244—35 R **3 Claims**



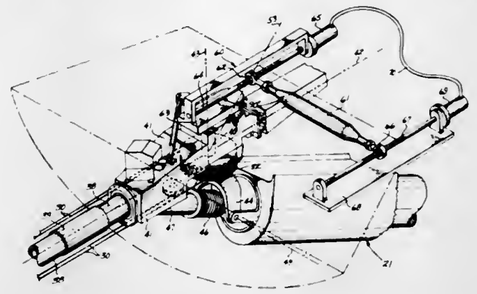
1. A supercritical aerofoil having a leading edge, an upper and a lower surface and a trailing edge and wherein the leading edge is circular with a radius of 2% to 4% chord, the upper surface has a forward transition zone extending from said leading edge to about 20% of the distance along the chord and wherein the upper surface curvature radius increases rapidly from said leading edge radius to one from about 3 to about 5 times the chord, a constant radius zone extending from said forward transition zone for about 0.5 to 0.8 of the chord length and wherein the radius is substantially constant at 3 to 5 times the chord, and a rear zone extending to the trailing edge and wherein the curvature decreases rearwardly; the lower surface has a forward zone extending from the leading edge to a point not less than about 40% and not more than about 55% of the chord the radius of curvature whereof is at least equal to the chord but smaller than said upper surface constant radius zone radius, a curvature transition zone extending from said forward zone to between 55% and 70% of the chord, and a rearward zone extending from the transition zone to about the trailing edge and which is concave and has a mean radius of about equal to the chord, whereby a rear part of the aerofoil is effectively cambered; and said leading edge being a drooped leading edge, and the aerofoil having a thickness/chord ratio of 10% to 14%; whereby in use at supercritical speeds air passing over the upper surface is rapidly accelerated over the leading edge and forward zone to a supersonic speed and decelerated sufficiently before the trailing edge to permit the effective camber of the rear part of the aerofoil to augment the lift and without generating a shock wave sufficiently strong to cause a significant increase in drag, and in use at low speeds sufficient lift is generated for take off and landing on normal length runways.

4,072,283

AERIAL REFUELING BOOM ARTICULATION

Richard Herschel Weiland, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 17, 1976, Ser. No. 751,553
Int. Cl.² B64D *39/00*
U.S. Cl. 244—135 A **13 Claims**



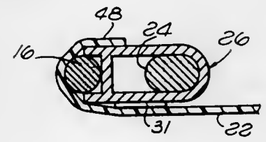
1. Apparatus for attaching a boom to a supply airplane for the aerial transfer of material to a receiver airplane, comprising: a boom housing mounted to support structure of the supply airplane for rotation about a roll axis approximately parallel to the longitudinal axis of the supply airplane; a spindle supported in said housing for rotation about a vertical axis approximately parallel to the yaw axis of the supply airplane; said spindle connectably supporting the boom for rotation about an axis of elevation relative to the receiver airplane, said elevation axis being approximately transverse to the longitudinal axis of the supply airplane; and means interconnected between said spindle and fixed structure of the supply airplane for kinematically producing a geometrically canted azimuth axis which provides a certain amount of boom motion about said roll axis with sideward movement of the boom.

4,072,284

KITE BRACKET

Bennett Arnstein, 3049 W. 8th St., Los Angeles, Calif. 90005

Filed Dec. 27, 1976, Ser. No. 754,111
Int. Cl.² B64C *31/06*
U.S. Cl. 244—153 R **1 Claim**



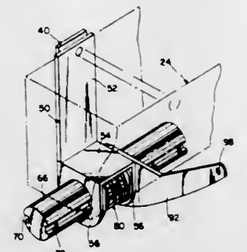
1. I claim a kite structure containing but not limited to the following elements: a main body portion formed from a thin flexible material with two leading edges diverging rearwardly; two wing struts attached to the main body, one adjacent to each leading edge; two brackets attached to the main body, one adjacent to each wing strut; each bracket being a monolithic structure whose shape is the combination of an open channel and a triangular pocket, the side walls of the channel being extended to form the side walls of the triangular pocket which meet and join to form the inboard boundary of the triangular pocket, the base of the channel forming the outboard boundary of the triangular pocket; attaching means for securing said main body to the side wall of said bracket; and further attaching means for holding said leading edge in a folded position over said wing strut whereby said wing strut is nonrigidly held in said open channel.

4,072,285

DUMPABLE RAIN GUTTER SYSTEM

Edward L. Greenwood, 3721 S. Queensgrove Circle, Virginia Beach, Va. 23452

Filed Sept. 1, 1976, Ser. No. 719,401
Int. Cl.² E04D *13/06*
U.S. Cl. 248—48.2 **12 Claims**



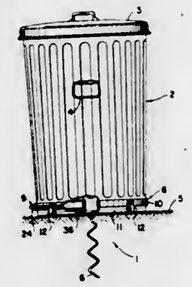
1. A dumpable rain gutter support for normally supporting a rain gutter of the type having a vertical rear wall, a horizontal bottom wall and a front wall in an upright position and allowing the rain gutter to turn downward to be cleaned, comprising:
a mounting bracket adapted to be secured to the facia or trim board of a building;
a gutter bracket adapted to be secured to the gutter, said gutter bracket including a vertical portion located behind and secured to the rear wall of the gutter and a horizontal ledge disposed beneath the gutter to support the bottom wall thereof;
a first pair of spaced vertical flanges on said mounting bracket, each flange being provided with an opening in horizontal alignment with the opening in the other flange;
a second pair of spaced vertical flanges extending downward from said horizontal ledge of said gutter bracket, each flange being provided with an opening in horizontal alignment with the opening in the other flange;
a pivot rod received in the openings of said first and second flanges for pivotally connecting said mounting bracket and said gutter bracket together; and
resilient bias means for normally maintaining said gutter bracket upright and allowing said gutter bracket to pivot downward to permit the gutter to be cleaned.

4,072,286

GARBAGE CAN SUPPORT

William S. Foncannon, P.O. Box 123, Mullinville, Kans. 67109

Continuation-in-part of Ser. No. 622,772, Oct. 15, 1975, abandoned. This application Sept. 17, 1976, Ser. No. 724,737
Int. Cl.² A47G *23/02*
U.S. Cl. 248—154 **3 Claims**



1. A garbage can support comprising:
a. a generally horizontally disposed base having a plurality

of radially extending, substantially flat arms with circumferentially spaced outer ends;

b. a plurality of clips each having a base and an upstanding leg attached thereto; each of said clip bases being elongate, and having a downwardly disposed C-shaped channel wherein a different one of said arms is positioned for sliding, longitudinal translation thereon; each of said clip legs having a transverse opening therethrough;

c. a normally arcuate band member positioned slidably within each of the openings of said legs for connection therewith; said band member being supported above said arms by said clips whereby said elongate clip base resists twisting from forces applied thereto by said band; said band having spaced ends between adjacent arms;

d. a quick release locking mechanism operably connecting said band ends and including:

1. a toggle arm pivotally connected with one end of said band and disposed for operation in a horizontal plane;
2. a first sleeve having a transversely disposed aperture therethrough and being separably connected with the other end of said band;
3. a link member having a first portion thereof positioned within said sleeve aperture and being pivotally connected with said first sleeve; a second portion of said link member being pivotally connected with said toggle arm whereby selected rotation of said toggle arm causes the ends of said band to converge to a closed position, wherein said clips and said band are clamped abuttingly about a lower portion of said container and said toggle arm engages a portion of said band to maintain said closed position; and

e. means separably connecting said first sleeve with said band other end at circumferentially spaced positions thereon to accomodate variously sized containers, and including:

1. a plurality of radially disposed and circumferentially spaced apertures through said band and positioned adjacent to said other end thereof; and
2. a rod attached radially to said first sleeve and disposed within one of said band apertures, said rod having a threaded free end and a nut engaged therewith for separably connecting said band and first sleeve.

4,072,287

SEAT SUPPORTING ASSEMBLY OF THE RESILIENTLY LOADED TYPE

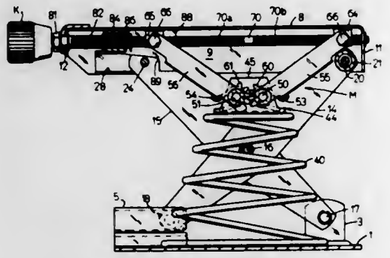
Richard F. Swenson, Milwaukee; Shawn H. Elmen, Wauwatosa, and John J. Gryga, Jr., Milwaukee, all of Wis., assignors to Milsco Manufacturing Company, Milwaukee, Wis.

Filed Jan. 19, 1977, Ser. No. 760,534

The portion of the term of this patent subsequent to June 14, 1994, has been disclaimed.

Int. Cl.² F16M *13/00*

U.S. Cl. 248—399 **10 Claims**



1. A seat supporting assembly comprising a lower base member, an upper seat platform for supporting a seat, linkage means connected between said base and said platform for vertically positioning the platform relative to the base, a spring mounted on the base and extending upwardly therefrom, a spring loaded mechanism mounted on the upper end of said spring and pivotally secured to said upper seat platform, mechanism for adjusting said spring loaded mechanism to raise and lower said platform relative to said base, an upstop limit for limiting the upward movement of said platform, said adjusting mechanism also having an actuator for selectively operating said up-stop limit or said adjusting mechanism.

4,072,288

CHAIR WITH PNEUMATICALLY ADJUSTABLE SEAT HEIGHT AND BACK SUPPORT INCLINATION

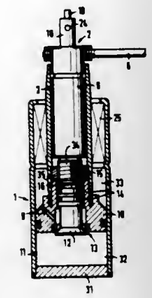
Winfried Wirges, Koblenz-Moselweiss, and Herbert Freitag, Koblenz-Metternich, both of Germany, assignors to Stabilus GmbH, Koblenz-Neuendorf, Germany

Filed May 17, 1976, Ser. No. 686,738

Claims priority, application Germany, June 10, 1975, 2525752

Int. Cl.² A47C *7/40*

U.S. Cl. 248—404 **17 Claims**



1. A pneumatic spring assembly comprising:

a. a first pneumatic spring including a first cylinder portion having an axis and defining a first cavity therein, a first piston axially movable in said cavity and axially separating two compartments of said cavity, a first piston rod portion secured to said piston for joint axial movement and axially projecting from said cavity, a gas under a pressure higher than atmospheric pressure filling said compartments, first valve means connecting said compartments, and first manually operable means for opening and closing said valve means and for thereby controlling flow of said gas between said compartments;

b. a second pneumatic spring including a second cylinder portion having an axis and defining a second cavity therein, a second piston axially movable in said second cavity and axially separating two compartments of said second cavity, a second piston rod portion secured to said second piston for joint axial movement and axially projecting from said second cavity, a gas under a pressure higher than atmospheric pressure filling said compartments of said second cavity, second valve means connecting said compartments of said second cavity for controlling flow of said gas therebetween, and second manually operable means for opening and closing said second valve means while said first valve means are open and while said first valve means are closed,

1. one of said portions of said second pneumatic spring being received in one of said portions of said first pneumatic spring; and

c. securing means connecting said one portion of said second pneumatic spring to said one portion of said first pneumatic spring and limiting relative axial movement of the connected portions.

4,072,289

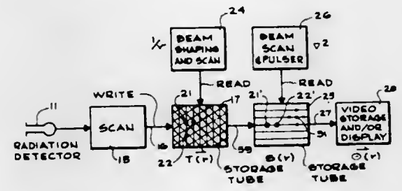
AXIAL TOMOGRAPHY

Keith A. Brueckner, La Jolla, and John H. Lewis, Los Angeles, both of Calif., assignors to Xonics, Inc., Van Nuys, Calif.

Filed Sept. 10, 1976, Ser. No. 722,202

Int. Cl.² G03B *41/16*

U.S. Cl. 250—445 T **33 Claims**



1. In an apparatus for producing an axial tomographic image of an object, with a detector for receiving radiation along a plurality of sets of paths, with said sets of paths overlapping each other, providing a plurality of sets of radiation detector output signals, the improvement including in combination:

first means for storing said detector output signals in analog form at a surface with signals of one set overlying signals of another set whereby the signals resulting from radiation through a zone of the object are summed at a corresponding zone at said surface producing a first stored signal;

first means for reading said first stored signal, including means for scanning across said surface and means for producing second signals, with a second signal for a scan point being a function of the magnitude of the first stored signal at the scan point and varying substantially inversely proportional to distance from the scan point;

second means for storing said second signals producing second stored signals; and

second means for reading said second stored signals at each of a plurality of points of said second storage means and including means for producing a video signal for each point, with a video signal being substantially the Laplacian of the second stored signal for the point, and with the video signal corresponding to the desired image.

4,072,290

VALVE FOR DISPOSABLE GAS LIGHTER

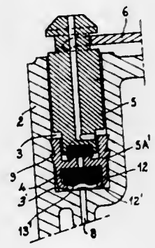
Guy Neyret, Francheville, France, assignor to Etablissements Genoud & Cie, Venissieux, France

Filed Sept. 8, 1975, Ser. No. 611,264

Claims priority, application France, Sept. 10, 1974, 74 31436

Int. Cl.² F23D *13/04*; F16K *47/08*

U.S. Cl. 251—127 **2 Claims**



1. A valve for a lighter having a reservoir for a compressible fluid, comprising:

a housing formed with an upright well, a gas outlet communicating with said reservoir and opening into said well at the bottom thereof, and a shoulder surrounding said outlet at said bottom of said well;

a compressible unapertured diffuser filter disk member of porous material in line with said outlet; a support washer for said disk member;

a valve seat member force-fittedly received in said well and having a pair of opposite sides while being formed with a passage extending between said sides, one of said sides bearing against and compressing said disk member whereby fluid exiting from said reservoir through said outlet enters said passage only upon diffusion through said disk member, one of said members bearing against said shoulder; and

a valve body sealingly engageable over said passage at the other side of said seat member, said seat member having a cavity and being provided with a central boss at said other side, said body extending into the cavity of said plug and bearing against said boss, said plug and said well being cylindrical and said plug having outwardly directed ridges engaging a wall of said well, said one side of said seat member being formed with an extension forming a second cavity which opens toward said shoulder, said extension including gripping edges which are directed transversely for retaining said disk and washer within said second cavity.

4,072,291

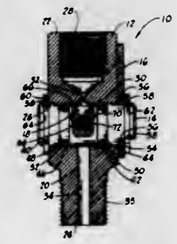
ROTARY VALVE WITH SPRING BIASED VALVE MEMBER

Ladd M. Adams, Norman, Okla., assignor to Entek Corporation, Norman, Okla.

Filed Aug. 22, 1975, Ser. No. 606,865

Int. Cl.² F16K *5/06, 15/04*

U.S. Cl. 251—181 **10 Claims**



1. A valve comprising:

a valve body;

a flow passage formed in said valve body;

a cylindrical bore of uniform diameter through its full length extending entirely through said valve body and transversely intersecting said flow passage;

cylindrical valve stem means journaled in said cylindrical bore and having a transverse cavity formed therein aligned normal to the axis of rotation of said valve stem means, and further having a reduced diameter portion disposed centrally on said stem means adjacent said cavity for communicating portions of said flow passage located on opposite sides of said bore with each other when said valve is open;

seal means mutually engaging said valve stem means and said bore for providing fluid-tight communication between said cylindrical bore and said flow passage at the intersection therebetween;

valve seat means disposed in said valve body along at least one line of intersection between said flow passage and said bore;

spherical valve member means in the form of a sphere having an uninterrupted spherical external surface and slidably and rotatably partially received in the cavity in said valve stem means and adapted for rotative motion about an infinite number of axes of rotation relative to said valve stem means for engaging said valve seat means with a portion of its spherical external surface to close said flow

passage and, alternately, disengaging from said valve seat means to open said flow passage;

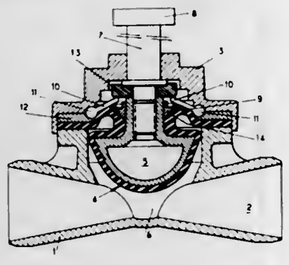
biasing means in said cavity and operatively engaging said valve stem means and said valve member means for urging said valve member means radially outwardly relative to said valve stem means; and

operator means engaged with said valve stem means for moving said valve stem means and said valve member means relative to said valve seat means and said valve body into a position closing said flow passage and, alternately, into a position opening said flow passage.

4,072,292
DIAPHRAGM VALVE

Gabriel J. C. Banon, Paris, France, assignor to Societe Industrielle d'Etudes et de Realisations Scientifiques S.I.E.R.S., Paris, France

Filed Apr. 20, 1976, Ser. No. 678,552
Claims priority, application France, Apr. 29, 1975, 75 13372
Int. Cl.² F16K *7/12*
U.S. Cl. 251—331 **2 Claims**



1. A diaphragm valve of the type, comprising:

a valve body with a fluid passage defined therethrough;

a flexible diaphragm clamped at its periphery between said body and a cover;

a movable knob, of suitable configuration and integral with a valve stem mounted so as to be slidable axially within said cover, for displacing said diaphragm between a position opening and a position closing the fluid passage; and

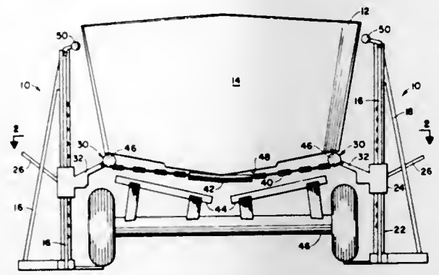
a plurality of radially disposed movable members arranged ina side-by-side manner above an annular portion of said diaphragm concentrically disposed about said valve stem, each of said members being pivotably mounted at one of the ends thereof upon said cover while the other ends thereof are held upon said valve stem between an upper stop integral with said stem and a lower stop freely slidable upon said stem in such a way as to form, along the radial extent thereof, a substantially continuous, movable supporting surface for said diaphragm annulus and to provide rigid support for said diaphragm annulus on the cover side thereof so as to preclude stretching thereof under pressure of the fluid in said fluid passage.

4,072,293
BOAT JACKS

Boyd Sadler, 3400 Browning Street, Victoria, British Columbia, Canada (V8P 4E1)

Filed Feb. 28, 1977, Ser. No. 772,583
Int. Cl.² B66F *7/12*
U.S. Cl. 254—89 R **5 Claims**

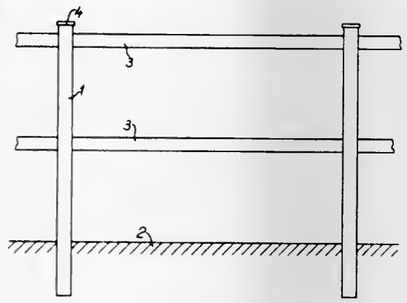
1. In a boat jack system involving boat jacks operable in laterally opposing pairs to lift a boat onto or off a carrier therefor, each boat jack including a tripod support, a center pole containing a vertically movable jack component and a manually operable cranking arm for moving said jack component, the improvement which comprises providing a T-shaped base for said tripod support, the top of the "T" facing the front of said jack, a horizontal tubular lifting member being mounted to a lifting bar therefor, said lifting bar mounted in turn to said movable jack component, an elongated chain detachably mountable to and between each said horizontal lifting member and lifting bar, intermediate the ends of said chain in a generally central position there being mounted a support tube, said elongated chain providing simultaneous lifting support to said jacks and prevention of their lateral movement when liftingly engaged with said boat.



4,072,294
TUBULAR FENCE

Karl Thure Densen, 24, rue de Geneve, - 01210 Ferney-Voltaire, France

Filed Apr. 17, 1975, Ser. No. 568,817
Claims priority, application Switzerland, May 2, 1974, 5974/74
Int. Cl.² E04H *17/16*
U.S. Cl. 256—24 **3 Claims**

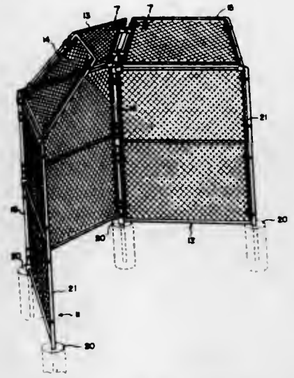


1. A fence construction kit comprising, a plurality of individual tubular posts, a plurality of tubular cross-pieces each of generally uniform cross-section along its entire length and all having alike first and second ends, means defining apertures in the posts for receiving the ends of cross-pieces extending therein and for supporting the ends of the cross-pieces on the posts when the posts are upstanding and with the cross-pieces disposed transverse to the posts while allowing a relative movement of the cross-pieces and posts along an axial direction of the cross-pieces, said posts having upstanding tabs adjacent the periphery of said apertures, means defining in an end portion of each of the cross-pieces a plurality of recesses spaced-apart from one another along an axial direction of the cross-piece, said recesses of each end of a cross-piece being receptive of said tabs to selectively and releasably position cross-pieces axially relative to a post in any one of a plurality of discrete axial positions defined by said recesses, and locking means cooperative with the posts and the ends of the cross-pieces for releasably securing the cross-pieces in any one of said discrete axial positions relative to the posts.

4,072,295
FOLDABLE BACKSTOP AND LIKE STRUCTURE

Darrel V. Roberts, 13455 Fort St., Draper, Utah 84020

Filed Mar. 1, 1976, Ser. No. 662,543
Int. Cl.² E04H *17/16*
U.S. Cl. 256—26 **5 Claims**

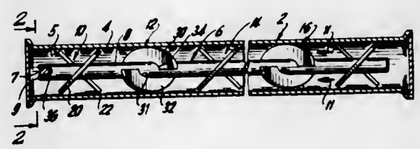


1. A factory-fabricated baseball backstop or like structure constructed to fold compactly for transportation to an erection site, comprising a plurality of side-by-side, laterally adjoining and hinged panel sections, each having a frame made up of steel tubing as upstanding post and transverse frame members, and having steel chain link fence fabric covering the frame; hinges in the form of relatively short sleeves of steel tubing rigidly secured in mutually spaced relationship to respective transverse frame members of one of mutually adjoining sections and freely encircling a post frame member of the other said mutually adjoining sections as a hinge sleeve, said post constituting the hinge pintle; means attaching one side of the chain link fence fabric of said one section to a post frame member of that section; means attaching the other side of the chain link fence fabric of said one section to the hinge-sleeve-encircled, post frame member of said other of the mutually adjoining sections, the chain link fence fabric of said one section being stretched taut between the post frame members to which it is attached; and means for preventing hinging action of the hinges following erection of the structure, whereby, in the erected structure, adjoining panel sections have a single post in common which is a part of only one of said adjoining panel sections, mutually adjacent lateral margins of the fence fabric of the respective adjoining panel sections being attached to the common post under stretching stress.

4,072,296
MOTIONLESS MIXER

Lewis G. Doom, 95 Meadow Farm Road, East Islip, N.Y. 11730

Continuation of Ser. No. 596,249, July 16, 1975, abandoned.
This application Oct. 12, 1976, Ser. No. 731,775
Int. Cl.² B01F *15/00*
U.S. Cl. 366—337 **2 Claims**



1. A motionless mixer includes

a substantially cylindrical conduit defining a channel having a central axis;

an elongated member disposed longitudinally within said channel along said central axis, said elongated member having a transverse end surface and a slot-like aperture extending into and across said end surface;

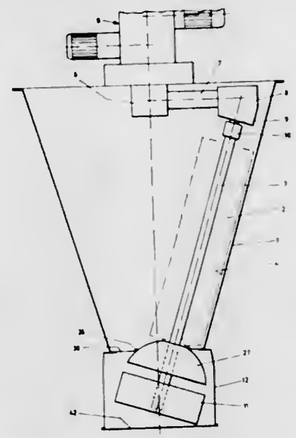
a plurality of baffle means attached to said elongated member at spaced longitudinal points; and

a cross member of a first cross sectional area having two ends which ends are attached respectively to two opposed sides of said channel, so that said cross member extends transversely across said channel, said cross member including at least one longitudinal portion having a smaller cross sectional area than said first cross sectional area which portion intersects said central axis and is adapted to cooperate with said slot-like aperture in said one end surface of said elongated member.

4,072,297
CONICAL MIXING APPARATUS HAVING SUPPORT STRUCTURE FOR THE MIXING SCREW PROVIDED BELOW THE BOTTOM OF THE MIXING VESSEL

Jan Willem de Vries, Vincent van Goghstraat 69, Zelhem, Netherlands

Filed Jan. 12, 1977, Ser. No. 758,826
Claims priority, application Netherlands, Jan. 21, 1976, 7600638
Int. Cl.² B01F *7/08*
U.S. Cl. 366—287 **9 Claims**



1. Mixing apparatus comprising at least one mixing vessel mounted on a supporting housing, said mixing vessel having a side wall, a bottom wall having a central aperture and a vertical axis, a mixing screw located in said vessel having a central shaft connected to a dirve and support mechanism at its upper end for simultaneously rotating said screw around the axis of its shaft and revolving said screw around the axis of the vessel, the lower end of the mixing screw shaft extending through said aperture and being supported below said vessel in a bearing located in said housing, said bearing comprising a universal joint as well as radial and axial force receiving bearings, said universal joint having a first tiltable member supported by means of pivot pins extending from said housing and a second tiltable member supported by means of pivot pins extending from said first tiltable member, the radial and axial force receiving bearings being mounted in a bearing support in said second tiltable member perpendicular to the pins thereof, a cover secured over said bearing support and around the mixing screw shaft extending through the aperture in the bottom of the mixing vessel, said cover having its upper surface shaped as a segment of a sphere around the centre of the universal joint and means for sealing the spherical surface of the cover with respect to the aperture in the bottom wall of said mixing vessel.

4,072,298
METHOD OF COOLING A QUENCHING BATH OF MELTED SALT

Berthold Kranz, Duren, Germany, assignor to Firma Carl Canzler, Duren, Germany

Filed July 7, 1975, Ser. No. 593,256
Claims priority, application Germany, July 12, 1974, 2433539
Int. Cl.² G05D *23/13*
U.S. Cl. 266—44 5 Claims

1. A method of cooling a treatment bath of melted salt into which heat is being introduced by the work or substance which is being treated therein, as when hot workpieces are quenched, for example, the salt bath cooling method comprising the steps of:

using a primary cooling medium a liquid whose boiling point lies substantially below the operating temperature of the salt bath;

heating said liquid primary cooling medium to a state of partial evaporation, so as to create a mixture of liquid and vapor;

introducing said liquid and vapor mixture into the salt bath, in direct contact therewith, thereby

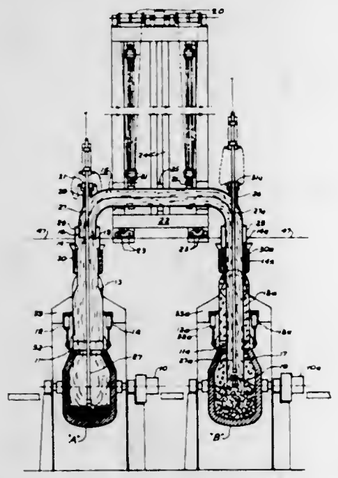
evaporating the remaining liquid portion of the cooling medium through direct heat transfer from the melted salt to the cooling medium, with the previously evaporated portion of said cooling medium acting as an atomizing agent on the liquid portion of the cooling medium, thus controlling its expansion during evaporation; and

agitating the treatment bath by utilizing the expansion forces acting on the completely evaporating cooling medium to entrain a portion of the melted salt in a circulatory flow.

4,072,299
METHOD AND APPARATUS FOR BASIC OXYGEN STEEL MAKING EMPLOYING THE OFF-GAS PRINCIPLE OF PRE-HEATING PURPOSES

Albert Calderon, 1065 Melrose Drive, Bowling Green, Ohio 43402

Filed Apr. 27, 1976, Ser. No. 680,757
Int. Cl.² C21C *5/40*
U.S. Cl. 266—44 24 Claims

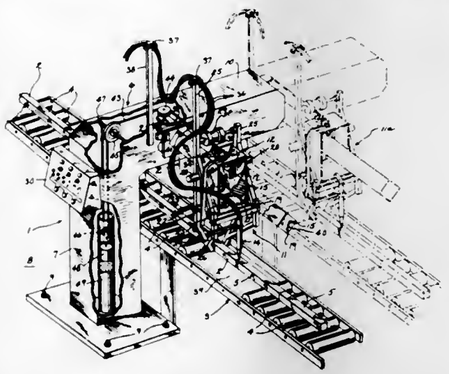


1. In the conservation of energy from the off-gas generated during refining of steel in the basic oxygen steel-making process wherein the concept of dual furnaces is employed, the first furnace doing the refining and the second furnace doing the pre-heating of the solid charge for the subsequent heat by means of the energy contained in said off-gas, the improved method of providing ducting means to direct said off-gas from the mouth of said first furnace doing the refining through the mouth of said second furnace doing the pre-heating in such a way that the discharge end of said ducting means is within said second furnace and in close proximity to the solid charge within said second furnace for the efficient transferrence of the heat energy from said off-gas to said solid charge, in order to guarantee the impingment of said off-gas on top of said solid charge for the efficient transferrence of the heat energy from said off-gas to said charge, and reacting said off-gas with an oxidizing agent in order to transfer to said solid charge with said second furnace the sensible heat contained in said off-gas and also the energy released from the combustion of said off-gas.

4,072,300
CONTINUOUS CASTING CUT-OFF DEVICE

Alfred Pfeuffer, Neu-Isenburg, Germany; Herbert Rudolf, Brookfield, and Fred Balfanz, Waukesha, both of Wis., assignors to C-R-O, Inc., Menomonee Falls, Wis.

Filed Nov. 11, 1976, Ser. No. 741,289
Int. Cl.² B23K *7/00*
U.S. Cl. 266—50 18 Claims



1. For use with a continuous metal casting apparatus wherein a metal bar moves continuously along an elongated longitudinally extending bed, a cut-off apparatus for the bar, said apparatus comprising:

(a) a fixed frame support member adapted to extend transversely over the said bed,

(b) a carriage assembly with said assembly carrying bar clamping means and bar cut-off means,

(c) and track means extending longitudinally from said frame support and suspending said carriage assembly therefrom for reciprocable movement thereon,

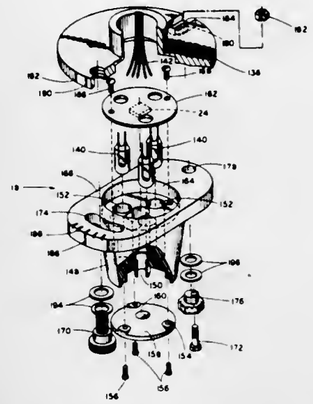
(d) the outer end of said track means remote from said frame support being unobstructed to facilitate quick removal and replacement of said carriage assembly therefrom.

4,072,301
TRACING HEAD AND DRIVE

Frans Brouwer, Glencoe, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 386,556, Aug. 8, 1973. This application Sept. 18, 1975, Ser. No. 614,651
Int. Cl.² B23K *7/10*
U.S. Cl. 266—60 8 Claims

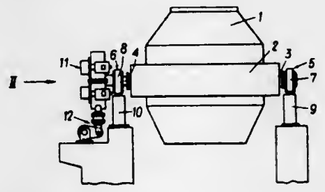
1. For use in a contour tracing system, a tracing head comprising a shaft, a housing assembly rotatably carrying said shaft, a steering motor carried by said housing for rotating said shaft, a photocell assembly, circuit means responsive to a signal from said photocell assembly for controlling said motor to rotate said shaft, an optical assembly including a housing for carrying said photocell assembly, means carried by said shaft for rotation therewith, respective indicia including a zero mark on said shaft carried means and on said optical assembly housing, first means connecting said optical assembly housing to said shaft means for securing said optical assembly to said shaft for rotation with said shaft, and first eccentric means rotatable about the axis of said connecting means with said zero marks in registration for translating said optical assembly housing and photocell assembly transverse to a line extending from said shaft carried means zero mark to the axis of said shaft to provide said photocell assembly with zero kerf adjustment in response to said photocell assembly being in registration with said line, and means extending through the housing and into the shaft carried means opposite said eccentric permitting rotation of said housing about said first connecting means thereby providing the normal kerf adjustment.



4,072,302
TILTABLE METALLURGICAL VESSEL ARRANGEMENT

Ernst Riegler, Enns, and Manfred Schmidt, Linz, both of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Jan. 31, 1977, Ser. No. 764,202
Claims priority, application Austria, Feb. 18, 1976, 1140/76
Int. Cl.² C21C *5/46*
U.S. Cl. 266—245 6 Claims

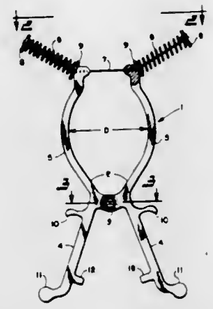


1. In a tiltable metallurgical vessel arrangement, in particular a converter to be used in a steel making plant, of the type including horizontal carrying trunnions for carrying the vessel, a fixed bearing and an expansion bearing accommodating the carrying trunnions, bearing housings in which the fixed bearing and the expansion bearing are arranged, force measuring means for mounting the bearing housings thereon, and a supporting construction, the force measuring means resting on the supporting construction, vertical guide means with their lateral dimension extending parallel to the axes of the carrying trunnions for guiding the bearing housings thereon, the improvement characterized in that the vertical guide means are constituted by vertical sliding faces provided on each bearing housing and on the supporting construction at both sides of the axes of the carrying trunnions so as to form guides and counterguides engaging each other so as to prevent horizontal movement of the bearing housings in the direction of the axes of the carrying trunnions.

4,072,303
SPRING CLAMP FOR PAPER LOGS

Ferdinand W. Szabo, 17251 McCracken Road, Maple Heights, Ohio 44137

Filed Apr. 11, 1977, Ser. No. 786,263
Int. Cl.² B25B *1/04*
U.S. Cl. 269—131 2 Claims

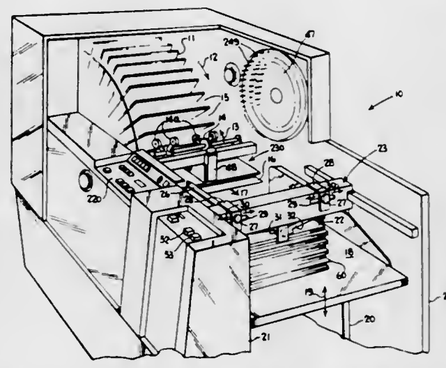


1. A spring clamp for holding a log made of rolled-up newspapers from unrolling during installation of ties around the end portions of the log, comprising a pair of curved jaws hinged together at one end for movement toward and away from each other, said jaws having handles which diverge from said one end thereof and which are adapted to be squeezed together to move said jaws away from each other; and spring means acting on the spaced apart free ends of said jaws for yieldable movement of said jaws as aforesaid into and out of engagement with a log therebetween; said spring means comprising laterally extending elongated slender springs which at one end bear on said free ends, and a flexible cord secured to the other end of said springs and extending through openings in said free ends and across the space therebetween to embrace the portion of the log between said free ends; said springs buckling to longitudinally curved form upon movement of said jaws away from each other thus to yieldably actuate said jaws to grip a log with approximately constant force despite wide variation of log diameter.

4,072,304
COLLATOR SYSTEM

Michael A. Brown, Norwalk, and Hans C. Mol, Wilton, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Oct. 20, 1975, Ser. No. 623,627
Int. Cl.² B65H *39/045*
U.S. Cl. 270—58 1 Claim



1. A rotary drum collator operating in a RUN/REJECT mode, comprising:

a rotatable drum having a plurality of pockets for storing

quantities of sheet material to be collated into sets, said pockets being angularly arranged about said drum;

rotatable withdrawing means disposed adjacent said drum for removing the sheet material from the pockets of said drum;

stacking means disposed adjacent the withdrawing means for stacking sheet material in a stack composed of collated sets positioned in alternately off-set stack sets during normal operation, and stacking miss-collated sheet material in said stack in a reject position differing from the alternately stacked sets when a feeding malfunction is detected, said stacking means including an off-set mechanism having alternating means for alternately actuating and deactuating said off-set mechanism, and program switching means electrically connected to said alternating means for operating said alternating means in a cyclic manner;

sensing means for sensing a malfunction in the feeding of said sheet material and providing a malfunction signal; and

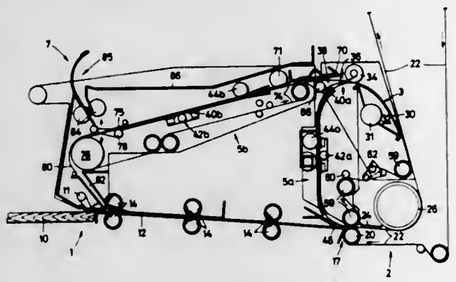
cycling means operatively connected to said sensing means and said stacking means for controlling the stacking means to stack the sheet material in said reject position in response to a feeding malfunction signal.

4,072,305

PHOTOCOPYING MACHINE HAVING A REPEAT MECHANISM

Karl Scheid; Werner Schweisfurth, both of Siegen, and Eberhard Quast, Friesenhagen, all of Germany, assignors to Meteor-Siegen Apparatebau Paul Schmeck GmbH, Siegen, Germany

Filed Aug. 30, 1976, Ser. No. 718,617
Claims priority, application Germany, Sept. 6, 1975, 2539799
Int. Cl.² B65H *29/64*
U.S. Cl. 271—3 **7 Claims**



1. Photocopying machine comprising a repeat mechanism which, after an original has left the exposure station, optionally returns said original into the entry position, a feed mechanism guiding the original and the copying material past an exposure station, a separating station arranged in the feeding direction behind the exposure station having means for detaching the original from the copying paper and a return feeding mechanism which picks up the original, supplies the original to the entry members at the entry position and moves it simultaneously for the purpose of alignment against a lateral bearing or abutment edge, wherein the conveying speed of the return feeding mechanism is somewhat less than that of the feeding mechanism and a loop of the original is formed between the return feeding mechanism and said feed mechanism.

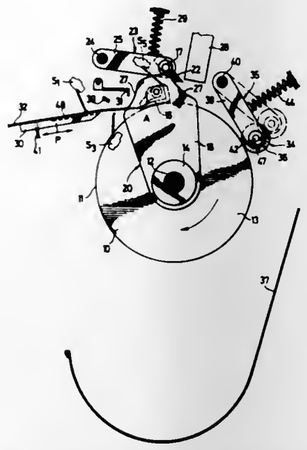
4,072,306

SHEET FEED APPARATUS

Hermann Idstein, Oestrich-Winkel, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 15, 1976, Ser. No. 732,852
Claims priority, application Germany, Oct. 16, 1975, 2546463
Int. Cl.² B65H *5/04, 9/06*
U.S. Cl. 271—3 **28 Claims**

1. A sheet feed apparatus suitable for feeding an original into a copying machine at an intake position and through the machine past an exposure station, said apparatus comprising a rotary support having a surface for supporting the original, means selectively rotatable with said rotary support and including selectively closable jaws for gripping the leading edge of the original, means for selectively coupling and decoupling said gripping means for rotation with said support, means in advance of the exposure station for pressing the original against the supporting surface, means associated with said



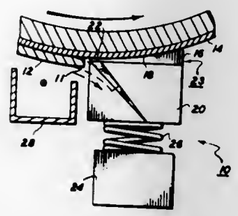
rotary support for conveying the orginial in contact with said supporting surface when the gripping means is stationary, and means for releasing the original from the gripping means for releasing the original from the gripping means at a discharge position after the support has made a predetermined number of revolutions, whereby multiple revolutions of an original and particularly one which is longer than the surface of the rotary support are possible.

4,072,307

CORNER SHEET STRIPPER

James J. Knieser, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 25, 1977, Ser. No. 781,892
Int. Cl.² B65H *29/56*
U.S. Cl. 271—174 **13 Claims**



1. In a copier in which images are formed on an imaging area of an imaging surface moving in a normal direction and transferred to a copy sheet, and in which said imaging surface also has a defined non-imaging edge area thereon adjacent to but outside of said imaging area, wherein the copy sheet is adhered to said imaging surface directly adjacent to, but not within, said edge area of said imaging surface, during said transfer, and wherein the adhering copy sheet is stripped from said imaging surface by a sheet stripping system engaging the lead edge thereof; the improvements in said sheet stripping system comprising:

a mechanical copy sheet stripping member mounted to said copier adjacent a desired stripping point along said moving imaging surface,

said stripping member having a bearing portion with a bearing surface which directly slidably engages said imaging surface only in said edge area thereof, outside of said imaging area thereof,

said bearing surface being the only portion of said stripping member engaging said imaging surface,

said stripping member having resilient mounting means for movement of said stripping member together with movement of said imaging surface in a direction perpendicular to said normal movement direction directly controlled by said engagement of said bearing portion thereof with said edge area,

said stripping member having an integral stripping finger portion with a sheet stripping edge thereon for mechanically engaging and stripping a copy sheet from said imaging area at a corner of the sheet adjacent said edge area,

said stripping finger portion and said stripping edge thereon being mounted to, and supported by, said bearing portion for movement therewith,

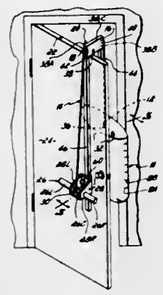
said stripping finger portion extending from said bearing portion in said edge area out over said imaging area of said imaging surface, continuously spaced therefrom, with said stripping edge maintained closely spaced from said imaging area by less than the thickness of the copy sheet by said continuous engagement of said bearing portion with said non-imaging edge area of said imaging surface.

4,072,308

PORTABLE WEIGHT LIFTING TYPE FOREARM EXERCISER

Leslie T. Applegate, Cincinnati, Ohio, assignor to Surgical Appliance Industries, Inc., Cincinnati, Ohio

Filed Apr. 7, 1977, Ser. No. 785,766
Int. Cl.² A63B *21/06*
U.S. Cl. 272—117 **4 Claims**



1. A forearm exerciser comprising:

a rigid U-shaped frame means adapted to be secured over the top of a door, said means including first and second spacedapart generally parallel legs and a transverse cross-member rigidly underconnecting said legs each other at their upper ends,

a clamp means mounted on the lower end of the first leg and movable against one face of a door for urging the second leg against the other face of the door when the legs straddle the door faces with the cross-member resting atop the upper edge of the door,

a cable guide on said transverse cross member,

a flexible cable slidably engaged with said guide, said cable having first and second ends,

a weight attached to said first cable end,

a rod attached to said second cable end, said rod having a hand-engageable section to facilitate gripping said rod with a user's hand, and

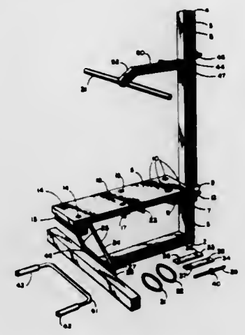
a rotatable mount means secured to said second leg for mounting said rod for rotation about a generally horizontal axis generally perpendicular to said second leg to facilitate reeling and unreeling said cable on said rod, and in turn raising and lowering said weight, when said rod is gripped by a user's hand and rotated in first and second opposite directions, respectively.

4,072,309

MULTI-PURPOSE EXERCISE DEVICE

Jerry Lee Wilson, 5816 Vista Clara, El Paso, Tex. 79912

Filed June 21, 1976, Ser. No. 698,463
Int. Cl.² A63B *21/04*
U.S. Cl. 272—136 **8 Claims**



1. Multiple purpose exercise apparatus comprising:

a frame having forward and rearward positions comprising a ground-supported base and a stationary vertical support member extending upwardly from the rear of the base,

a bench, support means associated with said frame for maintaining the bench at a level above the base,

a lever arm pivotally attached to said vertical support member and extending outwardly over said base, fastening means for securing the lever arm to the support member comprising a plurality of vertically aligned bores in the support member, a transverse bore carried by the rearward portion of the lever arm, and pin means extending through both bores for removably pivotally attaching the lever arm to the vertical support member such that the lever arm can move freely only in a vertical plane, biasing means attachable to the lever arm at a position spaced from the connection of the lever arm on the vertical support member for selectively providing resistance to upward or downward motion of the lever arm in the vertical plane, and

attachment means mountable in the vertically aligned bores for selectively attaching the biasing means at various position on the vertical support member.

4,072,310

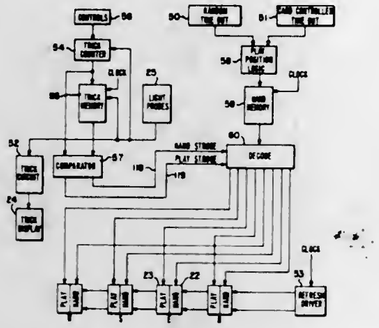
CONTROL APPARATUS FOR A CARD GAME SIMULATOR

Dale R. Beam, 3243 Windmill Drive, Dayton, Ohio 45432

Filed Jan. 15, 1976, Ser. No. 649,504
Int. Cl.² A63B *9/00*
U.S. Cl. 273—1 E **18 Claims**

1. A card game simulator comprising a plurality of hand displays each of which has a plurality of light generating elements for representation of playing cards capable of being held by that hand, card assignment means for assigning playing cards to each such hand, a recirculating hand memory for storage of said card assignments, illumination control means responsive to said hand memory for periodically activating in each hand display the light generators representing cards assigned to that hand, a photosensitive detector for detecting illumination of any of said light generators when placed in close proximity thereto, a recirculating trick memory synchronized with said hand memory and actuated by an output from

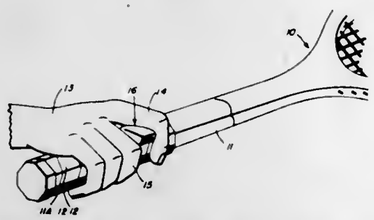
said detector for remembering the time period of said output, and gating means connected to said trick memory for preventing said illumination control means from activating a light generator during occurrence of time periods remembered by said trick memory; said trick memory comprising a trick code generator, means for loading codes from said trick code generator into the trick memory in response to output signals from said detector, output terminal means for reading out trick codes previously loaded into said trick code memory, and means connected to said output terminal means for generating control strobes for said gating means in response to trick codes read out from said output terminal means.



4,072,311
INDEX FINGER POSITIONING DEVICE FOR TENNIS RACKET HANDLES

Shirley J. Bertucci, 6126 St. Charles Ave., New Orleans, La. 70118

Filed Aug. 30, 1974, Ser. No. 501,972
Int. Cl.² A63B *69/38*
U.S. Cl. 273—75 **1 Claim**

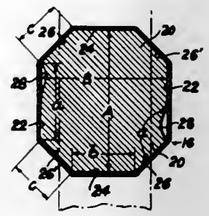


1. In combination, a tennis racket having a handle and ball striking head, said handle having at least one flat side lying in the plane of said ball striking head, an index finger positioning device comprising an upstanding finger engaging means positioned on said at least one flat side at a point along its length to lie between the index finger and the middle finger when the racket is grasped by a player in a playing position, said upstanding finger engaging means in plan view being generally of an obtuse triangular construction having rounded ends and in a side elevation being tapered upwardly on a curve from its base toward its apex with the long side being positioned angularly across the major axis of the handle and the base being substantially parallel to the major axis of the handle and being aligned with the edge of said at least one flat side and upstanding therefrom, said finger engaging means being in a fixed position along the axis of the racket handle dependent upon the side of the players hand and playing grip, and securing means positively locating and maintaining said upstanding finger engaging means on said handle in said fixed position.

4,072,312
TENNIS RACQUET HANDLE CONSTRUCTIONS

Benjamin Kahn, 1605 Michigan Ave., Miami Beach, Fla. 33139

Filed Jan. 20, 1976, Ser. No. 650,689
Int. Cl.² A63B *49/08*
U.S. Cl. 273—75 **9 Claims**

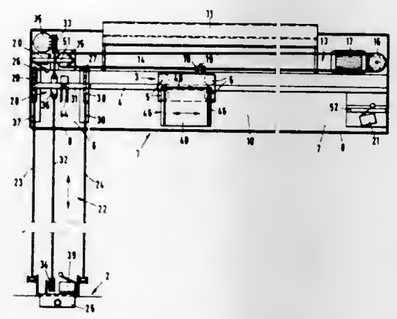


1. In a tennis racquet of the character described having a playing face adapted for ball-striking, a longitudinal octagonal-like handle providing a pair of parallel and opposed grip-embracable longitudinal surfaces spaced apart and parallel to the plane of said ball-striking surfaces, and another pair of spaced, opposed and parallel grip-embracable longitudinal surfaces at right angles to the first mentioned pair, the transverse distance between the surfaces of the first mentioned pair of surfaces being less than 84% of the transverse distances between the surfaces of the second mentioned pair, whereupon gripping of the handle, the said difference in said transverse distances between the said pairs of surfaces is sensibly perceptive and mentally impressive upon the grip of the player, whereby the disposition of the handle and the ball-striking surface is orientatively discerned before the players stroke without observation or physical contact with the racquet other than by a single-hand grip, and also whereby the said distance difference discernment is retained throughout the players stroke and diametrically opposed scollups each extending along an edge of its containing surface.

4,072,313
TARGET MECHANISM

Bernhard Murso, Esslingen-Hegensberg, and Eberhard Riedmüller, Seissen, both of Germany, assignors to Ernst K. Spieth, Zell (Neckar), Germany

Filed Mar. 31, 1976, Ser. No. 672,185
Claims priority, application Germany, Apr. 17, 1975, 2516986
Int. Cl.² F41J *9/00*
U.S. Cl. 273—105.2 **13 Claims**

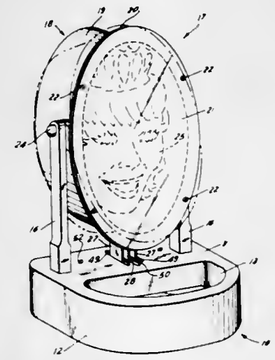


1. A target mechanism for a shooting range having a marksman's station and a target station, comprising a transverse guide means mounted on the target station transversely of the line of fire, a target cart mounted for movement along the transverse guide means between two end positions, a transverse drive mechanism for moving the target cart in either direction on the transverse guide means, a motor for driving the transverse drive mechanism, a longitudinal guide means extending between the marksman's station and the target station adjacent to one end of the transverse guide means, a sliding carriage mounted for reciprocating movement along the longitudinal guide means from the target station and the marksman's station between two end positions, the sliding carriage being adapted to receive the target cart when it is in its one end position at the target station, a longitudinal drive mechanism connected with the sliding carriage for moving it along the longitudinal guide means between its two end positions, and a motor for driving the longitudinal drive mechanism.

4,072,314
SOUND-PRODUCING MIRROR TOY

Beverly Rosen, East Brunswick, and Sidney A. Tepper, Millburn, both of N.J., assignors to Lasco Toys International Inc., East Brunswick, N.J.

Filed July 27, 1976, Ser. No. 709,063
Int. Cl.² A63F *9/18*
U.S. Cl. 273—161 **11 Claims**



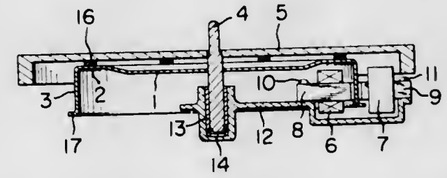
1. A sound-producing mirror toy, comprising:
(a) a base,
(b) a housing movably mounted on said base,
(c) a mirror comprising one wall of said housing, said mirror being of the type which reflects light from its front surface when there is darkness behind it and which becomes transparent when there is light behind it, said mirror comprising a transparent sheet carrying a metal coating, and said mirror being planar so that it faithfully reflects the image of a person looking at it,
(d) a representation within said housing behind said mirror,
(e) a light source within said housing behind said mirror,
(f) an electrical sound-producing mechanism, and
(g) means for simultaneously energizing said light source, to make said representation visible through said mirror, and for actuating said sound producing mechanism.

4,072,315
TURNTABLE DIRECT-DRIVE SYSTEM

Toshio Tsujihara, Kobe; Humitoshi Saito, Kyoto, and Teruaki Kitamori, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Mar. 30, 1976, Ser. No. 672,002
Claims priority, application Japan, Apr. 7, 1975, 50-42644; Apr. 7, 1975, 50-47541; Nov. 6, 1975, 50-151482; Nov. 6, 1975, 50-151483; Nov. 6, 1975, 50-151484
Int. Cl.² G11B *17/00, 3/60;* **H02K** *1/22*
U.S. Cl. 274—1 E **6 Claims**

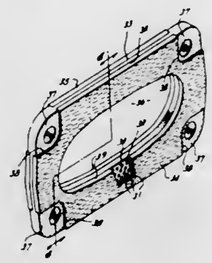
1. In a turntable direct drive system comprising:
a base;
a vertical turntable shaft extending upwardly from said base;
rotatable means having a horizontal surface portion and a downwardly extending cylindrical peripheral lip, said means being mounted on said shaft and including a turntable surface adjacent said horizontal surface portion;
a first stator core with a drive winding thereon adjacent said base within said peripheral lip and spaced a first predetermined distance from said lip; and
a second stator core with a drive winding thereon adjacent said base outside said peripheral lip in juxtaposition with said first stator core and spaced a second predetermined distance from said lip,
said stator cores and windings cooperating to be adapted to exert a driving force on said peripheral lip to cause said rotatable means to rotate about the axis of said shaft;
the improvement wherein said rotatable means comprises (i) a cylindrical rotor of non-magnetic electrically conductive material having said horizontal surface portion and cylindrical lip, said rotor lip having an outwardly extending edge protruding from the bottom of said lip and extending beneath a portion of said second stator core to prevent movement of said rotor away from said base, (ii) a separate turntable coupled to said rotor for rotation therewith, said turntable being spaced apart from a major part of said horizontal surface portion of said rotor, said turntable having said turntable surface, the weight of said rotor being substantially less than the weight of said turntable, and (iii) coupling means between said rotor and said turntable for providing a rotational force to said turntable while isolating said turntable from vibrations of said rotor and from warping forces due to any warped condition of said rotor.



4,072,316
THREE-PIECE HEAT RESISTANT GASKET

John W. Decker, Stockbridge, and Myron W. Tubbs, Royal Oak, both of Mich., assignors to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Nov. 26, 1976, Ser. No. 745,094
Int. Cl.² F16J *15/12*
U.S. Cl. 277—235 B **12 Claims**



1. A heat resistant gasket comprising,
a one-piece rigid heat insulating body of molded resin and having
a web portion presenting two oppositely facing planar parallel faces, the web portion surrounding at least one fluid passage which extends through it from one said face to the other, and
a plurality of bolt hole-presenting bosses integral with said web portion and projecting outwardly from said faces,
a two compressible gaskets elements, each a flat slab

formed from a resilient gasket material which is heat insulative, said elements being adhesively secured to the respective planar faces of the web portion of said rigid body,

said bosses by their outward projection from said faces establishing seats on said web portion on which they position said gasket elements,

each said gasket element abutting the bosses which thereby locate the gasket element on its seat with respect to said passage,

each said gasket element having an opening through it which is substantially congruent with the fluid passage in said rigid body,

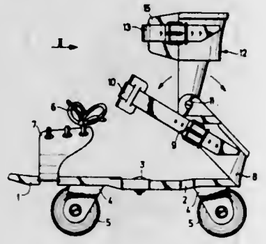
the combined thickness of the web portion and the two gasket elements secured thereon being greater than the thickness of the body at the bosses.

4,072,317

ROLLER SKATE HAVING ANKLE BRACING SUPPORT

Rudiger Pommerening, Glocksee 110, 3216 Salzhemmendorf, Germany

Filed May 17, 1976, Ser. No. 687,433
Claims priority, application Germany, May 17, 1975, 2522199
Int. Cl.² A63C *17/06, 3/02*
U.S. Cl. 280—11.23 **13 Claims**



1. A single tracked roller skate, comprising:

a base,

a plurality of rollers, arranged along a single track,

means mounting said base on said plurality of rollers,

first and second fastening means on said base for fastening said skate to the foot of a wearer, said first fastening means being located adjacent the front of the base and said second fastening means being located adjacent the back of said base for fastening the ankle of a wearer, said second fastening means comprising:

heel grip means including a generally U-shaped, rigid yoke member which is rigidly secured to the rear of said base and projects obliquely upwardly and forwardly therefrom to surround the heel of the wearer,

an ankle strap on said heel grip means for encircling the foot of a wearer about the ankle,

ankle support means engageable with the leg of a wearer immediately above the ankle, said ankle support means including a cradle for supporting engagement with the leg of a wearer, said ankle support cradle being a concave C-shape in cross section and inwardly convex in longitudinal section, and

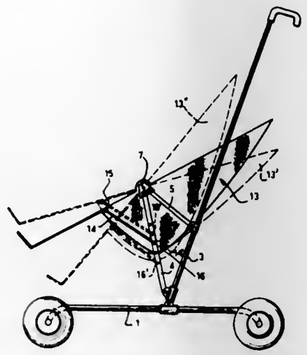
means pivotably mounting said ankle support means on said heel grip means at a point adjacent to the wearer's ankle, so as to permit pivotal displacement with respect to said base about an axis substantially parallel to the rolling axis of said rollers.

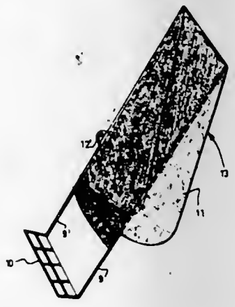
4,072,318

BABY CARRIAGE

Pierre Laune, Attiches, France, assignor to Eurolando, Attiches, France

Filed Oct. 12, 1976, Ser. No. 731,375
Claims priority, application France, Oct. 9, 1975, 75 30904
Int. Cl.² B62B *7/08*
U.S. Cl. 280—42 **6 Claims**





1. A baby/child carriage of the type having a transversely collapsible chassis and a body mounted thereon to support the baby or child either in a prone or in a sitting position; said body comprising:

(a) two lateral members independent of and parallel to each other and pivotally mounted on the chassis by two pivot pins forming articulations for said lateral members on the chassis, thus permitting each of the lateral members to pivot in a vertical plane;

(b) manually operable means for locking each of the lateral members in a plurality of determined angular positions with respect to the chassis, and;

(c) a flexible support forming structure connected to the lateral members and adapted to accommodate the baby or child; thus enabling the two lateral members to be brought together to form a collapsed bundle when the chassis is put in collapsed position.

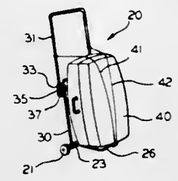
4,072,319

HAND TRUCK WITH RETRACTABLE FRAME

Henry D. Berger, Chicago, Ill., assignor to Kimberly Rose Company, Inc., Chicago, Ill.

Filed Apr. 19, 1976, Ser. No. 678,245
Int. Cl.² B62B *3/00*
U.S. Cl. 280—47.37 R **8 Claims**

1. A hand truck having a pair of frame members which slide together or apart relative to each other so that they may be moved between extended and retracted positions, said pair of members comprising two separate, U-shaped members positioned in a front to back relationship, two pairs of fitting means for slidingly joining opposing arms of the pair of U-shaped members, and latch means on each pair of said fitting means for releasably securing together that pair and therefore the pair of U-shaped members when extended apart, said latch means both latching and unlatching responsive to forces applied directly to the frame to extend or retract the U-shaped members.

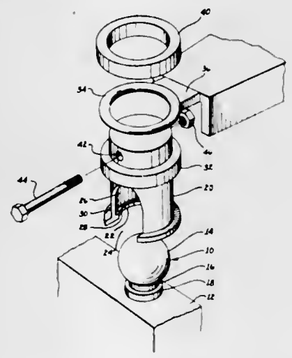


4,072,320

COUPLING ELEMENT FOR TRAILER HITCHES

Leon A. Powell, 2144 W. Broadway No. 67, Phoenix, Ariz. 85041

Filed Aug. 5, 1976, Ser. No. 712,094
Int. Cl.² B60D *1/14*
U.S. Cl. 280—415 A **4 Claims**



1. A device for coupling a hitch ring of a trailer tongue to a ball-type trailer hitch having a ball member and a neck of reduced cross-sectional dimension connecting said ball member to a towing vehicle, said device comprising:

a. an elongated tubular member penetratingly insertable within the hitch ring for engaging the ball member of the hitch and for transmitting horizontally oriented forces from the hitch ring to the ball member, said tubular member having an inner chamber for receiving the ball member;

b. a partially cutaway annular flange positioned on one end of said tubular member for receiving and partially circumscribing the neck, the cutaway portion of said flange forming a first orifice dimensioned to accomodate the nect but not the ball member, said flange having an outer diameter greater than the outer diameter of said tubular member and an inner diameter less than the diameter of the ball member;

c. a second orifice located in the wall of said tubular member coincident with opposed edges of said first orifice and communicating with said chamber, said second orifice being dimensioned to permit removal of the ball member from said chamber therethrough by relative lateral displacement between said tubular member and the hitch;

d. first retaining means slidably locatable along the longitudinal axis of said tubular member and positionable around said tubular member adjacent said flange for closing off said second orifice and precluding lateral displacement of the ball member from within said chamber; and

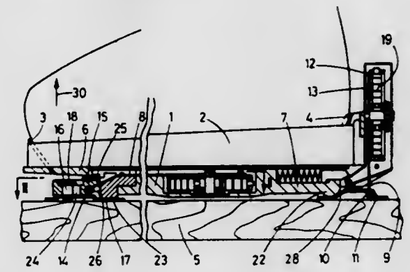
e. second retaining means removably locatable along the longitudinal axis of said tubular member for retaining the hitch ring adjacent said first retaining means and in a fixed relationship with respect to the longitudinal axis of said tubular member.

4,072,321

LOST MOTION ANCHOR FOR A SELF-RESTORING SKI BINDING

Francis Vaudaux, Boege, France, assignor to The Garcia Corporation, Teaneck, N.J.

Filed Apr. 27, 1976, Ser. No. 680,859
Claims priority, application France, May 2, 1975, 75 13803
Int. Cl.² A63C *9/00*
U.S. Cl. 280—637 **12 Claims**



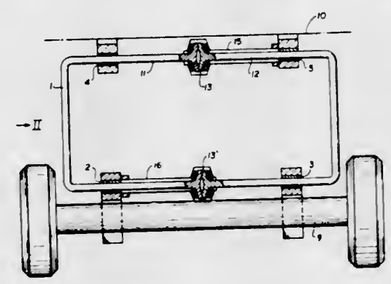
1. In a ski binding comprising a sole plate; at least one flexible connection connecting an extremity of said sole plate to a ski and at least one elastic tension device associated with said flexible connection and placing a continuous tension thereon for releasably retaining said sole plate on said ski; an improved anchor means for securing said flexible connection to said ski which comprises: a base plate secured to the surface of said ski; a post arranged perpendicularly to said base plate; a head pivotally connecting an end of said flexible connection to said post; and guide means on one of said base plate and said head for permitting rotational and limited longitudinal sliding movement of said head in relation to said base plate as said sole plate moves into and out of position adjacent said head.

4,072,322

AXLE SUSPENSION SYSTEMS FOR A VEHICLE

Dietrich Fuchs, Karlsfeld, and Albin Luttner, Munich, both of Germany, assignors to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Munich, Germany

Filed Oct. 4, 1976, Ser. No. 729,417
Claims priority, application Germany, Oct. 14, 1975, 2545904
Int. Cl.² B60G *15/00*
U.S. Cl. 280—713 **10 Claims**



1. An apparatus for supporting a vehicle body having a

longitudinal axis, an axle means extending transversely to said longitudinal axis, comprising stabilizer means for connecting the vehicle body to said axle means, said stabilizer means comprising frame means including two frame members, each member including a respective first and second arm, means rigidly interconnecting corresponding arms to each other at one end thereof, said first and second arms also extending transversely of said longitudinal axis, flange means interconnecting the opposite ends of the first arms to each other and also the opposite ends of the second arms to each other, means pivotally mounting said first arms to said body and said second arms to said axle, first and second rigid force transmitting means connected to the respective flange means at one end of the first and second force transmitting means, while the other end of the first force transmitting means is connected to the vehicle body and the other end of the second force transmitting means is connected to the axle.

4,072,323

PASSIVE SEAT BELT DEVICE

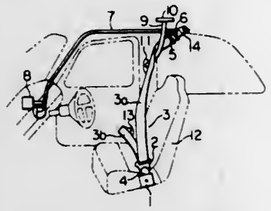
Toshiaki Shimokawa, Nishio, and Kunitaka Suzuki, Toyota, both of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Nov. 12, 1975, Ser. No. 631,238

Claims priority, application Japan, Nov. 14, 1974, 49-138189[U]

Int. Cl.² B60R *21/02*

U.S. Cl. 280—745 **6 Claims**



1. A passive seat belt device for use with an occupant in a motor vehicle comprising: a seat belt means having at least a shoulder belt which is secured at its one end to the inner and upper side portion of a compartment of the vehicle for tightening said occupant in position; a drive mechanism including a rail running along the side edge of the inner roof portion of said compartment, hanger means which slidably hang said shoulder belt and being capable of shifting along said rail forwards and rearwards, said seat belt driving means automatically bringing said seat belt means into an occupant-tightening position when a door of the vehicle is closed and into an occupant-releasing position when said door is opened; and a support arm which is positioned over said rail a short distance from the inner side wall of said compartment with its opposed ends fixed above and below said rail and spaced forward of the rearward end position of said hanger means along said rail and with which said shoulder belt engages to be kept away from the neck portion of said occupant, said support arm extending in the vertical direction so that said shoulder belt is allowed to move upwards and downwards in engagement with said support arm whenever said seat belt means is moved toward said occupant.

4,072,324

SHEAR PIN ASSEMBLY FOR COUNTERWEIGHTS

Bobby D. Griffith, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

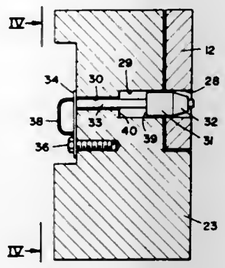
Filed Aug. 19, 1976, Ser. No. 715,742

Int. Cl.² B60R *11/00*

U.S. Cl. 280—759 **10 Claims**

1. A shear pin assembly in combination with a counterweight adapted for mounting on a frame of a vehicle comprising

a shear pin reciprocally mounted in a bore formed in said counterweight for movement in first and second opposite directions between an extended position whereby an end of said shear pin extends outwardly from said counterweight and a retracted position within said counterweight,



first stop means for limiting movement of said shear pin in said first direction to hold it in its extended position,

second stop means for limiting movement of said shear pin in said second direction to hold it in its retracted position and

adjustable locking means separate and offset from said shear pin and mounted solely on said counterweight and attaching said shear pin to said counterweight for selectively locking said shear pin at its extended or retracted position thereon.

4,072,325

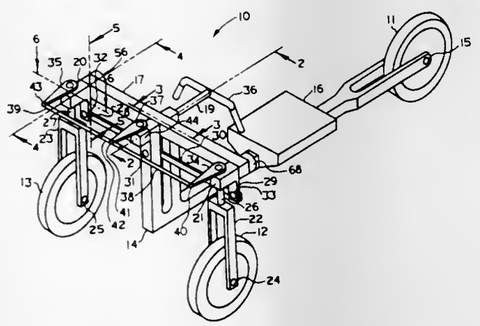
PENDULUM STABILIZED GROUND VEHICLES

Jerd Bright, and Donald Ray Bright, both of Sunnyvale, Calif., assignors to Bright Engineering, Incorporated, Sunnyvale, Calif.

Filed Jan. 28, 1977, Ser. No. 763,681

Int. Cl.² B62D *9/00*

U.S. Cl. 280—772 **8 Claims**



1. A ground vehicle including, in combination, suspension frame means, ground wheel means, ground wheel support means, means coupled to proximate extremities of said suspension frame means for pivotally supporting said ground wheel support means, pendulum means, means centrally coupled to said suspension frame means for pivotally supporting said pendulum means such that said pendulum means depends downwardly from said suspension frame means, means for intercoupling said pivotally supported ground wheel support means and said pivotally supported pendulum means such that motion of said pivotally supported pendulum means transverse to the direction of travel of said vehicle causes a corresponding motion of said pivotally supported ground wheel support means and hence, of said attached ground wheel support means and said ground wheel means.

4,072,326

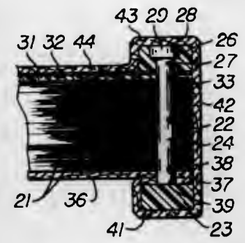
WRAP-AROUND COVER FOR BOOKS

Charles T. Groswith, III, Los Altos, and Ralph M. Woodley, Palo Alto, both of Calif., assignors to Velo-Bind, Inc., Sunnyvale, Calif.

Filed July 19, 1976, Ser. No. 706,496

Int. Cl.² B42D *1/00, 3/00*

U.S. Cl. 281—29 **14 Claims**



1. A book comprising a plurality of sheets, a first end cover, a second end cover, a spine cover, a first binding strip overlying the spine margin of said first end cover, a second binding strip overlying the spine margin of said second end cover, cooperating binding means on said strips for securing said strips together, said sheets, both said end covers, said second binding strip and a first edge of said spine cover formed with aligned apertures spaced along the marginal edge of said book for reception of said binding means, said spine cover having said first edge bound under said first binding strip and being wrapped around an edge of said first strip opposite said spine, over the outside of said first strip, over the outside of the spine of said book, over the outside of said second strip and having an overlapping portion overlapping at least a portion of said second end cover, and means securing said overlapping portion to said at least a portion of said second end cover.

4,072,327

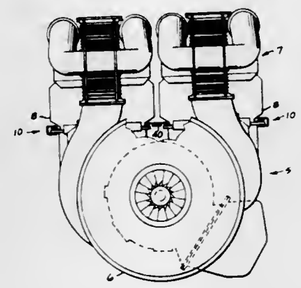
SLIP JOINT BETWEEN A GAS TURBINE ENGINE AND A HEAT EXCHANGER

D. Craig Young, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 1, 1976, Ser. No. 728,589

Int. Cl.² F16L *39/04*

U.S. Cl. 285—137 R **6 Claims**



1. In an assembly having first and second bodies, the first body including a rectangular-shaped hot gas discharge manifold defining a first flange thereabout having a flat surface, the second body including a rectangular-shaped hot gas inlet manifold defining a second flange thereabout having a flat surface, the first and second bodies affixed one to the other at a point remote of said manifolds and with said flat surfaces in an abutting relation, and said first and second bodies having different thermal expansion rates, a slip joint for connecting the hot gas discharge manifold of the first body to the hot gas inlet manifold of the second body, the slip joint comprising:

clamp means fixed relative the first body allowing limited translational movement of second body relative the first body while sealingly allowing the hot gas discharge manifold to communicate gases from the first body to the second body through the hot gas inlet manifold under varying temperature conditions;

the clamp means comprising a plurality of generally rectilinear C-shaped members, each having an open side, opposing base sides, and a closed side opposite the open side, and wherein each C-shaped member may be disposed with the open side thereof in a clamping relationship with the first and second flanges, while said first and second flanges are in an abutting relation;

said first flange defining a plurality of spaced-apart threaded bores;

a base side of each C-shaped member defining a plurality of holes each alignable with the spaced-apart threaded bores of the first flange, and each hole of larger diameter than the threaded bore;

the assembly further comprising bolt means threadably disposable in said bore and extending outwardly therefrom through said aligned holes so that said C-shaped member is retained in a clamping relation with the first and second flanges.

4,072,328

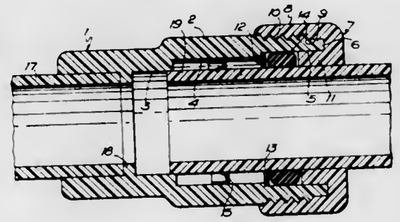
PIPE COUPLINGS

David Robert Elliott, Burnley, England, assignor to Hepworth Plastics Limited, Sheffield, England

Filed May 25, 1976, Ser. No. 689,833

Int. Cl.² F16L *27/00, 47/02*

U.S. Cl. 285—169 **9 Claims**



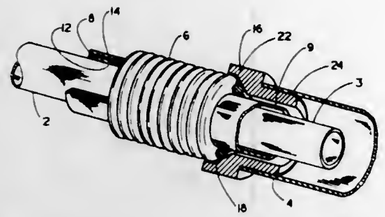
1. A pipe coupling comprising a socket portion at one end of a bore, with a first internal radial enlargement adjacent the bore, a first shoulder being defined between said first enlargement and said bore, and a second radial enlargement adjacent the end of the socket portion remote from the bore, an end cap having an opening through which a pipe is inserted into the bore, said end cap having an outer portion adapted to be secured on the outside of the socket portion and an inner portion with an internal diameter substantially equal to that of the bore, a washer adjacent a second shoulder at the junction between the enlargements and having an internal diameter substantially equal to that of the bore, a resilient sealing ring housed between the inner portion of the end cap and the washer, and a toggle ring located between said washer and said first shoulder, said toggle ring being slidable along the first enlargement and having an aperture smaller in diameter than that of the bore, said resilient sealing ring providing a seal between a wall of said second enlargement and the pipe on a portion of said pipe located between said end cap and said slidable toggle ring.

4,072,329

FLEXIBLE FLUID CONNECTING DEVICE

Paul A. Mutchler, University City, Mo., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Sept. 20, 1976, Ser. No. 725,034
Int. Cl.[2] F16L *55/00*
U.S. Cl. 285—187 **5 Claims**



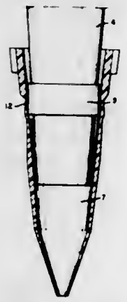
1. A fluid connecting device comprising:
a first conduit member having a first open end, a second conduit member having a first open end, said second conduit member having an inner diameter greater than the outer diameter of said first conduit member, said first open end of said first conduit member coaxially extending into said first open end of said second conduit member;
a resilient flexible sleeve having a first open end and a second open end and surrounding said first conduit member;
said first open end of said sleeve being fixedly attached to said first conduit member in a substantially fluid tight relation;
a straight flange end on said flexible sleeve extending inwardly into said second conduit, said straight flange end encircling and being radially spaced from said first open end of said first conduit member, said straight flange end being spaced from said second conduit with sealing means disposed therebetween; and,
said resilient flexible sleeve maintaining said sealing means in sealing position between said second conduit member and said flexible sleeve.

4,072,330

SLIP-ON PIPETTE TIP MEMBER AND PIPETTE DEVICE THEREFOR

Gottfried Brysch, Hamburg, Germany, assignor to Eppendorf Geratebau Netheler & Hinz GmbH, Hamburg, Germany

Filed May 26, 1976, Ser. No. 690,151
Claims priority, application Germany, June 12, 1975, 2526296
Int. Cl.[2] B01L *3/02*; F16L *47/00*
U.S. Cl. 285—239 **11 Claims**



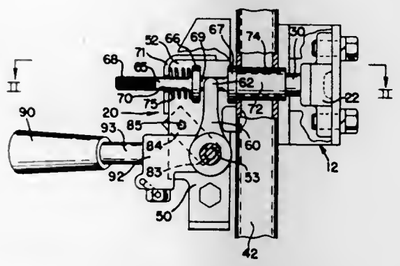
1. An improved slip-on pipette tip member in the form of an elongated receptacle being at least partly of a conical configuration for mating with an adapter cone of a pipette device onto which the tip member is to be engaged, said tip member having a top mounting opening, a bottom fluid intake and discharge opening, and a hollow passageway formed by outer walls and extending between said top mounting opening and said fluid intake and discharge opening for fluid communication therebetween wherein the improvement comprises a sealing zone located along the axial length of said pipette tip member in a position between said mounting opening and said intake and discharge opening to be engaged by a radially projecting collar on the end portion of said adapter cone of said pipette device, said sealing zone comprising a portion of wall area of selectively reduced wall thickness at the outer surface of said tip member, said wall portion of said tip member being more resilient and elastically adaptable in the area of said sealing zone relative to the other walls of said tip member so that said sealing zone is deformable with yieldable characteristics being of reduced rigidity in order to more effectively receive and seal said end of said adapter cone.

4,072,331

DOOR LATCH HAVING THREE-WAY ACTUATION MEANS

Max E. Butterfield, Peoria; Robert M. Alt, Washington, and James E. March, Princeville, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed June 28, 1976, Ser. No. 700,271
Int. Cl.[2] E05C *15/02*
U.S. Cl. 292—173 **4 Claims**



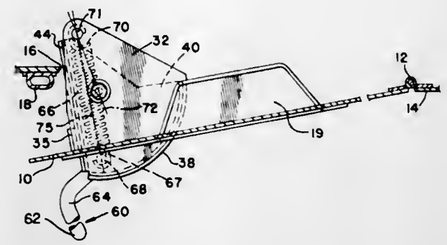
1. In a latch device mounted in a door, a base secured to said door, a shaft rotatably mounted on said base with a portion located inside said door and a portion extending through said door to the exterior thereof, a strike bar slidably carried by said base and extending transverse to the axis of said shaft, spaced abutments radially extending from said strike bar and being located on the strike bar inside said door, a lever keyed to said shaft and having a pair of fingers straddling said strike bar between said spaced abutments, the width of said fingers in the direction of movement of the strike bar being less than the spacing between said abutments, a spring surrounding said strike bar for urging a latch end portion of the strike bar out of the door and into the latched position, the spacing between said fingers on the lever and the abutment on the latch end portion of said strike bar being sufficient to permit the latch bar to be moved to the unlatched position without movement of said lever, exterior handle means keyed to the end portion of said shaft located exterior to said door, interior handle means keyed to the end portion of said shaft located inside the door, whereby pivoting either the interior or exterior handle means will pivot the shaft and the lever to contact one of said abutments to compress the spring and to retract the strike bar into the door, and handle means on said strike bar for moving said strike bar relative to said lever independent of the internal and external handle means for retracting the strike bar from a latched position.

4,072,332

DOOR LATCH HAVING OVERCENTER SPRING

Robert L. Isaia, Roanoke, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed July 19, 1976, Ser. No. 706,717
Int. Cl.[2] E05C *3/04*
U.S. Cl. 292—228 **8 Claims**



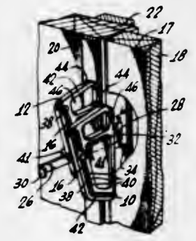
1. In a latch arrangement for securing a panel over an opening in a housing, said panel being hinged to said housing and having a pair of plates projecting inwardly toward the inside of said housing, latch means pivotally mounted about an axis extending between said plates, a projecting portion of said latch means extending from said panel and being adapted to engage an inside wall of said housing to secure said panel over said opening, said latch means is comprised of a pair of spaced walls joined together by a cylindrically-shaped portion having a center on said axis of said pivotal mounting of said latch means, and a base extending between said spaced walls with one end thereof forming said projecting portion, a handle carried by said latch means and extending to a position exterior of said panel, a spring connected at one end to said latch means and connecting at the other end to said plates, said other end of said spring and said axis about which said latch means pivots lying along a fixed axis, movement of said handle pivots said latch means and said spring to shift said spring from a position on one side of said fixed axis to the other side thereof, whereby clockwise movement of said handle and said latch means moves the one end of said spring beyond said fixed axis whereupon the projecting portion of the latch means is disengaged from the inside of said housing and whereby movement of said handle in a counterclockwise direction will move the spring back beyond said fixed axis for positioning said projecting portion of said latch means against the inside wall of said housing for holding the panel latched over the opening into said housing.

4,072,333

REMOVABLE DOOR-LOCKING DEVICE

Charles G. Hutter, III, Hollywood, Calif., assignor to Physical Systems, Inc., North Hollywood, Calif.

Filed Oct. 29, 1976, Ser. No. 736,832
Int. Cl.[2] E05C *19/18*
U.S. Cl. 292—292 **4 Claims**



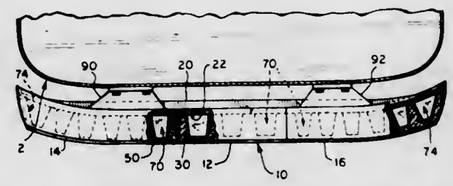
1. For use with a door that is pivotably mounted in a frame, the door having a latch movable into a cooperating recess in the frame, a removable door-locking device comprising:
a pair of adjacent wedges each having an abutment surface and a locking surface that lies at an acute angle to said abutment surface, each of said wedges having a main slot bounded on one side by said locking surface and a secondary slot extending from said main slot toward said abutment surface to permit said connecting means to move toward said abutment surface;
a hook having a body portion normal to said abutment surfaces that is at least partially disposed between said wedges and capable of projecting from between said wedges past said abutment surfaces, and at least one end portion extending from said body portion at an angle thereto for insertion in said recess; and
connecting means attached to said hook for slidably engaging said locking surfaces;
whereby one of said abutment surface can engage the door while the other of said abutment surfaces engages the frame to hold the door in a closed position.

4,072,334

ENERGY ABSORBING BUMPER

Wan Seegmiller; Bruce O. Young, both of Sacramento, and Joe A. Story, Davis, all of Calif., assignors to Energy Absorption Systems, Inc., Chicago, Ill.

Continuation of Ser. No. 597,586, July 21, 1975, abandoned.
This application Oct. 15, 1976, Ser. No. 732,944
Int. Cl.[2] B60R *19/08*
U.S. Cl. 293—71 R **11 Claims**



1. An energy dissipating bumper for a motor vehicle capable of returning to its original configuration after an impact, comprising:
a relatively rigid support member and a bumper module disposed over the support member;
the support member having means for attachment to the vehicle;
the bumper module having a core of compressible, open celled, thermoplastic foam having a continuous front wall and a plurality of spaced apart columns extending rearwardly from the front wall, and a resilient, thermoplastic outer skin enclosing the core, the spaces between the rearwardly extending skin covered columns forming spaced apart, unfilled cavities open to the atmosphere along the rear side of the bumper module;
whereby the collision rebound effect of the foamed core is diminished.

4,072,335

LIFTING DEVICE

Arlan William Tift, 3310 Panorama Drive, Redding, Calif. 96001, and Delbert W. Strait, 5334 Pine St., Anderson, Calif. 96007

Filed Mar. 7, 1977, Ser. No. 775,105
Int. Cl.[2] B66F *13/00*
U.S. Cl. 294—93 **3 Claims**

1. A device for lifting articles, which articles include a hole of fixed size extending through such article, said device comprising:
1. Rod means with offset means on one end thereof said

offset means and rod means being of a size so as to be insertable through said article in said hole;

2. Tab means attached essentially perpendicularly to said rod at a distance from said offset means;

3. Elongated cylindrical means slideably mounted about said rod means, with said offset means extending outwardly from the first end of said cylindrical means, said cylindrical means having an elongated opening in its wall suitable to allow said tab means to project outwardly therethrough and of such length that said rod means with said tab means attached can slide within said cylindrical means;

4. Lever means pivotally attached to said cylindrical means at its second end;



5. Means cooperative with the said first end of said cylindrical means which means prevent said cylindrical means from entering the said hole in said article; and

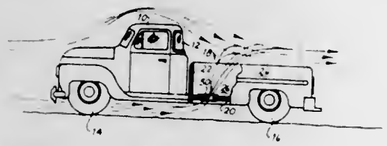
6. Connecting means pivotally connecting said tab means to said lever means in such manner that the said rod means is forced into said cylindrical means so as to bring the said offset means closer to the said first end of said cylindrical means when the lever means is moved in one direction and so that said offset means is moved away from said first end of said cylindrical means when the said lever means is moved in the other direction.

4,072,336

VACUUM SPOILER FOR PICKUP

Leo J. Ruzicka, 4804-19th St., Lubbock, Tex. 79407

Filed Nov. 1, 1976, Ser. No. 738,165
Int. Cl.² B62D *35/02*
U.S. Cl. 296—1 S **4 Claims**



1. In a pickup truck having

a. a cab with a straight back thereto, and

b. a bed with

(i) side walls and

(ii) a floor having a front next to the cab,

c. said bed adjacent the straight back of the cab, THE IMPROVED STRUCTURE FOR REDUCING FUEL CONSUMPTION AT HIGH SPEEDS, COMPRISING:

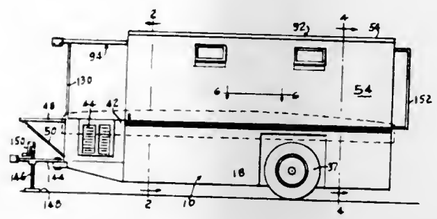
d. an elongated cross slot through the front of the bed floor to vent air from under the bed to behind the cab.

4,072,337

TRAILER CONSTRUCTION

Joseph K. Barker, Rt. 7 Box 101, Abingdon, Va. 24210

Filed Jan. 30, 1976, Ser. No. 653,904
Int. Cl.² B63B *35/34*
U.S. Cl. 296—27 **9 Claims**



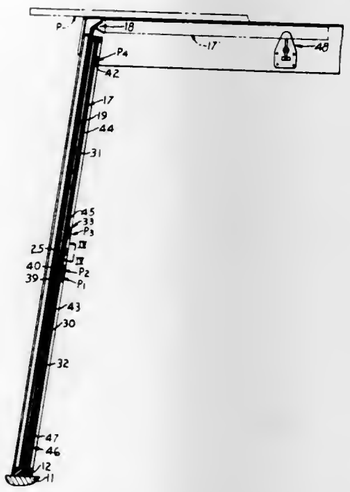
1. A trailer vehicle comprising a base and an elongated shelter structure arranged over said base, said shelter structure comprising normally vertical rigid parallel side walls, and releasable means extending transversely of and connected between said walls at spaced points therealong for supporting said walls in vertical position, certain of said releasable means comprising transverse rafters extending across said shelter body and pivotally connected at their remote ends to the respective walls, each rafter being formed of complementary sections in end-to-end relationship centrally of the width of said body, and a splicing device connecting the adjacent ends of each rafter and releasable from at least one such end whereby each section is free to swing downwardly about its pivotal connection with said walls, each wall being pivotally connected to said base to swing downwardly and inwardly to substantially horizontal positions after said rafter sections have been swung downwardly to positions adjacent said walls.

4,072,338

OPENABLE DUAL WINDSHIELD ARRANGEMENT FOR CONSTRUCTION VEHICLES

Dean M. Lawrence, Aurora, and Fred E. Simpson, Oswego, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 5, 1976, Ser. No. 673,508
Int. Cl.² B62D *27/00*
U.S. Cl. 296—28 C **11 Claims**



1. A dual windshield arrangement, mounted on a main frame of an operator's cab, comprising

a sub-frame having an upper end thereof pivotally mounted

in a fixed position on said main frame solely for swinging movements between closed and opened positions,

an upper windshield mounted on said sub-frame,

a lower windshield slidably mounted on said main frame and on said sub-frame for sliding movements below or in overlying relationship relative to said upper windshield whereby said upper windshield can be solely opened, said lower windshield can be solely opened or said upper and lower windshields can be opened simultaneously,

first latch means releasably attaching said sub-frame to said main frame, and

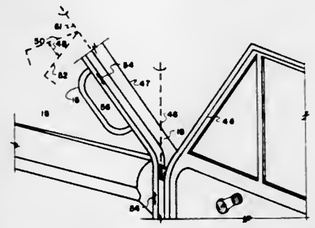
second latch means releasably attaching said lower windshield in a selected position on one of said main frame and said sub-frame.

4,072,339

HIGH GROUND CLEARANCE PASSENGER VEHICLE HANDLE APPARATUS

Melvin Albert Rothlisberger, 721 Fifth St., Elko, Nev. 89801

Filed July 15, 1976, Ser. No. 705,676
Int. Cl.² B60N *3/02*
U.S. Cl. 296—71 **5 Claims**



1. In combination with a high-ground clearance passenger vehicle of the type having a door to permit entry thereinto and a functionally vertical door post cooperatively associated with said door, a handle apparatus comprised of:

a base with legs extending away from opposite ends thereof to form a 'U'-shaped handle member;

securing means to secure said handle member to said door post to extend away therefrom into the interior of said vehicle and to form a 'D'-shaped opening, said base and said legs being sized in length and section so that a hand may readily grasp said handle member;

wherein said handle member is secured to said doorpost at a point along its length to be graspable by the hand of vehicle entrant and to provide said entrant with a means when grasped, to apply a lifting force to assist said entrant in entering said vehicle; and

wherein said handle member is secured to said door post at an angle from about 25 degrees to about 65 degrees, said angle being the angle between a plane containing the legs of said handle member and a plane parallel to the door of said vehicle in a closed position.

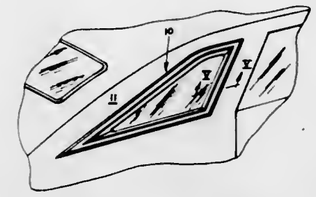
4,072,340

WINDOW ASSEMBLY

Cleon C. Morgan, Holland, Mich., assignor to Donnelly Mirrors, Inc., Holland, Mich.

Filed Sept. 20, 1976, Ser. No. 724,618
Int. Cl.² B60J *1/00*
U.S. Cl. 296—84 R **24 Claims**

1. A vehicular window assembly formed as a complete unit prior to installation and adapted for installation from the exterior of a vehicle body to provide an assembly for closing an opening in a vehicle body, said window assembly comprising a casing constructed of a molded plastic material approximating the shape and size of the opening in said vehicle; a transparent window having a peripheral edge with said casing molded around said peripheral edge; attachment means for attaching said casing to said vehicle body, said casing being molded around at least a first portion of said attachment means so as to embed said first portion within the casing; said casing having an inner surface arranged to face in a direction toward the inside of the vehicle body and an outer surface arranged to face in a direction toward the outside of said vehicle body; said attachment means having second portions spaced along the casing, extending in a direction toward the inside of said vehicle body, and constituting affixing means for affixing said composite casing and transparent window over said opening in the vehicle body; said casing and attachment means structure providing a finished trim around said window and the periphery of the opening in the vehicle body by which said second, affixing portions of said attachment means are concealed from view outside of the vehicle body.

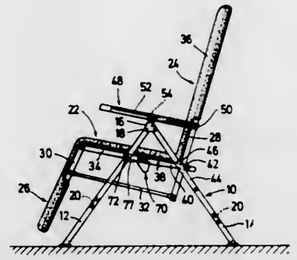


4,072,341

ADJUSTABLE CHAIR

Rudolf Kurz, Bietigheim-Bissingen, Germany, assignor to Kurz GmbH, Bietigheim, Germany

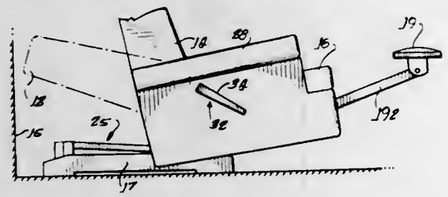
Filed Dec. 1, 1975, Ser. No. 636,709
Claims priority, application Germany, Dec. 3, 1974, 7440096[U]
Int. Cl.² A47C *4/00*
U.S. Cl. 297—27 **17 Claims**



1. In an adjustable chair, a combination comprising a frame including a pair of lateral portions; a seat; a backrest; means for connecting said backrest to said frame for movement relative thereto through a series of first positions between an erect and an intermediate position, and through a series of second positions between said intermediate and a fully reclined position; means for arresting said backrest in selected ones of said first positions, including a first arresting member connected to said frame and a second arresting member connected to said backrest for movement therewith relative to said first arresting member, one of said arresting members having at least one detent projection and the other arresting member including an arresting portion juxtaposed with a region of movement of said detent projection relative to said arresting portion which corresponds to the movement of said backrest between said erect and intermediate positions and having a plurality of detent recesses in a selected one of which said detent projection is received to arrest said backrest in a selected first position, whereas said detent projection is outside said region in said second positions of said backrest so that the latter is infinitely adjustable between said second positions; a pair of armrests each associated with one of said lateral portions; a pivot con-

necting a respective one of said armrests to said backrest; and means accommodated in at least said one armrest and operative for damping said movement of said backrest toward said fully reclined position thereof at least in a range in which said backrest approaches said fully reclined position, said damping means including a helical tension spring having two ends one of which is attached to said pivot, and a connecting rod attached to said associated lateral portion and partially accommodated in said tension spring, said tension spring and said connecting rod having associated abutment portions which are disengaged from one another when said backrest is outside said range and engage one another when said backrest is within said range so that movement of said backrest in said range toward said fully reclined position results in tensioning of said tension spring.

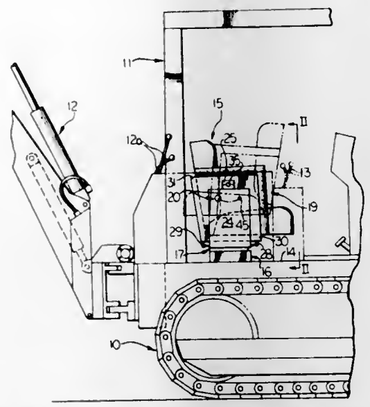
4,072,342
RECLINER CHAIR
Carl B. Johnson, and Henry James, both of Pontiac, Ill., assignors to Pontiac Furniture Industries, Inc., Pontiac, Ill.
Filed Apr. 20, 1976, Ser. No. 678,702
Int. Cl.² A47C *1/02*
U.S. Cl. 297—84 **7 Claims**



1. In a wall-clearing reclining chair comprising a base, a chair chassis movably supported by said base, a chair back on said chassis, a chair seat on said chassis, an extendible footrest on said chassis, and means on said chassis for shifting said chair back and chair seat between a sitting position and a reclined position and for extending said footrest, the improvement comprising means supporting said chassis for forward and downward travel along said base by the weight of the occupant from a rearward sitting position with the footrest retracted to a forward position at which the chair back may be reclined with the footrest extended without rearward projection of the back farther rearwardly than in said sitting position latch means for latching said chair chassis at said sitting position, means operable by the occupant to actuate said latch means to release said chair chassis for forward shifting movement under the occupant's weight, and a biasing means activated by said forward and downward travel to return said chair chassis rearwardly to the sitting position when the occupant rises from the chair.

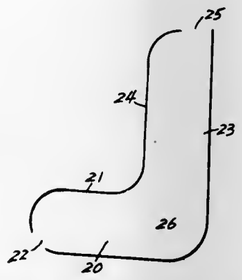
4,072,343
REVERSIBLE AND ADJUSTABLE BILEVEL SEAT FOR DUAL-PURPOSE VEHICLE
Gonzalo Dario Vidal Meza, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Dec. 27, 1976, Ser. No. 754,784
Int. Cl.² A47C *1/00*
U.S. Cl. 297—93 **14 Claims**

1. A reversible and adjustable seat apparatus for an operator's station of a dual-purpose vehicle having a first implement at the front and a backhoe at the rear with backhoe controls which are higher above the vehicle platform than are the first implement controls, said seat apparatus comprising, in combination:
a base fixed to the vehicle platform;
mounting means on the base comprising parallel upright side members;
a rotational assembly comprising a first transverse plate, a first cushion member secured to said first transverse plate, a second transverse plate, a second cushion member secured to said second transverse plate, parallel upright arms flanking said plates immediately adjacent the upright side members, and aligned pivots on said arms journalled in sockets in said side members to define a pivot axis on which the rotational assembly may be turned between a forwardly facing position with the first cushion member forming a seat while the second cushion member forms a backrest, and a rearwardly facing position with the second cushion member forming a seat while the first cushion member forms a backrest, said pivot axis being so located



that the seat is at a higher level in the rearwardly facing position, and being at the intersection of planes which bisect the following angles;
(a) the angle between the seating surface of the first cushion member in its forwardly facing position and in its rearwardly facing position, and
(b) the angle between the seating surface of the second cushion member in its forwardly facing position and in its rearwardly facing position;
and means for selectively locking said rotational assembly to said mounting means in either of said positions.

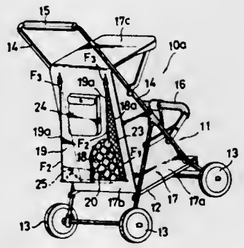
4,072,344
CONVECTIVELY AIR-VENTILATED FURNITURE
Chou H. Li, 379 Elm Drive, Roslyn, N.Y. 11576
Filed Oct. 14, 1976, Ser. No. 713,254
Int. Cl.² A47C *7/72*
U.S. Cl. 297—180 **16 Claims**



1. A convectively air-ventilated furniture comprising:
an elongated and hollow member having a lower end and an upper end and having also a top contact surface for the user of the furniture to rest against;
first wall means defining an air inlet opening at the lower end;

second wall means defining an air exit opening at the upper end;
third wall means defining an elongated, convective air channel extending from the air inlet opening to the air exit opening inside the hollow member;
at least a major portion of the contact area between the user and the top contact surface being air impermeable but sufficiently thermally conductive so that the body heat of the user heats up the air inside the hollow member thereby, through chimney effect, initiating and maintaining in the air channel a significant convective air current directed from the air inlet opening toward the air exit opening and substantially increasing the rate of heat transfer between the user and the air inside the hollow member.

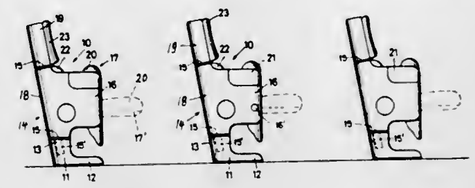
4,072,345
BABY CARRIAGE
Akiko Matsuda, Nyuzen, Japan, assignor to Yoshida Kogyo K.K., Japan
Filed Dec. 27, 1976, Ser. No. 754,519
Int. Cl.² A47C *7/36*
U.S. Cl. 297—184 **2 Claims**



1. A baby carriage comprising:
(a) a frame structure;
(b) a compartment for accommodating an infant, said compartment being made of substantially air-tight materials and including a pair of side portions and a back rest provided with an opening therein;
(c) a perforated member extending over said opening;
(d) a cover for covering said opening, said cover being integral with said compartment at its upper portion of said cover and coextending with said opening;
(e) a pair of slide fastener stringers, one of which is secured to and along the marginal edges of said cover and the other stringer to and along the marginal edges of said opening, said stringers being selectively coupled and uncoupled by a slider whereby said cover is selectively closed over and removed from said opening;
(f) a pair of aerative members of a substantially triangular shape, each member being interposed between the respective marginal edges of said cover and said opening, said aerative members being attached immediately adjacent to and inside of said slide fastener stringers.

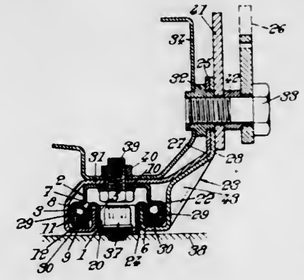
4,072,346
SEATING FURNITURE
Ralf Schueler, Gabrielenstrasse 66, 1000 Berlin 27, Germany
Filed May 14, 1975, Ser. No. 577,441
Claims priority, application Germany, May 17, 1974, 2424134
Int. Cl.² A47C *7/62*
U.S. Cl. 297—217 **32 Claims**

1. A seating furniture comprising base means, right and left lateral side wall means including rear edges and lower edges, said lower edges being secured to said base means, two substantially upright column means secured to said base means and respectively to said rear edges and said lateral side wall means, seat means proper, back rest means including a first part and a second part, each of said lateral side wall means comprising a first side wall member secured to its respective column means, a second side wall member, and guide means securing said second side wall member to said first side wall member in telescoping fashion to forwardly extend said second side wall member, said guide means taking up static forces, said second part of the back rest means forming a structural unit with said



second said wall member, said column means having upper ends above said second part of said back rest means, said first part of said back rest means interconnecting said columns, journal means securing said seat means proper to said second side wall member, and electrical means in at least one of said substantially upright column means.

4,072,347
SEAT SLIDING RUNNER
Bernard Boisset, Etampes, France, assignor to Societe Industrielle Bertrand Faure Brieres-les-Scelles, Etampes, France
Filed Jan. 7, 1977, Ser. No. 757,692
Claims priority, application France, Jan. 16, 1976, 76 01115
Int. Cl.² A62B *35/00*
U.S. Cl. 297—385 **9 Claims**



1. In a sliding runner supporting a motor vehicle seat, said sliding runner comprising: a lower profiled member of generally channel section having opposed flanks extended externally by respective angle section members and respective arched portions joining said angle section members to said flanks, each said angle section member having a first web extending downwardly from the corresponding arched portion and a second web extending outwardly from the bottom of the first web; means attaching said lower profiled member to the floor of the vehicle; an upper profiled member of generally inverted channel section having opposed flanks enveloping said angle section members of said lower profiled member and being extended inwardly by respective inwardly-directed ledges which extend below said outwardly extending webs of the respective angle section members of said lower profiled member; and ball races facilitating sliding of said upper profiled member along said lower profiled member and defined between each said flank of said upper profiled member and the corresponding angle section member of said lower profiled member, the improvement which comprises:
a. each said flank of said lower profiled member defining with its corresponding arched portion and first web a downwardly open inverted channel, and
b. a jaw member embracing said upper profiled member and means securing said jaw member to said upper profiled member, said jaw member having a lateral lug constituting

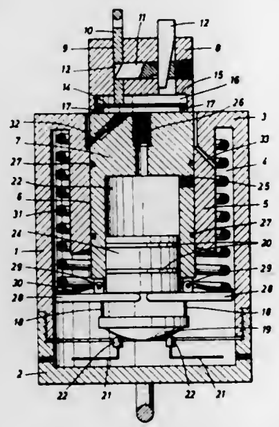
a lower anchoring point for a safety belt and respective walls which extend inwardly below the inwardly extending ledges of the upper profiled member and which terminate in respective turned up edges penetrating into the said downwardly open inverted channels provided by said lower profiled member.

4,072,348

SAFETY DEVICE FOR USE IN A VEHICLE HAVING A SEAT

Josef Auer, Ladestrasse4, Worgl, Austria

Filed June 1, 1976, Ser. No. 691,587
Claims priority, application Austria, June 3, 1975, 4212/75; Feb. 24, 1976, 1346/76
Int. Cl.² B60R *21/10*
U.S. Cl. 297—386 **6 Claims**



1. A safety device for use in a vehicle having a seat, which comprises

(a) a safety belt adapted to be affixed at one end relative to the seat and to be applied to a person who occupies the seat,

(b) a means for releasably holding the belt in position for retaining the person on the seat when the belt is applied to the person, the releasable holding means including

(1) a control cylinder and a control piston slidably movable in the cylinder, one of said cylinder and said piston adapted to be affixed relative to the seat and the other of said cylinder and said piston adapted to be connected at one end to the other end of the belt, the piston being adapted to be pulled out of the cylinder in a predetermined direction to an enabling position in response to a tensile load on the belt in excess of a predetermined value,

(c) retaining means arranged to prevent pulling of the control piston out of the control cylinder opposite to the predetermined direction,

(d) a drive spring acting upon the retaining means and arranged to be stressed as the control piston moves out of the control cylinder against the force of the spring,

(e) a retarding mechanism adapted to perform a predetermined stroke under the action of the spring when the control cylinder and piston are in the enabling postion,

(f) piston movement limiting means constituted by rocker levers pivoted to the control piston near the other end thereof, the rocker levers having a radially inwardly extending arm and a radially outwardly extending arm, and being pivotal between an extended position, in which the outwardly extending arms extend outside the periphery of the control piston and prevent the control piston from being pulled out of the cylinder, and a retracted position, in which the levers are retracted from the periphery and permit movement of the entire control piston out of the cylinder to release the belt,

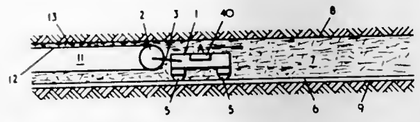
(1) the retarding mechanism comprising another piston arranged between the control piston and the rocker levers to move from a retaining position to a release position as the retarding mechanism performs the predetermined stroke so as to hold the rocker levers in the extended position when the retarding mechanism is in the retaining position and to permit the rocker levers to move to the retracted position when the retarding mechanism is in the release position.

4,072,349

STEERING OF MINING MACHINES

Dennis Hartley, Burton-on-Trent, England, assignor to Coal Industry (Patents) Limited, London, England

Continuation of Ser. No. 525,095, Nov. 19, 1974, abandoned. This application May 19, 1976, Ser. No. 687,761
Claims priority, application United Kingdom, Dec. 7, 1973, 56746/73
Int. Cl.² E21C *35/08*
U.S. Cl. 299—1 **18 Claims**



18. A method of controlling a cutting horizon of mineral cutter means which win a strip of mineral by separate roof and floor cutting stages comprising:

(a) cutting one of the separate roof and floor stages;

(b) cutting the other of the separate roof and floor stages;

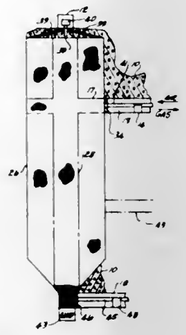
(c) controlling the cutting horizon of one of said cutting stages by sensing the cutting horizon associated with the other cutting stage.

4,072,350

MULTI-STAGE METHOD OF OPERATING AN IN SITU OIL SHALE RETORT

William J. Bartel, and Robert S. Burton, III, both of Grand Junction, Colo., assignors to Occidental Oil Shale, Inc., Grand Junction, Colo.

Continuation-in-part of Ser. No. 656,391, Feb. 9, 1976, abandoned, which is a continuation of Ser. No. 538,096, Jan. 2, 1975, abandoned. This application Jan. 27, 1977, Ser. No. 762,848
Int. Cl.² E21B *43/26*; E21C *41/10*
U.S. Cl. 299—2 **28 Claims**



1. A method of processing oil shale in an in situ oil shale retort in a subterranean formation containing oil shale, said in situ retort comprising a cavity having a gas inlet, a gas outlet,

and at least one intermediate access to the cavity between the gas inlet and gas outlet and containing a fragmented permeable mass of particles containing oil shale, comprising the steps of:

establishing a processing zone in the in situ oil shale retort near the gas inlet;

during a first sate of processing introducing a processing gas to the processing zone through the gas inlet and withdrawing off gas from the cavity at such an intermediate access downstream from the processing zone for advancing the processing zone through a first portion of the fragmented mass; and

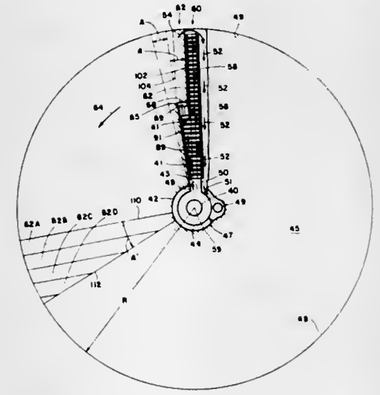
thereafter during a subsequent stage of processing introducing a processing gas to the processing zone through an intermediate access upsteam from the processing zone and withdrawing off gas from the cavity through the gas outlet for advancing the processing zone through a second portion of the fragmented mass.

4,072,351

RADIAL MINING METHOD

Henry L. Roye, 801 NW. Third, Stigler, Okla. 74462

Filed Jan. 24, 1977, Ser. No. 761,797
Int. Cl.² E21C *41/00*
U.S. Cl. 299—11 **10 Claims**



1. A method of mining a subterranean mineral seam, for complete removal of said mineral over a selected circular area, and for minimum distance of transport of supplies and product, comprising:

(a) drilling at least a first large diameter central vertical or slope shaft, at a selected point on the surface of the earth, down to the selected seam of said mineral;

(b) enlarging said shaft at its base in said seam to a selected radius to form a workroom;

(c) drilling at least a second small diameter central shaft parallel to said first shaft adjacent said workroom;

(d) drilling a first radial shaft in said seam, from said workroom, to a selected radius R, by any conventional method, using movable roof supports such as extensible hydraulic chocks to support the roof, said chocks placed at successive radial distances from said workroom; with their extensions directed to the first wall on a first side of said first radial shaft;

(e) after said first radial shaft is complete, using a continuous mining method, directed radially, at a selected angle A to the axis of said first radial shaft, on said first side of said first shaft, drilling a second radial shaft;

(f) as said continuous miner moves radially outwardly, successively extending the extensible portion of said chocks to support the new roof area;

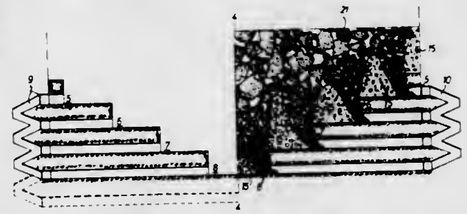
(g) when said second radial shaft reaches a first deflection point where said second shaft becomes as wide as the cutter of said continuous miner, changing the direction of advance of said miner to a direction parallel to that of said first shaft; whereby said first wall of said first shaft will be advanced by the width of said cutter.

4,072,352

METHOD FOR MINING OF ROCK OR ORE ACCORDING TO THE BLOCK CAVING PRINCIPLE IN MASSIVE FORMATIONS

Erik Ingvar Janelid, Forsetevagen 18, Djursholm, Sweden

Filed Aug. 18, 1975, Ser. No. 605,465
Claims priority, application Sweden, Aug. 20, 1974, 7410589
Int. Cl.² E21C *41/00*
U.S. Cl. 299—19 **7 Claims**



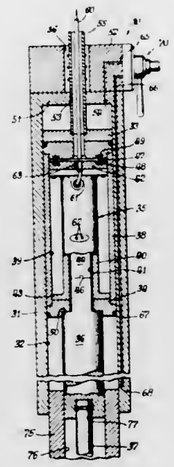
1. A method for mining of rock or ore according to the block caving principle, comprising driving, at several levels, substantially straight, parallel and horizontal drifts into the lower part of a block, choosing the distance between the drifts of each level so that remaining supporting pillars will cover at least 40% of the block area, undercutting the block from the drift in such a way that the drift openings toward the undercut area and the drift coverings will be arranged in a stepped configuration, the drift openings being utilized as draw-points for the caving material, the number of drift levels being chosen with regard to desired horizontal distance along the direction of the drifts between the draw-points at adjacent levels, and further blasting down said drift coverings to retreat the draw-points if cracks and cave-ins occur in the coverings at said drift openings.

4,072,353

THRUST-IMPACT ROCK-SPLITTER

George B. Clark, Wheat Ridge, Colo., and Terry F. Lehnhoff, Vichy, Mo., assignors to The Curators of the University of Missouri, Columbia, Mo.

Filed Aug. 27, 1976, Ser. No. 718,115
Int. Cl.² E21C *37/02*
U.S. Cl. 299—22 **3 Claims**



1. A rock-splitting tool having two or more elongate pres-

sure bars and an axially driven central wedge for radially separating the pressure bars, and comprising:

a hydraulically actuated thrust servomotor having a power output shaft for providing a steady output force;

means defining a first force transmission path including an anvil connecting said power output shaft with the wedge;

an impact hammer having a housing and an internal oscillating piston adapted to impart impact forces to said anvil by the momentum of said piston thereby defining a second force transmission path through said anvil to the wedge; and

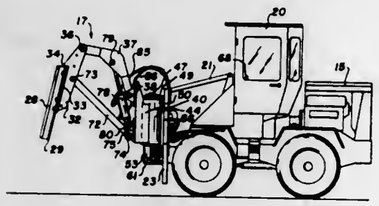
resilient means disposed between said impact hammer housing and said thrust servomotor for pre-loading said impact hammer housing through said anvil against the wedge.

4,072,354

BREAKER APPARATUS

John Holmes, Richmond, Canada, assignor to William Machinery Limited, Richmond, Canada

Filed May 6, 1976, Ser. No. 683,812
Int. Cl.² F23J *1/06*
U.S. Cl. 299—37 **10 Claims**



1. Breaker apparatus for breaking surface crusts and the like, comprising a base adapted to be mounted on a traction unit, an elongate passive, non-pneumatic breaker bar unit comprising an elongated, fixedly mounted breaker bar having a breaker point at a lower end thereof, linkage swingably mounting the breaker bar unit on the base for substantially vertical movement, said linkage maintaining the breaker bar unit in a generally downwardly-extending attitude and comprising vertically spaced upper and lower links pivotally connected at opposite ends to the base and the breaker bar unit, a single hydraulic cylinder unit having a lower end connected to the base and an upper end connected to the upper link, and operating means for selectively supplying pressure fluid to said cylinder unit alternatively to swing the upper link up and down and consequently to raise the lower said breaker bar unit to cause said point thereof to strike surface crusts and the like therebeneath and, together with said single hydraulic cylinder unit, constituting the sole means for the said raising and lowering of said breaker bar unit.

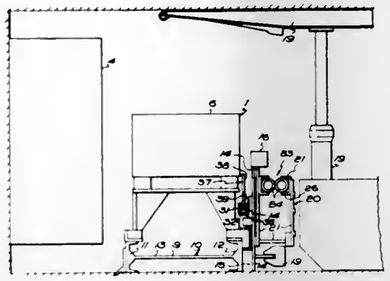
4,072,355

FLUID SUPPLY DUCT AND PICKUP FOR MINING MACHINES

Gerald Richard Oldham Pentith, Barnsley, England, assignor to Summit Mining Ltd., Barnsley, England

Filed July 26, 1976, Ser. No. 708,379
Claims priority, application United Kingdom, July 26, 1975, 31386/75; July 26, 1975, 31387/75
Int. Cl.² E21C *35/08, 35/22*
U.S. Cl. 299—43 **9 Claims**

1. A supply duct for use with mining equipment, or the like, to supply fluid to said equipment in the absence of trailing hoses in the vicinity of operation of said equipment, said supply duct comprising, in combination, an outer channel-like casing having an elongate opening formed in a wall portion thereof, an inner casing of a channel-like configuration formed for a material impervious to said fluid, and disposed within said outer casing to in effect line the inner walls thereof, said inner casing including an elongate, normally sealed slot formed therein and aligned with said elongate opening in said outer channel-like casing, said normally sealed slot being defined by opposed, resilient inner casing portions, the resiliency of which maintains said portions in engagement to seal said slot, while permiting said portions to be displaced, such as by a fluid



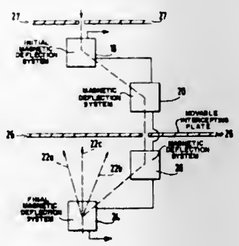
pickup means, to permit entry thereof to the interior of said inner casing with said resilient portions engaged about said fluid pickup means to maintain said seal, whereby said fluid pickup means may be moved along the length of said duct in communication with fluid being transported therein, without disruption of the sealed engagement of said inner casing portions, except proximate said fluid pickup means.

4,072,356

ELECTRON BEAM WELDING GENERATORS

Allan Sanderson, Balsham, England, assignor to The Welding Institute, Cambridge, England

Filed Jan. 24, 1975, Ser. No. 544,010
Int. Cl.² B23K *15/00*; H01J *37/315, 3/26*
U.S. Cl. 219—121 EB **9 Claims**



8. An electron beam generator comprising:

a housing;

an electron gun mounted within said housing;

an electron lens mounted within said housing; and

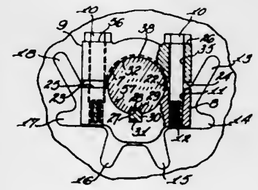
means within said housing defining a fixed path for the electron beam from the gun towards a predetermined welding point on a predetermined welding axis and blocking other paths, the path-defining means including a beam-directing means upstream of the electron lens comprising at least three electromagnetic beam-deflecting systems, including respective coils, a first of the beam deflecting systems being fixed in the housing in the direct path of the beam from the gun, and each other beam-deflecting system being fixed in the housing in the path of the beam as deflected by the preceding beam-deflecting system, the final beam deflecting system being mounted on the predetermined welding axis and the electron beam path from the final beam deflecting system to the welding point being in alignment with the electron beam path from the electron gun to the first beam deflecting system, whereby at least one of the beam-deflecting systems is off-set with respect to the said welding axis and the said path defined by the beam-directing means is non-linear; circuit means in which said coils of the beam-deflecting systems are connected for controlling the ratio of current passing through the coils; the generator further including intercepting means positioned between the final and first beam deflecting systems and extending across the electron beam generator to block paths between the workpiece and cathode other than the said fixed path, the intercepting means being movable to open the path from the workpiece to the electron gun for beam prealignment.

4,072,357

CLAMP STYLE WHEEL BUSHING

Kenneth N. Hansen, Waukesha, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 22, 1975, Ser. No. 643,311
Int. Cl.² B60B *37/00*
U.S. Cl. 301—1 **10 Claims**



1. A wheel and drive axle assembly comprising, a drive axle, an integral wheel and wheel hub section defining an axle opening and an arcuate axle bearing surface in said wheel hub section engaging said drive axle, means defining a rectangular key slot and a tapered keyway in said wheel hub and said axle, a key frictionally locked in said key slot and adapted for withdrawing from said keyway when said hub is loosened from said axle, reinforcing ribs between said wheel hub section and wheel extending downwardly from the wheel hub section to broaden the base and reinforce said wheel hub section, means defining counterbored and threaded holes in said wheel hub section with the counterbore on the axle engaging side of said wheel hub section, a cap hub section defining an arcuate axle bearing surface for engaging said drive axle and fastening portions in spaced relation to said wheel hub section, means defining bored holes in said cap hub section aligned with said counterbored and threaded holes in said wheel hub section, a plurality of cap screws extending through said bored holes in said cap hub section and threadedly engaging the threaded portion of the counterbored and threaded holes in said wheel hub section to thereby provide resiliance of the free length of said bolts to retain locking of said wheel on said drive axle under varying stress and thermal conditions.

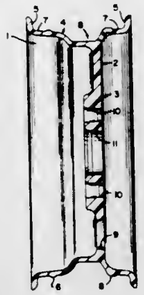
4,072,358

COMPRESSION MOLDED CUT-FIBER REINFORCED PLASTIC WHEELS

Raouf Abdul Ridha, Kent, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Apr. 28, 1976, Ser. No. 680,821
Int. Cl.² B60B *1/06*
U.S. Cl. 301—63 PW **6 Claims**

1. A compression molded cut glass fiber reinforced plastic wheel, the rim, disc and hub portions of said wheel being uniformally and predominately axially reinforced by cut glass fibers located in planes parallel to the axis of said wheel, said cut glass fibers being from ⅛ inch to 1-½ inches in length and



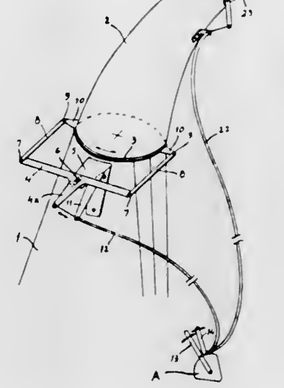
present in an amount within the range of 35% to to 75% on the weight of said plastic.

4,072,359

DEVICE FOR MANEUVERING THE DISCHARGE TUBE OF A HARVESTING MACHINE

Salomo Lillkvist, Alholmsgatan, Finland, assignor to A/S GYRO, Skive, Denmark

Filed Nov. 17, 1976, Ser. No. 742,428
Claims priority, application Finland, Nov. 21, 1975, 753291
Int. Cl.² B65G *53/40*
U.S. Cl. 302—34 **4 Claims**



1. Maneuverable discharge tube means comprising a lower duct portion, a discharge duct portion rotatably mounted on said lower duct portion, and means for rotatably maneuvering said discharge duct portion relative to said lower duct portion, said maneuvering means comprising:

a pair of ears secured to said discharge duct portion at respective opposite sides of the latter;

a bracket secured to said lower duct portion;

an elongated lever pivotally mounted on said bracket at a point on the lever intermediate the ends thereof;

a pair of elongated, rigid links,

one of said links having one of its ends pivotally connected to one end of the lever and having its other end pivotally connected to one of said ears,

the other of said links having one of its ends pivotally connected to the other end of the lever and having its other end pivotally connected to the other of said ears; and

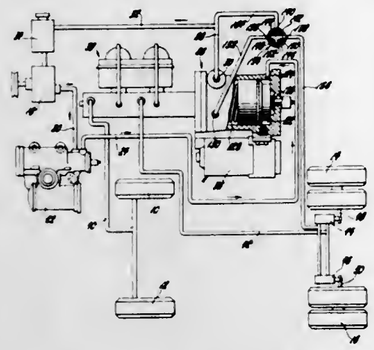
means for rotating said lever relative to said bracket.

4,072,360

HYDRAULIC PRESSURE BRAKE SYSTEM WITH SPRING APPLY PRESSURE RELEASE PARKING BRAKE MODE

Luther E. Carroll, Dayton, Ohio, and James C. Clement, Troy, Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 689,457, May 24, 1976, abandoned. This application Feb. 16, 1977, Ser. No. 769,222
Int. Cl.² B60T *13/22*
U.S. Cl. 303—2 **5 Claims**



1. A hydraulic pressure brake system comprising:
a power circuit including a pressure actuated booster having a pressurizable power chamber and a hydraulic fluid outlet having a normal back pressure when hydraulic power is available in said circuit for booster operation;
a brake actuating circuit including a master cylinder powered by said booster and a wheel brake actuator, said actuator having combined service brake operator and spring apply-pressure released parking brake operator sections;
a wheel brake subject to energization by said actuator to selectively function as a service brake or a parking brake;
and control means operable in one condition to direct said normal back pressure to said actuator without requiring power actuation of said booster to pressure release said parking brake operator section and operable in another condition to dump the normal back pressure from said actuator to actuate a spring apply portion of said parking brake operator section to energize said wheel brake to function as a parking brake;
said service brake operator section being actuated by pressure from said master cylinder to apply and release said wheel brake as a service brake when said parking brake operator section is in the pressure released condition.

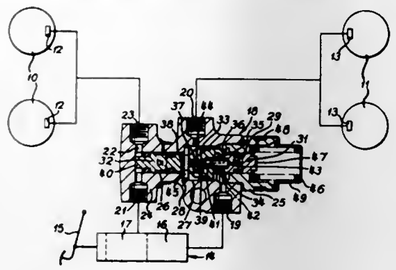
4,072,361

VALVE DEVICES FOR USE IN LIQUID PRESSURE BRAKING SYSTEMS OF VEHICLES

Eric Charles Hales, Leamington Spa, England, assignor to Automotive Products Limited, Warwickshire, England

Filed Nov. 10, 1975, Ser. No. 630,288
Claims priority, application United Kingdom, Nov. 11, 1974, 48739/74
Int. Cl.² B60T *8/18, 8/26*
U.S. Cl. 303—6 C **4 Claims**

2. A valve device for use in a liquid pressure vehicle braking system which has two sub-systems, comprising a housing having a stepped cavity closed at one end and opened at the other end, biasing means, a stepped plunger mounted within said cavity and arranged when the valve device is mounted in a braking system so that liquid pressure in said braking system exerts a force on the stepped plunger which is opposed by said biasing means, a passage in said housing, a valve member, said biasing means engaging said plunger and tending to move same to permit said valve member to open said passage to bypass said plunger, said cavity having a central portion of uniform cross-section between two end portions, each end portion of the cavity having a uniform cross-section and being smaller in cross-sectional area than is the central portion of the cavity, the stepped plunger comprises a plunger assembly located within said cavity and having three lands, a central one of the three lands being slidably fitted within the central cavity portion and each of the other two lands being slidably fitted within a respective one of the two end cavity portions, said housing having a first port which opens into the closed end portion of the cavity and which is for connection into a first of the two sub-systems when the valve device is mounted in a braking system, second and third ports in said housing opening into the central cavity portion with one on each side of the central plunger land and being for connection into the second of the two sub-systems when the valve device is mounted in a braking system, the by-pass passage being formed in said plunger assembly and connecting the part of the central cavity portion



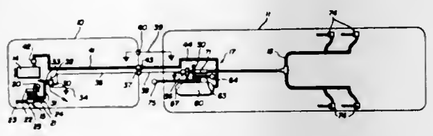
that is on one side of the central plunger land to the part of the central cavity portion that is on the opposite side of the central plunger land, the said valve member being a one-way valve in said passage, and abutment means in said housing co-operating with a stop surface provided in said cavity to hold said one-way valve open for certain positions of the plunger assembly within the cavity, the end of the plunger assembly remote from the closed end of the cavity being adapted to be acted upon by said biasing means when the valve device is mounted in a liquid pressure vehicle braking system so that the biasing means urges the plunger assembly towards the closed end of the cavity and the abutment means being so arranged that the one-way valve is opened as the plunger assembly approaches that end of the cavity, said plunger assembly comprising two plunger components which are coupled together, the central land and one of the other two lands being formed as one of the plunger components and the other land being formed as the other plunger component, said two plunger components being interconnected by a transverse pin.

4,072,362

TRAILER BRAKE SYSTEM

John A. Van Anrooy, St. Joseph, Mich., assignor to Lambert Brake Corporation, St. Joseph, Mich.

Filed June 14, 1976, Ser. No. 696,048
Int. Cl.² B60T *13/68*
U.S. Cl. 303—7 **36 Claims**



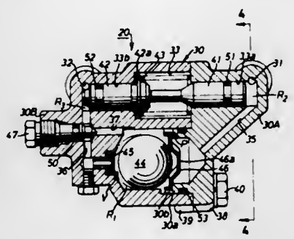
30. A brake system for a towing vehicle and trailer, comprising a towing vehicle fluid brake system, an electromechanical transducer connected to the towing vehicle fluid brake system for developing an electrical signal which varies proportionately in accordance with fluid pressure experienced in the towing vehicle brake system, a trailer fluid brake system, a power booster for energizing the trailer brake system, continuously energized fluid pressure supply means for creating a given absolute fluid pressure in the power booster, and an electromagnetic control electrically connected to the transducer and mechanically connected to the power booster for proportionately varying the fluid pressure and consequent braking action in the trailer brake system in accordance with the variation in the electrical signal.

4,072,363

INERTIA-CONTROLLED VALVE FOR VEHICLE BRAKING SYSTEMS

Nogami Tomoyuki, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Feb. 7, 1977, Ser. No. 766,532
Claims priority, application Japan, Aug. 10, 1976, 51-95063
Int. Cl.² B60T *8/14*
U.S. Cl. 303—24 C **5 Claims**



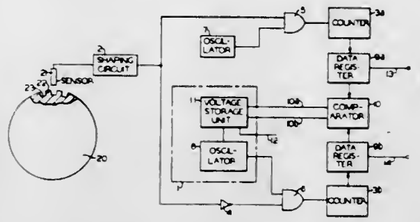
1. In a fluid pressure control device for a vehicle braking system incorporating between a master cylinder and a wheel brake cylinder, which comprises a housing adapted to be fixedly mounted at an inclined angle on a vehicle body frame, said housing being provided thereon with an inlet port for connection to said master cylinder and an outlet port for connection to said wheel brake cylinder and being provided therein with a stepped bore in communication with said inlet and outlet ports respectively at the small and large diameter portions thereof and a first fluid chamber provided in parallel with said stepped bore and in communication with the small and large diameter portions of said stepped bore at both sides thereof; a differential piston slidably disposed within said stepped bore to provide second and third fluid chambers respectively in open communication with said inlet and outlet ports, the smaller end of said piston being exposed in said second chamber and the larger end in said third chamber; a spring loading said piston axially in a direction toward said outlet port; and a cut-off valve including a valve seat provided on the side wall of said first chamber to permit fluid flow between said second and third fluid chambers and an inertia-controlled ball housed within said first chamber to co-operate with said valve seat and rolling toward said valve seat on the inclined bottom surface of said first chamber to cut-off fluid flow from said second chamber to said third chamber when said ball is subjected to a deceleration in excess of a predetermined value;
the improvement wherein said inlet and outlet ports are arranged to be located at the upper portion of said housing when mounted on the vehicle body frame and directly connected to the small and large diameter portions of said stepped bore respectively and wherein a bypass passage is provided to permit fluid flow from the upper portion of said first fluid chamber toward said outlet port and a fluid blocking means is disposed within said bypass passage to normally close said bypass passage, said fluid blocking means being adjusted to open said bypass passage only when brake fluid is supplied into said vehicle braking system.

4,072,364

COMPENSATING CIRCUIT ARRANGEMENT IN A WHEEL ANTI-SKID BRAKE CONTROL SYSTEM TO OBTAIN CORRESPONDING MEASURED VALUES OF THE DURATION OF THE HALF CYCLE ALTERNATIONS OF A WHEEL GENERATED VOLTAGE

Wolfgang Gudat, and Gerhard Ruhnau, both of Hannover, Germany, assignors to WABCO Westinghouse GmbH, Hannover, Germany

Filed Oct. 18, 1976, Ser. No. 733,424
Claims priority, application Germany, Nov. 29, 1975, 2553806
Int. Cl.² B60T *8/02*
U.S. Cl. 303—95 **8 Claims**



1. In an anti-skid brake control system for a wheeled vehicle, an electronic circuit for generating a wheel speed signal in accordance with the time duration of a half cycle of a sinusoidal waveform whose positive and negative alternations are provided by a sensor that detects the presence or absence of a tooth of a rotor that revolves with a wheel of the vehicle, said electronic circuit comprising:
(a) timing means subject to said sinusoidal waveform for providing a time signal representative of the time duration of a respective one of said positive and negative alternations of said sinusoidal waveform;
(b) comparator means for detecting a difference between said time signal of a positive alternation and said time signal of a negative alternation of said sinusoidal waveform; and
(c) compensating means for regulating said timing means so as to modify said time signal corresponding to one of said positive and negative alternations of said sinusoidal waveform when said comparator means detects a difference therebetween, whereby said wheel speed signal generated during a positive half cycle and a negative half cycle of said sinusoidal waveform are in correspondence for any given velocity of wheel rotation.

4,072,365

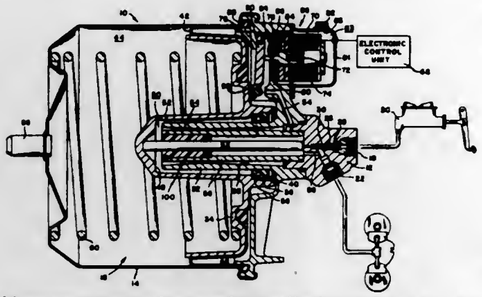
MODULATOR FOR AN ADAPTIVE BRAKING SYSTEM

Edward M. Pauwels, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Apr. 5, 1977, Ser. No. 784,903
Int. Cl.² B60T *8/02*
U.S. Cl. 303—115 **11 Claims**

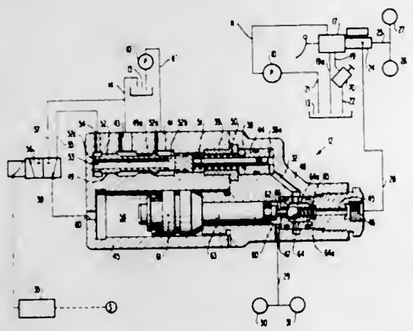
10. A modulator for an adaptive braking system comprising:
a housing defining a chamber therewithin and having an inlet, an outlet and valve means for regulating fluid communication between the inlet and outlet;
a pressure responsive member movable within said chamber to form a pair of variable volume cavities within said housing, said cavities communicating with each other via a passage within said housing; and
a sensing means cooperating with the passage and an output

of a controller for the adaptive braking system in order to open and close communication through the passage;



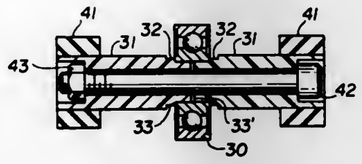
said pressure responsive member sealingly engaging a portion of said housing and said portion of said housing including the passage communicating with the cavities.

4,072,366
ANTI-SKID CONTROL APPARATUS
Toshiyuki Kondo, Anjo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan
Filed Dec. 22, 1976, Ser. No. 753,442
Claims priority, application Japan, Dec. 31, 1975, 51-158547; Dec. 31, 1975, 51-158549
Int. Cl.² B60T 8/10
U.S. Cl. 303—116 15 Claims



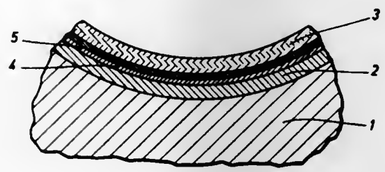
1. In a hydraulic braking system for an engine-driven vehicle having front and rear wheel brakes, brake energization means including a master cylinder interconnected with said front rear wheel brakes and operable to effect pressurization thereof, and a cut-off valve between said master cylinder and said rear wheel brakes and operable to interrupt pressurization of said rear wheel brakes in response to a signal indicating a skid condition; the improvement which comprises pressure responsive means operably engaging said cut-off valve an acted upon by fluid pressure from said master cylinder, an engine driven fluid pressure source acting on said pressure responsive means in opposition to said master cylinder pressure and normally operable to hold said cut-off valve open, pressure control means between said fluid pressure source and said pressure responsive means and including means developing a predetermined minimum pressure in said fluid pressure source, said pressure control means including a housing having a bore, a control piston slidably disposed in said bore, means interconnecting said pressure control means and said brake energization means to vary the pressure from said fluid pressure source to said pressure responsive means in response to change in pressure developed by said brake energization means, said interconnecting means including a second piston slidable in a second bore and aligned with said control piston, said second piston being movable towards the control piston by pressure developed by said brake energization means, a compression spring caged between said control piston and said second piston, a control valve operable in response to a signal indicating a skid condition at said rear wheels to lower the pressure from said fluid pressure source to said pressure responsive means to close said cut-off valve and interrupt pressurization of said rear wheel brakes.

4,072,367
NOISE REDUCING INSERTS FOR SPINDLE TAPE IDLERS
Joe Johnson, Jr., Powder Springs, Ga., assignor to Coats & Clark Inc., Stamford, Conn.
Filed Nov. 24, 1976, Ser. No. 744,714
Int. Cl.² F16C 35/04
U.S. Cl. 308—18 8 Claims



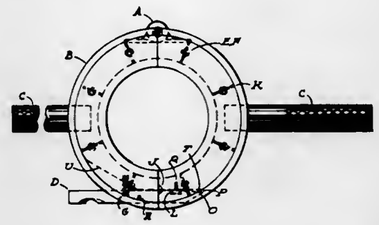
1. A tape idler pulley assembly adapted to be supported in open mounting slots, comprising a pulley, a rolling bearing having a radially outer race press fit in said pulley and an inner race, a pair of plastic rods having first ends close fitted in the inner race of said bearing from opposite sides thereof, and a pair of resilient sleeves close fit around the other ends of said rods, said sleeves having a diameter requiring deformation thereof for insertion in said mounting slots.

4,072,368
SLIDING-SURFACE BEARING AND PROCESS OF MANUFACTURING THE SAME
Otto Ehrentraut, Gmuden, Austria, assignor to Miba Gleitlager Aktiengesellschaft, Laakirchen, Austria
Filed Sept. 17, 1976, Ser. No. 724,397
Claims priority, application Austria, Sept. 24, 1975, 7329/75
Int. Cl.² F16C 17/00
U.S. Cl. 308—3 R 13 Claims



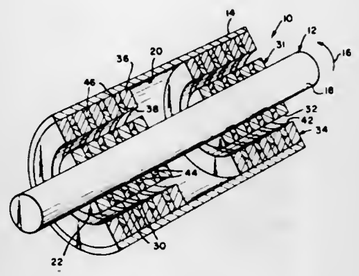
1. A sliding-surface bearing which comprises
a bearing metal layer,
a sliding-surface layer consisting of a lead alloy which contains copper and tin, and
an additional layer which is disposed between said bearing metal layer and said sliding-surface layer and adjoins the latter and consists of a lead-copper alloy which is initially free from tin.

4,072,369
DRILL PIPE STABBING PROTECTOR
Salvador J. Segreto, 6300 Gillen St., Metairie, La. 70003
Filed Nov. 4, 1976, Ser. No. 738,667
Int. Cl.² F16C 1/26, 29/00
U.S. Cl. 308—4 A 9 Claims



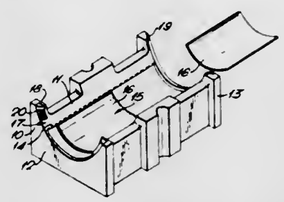
1. A stabbing protector device embodying apparatus for use in oil well drilling operations which requires the continuous addition of pipe to another in the formation of drill pipe strings, which comprises the combination of:
a tubular metal member constituted of two sections which, when alternately disposed parallel mating surfaces are fitted together, form a body of generally cylindrical shape having an aperture axially therethrough,
hinge means located at one of the alternately disposed mating surfaces which connect and hold the two sections of the tubular member in permanent pivotal relationship, one section relative to the other section of the body.
locking means located at the other of the alternately disposed mating surfaces by virtue of which the two sections constituting the body of the tubular body can be brought together and locked,
a handle located on each of the two sections of the tubular member constituting the body,
a replaceable split-ring of a resilient materials, segments of which are located on the upper face of each of the two tubular metal sections of the body to provide a protective head member.

4,072,370
RADIAL MAGNETIC BEARING
Ken G. Wasson, Aptos, Calif., assignor to Spectra-Flux, Inc., Watsonville, Calif.
Filed Aug. 24, 1976, Ser. No. 717,257
Int. Cl.² F16C 32/04
U.S. Cl. 308—10 11 Claims



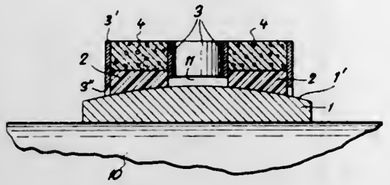
1. A radial magnetic bearing comprising:
a shaft having a circumferential surface and a housing having an inner cylindrical surface substantially centered about and spaced from said circumferential surface;
a first plurality of axially magnetized ring magnets secured to said circumferential surface of said shaft and being axially terminated in faces for defining magnetic poles, in which like poles of adjacent ones of said magnets face one another, said like pole faces of said adjacent magnets being spaced apart from one another for defining means for defining a configuration of openings;
a first plurality of ferro-magnetic rings positioned in said openings means and secured to said pole faces, for providing a flux path tangential to said circumferential surface for thereby smoothing out any non-uniform magnetization of said magnets;
a first plurality of radially magnetized ring magnets positioned radially adjacent said first plurality of ferro-magnetic rings;
a second plurality of axially magnetized ring magnets secured to said inner cylindrical surface of said housing and being axially terminated in faces for defining magnetic poles, in which like poles of adjacent ones of said magnets face one another, said like pole faces of said adjacent magnets being spaced apart from one another for defining means for defining a configuration of openings, said like poles of said second plurality of axially magnetized ring magnets being radially aligned with said like poles of said first plurality of axially magnetized ring magnets for radially repelling said first and second plurality of magnets from one another and thereby for centering of said shaft with respect to said housing;
a second plurality of ferro-magnetic rings positioned in said openings means of said second plurality of magnets and secured to said pole faces thereof, for providing a flux path tangential to said inner cylindrical surface for thereby smoothing out any non-uniform magnetization of said second plurality of said magnets; and
a second plurality of readially magnetized ring magnets positioned radially adjacent said second plurality of ferro-magnetic rings.

4,072,371
BEARINGS FOR RAILWAY VEHICLE AXLES
Joseph Henry Hill, Greenford, and David Frederick Green, Maidenhead, both of England, assignors to Vandervell Products Limited, England
Filed May 6, 1976, Ser. No. 683,969
Int. Cl.² F16C 33/04
U.S. Cl. 308—56 16 Claims



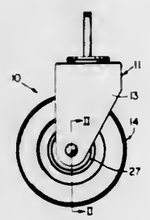
1. A bearing for a vehicle axle comprising a metal block having a part cylindrical recess extending along one face of the block between opposed end faces of the block, a journal bearing lining extending along said recess to support the vehicle axle for rotation, the end faces of the block having convexly radiussed corners merging with said part cylindrical recess and the surface of each corner having indents to provide pits for receiving lubricant.

4,072,372
HEAVY-DUTY SWIVEL BEARING
Heinz Korrenn, Obbach; Wolfgang Teich, Schweinfurt, and Helmut Heimrich, Sennfeld, all of Germany, assignors to Kugelfischer Georg Schafer & Co., Schweinfurt, Germany
Filed Nov. 11, 1976, Ser. No. 741,126
Claims priority, application Germany, Nov. 12, 1975, 2550791
Int. Cl.[2] F16C *23/04, 33/10*
U.S. Cl. 308—72 15 Claims



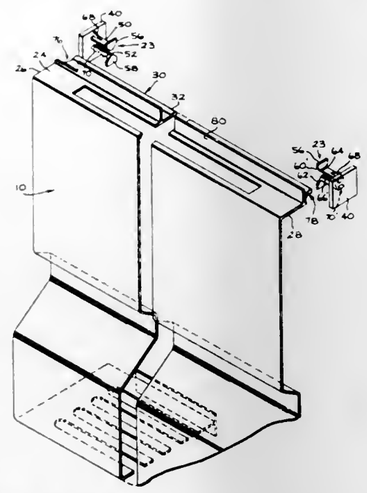
9. A swivelable journal bearing for a shaft, comprising:
a shaft-supported inner ring with a spherically convex outer surface;
an outer annular body divided into a multiplicity of socket elements rigidly welded to one another, said body coaxially surrounding said ring with clearance, each of said socket elements being formed with at least one throughgoing aperture facing said ring;
a low-friction insert in each aperture projecting into said clearance, said insert having a spherically concave face in contact with and conforming to said outer surface; and
a plug of a hardenable substance in each aperture back-stopping the insert thereof.

4,072,373
WHEEL CONSTRUCTION
John W. Black, Hickory Corners, Mich., assignor to Pemco-Kalamazoo, Inc., Kalamazoo, Mich.
Filed Sept. 16, 1976, Ser. No. 723,927
Int. Cl.[2] F16C *33/00*
U.S. Cl. 308—191 15 Claims



1. A wheel construction, comprising:
wheel means having an axially extending hole therethrough, said hole having a first diameter;
bearing means;
bearing housing means for housing said bearing means therein and having a second diameter less than said first diameter, said bearing housing means being located inside said hole with the center of said bearing housing means being concentric with the outside diameter of said wheel means, the difference between said first and second diameters defining a spacing therebetween;
a moldable, synthetic resin material filling said spacing; and
means for positively securing said moldable, elastomeric material in said spacing to effect a securement of said bearing housing means to said wheel means.

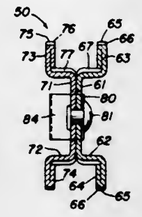
4,072,374
SIDE FASTENER CLIP FOR A PLATE-LIKE MEMBER
Howard D. F. True, Jr., Fern Creek, Ky., assignor to General Electric Company, Louisville, Ky.
Filed Sept. 27, 1976, Ser. No. 726,827
Int. Cl.[2] A47B *96/06;* A44B *21/00*
U.S. Cl. 312—214 6 Claims



1. A fastener clip for mounting a plate-like member to a side wall, the plate-like member having a side edge to be held generally adjacent the side wall and a a beaded leading edge perpendicular to the side edge, the plate-like member also including means for preventing further forward movement beyond an installed position, said fastener clip comprising:
a base member adapted for secure mounting to the side wall;
a pair of spaced resilient parallel legs projecting outwardly from said base member generally perpendicularly to the side wall, the gap between said parallel legs being generally parallel to the installed position of the leading edge of the plate-like member;
said parallel legs being spaced sufficiently far to receive the thickness of the plate-like member and sufficiently close to require deforming of said parallel legs to permit passage of the bead on the leading edge of the plate-like member; and
a head formed on the end of each leg and extending generally away from the gap between said legs, each of said heads having at least a first inclined surface with said first inclined surfaces oriented with respect to each other so as to form a generally "V" shaped channel for guiding the leading edge and bead of the plate-like member into the space between said parallel legs;
whereby the plate-like member is installed by positioning the leading edge in generally parallel relationship with said legs and inserting the bead and the leading edge through the gap between said legs.

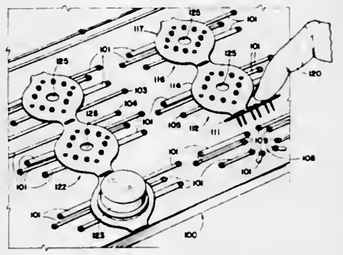
4,072,375
DRAWER SLIDE ASSEMBLY WITH TAPERED RUNNER
Jack L. Boone, Algona, Iowa, assignor to Snap-on Tools Corporation, Kenosha, Wis.
Filed May 9, 1977, Ser. No. 795,264
Int. Cl.[2] A47B *88/00*
U.S. Cl. 312—338 10 Claims

1. A drawer slide assembly for slidably mounting a drawer in a cabinet, said slide assembly comprising a first elongated track member adapted to be mounted in use substantially horizontally on the inside of the associated cabinet and having a first elongated support portion, a second elongated track member adapted to be mounted in use substantially horizontally on the outside of the associated drawer and having a second elongated support portion, and an elongated runner having first and second support arms respectively extending laterally in opposite directions and respectively provided with longitudinally extending and substantially parallel lower and upper bearing surfaces, each of said lower and upper bearing surfaces having inclined end portions terminating at end corners at the opposite ends thereof so that said inclined end portions of said lower bearing surface respectively converge with said inclined end portions of said upper bearing surface toward the adjacent ends thereof, said runner being disposed in use between said



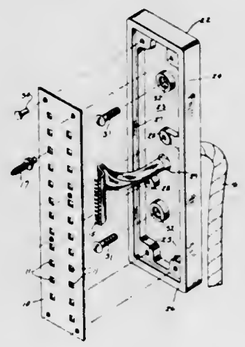
first and second track members with said lower bearing surface being supported upon said first support portion in longitudinal sliding engagement therewith and with said second support portion being supported upon said upper bearing surface in longitudinally sliding engagement therewith thereby slidably to support the associated drawer on the associated cabinet, whereby said end corners of said lower and upper bearing surfaces are disposed in use out of engagement with said first and second support portions thereby to prevent snagging thereof.

4,072,376
SOCKET ASSEMBLIES
Suel Grant Shannon, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Continuation of Ser. No. 422,489, Dec. 6, 1974, abandoned. This application Dec. 18, 1974, Ser. No. 534,113
Int. Cl.[2] H01R *13/48*
U.S. Cl. 339—17 C 7 Claims



1. An assembly of connected socket assemblies mounted upon predetermined patterns of holes in a substrate, each constructed to receive a component and each comprising:
a wafer of insulative material with a plurality of holes formed therethrough in said predetermined pattern;
a plurality of sockets having an open ended tubular portion individually positioned in said holes with said open end of said sockets being on a first side of said wafer and the tubular portion of said sockets extending through said wafer;
said tubular portions of said sockets constructed to contact fit within the holes in said substrate;
flexible connecting means connected between adjacent ones of said socket assemblies and being of a length to separate adjacent wafers a distance equal to the distance between adjacent patterns of holes to enable mounting of at least two of said socket assemblies upon said substrate with the tubular portions of the sockets of a given wafer, while being mounted, being aligned with the predetermined pattern of holes by the established alignment of said tubular portions of said sockets of the adjacent wafer which was mounted immediately preceding the mounting of said given wafer.

4,072,377
TERMINAL BLOCK
Harley J. Van de Loo, Milwaukee, and Hans J. Ziegler, Whitefish Bay, both of Wis., assignors to Utility Products Co., Milwaukee, Wis.
Filed May 10, 1976, Ser. No. 684,884
Int. Cl.[2] H05K *1/10*
U.S. Cl. 339—17 F 2 Claims



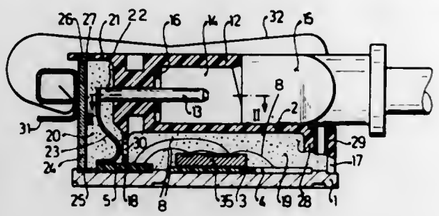
1. A terminal block comprising:
a rigid support board having a plurality of spaced apertures therein;
a plurality of separate printed circuit conductive paths disposed on one side of said board, each conductive path including a terminal area aligned with one of said apertures and a terminus area, the terminus areas of the conductive paths being grouped together;
a terminal extending through each aperture and projecting outwardly from the opposite side of said board, each terminal including a shoulder intermediate its ends and adapted to rest against the surface of said opposite side of said board, and
a hollow cylindrical mounting end adapted to be received in one of said apertures and to be deformed to physically restrain the terminal on said board against withdrawal and to physically and electrically engage said terminal with said terminal area of the respective conductive path;
cooperating means on each terminal and said board locking said terminals against rotation on said board,
said cooperating means comprising a mounting portion with a polygonal cross section on each terminal and a polygonal shape formed at each aperture to receive and mate with said mounting portion;
a cable carrying conductors each of which is connected to a terminus area of a respective conductive path; and
a box-like shell having a back wall, an upstanding rim extending about the entire periphery of said back wall, one open side and a cable opening,
said board being supported on said shell at the rim to close said open side and with the surface of said one side of said board facing the interior of said shell so as to provide a space between said one side of said board and the opposing surface of said back wall, and said cable extending through said cable opening.

4,072,378

PROTECTIVELY COVERED MOUNTING FOR A PLUG-IN ELECTRONIC APPARATUS OF A MOTOR VEHICLE

Eduard Lockbrunner, Hemmingen, and Dietmar Schnepf, Esslingen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Dec. 2, 1978, Ser. No. 746,709
Claims priority, application Germany, Dec. 5, 1975, 2554747
Int. Cl.[2] H05K *7/10*; H01R *13/50*
U.S. Cl. 339—17 C **9 Claims**



1. A protectively covered mounting for a plug-in electronic control apparatus of a motor vehicle that comprises electronic components, which mounting comprises:
- a base plate (1) of thermally conducting material on which said electronic components (3,4) are fixedly mounted;
- a conductor pattern plate (5) likewise fixedly mounted on said base plate (1);
- a cover (2) covering a portion of said base plate (1) so as to form first (19) and second (20) wiring cavities on opposite sides of a wall of said cover which is substantially perpendicular to said base plate (1) and having plug connectors (13,22) held therein and also a recess for accepting a mating connector (15) insertable into said recess from outside of said cover, said recess having no part thereof adjacent to said base plate (1), said plug connectors having their control apparatus ends extending into said second wiring cavity (20) and their other ends extending into said recess (14);
- electronic components on said base plate in said first wiring cavity, and--.
- a cover plate (24) removably covering said second wiring cavity with one edge of said cover plate adjacent to said base plate (1) and the other edges thereof adjacent to walls of said cover (2).

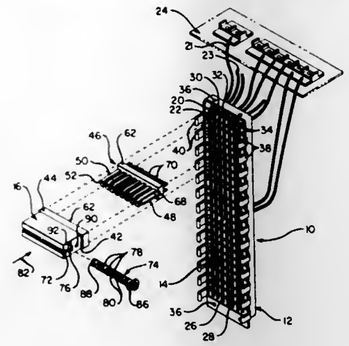
4,072,379

ELECTRIC POWER DISTRIBUTING APPARATUS

Gary L. Towne; Noel F. Depew, and Charles A. Fowler, all of Wichita, Kans., assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 13, 1976, Ser. No. 750,334
Int. Cl.[2] H05K *1/07*
U.S. Cl. 339—17 LM **5 Claims**

1. An electric distributing apparatus comprising:
- a housing having a plurality of conductors therein;
- a module for providing an electrical connection between selected ones of said conductors and a circuit member having electrical contacts thereon;
- means for securing said module to said housing;
- said module having an opening therein to receive said circuit member and comprising:
- conductor means having first and second ends, said first ends forming an electrical connection with selected ones of said conductors when said module is secured to said housing; said second ends contacting said electrical contacts on said circuit member to form an electrical connection therebetween when said circuit member is operatively inserted in said opening in said module;
- said module having means thereon to move said second ends of said conductor means out of contact with said electrical contacts on said circuit member to enable said circuit member to be inserted or removed from said opening in said module;
- said conductors being made of a conductive metal and said first ends of said conductor means being shaped to form an interference fit with the associated said conductors to thereby cut into the surfaces of said conductors when forming said electrical connection therewith;
- said conductors having first portions thereof positioned in spaced parallel relationship in said housing and also having second portions integrally formed with the associated



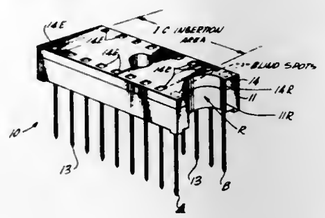
said first portions and which said second portions extend out of said housing for a direct connection to a power source means; and
- said first portions of said conductors having predetermined varying lengths so as to afford a selection of said conductors to which said first ends of said conductor means are connected when said module is secured to said housing;
- said conductor means being positioned in said module so as to be perpendicular to said first portions of said conductors when said module is secured to said housing.

4,072,380

DUAL INLINE INTEGRATED CIRCUIT SOCKET

Eugene G. Freehauf, Ontario, Calif., assignor to Zero Corporation, El Monte, Calif.

Continuation-in-part of Ser. No. 716,113, Aug. 20, 1976, abandoned. This application Jan. 17, 1977, Ser. No. 759,748
Int. Cl.[2] H05K *1/12*
U.S. Cl. 339—17 CF **12 Claims**



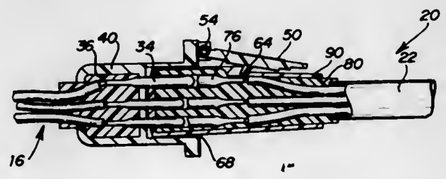
1. An improved socket for receiving the leads of a dual inline integrated circuit package or the like pluggable unit comprising:
- an insulative body having a plurality of longitudinally spaced apart socket apertures extending through the body and arranged adjacent opposite longitudinal edges of the body in parallel aligned rows, the spacing between each of the sockets in said rows being substantially the same,
- a plurality of electrical conducting contacts having a female socket portion constructed and defined at one end and a male terminal extending therefrom, the contacts being mounted and held in each of the socket apertures with the male terminals extending outwardly from one side of the insulative body, and
- an insulative cap member having a preselected lengh with a plurality of longitudinally spaced apart entry apertures constructed and defined to extend through the cap member and arranged in aligned parallel rows adjacent opposite edges of the cap member, the cap member being secured to the insulative body with each of the entry apertures mounted in vertical alignment with the corresponding female socket portions, the number of entry apertures defined in the cap member being less than the number of socket apertures containing female socket portions in the insulative body but permitting the leads of an integrated circuit package or the like pluggable unit to be mounted into the entry apertures of the cap member in an electrical conducting relationship with the electrical contacts.

4,072,381

TRACTOR-TRAILER ELECTRICAL CONNECTOR SYSTEM

James G. Burkhart, Dallas; Montgomery P. Burkhart, Rockwall, and James D. Coley, Rickwall, all of Tex., assignors to Air-Tex Wire Harness, Inc., Garland, Tex.

Continuation-in-part of Ser. No. 568,922, April 17, 1975, abandoned. This application Nov. 1, 1976, Ser. No. 737,678
Int. Cl.[2] H01R *13/44, 13/52*
U.S. Cl. 339—29 R **3 Claims**



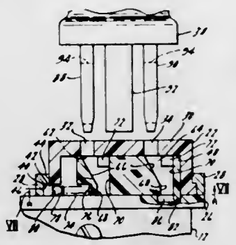
1. An electrical connector system for supplying electrical power from electrical wires in a tractor cab vehicle to electrical wires in a trailer comprising:
- a first socket for being mounted to the tractor cab and for being wired to the electrical wires of the tractor cab,
- a second socket for being mounted in the trailer and for being wired to the electrical wires of the trailer,
- each of said sockets including a plurality of male terminals each connected at the rear to one of the electrical wires in the tractor cab or trailer,
- means for supporting said male terminals such that said male terminals are maintained at a predetermined orientation within each of said sockets,
- means for insulating said male terminals from one another and for insulating said male terminals from an external environment,
- each of said sockets having a circular aperture encompassing the forward ends of said male terminals and terminating in a rear face portion within said socket,
- each of said sockets including flanges for attachment to a wall of the tractor cab or trailer,
- an insulated cable having a predetermined length with a plurality of electrical cable wires extending therethrough to extend between said first and second sockets when attached to the trailer and the tractor cab,
- first and second identical plugs integrally molded to opposite ends of said cable such that said plugs and insulated cable comprise an integral unitary member of a length to extend between said sockets mounted on the tractor cab or trailer,
- each of said plugs including a plurality of female terminals dimensioned and oriented for mating with said male terminals of either of said sockets and each female terminal connected at the rear of one of said plurality of cable wires within said cable,
- each of said plugs further having an elastomeric plug core surrounding the rear portion of said female terminals and portions of said plurality of cable wires, such that said female terminals are maintained at a predetermined orientation for mating with said male terminals and wherein the connections between said female terminals and said plurality of cable wires are covered and insulated,
- each of said plug cores having outwardly extending wings,
- each of said plug cores having a front face portion including a plurality of apertures for receiving the open ends of said female terminals,
- each of said plug cores further having a rear face portion including an aperture to permit said cable to extend from said plug cores,
- a pair of cylindrical shaped plug housings having first and second ends, fabricated from generally rigid synthetic polymer formed integrally and circumferentially about said plug cores and including outwardly extending wings formed integrally about said plug core outwardly extending wings for enabling removal of said plugs from said sprockets,
- said first end of each of said plug housing having a diameter approximately equal to the diameter of said plug core front face portion and including apertures mating with said apertures in said plug core,
- said first ends of said plug housings having diameters dimensioned to be closely received within said circular apertures within said sockets and to be disposed adjacent said rear face of said sockets, wherein a watertight electrical connection may be made between the tractor cab and the trailer, and
- said second ends of said plug housings having diameters approximately equal to the diameter of said plug core rear face aperture and formed integrally with said plug core rear face portions to thereby provide a strain relief for said insulated cable and a watertight seal between said insulated cable and said plug cores.

4,072,382

SAFETY OUTLET

Kurt W. Reschke, 21515 Thorofare, Grosse Ile, Mich. 48138

Filed June 2, 1976, Ser. No. 691,979
Int. Cl.[2] H01R *13/44*
U.S. Cl. 339—40 **14 Claims**



1. A safety outlet comprising:
- a housing having electrical contacts disposed therein adapted to engage the prongs of a plug;
- a cover member secured to said housing and having apertures disposed therein adapted to allow said prongs to pass through said cover member to engage said contacts; and
- a rotatable member movably secured to said cover member, said rotatable member having apertures therein adapted to receive said prongs and further having means provided thereon engaging said cover member to prevent rotation thereof when said rotatable member is in a first predetermined position, said means being adapted to be released in response to the insertion of said prongs in said apertures of

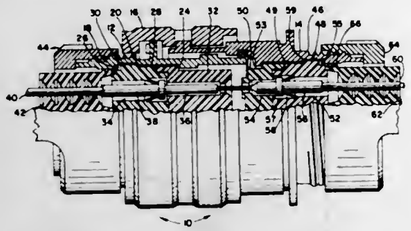
said rotatable member, whereby said rotatable member may be rotated from said first predetermined position in which access to said apertures of said cover member is effectively blocked by said rotatable member to a position in which said apertures are aligned, thereby allowing said prongs to pass through said cover member apertures and engage said contacts, said rotatable member further including a slidable member disposed within said rotatable member, said slidable member being adapted to cooperate with said cover member to limit the rotation of said rotatable member.

4,072,383

ELECTRICAL CONNECTOR INSERT RETENTION ASSEMBLY

John Keith Cameron, Hillside, and Ronald Francis Krolak, North Riverside, both of Ill., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Dec. 24, 1975, Ser. No. 644,348
Int. Cl.² H01R *13/48*
U.S. Cl. 339—59 R **31 Claims**



1. An electrical connector member comprising
plastic insert means for carrying at least one contact member and including an end portion with an outer weakened portion,
one-piece insert housing means including an axially extending inner cavity housing a section of said insert means,
insert retaining means in said housing means snugly retaining said insert from axial movement in said cavity in a mounted position,
insert entry means in said housing axially leading to said cavity,
insert compression means in said housing means in axial juxtaposition to said cavity for radially compressing and deforming said weakened portion, and
said weakened portion including a portion permanently deformed beyond its elastic limit by and at least partially disposed in said insert compression means.

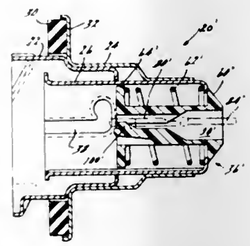
4,072,384

LAMP SOCKET

Marvin W. Moore, Rochester, Mich., assignor to Microdot Inc., Greenwich, Conn.

Continuation of Ser. No. 599,064, July 25, 1975, abandoned. This application Dec. 1, 1976, Ser. No. 746,215
Int. Cl.² H01R *13/40*
U.S. Cl. 339—59 L **4 Claims**

1. A lamp socket comprising a socket housing, a core member made of two like sections insertable into said housing in one direction and having at least one passageway in each section, said housing being adapted to accept a light bulb in said one direction, said bulb having two contacts, a pair of relatively thin flat rectangular terminals, each having a laterally extending end face and an aperture therethrough spaced from said end face, said terminals being directly attached to electrical conductors, respectively, said terminals adapted to be inserted in the passageway of each section of said core member in a direction opposite to said one direction with the end faces thereof extending beyond said core member in lamp contact engaging position, and a locking tab within each said core



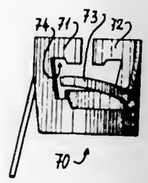
member section extending into the aperture of the terminal therein for securing said terminals within said passageways.

4,072,385

BAYONET CONNECTION BETWEEN TWO ELECTRICALLY CONDUCTIVE COMPONENTS

Peter Wallner, Kriens, Switzerland, assignor to Schurter AG, Luzern, Switzerland

Filed Oct. 12, 1976, Ser. No. 731,559
Claims priority, application Switzerland, Oct. 21, 1975, 13594/75
Int. Cl.² H01H *85/16*; H01R *13/54*
U.S. Cl. 339—88 R **15 Claims**



1. A bayonet connection between two electrically conductive components, especially for a fuse holder, comprising a pair of connection components, one of the connection components possessing an electrically conductive spring, said spring being electrically conductively connected with said one connection component, said one connection component has at least one hook-like part provided with a mouth, and said spring comprises an elongate component primarily extending in the peripheral direction and protruding into said mouth of said hook-like part, said spring, when the two connection components are operatively interconnected, electrically conductively contacting the other connection component and uring said other connection component towards said hook-like part.

4,072,386

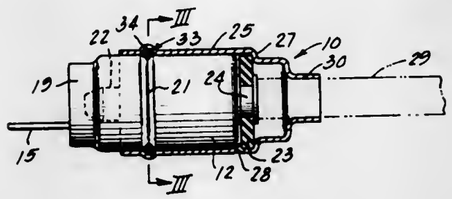
SOLID SHELL PHONOCONNECTORS

William H. Wallo, Clearwater, Fla., assignor to Perfection Enterprises, Inc., Chicago, Ill.

Filed Feb. 6, 1975, Ser. No. 547,544
Int. Cl.² H01R *13/54*
U.S. Cl. 339—91 R **14 Claims**

1. A phonoconnector pin plug assembly for coupling with a phonoreceptacle and having an electrically conductive pin plug and an electrically conductive socket shell in electrically insulated concentric relation about the pin plug and with a phonoreceptacle receiving open mouth end directed in the same direction as said plug thereby to facilitate receiving the phonoreceptacle, comprising:
the socket shell being drawn from one piece of thin electrically conductive sheet metal and having a solid tubular wall with an inner substantially uniformly cylindrical

diameter throughout a substantial length portion of the wall extending inwardly from said open mouth end to engage about a complementary cylindrical outside diameter of an electrically conductive phonoreceptacle shell received therein in free sliding fit throughout said length;
said socket shell wall being formed with a radially outwardly projecting annular bulge defining an annular inwardly opening groove in said inner diameter, and spaced a limited distance from said open mouth end so that there is a solid annular leadin length of said wall between said open mouth end and said groove and a substantial length of said wall extends from said groove inwardly for receiving the receptacle shell in said free sliding fit; and
an electrically conductive spring wire resilient split out-of-round clutch ring firmly engaged within said groove and having clutching area of limited circumferential extent projecting generally radially inwardly from the groove and from said inner diameter of the socket shell wall for releasably retainingly engaging the receptacle shell;



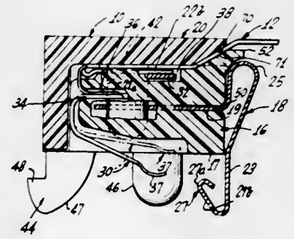
said groove being at least as deep as the cross-sectional diameter of the wire of the clutch ring so that the clutch ring except for said clutching area is received in the groove free from interference with sliding reception of the receptacle shell into mated relation within the socket shell, and the clutching area is located on the ring to protrude from the groove sufficiently for, and in a manner to effect, transverse eccentric thrusting clutching engagement with the receptacle shell to force a large circumferential surface area of the receptacle shell, opposite from where thrust is imposed by said clutching area, into firm electrical as well as retaining contact with the engaged surface of the wall of the socket shell, the spring bias generated in the clutch spring by the thrusting engagement of said clutching area with the receptacle shell also assuring firm electrical engagement of the clutch ring with both of the shells.

4,072,387

MULTIPLE CONDUCTOR CONNECTOR UNIT AND CABLE ASSEMBLY

Jerzy R. Sochor, Hermosa Beach, Calif., assignor to Spectra-Strip Corporation, Garden Grove, Calif.

Filed Feb. 20, 1976, Ser. No. 659,892
Int. Cl.² H05K *1/07*; H01R *13/54*
U.S. Cl. 339—91 R **24 Claims**



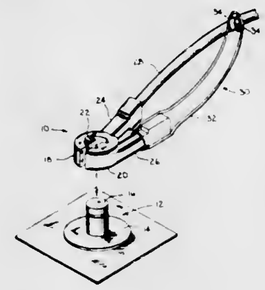
1. A multiple contact connector unit for electrically connecting a printed circuit board, having multiple electrical contact pad areas, to a flexible normally flat, multi-conductor cable which comprises:
an insulator base having multiple, insulated, laterally aligned, socket means therein extending along substantially the entire length of said insulated base for biasing multiple spring contact members within said insulator base;
pivotal alignment means, affixed to said insulator base, for pivotally mounting said connector unit to said printed circuit board and accurately aligning said connector unit, in a predetermined manner, with said printed circuit board;
an insulator cover;
means to affix said insulator cover to said insulator base, said cover together with said insulator base defining a laterally extending entrance slot therebetween through which said multi-conductor cable may pass and be fixed in place relative to said socket means of said insulator base; and
an elongated retention spring, a first end of which extends along substantially the entire length of said insulator base and is affixed thereto, and the other end of which has an elongated gripping portion extending below the lowermost surface of said insulator base, said elongated gripping portion having a length which extends substantially the entire length of said insulator base and which also extends across the entire length of said laterally aligned multiple socket means biasing said multiple spring contact members, said elongated gripping portion being displaced from said insulation base as said connector unit is pivotally mounted onto said printed circuit board but clamping said printed circuit board to said insulator base under a predetermined and substantially uniform contact pressure to thereby urge spring contact members to be contained in said socket members into substantially uniform pressurized electrical contact with said contact pad areas of said printed circuit board after said connector unit and printed circuit board are in full abutment with each other.

4,072,388

ANTI-SNAG DEVICE FOR ELECTRODE LEAD CLIPS

David M. Dunn, Menomonee Falls, Wis., assignor to Marquette Electronics, Inc., Milwaukee, Wis.

Filed Apr. 6, 1977, Ser. No. 785,074
Int. Cl.² H01R *13/58*
U.S. Cl. 339—103 R **8 Claims**



1. An anti-snag device for use with a lead clip having an electrical contact portion for engaging an electrocardiographic electrode, said electrical contact portion having first and second generally adjacent arms, each of said arms having one end fixed to said electrical contact portion and a free end, said arms being moveable toward and away from each other for opening and closing the clip, said first arm having a lead wire extending from the free end thereof, said anti-snag device comprising:
elongated means extending from the free end of said second

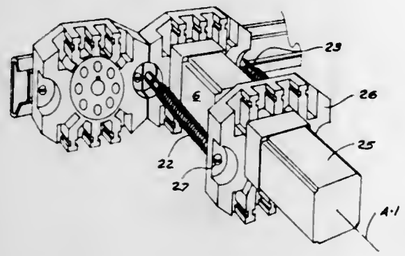
arm and engaging said lead wire at a point removed from the free end of said first arm, said elongated means having sufficient length to permit said toward and away movement of said arms.

4,072,389

STACKED, PLUG-IN RELAYS

George S. Hudimac, Allentown, Pa., assignor to Mechanical Service Company, Inc., Allentown, Pa.

Filed May 16, 1977, Ser. No. 797,438
Int. Cl.² H01R *13/62*
U.S. Cl. 339—119 R **5 Claims**



1. An adaptor for use in supporting first and second electricals units, each unit having a mounting base and a housing adapted to be removeably plugged into the base and when the units are supported the top of the housing of the first unit being closely adjacent the bottom of the base of the second unit, the adaptor comprising:

an elongated member including a pair of shanks;

means on one end of one shank for connecting the member to the top of the base of the first unit;

means on one end of the other shank for connecting the member to the bottom of the base of the second unit;

means on the shanks to be engaged whereby to form a substantially rigid part to support the second unit with respect to the first unit and to be disengaged to permit the second unit to be moved with respect to the first unit;

a spring surrounding the shanks, the opposite ends of which are respectively connected to the shanks and the spring urging the shanks into said engagement; and

said spring and said means on the shanks providing for the second unit to first be moved in a direction along the axis of the member to separate the shanks and effect said disengagement and secondly be moved laterally with respect to the axis without the member being disconnected from either base and the second lateral movement placing the second unit in a position to allow the first unit to be removed and/or replaced.

4,072,390

ELECTRICAL CONNECTOR

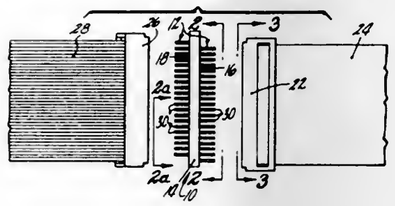
Roy W. Fox, 4 Juniper Circle, Canton, Conn. 06019, assignor to Roy W. Fox, Canton, Conn.

Filed Sept. 9, 1976, Ser. No. 721,768
Int. Cl.² H01R *23/02*
U.S. Cl. 339—176 MF **3 Claims**

1. An electrical connector for ribbon cable terminals comprising:

a block of insulating material having a longitudinal axis;

a plurality of substantially identical conductor pins, each having a first end portion projecting from a side of the block and a second end portion projecting from an opposite side of the block, the first end portion and second end portion of each pin being joined by a bent intermediate portion embedded in the block, each pin being shaped such that the respective axes of the first and second end portions thereof are in spaced parallel relationship and are disposed in a common plane with the axis of the intermediate portion therebetween, the pins being arranged in first and second longitudinally extending sets such that on each of the said sides of the block two parallel, laterally adjacent rows of first end portions and second end portions, respectively, are defined with each of the first end portions laterally adjacent a second end portion so as to form



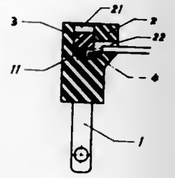
longitudinally spaced pairs of laterally adjacent pins and such that the respective planes defined by the pins in a set are parallel and form acute angles with the longitudinal axis of the block, the respective intermediate portions of a said pair or pins being in crossing relationship when viewed along the axis of the block.

4,072,391

ELECTRIC PLUG FORMED BY SQUEEZING ASSEMBLY

Jui Jung Hung, No. 584, Jui Lung Road, Kaohsiung, China /Taiwan

Filed Aug. 13, 1976, Ser. No. 714,234
Int. Cl.² H01R *11/02*
U.S. Cl. 339—196 R **1 Claim**



1. An electric plug comprising

at least one pole plate, each pole plate having a longitudinal axis, a transverse axis, two flat faces, edges and ends;

a squeezing arm on each pole plate at one end thereof, said squeezing arms being integral with said pole plate extending perpendicularly from one of said faces;

a connecting wire electrically associated with each pole plate;

a plug base, said base having an assembly cavity, a pole slot for each pole plate, a wire hole for each wire, at least one latch tunnel, a longitudinal axis, upper and lower ends, front and back faces, and a transverse axis perpendicular to the plane of said front and back faces, each pole slot extending through said lower end of said base terminating in said cavity and being aligned along said longitudinal axis of said base with the major axis of said slot parallel to said transverse axis, said assembly cavity being provided with a recess where each pole slot terminates, each wire hole extending through the back face of said base terminating in said assembly cavity at the recess where the associated pole slot terminates, each said wire hole being aligned parallel with said transverse axis, said at least one latch tunnel extending through said assembly cavity near the level of each wire hole above each recess; and

at least one fixing latch;

each pole plate extending through a pole slot with its squeezing arm positioned in one recess; each connecting wire extending through a wire hole being fixed into the associated recess by the squeezing arm of the associated pole plate thereby making an electrical contact between each wire and the

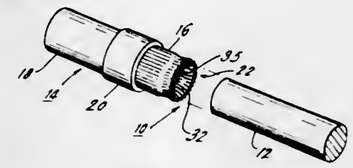
associated pole plate; at least one fixing latch extending through a latch tunnel pressing and fixing each squeeze arm against each connecting wire.

4,072,392

SPRING WIRE FORMED TULIP CONTACT

Lorne D. McConnell, Chalfont, and Leonard J. Kucharski, Harleysville, both of Pa., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Sept. 22, 1976, Ser. No. 725,378
Int. Cl.² H01R *13/12*
U.S. Cl. 339—258 R **9 Claims**



1. A female contact member adapted to engage a male contact member, comprising:

a conductive stud member;

a plurality of spring wire fingers having a circular cross-section, said fingers located adjacent the periphery of said stud member and extending from said stud member to form a female contact sleeve;

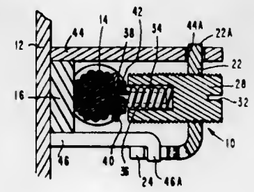
means for retaining said fingers in said position adjacent the periphery of and extending from said stud member and for retaining said fingers in good electric contact with said stud member, the periphery of said stud member having a plurality of parallel, longitudinally extending grooves therein, each of said wire fingers being seated in respective ones of said longitudinally extending grooves in the periphery of said stud member.

4,072,393

ELECTRICAL CONNECTORS

Robert E. McDermott, 16 Munro Court, Troy, N.Y. 12180, and William Golden, 1203 Fourth Ave., Watervliet, N.Y. 12189

Filed June 7, 1976, Ser. No. 693,439
Int. Cl.² H01R *11/10*
U.S. Cl. 339—272 UC **7 Claims**



1. An electrical connector of the resilient spring type for clamping a first conductor against a second conductor and for resiliently expanding so as to maintain a clamping force on said first conductor in the event of the deformation of one or both of said conductors, said connector being of the type comprising a frame including means defining a threaded opening therethrough and a connector screw threadedly received in said opening, said screw being turnable relative to said frame to advance a first end thereof in a direction to force said first conductor against said second conductor, said connector being characterized by

A. means defining a cylindrical cavity extending axially to a certain depth into the first end of said screw;

B. a helically coiled spring having lateral dimensions that enable it to be received in said cavity, said spring defining an interior hollow space and including a first end contacting the end of said cavity within said screw and a second, opposite end that normally protrudes from said cavity away from the first end of said screw, said spring having an uncompressed length between about 1.5 to 2.0 times the depth of said cavity; and

C. conductor contacting means including

i. a conductor contacting pad having lateral dimensions greater than those of said cavity, means defining a central aperture therethrough, a first side for contacting said first conductor and a second, opposite side for contacting the second, protruding end of said spring and,

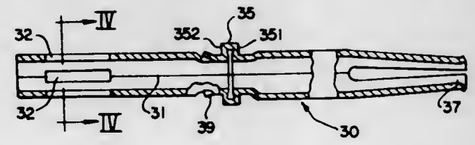
ii. a rivet having a shaft received in said aperture of said pad and protruding from the second side of said pad, said shaft having lateral dimensions that enable it to be received within the interior hollow space defined by said spring, said pad being pivotal about said shaft and resiliently expandable away from the first end of said screw under the action of said spring through a range determined essentially by the difference between the depth of said cavity and the uncompressed length of said spring.

4,072,394

ELECTRICAL CONTACT ASSEMBLY

Clifford R. Waldron; Karl W. Yonkers; Robert Goebeler, all of Unadilla; David L. Frear, Binghamton, and Edward J. Bright, Bainbridge, all of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Mar. 1, 1976, Ser. No. 662,678
Int. Cl.² H01R *11/08*
U.S. Cl. 339—276 T **3 Claims**



1. An electrical connector assembly comprising:

a housing;

a dielectric insert mounted within said housing, said insert having a plurality of axial bores therein;

means for mounting an electrical contact in each of said axial bore; and

a plurality of electrical contact assemblies each mounted in a respective bore by said contact mounting means, said electrical contact assemblies comprising:

a sleeve stamped and formed from a sheet of metal, said sleeve having:

a front pin portion for mating with a socket contact; and

a rear wire receiving portion having an unwelded seam, and a plurality of axially extending slots in the wall of said sleeve equally spaced from each other with the longitudinal axis of each of said slots parallel to the longitudinal axis of said sleeve;

an enlarged portion located between said front portion and said rear portion, said enlarged portion including a forwardly facing shoulder and a rearwardly facing shoulder; and

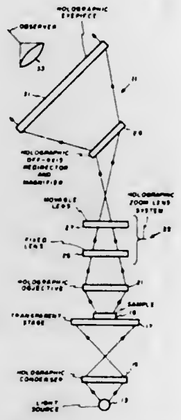
an outer sleeve located over the rear wire receiving portion of said sleeve.

4,072,395

MICROSCOPE

Windell N. Mohon, Winter Park, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 24, 1976, Ser. No. 689,015
Int. Cl.[2] G02B *21/00*
U.S. Cl. 350—33 **26 Claims**



1. In a microscope having a predetermined radiant energy path therethrough:

means for generating and broadcasting a predetermined radiant energy;

transparent means spatially disposed from said predetermined radiant energy generating and broadcasting means for supporting an object to be viewed in magnified form on the aforesaid predetermined radiant energy path;

means spatially disposed between said transparent supporting means and the aforesaid radiant energy generating and broadcasting means for condensing a portion of the radiant energy generated thereby and for passing it along said predetermined radiant energy path and through said transparent supporting means and the object to be viewed in magnified form supported thereby;

objective lens means spatially disposed from said radiant energy condensing means, the aforesaid transparent supporting means, and on the aforesaid predetermined radiant energy path;

an off-axis, redirector, and magnifier holographic lens means spatially disposed from said objective lens means and on the path of the radiant energy that has been passed through the object to be viewed in magnified form for effectively and simultaneously redirecting and magnifying the radiant energy passed therethrough as a magnified image thereof; and

biocular eyepiece lens means spatially disposed from said off-axis, redirector, and magnifier holographic lens means for receiving and collimating the aforesaid redirected and magnified object image in such manner that it may be viewed simultaneously by a plurality of sensors responsive to the aforesaid predetermined radiant energy.

4,072,396

FOCUSSING OBJECTIVE MECHANISM FOR TELESCOPIC RIFLE SIGHTS

Cecil Jack Ross, El Paso, Tex., assignor to W. R. Weaver, El Paso, Tex.

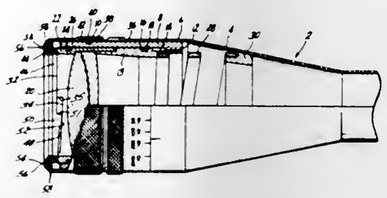
Filed July 10, 1975, Ser. No. 594,904
Int. Cl.[2] G02B *7/04*
U.S. Cl. 350—46 **5 Claims**

1. A focussing objective mechanism for a telescopic gun sight comprising in combination:

a. a sight barrel;

b. an objective lens assembly mounted in said barrel for axial reciprocal movement therein, said lens assembly having one end wall thereof formed with a predetermined helical pitch extending for substantially the entire duration of said one end wall;

c. a ring rotatably mounted on said barrel but fixed against axial movement thereon, said ring being adjacent to said



lens assembly and having an end surface facing said lens assembly end wall, substantially the entire duration of said end surface which faces said lens assembly end wall being formed with the same predetermined helical pitch as said lens assembly end wall; and

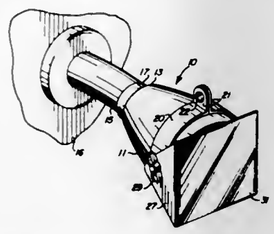
d. spring means engaging said lens assembly to bias said end wall into engagement with said ring end surface.

4,072,397

MIRROR ATTACHMENT FOR SHOWER HEAD

Thomas H. Ross, 201 E. Monterey Way, Phoenix, Ariz. 85012

Continuation-in-part of Ser. No. 610,653, Sept. 5, 1975, abandoned. This application Aug. 4, 1976, Ser. No. 711,487
Int. Cl.[2] G02B *5/08*
U.S. Cl. 350—61 **15 Claims**



1. A bathroom mirror device for use in a shower, said device comprising:

a. a shower head including,

i. a barrel member having a forward end and a rearward end,

ii. a conduit communicating with said rearward end for delivering water to said barrel portion;

iii. a spray member carried proximate said forward end for emitting water from said barrel member;

b. a relatively thin panel having a back surface and a front reflective surface; and

c. support means engageable with said shower head for holding said panel in a position in which water from said shower head is received against the back surface of said panel, said panel being thermally responsive to the temperature of said water to prevent condensation of moisture upon said reflective surface.

4,072,398

COMMUNICATION CABLE

Herbert Larsen, Munich; Guenter Zeidler, Unterpfaffenhofen, and Dieter Schicketanz, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation of Ser. No. 433,310, Jan. 14, 1974, abandoned. This application June 21, 1976, Ser. No. 698,153
Claims priority, application Germany, Jan. 19, 1973, 2302662
Int. Cl.[2] G02B *5/16*
U.S. Cl. 350—96.23 **2 Claims**



1. A communication cable with a high transmission capacity comprising:

a plurality of optical fibers, each of said fibers having a protective coating, said plurality of optical fibers being loosely twisted together to define a basic group of optical fibers,

a sheath surrounding each basic group of optical fibers,

a first protective sheath surrounding a plurality of said basic groups with clearance between said basic groups and said first protective sheath,

a metal foil encasing said first sheath,

a second sheath surrounding said metal foil,

separate tension-relieving wires lying outside of and adjacent to said basic groups within said first protective sheath, and

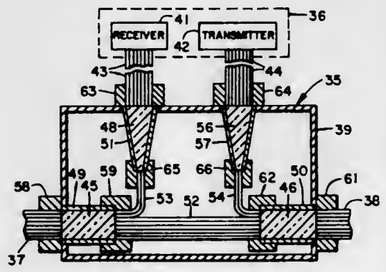
a lubricant filling interspaces between said plurality of optical fibers and said sheath as well as between said basic groups and said first protective sheath so that the optical fibers in each basic group may move relative to each other and each of the basic groups may move relative to each other with an avoidance of mechanical damage.

4,072,399

PASSIVE OPTICAL COUPLER

Roy E. Love, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed July 5, 1973, Ser. No. 376,573
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.16 **7 Claims**



1. A passive optical coupler for use in an optical communication system including first and second optical signal transmission lines, said coupler comprising,

first and second light mixers, each having an input portion for receiving light and an output portion across which light received by the input portion is relatively evenly distributed, the input portion of said first mixer being adapted to be connected to an end of said first transmission line, and the output portion of said second mixer being adapted to be connected to an end of said second transmission line,

first coupling means for coupling most of the light at the output portion of said first mixer to the input portion of said second mixer, the remaining light available at the output portion of said first mixer constituting an output optical signal,

output means for receiving said output optical signal,

second coupling means disposed adjacent to the output portion of said first mixer for coupling said output optical signal to said output means,

input means for providing an input optical signal, and

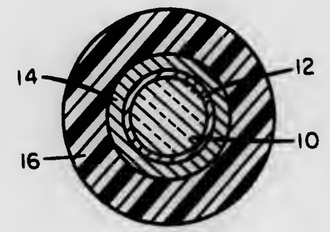
third coupling means for coupling said input optical signal from said input means to the input portion of said second mixer.

4,072,400

BUFFERED OPTICAL WAVEGUIDE FIBER

Stewart A. Claypoole, Painted Post, and Daniel C. Wilhelm, Campbell, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 593,286, July 7, 1975, abandoned. This application June 4, 1976, Ser. No. 692,895
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.30 **13 Claims**



1. A buffered optical waveguide fiber comprising

an optical waveguide fiber,

a resinous protective coating applied to the external longitudinal surface of said fiber,

a coating of a release agent applied over said protective coating, and

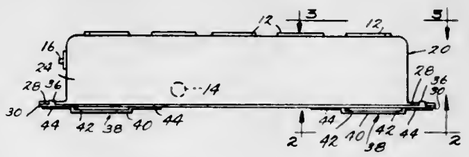
a protective layer of a thermoplastic synthetic resinous material surrounding said fiber disposed over said coating of release agent.

4,072,401

MOUNTING ARRANGEMENT FOR CASED ELECTRICAL COMPONENTS

John C. Instone, Cherry Hill, N.J., assignor to SGL Industries, Inc., Haddonfield, N.J.

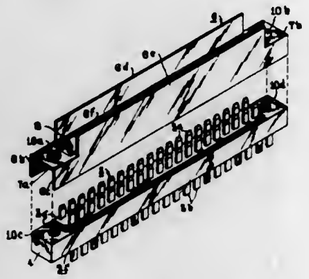
Filed Dec. 21, 1976, Ser. No. 753,354
Int. Cl.[2] H02G *3/10*
U.S. Cl. 339—125 R **9 Claims**



1. A cased electrical component wherein the case comprises a base having a generally planar exterior face and a cover which cooperates with the base to define an internal space in

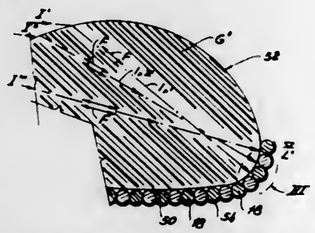
which the electrical component is located, said case having at least two integral ears lying generally in the plane of the exterior surface, each of said ears having an aperture therethrough, means adjacent each ear and fixed to said case in a position such that the respective aperture is obstructed; and a mounting bracket of the temporary mounting type attached to said exterior surface adjacent each ear and projecting from said exterior surface in a direction at a right angle thereto.

4,072,402
ELECTRICAL CONNECTOR
Robert J. Butler, 101 Bowdoin St., Malden, Mass. 02148
Filed Jan. 19, 1976, Ser. No. 650,434
Int. Cl.² H01R *13/46*
U.S. Cl. 339—136 M **4 Claims**



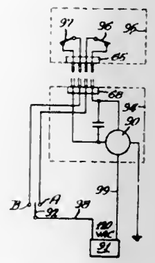
1. An electrical connector of the type adapted to mate with a female connector having a pair of receptacles each adapted to receive a keying pin, comprising a plastic body having an opening adjacent one end adapted to removably receive one of said keying pins, a plurality of metal connector pins each embedded in and having a projecting portion extending from one surface of said plastic body, and an integral extruded sheath of H-shaped cross section positioned on said body and having a pair of side walls with parallel planar portions positioned in contact with opposed surfaces of said plastic body and each having an integral skirt portion extending therefrom for a distance at least equal to the length of said projecting portions of said pins, and a bridge formed integrally with said side walls and maintaining said side walls in fixed space relationship, said bridge having a transverse opening positioned in alignment with said opening in said plastic body, thereby to reinforce said plastic adjacent said opening.

4,072,403
RETRO-REFLECTING ASSEMBLY
Ludwig Eigenmann, Vacallo, Switzerland
Filed July 15, 1976, Ser. No. 705,596
Claims priority, application Italy, July 16, 1975, 25456/75; June 6, 1976, 24096/76; July 6, 1976, 25067/76
Int. Cl.² G02B *5/128*
U.S. Cl. 350—105 **6 Claims**



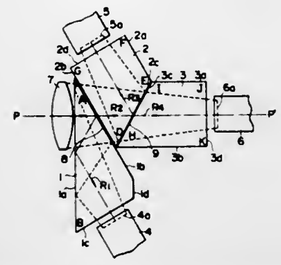
1. An improved retro-reflecting assembly comprising a transparent globule having a first uncoated part-spherical surface portion positioned to be impinged by light rays, a second substantially flat surface portion opposite said first surface portion and a toroidal surface portion intermediate said first and said second surface portions and having a generatrix of radii of curvatures considerably smaller than that of said first part spherical surface portion; and a monolayer of externally reflecting transparent microspheres for focussing and retro-reflecting light beams which impinge on said first surface portion and which have passed through and being reflected by said globule, said monolayer being applied to said second substantially flat surface portion and to at least part of said toroidal surface portion.

4,072,404
CONTROL MECHANISM FOR POSITIONING PROJECTION SCREEN IN CLOSED POSITION
Donald J. Brown, Naperville, Ill., assignor to Knox Manufacturing Co., Wood Dale, Ill.
Filed Jan. 9, 1976, Ser. No. 647,870
Int. Cl.² G03B *21/56*; A47G *5/02*; A47H *1/00*
U.S. Cl. 350—117 **6 Claims**



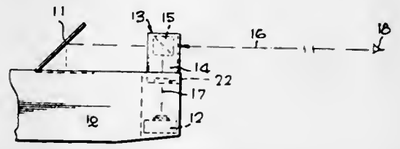
1. A motor driven wall-type projection screen apparatus, comprising an elongated casing adapted to be mounted on a supporting surface, the casing having flange portions to afford a longitudinally extending slot; an elongated roller rotatably journalled in the casing; a flexible projection screen having a transverse marginal edge portion secured to said roller and a free marginal edge portion suspended from the roller, said screen being wound upon said roller when in closed position and being unwound from said roller when in exposed viewing position; a reversible electric drive unit operatively connected to one end portion of the roller for rotating the roller to move said screen to exposed viewing position and to closed position; circuit means for making an electrical connection with the drive unit, the circuit means including first switch means for actuating the drive unit to move the screen toward closed position and second switch means positioned adjacent the roller, said second switch means being movable between an actuating position and an inoperative position and being normally urged to actuating position, the second switch means when in inoperative position electrically interrupting the circuit means to the drive unit; and an elongated slat secured to the free marginal edge of the screen, the slat having a length and shape to nest within and substantially close the slot in the casing when the screen is in closed position, a portion of said slat when so nested being positioned to engage the second switch means to move said second switch means from actuating position to inoperative position to open the circuit means and arrest movement of the drive unit and of the roller.

4,072,405
PRISM SYSTEM FOR USE IN TRICOLOR SEPARATION
Banri Ozeki, Tokyo, Japan, assignor to Tokina Optical Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 586,703, June 13, 1975, abandoned. This application Feb. 7, 1977, Ser. No. 766,005
Claims priority, application Japan, June 13, 1974, 49-66590
Int. Cl.² G02B *27/14*; H04N *9/04*
U.S. Cl. 350—173 **4 Claims**



1. A prism system for use in tricolor separation, the system comprising:
- a first prism of a right-angled triangular shape, said first prism having an oblique surface end and a first base surface forming an angle of 30° with its oblique surface;
- second and third prisms of a trapezoidal shape, each having parallel top and bottom surfaces, and an oblique surface forming an angle of 120° with its top surface, said oblique surfaces of said second and third prisms being adjacent;
- a first interference filter interposed and bonded between said first base surface of said first prism and said bottom surface of said second prism whereby when light passes through said oblique surface of said first prism at a right angle thereto and is incident upon said first interference filter, light of one wave length range having one of three primary colors reflected by said first interference filter, while light components of the other wave length ranges are allowed to be transmitted through said first interference filter in the same direction as that of the incident light; and
- a second interference filter interposed and bonded between said oblique surface of said second prism and said oblique surface of said third prism, whereby a transmitted light component of another light wave length range of the three primary colors is reflected by said second interference filter, while the remaining light component of the remaining light wave range is transmitted through said second interference filter.

4,072,406
CAMERA PERISCOPE WITH LOUVERS FOR CONTROLLING LIGHT SCATTERING
Maurice G. Amesbury, 22552 Lark Spring Terrace Diamond Bar,, Los Angeles, Calif. 91765
Filed June 17, 1976, Ser. No. 697,202
Int. Cl.² G02B *27/14*
U.S. Cl. 350—173 **7 Claims**



1. A periscope for mounting onto a gunsight along the line of sight between a viewer and a target display, the combination comprising:
- an elongated housing;
- a beam-splitter cube mounted on said housing on said line of sight;
- means incorporated into said beam-splitter cube for branching an image simultaneously to the viewer and to the lens of a camera;
- front and rear panels carried on said housing of light transparent material so as to avoid obstruction of the viewer's line of sight;
- said housing having opposite sides of opaque material;
- said front and rear panels are light control films; and
- said light control films comprise microlouvers for controlling the scattering of stray light introduced to said housing.

4,072,407
APPARATUS FOR HOLDING, READING AND HANDLING BOOKS
Andre Zeisky, 21 Sturgis Road, Kendall Park, N.J. 08824
Filed June 21, 1976, Ser. No. 697,828
Int. Cl.² G02B *27/02*; B42D *17/00, 9/00*
U.S. Cl. 350—241 **15 Claims**

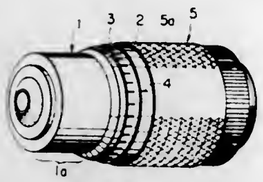


1. Apparatus for aiding in the handling of books comprising a body having an elongated member adapted to fit along the center line of an open book, said body having means fixed at one end resiliently biased with respect to said body for removably fastening said body to the spine of said book, said body being formed of an elongated continuous wire provided with a reverse bend forming a pair of parallel coplanar elongated slide members between its ends, said slide members being spring loaded with respect to each other, and an auxiliary member slidably secured to one of said parallel members for manual movement along its length in association with the printed matter in said book and held at least in part against movement therealong by the bias of said parallel slide members.

4,072,408
LENS MOUNT FOR A MICROSCOPE OBJECTIVE
Toshifumi Uetake, and Tsutomu Tojyo, both of Hachiouji, Japan, assignors to Olympus Optical Co., Ltd., Japan
Filed Mar. 23, 1976, Ser. No. 669,474
Claims priority, application Japan, Mar. 28, 1975, 50-40955
Int. Cl.² G02B *7/04*
U.S. Cl. 350—255 **2 Claims**

1. A lens mount for a microscope objective comprising a correcting thin ring for moving a part of lenses constituting the objective along the optical axis for the purpose of correcting aggravation of aberrations caused by variation in thickness of cover glasses, and a friction band arranged round the outer surface of said correcting ring for finger bulb movement of said ring and made of soft and frictional material such as rubber,

said microscope objective being used by mounting to a revolver closely spaced to other microscope objectives which



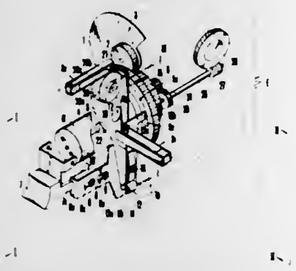
necessitates said ring being thin and being arranged to correct aggravation of aberrations by moving said part of lenses by rotating said friction band.

4,072,409

RELEASE DEVICE OF MOTION PICTURE CAMERA

Noritsugu Hirata, Yokohama; Tomoshi Takigawa, Machida, and Kazuo Ishikawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 11, 1976, Ser. No. 685,190
Claims priority, application Japan, May 19, 1975, 50-59439
Int. Cl.² G03B *1/00*
U.S. Cl. 352—174 **17 Claims**



1. A motion picture camera comprising:

(a) an exposure aperture,

(b) rotatable shutter means arranged for selectively uncovering and covering said exposure aperture by the rotational movement,

(c) stop means arranged normally for latching said shutter means at a position in which the shutter means fully covers the exposure aperture, said stop means being movable in either of at least a first and a second predetermined plane of substantially different orientation and releasing the latching of the shutter means of the movement in said first plane,

(d) release means manually operable from the outside of said camera and arranged upon acutation for displacing said stop means in said first plane from its latching position to its unlatching position against said shutter means, said release means being operatively engageable with the stop means, so long as the stop means is retained in said first plane, and

(e) disengaging means responsive to the rotational operation of said shutter means for displacing said stop means in at least said second plane to break off the operative engagement with said release means and thereafter for causing said stop means to return to its latching position against said shutter means once during each revolution of the shutter means,

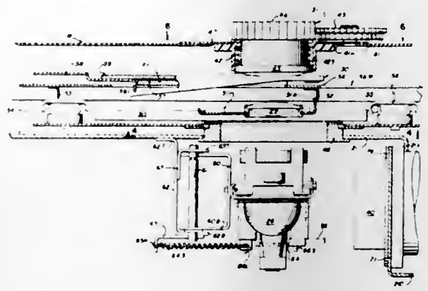
thereby only one single frame shot being made possible despite the fact that said release means remains held in the actuated position.

4,072,410

CONVERTIBLE INPUT READER-PRINTER

Frank L. Kratcoski, Trapon Springs, Fla., and Herbert H. Hausmann, Prairie View, Ill., assignors to Oce'-Industries, Inc., Chicago, Ill.

Filed Apr. 22, 1976, Ser. No. 679,246
Int. Cl.² G03B *21/11*
U.S. Cl. 353—68 **13 Claims**



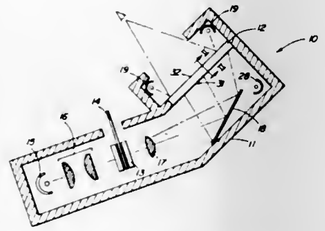
1. A convertible arrangement for selectively shifting fiche film projecting means and roll film projecting means into operative alignment with a common optical axis that intersects a fiche image plane and extends to a projection plane, the arrangement being characterized in that the fiche film projecting means includes beam projecting structure mounted for controlled shifting movement between an operative position of alignment with the optical axis and an out-of-the-way position spaced from the optical axis, the roll film projecting means includes beam projecting structure mounted for controlled shifting movement between an out-of-the-way position spaced from the optical axis and said operative position of alignment, and selectively operable control means interconnecting the fiche beam projecting structure and the roll beam projecting structure in ganged relationship to effect controlled shifting movement thereof for converting between a fiche film imput mode and a roll film input mode.

4,072,411

DISPLAY DEVICE HAVING IMAGE SENSE REVERSAL CAPABILITY

Lee Fitzpatrick Frank, and Joseph Yorks Kaukeinen, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 3, 1976, Ser. No. 682,304
Int. Cl.² G03B *21/00*
U.S. Cl. 353—121 **21 Claims**



1. An improved viewing device comprising:

a. an electro-optical display panel including means for receiving and storing an electric field pattern corresponding to an image to be viewed and means, responsive to such a received pattern, for modulating incident light in accordance with such pattern;

b. imaging means for applying an imagewise electric field pattern across said display panel thereby establishing in said panel a light modulating pattern corresponding to said field pattern in a first image sense; and

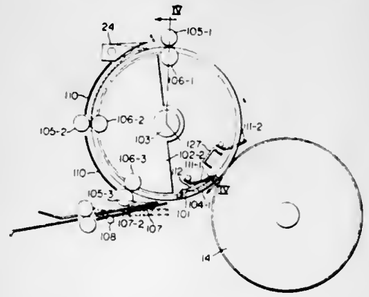
c. reversing means for selectively impressing a uniform electric field across said panel with the imagewise field pattern stored therein, said uniform field being of the same polarity as said field pattern and of magnitude sufficient to reverse said first modulating pattern to a second light modulating pattern corresponding to said field pattern in an image sense opposite to said first modulating pattern.

4,072,412

IMAGE TRANSFER DEVICE

Masashi Suda, Iruma, and Shunichi Kubo, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1975, Ser. No. 643,804
Claims priority, application Japan, Dec. 28, 1974, 50-2500; Dec. 28, 1974, 50-2501; Dec. 28, 1974, 50-2502
Int. Cl.² G03G *15/16*
U.S. Cl. 355—3 TR **16 Claims**



1. An image transfer device for causing developed images formed on an image-bearing member to be transferred therefrom to a transfer medium, said device comprising:

corona discharge means opposed to said image-bearing member for imparting corona discharge;

gripper means for gripping the leading end edge of said transfer medium;

support means extending between said corona discharge means and said image-bearing member and supporting said gripper means for circulatory movement; and

transfer medium confining means for confining the path of the transfer medium gripped and guided by said gripper means substantially within the path of said gripper means, said transfer medium confining means including at least one set of confining roller pairs disposed with the path of said gripper means intervening therebetween.

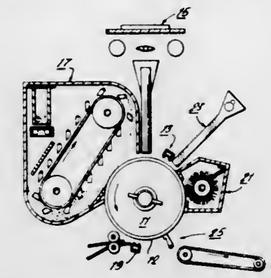
4,072,413

ELECTROSTATOGRAPHIC REPRODUCTION METHODS AND MACHINES

Colin Lawrence Amess, Welwyn Garden City, England, assignor to Xerox Corporation, Stamford, Conn.

Filed May 11, 1976, Ser. No. 685,478
Claims priority, application United Kingdom, Oct. 31, 1975, 45375/75
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 CH **3 Claims**

1. An electrostatographic reproduction machine in which imaging radiation is transmitted from a insulation layer to form a latent image of a document or other information, including a charging corotron arranged to differentially charge said layer such that said layer is relatively more highly charged centrally to compensate in the formation of said latent image for differential reductions of the imaging radiation, said layer being arranged to be moved relative to and in an arcuate path adjacent said corotron which is misaligned with respect to a line parallel to the axis of said arcuate path.

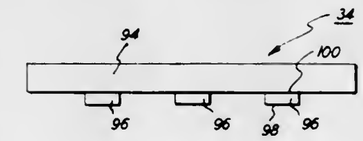


4,072,414

SCREEN FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE

William J. Hanson, Macedon, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 29, 1976, Ser. No. 736,989
Int. Cl.² G03G *15/01*
U.S. Cl. 355—4 **15 Claims**



1. An electrophotographic printing machine for reproducing a transparency, including:

a photoconductive member;

means for charging at least a portion of said photoconductive member to a substantially uniform level;

a screen member comprising a plurality of opaque regions with at least a portion thereof having a light reflecting surface on one side thereof and a light absorbing surface on the other side thereof; and

means for projecting a light image of the transparency through said screen member onto the charged portion of said photoconductive member to record thereon a modulated electrostatic latent image, said screen member being positioned so that the reflecting surfaces of the opaque regions form a visual image of the transparency and the absorbing surfaces of the opaque regions absorb incident light rays.

4,072,415

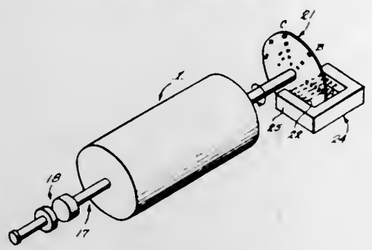
APPARATUS OF GENERATING CONTROL SIGNALS FOR CONTROLLING AN OPERATION OF AN ELECTROPHOTOGRAPHIC COPYING MACHINE

Kazuya Inoue, Musashino, and Yukio Katano, Kawaguchi, both of Japan, assignors to Kabushiki-Kaisha K I P, Tokyo, Japan

Filed Aug. 26, 1976, Ser. No. 718,208
Claims priority, application Japan, Sept. 8, 1975, 50-108098
Int. Cl.² G03G *15/00*
U.S. Cl. 355—14 **6 Claims**

1. An apparatus of generating control signals for controling an operation of an electrophotographic copying machine of the type wherein said control signals are generated in timed relationship with rotation of a photosensitive drum disposed in said copying machine, the improvement comprising a disk having through-holes therein and driven in association with said photosensitive drum, a light emitting device, a photosensi-

tive device spaced apart from said light emitting device to sense binary coded light signals formed by said light emitting device and said through-holes of said disk and a decoder connected to said photosensitive device, said disk having a strobe section for strobe through-holes and a plurality of code sections for code through-holes associated with said strobe



through-holes, said strobe section and said code sections being formed in outer and inner radial portions, respectively, of said disk, and the arrangement being such that as said disk rotates said strobe and code through-holes are, in operation, brought into registration with the path of light from said light emitting device to said photosensitive device to permit light to pass through said through-holes.

4,072,416

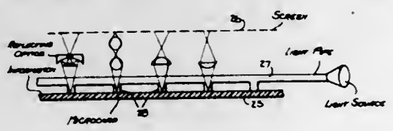
OPTICAL SCANNING SYSTEM FOR READING MICRO-IMAGE RECORDS

Adnan Waly, Stamford, Conn., assignor to Izon Corporation, Stamford, Conn.

Division of Ser. No. 291,589, Sept. 25, 1972, Pat. No. 4,033,686, which is a division of Ser. No. 135,996, April 21, 1971, Pat. No. 3,704,068. This application Apr. 9, 1976, Ser. No. 675,620

Int. Cl.² G03B *27/44*

U.S. Cl. 355—46 **5 Claims**



1. An optical system for reading a microrecord wherein a plurality of data sets are formed on the face of a planar record medium, each data set representing a reduced scale image of a distinct page of intelligence and being dissected into a multiplicity of data sub-sets which are dispersed on the medium in accordance with a predetermined pattern, the dispersed sub-sets which constitute the plurality of data sets being interlaced with each other whereby each data set occupies a distinct position on the medium and may optically be extracted therefrom, said optical system comprising an array of lensettes in parallel relation to the record medium, each lensette in the array being optically aligned with a respective correspondingly-positioned sub-set in a selected data set and being constituted by a reflective concave element and a reflective spherical element associated therewith to project an image of the sub-set to recreate the page represented by the selected data set.

4,072,417

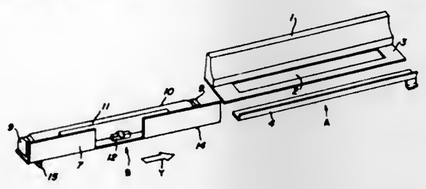
EXPOSURE DEVICE FOR A XEROGRAPHIC COPYING MACHINE

Koichi Motomura, Ebina, Japan, assignor to Rank Xerox Ltd., London, England

Filed Sept. 13, 1976, Ser. No. 722,941

Int. Cl.² G03B *27/54*

U.S. Cl. 355—67 **2 Claims**



1. An exposure device for a xerographic copying machine comprising:

(a) a rail unit adapted to be rigidly mounted to the copying machine, the rail unit having supporting means, means defining an elongated exposure aperture, and an elongated reflecting mirror located along one elongated side of the exposure aperture,

(b) a light source unit having a housing adapted to be slid along and supported by the supporting means, and an elongated exposure lamp mounted on the housing, and

(c) means for guiding the exposure lamp along the other elongated side of the exposure aperture and for limiting the movement of the housing in a direction transverse to the direction the housing is to be slid, and means for stopping the housing in a predetermined position alongside the exposure aperture and for biasing the housing against the supporting means.

4,072,418

DEVICE FOR PREVENTING MOVEMENT OF AN ORIGINAL DOCUMENT ON A RECIPROCATING COPIER PLATEN

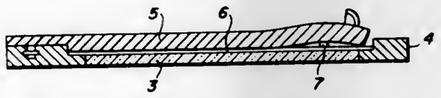
Kaoru Fujizuka, Ebina, Japan, assignor to Rank Xerox Ltd., London, England

Filed Mar. 16, 1976, Ser. No. 667,919

Claims priority, application Japan, May 29, 1975, 50-71345

Int. Cl.² G03B *27/62*

U.S. Cl. 355—75 **1 Claim**



1. An electrostatic copying apparatus including a reciprocating platen and a means for facilitating removal of a document from said platen without creating a vacuum hold on said document, said facilitating means comprising:

a. a platen cover, and

b. space creating means detachably secured to said cover and adapted when said cover is closed to allow through-flow of air over said document on said platen whereby the vacuum associated with the lifting of the platen cover away from the documents is substantially reduced.

4,072,419

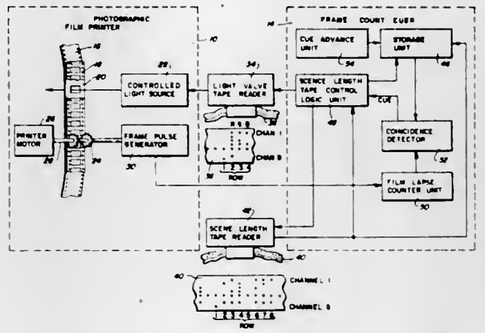
FRAME COUNT CUER FOR PHOTOGRAPHIC FILM PRINTERS

Charles J. Watson, Elgin, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Sept. 26, 1974, Ser. No. 509,590

Int. Cl.² G03B *27/78*

U.S. Cl. 355—83 **16 Claims**



1. An apparatus for monitoring the passage of film through a photographic film printer and for controlling the operation of the printer in accordance with the monitoring information, wherein the printer includes a selectively controllable light source and a signal generator providing an output signal related to the quantity of film passing through the printer, comprising:

storage means for storing film frame addressing cuing information in integral units of length greater than a frame and in numbers of frames;

a bi-directional counter unit including a direction sensing means for connection with the signal generator providing an incremental or decremental count in said integral units of length and in numbers of frames of the film passing through the printer;

comparator means for comparing the information in said storage means with the count of said counter unit and providing an output cue signal to said printer upon the occurrence of a predetermined relation between the storage means and said counter unit wherein the comparator means includes a programmable means for selectively varying said information stored in said storage means to provide for the occurrence of a predetermined relation between the storage means and the counter unit either in advance of or after the information originally stored in the storage means; and

selectively actuatable reset means connected to said comparator means to reset said bi-directional counter upon the occurrence of said cue signal.

16. A frame count cuer for monitoring the passage of film through a film printer and for controlling the operation of a selectively controllable light source on the printer in accordance with monitoring information, comprising:

a signal generator on the film printer providing an output signal related to the quantity of film passing through the printer;

a control element comprising a punched tape bearing film frame cuing information;

reader means for reading the control element and providing a signal related to said cuing information in integral units of length greater than a frame and in numbers of frames;

storage means connected to the reader means for storing film frame cuing information read by said reader means in said integral units of length and numbers of frames;

direction sensing means connected to the signal generator providing a first signal for film passing through the printer in a first direction and second signal for film passing through the printer in a second direction;

a counter unit connected to the direction sensing means for receiving said first and second signals from the direction sensing means to provide a count in integral units of length and numbers of frames of film passing through the printer; and

comparator means for comparing the information in said storage means with the count of said counter unit and providing an output cue signal to said printer upon the occurrence of a variable predetermined relation between the storage means and said counter unit, wherein the control element is formed in a loop and said cuer includes a discriminator means for sensing a predetermined code upon said tape, and master reset means connected to said discriminator means providing a reset signal to the counter unit upon sensing the predetermined code for continuous, loop operation of the frame count cuer.

4,072,420

MICROFILM CARD DUPLICATION

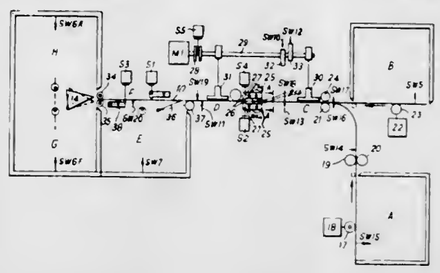
Anthony John Wicks, London, and Eric Terence Wilson, Medstead, both of England, assignors to Wicks & Wilson Limited, London, England

Filed Jan. 26, 1976, Ser. No. 652,146

Claims priority, application United Kingdom, Apr. 8, 1975, 14404/75

Int. Cl.² G03B *27/30*

U.S. Cl. 355—100 **18 Claims**



1. A microfilm card duplicating machine comprising means for feeding copy cards sequentially to an image reproducing means for duplicating images carried by master cards fed thereto onto one or more copy cards per master, means for routing copy and master cards to a receiving station after copying and master card delaying means for enabling delivery of a master card to the receiving station only when its duplicate copy card(s) have been delivered thereto to form an interleaved stack of master and copy cards arranged with said one or more copy cards being preceded in each case by the associated master card.

4,072,421

METHOD AND APPARATUS FOR OPTICAL DISCRIMINATION OF PARTICLES

Lawrence J. Coyne, White Plains; Wilberdan V. George, Brooklyn, and Warren Groner, Whitestone, all of N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

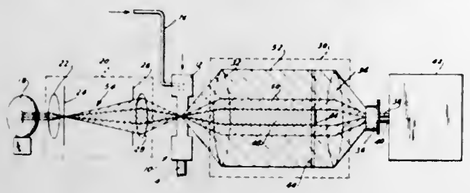
Filed Aug. 30, 1976, Ser. No. 718,745

Int. Cl.² G01N *33/16, 21/26*

U.S. Cl. 356—39 **20 Claims**

1. Apparatus for discriminating particles having particular light absorbing and scattering characteristics when illuminated by a beam of light, comprising: means for passing said particles, in turn, along an optical interaction station, a light source for directing a beam of light transversely through said station along an optical axis, and an optical detection system having an entrance aperture and including a photodetector for receiving light as scattered and absorbed by particles being passed, in turn, through said station, said detection system including means intermediate said station and said photodetector for

partially obstructing an interior portion of said light beam while passing to said photodetector a portion of said scattered



light which is substantially equal to the light which is scattered by said particles, in turn, outside said entrance aperture.

4,072,422

APPARATUS FOR INTERFEROMETRICALLY MEASURING THE PHYSICAL PROPERTIES OF TEST OBJECT

Nobuyoshi Tanaka, Yokohama; Mitsuo Takeda, Kawasaki, and Kazuya Matsumoto, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 20, 1976, Ser. No. 734,245

Claims priority, application Japan, Oct. 27, 1975, 50-129105; Oct. 27, 1975, 50-129106

Int. Cl.² G01B *9/02*

U.S. Cl. 356—108 **9 Claims**



1. An apparatus for interferometrically measuring the physical properties of a test object having at least two surfaces including a first surface making a portion of incident light reflected and another portion of the light transmitted and a second surface making at least a portion of incident light reflected, said test object being to permit the propagation of the light between said first and second surfaces, which comprises:

illumination means for illuminating said test object with broadband light so as to form first and second wave fronts having therebetween an optical path difference corresponding to the optical path length between said first and second surfaces of said test object,

interference fringe forming means for receiving said first and second wave fronts, splitting said first wave front into third and fourth wave fronts tilted to each other and said second wave front into fifth and sixth wave fronts tilted to each other and making said third wave front intersect said fourth and sixth wave fronts and further said fifth wave front intersect said fourth and sixth wave fronts so as to form a broadband light interference fringe,

image forming means for forming an image of said test object in the position where said broadband light interference fringe is formed by said interference fringe forming means, and

viewing means for allowing to view the image of said test object and said broadband light interference fringe simultaneously.

4,072,423

LIGHT INTERFERENCE DEVICE WITH LOW DEGREE OF SPACIAL COHERENCE

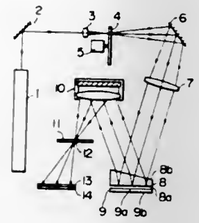
Yoshiaki Kimura, Hachioji, and Hiroshi Ito, Inagi, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jan. 16, 1976, Ser. No. 649,847

Claims priority, application Japan, Jan. 21, 1975, 50-9402

Int. Cl.² G01B *9/02*

U.S. Cl. 356—109 **6 Claims**



1. A light interference device for measuring the flatness of a surface to be measured, said surface to be measured being one side of a plate of transparent material having a back face, said device comprising a light source, an optical element having a reference surface for interference upon which a parallel light bundle from the light source impinges and passes through and from which a parallel light bundle is reflected, said reference surface being locatable adjacent but spaced from said surface to be measured whereby interference fringes are generated as a result of the interaction of light rays reflected from said reference surface and from said surface to be measured, said light source having a low degree of spatial coherence whereby said interference fringes are localized near said interference surface, an optical system between said light source and said reference surface for providing a parallel light bundle coming out from said reference surface toward said surface to be measured at an angle θ within the range of $0° < \theta \leqq 30°$, an observing surface, and an optical projection system for projecting interference fringes localized near said interference surface onto said observing surface.

4,072,424

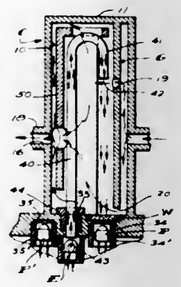
OPTICAL DEVICE FOR MEASURING THE TURBIDITY OF A LIQUID

James P. McMullan, and Albert Stevens, both of 2630 Seaman Ave., El Monte, Calif. 91733

Filed Jan. 30, 1976, Ser. No. 653,739

Int. Cl.² G01N *21/26*

U.S. Cl. 356—208 **10 Claims**



1. A turbidimeter comprising a chest with an elongate fluid conducting chamber having upstream and downstream sides, inlet and outlet ports communicating with the upstream and downstream sides of the chamber between the ends thereof,

flow directing means in the chamber in the upstream side portion thereof directing fluid flowing into the chamber through the inlet port longitudinally outwardly toward the opposite ends and thence toward the downstream side of the chamber, a light emitter at one end of the chest outside the chamber, an elongate light conducting light pipe with an inlet end exposed to the emitter, extending longitudinally freely through the chamber and having a recurvate free end portion with an outlet end in the chamber at the other end portion of the chest and disposed toward said one end of the chest and across which fluid directed toward said other end and thence downstream in the chamber by said flow directing means is directed, a light responsive photo cell at said one end of the chest outside the chamber in alignment with the outlet end of the light pipe, a light conducting window between the cell and chamber with a surface within the chamber and across which fluid directed toward said one end and thence downstream in the chamber by the flow directing means is directed.

4,072,425

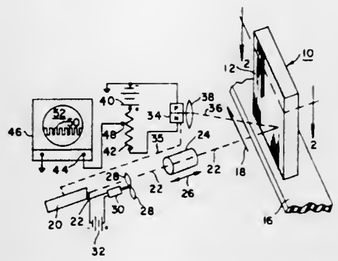
METHOD OF INDICATING THE RELATIVE ROUGHNESS OF A SURFACE

Thomas Guttman, Philadelphia, Pa., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 9, 1976, Ser. No. 713,069

Int. Cl.² G01N *21/48*

U.S. Cl. 356—209 **9 Claims**



1. A method of indicating the relative roughness of a surface finished with a plurality of substantially uniform parallel grooves, said method comprising the steps of:

directing an incident beam of light substantially perpendicularly to said surface,

interrupting said incident beam periodically,

focusing said beam so that its width at said surface is substantially that of the narrowest groove that represents the least roughness to be indicated,

providing a light-sensitive device disposed laterally of said beam to received reflected light of said beam from said surface,

providing relative motion between said surface and said beam in a direction substantially perpendicular to the direction of said grooves, and

converting the energy of said reflected light received by said device to a visual display, whereby to indicate the relative roughness of said surface.

4,072,426

METHOD AND APPARATUS FOR DETERMINING THE REFLECTIVE PROPERTIES OF SURFACES, ESPECIALLY COATED SURFACES

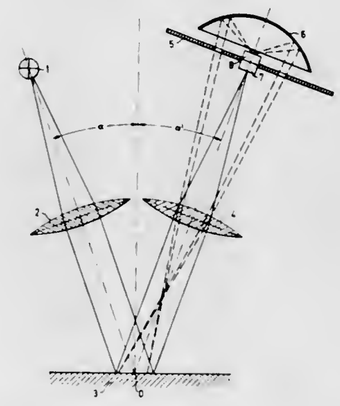
Herwig Horn, Graz, Austria, assignor to Pluss-Staufer AG, Oftringen, Switzerland and Zentrum fur Elektronemikroskopie, Graz Steyrergasse, Austria

Filed Aug. 8, 1974, Ser. No. 495,576

Claims priority, application Germany, Jan. 17, 1974, 2402127

Int. Cl.² G01N *21/48*

U.S. Cl. 356—212 **11 Claims**



1. The method of determining the reflective characteristics of a surface, especially a coated surface, which comprises; directing a bundle of parallel light rays against a substantial area of the surface at a predetermined angle of incidence, condensing with a first condensing means first light rays which reflect from said surface at an angle of reflection numerically equal to said angle of incidence, simultaneously condensing with a second condensing means second light rays that reflect from said surface at an angle which is numerically different from said angle of incidence and disposed in surrounding relation to the condensed first light rays which have passed through said first condensing means and falling within predetermined inner and outer radial limits, intercepting the condensed first and second light rays by respective light sensitive electrical components, and comparing the changes in value of said components to arrive at a value for the reflective characteristics of said surface.

4,072,427

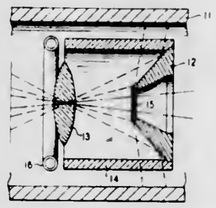
FAULT INSPECTION SYSTEM

Dietrich Anselm Alsberg, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 28, 1976, Ser. No. 709,308

Int. Cl.² G01N *21/32*

U.S. Cl. 356—241 **2 Claims**



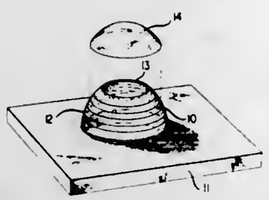
1. A visual fault inspection system for waveguide and the like comprising a thin-walled hollow cylinder of optical transparent material, lens means mounted at one end of said cylinder, a conical reflector mounted in-line with said lens means at

the other end of said cylinder to permit the viewing of objects substantially at right angles to the optical axis of the lens means, said conical reflector having the center portion of the cone eliminated to provide a forward look into the waveguide, a negative lens mounted in the center aperture of the conical reflector to compensate for focusing differentials, light means positioned adjacent the end wall of said cylinder at which said lens means is mounted to provide the requisite illumination of the internal wall of the waveguide and of the forward area, a video transmitter including a camera tube positioned to receive images relayed by said lens means, means for producing a polar scan in the camera tube, a video receiver including means for displaying signals obtained from the polar scanned camera tube in accordance with a rectangular raster, means for restricting the rectangular raster display to a display of only the internal wall image reflected by the conical reflector, a separate display means for displaying the forward look image in the original polar coordinate form, and means for restricting this latter display to a display of only the forward look image.

4,072,428
INSPECTING AND MEASURING OF SOFT CONTACT LENSES

Herbert L. Moss, 845 Field Ave., Plainfield, N.J. 07060

Filed June 1, 1976, Ser. No. 691,349
Int. Cl.² G01N *21/16*; G02B *7/02*; G01B *9/00*
U.S. Cl. 356—244 **6 Claims**

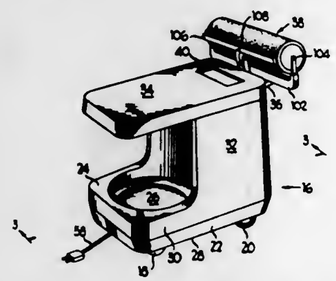


1. A series of tools for inspecting and measuring soft contact lenses, each said tool comprising a substantially flat plate formed integrally with a convex semispheroidal protrusion having a round central opening, the inverse concave interior of each said protrusion being dimensioned to form a snap-on fitting for the stop of a standard measuring instrument, the protrusions of the tools of said series having graduated external radii of curvature.

4,072,429
PAINT ROLLER

Rouben T. Terzian, Chicago, and Derek A. Brand, Naperville, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Sept. 4, 1975, Ser. No. 610,119
Int. Cl.² B43K *5/02*; B44D *3/28*
U.S. Cl. 401—146 **13 Claims**



1. Apparatus for applying paint or other fluid material to a surface, which apparatus comprises a wheeled carriage for movement along a floor or other generally flat surface, said carriage including a base element supported by wheels and having a well for receiving a paint pail or the like, peristaltic pump means mounted on said carriagne including a flexible conduit for delivering fluid therethrough from the pail positioned in said well, and applicator means having a paint absorbent surface and manifold means for receiving paint from said conduit and distributing the paint evenly over said absorbent surface,

wherein said applicator means is a paint roller having a bifurcated yoke with a handle secured thereto and said manifold means is formed by said yoke,

a hood element upstanding from said base and overlying said well at a height above said paint pail,

said hood includes a hook means for engaging and hanging said paint roller by its manifold in upright position,

said hood element includes a top aperture and a grippable element whereby a hand inserted through the aperture can grip the grippable element for purposes of moving said carriage.

4,072,430
WRITING INSTRUMENT

Katsumi Otsuka, Funabashi, Japan, assignor to Teibow Company Limited, Japan

Filed Aug. 6, 1975, Ser. No. 602,402
Claims priority, application Japan, Sept. 6, 1974, 49-107271[U]
Int. Cl.² B43K *1/06*
U.S. Cl. 401—265 **11 Claims**

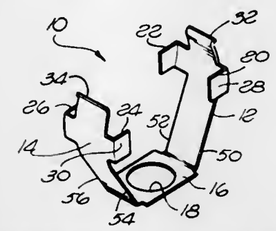


1. In a writing instrument comprising a cylindrical casing having a rear end and a forward end, an ink reservoir in said casing, and a writing nib having a rear end in said ink reservoir and a forward end projecting from the forward end of said casing, said nib having a tapered tip portion extending forwardly from said forward end of the casing, the improvement wherein said nib comprises an outer wall of cylindrical shape and a plurality of inner partitions formed integral with said outer wall in cantilever fashion, each said inner partition having a transverse cross-section which is comprised of a plurality of partially intersected circles of different diameter aligned radially in such a manner that the intersected circles of larger diameter and of smaller diameter are arranged alternately, each intersected circle of each inner partition being spaced circumferentially on a concentric circle coaxial with said outer cylindrical wall from the corresponding intersected circle having the same diameter of the neighboring inner partition, so that an inner capillary conduit for ink comprised of a plurality of capillary passages of various transverse dimensions is defined between said outer cylindrical wall and said inner partitions, one end of said inner capillary conduit for the ink terminating at said tapered tip portion of the nib and the other end terminating at said rear end of the nib, whereby said ink contained in said ink reservoir is introduced from said reservoir to said inner capillary conduit and can flow to said tip portion through said capillary passages of various dimensions, so that the ink flows smoothly and continuously to said tip through the capillary conduit upon the consumption of ink due to the use of said writing instrument.

4,072,431
ANTIROTATION CLIP

William J. Waight, Reseda, and Stanley E. Roche, Granada Hills, both of Calif., assignors to Textron Inc., Valencia, Calif.

Filed Apr. 5, 1977, Ser. No. 784,895
Int. Cl.² F16C *11/06*; F16J *1/14*
U.S. Cl. 403—158 **6 Claims**



1. An anti-rotation spring clip adapted for attachment to an object to prevent rotation thereof in a predetermined axis, said clip comprising:

a unitary U-shaped member having first and second arms interconnected by a bight portion;

said first arm having first and second spaced apart opposed inwardly directed tabs thereon;

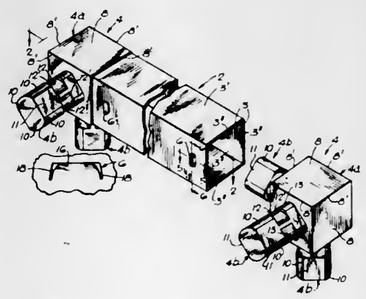
said second arm having third and fourth spaced apart opposed inwardly directed tabs thereon; and

said tabs each having an outer bearing surface.

4,072,432
CONNECTOR FOR TUBULAR FRAME MEMBERS

Paul M. Levy, Skokie, Ill., assignor to Capitol Hardware Manufacturing Company, Inc., Chicago, Ill.

Filed May 6, 1976, Ser. No. 683,819
Int. Cl.² F16B *7/22*
U.S. Cl. 403—170 **12 Claims**

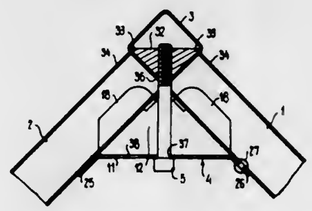


1. In combination with a tube connector fitting for interconnecting substantially square open-ended tubes each having an interior defined by two pairs of orthogonally related parallel flat surfaces spaced apart a given distance, said tube connector fitting comprising a hub portion having tube-receiving projections extending in different directions from said hub portion, said hub portion forming tube end abutment surfaces immediately about the points said tube-receiving projections extend from said hub portion, each of said tube-receiving projections having diametrically opposed portions of maximum spacing which fit loosely within said square tube in one angular position of insertion into the tube and frictionally engaged the interior surfaces of said tube when the inserted connector fitting or tube receiving the same is rotated 45° therefrom, each of said tube-receiving projections having diametrically opposed portions of lesser spacing between said diametrically opposed portions of maximum spacing which portions of lesser spacing provide clearance for the passage of internally projecting flexible resilient locking means on one of the square tubes when the tube connector fitting has said one angular position of insertion with respect thereto, and grooves formed in and extending transversely of the longitudinal axes of said tube-receiving projections which grooves are defined by recessed radially outwardly facing surfaces which at their outermost margins intersect radially outwardly extending tube projection locking shoulders, said grooves being in axial alignment with said diametrically opposed projection portions of maximum spacing, said recessed radially outwardly extending groove surfaces being spaced a greater distance from the center of the associated tube-receiving projections than the portions thereof between said recessed groove surfaces, to form locking projection deforming means when forced against the outer side surfaces of said resilient locking means of one of said tubes upon said 45° rotation of the same; the improvement comprising open-ended square tubes inserted over said connector fitting projections, each of said square tubes having adjacent the opposite ends thereof inwardly projecting flexible resilient tongues extending longitudinally away from the adjacent tube axes and each of which present at each side thereof facing transversely of the longitudinal axis of the tube curved surfaces either of which is engagable by said recessed radially facing groove surface of said fitting when the tube is inserted fully over a fitting projection, each tongue having a length to extend somewhat beyond the point of the connector fitting projection adjacent to where the associated groove-formed locking shoulder is located when the tube is in said fully inserted position so that the adjacent groove surface engages one of said curved surfaces of the adjacent tongue and inwardly deforms and shortens axially said tongue to cause it to enter the adjacent connector fitting projection groove and resiliently engage said groove-forming locking shoulder thereof when the connector fitting or tube is rotated 45° to bring the tube and connector fitting into their frictionally engaging positions, the entry of the tongue into the groove drawing the connector fitting and tube axially together to bring the end of the tube into abutment with said tube end abutment surface of the connector fitting hub portion.

4,072,433
THREE-TUBE CORNER JOINT

Wolf Veyhl, Zwerenberg, Germany, assignor to Veyhl-Produktion KG, Zwerenberg, Germany

Filed Apr. 6, 1976, Ser. No. 674,100
Claims priority, application Germany, Apr. 10, 1975, 2515569
Int. Cl.² F16D *1/00*, *3/00*
U.S. Cl. 403—172 **21 Claims**



1. In a joint assembly for three tube sections forming the corner of a tube frame, including

a. a first tube section having a first inner side, a second outer side, and two opposing walls which are perpendicular to the first side;

b. a second tube section having a first inner side, a second outer side, and opposing walls which are perpendicular to the first side, said first and second tube sections being

located in a common plane, the first side of said first section and the first side of said second section mutually facing each other;

c. a third tube section which is arranged perpendicularly to said common plane, and having a plurality of walls including two adjoining lateral faces, with the ends of the first and second tube sections being pressed against said two adjoining lateral faces by a tensioning bolt; and

d. a tensioning piece having ends which are hooked into openings provided in the mutually facing sides of the first and second tube sections, said tensioning bolt extending through a hole in said tensioning piece and engaging in a diagonally disposed threaded hole of the third tube section;

the improvement wherein:

the mutually facing sides of the first and second tube sections are exclusively restrained at locations which are immediately adjacent to the two opposing walls of the first and second tube sections;

the tensioning piece has a U-shaped cross section in a plane which is perpendicular to the common plane in which the first and second tube sections are located, said tensioning piece includes a transverse web extending transversely to the first and second tube sections and two spaced-apart legs which are parallel to said common plane in which the first and second tube sections are located, said U-shape being defined by said transverse web and said two spaced-apart legs; the mutually facing sides of the first and second tube sections have slots immediately adjacent to the opposing walls, the legs of the tensioning piece have boundary portions which engage in these slots; the bolt bears against the transverse web of the tensioning piece; and

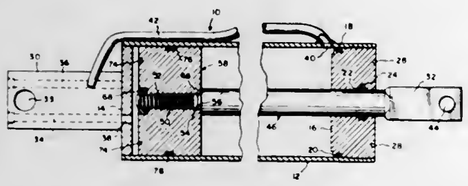
the legs of the tensioning piece are provided with slots, and the mutually facing sides of the first and second tube sections have wall portions which engage in the slots in the legs.

4,072,434

HYDRAULIC CYLINDER WITH CONCENTRICALY MAINTAINED PISTON AND ROD

Kenneth C. Homuth, 1885 E. Old Shakopee Road, Bloomington, Minn. 55437

Continuation-in-part of Ser. No. 637,362, Dec. 3, 1975, abandoned. This application Jan. 24, 1977, Ser. No. 761,609
Int. Cl.[2] F16B *9/00*
U.S. Cl. 403—263 **7 Claims**



1. In a hydraulic cylinder of the type having a piston and rod threadably attached, the improvement comprising

a. a shoulder on said rod abutting against a first piston surface and a threaded stem extending from said shoulder in threaded engagement through said piston;

b. a counterbore in a second piston surface axially aligned with the piston threaded stem engagement portion; and

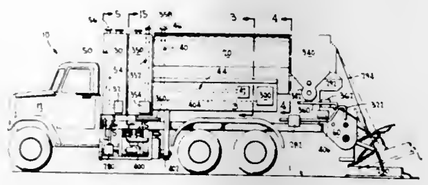
c. a deformable ring sized for interference fit into said counterbore and having a narrowed inner circumference comprising a circumferential rib of minimum width less than the thread pitch of said threaded stem, and sized for self-tapping engagement with said threaded stem.

4,072,435

METHOD AND APPARATUS FOR MAINTAINING HIGHWAYS

Ralph W. Coho; John L. Kugle, both of Lancaster, and Robert C. Futty, Willow Street, all of Pa., assignors to IRL Daffin Associates, Inc., Lancaster, Pa.

Filed Nov. 11, 1976, Ser. No. 741,060
Int. Cl.[2] E01C *19/10*
U.S. Cl. 404—110 **21 Claims**



13. A self-contained highway maintainer apparatus comprising, in combination:

an elongated mobile frame having a longitudinal axis;

a storage bin disposed on said frame for storing aggregate;

a first tank disposed on said frame for storing liquid asphalt cement;

a first heating means disposed in said storage bin for maintaining the aggregate at a temperature of from about 70° F to about 250° F;

a second heating means disposed in said first tank for maintaining the liquid asphalt cement at a temperature of from about 100° F to about 195° F;

mixing means attached to said frame including a plurality of mixer elements;

delivery means having a length disposed to receive the aggregate fed from said storage bin and discharge the same into said mixing means;

pump means coupled to said first tank for discharging the liquid asphalt cement from said first tank into said mixing means; and

a spreading means connected to said frame and disposed below said mixing onto a road surface;

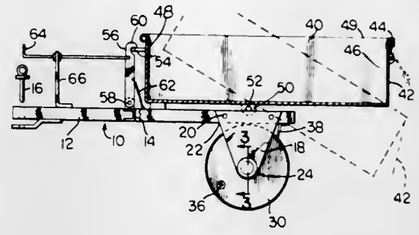
said mixing means includes at least three mixing elements aligned perpendicularly to said longitudinal axis of said frame, each of said mixing elements being operatively associated with another, the first mixing element comprising a first shaft having a longitudinal center, and a plurality of first mixing blades in spaced apart relationship on said first shaft, said mixing blades being disposed on said first shaft to direct the materials being mixed towards the longitudinal center of said first shaft, the second mixing element comprising a second shaft aligned parallel to and on the same horizontal plane as said first shaft having a longitudinal center and opposite ends, said centers of said first and second shafts being aligned along the longitudinal axis of said frame, a plurality of second mixing blades disposed on said second shaft in spaced apart relationship and aligned on said second shaft to direct the materials being mixed towards the ends of said second shaft, the third mixing element comprising an auger-conveyor aligned parallel to and directly below said second mixing element having opposite ends and a longitudinal center, said auger--conveyor being arranged to direct the materials being mixed from the ends thereof towards the longitudinal center thereof, and drive means for rotationally driving said mixing elements.

4,072,436

IMPLEMENT, ESPECIALLY FOR LAWN WORK

Bobby G. Wolf, R.R. No. 2, Box 59, Lafontaine, Ind. 46940

Filed Dec. 9, 1976, Ser. No. 749,169
Int. Cl.[2] E01C *19/26*
U.S. Cl. 404—122 **8 Claims**



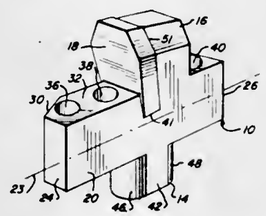
1. An implement for use in lawn work comprising: a generally horizontal frame having forward and rear ends, a hitch on said forward end, a cylindrical roller rotatably connected to said frame toward said rear end thereof and having an axis of rotation extending transversely of said frame, an upwardly opening cargo body having a forward end and an open rear end, said body being tiltably mounted on said frame above said roller, said roller being positioned beneath the center portion of the length of said body and being substantially the sole ground support for said body, and gate means pivotally connected to said body for opening and closing said rear end thereof.

4,072,437

REMOVABLE CUTTER TOOTH

Garland Y. Smith, Hinsdale; Gerald R. Scott, Elmhurst; George A. Blazek, Woodridge, and John L. Kowalski, Downers Grove, all of Ill., assignors to Garland Smith Engineering Co., Inc., Hinsdale, Ill.

Filed June 24, 1976, Ser. No. 699,427
Int. Cl.[2] B26D *1/00, 1/12;* B23B *41/02*
U.S. Cl. 407—118 **6 Claims**



1. A removable tooth for use with a cylindrical tooth carrier for cutting a coupon comprising: a substantially rectangular base having a pair of parallel faces, a plurality of midpoints between said parallel faces defining a central longitudinal axis, a first relief and a second relief formed integral with one face of said pair of parallel faces, each of said reliefs being positioned at an acute angle to said central longitudinal axis; a thrust pin formed integral with the substantially rectangular base at a third face of said substantially rectangular base and being adapted to engage a first portion of a cylindrical tooth carrier; an upstanding rib formed integral with a fourth face of the substantially rectangular base; a cutting insert connected to the substantially rectangular base and to the upstanding rib, said cutting insert being adapted to engage cuttingly a surface to be machined; and a plurality of apertures, each aperture being adapted to receive a machine screw, said plurality of apertures being positioned in said substantially rectangular base

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4,072,438

INSERT TYPE DRILL AND INSERT THEREFOR

Thomas R. Powers, Rogers, Ark., assignor to TRW Inc., Cleveland, Ohio

Filed July 26, 1976, Ser. No. 708,836
Int. Cl.[2] B23B *29/03;* B26D *1/00, 1/12*
U.S. Cl. 408—59 **13 Claims**



1. A drill useful for performing a variety of metal removal operations comprising:

an elongated, generally cylindrical body having a longitudinal axis and terminating in first and second axially opposed ends;

a slot extending from said first end a substantial distance axially along said body, said slot having a generally v-shaped cross-section in planes perpendicular to said axis and having a radial depth greater than the radius of the body;

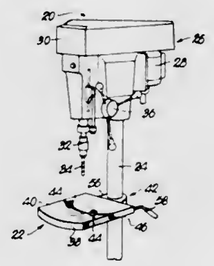
a hard cutting indexable insert mounted in said slot at the end thereof adjacent said first end of said body, said insert including first and second intersecting faces which define a continuous cutting edge that extends from the axis of said body to a point slightly beyond the radial extent of said body, all points along said cutting edge being axially outwardly of the first end of said body with the radially inner end of said cutting edge being located axially inwardly of its radially outer end to provide the drill with a negative lead, and the first face being positioned to provide the cutting edge with effective neutral rake.

4,072,439

SAFETY GROOVE DRILL PRESS AND ATTACHMENTS

Richard E. Diggs, P.O. Box 776, Carthage, Mo. 64836

Filed May 18, 1976, Ser. No. 687,523
Int. Cl.[2] B23B *39/00;* B23D *7/08*
U.S. Cl. 408—90 **8 Claims**



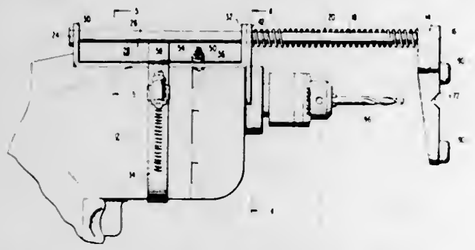
1. In a drill press having a work-supporting table and a powered cutter above the table reciprocable toward and away from the latter, said table and said cutter being relatively swingable in an arcuate path of travel intersecting the reciprocative path of the cutter, the improvement including:

structure on said table defining a continuous, arcuate, recessed groove in the surface of the table, said groove facing the cutter and being disposed directly below the latter,

said groove extending parallel to the path of relative movement between said table and said cutter,
said structure including a protector strip facing said cutter and defining the bottom of said groove,
said strip being comprised of material which is harder than said cutter whereby to prevent damage to said structure when the latter comes in contact with said cutter.

4,072,440
GUIDE ATTACHMENT FOR PORTABLE POWER DRILLS

Robert L. Glover, P.O. Box 335, Ash Fork, Ariz. 86320
Filed Mar. 11, 1977, Ser. No. 776,713
Int. Cl.² B23B *45/14*
U.S. Cl. 408—112 **12 Claims**

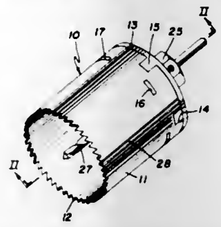


1. In a universal drill guide assembly for use with hand-held power drills, comprising, in combination,
a base having a pair of parallel laterally spaced guide rods projecting from one surface thereof,
a drill support assembly adapted to be releasably mounted on a drill housing, such drill support assembly being moveably mounted on the guide rods to support the drill for movement toward and away from the base,
spring means normally urging the drill support assembly away from the base,
the base including a plate member having a central opening therethrough through which the bit of a drill may pass when the drill guide is mounted on a drill, the plate member having a flat surface on the side opposite the guide rods and extending perpendicular to the axis of the guide rods, a plurality of bores formed in the base from the flat surface, the bores being disposed in a predetermined pattern relative to the opening and to the axis of the guide rods,
and a plurality of feet mounted one in each of at least selected ones of the bores and projecting outwardly from the flat surface, each of the feet including mounting means adapted to be releasably retained in one of the bores and a generally cylindrical body portion projecting outwardly from the flat surface, the body portions being of substantially equal length and diameter, whereby the feet may be arranged in predetermined patterns on the flat surface to adapt the guide for different drilling operations.

4,072,441
HOLE SAW

Gabriel M. LaPointe, Worcester, Mass., assignor to Parker Manufacturing Company, Worcester, Mass.
Filed Apr. 15, 1976, Ser. No. 677,381
Int. Cl.² B23B *51/04*
U.S. Cl. 408—204 **4 Claims**

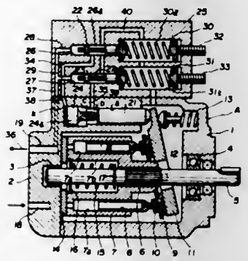
1. Hole saw, comprising:
a. a hardened metal tube having teeth formed at one end edge,
b. a cap formed of a tough polymer fitted to the other end of the tube, and
c. means locking the cap and the tube together in driving relationship, the means consisting of axially-extending notches formed on the said other end of the tube and torque lugs laterally formed on the cap to fit snugly in the notches, apertures being formed on the tube adjacent the



said other end and resilient detent fingers being formed on the cap to snap into the apertures to prevent relative axial movement between the tube and cap.

4,072,442
VARIABLE DELIVERY HYDRAULIC PUMP

Takeshi Horiuchi, 9-305, Lot 8, Hiratadai, Ibaraki, Osaka, Japan
Filed June 29, 1976, Ser. No. 700,953
Claims priority, application Japan, July 4, 1975, 50-82871; Mar. 15, 1976, 51-28458; Apr. 6, 1976, 51-38904
Int. Cl.² F04B *1/26*
U.S. Cl. 417—218 **11 Claims**

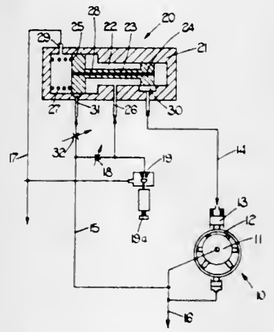


1. In a variable delivery hydraulic pump including a housing having a suction and a discharge conduit, a variable control element movable between maximum and minimum displacement positions corresponding, respectively, to a maximum and a minimum fluid discharge amount, a pumping means associated with said variable control element and controlled thereby to vary the fluid discharge amount of said pumping means between said maximum and minimum amount, the improvement comprising:
a biasing means for constantly urging said variable control element toward said maximum displacement position, a bore, a pilot plunger and a control plunger slidably disposed in said bore with one end of said control plunger in operative engagement with said variable control element for adjusting said displacement position thereof from said maximum to said minimum against the urging of said biasing means, said pilot plunger being slidable with one end thereof in engagement with the other end of said control plunger through a stroke distance to thereby move, engaged with said control plunger, said variable control element from said maximum displacement position to an intermediate displacement position between said maximum and minimum positions, to vary said fluid discharge amount from said maximum amount to a medium amount, said control plunger being slidable through a stroke distance to move said variable control element from said intermediate displacement position to said minimum displacement position to vary said fluid discharge amount from said medium amount to said minimum amount,
means for controlling the sliding movement of said pilot and

control plungers including first and second spool valves each disposed for axial movement in a spool chamber, each spool chamber having one end thereof in fluid communication with said discharge conduit of said pumping means, so that said spool valves will be exposed to the fluid discharge pressure of said pumping means, first and second push members disposed at the other ends of said first and second spool chambers for engaging the ends, respectively, of said first and second spool valves for urging said spool valves against the fluid discharge pressure from said discharge conduit, said first and second push members exerting different biasing forces on said respective spool valves so that said spool valves will each be caused to move against said respective push members in response to different fluid discharge pressures, a first control conduit for establishing fluid communication from a point intermediate the said ends of said first spool chamber, and thereby from said discharge conduit when said first spool valve is moved past said point towards its said other end, to the other end of said pilot plunger in said bore when said fluid discharge pressure exceeds a medium level to overcome the biasing force of said first push member, a second control conduit for establishing fluid communication from a point intermediate the said ends of said second spool chamber, and thereby from said discharge conduit when said second spool valve is moved past said point in said second spool chamber toward its said other end, to a point in said bore between said pilot and control plungers when said fluid discharge pressure exceeds a maximum level to overcome the biasing force of said second push member, the biasing force of said first and second push members being such that said spool valves will be moved thereby to close off said first and second control conduits from said fluid discharge conduit when said fluid discharge pressure is lower than said medium level whereby said biasing means will move said variable control element to its said maximum displacement position to cause said pumping means to discharge said maximum amount of fluid.

4,072,443
CONTROL VALVE ARRANGEMENTS FOR VARIABLE STROKE PUMPS

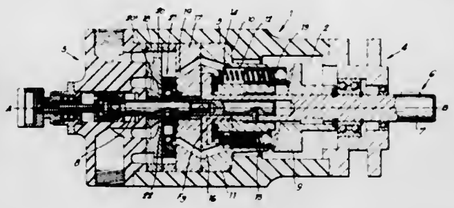
Ronald Alfred Heath, Birmingham, England, assignor to Lucas Industries Limited, Birmingham, England
Filed Sept. 22, 1976, Ser. No. 725,435
Claims priority, application United Kingdom, Oct. 4, 1975, 40705/75
Int. Cl.² F04B *49/08*
U.S. Cl. 417—218 **5 Claims**



1. A control valve arrangement for a variable-stroke positive displacement pump which includes a stroke-varying device operated by a servo pressure, said control valve arrangement comprising a body having a bore, a spool control element slidable in said bore, first and second inlets communicating with said bore, means for applying to said first inlet an operating pressure derived from the outlet pressure of said pump, means for connecting said second inlet to the outlet of said pump, said operating pressure urging said control element in a first direction, means biasing said control element in a second direction against said operating pressure, a first outlet for connecting said bore to a low pressure, a second outlet communicating with said bore, said control element being operable to derive said servo pressure at said second outlet from the pressures at said first inlet and said first outlet, movement of said control element in said first direction acting to vary the servo pressure at said second outlet in a sense to reduce the stroke of said pump, and means for reducing the pressure at said first inlet, said spool control element including means responsive to movement of said control element by more than a predetermined amount in said second direction for interconnecting said second inlet and said first outlet.

4,072,444
AXIAL PISTON PUMPS

Georges J. Kaiser, Chenee, Belgium, assignor to Fabrique Nationale Herstal S.A., Herstal-lez-Liege, Belgium
Filed May 24, 1976, Ser. No. 689,464
Claims priority, application Belgium, May 30, 1975, 254376
Int. Cl.² F04B *1/14*
U.S. Cl. 417—269 **3 Claims**



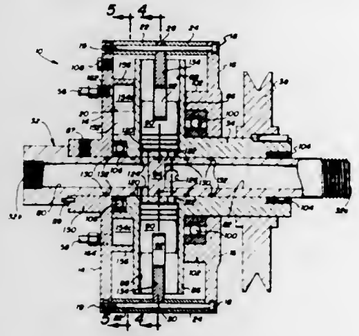
1. In an axial piston pump which includes a shaft, at least a plurality of annularly distributed pistons housed in cylinders of a fixed block and in permanent contact with an inclined plate fixed to the pump shaft, an annular rotatable valve mounted on an eccentric fixed to said shaft, inlet and outlet means in the block for the cylinders and means for ensuring an axial hydrostatical compensation, the improvement wherein said means comprise, for each piston housing, a pocket provided in said block and an axially movable bobbin housed in said pocket; and additionally comprising a continuous annular flange carried by said shaft of the pump and forming with each said bobbin a respective balancing recess, said pockets and said bobbins facing said annular flange carried by said shaft of the pump with said bobbins when sliding being in contact with a continuous surface of said flange, said recesses being formed exclusively by said bobbins and said continuous annular flange.

4,072,445
ROTARY GAS PRESSURE ENGINE SYSTEM

Johnny L. Hay, 1001 Willow Ridge Road, Fort Worth, Tex. 76103
Filed July 26, 1976, Ser. No. 708,895
Int. Cl.² F04B *17/00, 35/00*; F01B *13/06*
U.S. Cl. 417—379 **15 Claims**

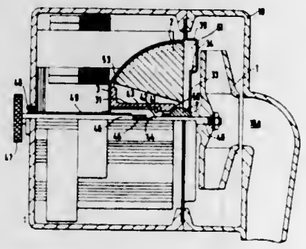
1. A rotary gas pressure engine comprising:
a housing;
a stationary shaft extending through said housing;
a circular cylinder block rotatably mounted on said stationary shaft;
said cylinder block including a plurality of radial piston cylinders formed therein;
said housing including a circumferentially mounted cam ring having generally elliptical risers around its inner periphery;

a plurality of pistons mounted for slidable movement within said piston cylinders and including means for bearing against said cam ring;
drive means connected to said cylinder block and extending external of said housing for driving a power take-off;



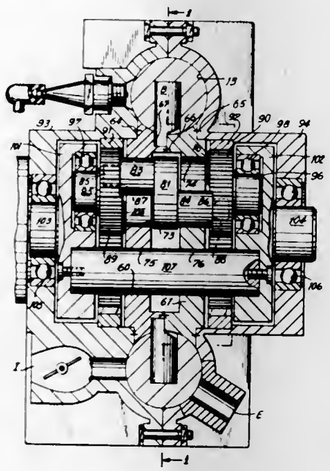
a gas generator for supplying gas to said cylinder block to cause movement of said pistons and rotation of said cylinder block; and
means within said housing and rotatably with said cylinder block for pumping fluid to said gas generator.

4,072,446
ELECTROMAGNETICALLY DRIVEN PUMPS
Alan John Walker, Dornoch, Scotland, assignor to R. E. Dupont Research and Investment Services Limited, Isle of Man, United Kingdom
Filed Feb. 24, 1976, Ser. No. 661,038
Claims priority, application United Kingdom, Jan. 20, 1976, 2150/76
Int. Cl.² F04B *17/00*
U.S. Cl. 417—420 **8 Claims**



1. An electromagnetically driven pump comprising:
a casing adapted to house a rotatable unit comprised by an impeller and an armature and having a fluid-inlet opening to lead fluid into the casing to the impeller in a direction parallel to the impeller axis of rotation;
a stator having a frusto-spherical magnetically effective surface complementary to that of the armature and spaced therefrom to form an air gap;
frusto-spherical bearing means for said rotatable unit said means having its convex part rotatable with the said unit and its concave part non-rotatably mounted;
a fluid-tight wall of frusto-spherical formation and of magnetically permeable material fixedly located in the air gap between the armature and the stator; and
an annular second wall extending generally radially between the impeller and the armature, said second wall comprising an outer annular portion and an inner rotary frictional seal means arranged to be operative between said second wall outer portion and said rotatable unit and to be resiliently urged in a direction parallel to the axis of rotation of the machine and to allow appreciable precessional freedom of motion of the axis of rotation of the rotatable unit about the geometric centre of the frusto-spherical bearing means, said seal means comprising an annular resilient portion of which the inner margin bears frictionally upon and in sealing contact with the convex part of said bearing means upon which said margin additionally exerts thrust upon said convex part in a direction parallel to the axis of rotation thereof;
the stator, rotatable unit, bearing and seal means all being constructed and assembled so that in their spherical relationship they are concentric.

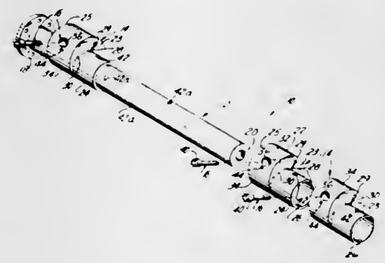
4,072,447
ALTERNATING PISTON ROTARY APPARATUS
Peter Gaspar, 1567 Parker Ave., Fort Lee, N.J. 07024
Continuation-in-part of Ser. No. 375,706, July 2, 1973, abandoned. This application Mar. 8, 1976, Ser. No. 664,513
Int. Cl.² F01C *1/00*; F04C *17/00*; F02B *55/14*
U.S. Cl. 418—36 **15 Claims**



1. Rotary apparatus having a casing shaped to form generally a toroidal hollow annular chamber therein, said casing having an opening into said chamber which is circularly continuous about the central axis of the torus, inlet and exhaust means through the structure that defines the toroidal chamber and communicating with that chamber, said apparatus also having two generally wheel-like and generally figure of revolution shaped piston carrier members, which are mounted rotatably with their axes at the central axis of the torus, said piston carriers each having a flange-like generally continuous peripheral portion, exactly two pistons on each piston carrier and carried by a flange portion of each of said two piston carriers and fitting within the toroidal chamber in alternating occurrence about the toroid as respects which piston carrier each piston is carried by, a flange-like portion of each of said piston carriers serving to close at least in part the circularly continuous opening in the toroidal chamber that was left by the casing, a generally radial slot opening through an intermediate portion of at least a first piston carrier, a crankshaft extending through said slot, a crankpin of said crankshaft located in said slot, and said crankshaft extending into a portion of the second piston carrier, a ring gear with inwardly facing teeth fixed to the casing concentric with the central axis, a gear wheel operatively connected to said crankshaft and having a pitch diameter one half of the ring gear's and mounted within the ring gear and meshing with it and having its teeth sweep through the central axis, leaving a crescent shaped empty space between the ring gear and the gear wheel that has half its diameter, a

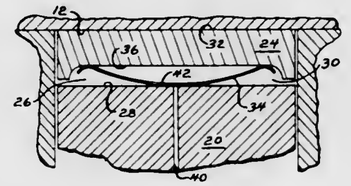
rotary header member to that side of the ring gear which is farther from the first piston carrier, said rotary header member being journaled for rotation about the central axis and having secured in it the crankshaft's axial journal, whereby this rotary header member rotates at the same rate as the revolutions of the crankshaft bodily (as distinguished from the crankshaft's rotations), a functionally similar rotary header member being provided beyond the ring gear, to the opposite side from the first mentioned header member and mounted for rotation about the central axis, said rotary apparatus also including at least one other member that passes through the crescent-shaped open space and secures the two opposite header members to each other, for firmly securing the two headers against relative motion or looseness of either with respect to the other, the headers and connected parts that rotate with the constituting a drum assembly.

4,072,448
BUILT-UP MAINSHAFT FOR MULTI-UNIT ROTARY MECHANISMS AND METHOD OF MANUFACTURE THEREOF
Robert W. Loyd, Jr., Wyckoff, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.
Filed May 7, 1976, Ser. No. 684,256
Int. Cl.² F01C *1/02*; G05G *5/16*; F16D *1/08*; F01L *1/34*
U.S. Cl. 418—60 **6 Claims**



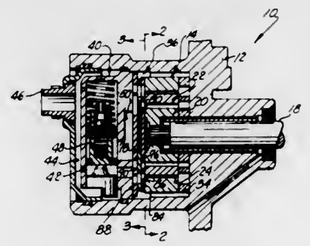
1. A built-up mainshaft for a multi-unit rotary mechanism comprising:
a. an elongated shaft element of substantially uniform outside dimensions for substantially the entire length thereof;
b. a plurality of eccentric elements;
c. each eccentric element comprises:
c-1. a relatively rigid, generally cylindrical body portion for supporting a rotor;
c-2. a sleeve-like portion integral with the cylindrical body portion and extending with its axis parallel and radially offset from the axis of the cylindrical body portion;
c-3. a bore extending through the sleeve-like portion and cylindrical body portion and of a cross-sectional size and shape to receive therethrough said shaft element;
c-4. a slot in said cylindrical body portion and in the sleeve-like portion extending in a plane containing the longitudinal axis of said bore the full length of the cylindrical body portion and into the sleeve-like portion and radially to a point short of the outer periphery of the cylindrical portion;
c-5. scoring means in said sleeve-like portion adjacent the cylindrical body portion and extending in a plane normal to the plane containing the longitudinal axis of the bore and communicating with said slot; and
d. a clamping means for each eccentric element coacting with the said slot and scoring means to effect deformation of the cylindrical body portion and thereby cause the cylindrical body portion to embrace said shaft element in torque transmitting relationship.

4,072,449
COMBINED SEAL BIASING SPRING AND CHECK VALVE FOR ROTARY MECHANISMS
Paul J. Staebler, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Mar. 12, 1976, Ser. No. 666,521
Int. Cl.² F01C *19/04, 21/04*; F04C *27/00, 29/02*
U.S. Cl. 418—87 **5 Claims**



1. A rotary mechanism comprising:
a housing defining an operating chamber;
a rotor journalled within said chamber;
at least one seal receiving groove in said rotor;
a seal within said groove;
spring means within said groove and urging said seal into sealing engagement with said housing;
a source of oil under pressure;
an oil conduit in fluid communication with said source and ending in an opening in said groove beneath said spring means and positioned to be closed by said spring means; and
means whereby oil is directed to said conduit in pressurized pulses;
whereby said spring means additionally serves as a check valve opening to permit oil to enter said groove when oil under pressure is directed to said conduit and preventing pressurized gas from entering said conduit from said chamber.

4,072,450
PUMP ASSEMBLY
Robert E. Carlson, Livonia, Mich., assignor to TRW Inc., Cleveland, Ohio
Filed Jan. 12, 1976, Ser. No. 648,474
Int. Cl.² F04C *15/00*
U.S. Cl. 418—133 **14 Claims**



2. A pump assembly comprising a body member having a bore which at least partially defines a pumping chamber, a rotatable rotor disposed in said pumping chamber, said rotor cooperating with said bore to form two separate working areas, and pressure plate means for at least partially defining a pair of inlet ports through which fluid flows into said working areas during rotation of said rotor in said pumping chamber and a pair of outlet ports through which fluid flows from said working areas during rotation of said rotor in said pumping chamber, said pressure plate means including a plurality of plate sections having major and minor side surfaces and which cooperate to at least partially define said pairs of inlet and

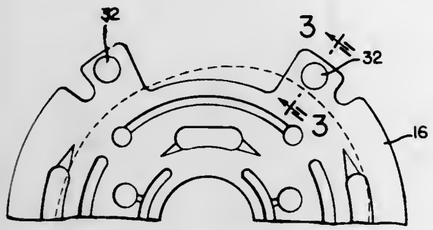
outlet ports, said plurality of plate sections includes a first plate section having an outer major side surface disposed in abutting engagement with said body member, a second plate section having inner and outer major side surfaces extending parallel to the outer major side surface of said first plate section, and an intermediate plate section disposed between said first and second plate sections, said intermediate plate section including surface means cooperating with an inner major side surface of at least one of said first and second plate sections to form a passage disposed between said first and second plate sections and interconnecting the ports of one of said pairs of ports, first joining means for fixedly joining a first major side surface of said intermediate plate section to an inner major side surface of said first plate section to prevent leakage of fluid between said first major side surface of said intermediate plate section and said inner major side surface of said first plate section, and second joining means fixedly joining a second major side surface of said intermediate plate section to said inner major side surface of said second plate section to prevent leakage of fluid between said second major side surface of said intermediate plate section and said inner side surface of said second plate section.

4,072,451

POWER TRANSMISSION

Albin Joseph Niemiec, Sterling Heights, Mich., assignor to Sperry Rand Corporation, Troy, Mich.

Filed Oct. 12, 1976, Ser. No. 731,277
Int. Cl.² F04C *29/00*
U.S. Cl. 418—178 **2 Claims**



1. A rotary sliding vane pump or motor having a body comprising a central cam ring having circular arcs of major and minor diameters alternately spaced around its inner cam surface and connected by ramps along which fluid displacement can occur, said body further comprising end covers, means forming inlet and outlet terminals connected respectively with the ramps, a slotted rotor within the cam ring and carrying radially slidable vanes to traverse the inner cam ring surface, one or more cheek plates interposed between one or both end covers and the rotor, the vanes, and the stationary cam ring, the cheek plate or plates having a wear face of bearing material abutting the rotor and vanes wherein the wear face is a layer of bearing material formed on a harder metal back, the back being deformed over discrete limited areas to provide wearresistent contacts with the cam ring, whereby the wear between the cheek plate and the cam ring as it radially expands and contracts under intermittent pressure loads is reduced.

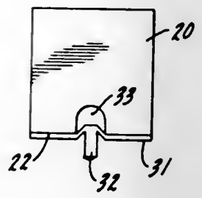
4,072,452

ROTARY COMPRESSOR VANE WITH BUILT-IN SPRING

Rajesh N. Sheth, Mt. Prospect, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed July 27, 1976, Ser. No. 709,065
Int. Cl.² F04C *29/00*; F16F *1/46*
U.S. Cl. 418—266 **3 Claims**

1. A rotary compressor of the type including a cylindrical rotor having a plurality of extensible vanes received in complementary vane slots, a vane, an elastomeric spring means fastened to the radially inner edge of said vane, and means for



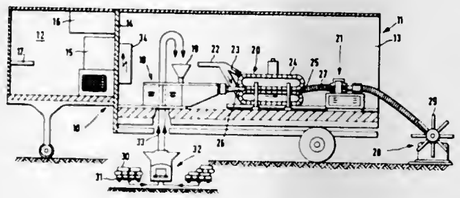
applying tensile stress to stretch said elastomeric spring means responsive to a radially inward movement of said vane.

4,072,453

PLANT FOR THE PRODUCTION OF TUBULAR OR HOSE-LIKE ARTICLES OF SYNTHETIC MATERIAL

Heinrich Oltmanns, Jeddeloh, and Klaus Volckmann, Bad Zwischenahn, both of Germany, assignors to Ziegelwerke Heinrich Oltmanns, Oldenburg, Germany

Filed Aug. 11, 1976, Ser. No. 713,337
Claims priority, application Germany, Aug. 21, 1975, 2537184
Int. Cl.² B29C *3/02*
U.S. Cl. 425—62 **11 Claims**



1. A mobile unit for the continuous production of plastic tubes, particularly corrugated tubes for draining purposes, comprising:

an elongated, wheeled, vehicular platform (**10**) having an enclosure (**11**) mounted thereon and enclosing same;

an extruder (**18**) for plastic material mounted on said platform;

a molding device (**20**) mounted on said platform, said molding device including a pair of rotatable loops (**24, 25**) of chainlike connected dies (**53**) abuttable along a common rectilinear portion located at the output of said extruder;

mold cooling means including cooling passages (**55-58**) in said dies having inlets and outlets (**59, 60**), a pair of loops of flexible cooling lines (**61,62**), one of said cooling lines being connected to said inlets and the other of said cooling lines being coupled to said outlets of said cooling passages, said pair of loops of cooling lines being rotatable with said loops of dies, and swivelable coupling means operatively associated with said rotatable cooling lines (**65**) for connecting said rotatable cooling lines to a stationary source of coolant (**50**);

a punching device (**21**) mounted on said platform at the output of said molding device for applying apertures to the extruded and molded tube; and

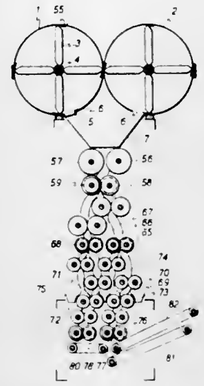
power supply means (**15**) energizing said extruder, said molding device, said mold cooling means, and said punching device.

4,072,454

AUTOMATIC NOODLE MACHINE

Ren Jen-Shuy, No. 227, Min Sheng District, Lu Chou Village, Taipei Hsien, China /Taiwan

Filed Apr. 28, 1975, Ser. No. 572,396
Int. Cl.² A21C *11/22*
U.S. Cl. 425—101 **5 Claims**



1. An automatic noodle machine comprising: two blenders in which the axis is horizontal and containing rotary blades secured to a shaft which are utilized for mixing the flour powder and water homogeneously by changeable rotary speed; outlets and related outlet closing means on said blenders for flowing out the blended flour paste into a funnel; means controlling said outlet closing means to open their respective outlets; first pressing roll set under said funnel for pressing said blended flour paste into the primary thick flour slice; first inserting cutter under said first pressing roll set for cutting said primary thick flour slice into many equal wide flour strips; a guide board close to the trough of said first inserting cutter separating said equal wide flour strips from said first inserting cutter; distributor under said first inserting cutter for distributing said equal wide flour strips into two courses to enter into second pressing roll set for to be thinned once more; second inserting cutters and their related guided boards under said second pressing roll set for cutting said flour strips which come from said second pressing roll set into many equal wide flour strips; distributors under said second inserting cutter for distributing one course of the flour strip which comes from said second inserting cutter into two courses again and entering them into third pressing roll sets which are set under said second inserting cutter; fourth pressing roll sets under said third pressing roll sets for piling up two courses of said flour strip which come from said third pressing roll sets into one course; dry flour powder container above said fourth pressing roll sets for releasing the dry flour powder onto the surface of said fourth pressing roll sets and thus the surface of said flour strips; fifth pressing roll sets under said fourth pressing roll sets for pressing the flour strips which come from said fourth pressing roll sets; third inserting cutter under said fifth pressing roll sets for cutting said flour strips which come from said fifth pressing roll sets into the noodles; belt conveyer for transporting said noodles out.

4,072,455

SPIRAL-LINE PRESS FOR THERMOPLASTIC SYNTHETICS

Erich Beck, Ingenieur, 652 Worms 27, Am See 29, Germany

Filed Oct. 21, 1975, Ser. No. 624,424
Claims priority, application Germany, Oct. 22, 1974, 2450030
Int. Cl.² B29F *3/06*
U.S. Cl. 425—133.1 **2 Claims**

1. A spiral-line press comprising:

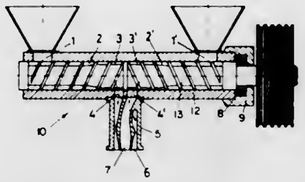
a support housing, a circularly driven shaft in said housing an axial bearing in said housing supporting said shaft, means provided so that said housing for the axial bearing is simplified and the space requirements can be reduced including;

said shaft defining first and second material conveying portions;

a first spiral conveyor on said shaft at said first material conveying portion;

a second spiral conveyor on said shaft at said second material conveying portion;

said first and second spirals are opposingly oriented on said



shaft for conveying material from opposite ends of said shaft along respectively corresponding portions;

said first and second spiral conveyors having respective length to diameter ratios of not more than 14:1;

said first and second spiral conveyors defining corresponding metering zones where conveyed material is output from said press, wherein said metering zones have a phase depth of not more than 1/25 of said corresponding spiral diameter; and

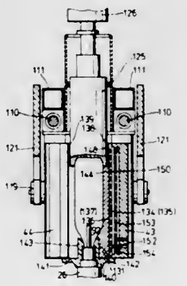
means connected to said shaft for driving said spirals along with said shaft at a peripheral speed of at least 0.3 m/sec.

4,072,456

APPARATUS FOR BLOW-MOLDING HOLLOW ARTICLES, IN PARTICULAR BOTTLES

Adolf Appel, Egestorf-Nordheide, and Wolfgang Reymann, Hamburg, both of Germany, assignors to Heidenreich & Harbeck Zweigniederlassung der Gildemeister AG, Hamburg, Germany

Filed Oct. 1, 1976, Ser. No. 728,826
Claims priority, application Germany, Oct. 8, 1975, 2545133
Int. Cl.² B29D *23/03*
U.S. Cl. 425—183 **5 Claims**



1. A blow mold for forming a bottle having a longitudinal axis, comprising a pair of openable and closable blow mold blocks having their confronting faces provided with generally semi-cylindrical recesses, a generally semi-cylindrical mold insert snugly fitting in each recess, the two inserts having their inner faces contoured to cooperably define the shape of the bottle to be blown, the confronting faces of said mold blocks having a series of axially spaced, circumferential grooves therein opening freely onto the adjacent mold insert, the grooves extending around the inner periphery on the confronting faces of the mold blocks and terminating adjacent each

mold block edge, sealing means interposed between each of said inserts and its adjacent block to seal the edges of each insert to its block, and axially extending fluid passages in said blocks communicating with said grooves for circulating a heat exchange fluid through said grooves.

4,072,457

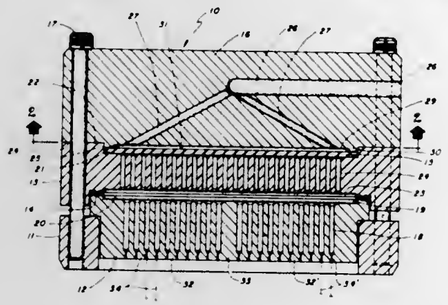
SPIN POT WITH IMPROVED TOP CAP

James Judson Cooksey, Colonial Heights, and Garland Linwood Turner, Chesterfield, both of Va., assignors to Allied Chemical Corporation, Morris Township, N.J.

Continuation-in-part of Ser. No. 612,389, Sept. 11, 1975, abandoned. This application Jan. 21, 1977, Ser. No. 760,880

Int. Cl.[2] D01D *3/00*

U.S. Cl. 425—192 S **11 Claims**



3. A top cap, for use in conjunction with a spin pack assembly for the extrusion of synthetic filaments, comprising:

A. a flow inlet passage, said flow inlet passage bringing molten polymer to an area the central axis of which substantially coincides with the central axis of said top cap; and

B. a plurality of substantially identical polymer delivery channels, said delivery channels communicating with said flow inlet passage at said area and branching radially therefrom at substantially equal intervals through said top cap to open at the lower surface of said top cap into a distribution space for said spin pack assembly, the cross-sectional area of each of said delivery channels remaining substantially uniform along its respective length, the number of said delivery channels being between three and 80 and the ratio of said number of said delivery channels to twice the distance in inches between said central axis and the inner edge of any one of said delivery channels at said lower surface of said top cap being between 1 to 2 and 3 to 1, said delivery channels opening in the peripheral 50% of said bottom surface which is disposed above the internal wetted area of said distribution space for said spin pack assembly, the sum of the cross-sectional areas of said delivery channels being substantially the same as the cross-sectional area of said flow inlet passage;

whereby molten polymer flows through said top cap under identical pressures and with identical residence times to be uniformly distributed into said distribution space where the flow of said molten polymer is substantially laminar.

4,072,458

MOULD CARRIER

Alfred Schlieckmann, Lindau, Germany, assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Oct. 17, 1975, Ser. No. 623,424

Claims priority, application Germany, Dec. 2, 1974, 2456949

Int. Cl.[2] B29C *1/16*

U.S. Cl. 425—451.6 **10 Claims**

1. A mould carrier for complementary mould halves of a mould particularly adapted for use in making polyurethane foam products, which comprises in combination

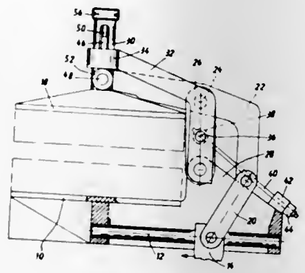
a mould carrier frame;

lower and upper platens respectively supporting said complementary mould halves on said frame and pivotal mounting means on said frame for at least one of said platens to permit movement thereof between a mould closed position wherein said platens are disposed in parallel relation, and a mould open position wherein said platens are disposed substantially 90° to each other;

an actuating member mounted on said frame for reciprocal linear movement; and

a compound lever system connected between said actuating member and said pivotally mounted platen to move said platen between mould open and mould closed positions in response to reciprocal movement of said actuating member, said compound lever system comprising:

(a) a two-armed main lever and an intermediate link, said link being pivotally connected at one of its ends to said main lever intermediate the ends of the latter, the other end of said link being pivotally connected to said frame whereby said main lever is supported on said frame to permit its articulation about one or more pivot points;



(b) a toggle lever connecting a first arm of said main lever to said actuating member;

(c) a guide pin secured to the upper face of said pivotally mounted platen, and trunnion means on said guide pin pivotally connecting and supporting said platen on the other arm of said main lever, and means for adjusting said trunnion means axially of said guide pin whereby to change the pivot point of said main lever along said pin;

(d) a guide lever pivotally mounted at one of its ends to said frame coaxially with the pivotal connection of said intermediate link to said frame, said guide lever at its opposite end having a bushing which receives said guide pin to permit limited axial movement of said pin relative to said guide lever;

(e) said toggle lever being disposed, when said reciprocal actuating means is at its limiting position corresponding to mould closed position, to lock said main and guide levers against pivotal movement.

4,072,459

NOZZLE FOR A GRANULATING DEVICE FOR GRANULATING SYNTHETIC PLASTICS MATERIAL

Friedrich Lambertus, Stuttgart, Germany, assignor to Werner & Pfleiderer, Stuttgart, Germany

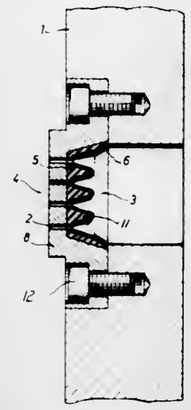
Filed Apr. 12, 1976, Ser. No. 676,219

Claims priority, application Germany, Apr. 19, 1975, 2517402

Int. Cl.[2] B29F *3/04*

U.S. Cl. 425—464 **7 Claims**

1. In a device for granulating synthetic plastics material while in flowable consistency comprising a nozzle including a plate having a plurality of bores cylindrical along their length and a recess leading to said bores, said nozzle plate having an inlet side and an outlet side, the improvement comprising insulation material on the inlet side of the nozzle plate adjacent thereto and extending over at least several of said bores for reducing heat loss as the material to be granulated is passing through said bores, said insulation material comprising a plurality of protrusions extending from the inlet side of the nozzle plate in axial direction into said recess, said protrusions tapering in narrowing fashion away from said inlet side and being rounded such that adjcent protrusions define therebetween a generally funnel-shaped extension of the respective nozzle bore thereby elongating the effective length of the bores, said nozzle having a space for receiving material to be fed to said



bores, said space opening into said recess and being common to said funnel-shaped extensions and in direct communication therewith such that the funnel-shaped extensions divide the flow of material to be granulated into several partial streams, and form-retaining coating means covering said insulation material at least on the areas defining said protrusions.

4,072,460

EMBOSSED PATTERNING OF ASBESTOS-CEMENT AND LIKE SHEETS
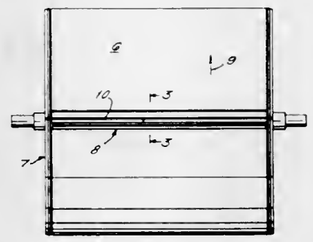
Warwick Henry Gazzard, St. Ives, and Roger Michael Kearin, Galston, both of Australia, assignors to James Hardie & Coy. Pty. Limited, Australia

Filed Nov. 6, 1975, Ser. No. 629,539

Claims priority, application Australia, Nov. 7, 1974, 9519/74

Int. Cl.[2] B29C *1/00*

U.S. Cl. 425—471 **2 Claims**



1. Apparatus for use in the production of sheets by successive laminations of a film of impressionable material with patterning in three-dimensional relief thereon, comprising:

(a) a rotatable size roll;

(b) a flexible mould layer having a surface patterned in three-dimensional relief circumferentially wrapped about said size roll with its patterned surface outward;

(c) circumferential lost motion connection means to secure the mould layer to the roll while permitting circumferential movement of the layer in relation to the roll and restraining radial movement therebetween comprising:

(1) a hinge for mounting the leading edge of the mould layer to the roll having one leaf attached to the mould layer and one leaf attached to the roll;

(2) an axially-directed keeper plate means mounted on said roll and engaging the trailing end of said mould layer to restrain said trailing end against radial movement but permit circumferential movement thereof;

(3) a pair of circumferentially directed keeper plates means mounted on said roll and respectively engaging the side edge margins of said mould layer to restrain said margins against radial movement away from the roll but permitting circumferential movement thereof.

4,072,461

APPARATUS FOR THE PRODUCTION OF LAMINATED BODIES PARTICULARLY, MULTILAYERED SHOE SOLES

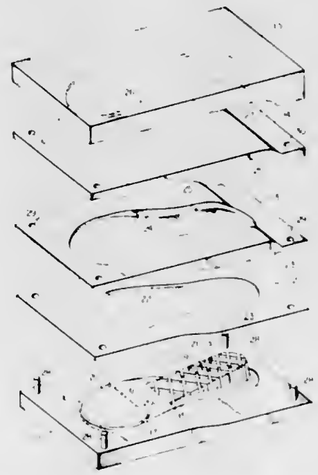
Harald Pirk, Breuberg, Germany, assignor to Metzeler Kautschuk AG, Munich, Germany

Division of Ser. No. 722,418, Sept. 13, 1976. This application Feb. 24, 1977, Ser. No. 771,736

Claims priority, application Germany, Sept. 11, 1975, 2540433

Int. Cl.[2] B29C *9/00, 11/00;* **B29H** *3/00*

U.S. Cl. 425—515 **7 Claims**



1. A vulcanization mold for producing a laminated article of at least three individual layers, the interfaces formed between the individual layers of the laminate being non-planer, wherein the mold comprises first and second outer mold plates, said first and second outer mold plates each having at least one mold cavity corresponding to the outer layers of the desired laminated article and each having a non-planar inner surface in which said at least one mold cavity is formed; a middle molding plate positioned between the first and second outer mold plates and movable in the direction of opening and closing of the mold and having an aperture corresponding to the middle layer of the desired laminate and having non-planar opposing surfaces corresponding to the inner surfaces of the first and second outer mold plates, respectively; and first and second intermediate plates, said first intermediate plate being removably positioned between the first outer mold plate and middle mold plate and said second intermediate plate being removably positioned between the second outer mold plate and the middle mold plate, each of said intermediate plates having a substantially uniform thickness and each having continuous non-planar surfaces, the surfaces of the first intermediate plate corresponding to the inner surface of the first outer mold plate and the surfaces of the second intermediate plate corresponding to the inner surface of the second outer mold plate; and wherein said molding plates and intermediate plates are arranged so as to be capable of forming a closed mold the mold cavities of which are aligned according to the alignment of the corresponding layers of the desired laminate.

4,072,462

TRANSFER PRINTING

Cyril Eric Vellins, and Leonard Fox Dixon, both of Huddersfield, England, assignors to L. B. Holliday & Company Limited, Huddersfield, England

Filed Nov. 8, 1974, Ser. No. 522,115

Claims priority, application United Kingdom, Nov. 12, 1973, 52493/73

Int. Cl.[2] D06P *5/06, 5/08, 5/10*

U.S. Cl. 8—2.5 A 16 Claims

1. A method of transfer printing in which printing is effected by transfer from a paper support web printed with an ink formulation containing at least one sublimable dyestuff suitable for transfer printing and having one or more amino, hydroxy or hydroxyalkylamino first reactant groups in the dyestuff molecule, or any combination thereof, onto a textile fabric composed of a natural and/or synthetic cellulosic material alone or in a blend with at least one natural and/or synthetic non-cellulosic material, the textile fabric having thereon a curable resin which is at least partly uncured and contains one or more hydroxymethyl, alkoxymethyl or aldehyde second reactant groups capable of reaction with the first reactant groups of the dyestuff or dyestuffs, the transfer printing being effected at a sufficiently high temperature and for a sufficient period of time to effect both a sublimation transfer of the sublimable dyestuff to the textile fabric and either a curing or an end-curing of the resin with simultaneous reaction between said first and second reactant groups to fix the dyestuff onto the cellulosic or part cellulosic textile fabric.

4,072,463

LIQUID PREPARATIONS OF REACTIVE DYESTUFFS

Ludwig Schlafer, Fischbach, Taunus, and Konrad Opitz, Liederbach, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

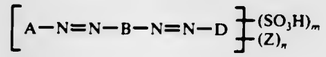
Filed Apr. 7, 1975, Ser. No. 565,737

Claims priority, application Germany, Apr. 9, 1974, 2417255

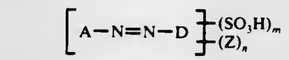
Int. Cl.[2] C09B *31/00;* D06P *1/38;* C09B *33/00*

U.S. Cl. 8—41 B 7 Claims

1. A liquid aqueous dyeing preparation of a reactive dyestuff which contains from 15 to 30% by weight of a dyestuff, which in the form of its free acid corresponds to the formula



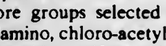
or the formula



in which A is a benzene or naphthalene nucleus which may contain 1, 2 or 3 substituents selected from the group consisting of fluorine, chlorine, bromine, lower alkyl, lower alkoxy, trifluoromethyl, acetylamino, benzoylamino, chloroacetylamino, methylbenzoylamino, chlorobenzoylamino, carboxy, lower alkylsulfonyl, lower alkylsulfonylamino, phenylsulfonylamino, carbonamide, N-alkyl- and N-phenyl-substituted carbonamide, sulfonamide, N-alkyl- and N-phenyl-substituted sulfonamide,

B is a naphthalene nucleus which may be substituted by one or more groups selected from the group consisting of acetylamino, chloro-acetylamino, benzoylamino, carboxy, carbonamide, sulfonamide, lower alkyl-sulfonylamino, phenylsulfonylamino, lower alkylsulfonyl, phenylsulfonyl, hydroxy, amino, lower alkylamino and phenylamino in ortho position to one or to both azo groups,

D has the same meaning as B or is a pyrazol-4-yl-radical which is substituted in 3-position by a methyl, carboxy, carbonamide or carboxylic acid alkyl ester group having from 2 to 5 carbon atoms, and which carries in 5-position a hydroxy or an amino group, and which contains in 1-position a bound phenyl radical or naphthyl radical, which may be substituted by 1, 2 or 3 substituents selected from the group consisting of acetylamino, benzoylamino, lower alkyl, lower alkoxy, carboxy, carbonamide, sulfonamide, nitro, chlorine and bromine and in which the sulfo groups and the reactive radical(s) Z stand at the aromatic radicals of A, B or D, *m* is 2, 3, 4, 5 or 6, and *n* is 1 or 2, or of the copper, chromium or cobalt complex dyestuffs of a dyestuff which corresponds, in its metal-free form, to one of the above-mentioned formulas, in which A, B and C have the meanings specified above, and wherein the carbocyclic aromatic nuclei of the radicals A, B or D contain the radical of a hydroxy, amino or a carboxy group, to which the metal atom is linked, or of an anthraquinone or trisazo dyestuff or of a copper phthalocyanine dyestuff of the formula



wherein F is the dyestuff radical of an anthraquinone or a trisazo or a copper phthalocyanine dyestuff, and wherein Z is a fiber-reactive group selected from the group consisting of vinylsulfonyl, β-thiosulfato-ethylsulfonyl, β-phosphatoethylsulfonyl, β-chloro-ethylsulfonyl, β-sulfato-ethylsulfonyl, β-sulfato-ethylsulfonyl-N-(alkyl 1-4 C)-amido and vinylsulfonyl-N- (alkyl 1-4 C)-amido, *m* is 2, 3, 4, 5 or 6, and *n* is 1 or 2,

and which dyeing preparation contains from 1 to 5% by weight of a buffer substance that does not show any chemical reaction with the reactive group Z, and which is selected from the group consisting of sodium acetate, potassium acetate, sodium oxalate, potassium oxalate, acid sodium and potassium salts of phosphoric acid and secondary and tertiary sodium and potassium salts of phosphoric acid and sodium borate, and has a pH value in the range of from 3 to 7.

4,072,464

EPOXYPROPYL AMMONIUM SALT AND BORIC ACID ASSISTED DYEING PROCESS

Jean Balland, Chateaurenault, France, assignor to Manufacture de Produits Chimiques Protex, Paris, France

Filed Mar. 1, 1976, Ser. No. 662,913

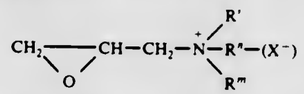
Claims priority, application France, Mar. 4, 1975, 75 07325

Int. Cl.[2] D06P *1/68*

U.S. Cl. 8—84 6 Claims

1. In a process for the treatment of textile material to improve the dyeing or printing thereof, the improvement which comprises the steps of:

a. applying to said textile material an epoxypropylammonium salt having the formula:



in which R′, R″, R‴ are lower alkyl radicals and X− is an anion selected from the group which consists of sulfate, sulfonate, phosphate and halogenide;

b. fixing the salt upon the textile material at least in part at an elevated temperature; and

c. treating the textile material prior to the application of said elevated temperature thereto with boric acid in an amount sufficient to avoid all yellowing of the fibers of said material and to prevent any detrimental action of urea at the elevated temperature.

4,072,465

DYEING POLYESTER FIBERS

Manfred Daeuble, Frankenthal, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Aug. 11, 1975, Ser. No. 603,443
Claims priority, application Germany, Sept. 14, 1974, 2444102
Int. Cl.² D06P 5/04
U.S. Cl. 8—169 10 Claims

1. In a process for dyeing polyester fibers with a disperse dye under pressure and at a temperature above 100° C. in an aqueous liquor containing anionic and nonionic surface active agents as an emulsifier, the improvement which comprises carrying out the dyeing such that 1000 parts by weight of said aqueous liquor contain as the leveling agent from 0.3 to 3 parts by weight of an aliphatic compound selected from the group consisting of esters, nitriles and ketones having from 7 to 16 carbon atoms.

4,072,466

CELLULOSIC TEXTILE TREATED WITH LOW FORMALDEHYDE FULLY ETHERIFIED METHYLOLATED MELAMINE WITH UREA-FORMALDEHYDE-GLYOXAL

David Trimble Hermann, Belle Mead, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 504,407, Sept. 9, 1974, Pat. No. 4,039,496.
This application Mar. 25, 1977, Ser. No. 781,230
Int. Cl.² D06M 15/58
U.S. Cl. 8—183 6 Claims

1. A process for finishing cellulose-containing textile materials comprising

impregnating the materials with an aqueous solution containing an acid catalyst and a water-soluble textile finishing composition prepared by

reacting relative amounts of about 1.0 mole of melamine and from about 9.5 to 11.5 moles of formaldehyde at a pH of about 6.0 to 6.5 and a temperature of about 60° C. to 75° C., while concentrating under vacuum to form a reaction mixture of substantially fully methlolated melamine and formaldehyde,

recovering from about 30 to 35% by weight of the reaction mixture as distillate over a period of about 2 ½ to 3 hours,

etherifying the reaction mixture by reacting it in highly acidified alcohol at slighly elevated temperatures to obtain a mixture of substantially fully alkoxymethylated melamine resin and formaldehyde,

reacting the mixture of substantially fully alkoxymethylated melamine and formaldehyde with from about 1.65 to 3.3 moles of urea per mole of melamine and from about 0.1 to 0.5 mole of glyoxal per mole of urea at a pH of about 6.0 to 6.5 and a temperature of 60° to 75° C. under vacuum over a period of about 1 to 2 hours to recover an amount of distillate which ranges from about 15 to 20% based on the total weight of the reaction mixture,

reacting the mixture at a temperature of about 60° C. to 75° C. under atmospheric pressure for a period of about 2 to 3 hours to achieve a free formaldehyde content from about 0.75 to 3.5% and a solids content of from about 65% to 75% by weight of the mixture,

cooling the reaction mixture to ambient temperatures,

adding an acid-binding agent to make the mixture moderately alkaline, and

diluting the mixture with water to obtain suitable free formaldehyde and solids content,

drying the impregnated textile material, and

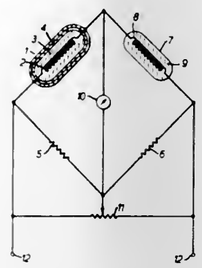
curing the dried textile material at a temperature from 325° to 350° F. for a period of 1 to 2 ½ minutes to obtain 2% to 10% of solids thereon based on the weight of the textile material.

4,072,467

COMBUSTIBLE GAS DETECTORS

Eric Jones, Chelmsford, England, assignor to English Electric Valve Co., Ltd., England

Filed Oct. 15, 1976, Ser. No. 732,861
Claims priority, application United Kingdom, June 18, 1976, 25464/76
Int. Cl.² G01N 27/16
U.S. Cl. 23—254 E 9 Claims



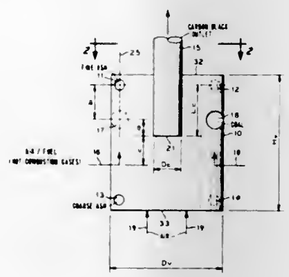
1. A gas detector of the kind in which a heatable wire filament exhibits a change in resistance occasioned by the change in its temperature which occurs due to the oxidisation of a combustible gas passing over it and wherein said heatable wire filament is embedded in a pellet consisting of a homogeneous mixture of an oxidisation catalyst material and a substantially non catalytic carrier material and a layer of oxidisation catalyst material is provided on the outside of said homogeneous pellet.

4,072,468

APPARATUS FOR THE PRODUCTION OF CARBON BLACK FROM COAL

Paul J. Cheng, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 583,317, June 2, 1975, Pat. No. 3,975,504, which is a continuation-in-part of Ser. No. 393,492, Aug. 31, 1973, abandoned. This application June 3, 1976, Ser. No. 692,623
Int. Cl.² C09C 1/50; B23C 5/18
U.S. Cl. 23—259.5 3 Claims



1. A carbon black reactor comprising:

a. a vertically positioned essentially cylindrically shaped chamber closed by an upper wall and a lower wall;

b. means for removal of smoke opening axially from said chamber through the upper wall and having a lower extremity extending downward into said chamber;

c. means for tangential introduction of coal through the periphery of said chamber above said lower extremity of said means for smoke removal said means for tangential introduction alligned to establish a mass of solids reactants helically flowing around the cylindrical chamber in one direction;

d. means for removing fine ash tangentially from said chamber proximate to the upper wall of said chamber said means for removing fine ash alligned to receive said fine ash tangentially in the direction of flow of the mass flowing helically around the cylindrical chamber;

e. means for introducing oxidant extending radially through the periphery of said chamber and opening axially upwardly into said chamber at a locus beneath said lower extremity of said means for smoke removal;

f. means for the introduction of fuel gas radially through the periphery of the chamber and opening axially upwardly into said chamber, said means being located so that the fuel and the oxidant form a combustible mixture;

g. means for the tangential withdrawal of coarse ash through the periphery of said chamber proximate to the lower wall said means for removing coarse ash alligned to said coarse ash tangentiallly in the direction of flow of the mass flowing helically around the cylindrical chamber, and

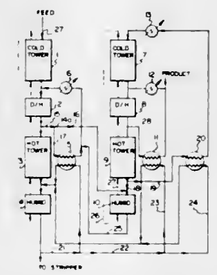
h. means for the axial introduction of secondary oxidant into said chamber through said lower wall.

4,072,469

INTERCONNECTION ARRANGEMENT FOR A DUAL TEMPERATURE ISOTOPE EXCHANGE

Gerard J. C. A. Pauluis, Brussels, Belgium, assignor to Atomic Energy of Canada Limited, Ottawa, Canada

Filed June 17, 1976, Ser. No. 697,221
Claims priority, application Canada, Sept. 9, 1975, 235094
Int. Cl.² B01D 59/33
U.S. Cl. 23—260 1 Claim



1. An interconnection arrangement for two stages of a dual temperature isotope exchange apparatus for production of water enriched in deuterium comprising:

a. a first stage including a cold tower, a dehumidifier, a hot tower, a humidifier, piping means for passing hydrogen sulphide gas through the humidifier, hot tower, dehumidifier, cold tower and recycling to the bottom of the humidifier, a liquid inlet feed to the top of the cold tower, and piping means for passing the liquid from the bottom of the cold tower through the dehumidifier, the hot tower, and the humidifier to a first stage output,

b. a second stage including a cold tower, a dehumidifier, a hot tower, a humidifier, piping means for passing hydrogen sulphide gas through the humidifier, hot tower, dehumidifier, cold tower and recycling to the bottom of the humidifier, a liquid inlet feed to the top of the cold tower, and piping means for passing the liquid from the bottom of the cold tower through the dehumidifier to a second stage output,

c. a first heat exchanger,

d. a second heat exchanger,

e. a third heat exchanger,

f. means for taking a minor proportion of the liquid from the first stage output, passing generally equal fractions of this through the said first, second and third heat exchangers in parallel, recombining the fractions and returning to the piping means at a location between first stage hot tower and humidifier,

g. means for taking a minor proportion of the liquid from the piping between first stage dehumidifier and hot tower, passing a major proportion of this through the first heat exchanger and returning to the top of the second stage humidifier,

h. means for taking a minor proportion of the liquid from the piping between second stage dehumidifier and hot tower, passing this through the second heat exchanger, returning a major proportion to the top of the second stage dehumidifier, and passing the remainder to an output as product,

i. means for passing the liquid from the second stage output to the top of the first stage dehumidifier, and

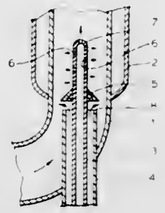
j. means for taking a minor porportion of the liquid from the bottom of the second stage hot tower, passing through the said third heat exchanger and returning to the top of the second stage cold tower as liquid inlet feed.

4,072,470

GAS FEEDER FOR SULFONATION APPARATUS

Keiichi Tsuto, Wakayama; Kanji Majima, Chiba, and Toshio Hirasaka, Yokohama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Mar. 23, 1977, Ser. No. 780,820
Claims priority, application Japan, Mar. 31, 1976, 51-39425[U]
Int. Cl.² C07C 143/02.16; B05B 7/06; B01J 4/00
U.S. Cl. 23—284 7 Claims

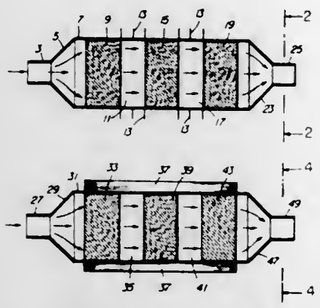


1. In a sulfonation apparatus in which a sulfonatable organic compound is flowed along the inner wall of a reaction tube in the form of a film and a gas containing SO_3 is flowed in the reaction tube in concurrent flow relationship with the organic compound for gas-liquid reactive contact therewith, the improvement which comprises: apparatus for feeding said gas comprising a pair of concentric gas-feeding tubes disposed concentrically in said reaction tube whereby a gas containing SO_3 can be flowed in the inner gas-feeding tube and an inert gas can be flowed in the annular clearance between the inner gas-feeding tube and the outer gas-feeding tube, the upper portion of the inner gas-feeding tube projecting above the upper end of the outer gas-feeding tube so that the upper end of the inner gas-feeding tube is disposed a preselected distance above the upper end of the outer gas-feeding tube, a baffle plate mounted on the upper projecting portion of the inner gas-feeding tube at a location close to, but spaced upwardly from, the upper end of the outer gas-feeding tube so that the inert gas is deflected outwardly to impinge against the inner wall of the reaction tube so that the sulfonatable organic compound does not become colored excessively by contact with SO_3-containing gas that flows through said inner gas-feeding tube.

4,072,471
CATALYTIC CONVERTER FOR REMOVING NOXIOUS COMPONENTS FROM A GASEOUS STREAM

Charles R. Morgan, Jr., Wenonah, and Paul W. Snyder, Jr., Pitman, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 28, 1974, Ser. No. 473,631
Int. Cl.[2] B01J *8/00*; F01N *3/15*
U.S. Cl. 23—288 FB 7 Claims

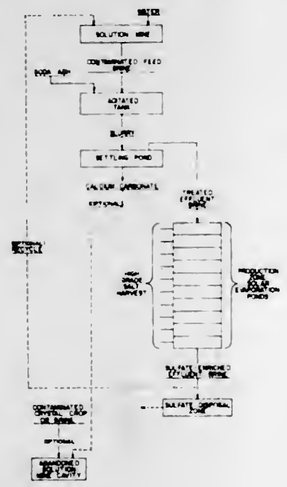


1. In a catalytic converter for use in a gaseous stream which comprises cylindrical segments of monolithic ceramic impregnated with one or more catalytically active materials, said segments of ceramic being contained in a cylindrical metal container having a gas inlet upstream from said segments and a gas outlet downstream therefrom and a plurality of spaced apart protruding metal fins attached to the outer circumference thereof, the improvement which comprises having said segments to monlithic ceramic axially spaced apart by about two inches within said metal container.

4,072,472
PRODUCTION OF HIGH PURITY SALT FROM HIGH SULFATE SALT DEPOSITS

Jerome A. Lukes, 1539 - 33rd St., Ogden, Utah 84403

Filed Dec. 12, 1973, Ser. No. 424,179
Int. Cl.[2] B01D *11/02, 9/02*; C01D *3/06, 3/08*
U.S. Cl. 23—297 7 Claims

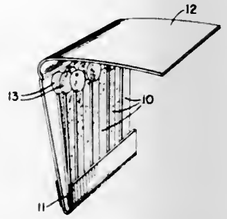


1. A process comprising:
contacting a subterranean deposit containing NaCl contaminated with calcium and sulfate with an aqueous solvent to produce an aqueous brine containing dissolved calcium and sulfate values;
transferring said contaminated brine to a calcium treatment zone and contacting said brine with a reagent to insolubilize said calcium values, thereby producing a slurry with an aqueous phase substantially free from dissolved calcium values;
transferring said aqueous phase to the first of a plurality of solar evaporation ponds arranged in a production zone for series flow such that the brine is maintained at its saturated concentration with respect to NaCl throughout the zone and becomes progressively more concentrated with respect to sulfate in successive ponds, thereby producing an NaCl crystal crop in each of said ponds;
adjusting the flow rate of brine through said production zone to maintain the concentration of sulfate in the last of said ponds below its saturated concentration, thereby producing a sulfate-enriched effluent brine from said production zone;
removing said sulfate-enriched effluent brine from said production zone; and harvesting the NaCl crystal crop from individual solar evaporation ponds of said production zone.

4,072,473
SELF-EXTINGUISHING MATCH AND METHOD OF MANUFACTURE

Stanley J. Radkowski, Wilbraham; John M. Lawrence, Monson; Enever Naggar, Longmeadow, and Raymond W. Dunham, Springfield, all of Mass., assignors to Diamond International Corporation, New York, N.Y.

Filed Mar. 31, 1976, Ser. No. 672,492
Int. Cl.[2] C06F *3/02*; B05C *1/00*
U.S. Cl. 44—46 24 Claims



1. A self-extinguishing match comprising
a match splint having opposite surfaces and opposite edges,
a layer of paraffin extending from one end of said splint along only a portion of said splint to a point between said one end and the opposite end of said splint,
an igniting head on said one end of said splint,
chemical fire retardant material on said opposite surfaces and opposite edges of said splint from said one end and extending toward said opposite end further along said splint than said layer of paraffin.

5. A method of manufacturing book matches of the self-extinguishing type comprising the steps of
preparing match splint combs,
mounting said combs on a conveying means with free ends of the match splints extending therefrom,
moving said combs on said conveying means and partially dipping said combs in hot melted paraffin, partially dipping said combs in igniting match head material,
dipping said combs to a point further up the combs beyond the farthest extent that paraffin will reach on the match splint combs in chemical fire retardant material in liquid form following any previous mentioned step after mounting said combs on a conveying means,
drying the material on said combs,
and assembling said combs into book match form.

4,072,474
MOTOR FUEL COMPOSITION

Robert R. Kuhn, Lansdale, and Warren H. Machleder, Bluebell, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

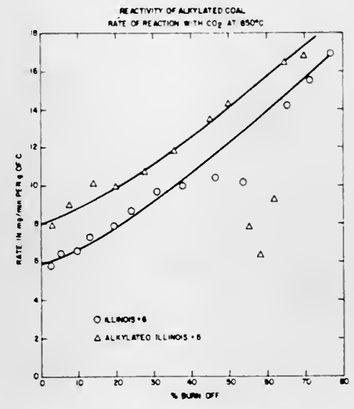
Continuation-in-part of Ser. No. 505,718, Sept. 13, 1974, abandoned, which is a continuation-in-part of Ser. No. 356,655, May 2, 1973, Pat. No. 3,846,089. This application June 30, 1975, Ser. No. 591,913
The portion of the term of this patent subsequent to Nov. 5, 1991, has been disclaimed.
Int. Cl.[2] C10L *1/22*
U.S. Cl. 44—58 10 Claims

1. A motor fuel composition consisting essentially of (a) a major amount of a hydrocarbon fuel for internal combustion engines, and (b) a minor detergent amount of a mixed polyester of a polycarboxylic acid residue and a mixed ester group residue of a C_1-C_{24} alcohol and a C_4-C_9 alkyl phenoxy polyethoxy ethanol containing 1-20 moles of ethylene oxide.

4,072,475
METHOD FOR IMPROVING GASIFICATION PROCESS RATES AND YIELDS BY MEANS OF ELECTROPHILIC AROMATIC SUBSTITUTION PRETREATMENT OF COAL

Richard H. Schlosberg, New Providence; Franklin J. Wright, Plainfield, and Ronald L. Hartgerink, Edison, all of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Sept. 3, 1976, Ser. No. 720,144
Int. Cl.[2] C10J *3/00*
U.S. Cl. 48—210 26 Claims



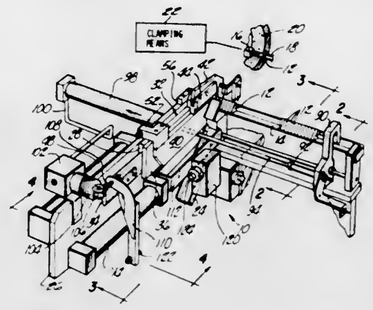
1. A process for the gasification of coal which comprises:
(1) treating the coal with a reagent selected from the group consisting of alkylating agents and acylating agents and thereby introducing into the coal a radical selected from the group consisting of aliphatic hydrocarbon radicals and acyl radicals respectively to yield a treated coal;
(2) subjecting the treated coal to gasification conditions.

4,072,476
AUTOMATIC LOADER

Walter A. Kulson, Plymouth, Mich., assignor to Wit-Son Carbide Tool, Inc., Plymouth, Mich.

Filed Sept. 11, 1975, Ser. No. 612,291
Int. Cl.[2] B24B *19/08*
U.S. Cl. 51—215 H 13 Claims

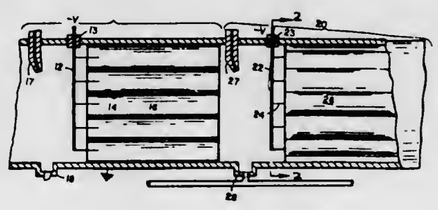
1. Apparatus for transferring workpieces from a magazine stack to a clamping spindle comprising: a slide body mounted for reciprocal displacement between a pick-up position and a release position; part holder means on the slide body and defining a seat for receiving the workpieces laterally thereof and releasing the workpieces axially and incrementally urging the workpieces into the seat when the body is in the pick-up position; and means for adjusting the position of the part holder means with respect to the slide body to relocate the relative position of the seat thereon for precisely receiving the workpieces therein, said part holder means comprising a plate having a surface for facial abutment against a surface of the slide body, a cam aperture formed in the plate, a cam hole in the body and aligned with the cam aperture when the plate is on the body, and a cam screw extending into the hole through and in contact with the aperture for displacing the plate relative to the body upon rotation thereof.



4,072,477
ELECTROSTATIC PRECIPITATION PROCESS

Donald N. Hanson, Orinda, and Charles R. Wilke, El Cerrito, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Continuation of Ser. No. 252,406, May 11, 1972, abandoned, which is a continuation-in-part of Ser. No. 700,436, Jan. 25, 1968, abandoned, which is a continuation-in-part of Ser. No. 518,405, Jan. 3, 1966, abandoned. This application Mar. 21, 1975, Ser. No. 560,980
Int. Cl.[2] B03C *3/01*
U.S. Cl. 55—10 2 Claims



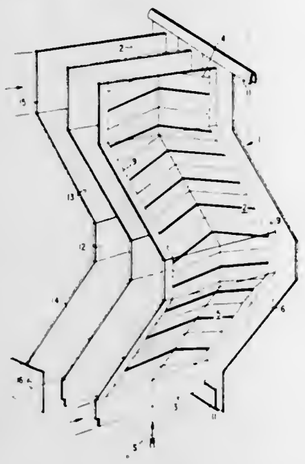
1. An electrostatic precipitation process for continuously removing foreign particles from a gas stream and depositing said particles on conductive surface means coupled to ground and at least partially bounding said gas stream including the steps of introducing into said gas stream in the vicinity of said surface means a predetermined number of additional particles and electrostatically charging both said foreign particles and said additional particles with a charge of the same predetermined polarity, such predetermined number of additional particles being selected that together with said foreign particles there is provided adjacent said surface means a space charge region of sufficient intensity where substantially all of said foreign particles and said additional particles move towards said surface means and are deposited thereon under the influence of the electric field formed by said space charge region.

4,072,478

MIST REMOVER

Ulrich Regehr, 65, Susterfeld, Aachen, Germany (D-51), and Siegfried Bulang, 177 Drievogelstraat, Kerkrade-West, Netherlands

Continuation of Ser. No. 565,726, March 31, 1975, abandoned, and a continuation-in-part of Ser. No. 396,796, Sept. 13, 1973, abandoned, and Ser. No. 396,793, Sept. 13, 1973, abandoned.
This application Aug. 11, 1976, Ser. No. 713,426
Claims priority, application Germany, Sept. 22, 1972, 2246474; Sept. 22, 1972, 2246475
Int. Cl.² B01D *45/00*
U.S. Cl. 55—440 **12 Claims**



1. An apparatus for removing mist from a gas flow comprising a plurality of partitioning walls arranged in parallel relation to one another and a plurality of separator plates arranged in parallel relation to one another and at right angles to the partitioning walls, the partitioning walls further comprising means for maintaining the relation between the separator plates and the partitioning walls, the separator plates having a v-shaped cross-section comprising a floor portion, two inclined, oppositely-sloped wall portions joined to the floor portion at opposite extremities thereof, and two outwardly-extending lip portions fixed to the wall portions in substantially parallel relation to the floor portion, the projected included angle between the two wall portions being equal to or less than 90°, the partitioning walls and separator plates thus defining a plurality of tortuous rectangular channels through which a gas can flow from a gas flow inlet portion a gas flow outlet portion thereof, each separator plate further comprising a plurality of chevron-shaped directing grooves formed by V-shaped sinusoidal corrugations arranged uniformly adjacent to each other such that a continuous pattern of directing grooves exists from the end of the gas flow inlet portion through the gas flow outlet portion, the chevron-shaped directing grooves pointing from the gas flow inlet portion to the gas flow outlet portion and having a chevron angle of between 125° and 135°, said directing grooves being centrally disposed between each pair of partitioning walls and terminating short of the opposite edges of said plates such that run off zones free of grooves exist between the chevron-shaped directing grooves and each partitioning wall, the partitioning walls projecting above and below the separating plates and joined together by means for varying the spacing between the separator plates, the gas flow inlet portion of the separator plates having a lengthwise dimension substantially shorter than that of the gas flow outlet portion and being void of said directing grooves.

4,072,479

IMPREGNATED ACTIVATED CARBON FOR IMPROVED REMOVAL OF MALODOROUS COMPOUNDS

Rabindra Kumar Sinha, Oakdale; Norman J. Wagner, and Ronald S. Joyce, both of Pittsburgh, all of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 662,783, March 1, 1976, abandoned, which is a continuation-in-part of Ser. No. 570,542, April 22, 1975, abandoned. This application Dec. 20, 1976, Ser. No. 752,498
Int. Cl.² B01D *53/04*
U.S. Cl. 55—73 **5 Claims**

1. A process for removal of H_2S and methyl mercaptan from gas streams containing oxygen, comprising contacting said gas stream with an activated carbon having impregnated therein from about 0.5 to about 20 percent by weight of NaOH, and from about 4 to about 50 percent by weight of moisture, both based on weight of dry activated carbon.

4. An activated carbon for removal of H_2S and methyl mercaptan, characterized by having impregnated therein from about 0.5 to about 20 percent by weight of NaOH, and from about 4 to about 50 percent by weight of moisture, both based on weight of dry activated carbon.

4,072,480

DUAL IMPREGNATED ACTIVATED CARBON FOR IMPROVED REMOVAL OF MALODOROUS SULFUR COMPOUNDS

Norman J. Wagner, Pittsburgh, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Jan. 7, 1977, Ser. No. 757,729
Int. Cl.² B01D *53/04*
U.S. Cl. 55—73 **7 Claims**

1. A process for removal of malodorous sulfur compounds from gas streams containing oxygen, said compounds being one or more members selected from the group consisting of H_2S and mercaptans, which process comprises contacting said gas stream with an activated carbon having impregnated therein from about 0.5 to about 20 percent by weight of NaOH, from about 0.1 to about 5 percent by weight of PbOAc, and from about 4 to about 50 percent by weight of moisture, all based on weight of dry activated carbon.

6. An activated carbon for removal of malodorous sulfur compounds, characterized by having impregnated therein from about 0.5 to about 20 percent by weight of NaOH, from about 0.1 to about 5 percent by weight of PbOAc, and from about 10 to about 40 percent by weight of moisture all based on weight of dry activated carbon.

4,072,481

DEVICE FOR SEPARATING MULTIPLE PHASE FLUID SYSTEMS ACCORDING TO THE RELATIVE SPECIFIC GRAVITIES OF THE PHASE

Claude C. Laval, Jr., 2444 N. Farris Ave., Fresno, Calif. 93705

Continuation of Ser. No. 675,298, April 9, 1976, abandoned. This application Feb. 24, 1977, Ser. No. 771,687
Int. Cl.² B01D *19/00*; B04C *5/103*
U.S. Cl. 55—177 **6 Claims**

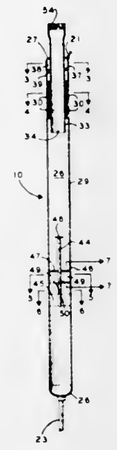
1. In combination with a pump for liquids having an intake disposed in a well containing a three phase fluid system including a gaseous phase, a liquid phase and a particulate solid phase, a device for protecting the liquid pump from the passage of the gaseous phase and the particulate solid phase therethrough comprising:

A. a vortexing chamber immersed in the fluid system in the well having upper and lower end walls and a sidewall defining a surface of revolution concentric to an axis disposed longitudinally of the well;

B. a substantially cylindrical vortex finder connected to the intake of said pump mounted in the upper end wall of the chamber and extended concentrically axially downwardly in the chamber having an open lower end intermediate the upper and lower end walls of the chamber;

C. a partition circumscribing the vortex finder mounted on the sidewall in downwardly spaced relation to the upper end wall of the chamber to define a compartment for collecting gas thereabove in the chamber, said partition having a gas passage therethrough adjacent to the vortex finder to admit gas to the compartment and being substantially impervious outwardly thereof;

D. means in the sidewall for directing the fluid system of the well into the vortexing chamber tangentially to a circle concentric to the axis thereof at an elevation below the passage in response to operation of the pump whereby the fluid swirls downwardly in the chamber in a centrifuging



action throwing solid particles outwardly for gravitational descent to the lower end of the chamber, the gaseous components swirl inwardly and upwardly for movement through the passage into the gas collecting compartment, and said fluid having had solid particles and gaseous components centrifuged therefrom swirls downwardly and then upwardly through the lower end of the vortex finder;

E. a gas pump for drawing gas from the compartment having an intake connected to the compartment and a discharge at the surface of the well; and

F. a tail pipe for drawing solid particles from the chamber mounted on the lower end wall in communication with the vortexing chamber and downwardly extended therefrom.

4,072,482

CONTINUOUS DEODORIZING APPARATUS OF FAT AND OIL

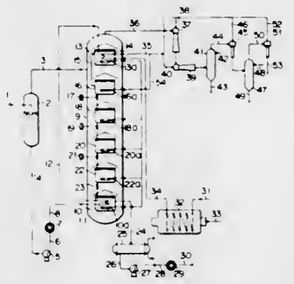
Makoto Aoki, Machida, and Tadao Nishiyama, Yokohama, both of Japan, assignors to The Nisshin Oil Mills, Ltd. and JGC Corporation, both of Tokyo, Japan

Filed June 21, 1976, Ser. No. 698,124
Int. Cl.² B01D *19/00*
U.S. Cl. 55—195 **5 Claims**

1. An apparatus for continuously deodorizing fat and oil, comprising:

a. a deodorizing tower having an inlet means for supplying a feedstock fat or oil containing an odor-emitting substance, an outlet means for delivering the deodorized fat or oil, the tower housing a heating tray uppermost, a charge control tray beneath the heating tray, a heat exchange tray at the bottom, a discharge control tray just above the heat exchange tray, and at least one deodorizing tray disposed between the charge control tray and the discharge control tray;

b. a steam ejector for withdrawing the odoremitting substances from the top of the tower; and



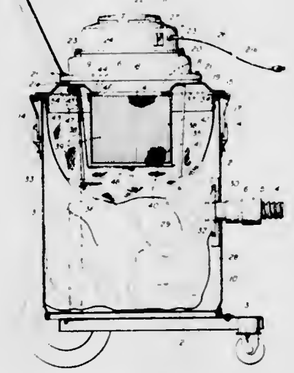
c. a steam superheater for generating a superheated steam which is used as the heat transfer medium for heating the feedstock fat and oil in the heating tray and, then, utilized as the operating stream of the steam ejector.

4,072,483

VACUUM CLEANERS

Dewey I. Doyle, Jr., Grand Rapids, Mich., assignor to Doyle Vacuum Cleaner Company, Grand Rapids, Mich.

Filed May 20, 1976, Ser. No. 688,111
Int. Cl.² B01D *46/02*
U.S. Cl. 55—372 **4 Claims**



1. A vacuum cleaner comprising

a. a casing comprising

(1) a tank having

(a) a closed bottom; and

(b) an open top, and

(2) a cover member

(a) mounted on said open top, and

(b) movable between open and closed position relative thereto,

b. said tank having inlet means for feeding air thereinto,

c. said cover having outlet means for feeding air outwardly therethrough,

d. a combination motor-blower unit mounted in said cover for drawing air inwardly through said inlet means and discharge air outwardly through said outlet means when said cover is disposed in said closed position on said tank,

e. a filter bag removably mounted in said tank and operatively connected to said inlet means for filtering air passing from said inlet means to said outlet means,

f. a second filter removably mounted on said open top and

extending thereacross in position to filter air passing from said filter bag to said outlet means,

g. a third filter releasably secured to and supported by said cover member in downwardly projecting relation thereto in a position to filter air passing from said second filter to said outlet means, and

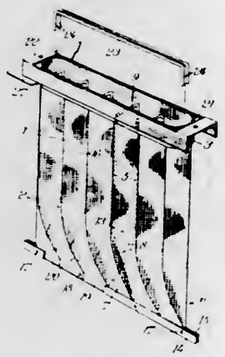
h. means secured to and projecting downwardly from said cover in position to prevent said second filter from engaging said third filter.

4,072,484

BAG FILTER

Christian Carre, Houilles; Jean-Pierre Guibet, Gamilly-Vernon; Albert Rebours, Chatou, and Andre Rigal, Le Pecq, all of France, assignors to Air Industrie, Courbevoie, France

Filed July 12, 1976, Ser. No. 704,647
Claims priority, application France, July 25, 1975, 75 23301
Int. Cl.² B01D *46/02*
U.S. Cl. 55—379 **13 Claims**



1. A filter bag for a filter system, comprising a number of parallel channels having one open end and embodied by interconnecting, along parallel assembly lines distributed over bag length, two opposite side walls of the bag, the side walls meeting at the open end; and a frame introduced into each channel, the frame having two substantially parallel members which extend in a plane at least substantially perpendicular to the main direction of the bag, such plane being equidistant from the two assembly lines forming the lateral boundaries of the particular channel concerned, wherein, at the bottom bag end near the bag end remote from the open end of the bag, the two substantially parallel members have lower portions which are configured to meet by way of a bottom member which is substantially perpendicular to the plane of the two substantially parallel members — that is which extends substantially in the main direction of the bag, such that the frame as viewed perpendicularly to said plane tapers over its lower portion from a width determined by said parallel members to a substantially lesser width determined by said bottom member.

4,072,485

METHOD OF AND ARRANGEMENT FOR PROCESSING THROUGH LOW TEMPERATURE HEAT EXCHANGES AND IN PARTICULAR FOR TREATING NATURAL GASES AND CRACKED GASES

Charles Becdelievre, Maurepas; Victor Kaiser, Maisons Laffitte, and Henri Paradowski, Rueil-Malmaison, all of France, assignors to Compagnie Francaise d'Etudes et de Construction - Technip, Rueil-Malmaison, France

Filed Oct. 4, 1976, Ser. No. 729,182
Claims priority, application France, Jan. 30, 1976, 76 02625
Int. Cl.² F25J *3/06*
U.S. Cl. 62—23 **16 Claims**

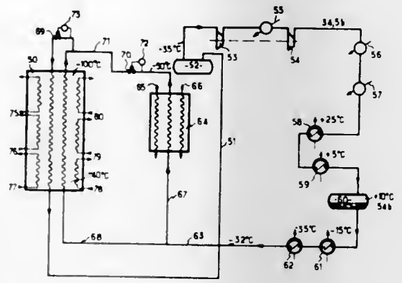
1. In a method for refrigerating a natural gas or a cracked gas by indirect heat exchange with a cycle gas mixture at temperatures ranging from −40° C. to −140° C., the improvement comprising the sequence of steps

compressing a cycle gas mixture consisting essentially of C_1, C_2 and C_3 hydrocarbons,

cooling said compressed cycle gas mixture in a plurality of successive staged external, indirect heat exchanges with coolants selected from the group consisting of water, air, propane and propylene to about 40° C., whereby said cycle mixture is fully condensed,

dividing the fully condensed cycle mixture into at least an auxiliary stream and a remaining stream,

passing said auxiliary stream through an auxiliary heat exchanger countercurrently in indirect heat exchange with a colder stream employed in refrigerating the natural gas, whereby said auxiliary stream is sub-cooled,



passing said remaining stream through a main heat exchanger countercurrently in indirect heat exchange with a combined liquefied sub-cooled cycle mixture as defined below after the latter has been expanded and passed into said main heat exchanger, whereby said remaining stream is sub-cooled,

combining said sub-cooled auxiliary and remaining streams to form said combined liquefied sub-cooled cycle mixture,

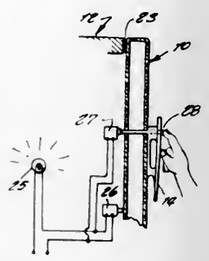
expanding said combined sub-cooled stream and passing it at a temperature of from about −100° C. to about −140° C. countercurrently into said main heat exchanger in indirect heat exchange with said remaining stream and with a warmer stream employed in refrigerating the natural gas.

4,072,486

SEE-THROUGH, SMOKED GRAY, PLEXIGLASS REFRIGERATOR DOOR

Ruth Joseph, 153 Brabant St., Apt. 5C, Staten Island, N.Y. 10303

Filed Nov. 3, 1976, Ser. No. 738,294
Int. Cl.² F25D *23/02*
U.S. Cl. 62—131 **1 Claim**



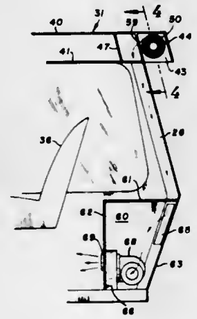
1. A household refrigerator including a case having a cooler compartment and a freezer compartment cooled by a refrigerating mechanism, and a front door of said refrigerator being made from a transparent Plexiglass material that is tinted smoke gray so that visibility therethrough is not readily clear from an outside when an interior of said refrigerator is not illuminated; said door including a sealed, central, air space insulation between inner and outer wall thereof; said door being mounted upon hinges and including a pull handle, a magnet-impregnated gasket mounted on an inner side of said door for abuttment with a metal front face of said refrigerator case; a lamp inside said case being in a circuit with a first switch automatically operated when said door is opened and is also in a circuit with a second switch manually operated by a pushbutton on an outer side of said door, said lamp providing illumination means inside said refrigerator so to allow clear visibility readily through said transparent, smoke gray Plexiglass door.

4,072,487

AIR CONDITIONING APPARATUS FOR TRACTOR CAB

Gordon A. Irwin, Harwood, N. Dak., assignor to Steiger Tractor Inc., Fargo, N. Dak.

Filed Dec. 10, 1976, Ser. No. 749,361
Int. Cl.² B60H *3/04*
U.S. Cl. 62—244 **9 Claims**



1. In combination, a tractor having an operator's cab comprising a plurality of side walls and a roof, said side walls including a rear wall, and said roof having a portion projecting rearwardly beyond said rear wall,

an air conditioner for said cab including an air inlet, a filter, heat exchange means for changing the heat content of the air passing therethrough, an air outlet opening into said cab and air circulating means for causing air to enter said inlet and pass through said filter, said heat exchange means and out through said air outlet into said cab,

said rearwardly projecting portion of said roof having a compartment therein for said filter and a downwardly disposed air inlet disposed to the rear of said rear wall,

and means for mounting said filter in said compartment above said air inlet so that foreign matter accumulating on the exterior of said filter is free to fall off of said filter and out through said air inlet.

4,072,488

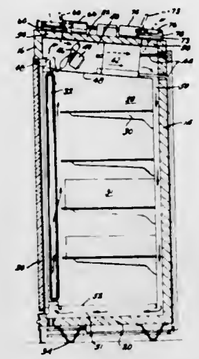
AIR DEFROST REACH-IN REFRIGERATED DISPLAY CABINET

William C. Johnston, Atlanta, Ga., assignor to Kysor Industrial Corporation, Cadillac, Mich.

Filed Dec. 10, 1976, Ser. No. 749,346
Int. Cl.² F25D *21/10*
U.S. Cl. 62—282 **5 Claims**

1. A reach-in refrigerated display case comprising:

a cabinet defining a product storage and display space therein and a coil chamber; access doors on one side of said cabinet to said storage and display space; refrigeration coil means in said chamber; recirculatory passage means between said space and said coil means including cold air flue means from said coil means to said space and return air flue means from said space back to said coil, at least one of said flue means being restricted to flow; air propelling means in said chamber for propelling air from said return flue means, to said coil means, then to said cold air flue means for passage about said product zone during normal operation; defrost inlet and outlet ports to and from said chamber and astraddle of said coil means and propelling means, the flow resistance through said ports being insignificant compared to that through said flues and display space, for flow of defrosting ambient air through said inlet



ports, said coil means, and said outlet ports under the influence of said propelling means to cause a short circuit flow of ambient air through said coil without significant flow through said product space when said ports are open, thereby creating aerodynamic isolation of the coil means from the display during defrost; doors on said inlet and outlet ports to open and close said ports; and door opening and closing means for said doors.

4,072,489

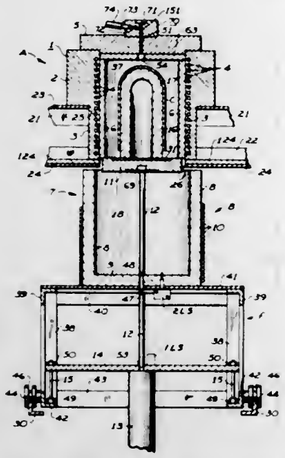
VACUUM PROCESS FOR AVOIDING DEVITRIFICATION DAMAGE TO TRANSPARENT SLIP-CAST SILICA CRUCIBLES

Ted A. Loxley; Walter G. Barber; Walter W. Combs, all of Mentor, and John M. Webb, Chargin Falls, all of Ohio, assignors to Sherwood Refractories, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 495,129, Aug. 5, 1974, Pat. No. 3,972,704, which is a continuation-in-part of Ser. No. 363,622, May 24, 1973, Pat. No. 3,837,825. This application May 10, 1976, Ser. No. 684,730
The portion of the term of this patent subsequent to Sept. 24, 1991, has been disclaimed.
Int. Cl.² C03B *23/20, 32/00*
U.S. Cl. 65—18 **7 Claims**

7. A process for manufacturing thin-wall water-free crucibles for use in the growing of silicon crystal rods comprising the steps of slip casting a porous vitreous silica crucible of a predetermined shape from a slurry of finely divided silica particles of high purity having an average particle size not in excess of 10 microns, the silica of said crucible containing chemically bound water in the form of hydroxyl groups, drying the crucible to remove the free water and firing it to burn out the combustibles and to strengthen the crucible while providing a rigid body of high purity, placing the crucible on a refractory support, heating the crucible on said support in a furnace from a temperature below 2200° F. to a sintering temperature up to about 3150° F. in a vacuum or helium atmosphere for a period of at least several minutes to coalesce the particles and to provide a high-density transparent vitreous silica, and cooling the resulting transparent silica crucible, the chemically combined water being removed from the fired crucible before it is sintered to high density by firing it at a temperature up to 2200° F. for a substantial time period and

under a high vacuum such that the transparent vitreous silica of the finished sintered crucible has a hydroxyl content so low that it is not subject to devitrification damage during growing of the silicon crystal.

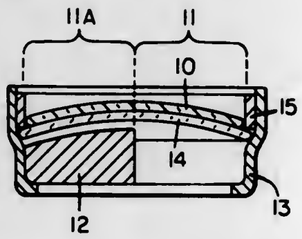


4,072,490

APPARATUS AND PROCESS FOR PRODUCING A GRADIENT PHOTOCHROMIC OPHTHALMIC LENS

Edwin J. Illig, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Nov. 8, 1976, Ser. No. 739,604
Int. Cl.² C03B *32/00*
U.S. Cl. 65—30 R **4 Claims**



1. A process for manufacturing a gradient photochromic ophthalmic lens blank which comprises the steps of:

(a) subjecting an ophthalmic lens blank composed of a potentially photochromic glass to a heat treatment at a temperature sufficient to develop photochromic properties in said glass, while

(b) maintaining a selected portion of the ophthalmic lens blank in proximity to a solid metal heat sink having a heat capacity of at least about 15 calories $^{\circ}C^{-1}$;

said metal heat sink acting to provide a temperature gradient across the ophthalmic lens blank which is effective to provide a gradient in photochromic properties thereacross.

4. Lens treating apparatus for producing a gradient photochromic ophthalmic lens blank which comprises:

(a) a cylindrical open-bottomed step-ring former cup, said former cup having a circular wall which includes a circumferential step therein;

(b) a ceramic former positioned within the step-ring former cup and edge-supported by the circumferential step, said ceramic former being suitable for supporting a potentially photochromic ophthalmic lens blank;

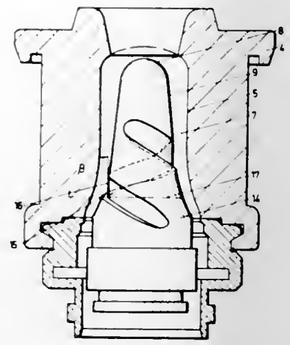
(c) a cast iron heat sink of semicircular cross-section positioned against the circular wall of the former cup and immediately beneath the ceramic former, said cast iron heat sink having a heat capacity of at least 15 calories $^{\circ}C^{-1}$.

4,072,491

METHOD FOR PRODUCING BLOWN HOLLOW GLASS OBJECTS

Heinz Kramer, Oldenburg; Norbert Peretti, Mulheim (Ruhr), and Helmut Waschneck, Dusseldorf, all of Germany, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 585,655, June 10, 1975, Pat. No. 4,008,063. This application Sept. 23, 1976, Ser. No. 725,735
Claims priority, application Germany, June 26, 1974, 2430656
Int. Cl.² C03B *9/14*
U.S. Cl. 65—72 **3 Claims**



1. A method for the production of blown hollow glass bodies having an optical inner wall structure comprising the steps of introducing a heated glass blank into a hollow mold cavity, providing a plunger having a central longitudinal axis and an exterior surface generally formed in a configuration tapering toward a narrower leading end of said plunger, said plunger being adapted to be inserted into said mold cavity with said leading end first and to be pressed against said glass blank to form said hollow glass body, forming on the exterior surface of said plunger a helically shaped molding pattern adapted to shape the inner wall structure of said glass body when said plunger is pressed against said glass blank, said helical molding pattern comprising a main pattern surface configured to extend throughout said helical molding pattern at an angle of not less than 90° relative to the diameter of said plunger, said angle being taken as an exterior angle relative to the body of said plunger when the diameter from which said angle is taken is located rearwardly of said main pattern surface relative to said leading end of said plunger, said angle being taken as an interior angle relative to the body of said plunger when the diameter from which said angle is taken is located forwardly of said main pattern surface relative to said leading end of said plunger, inserting said plunger into said mold cavity and pressing said plunger against said glass blank to form said hollow glass body with an optical inner wall configured with a pattern coinciding with the molding pattern on the exterior surface of said plunger, and withdrawing said plunger axially from said mold after pressing said plunger against said glass blank.

4,072,492

GLASS BENDING LEHR WITH PRE-HEAT HOOD

William A. Castine, Jr., Jeannette, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 26, 1976, Ser. No. 745,326
Int. Cl.² C03B *23/02*
U.S. Cl. 65—107 **10 Claims**

1. A method of shaping glass sheets including the steps of supporting a glass sheet on support means comprised of a material having a greater heat capacity than glass, conveying said support means and said glass sheet into a horizontally elongated heating chamber wherein the entire glass sheet is heated to a temperature sufficient to soften the glass sheet as it passes from an entrance end of the heating chamber to a longitudinally spaced exit end of the heating chamber, shaping the glass sheet while in the softened condition, removing the glass sheet from said support means, and conveying said support means back to the entrance end of the heating chamber so as to support a subsequent sheet of glass through the heating and shaping steps, wherein the improvement comprises:

trapping waste heat escaping from the heating chamber in a partially closed hood structure having a top, sides, and an open bottom spaced from and overlying at least a portion of said heating chamber so that the air within said hood becomes heated above ambient temperatures, and passing said support means through the heated air within said hood during the step of conveying the support means back to the entrance end of the heating chamber.



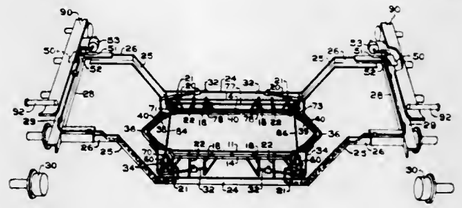
4. An apparatus for shaping glass sheets comprising a horizontally elongated heating chamber having longitudinally spaced inlet and outlet openings and means to heat sheets of glass therein to an overall softened condition, support means for supporting a sheet of glass as it passes through said heating chamber, conveyor means for passing said support means through the heating chamber from the inlet opening to the outlet opening, second conveyor means overlying the heating chamber for returning said support means to the inlet end of the heating chamber, and hood means spaced from the top of said heating chamber and having a top, sides, and an open bottom partially enclosing said second conveyor means and oriented to entrap hot air rising from the heating chamber.

4,072,493

METHOD AND APPARATUS FOR RESHAPING GLASS SHEETS

Vaughn R. Imler, Valencia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 720,866, Sept. 7, 1976, abandoned. This application Jan. 27, 1977, Ser. No. 763,259
Int. Cl.² C03B *23/02*
U.S. Cl. 65—107 **21 Claims**



1. Apparatus for shaping a glass sheet to a shape that includes a sharp bend extending across a dimension of said sheet by the gravity sag method comprising a plurality of rigid, metal shaping rails disposed in end-to-end relation to define an outline shaping mold having an upper shaping surface conforming to the shape desired slightly inward of the margin of a glass to be shaped thereon, each of said shaping rails having an upper edge surface providing a different portion of said upper shaping surface and including an end shaping rail having inner ends defining an end section of said mold and a pair of longitudinally extending, transversely spaced shaping rails defining a main section of said mold, means supporting said end shaping rail for pivoting relative to said main mold section between an open mold position wherein the inner ends of said end shaping rail are separated from a pair of transversely spaced ends of said elongated shaping rails and a closed mold position where said inner ends of said end shaping rail are closely spaced from said pair of ends of said elongated shaping rails, the ends of said elongated shaping rails providing supports for a flat glass sheet intermediate its ends when said sheet is mounted on said mold for bending and providing supports for the glass sheet after the latter is bent adjacent the inner ends of said end shaping rail, an elongated, electroconductive ribbon extending across the space between said elongated shaping rails entirely below said upper shaping surface along a line in close adjacency to the pair of flat glass supporting ends of said elongated shaping rails, guiding means located laterally outside each of said elongated shaping rails and having a surface engaging said ribbon to control the vertical position of said flexible electroconductive ribbon to one below said shaping surface, a pair of electrodes comprising an electrode laterally outside each of said guiding means for electrical connection with the ends of said ribbon and means carried in electrically insulating relation to said mold and its support adapted to couple said pair of electrodes to a source of electrical energy, said apparatus being clear of any structural element above the area enclosed by said rigid metal shaping rails to facilitate loading and unloading of a glass sheet relative to said mold.

14. A method of bending a glass sheet to a sharp bend by the gravity sag technique on an outline sectionalized mold comprising supporting a flat glass sheet intermediate its end on a pair of transversely spaced ends of elongated shaping rails forming a main section of said mold and at one longitudinal end portion thereof on the longitudinally outer portion of an end shaping rail pivotally movable between a spread mold position where its inner ends are spaced from the ends of said main section shaping rails and a closed mold position wherein said ends of said shaping rails are adjacent to one another so that a main portion of said glass sheet is superimposed over said main section of the mold and an end portion of said glass sheet is superimposed over said end shaping rail of the mold, supporting an electroconductive ribbon below and in approximate alignment with a line of support provided by said pair of ends of said main section shaping rails, heating the glass sheet in an enclosed hot atmosphere to an elevated temperature, applying electric current to said electroconductive ribbon whereby the latter radiates heat upward toward the bottom surface of said supported glass sheet, pivoting said end shaping rail upward to fold the end portion of said glass sheet supported thereon relative to the main portion of said glass sheet along a line aligned with the length of said ribbon.

4,072,494

METHOD AND DEVICE FOR THE WET COMPOSTING OF ORGANIC SLUDGE

Hans Gujer, Glattalstrasse 149, 8153 Rumlang, Switzerland

Continuation of Ser. No. 388,251, Aug. 14, 1973, abandoned. This application Aug. 7, 1975, Ser. No. 602,796
Claims priority, application Switzerland, Aug. 25, 1972, 12644/72
Int. Cl.² C05F *11/08*
U.S. Cl. 71—9 **14 Claims**



1. A method for wet composting organic sludge comprising feeding the sludge to be treated into a continuous flow system including a gas-tight mixing container together with an oxygen-containing gas for promoting a composting reaction in the

sludge, maintaining a static pressure in the mixing container within a range above 1 atmosphere and up to 6 atmospheres, said static pressure being developed by the composted sludge after flowing through said container, and simultaneously maintaining the temperature within the flow system within a range above 55° C. and less than 75° C.

4,072,495

5-BENZOFURANYL ESTERS AS HERBICIDES AND PLANT GROWTH REGULANTS

Peter Stuart Gates, Cambridge; John Gillon, Great Shelford, and David Thomas Saggers, Saffron Walden, all of England, assignors to Fisons Limited, London, England

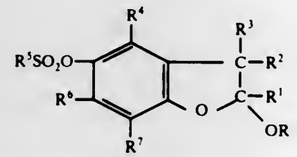
Continuation-in-part of Ser. No. 275,256, July 26, 1972, abandoned, which is a division of Ser. No. 826,274, May 20, 1969, Pat. No. 3,689,507. This application Jan. 12, 1976, Ser. No. 648,161

Claims priority, application United Kingdom, May 24, 1968, 24858/68; Feb. 8, 1969, 6951/69; Apr. 8, 1969, 17985/69

Int. Cl.[2] A01N *9/28*

U.S. Cl. 71—76 **37 Claims**

1. A herbicidal composition comprising a herbicidal amount of a benzofuranyl compound of the formula



wherein R is a member selected from the group consisting of alkyl of 1 to 8 carbon atoms, alkenyl of 2 to 4 carbon atoms, monochloro alkenyl of 2 to 4 carbon atoms, alkynyl of 2 to 6 carbon atoms, monochloro alkynyl of 2 to 6 carbon atoms, alkoxyalkyl of 2 to 8 carbon atoms; R^1 is hydrogen or alkyl of 1 to 4 carbon atoms; R^2 and R^3 are the same or different and are hydrogen or alkyl of 1 to 4 carbon atoms; R^5 is alkyl of 1 to 4 carbon atoms or monochloro alkyl of 1 to 4 carbon atoms; and R^4, R^6 and R^7 are the same are different and are hydrogen, halogen or alkyl of 1 to 4 carbon atoms, with an inert carrier or wetting agent.

4,072,496

2,6-DICHLOROBENZALDEHYDE TETRAHYDRO-2-FUROYL HYDRAZONE AND ITS USE AS A RIPENER FOR SUGARCANE

Louis G. Nickell, Ellicott City, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 458,430, April 5, 1974, Pat. No. 3,992,186. This application Aug. 3, 1976, Ser. No. 711,145

Int. Cl.[2] A01N *9/00*

U.S. Cl. 71—88 **5 Claims**

1. A process for modifying the ripening of field grown sugarcane so as to increase its yield of sucrose which comprises applying an amount effective to increase the amount of sucrose of 2,6-dichlorobenzaldehyde tetrahydro-2-furoyl hydrazone to the cane at a time from 2 to 10 weeks prior to harvest.

4,072,497

(5-ALKYLUREIDO-1,3,4-THIADIAZOL-2-YL-THIO) ACETIC ACID TERT-BUTYL ESTERS AND HERBICIDAL COMPOSITIONS AND PROCESSES

Friedrich Arndt, and Ludwig Nüsslein, both of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

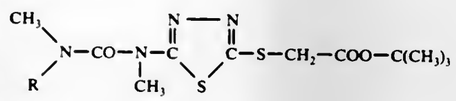
Filed Jan. 14, 1977, Ser. No. 759,560

Claims priority, application Germany, Jan. 16, 1976, 2601987

Int. Cl.[2] A01N *9/12;* **C07D** *285/12*

U.S. Cl. 71—90 **6 Claims**

1. (5-alkylureido-1,3,4-thiadiazol-2-yl-thio)-acetic acid ester of the formula



wherein R is hydrogen or methyl.

4. A herbicidal composition comprising from about 10 to 80% by weight of one or more of the esters defined in claim 1 and from about 90 to 20% by weight of a liquid or solid carrier material or a mixture of liquid and solid carrier materials.

6. A process of applying the composition of claim 4 to agricultural land for destruction, inhibition or reduction of undesirable weeds, comprising applying the said composition in an amount to provide for about 0.4 to 1.5 kg of active agents per about 2.5 acres of land.

4,072,498

PYRAZOLE AMIDES

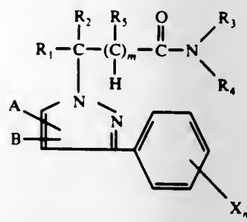
Malcolm W. Moon, and Gabriel Kornis, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 524,231, Nov. 15, 1974, abandoned. This application May 14, 1976, Ser. No. 686,548

Int. Cl.[2] A01N *9/22;* **C07D** *231/16, 231/12*

U.S. Cl. 71—92 **122 Claims**

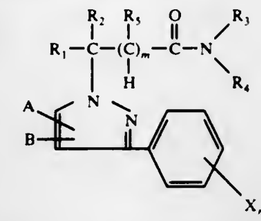
1. A compound of the formula:



where R_1 is hydrogen, alkyl of 1 to 7 carbon atoms, inclusive, haloalkyl of 1 to 7 carbon atoms, inclusive, phenyl, benzyl or cycloalkyl of 3 to 6 carbon atoms, inclusive, with the proviso that when R_1 is benzyl or cycloalkyl, m = O; R_2 and R_5 are the same or different and are hydrogen, halogen, alkyl of 1 to 6 carbon atoms, inclusive, haloalkyl of 1 to 6 carbon atoms, inclusive, or phenyl; R_1 and R_2 together with the attached carbon atom can be cycloalkyl of 3 to 6 carbon atoms, inclusive, when m = O; m is O or 1 provided that when m = O, R_1 is not hydrogen and when m = 1 at least one of R_2 or R_5 is hydrogen; R_3 is hydrogen, alkyl of from 1 to 8 carbon atoms, inclusive, phenyl or benzyl; R_4 is hydrogen, or alkyl of from 1 to 6 carbon atoms, inclusive, and R_3 and R_4 can be joined together to form a heterocyclic ring selected from the group consisting of pyrrolidine and piperidine; A and B are the same or different and are hydrogen, alkyl of from 1 to 6 carbon atoms, inclusive, phenyl, halogen, cyano, haloalkyl of 1 to 6 carbon atoms, inclusive, alkoxy or alkylthio in which the alkyl group is from 1 to 3 carbon atoms, inclusive or trifluoromethyl and when adjacent can

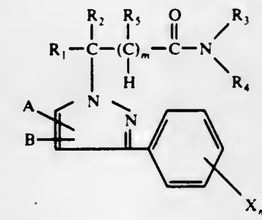
be joined to form a ring of from 5 to 7 carbon atoms, inclusive; X is halogen, nitro, cyano, acetyl, dimethylcarbamoyl, alkyl, haloalkyl, alkoxy or carboalkoxy in which the alkyl group is from 1 to 3 carbon atoms, inclusive, phenyl, benzyl, 2-phenylethyl and n is 0, 1, or 2; or an acid addition salt thereof.

121. A method for controlling weeds or undesirable vegetation which comprises applying to the locus thereof a herbicidally effective amount of a compound of the formula:



where R_1, R_2, R_3, R_4, R_5, m, X, n, A and B are as defined in claim 1.

122. A composition for herbicidal use comprising an inert adjuvant and, as the active ingredient, an effective amount of a compound of the formula:



where R_1, R_2, R_3, R_4, R_5, m, X, n, A and B are as defined in claim 1.

4,072,499

USE OF PYRIDYL PHTHALIMIDES AS PLANT GROWTH REGULANTS

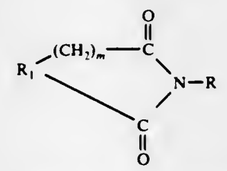
Frederic G. Bollinger, and John J. D'Amico, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 22, 1976, Ser. No. 753,394

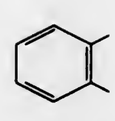
Int. Cl.[2] A01N *9/22*

U.S. Cl. 71—94 **6 Claims**

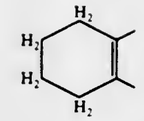
1. A method of regulating the growth of leguminous plants which comprises treating said leguminous plants with an plant growth regulating effective non-lethal amount of a compound of the formula



wherein R is pyridyl having one halo substituent, one lower alkyl substituent or two lower alkyl substituents; R_1 is selected from the group consisting of



and



and m is zero or one.

4,072,500

HALOGENATED 4-TRIFLUOROMETHYL-DIPHENYL-ETHER COMPOUNDS AND HERBICIDAL COMPOSITIONS

Lothar Rohe, Wuppertal; Jürgen Schramm, Dormagen; Erich Klauke, Odenthal-Hahnenberg; Ludwig Eue, and Robert Rudolf Schmidt, both of Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

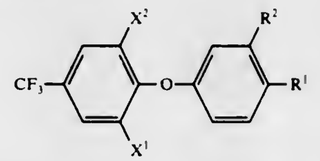
Division of Ser. No. 483,331, June 26, 1974, Pat. No. 3,957,865. This application Feb. 27, 1976, Ser. No. 662,066

Claims priority, application Germany, July 3, 1973, 2333848

Int. Cl.[2] A01D *9/12;* **A01N** *9/14;* **C07C** *149/34*

U.S. Cl. 71—98 **11 Claims**

1. Halogenated 4-trifluoromethyl-diphenyl ether compound of the formula



(I)

in which

R^1 is alkylthio of from 1 to 4 carbon atoms;

R^2 is hydrogen or methyl;

X^1 is halogen; and

X^2 is hydrogen or halogen.

4,072,501

METHOD OF PRODUCING HOMOGENEOUS MIXED METAL OXIDES AND METAL-METAL OXIDE MIXTURES

Thomas C. Quinby, Kingston, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 13, 1977, Ser. No. 787,128

Int. Cl.[2] B22F *1/02;* **C21C** *15/00;* **C22B** *5/02;* **C22C** *43/00*

U.S. Cl. 75—.5 BC **10 Claims**

1. A method of preparing particulate metal or metal oxide of controlled particle size comprising:

a. contacting an aqueous solution containing dissolved metal values with excess urea at a temperature sufficient to cause urea to react with water in said aqueous solution to provide a molten urea solution containing said metal values;

b. heating said molten urea solution containing metal values to cause said metal values to precipitate forming a mixture containing precipitated metal values;

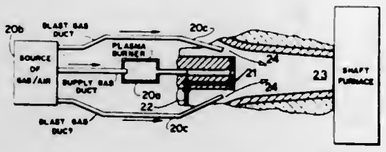
c. heating said mixture containing precipitated metal values to evaporate volatile material from said mixture, leaving a dry powder containing said metal values.

4,072,502

METHOD APPARATUS FOR INCREASING BLAST GAS TEMPERATURE IN A SHAFT FURNACE

Sven Santén, Hofors, and Carl Erik Grip, Lulea, both of Sweden, assignors to SKF Industrial Trading and Development Co. B.V., Nieuwegein, Netherlands and Norrbottens Jarnverk AB, Lulea, Sweden

Division of Ser. No. 449,784, March 11, 1974, Pat. No. 3,970,290. This application Sept. 19, 1975, Ser. No. 614,857
Claims priority, application Sweden, Mar. 26, 1973, 7343333
Int. Cl.[2] C21C *5/52*
U.S. Cl. 75—11 5 Claims



1. In a method of reducing ores in a shaft furnace which includes a tuyere and is operable with a first source of fuel fed into the upper part of the furnace, a source of blast gas, and means for flowing said gas through said tuyere into said furnace, the improvement in combination therewith comprising the steps: providing a source of additional fuel comprising a liquid hydrocarbon for increasing the blast gas temperature, providing a plasma burner, dividing said blast gas into first and remaining portions, flowing said first portion of said blast gas into said burner, heating said first portion of said blast gas in said burner by generating therewith a plasma, flowing said heated portion of said blast gas through a central passage in a nozzle which discharges into said tuyere, flowing said additional liquid fuel into said nozzle and discharging same in an annular flow generally surrounding said central passage, and thereby mixing said liquid fuel and said heated portion of the blast gas, and heating and gasifying said fuel which forms with said heated portion of the blast gas a first mixture, intermixing in said tuyere said first mixture and said remaining portion of said blast gas, thus forming a second mixture, and flowing said second mixture into said furnace at said tuyere level, where said additional fuel is substantially completely burned.

4,072,503

THERMAL TREATMENT OF LEACHING RESIDUE FROM HYDROMETALLURGICAL ZINC PRODUCTION

Stig Arvid Petterson, Skalleftehamn, Sweden; Tor Lindstad, Bjorkmyr, Norway; Frøystein Dyvik, Odda, Norway, and Georg Steintveit, Odda, Norway, assignors to Det Norske Zinkkompani A/S, Odda, Norway

Filed Mar. 19, 1975, Ser. No. 559,706
Claims priority, application Norway, Mar. 21, 1974, 741026
Int. Cl.[2] C22D *7/06*
U.S. Cl. 75—14 13 Claims

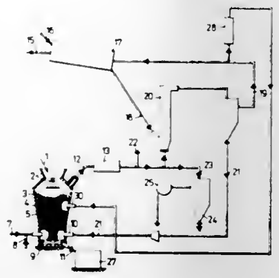
1. A method of treating residual material from the hydrometallurgical production of zinc which material consists of the leaching residue, iron precipitates from the leaching solution or mixtures of both from such production and which material contains zinc, lead and iron which method comprises heating and melting said residual material in a reactor under oxidation conditions at partial oxygen pressure to form lead oxide from the lead present in said residual material by supplying air to said material during such heating; said partial oxygen pressure being at least sufficient to prevent formation of lead sulphide; thereafter heating the oxidized material to fume off zinc in its elemental form by the addition of a reducing agent in a quantity sufficient to provide a partial oxygen pressure low enough to substantially reduce the lead and zinc yet high enough to avoid the simultaneous reduction of iron present; thereafter recovering at least the zinc from the fume and the lead as a melt; and the iron remaining in a slag.

4,072,504

METHOD OF PRODUCING METAL FROM METAL OXIDES

Örn Gunnar Perdahl, Lulea, and Sven Oscar Santen, Hofors, both of Sweden, assignors to Aktiebolaget Svenska Kullagerfabriken, Goteborg, Sweden

Continuation of Ser. No. 435,520, Jan. 22, 1974, abandoned. This application Mar. 24, 1976, Ser. No. 669,863
Claims priority, application Sweden, Jan. 26, 1973, 7301099
Int. Cl.[2] C21B *11/00*
U.S. Cl. 75—40 6 Claims



1. A method for producing liquid metal from metal oxides selected from the group consisting of oxides of tungsten, chromium, manganese, nickel, and iron and mixtures thereof by a first pre-reduction step and a final reduction and melting step, comprising;

(a) as said pre-reduction step, contacting said metal oxides with outgoing reducing gases from step (d) to pre-reduce said metal oxides to a degree of pre-reduction of at least 33%;

(b) feeding solid non-particulate reducing material to the top of a shaft furnace reactor to substantially fill said reactor;

(c) heating the bottom of said reactor to at least the melting point of the metal being produced to supply sufficient heat energy to cover the heat demand for said final reduction and melting step; and

(d) as said final reduction and melting step, blowing said pre-reduced metal oxides with a carrier gas through tuyeres into the bottom of said substantially filled reactor to contact said pre-reduced metal oxides with said solid reducing material to completely reduce said metal oxides and produce liquid metal and reducing gas.

4,072,505

METHOD OF SLAGGING MOLTEN METAL

Peter Hausen, and Klaus-Dieter Schulz, both of Dortmund, Germany, assignors to Hoesch Werke Aktiengesellschaft, Dortmund, Germany

Filed Oct. 6, 1976, Ser. No. 729,941
Claims priority, application Germany, Oct. 9, 1975, 2545262; Dec. 19, 1975, 2557362; Dec. 19, 1975, 2557361; Mar. 17, 1976, 2611203
Int. Cl.[2] C21C *7/00*
U.S. Cl. 75—61 12 Claims

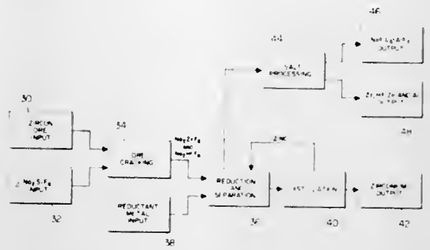
1. A method of removing slag from metal baths, in metallurgical vessels by means of a rabble, which includes the steps of: slightly tilting the vessel containing the slag covered metal bath while simultaneously by means of a rinsing gas first creating a slag-free zone on the bath surface at the lifted side of the vessel, subsequent to the creation of the slag-free zone at the temperature of the metal bath applying a synthetic slag powder to the slag-free bath surface to form a coherent viscous slag, placing a rabble on said slag-free zone of the bath surface, and moving said rabble substantially along the plane of said slag-free bath surface zone in the direction toward the lowered side of said vessel thereby pushing the collectively melted synthetically entrapped proceeding slag with the aid of said rabble for removal thereof toward and over the lowered rim arc of said vessel.

4,072,506

METHOD OF SEPARATING HAFNIUM FROM ZIRCONIUM

Joseph Allen Megy, Corvallis, Oreg., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Oct. 17, 1975, Ser. No. 623,325
Int. Cl.[2] C22B *34/14*
U.S. Cl. 75—63 17 Claims



1. The method of separating hafnium from zirconium, which comprises the steps of:

preparing a molten metal phase which comprises a solution of unseparated zirconium and hafnium and a solvent metal; and

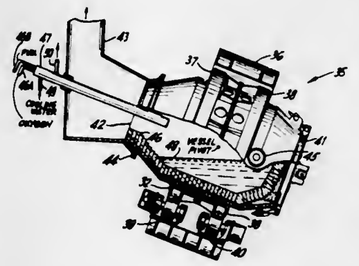
contacting the molten metal phase with a fused salt phase which includes a zirconium salt as one of its components, whereby zirconium and hafnium separation is effected by mutual displacement, with hafnium being transported from the molten metal phase to the fused salt phase while zirconium is transported from the fused salt phase to the molten metal phase.

4,072,507

PRODUCTION OF BLISTER COPPER IN A ROTARY FURNACE FROM CALCINED COPPER-IRON CONCENTRATES

Harold P. Rajcevic, Colonia; William R. Opie, Holmdel, and Dominic C. Cusanelli, South Plainfield, all of N.J., assignors to Amax Inc., Greenwich, Conn.

Division of Ser. No. 582,181, May 30, 1975, Pat. No. 4,006,010. This application July 29, 1976, Ser. No. 709,704
Int. Cl.[2] C22B *15/00*
U.S. Cl. 75—74 11 Claims



1. A method for the production of blister copper from copper-iron concentrate containing about 15 to 45% Cu, about 15 to 40% Fe, about 20 to 45% S, the total Cu, Fe and S content being at least about 85% and the balance gangue and residual metals which comprises,

dead roasting said sulfide concentrate at a temperature above 800° C to remove the sulfur therefrom and form a calcine containing ferric iron oxide as evidenced by the presence of substantial amounts of magnetic copper ferrite,

forming a smeltable charge in a rotary furnace comprising said calcine mixed with particulate carbonaceous reducing agent correlated to reduce copper oxide in said calcine and reduce said ferric iron oxide to FeO,

the amount of said carbonaceous reducing agent ranging from about 4 to 10% by weight of said calcine,

said charge also containing slag-forming constituents comprising SiO_2 proportioned to combine with reduced iron oxide and provide a slag having a melting point below 1250° C and having an Fe/SiO_2 ratio of about 1.2:1 to 4:1,

subjecting said charge to heating to a smelting temperature above the melting point of copper by directing a combusting stream of oxygen and a hydrocarbon fuel axially into said rotatable furnace from one end thereof while causing said charge to cascade by rotating said furnace,

the ratio of said oxygen to said hydrocarbon fuel being at least sufficient to effect substantially complete combustion of said fuel plus an excess of oxygen ranging from about 3% to 10% by volume,

continuing cascading said charge in said furnace, the residence time of said charge in said furnace being sufficient to reduce rapidly the copper oxide to molten blister copper containing less than about 1% iron and to form a molten fluid slag,

and then separating said blister copper from said slag.

4,072,508

METHOD FOR RECOVERING PALLADIUM FROM SPENT PALLADIUM CATALYSTS

Ludek Vodicka; Ivo Peka, and Voktor Suchy, all of Praha, Czechoslovakia, assignors to Vysoka skola chemicko-technologicka, Praha, Czechoslovakia

Filed Dec. 17, 1976, Ser. No. 751,791
Claims priority, application Czechoslovakia, Dec. 29, 1975, 8998/75
Int. Cl.[2] C22B *11/04*
U.S. Cl. 75—121 5 Claims

1. A method for recovering palladium values from spent palladium catalysts and ash thereof which comprises the steps of fluorinating the spent catalyst and ash at a temperature which increases gradually from 200° - 500° C and decomposing palladium fluorides so obtained with a mineral acid at a temperature ranging from 90° - 100° C to obtain palladium values in solution.

4,072,509

STEEL FOR NUCLEAR APPLICATIONS

Nikolai Nikolaevich Zorev, ulitsa Novinki, 6, kv. 23; Anatoly Alexandrovich Astafiev, Sharikopodshipnikovskaya ulitsa, 2, kv. 34; Alexandr Sergeevich Loboda, Otkrytoe shosse, 6, korpus 3, kv. 48; Vladimir Pavlovich Savukov, Simonovsky val, 19, kv. 21; Andrei Efimovich Runov, Zatonnaya ulitsa, 17, kv. 51, all of Moscow; Vladimir Alexandrovich Belov, Kolpino, ulitsa Very Slutskoi, 9, kv. 20, Leningrad; Jury Vasilievich Sobolev, prospekt Lenina, 10, kv. 10, Leningrad; Valentin Vasilievich Sobolev, Kolpino, ulitsa Pavlovskaya, 84, kv. 43, Leningrad; Nikolai Mikhailovich Pavlov, Kolpino, ulitsa Gromova, 16, kv. 50, Leningrad; Boris Evgenievich Paton, ulitsa Chkalova, 41a, kv. 26; Boris Izrailevich Medovar, ulitsa Anri Barbjusa, 22/26, kv. 109, both of Kiev; Jury Fedorovich Balandin, ulitsa Basseinaya, 117, korpus 1, kv. 35, Leningrad; Igor Vasilievich Gorynin, ulitsa Gromova, 16, kv. 50, Leningrad; Jury Ivanovich Zvezdin, Kostromskoi prospekt, 42, kv. 23, Leningrad; Kuzma Makeevich Ivanov, Nevsky prospekt, 175, kv. 3, Leningrad; Viktor Alexandrovich Ignatov, ulitsa Sofii Kovalevskoi, 10, korpus 2, kv. 169, Leningrad, and July Georgievich Emelyanenko, ulitsa Darvina, 5, kv. 5, Kiev, all of U.S.S.R.

Filed Jan. 5, 1977, Ser. No. 756,972
Int. Cl.[2] C22C *38/42*
U.S. Cl. 75—124 1 Claim

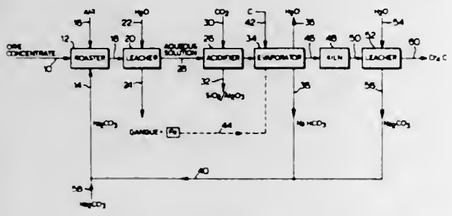
1. A steel consisting essentially of in percent by weight:
carbon from 0.13 to 0.18,
silicon from 0.17 to 0.37,
manganese from 0.30 to 0.60,
chromium from 1.7 to 2.4,
nickel from 1.0 to 1.5,
molybdenum from 0.5 to 0.7,
vanadium from 0.05 to 0.12,
aluminium from 0.01 to 0.035,
nitrogen from 0.005 to 0.012,
copper from 0.11 to 0.20,
arsenic from 0.0035 to 0.0055,
iron and impurities — the balance.

4,072,510

PRODUCTION OF FERROCHROME ALLOY

Allan M. Smellie, Mississauga, and Hans G. Brandstatter, Welland, both of Canada, assignors to Ontario Research Foundation, Mississauga, Canada

Division of Ser. No. 539,246, Jan. 7, 1975, Pat. No. 4,009,247, which is a continuation-in-part of Ser. No. 480,829, June 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 386,019, Aug. 6, 1973, abandoned. This application May 12, 1976, Ser. No. 685,816
Int. Cl.[2] C22C *39/14*
U.S. Cl. 75—130.5 6 Claims



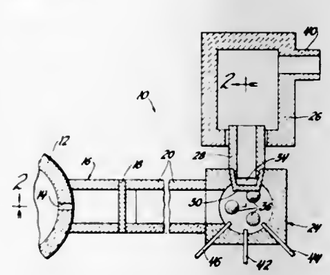
1. A process for the production of a ferrochrome alloy, which comprises forming an intimate admixture of finely-divided carbon, sodium chromate or sodium dichromate and an iron oxide, and reducing said sodium chromate or sodium dichromate and said iron oxide by an in situ solid state reaction in a reaction zone to form a ferrochrome alloy, said intimate admixture containing sufficient proportions of the components thereof to provide a ferrochrome alloy from said reducing step containing 55 to 66% Cr, 7 to 8% C and the balance Fe, said solid state reaction being carried out at a temperature of about 1025° C to about 1425° C while carbon monoxide formed in said solid state reaction is removed from said reaction zone.

4,072,511

METHOD OF PRODUCING SILICON CONTAINING CAST IRON

John D. Coyle, Cedarville, Mich., assignor to Harold Huston, Tonawonda, N.Y. and Ronald Beyerstedt, Wapaca, Wis.

Filed Nov. 26, 1976, Ser. No. 744,985
Int. Cl.[2] C22C *33/08*
U.S. Cl. 75—130 R 12 Claims



1. A method of producing cast iron in a cupola comprising the steps of:
(a) providing an initial cupola charge having a silicon content significantly less than the silicon content required in the melt,
(b) loading and melting the charge in a cupola,
(c) conducting the molten metal to a mixing vessel,
(d) increasing the silicon content by a substantially continuous addition of commercially pure granular silicon carbide to the mixing vessel while simultaneously agitating the molten metal by external means to an extent sufficient to bring the silicon into solution with the molten metal and
(e) conducting the silicon-enriched molten metal away from the mixing vessel.

4,072,512

CHARGE FOR MANUFACTURING ALUMINIUM-SILICON ALLOYS

Jury Ivanovich Brusako, Novo-Izmailovksy prospekt, 37, kv. 42; Sergei Alexandrovich Rzhavin, 17 Iinia, 18, kv. 94; Vasily Pavlovich Kiselev, ulitsa Lensoveta, 48, kv. 10; Mikhail Sergeevich Tarasov, ulitsa Shevchenko, 24, kv. 32; Vladimir Mendeleevich Rapoport, ulitsa Bulvarnaya, 117, kv. 12; Vladimir Vasilievich Timofeev, Gavanskaya ulitsa, 37, kv. 39, all of Leningrad; Raisa Ivanovna Ragulina, prospekt Metallurgov, 21, kv. 40, Zaporozhie; Miro Khristoforovich Alivoivodich, ulitsa 40 let Sovetskoi Ukrainy, 46, kv. 21, Zaporozhie; Anatoly Gavrilovich Kucherenko, prospekt Lenina, 192, kv. 159, Zaporozhie; Anatoly Mikhailovich Varjushenkov, prospekt Shaumiana, 52/1, kv. 45; Elena Pavlovna Isaeva, ulitsa P.Lavrova, 62, kv. 3, both of Leningrad; Ivan Arkhipovich Berezhnoi, ulitsa Patrioticheskaya, 15, kv. 20, Zaporozhie; Vasily Petrovich Rumyantsev, ulitsa Sportivnaya, 25, kv. 62, Zaporozhie; Grigory Safronovich Shpak, ulitsa Tennisnaya, 16, kv. 9, Zaporozhie; Dmitry Semenovich Guz, ulitsa Levoberezhnaya, 14, kv. 5, Zaporozhie; Dmitry Vladimirovich Ilinkov, ulitsa Tregubenko, 13, kv. 5, Zaporozhie; Pavel Ilich Volpin, prospekt Lenina, 210, kv. 16, Zaporozhie; Mikhail Pavlovich Avdeev, 7 kvartal, 30, kv. 7, Shelekhov, Irkutskoi oblasti; Stanislav Arsentievich Artemenko, prospekt Stalevarov, 25a, kv. 27, Zaporozhie, and Ljudmila Pavlovna Khrennikova, ulitsa Dzerzhinskogo, 70, kv. 5, Leningrad, all of U.S.S.R.

Continuation of Ser. No. 591,696, June 30, 1975, abandoned, which is a continuation of Ser. No. 174,532, Aug. 24, 1971, abandoned. This application June 1, 1976, Ser. No. 691,519
Claims priority, application U.S.S.R., Nov. 11, 1970, 1485663; Nov. 11, 1970, 1485661; Nov. 11, 1970, 1485659
Int. Cl.[2] C22C *21/02*
U.S. Cl. 75—148 4 Claims

1. A charge for manufacturing aluminium-silicon alloys, comprising a silica-alumina material and a carbonaceous reducing agent which comprises a mixture of petroleum coke and carbon black, the ratio of petroleum coke to carbon black, as referred to non-volatile carbon content in the charge, ranges from 3.0:1 to 0.5:1.

4,072,513

COPPER BASE ALLOYS WITH HIGH STRENGTH AND HIGH ELECTRICAL CONDUCTIVITY

Stanley Shapiro, New Haven; Eugene Shapiro, Hamden; Brian Mravic, North Haven, and W. Gary Watson, Cheshire, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 559,307, March 17, 1975, Pat. No. 4,007,039. This application Sept. 20, 1976, Ser. No. 724,415
Int. Cl.[2] C22C *9/00*
U.S. Cl. 75—164 5 Claims

1. A high conductivity and high strength copper base alloy consisting essentially of 0.8 to 5% by weight titanium as a first component, 1.2 to 5% by weight of a second component selected from the group consisting of antimony, phosphorus, silicon, arsenic, germanium, tin and mixtures thereof, balance copper, wherein the first and second components are present at an atomic ratio of not more than 10% above 5 atoms of said first component per 3 atoms of said second component.

4,072,514

MAGNESIUM COMPOSITES AND MIXTURES FOR HYDROGEN GENERATION AND METHOD FOR MANUFACTURE THEREOF

Masahiro Suzuki, 423, Yasaka, Kakegawa, Shizuoka, Japan

Division of Ser. No. 451,141, March 14, 1974, Pat. No. 3,957,483, which is a continuation-in-part of Ser. No. 242,790, April 10, 1972, abandoned. This application Mar. 8, 1976, Ser. No. 665,115
Claims priority, application Japan, Apr. 20, 1971, 46-10288
Int. Cl.[2] C22C *23/00*; C01B *1/07*
U.S. Cl. 75—168 R 2 Claims

1. A method for the manufacture of a magnesium mixture capable of inducing generation of hydrogen upon reaction with water in the presence of one member selected from the group consisting of NaCl and KCl, which method is characterized by melting magnesium, adding to the molten magnesium 0.01 to 30% by weight based on magnesium of an iron-containing powder selected from the group consisting of iron and iron oxide powder having a particle diameter not larger than 200 mesh; dispersing the iron-containing powder in the molten magnesium; and thereafter cooling the resultant mixture.

4,072,515

ELECTRICAL CONTACT MATERIAL

Kenya Motoyoshi; Masahiro Kume, and Yoshinari Amano, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed July 3, 1974, Ser. No. 485,579
Claims priority, application Japan, July 5, 1973, 47-762654
Int. Cl.[2] C22C *5/06*
U.S. Cl. 75—173 A 3 Claims

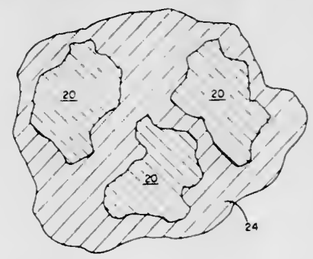
1. An electrical contact material of silver-indium oxide type, which is produced by the internal oxidation of an alloy consisting of 6–15% by weight indium, 0.2–8% by weight tin, 0.01–1% by weight magnesium and the balance silver.

4,072,516

GRAPHITE FIBER/METAL COMPOSITES

Roger T. Pepper, Cape Elizabeth, and Thomas A. Zack, Scarborough, both of Maine, assignors to Fiber Materials, Inc., Biddeford, Maine

Filed Sept. 15, 1975, Ser. No. 613,333
Int. Cl.[2] H01B *1/04*; H01C *1/04*
U.S. Cl. 75—229 7 Claims



1. A composite product comprising a plurality of carbon fibers each having a coating of a mixture of silicon oxide and silicon carbide, said fibers being disposed in a substantially solid matrix of metal.

2. A composite as defined in claim 1 wherein said metal is a carbide forming metal selected from the group consisting of aluminum, magnesium, titanium, nickel, alloys of said metals, and alloys which comprise one of said metals in major proportion.

4,072,517

MIGRATION IMAGING METHOD

William L. Goffe, Webster, and Joseph Mammino, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 572,762, April 29, 1975, abandoned, which is a division of Ser. No. 181,990, Sept. 20, 1971, Pat. No. 3,933,491, which is a continuation-in-part of Ser. No. 837,592, June 30, 1969, which is a continuation-in-part of Ser. No. 553,837, May 31, 1966, abandoned, and Ser. No. 837,591, June 30, 1969, Pat. No. 4,013,462. This application July 19, 1976, Ser. No. 706,318
Int. Cl.² G03G 13/22
U.S. Cl. 96—1 PS 25 Claims

1. An imaging method comprising the steps of:

a. providing an imaging member comprising a photoconductive softenable material layer containing migration marking particles;

b. electrically charging said member;

c. exposing said member to an image pattern of activating radiation and;

d. developing an image by decreasing the resistance of the photoconductive softenable material to migration of migration marking particles through the photoconductive softenable material whereby selected portions of the migration marking particles imagewise migrate in depth in the softenable layer.

4,072,518

METHOD OF MAKING TRIGONAL SELENIUM INTERLAYERS BY GLOW DISCHARGE

Lewis B. Leder, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 30, 1976, Ser. No. 755,704
Int. Cl.² G03G 5/082; B05D 3/06
U.S. Cl. 96—1.5 R 8 Claims

1. A method for controlling the amount of crystalline photoconductive selenium or selenium alloy material initially applied to a xerographic base or substrate comprising exposing the base or substrate, as a cathode, to a vapor cloud comprising uncharged photoconductive material plus oppositely charged high energy photoconductive material and inert gaseous ions; the vapor cloud being obtained essentially by vaporizing selenium or selenium alloy in a vacuum coater in convenient proximity to a glow discharge in the presence of an inert ion-forming gas and thereafter exposing the base or substrate to an un-ionized vapor cloud at least initially comprising selenium and at least .3% by weight arsenic.

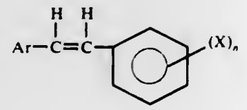
4,072,519

PHOTOCONDUCTIVE COMPOSITION, AND ELEMENT

James M. Pearson, Webster; David J. Williams, Fairport, and William W. Limburg, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 548,455, Feb. 10, 1975, abandoned, which is a continuation-in-part of Ser. No. 454,484, March 25, 1974, abandoned. This application Aug. 11, 1976, Ser. No. 713,475
Int. Cl.² G03G 5/04
U.S. Cl. 96—1.5 R 9 Claims

1. A photoconductive composition comprising a solid solution of at least one photogenerator compound represented by the formula



wherein

Ar is indolyl, N-alkyl 2-carbazyl, julolidinyl and the substituted analogues thereof, wherein said substituents are capable of releasing electrons to the relatively electron deficient centers within the compound;

X is $-NO_2$ or halogen; and

n is from 1 to 5

and an insulating polymeric matrix, said polymeric matrix being capable of rapid and efficient transport of charge carriers of at least one polarity.

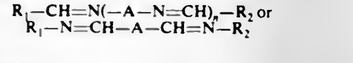
4,072,520

ELECTROPHOTOGRAPHIC DUAL LAYER RECORDING MATERIAL

Jürgen Rochlitz, Breckenheim, and Gunter Schön, Wiesbaden, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Apr. 25, 1973, Ser. No. 354,320
Claims priority, application Germany, Aug. 30, 1972, 2242595
Int. Cl.² G03Q 5/06
U.S. Cl. 96—1.5 R 6 Claims

1. An electrophotographic recording material comprising an electroconductive support material with a photoconductive double layer of organic materials composed of a homogeneous, uniform, opaque, charge carrier producing layer of tightly packed dyestuff molecules, prepared by high vacuum evaporation of the dyestuff, and a transparent top layer of insulating materials with at least one charge transporting compound, in which the organic dyestuff layer is composed of a compound of the general formula



in which

R_1 and R_2 are identical or different and stand for an optionally substituted phenyl, styryl, crabazyl, anthryl, pyrenyl of fluorenyl group,

n is 0 or 1, and

A is a optionally substituted aromatic and/or heterocyclic ring system selected from the group consisting of benzene, diphenyl, naphthalene, pyrene, perylene, diphenylether, diphenylamine, benzophenone, oxazole, imidazole, pyrazole, thiazole, oxadiazole, bisphenyl-oxadiazole, benzbis-thiazole, carbazole and xanthene groups,

and in which the transparent top layer is composed of a mixture of a charge transporting oxadiazole compound having an extended π-electron system, which recording material is useful in an electrophotographic copying process with negative charging of the top layer, if an electron-donating compound is used, and is useful in an electrophotographic copying process with positive charging of the top layer, if the top layer contains an electron-accepting compound.

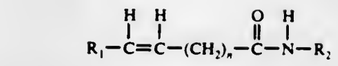
4,072,521

AMIDES OF ω — AND CIS ALKENOIC ACIDS IN IMAGING PROCESS AND ELEMENT

Charles G. Scouten, Webster, N.Y., and Willard C. Hamilton, Morganville, N.J., assignors to Xerox Corporation, Stamford, Conn.

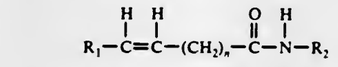
Filed June 3, 1976, Ser. No. 692,262
Int. Cl.² G03Q 13/22, 5/02, 5/04
U.S. Cl. 96—1.5 R 27 Claims

1. In an imaging process comprising the steps of forming a latent image on an imaging surface, developing said latent image by bringing a developing material within the influence of said latent image to form a powder image corresponding to said latent image, and removing at least a portion of at least any residual developed image from said imaging surface; the improvement comprising treating said imaging surface with an effective amount of a deposit forming material comprising amides of the structure



where R_1 is H or an alkyl group of 1 to about 18 carbon atoms, and n is an integer having a value such that the total number of carbon atoms is from about 10 to about 22 and where R_2 is H, phenyl, lower alkyl substituted phenyl, and lower alkyl groups where lower alkyl includes from 1 to about 7 carbon atoms in branched, straight chained, or cyclic configuration.

14. An imaging member wherein the imaging surface of said imaging member is provided with an adherent deposit of a material comprising amides of the structure



where R_1 is H or an alkyl of 1 to about 18 carbon atoms, and n is an integer having a value such that the total number of carbon atoms is from about 10 to about 22, and where R_2 is H, phenyl, lower alkyl substituted phenyl, and lower alkyl groups where lower alkyl includes from 1 to about 7 carbon atoms in either branched, straight chained, or cyclic configuration.

4,072,522

METHOD OF TREATING PHOTOCONDUCTIVE ZINC OXIDE

Hajime Miyatuka, Asaka, Japan, assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 583,074, June 2, 1975, abandoned, which is a continuation-in-part of Ser. No. 193,482, Oct. 28, 1971, abandoned. This application Nov. 15, 1976, Ser. No. 741,588
Int. Cl.² G03G 5/08
U.S. Cl. 96—1.8 5 Claims

1. A method of treating photosensitive zinc oxide to enhance its suitability for obtaining improved continous tone imaging and liquid development, comprising dispersing photosensitive zinc oxide particles uniformly in a distribution promoting liquid agent containing at least one of chloric acid, nitric acid, acetic acid, oxalic acid or formic acid applied in a concentration of about 10^{-4} to 10^{-6} mole of acid per gram of zinc oxide; and heat treating the uniformly dispersed and dried material in a temperature range of about 400° C. up to 700° C.

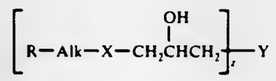
4,072,523

DEVELOPMENT OF PHOTOGRAPHIC SILVER HALIDE MATERIAL

Robert Joseph Pollet, Vremde; Francis Jeanne Sels, Kontich, and Camille Angelina Vandeputte, Mortsel, all of Belgium, assignors to AGFA-GEVAERT, N.V., Mortsel, Belgium

Filed Jan. 13, 1976, Ser. No. 648,723
Claims priority, application United Kingdom, Jan. 22, 1975, 2867/75
Int. Cl.² G03C 5/30, 1/48, 7/00, 7/16
U.S. Cl. 96—22 24 Claims

1. A method of developing a photographic element containing imagewise developable silver halide wherein development occurs in the presence of a compound, incorporated in the element or in the developer, corresponding to the following general formula and containing in its molecule at least one thioether sulphur atom linked to two carbon atoms:



wherein:

R is hydrogen, hydroxy, hydroxyalkyl, alkoxy, alkylthio or alkylamino,

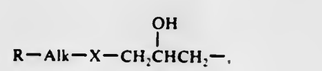
Alk is an alkylene group which may be interrupted by —O—, —S—, or —N(Q)— wherein Q is hydrogen or a C_1-C_5 alkyl group,

X is —O—, —S— or —N(Q)— wherein Q has the above meaning, and the value of z and the significance of Y are interdependent:

z being 1 for Y being hydroxy or the group —X'—Alk'—R' wherein X', Alk' and R' have the same significance as X, Alk and R,

z being 2 for Y being —O—, —S— or —N(Q)— wherein Q has the above meaning, and

z being a positive integer of at least 1 for Y being the residue of an aliphatic compound with more than one alcohol, thiol or amine function in which all or part of the alcohol-, thiol-, or amine-hydrogen atoms are replaced by the group



and

wherein the or at least one of the hydroxyl groups may have been converted into groups of the formula —OZA wherein Z is CO, SO_2 or CONH, and A is an alkyl or aryl group and wherein at least one of R, Alk, X and Y is or includes a thioether sulphur atom.

4,072,524

MIXTURES YIELDING THERMALLY STABLE PHOTO-CROSSLINKABLE LAYERS AND FOILS

Wolfgang Kleeberg, Erlangen; Roland Rubner, Rottenbach u Forchheim, and Wieland Bartel, Furth, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 3, 1975, Ser. No. 637,189
Claims priority, application Germany, Dec. 6, 1974, 2457882
Int. Cl.² G03C 5/00
U.S. Cl. 96—35.1 19 Claims

1. A composition comprising a mixture of;

a. a triallyl cyanurate prepolymer and/or a precopolymer of triallyl cyanurate with a compound containing a radical selected from the group consisting of allyloxy, allylester and mixtures thereof; and

b. a compound containing at least one N-maleimide group wherein the C=C double bond of the N-maleimide group is bonded to two radicals selected from the group consisting of hydrogens, hydrogen and chlorine, and hydrogen and methyl.

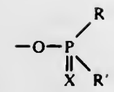
4,072,525

SILVER HALIDE PHOTOGRAPHIC MATERIAL CONTAINING TWO-EQUIVALENT COLOR COUPLER

Kozo Inouye; Yukio Yokota, and Kiyoshi Nakazyo, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 4, 1976, Ser. No. 711,746
Claims priority, application Japan, Aug. 8, 1975, 50-96435
Int. Cl.² G03C 7/00, 1/40
U.S. Cl. 96—55 27 Claims

1. A method for forming color images which comprises developing a silver halide photographic light-sensitive material in the presence of a photographic color coupler in which a hydrogen atom at the coupling position capable of coupling with an oxidation product of an aromatic primary amine developing agent is substituted with the group represented by the following general formula:



wherein R and R', which may be the same or different, each represents an alkyl group, an alkenyl group, an aryl group, an alkoxy group, an alkylthio group, an aryloxy group, a hydroxy group or an amino group; R and R' can combine each other to form a ring, and X represents an oxygen atom or a sulfur atom.

4,072,526

DEVELOPMENT OF PHOTOGRAPHIC SILVER HALIDE MATERIAL

Jeanne Francis Jeanne Sels, Kontich; Robert Joseph Pollet, Vremde; Camille Angelina Vandeputte, Mortsel, and Jozef Frans Willems, Wilrijk, all of Belgium, assignors to AGFA-GEVAERT, N.V., Mortsel, Belgium

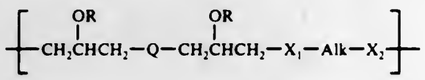
Filed Jan. 12, 1976, Ser. No. 648,722

Claims priority, application United Kingdom, Jan. 22, 1975, 2865/75

Int. Cl.² G03C *5/30, 1/28*

U.S. Cl. 96—66.3 **12 Claims**

1. Method of developing a photographic element containing imagewise developable silver halide wherein development occurs in the presence of a polyaddition compound, incorporated in the element or in the developer, said polyaddition compound being the reaction product of a diepoxide and a polyol under conditions to provide in said polyaddition compound recurring units of the following general formula, the recurring units containing at least one thioether sulphur atom linked to two carbon atoms:



wherein:

Q is —O—, —S—, —S alkylene S— or —O alkylene O— wherein the alkylene group may be interrupted by oxygen or sulphur,

each of X_1 and X_2 represents oxygen or sulphur,

Alk stands for alkylene which may be interrupted by oxygen or sulphur, and

R is hydrogen or COR_1, SO_2R_1 or $CONHR_1$ wherein R_1 is an alkyl group or an aryl group, and

wherein at least one of R, Q, X_1, Alk and X_2 is or comprises a thioether sulphur atom.

4,072,527

OXYGEN BARRIER LAYERS FOR PHOTOPOLYMERIZABLE ELEMENTS

Roxyni Fan, East Brunswick, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 292,501, Sept. 27, 1972, abandoned. This application June 3, 1976, Ser. No. 692,600

Claims priority, application Germany, Sept. 22, 1973, 2347784; Belgium, Sept. 26, 1973, 136064; Japan, Sept. 27, 1973, 48-108053

Int. Cl.² G03C *1/78*

U.S. Cl. 96—87 R **5 Claims**

1. A photopolymerizable element comprising, in order, (1) a support, (2) a solid photopolymerizable stratum, and (3) an adherent, solid, protective stratum over the entire area of said photopolymerizable stratum transparent to actinic radiation, said protective stratum having a thickness of 0.2 to 25 microns and being characterized in that it is (i) nonstrippable as an unsupported film, (ii) substantially impermeable to oxygen, and (iii) water permeable and composed of a macromolecular organic polymer or polymer mixture which is soluble in water or in a mixture of water and a water-miscible organic solvent, said protective stratum having dispersed therein, solid particles of at least one water-insoluble vinyl polymer taken from the group consisting of vinyl pyrrolidone-vinyl acetate copolymer, vinyl acetate-methyl methacrylate copolymer, poly(ethyl acrylate), and poly(methyl methacrylate-ethyl acrylatemethacrylate acid) terpolymer, said particles being at least 0.05 micron in diameter and being present in amounts from 10 to 60 percent by weight of the total polymer in said protective stratum.

4,072,528

OXYGEN BARRIER LAYERS FOR PHOTOPOLYMERIZABLE ELEMENTS

Martin Daniel Bratt, Old Bridge, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 292,503, Sept. 27, 1972, abandoned. This application June 3, 1976, Ser. No. 692,599

Claims priority, application Germany, Sept. 22, 1973, 2347784; Belgium, Sept. 26, 1973, 136064; Japan, Sept. 27, 1973, 48-108053

Int. Cl.² G03C *1/78*

U.S. Cl. 96—87 R **6 Claims**

1. A photopolymerizable element comprising, in order, (1) a support, (2) a solid photopolymerizable stratum, and (3) an adherent, solid, protective stratum over the entire area of said photopolymerizable stratum transparent to actinic radiation, said protective stratum having a thickness of 0.2 to 25 microns and being characterized in that it is (i) non-strippable as an unsupported film, (ii) substantially impermeable to oxygen, and (iii) water permeable and composed of a macromolecular organic polymer or polymer mixture which is soluble in water or in a mixture of water and a water-miscible organic solvent, said protective stratum having dispersed therein, solid particles of at least one water insoluble, chlorinated vinyl polymer selected from the group consisting of vinylidene chloride-acrylonitrile copolymer, vinylidene chloride-lower alkyl acrylate-itaconic acid terpolymer, poly(vinylidene chloride), and poly(vinylidene chloride-methyl methacrylate-itaconic acid) coethyl acrylate, said particles being at least 0.05 micron in diameter and being present in amounts from 10 to 60 percent by weight of the total polymer in said protective stratum.

4,072,529

GELLED PHOTOPOLYMER COMPOSITION AND METHODS OF MAKING THEM

Clayton W. Hoornstra, and Violete L. Stevens, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 20, 1975, Ser. No. 606,260

Int. Cl.² G03C *1/68;* **C08F** *8/00;* **C08G** *18/00*

U.S. Cl. 96—115 R **22 Claims**

1. A reversibly gelled composition, which is free radical-curable in an imagewise fashion by exposure to imagewise modulated actinic radiation and thereafter developable to form an article in relief, which gelled composition is a reaction product of a composition comprising:

Component (a) a first organic polymer bearing, per molecule, at least one ethylenic unsaturated group which is polymerizable by a free radical source; and

Component (b) a second organic polymer bearing, per molecule, at least two Z groups, wherein each Z is independently primary hydroxyl or mercapto;

with the proviso that when Component (a) bears at least two Z groups per molecule, Component (b) may be omitted.

4,072,530

REFRACTORY FURNACE WALL COATING

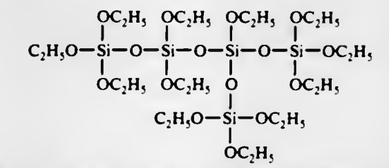
Yasutei Hirame, Kawaguchi, and Youichi Nakamura, Hatogaya, both of Japan, assignors to Fuji Chemical Industries Company, Tokyo, Japan

Filed June 17, 1976, Ser. No. 697,266

Int. Cl.² C04B *35/52*

U.S. Cl. 106—44 **2 Claims**

1. A refractory furnace wall coating composition comprising from about 45 to about 65% by weight of silicon carbide, from about 10 to about 15% by weight of a compound selected from the group consisting of stabilized zirconium oxide, bentonite, and a mixture thereof, from about 5 to about 10% by weight of silicon dioxide, from about 3 to about 5% by weight of a hydrolyzate of a poly (ethyl silicate), said hydrolyzate having the formula



from about 10 to about 20% by weight of a compound selected from the group consisting of sodium silicate, aluminum phosphate, and a mixture thereof, the balance being water, the percent being based on the weight of the composition.

4,072,531

PLUGGING COMPOSITIONS FOR BLAST FURNACE TAP HOLES

Kyohei Funabiki, and Tetsuya Tokunaga, both of Fujieda, Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 639,679, Dec. 11, 1975. This application Mar. 12, 1976, Ser. No. 666,290

Claims priority, application Japan, Mar. 15, 1975, 50-30669

Int. Cl.² C04B *35/02, 35/66, 35/04, 35/66*

U.S. Cl. 106—56 **6 Claims**

1. A blast furnace tap hole plugging composition comprising a condensate resin of a phenol and an aldehyde chemically modified by reaction under heating with a lignin selected from the group consisting of sulfite pulp lignin and kraft pulp lignin, present in an amount of about 5 to about 500 parts by weight per 100 parts by weight of phenol, a refractory filler, and a wetting agent present in an amount of from about 0.5 to about 20 parts by weight per 100 parts by weight of refractory filler, wherein the resin is present in a range of about 5 to about 30 parts by weight per 100 parts by weight of refractory filler.

4,072,532

HIGH TEMPERATURE RESISTANT CERMET AND CERAMIC COMPOSITIONS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Wayne M. Phillips, La Crescenta, Calif.

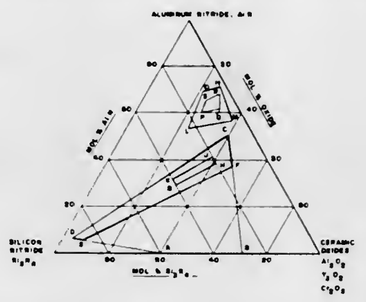
Filed Nov. 20, 1975, Ser. No. 633,876

Int. Cl.² C04B *35/58, 35/70*

U.S. Cl. 106—65 **18 Claims**

1. A high temperature oxidation resistant cermet composition having high strength and abrasion resistance and resistance to thermal shock, comprising a sintered body consisting essentially of high temperature resistant metal particles selected from the group consisting of molybdenum, tungsten, tantalum and niobium particles, dispersed in a solid solution of silicon nitride, aluminum nitride and an oxide selected from the group consisting of aluminum oxide, yttrium oxide and chromium oxide, and mixtures thereof, said cermet composition having good adhesion to substrates of a metal as defined above.

2. A cermet composition having high temperature oxidation resistance, and high abrasion and erosion resistance, high strength and resistance to thermal shock, comprising a sintered body consisting essentially of metal particles selected from the group consisting of molybdenum, tungsten, tantalum and niobium particles, coated with and dispersed in a solid solution of silicon nitride, aluminum nitride and an oxide selected from the group consisting of aluminum oxide, yttrium oxide and chromium oxide, and mixtures thereof, in molar proportions defined by the area bounded by points A, B, C and D on the ternary diagram in the accompanying drawing, said cermet composition having good adhesion to substrates of a metal as defined above.



4,072,533

LIGHTWEIGHT, NON-CEMENTITIOUS BUILDING MATERIAL

Jeffery L. Barrall, and William R. Reed, both of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Oct. 14, 1976, Ser. No. 732,534

Int. Cl.² C04B *35/16*

U.S. Cl. 106—84 **11 Claims**

1. An improved non-cementitious building material comprising sodium silicate and an expanded siliceous inorganic aggregate, the improvement comprising said building material further including an efflorescence inhibitor comprising a boron compound selected from the group consisting of the borates of zinc, calcium, magnesium, and mixtures thereof; a calcium salt selected from the group consisting of calcium nitrate, calcium phosphate, calcium orthophosphate, and mixtures thereof.

4,072,534

SUPER SULPHATE CEMENT REINFORCED WITH GLASS FIBERS

Jack Forrester Ryder, Abbots Langley, England, assignor to National Research Development Corporation, London, England

Filed Dec. 23, 1975, Ser. No. 643,927

Claims priority, application United Kingdom, Dec. 23, 1974, 55453/74

Int. Cl.² C04B *7/02*

U.S. Cl. 106—98 **16 Claims**

1. A process for preparing a glass fibre cementitious composite comprising alkali-resistant glass fibres and supersulphate cement which comprises admixing from 0.5 to 10% by weight, based on the glass fibre/wet cement mix, of said alkali-resistant glass fibres in a supersulphate cement matrix, said alkali-resistant glass fibres comprising from 5 to 20% by weight of a material selected from the class consisting of zirconia and stannia and from 60 to 80% by weight of silica.

4,072,535

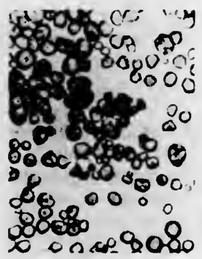
PRECOMPACTED-STARCH BINDER-DISINTEGRANT-FILLER MATERIAL FOR DIRECT COMPRESSION TABLETS AND DRY DOSAGE CAPSULES

Rolland W. P. Short, and Frank Verbanac, both of Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Continuation-in-part of Ser. No. 102,033, Dec. 28, 1970, abandoned, which is a division of Ser. No. 839,590, July 7, 1969, Pat. No. 3,622,677, which is a continuation-in-part of Ser. No. 646,496, June 16, 1967, abandoned. This application Sept. 26, 1975, Ser. No. 617,133

Int. Cl.[2] C08L *3/02*

U.S. Cl. 106—210 **11 Claims**



1. A directly compressible tabletting vehicle having binder-disintegrant properties consisting essentially of a free-flowing, precompacted-starch powder derived from a cold water insoluble granular starch which has been subjected to physical compaction without supplementary thermal energy to obtain a precompacted-starch powder having birefringent granules, non-birefringent granules and non-birefringent fragments of granules in which some aggregates of birefringent and non-birefringent granules and fragments are present, and having a loose bulk density in the range of from about 0.5 to about 0.7 grams per milliliter, a moisture content in the range of from about 9 to about 16%, total weight basis, said precompacted-starch powder being pulverized and screened to obtain a particle size distribution which is free of +40 mesh particles and at least 90% of said precompacted-starch powder is −80 mesh size, at least about 10% is +270 mesh size, and from about 30% to about 90% is −270 mesh size, on a total weight basis, said precompacted-starch powder having a cold water solubility of from 4% to about 40% by weight, and further characterized as capable of being directly compressed into a carrier tablet containing active ingredients, said tablet having a hardness index of at least about 4 kg., a friability weight loss of less than about 1.0%, a swelling power of 2.5 to about 12, and said tablet being capable of effectively disintegrating when placed in water.

4,072,536

WATER-SOLUBLE COATING COMPOSITIONS AND PROCESS FOR THEIR PREPARATION

Yutaka Otsuki, Yokohama; Yoshihiko Araki, Kawasaki, and Kazuho Aoyama, Tokyo, all of Japan, assignors to Nippon Oil Company, Ltd., Tokyo, Japan

Filed Apr. 14, 1976, Ser. No. 676,886

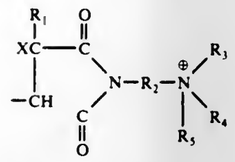
Claims priority, application Japan, Apr. 15, 1975, 50-44802

Int. Cl.[2] C08L *91/08*

U.S. Cl. 106—252 **9 Claims**

1. A coating composition for cathode-precipitating electrodeposition consisting essentially of

(1) a curable resinous film-forming component capable of being rendered water-soluble, said component consisting of an unsaturated organic compound having a molecular weight of 300 to 30,000 containing a carbon-carbon double bond in an amount corrresponding to an iodine number of 50 to 500, said unsaturated organic compound being selected from the group consisting of (a) a homopolymer of a conjugated diolefin containing 4 to 8 carbon atoms, (b) a copolymer of at least two conjugated diolefins containing 4 to 8 carbon atoms, (c) a copolymer of at least one conjugated diolefin containing 4 to 8 carbon atoms and a vinyl monomer having an ethylenic unsaturation containing 2 to 20 carbon atoms, (d) a natural oil, (e) a natural fat and (f) a petroleum resin produced by cationic polymerization of petroleum cracking fractions containing 4 to 10 carbon atoms with a Friedel-Crafts catalyst, said unsaturated organic compound having bonded thereto, through a carbon-carbon bond, organic basic groups of the following formula in aqueous solutions when rendered water-soluble



wherein R_1 is hydrogen, halogen or a hydrocarbon residue containing 1 to 3 carbon atoms, R_2, R_3 and R_4 are identical or different and each represents a hydrocarbon residue containing 1 to 20 carbon atoms, R_5 is hydrogen, and X represents hydrogen or a bond, the amount of said organic basic groups being 0.05 to 0.5 mole per 100 g of the film-forming component, and

(2) an aqueous or organic liquid medium, said film-forming component being rendered water-soluble by neutralization with a water-soluble inorganic or organic acid.

4,072,537

COMPOSITE SILICATE PIGMENT

Frederick L. Kurrle, Laurel, Md., assignor to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 668,436, March 19, 1976, Pat. No. 4,026,721. This application Mar. 2, 1977, Ser. No. 773,749

Int. Cl.[2] C09C *1/28*

U.S. Cl. 106—288 B **5 Claims**

1. A size press formulation suitable for sizing paper or the like comprising an aqueous solution of binder and pigment, the improvement which comprises as the pigment a composite white pigment comprising a clay pigment component having a platelet type structure, said platelets having planar surfaces and a metal silicate pigment component in the form of spherical particles of an alkaine earth metal silicate precipitated on the planar surfaces of the clay platelets, said metal silicate component comprising from about 10-90% by weight of the total composite pigment.

4,072,538

PROCESS FOR THE TWO-STAGE DECOMPOSITION OF HEMI-CELLULOSES TO XYLOSE

Rudolf Fahn, Gammelsdorf; Bernd Brenner, Moosburg, and Hans Buckl, Freising-Tumtenhausen, all of Germany, assignors to Sud-Chemie AG, Munich, Germany

Filed Oct. 4, 1976, Ser. No. 729,058

Claims priority, application Germany, Oct. 8, 1975, 2545110

Int. Cl.[2] C13K *13/00, 1/02*; C07C *31/18*

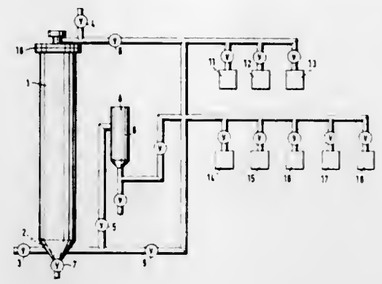
U.S. Cl. 127—37 **19 Claims**

1. In a process for the two-stage decomposition of a hemicellulose of a xylan-containing natural product for the purpose of obtaining xylose wherein the hemi-cellulose of xylan is treated in a first stage with a basic medium and the obtained solid residue is thereafter subjected in a subsequent stage to an acid treatment, the improvement wherein the treatment with said basic medium and said acid are carried out in a single reaction vessel and:

a. in the first stage the hemi-cellulose of xylan-containing material is treated at an atmospheric or elevated pressure and at an elevated temperature with an alkali hydroxide solution, the alkali content of which is sufficient to split off and neutralize acetic acid bound in the hemi-cellulose of the xylan-containing material, and the resultant alkaline solution is filtered off from the reaction vessel to leave behind the solid residue;

b. following the alkali treatment, the solid residue is extracted within the reaction vessel with at least one liquid surge at a temperature of about 20 to 120° C;

c. in the subsequent stage the so-extracted solid residue is



subjected at an elevated pressure and at an elevated temperature to an acid treatment, the acid treatment being effected employing an acid solution, said acid solution being filtered off following contact with said solid extraction residue from the reaction vessel;

d. the resultant acid treated residue is extracted afresh within the reaction vessel with at least one liquid surge at a temperature of about 20° to 120° C;

e. the extract obtained from said extraction and the solution obtained from the acid treatment are processed for the recovery of xylose or xylitol.

4,072,539

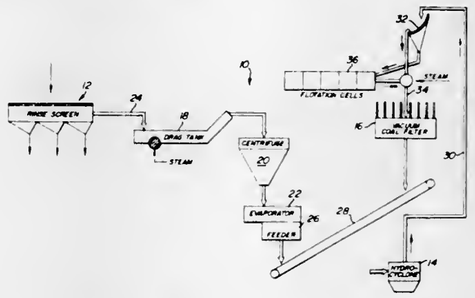
METHOD OF CLEANING RAW ORE

William Benzon, 613 Bittersweet Road, Center Valley, Pa. 18034

Filed Nov. 22, 1976, Ser. No. 743,553

Int. Cl.[2] B08B *7/04*; F26B *1/00, 5/04*

U.S. Cl. 134—25 R **7 Claims**



1. A method of cleaning a raw ore product such as coal comprising the steps of heating the ore product by conveying the ore product through a bath of hot water, then removing surface water from the ore product, and then drying the ore product to the desired moisture content by use of an evaporative cooler, said ore product moving through said evaporative cooler in a downward direction while being contacted by moving air traveling in a transverse direction, said air moving at a rate of substantially between 10,000 and 15,000 cubic feet per ton of ore product.

4,072,540

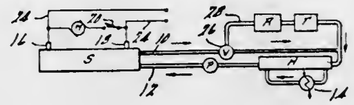
RECHARGEABLE ELECTRICAL ENERGY STORAGE DEVICE

Philip C. Symons, Birmingham, and Carmelo J. Amato, Livonia, both of Mich., assignors to Energy Development Associates, Madison Heights, Mich.

Continuation of Ser. No. 199,966, Nov. 18, 1971, abandoned. This application Feb. 14, 1974, Ser. No. 441,733

Int. Cl.[2] H01M *8/06, 8/18*

U.S. Cl. 429—70 **2 Claims**



1. In an electrically rechargeable electric energy storage system having (a) an electrode compartment means having an inlet means and an outlet means, said electrode compartment means having at least one cell having a positive halogen electrode and a negative metal electrode, wherein during the charge metal ions from an aqueous metal halide electrolyte are deposited onto the metal electrode and halogen is generated at the halogen electrode from the halide ions in the electrolyte, and during discharge the metal and halogen are converted back to the respective ions; (b) a storage compartment means having an inlet means and an outlet means and adapted to contain a halogen hydrate formed during the charging of the system; (c) a conduit means connecting the electrode compartment means and the storage compartment means, whereby electrolyte circulates between the electrode compartment means and the storage compartment means, the improvement which comprises valve controlled bypass means for said conduit means, said by-pass means having heat transfer means and halogen hydrate formation means serially included therein so as to cool the electrolyte which is circulating between the electrode compartment means and the storage compartment means through said conduit means, the halogen hydrate formation means being adapted to form halogen hydrate from the halogen and cool aqueous metal halide electrolyte solution during charging, said by-pass means being adapted to be disconnected from said conduit means after charging.

4,072,541

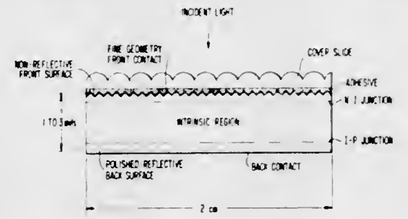
RADIATION HARDENED P-I-N AND N-I-P SOLAR CELLS

Andrew Meulenberg, Jr., and John Harvey Reynolds, both of Gaithersburg, Md., assignors to Communications Satellite Corporation, Washington, D.C.

Continuation-in-part of Ser. No. 634,221, Nov. 21, 1975, abandoned. This application Mar. 3, 1977, Ser. No. 774,164

Int. Cl.[2] H01L *31/06*

U.S. Cl. 136—89 SJ **10 Claims**



1. A radiation hardened solar cell comprising a high purity nominally intrinsic silicon substrate having a resistivity exceeding 100 Ω cm and a thickness of less than 10 mils, said substrate having a first region of one conductivity type formed within one surface of the substrate thereby providing a first junction, and a second region of opposite conductivity type formed

within the opposing surface of the substrate thereby providing a second junction, one of said surfaces forming the back surface of the solar cell and being reflective; and other of said surfaces forming the front surface of said solar cell and being non-reflective.

4,072,542

ALLOY SHEET METAL FOR FINS OF HEAT EXCHANGER AND PROCESS FOR PREPARATION THEREOF

Hiroshi Murakado; Kazuhiro Nakata; Eiki Usui; Tetsuo Tamiya, all of Moka; Masahiro Chikuda, Yokohama, Japan; Yoshinobu Kitao, Shimonoseki, and Akira Fujiwara, Kobe, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed June 30, 1976, Ser. No. 701,402

Claims priority, application Japan, July 2, 1975, 50-82128; Sept. 8, 1975, 50-109351; Oct. 3, 1975, 50-119933

Int. Cl.² C22D *1/04*; C22C *21/00*

U.S. Cl. 148—11.5 A **11 Claims**

1. A process for the preparation of metal sheets for use in the formation of fins of heat exchangers having tube-penetrating holes formed therein by piercing, burling, ironing and flanging steps, which comprises the steps of:

subjecting an Al slab, comprising at least one member from Ti, Zr, Mo, Cr, V, Hf, Ta, W, Nb, Tc and Re capable of peritectic reaction with Al, the amount of said element incorporated within said slab being 0.05 to 0.4% be weight when one element is incorporated therein, and when two or more elements are incorporated therein, the amount of at least one element incorporated therein is 0.05 to 0.4% by weihgt, and the total amount of said elements being incorporated therein is up to 0.5% by weight, and the Al slab further comprises at least one member selected from the group consisting of up to 0.25% by weight of Cu, up to 0.5% by weight of Mg, up to 0.5% by weight of Mn, up to 0.7% by weight of Fe, up to 0.002% by weight of Be, up to 0.1% by weight of B in the form of TiB_2 and up to 0.7% by weight of Si, to a soaking treatment, hot-rolling said slab, and cold-rolling said hot-rolled slab.

4,072,543

DUAL-PHASE HOT-ROLLED STEEL STRIP

Arthur P. Coldren; Geoffrey Tither, and Douglas V. Doane, all of Ann Arbor, Mich., assignors to Amax Inc., New York, N.Y.

Filed Jan. 24, 1977, Ser. No. 761,952

Int. Cl.² C21D *7/14, 9/46*

U.S. Cl. 148—12 F **6 Claims**



1. A dual-phase hot-rolled steel strip characterized as having a microstructure in the as-rolled condition comprised of a substantially continuous matrix comprised predominantly of polygonal ferrite having interspersed therethrough discrete islands of martensite, said steel containing as its essential alloying constituents from about 0.05% to about 0.11% carbon, about 0.6% to about 1.8% manganese, about 0.7% to about 1.2% silicon, about 0.2% to about 0.4% molybdenum, about 0.3% to about 0.9% chromium, up to about 0.1% vanadium, and the balance consisting essentially of iron along with the conventional impurities and residuals present in the usual amounts.

4,072,544

GROWTH OF III-V LAYERS CONTAINING ARSENIC, ANTIMONY AND PHOSPHORUS

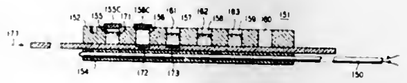
John Christian DeWinter, Howell Township, Monmouth County; Robert Edward Nahory, Lincroft, and Martin Alan Pollack, Westfield, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 676,556, April 13, 1976, Pat. No. 4,032,951.

This application Mar. 29, 1977, Ser. No. 782,354

Int. Cl.² H01L *21/208*

U.S. Cl. 148—171 **7 Claims**



1. In a process for coating a Group III-Group V substrate the steps comprising

heating a solid having gallium, arsenic, antimony and phosphorus constituents so that a growth solution having a solution temperature is formed;

heating said substrate to a temperature comparable to said solution temperature; and

applying said growth solution to said substrate by a liquid phase epitaxial method so that a grown coating results,

said solution including gallium, arsenic, antimony and phosphorus in proportions such that the grown coating is substantially lattice matched to said substrate,

whereby said grown coating is found to be graded in phosphorus content and to have a smooth surface having a lattice constant significantly different from said substrate so that growth of subsequent layers in electronic device manufacture is facilitated.

4,072,545

RAISED SOURCE AND DRAIN IGFET DEVICE FABRICATION

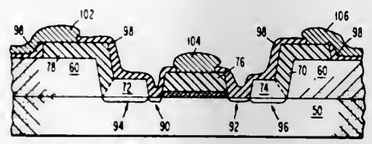
Francisco H. De La Moneda, Reston, Va., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 529,193, Dec. 3, 1974, Pat. No. 4,016,587.

This application May 21, 1976, Ser. No. 688,811

Int. Cl.² H01L *21/265*

U.S. Cl. 148—187 **8 Claims**



8. A process for fabricating an integrated circuit field effect transistor device having shallow source and drain regions, comprising the steps of:

growing a silicon nitride layer on the surface of a silicon substrate;

etching said silicon nitride layer so as to leave a first silicon nitride region and a second silicon nitride region spaced from said first silicon nitride region on the surface of said substrate;

growing a first thermal oxide layer on the exposed portions of the surface of said silicon substrate so as to form a first thermal oxide region surrounding said first and second silicon nitride regions and a second thermal oxide region between said first and said second silicon nitride regions;

etching said second thermal oxide region so as to expose the surface of said substrate beneath same;

growing a second, thin thermal oxide layer between said first and said second silicon nitride regions;

etching said first and said second silicon nitride regions so as to expose the surface of said silicon wafer thereunder as first and second window regions;

depositing a silicon layer on all exposed surfaces;

said silicon layer forming the polycrystalline silicon phase in those regions over said first thermal oxide layer and said thin thermal oxide layer;

said silicon layer forming a first epitaxial monocrystalline region over said first window region exposing said silicon substrate and a second epitaxial monocrystalline region over said second window region exposing said silicon substrate;

etching a first trough between said first epitaxial region and said thin oxide region and a second trough between said second epitaxial region and said thin oxide region;

doping the surface of said substrate exposed by said first and second troughs with a dopant of said second conductivity type;

growing a third thermal oxide layer thicker than said second thermal oxide layer, in said first and second troughs;

forming an electrical contact with each polycrystalline silicon region;

whereby an insulated gate field effect transistor is formed in a process which decouples the fabrication of the shallow source and drain junctions from their conductivity interconnections.

4,072,546

USE OF GRAPHITE FIBERS TO AUGMENT PROPELLANT BURNING RATE

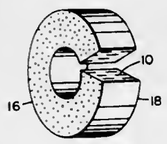
Richard Winer, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation of Ser. No. 210,654, Dec. 22, 1971, abandoned.

This application Nov. 5, 1975, Ser. No. 628,863

Int. Cl.² C06B *45/10*

U.S. Cl. 149—19.8 **12 Claims**



1. A solid propellant composition for use as a solid propellant in rocket motors, said composition being selected from the group consisting of single base, double base, triple base composite and composite modified double base composition types, said solid propellant composition containing a multiplicity of graphite fibers having diameters of from about 4 microns to about 10 microns substantially uniformly distributed throughout said solid propellant composition said graphite fibers comprising from about 0.03% to about 10% by weight based on the weight of the solid propellant composition.

4,072,547

PAPERHANGING HAND TOOL AND METHOD

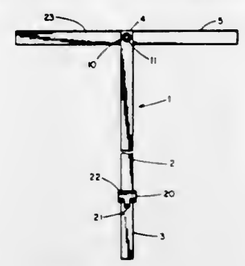
Joseph F. Pavnica, 311 S. Midland, Joliet, Ill. 60436

Filed Oct. 12, 1976, Ser. No. 731,712

Int. Cl.² E04F *13/20*

U.S. Cl. 156—71 **8 Claims**

1. A hand tool for hanging wallpaper, comprising an elongated handle of a preselected length, said handle including hand grasp means extending inwardly from a first end thereof to enable a workman to hold said handle with one hand, clamp means adjacent said hand grasp means to clamp an edge of a roll of wallpaper therein, a crosspiece affixed to the opposite second end of said elongated handle, including a roll of wallpaper draped over said crosspiece having a first fractional length extending along a first side from said crosspiece to said clamp means, the remaining fractional length of said draped over roll of wallpaper extending downwardly from said crosspiece on said opposite second side of said handle and crosspiece,



wherein said first fractional length of said roll of wallpaper is any fraction between one-third and one-half of the total length of said roll of wallpaper cut to wall height.

4,072,548

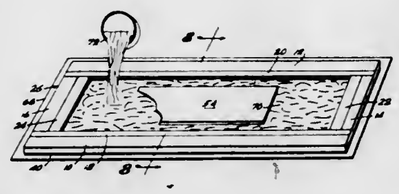
PANEL DOOR AND METHOD OF CONSTRUCTION

Howard S. Gerson, and Bernard Gerson, both of 3802 N.W. 32 Ave., Miami, Fla. 33142

Filed Dec. 27, 1976, Ser. No. 754,559

Int. Cl.² B32B *5/20*

U.S. Cl. 156—79 **5 Claims**



1. Method of constructing a panel door comprising the steps of:

a. Constructing a rectangular skeletal frame having outside and inside faces and defining at least one rectangular opening in a central portion thereof, providing a rectangular mold having a design side and sizing said rectangular opening to said mold prior to assembling said skeletal frame as by staples,

b. laminating a sheet of plywood in a covering relation to said outside face,

c. simultaneously routing out a central portion of said plywood sheet and a peripheral edge portion of said rectangular opening to form a simulated molding strip around said rectangular opening,

d. routing out a key groove in said skeletal frame within and around said rectangular opening,

e. placing said mold in said rectangular opening with said outside face in a down position and said mold design side in an up position and distributing foamable liquid polyurethane over said design side after spraying said design side with a release agent,

f. placing a sheet of polyvinyl chloride over said inside face,

g. placing the door in a press under pressure, sandwiched between said polyvinyl chloride sheet and a protective sheet of material on said outside face for a predetermined period of time until said polyurethane expands and hardens,

h. remove said door from said press and said sheets and mold from said door,

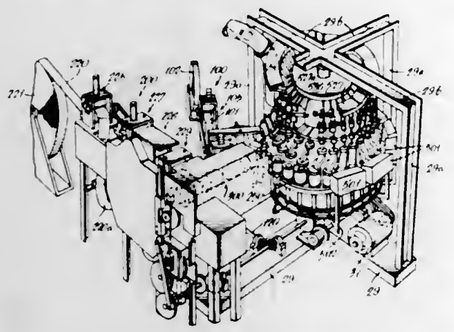
i. laminate a sheet of polyvinyl chloride over said inside surface.

4,072,549

METHOD AND APPARATUS FOR FABRICATING THERMOPLASTIC CONTAINERS

Stephen Amberg, Toledo, Ohio, and Ralph G. Amberg, Monticello, Ind., assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 418,612, Nov. 23, 1973, abandoned. This application Apr. 30, 1976, Ser. No. 681,855
Int. Cl.² B29D *23/10*
U.S. Cl. 156—86 **15 Claims**



1. The method of fabricating a cup-like container comprising the steps of: providing a rectangular blank of heat-shrinkable thermoplastic material; winding said blank about a generally cylindrical wrapping member to provide a tubular shape with a trailing end portion of said blank overlapping a leading end portion; transferring said tubular shape axially on said wrapping member; forming a cylindrical sleeve by joining said overlapping end portions of said tubular shape to one another in a liquid-tight seam extending the full length of said sleeve; providing an upwardly facing mandrel having an enlarged diameter portion at its lower end, the outer surface of said mandrel having the configuration of the inner surface of the sidewall of said container, and having a circumferentially extending concave rimming die portion located at said lower end; heating said mandrel rimming die portion to an elevated temperature; telescoping said cylindrical sleeve over said mandrel; forcing said sleeve axially downwardly about said lower end and into said mandrel rimming die portion to cause a portion of the lower end of the sleeve to be turned upwardly; rotating said mandrel as said sleeve is forced downwardly; advancing a complementary rimming die in juxtaposition with said mandrel rimming die portion during rotation of said mandrel to cause said upwardly turned portion to be directed inwardly to form a curled rim; subsequently exposing the sleeve to heat while it is in position over the mandrel to cause it to shrink so that the inner surface conforms to the outer surface of the mandrel; fusing a bottom closure disc to the end of said shrunken sleeve opposite said rim to form a liquid-tight seal and thus complete said container; and removing said container from said mandrel.

4,072,550

METHOD AND APPARATUS FOR BUILDING A CLOSED TORUS TIRE

Joseph F. Stalter, Jr., Mogadore, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed June 16, 1975, Ser. No. 587,184
Int. Cl.² B29H *17/00*
U.S. Cl. 156—123 R **15 Claims**

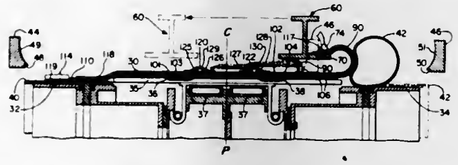
1. A method of manufacturing a closed torus pneumatic tire comprising:

forming a generally cylindrical carcass structure including at least one cord reinforced ply;

positioning a pair of inextensible bead cores coaxially about said cylindrical carcass structure and located in axial directions with respect to the carcass structure substantially in the position they will assume in the completed tire;

forming a first fold in said carcass structure without the aid of any internal restricting devices by radially expanding one axially outer end portion of said carcass structure by bladder means, drawing said one axially outer end portion axially across the central portion of said carcass structure to a predetermined axial position with respect to the bead portions by means of an annular ring having a radially outer annular surface for receiving a rolled-over end of said carcass structure and means for clamping said rolled-over end to said surface to thereby provide for the precise positioning in axial directions of the first fold portion with respect to one said bead core with the fold being free of internal restraint and releasing said one axially outer end portion;

forming a second fold in said carcass structure without the aid of any internal restricting devices by radially expand-



ing one axially outer end portion of said carcass structure by bladder means, drawing said other axially outer end portion axially across the central portion of said carcass structure to a predetermined axial position with respect to the bead portions by means of an annular ring having a radially outer annular surface for receiving a rolled-over end of said carcass structure and means for clamping said rolled-over end to said surface to thereby provide for the precise positioning in axial directions of the second fold portion with respect to the other said bead core with the fold being free of internal restraint to form a lapped portion with said first end portion and releasing said other axially outer end portion;

adhering said lapped portion together to form a closed torus chamber;

providing a belt and tread rubber on said closed torus chamber; and

shaping the chamber to the desired configuration and vulcanizing the tire.

4,072,551

NOVEL DOSAGE FORM

Dennis Joseph Dabal, Whippany, and Joseph James Williams, West Caldwell, both of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Division of Ser. No. 640,608, Dec. 15, 1975, abandoned. This application Feb. 7, 1977, Ser. No. 766,474
Int. Cl.² A61K *9/70*; B31C *11/06*
U.S. Cl. 156—378 **4 Claims**

1. A system for producing solid, pharmaceutical unit dosage forms comprising, in combination:

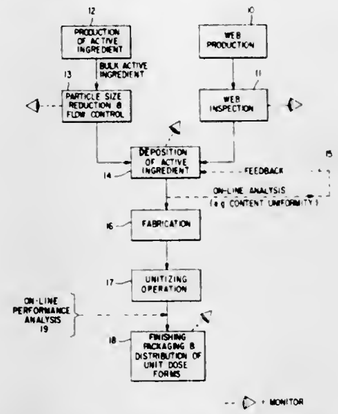
(a) first means for producing a web of edible, therapeutically inert material;

(b) second means receiving said web for loading to said web at least one medicament;

(c) third means receiving said loaded web for fabricating said loaded web into a solid geometric form of predetermined dimensions having said medicament substantially internalized, said form being divisible into a plurality of unit dosage forms, said means including means for cutting said loaded web transversely to form substantially uniform lengths of loaded web each divisible into a plurality of unit dosage forms, means for corrugating each length of web to form it into a loosely wound coil and means for convolute winding said loose coils to form a substantially solid rod;

(d) fourth means receiving said solid rod for cutting said rod transversely to form a plurality of unit dosage forms;

(e) fifth means receiving said unit dosage forms for sealing said unit dosage forms and completely internalizing said medicament; and



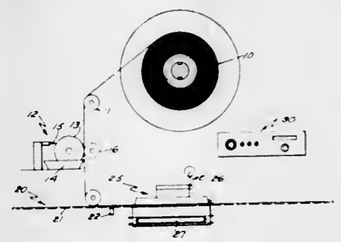
(f) means for testing on-line non-destructively the output of at least one of said first through said fifth means and thereby assure uniform quality of said unit dosage forms, wherein said third means includes means for applying water in predetermined amount to said rod, said means being positioned so that said water is applied only to the trailing edge of said rod and means for removing said water thereby longitudinally sealing said rod.

4,072,552

ULTRAVIOLET BLISTER SEALING MEANS

William D. Ewing, Warren, R.I., assignor to Foxon Packaging Corporation, Providence, R.I.

Filed Nov. 8, 1976, Ser. No. 739,555
Int. Cl.² B32B *19/02*; B65C *11/04*; E04B *1/00*
U.S. Cl. 156—380 **4 Claims**



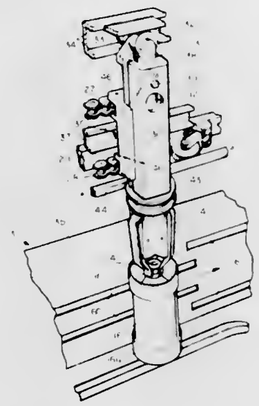
1. A packaging mechanism comprising means for feeding a transparent blister material, means for feeding a backing material, bond means for printing in a pattern ultraviolet curable coating on one of said materials, means for registering said materials, means reciprocating for pressing said materials together and means to expose said bond means to ultraviolet rays during the pressing of said materials together, all of said means operating as the feeding is continuously advanced.

4,072,553

APPARATUS CONTROLLING SHRINKAGE OF A SLEEVE WRAP ON A CONTAINER

Frederick Williams Braker, Toledo; Russell William Heckman, Perrysburg; George Allen Nickey, Toledo, and Terry Clair Potter, Sylvania, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 31, 1976, Ser. No. 672,227
Int. Cl.² B29D *3/00*; B65B *53/06*
U.S. Cl. 156—423 **9 Claims**



1. An apparatus for shrinking a plastic sleeve wrap on a container comprising

a conveyor operable for travel in a closed horizontal path,

a plurality of spaced apart chucks depending with their vertical axes normal to said path and rotatably mounted on said conveyor for rotation about said axes, each said chuck including an axially rotatable belt driven member, the chucks being moved through a container loading station along said conveyor path and operated responsive to movement through said station for grasping containers and suspending them vertically in an upright position for movement and rotation in said path,

a sleeve assembly station along said conveyor path,

means for axially assembling a sleeve of a heat shrinkable plastic material on each said container responsive to movement through said sleeve assembling station,

an elongated oven along said conveyor path spaced beyond said sleeve assembling station and through which said containers with sleeves are conveyed for shrinking the latter on the former,

a movable driving member comprising and endless belt means

means supporting said belt means along the conveyor path for engaging said rotatable member of the chucks during the span of movement of the containers while in the oven, and including

a variable speed drive means operatively connected to the belt means for running the latter at a predetermined speed in one direction along said oven span, wherein said belt means engages the said rotatable member of each of the moving chucks driving them at a rotary speed of at least 100 RPM.

4,072,554

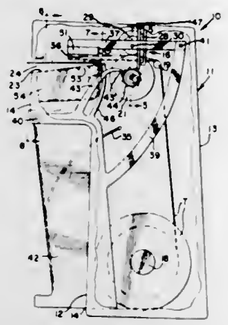
HAND PUNCH AND TAPE REINFORCEMENT APPLICATOR

John D. McKibben, 324 Cottonwood Court, Schaumburg, Ill. 60172

Filed Apr. 5, 1976, Ser. No. 674,045
Int. Cl.² B32B *31/00*; B26D *7/14*; B65M *23/34*
U.S. Cl. 156—514 **9 Claims**

1. A combination paper hole punch and reinforcement tape

applicator comprising a housing, a spindle for supporting a supply of tape, a drive roller supported for rotating movement, a concave peripheral groove in said drive roller for receiving a strip of tape from said supply, a driven roller having a peripheral rib depressing said tape into said groove so as to curl said



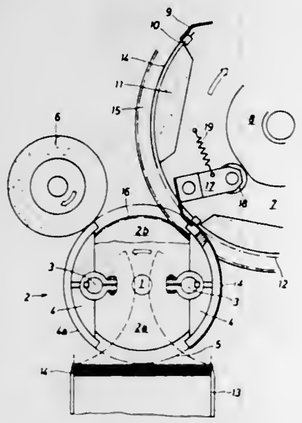
tape across its width, a paper and tape support, a movable tape support arm, a pad assembly for applying said tape to said paper, means moving said tape support arm to create tension in said tape from the end thereof to the support arm, and punch means for punching a hole through said tape and said paper while under tension.

4,072,555

LABEL EXTRACTING AND TRANSFERRING DEVICE

Georg Gau, Obertraubling, Germany, assignor to Hermann Kronseder, Worth, Donau, Germany

Filed Dec. 1, 1975, Ser. No. 636,499
Claims priority, application Germany, Dec. 20, 1974, 2460459
Int. Cl.² B65C *9/08*
U.S. Cl. 156—571 **5 Claims**



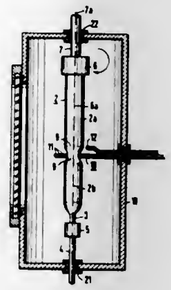
1. In a label extracting and transferring device having a label magazine, a label extracting carrier having arcuately shaped extraction pads, said carrier being rotatably mounted adjacent to said label magazine for extracting labels therefrom, means for coating adhesive over the surfaces of the extraction pads whereby labels extracted thereby from the magazine will stick to the pad surfaces, and a gripper cylinder having arcuately shaped gripper pads, said cylinder being rotatably mounted adjacent to said label extracting carrier for transferring said labels from said carrier to said gripper cylinder, the improvement including means for concurrently rotating said gripper cylinder and label extracting carrier in such manner that the peripheral speed of said label extracting carrier is greater than the peripheral speed of said gripper cylinder, thereby causing the label extracting carrier to tend to overtake the gripper cylinder during mutual rotation thereof, the arcuate surface of the extraction pads diverging from the arcuate surface of the gripper pads to develop a sharp bend in the label to promote peeling it from the adhesive coated surface of the extraction pads as the carriers rotate.

4,072,556

DEVICE FOR CRUCIBLE-FREE FLOATING-ZONE MELTING OF A CRYSTALLINE ROD AND METHOD OF OPERATING THE SAME

Otto Schmidt, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Continuation of Ser. No. 93,649, Nov. 30, 1970, abandoned. This application Oct. 16, 1972, Ser. No. 297,903
Claims priority, application Germany, Nov. 29, 1969, 1960089
The portion of the term of this patent subsequent to Feb. 7, 1993, has been disclaimed.
Int. Cl.² B01J *17/10*
U.S. Cl. 156—620 **4 Claims**



1. Method of operating a device for crucible free zone melting a crystalline rod end-supported by holders, one of which is rotatable about the longitudinal axis thereof, the rod being surrounded by an induction heating coil energizable for heating a molten zone formed in the rod, the coil being formed of at least one winding disposed in a single plane and a connecting lead to the coil formed as a partial winding and disposed outside the plane on a side thereof facing a portion of the rod which is to be zone melted which comprises securing in the rotary holder the portion of the crystalline rod to be zone melted, rotating the rotary holder at a speed within the range of from 0.1 to 1 r.p.m. in the direction of winding of the induction heating coil from partial winding through the main winding of the induction heating coil, heating a molten zone in said rod by said induction heating coil, and heating the edge of said molten zone at the boundary between said molten zone and the portion of the rod which is to be zone melted, said edge being heated by said partial winding whereby the heating applied by said partial winding prevents formation of projections of solid material at said edge.

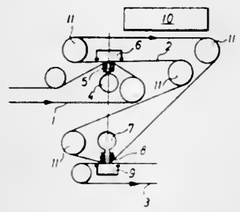
3. In a device for crucible-free zone-melting a crystalline rod, end-supported by holders, an induction heating coil disposed between the end holders and coaxial to said longitudinal axis, said induction heating coil being energizable for heating a molten zone formed in the crystalline rod and comprising at least one winding disposed in a single plane, and a connecting lead to the induction heating coil, said connecting lead being formed as a partial winding and disposed outside said plane on a side thereof facing the portion of the rod which is to be zone melted, the end holder on the same side as the partial winding being mounted for rotation, said partial winding being disposed substantially at the edge of the molten zone at the boundary between said molten zone and the portion of the rod which is to be zone melted, said partial winding thereby preventing formation of projections of solid material at the edge of said molten zone.

4,072,557

METHOD AND APPARATUS FOR SHRINKING A TRAVELLING WEB OF FIBROUS MATERIAL

Christian Schiel, Heidenheim-Schnaitheim, Germany, assignor to J. M. Voith GmbH, Heidenheim (Brenz), Germany

Continuation of Ser. No. 642,371, Dec. 19, 1975, abandoned. This application Feb. 28, 1977, Ser. No. 772,591
Claims priority, application Germany, Dec. 23, 1974, 2461229
Int. Cl.² D21H *5/24*; D21F *2/00*
U.S. Cl. 162—111 **10 Claims**



1. Method of shrinking a travelling web of fibrous material which comprises moving said web of fibrous material disposed on a porous carrier web to an area adjacent a moving transfer web for transfer of said web of fibrous material to said transfer web, maintaining the velocity of said moving transfer web lower than the velocity of said moving porous carrier, maintaining said porous carrier in a convex curvature toward the transfer web in the transfer area, and maintaining a pressure differential between the pressure at the underside of said porous carrier and the topside of said web of fibrous material by gas under pressure in the transfer area acting on the web of fibrous material, said gas under pressure emanating from a fixed position on the side of the carrier web opposite the side carrying the web of fibrous material, to aid in the transfer of said web of fibrous material to said transfer web.

4,072,558

NON-COMBUSTIBLE HARDBOARD SHEET

David Wallace Akerson, St. Paul, Minn., assignor to Conwed Corporation, St. Paul, Minn.

Continuation-in-part of Ser. No. 640,458, Dec. 15, 1975, Pat. No. 4,024,014. This application Feb. 16, 1977, Ser. No. 768,983
The portion of the term of this patent subsequent to May 17, 1994, has been disclaimed.
Int. Cl.² D21H *5/18*
U.S. Cl. 162—145 **10 Claims**

1. A process for producing a hardboard product having a fire rating of Class A according to ASTM Test E-84 comprising:
(a) forming an aqueous slurry of solids and water said solids consisting essentially of the following ingredients:
(i) from about 60% to about 85% by weight mineral material, said mineral material consisting essentially of:
(A) from about 20% to about 85% mineral fibers;
(B) from 0% to about 50% perlite;
(C) from 0% to about 25% of other mineral materials;
(ii) from about 15% to about 40% of a binding system, said binding system consisting essentially of:
(A) from about 5% to about 15% by weight cellulosic fibers;
(B) from about 10% to about 35% of a heat and moisture re-activatable binding agent;
(b) forming a relatively light product by depositing the said aqueous slurry on a forming screen;
(c) drying the said formed product to a moisture content of no greater than about 3% by weight;
(d) applying to each side of the dried product from about 7 pounds per thousand square feet to about 15 pounds per thousand square feet of water;
(e) simultaneously heating and pressing the formed product to reduce its thickness by a factor of at least 1.5 and to increase its density by a corresponding amount.

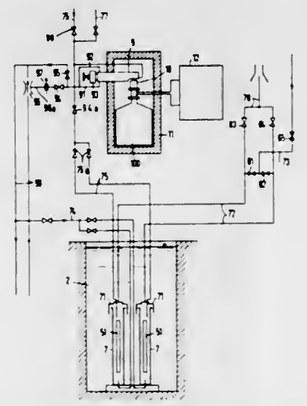
10. A process for producing a hardboard product having a fire rating of Class A according to ASTM Test E-84 from a relatively light dry product having the following ingredients:
(i) from about 60% to about 85% by weight mineral material, said mineral material being composed of:
(A) from about 20% to about 85% mineral fibers;
(B) from 0% to about 50% perlite;
(C) from 0% to about 25% of other mineral materials;
(ii) from about 15% to about 40% of a binding system, said binding system being composed of:
(A) from about 5% to about 15% by weight cellulosic fibers;
(B) from about 10% to about 35% of a heat and moisture re-activatable binding agent;
(iii) said relatively light product having a moisture content of no greater than about 3% by weight; said process comprising:
(A) applying to the light, dry product from about seven pounds per thousand square feet to about fifteen pounds per thousand square feet of a solution comprising water; and, thereafter,
(B) simultaneously heating and pressing the formed product to reduce its thickness by a factor of at least 1.5 and to increase its density by a corresponding amount.

4,072,559

METHOD AND APPARATUS FOR THE ZONE-WISE SHUFFLING OF NUCLEAR REACTOR FUEL ELEMENTS

Herbert Neidl; Günther Kaspar, and Rolf Drossel, all of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 416,684, Nov. 16, 1973, abandoned. This application Nov. 25, 1975, Ser. No. 635,379
Claims priority, application Germany, Nov. 30, 1972, 2258722
Int. Cl.² G21C *17/06*
U.S. Cl. 176—19 LD **4 Claims**



1. A water-cooled reactor installation comprising a reactor pit containing a pressure vessel containing an exposable core of individually removable vertically elongated clad fuel elements, a fuel element storage pit beside said reactor pit and adapted to be water-flooded to a level above said fuel elements when the elements are removed from said core and stored vertically in the storage pit, a fuel element lock interconnecting said pits, a circulating line containing a circulating flow of water, said line circulating water through said storage pit at least up to said level, at least one elongated test chamber vertically positioned in said storage pit and having an open top below said level through which one of said fuel elements can be removably inserted, said test chamber being dimensioned to closely confine any single one of the fuel elements at a time, said test

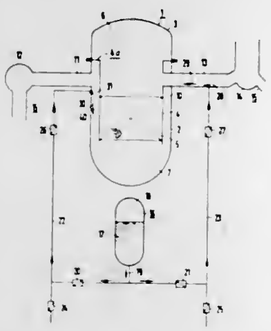
chamber being connected with said circulating flow of water and thereby containing a portion of said water in the form of testing water, a removable air bell closing said open top when said test chamber contains one of said fuel elements and said testing water, controllable means for supplying said air bell with compressed air to form an air cushion holding said testing water stationary in said test chamber for a dwell time causing the water to acquire gamma activity if one of said fuel elements in the test chamber has a cladding defect, means for removing said testing water in the form of a continuous flow of testing water from said test chamber after said dwell time, means for testing said continuous flow of removed testing water for gamma activity and means for returning a thereby tested flow of testing water back to said circulating line.

4,072,560

PRESSURIZED-WATER REACTOR PRESSURE VESSEL EMERGENCY CORE COOLANT CONNECTION ARRANGEMENT

Emmerich Seidelberger, Erlangen, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Sept. 17, 1975, Ser. No. 614,152
Claims priority, application Germany, Sept. 26, 1974, 2446090
Int. Cl.² G21C *9/00*
U.S. Cl. 176—38 **3 Claims**



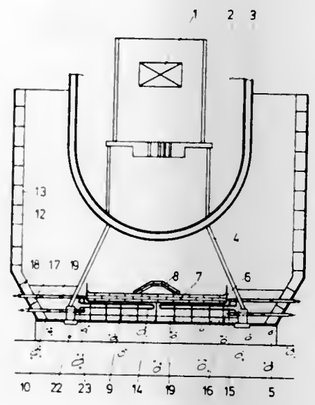
1. A pressurized-water reactor pressure vessel emergency core coolant connection arrangement comprising a pressurized-water reactor pressure vessel having an upstanding wall, a core on the inside of said wall and having a lower edge, an emergency core coolant opening being formed through said wall above said edge, means on said outside for supplying said opening with pressurized emergency core coolant, and nozzle means on the inside of said wall for directing said coolant downwardly substantially parallel with and in contact with said wall in the direction of said edge, a core barrel radially surrounding said core and the barrel forming an annular gap between itself and the inside of the pressure vessel's said wall and the gap having a closed top and an open bottom adjacent to the core's said lower portion, said vessel having a main coolant loop connection with said gap adjacent to the gap's said closed top and said emergency core coolant opening and nozzle means being adjacent to an upper portion of said gap and being separate from said coolant loop connection, said nozzle means being in the form of a cap fixed to the inside of said vessel and covering said emergency core coolant opening, said cap having a closed top and a concave inner surface and a bottom forming a downwardly-directed orifice.

4,072,561

BOTTOM COOLER FOR NUCLEAR REACTORS

Hans-Jurgen Friedrich, Forsbach, Germany, assignor to Interatom, Internationale Atomreaktorbau GmbH, Bensberg, Cologne, Germany

Filed July 28, 1976, Ser. No. 709,306
Claims priority, application Germany, Aug. 11, 1975, 2535729
Int. Cl.² G21C *9/00*
U.S. Cl. 176—38 **7 Claims**



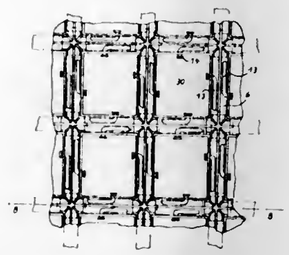
1. In a liquid metal-cooled nuclear reactor having a reactor vessel and a nuclear core received in the reactor vessel, a bottom tray disposed below the reactor vessel wherein the reactor core is received and serving as a receptacle for the reactor core upon melting thereof in the event of a hypothetical accident, and a cooler for the bottom tray comprising: at least one coolant distribution pipe and one collecting pipe disposed below the bottom tray at the circumference thereof, and a multiplicity of hairpin tubes connected in parallel and connecting said distribution and collecting pipes to one another, said tubes extending in radial direction equidistantly from one another and being in the shape of involutes running between the center and circumference of said tray.

4,072,562

DEVICE TO ACCEPT AXIAL FORCES OCCURRING ON FUEL ASSEMBLIES DURING THE OPERATION OF NUCLEAR REACTORS

Melvin F. Sankovich, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Sept. 24, 1976, Ser. No. 726,398
Claims priority, application Germany, Sept. 25, 1975, 2542757
Int. Cl.² G21C *3/04*
U.S. Cl. 176—50 **3 Claims**



1. In a nuclear reactor having upper and lower grid plates, protrusions projecting from the upper grid plate, and fuel assemblies with end fittings, wherein the fuel assemblies are positioned between the upper and lower grid plates, an improved arrangement for accepting axial forces comprising: a

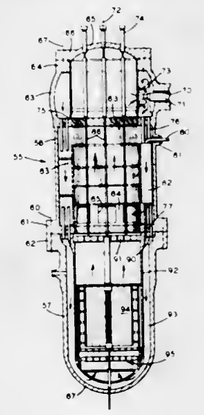
plurality of spring devices, each having a first bending arm, a torsion part, a second bending arm and an upset end; said torsion part fixed at one end to said first bending arm and at its other end to said second bending arm, and said second bending arm terminating in said upset end; each end fitting having a main body, a plurality of compression pieces, and guard plates; said main body having a plurality of grooves of a first type, a plurality of grooves of a second type, and a plurality of slots; each of said spring devices being disposed relative to the end fitting such that said first bending arm is embedded within a groove of said first type, said torsion part rests within a groove of said second type covered partly by one of said guard plates and clamped at its uncovered part by at least one of said compression pieces, said upset end extending through one of said slots; the fuel assembly being disposed such that said second bending arm is biased against the protrusion of the upper grid plate.

4,072,563

INDUSTRIAL TECHNIQUE FOR AN INTEGRAL COMPACT REACTOR

Bertrand N. McDonald, and Donald C. Schluderberg, both of Lynchburg, Va., assignors to The Babcock & Wilcox Company, New York, N.Y.

Filed June 24, 1976, Ser. No. 699,736
Int. Cl.² G21C *19/28*
U.S. Cl. 176—65 **5 Claims**



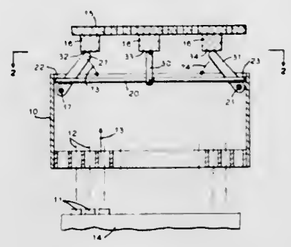
1. An integral nuclear power reactor system comprising a reactor core section that has a longitudinal axis, a heat exchanger section spaced longitudinally from said reactor core section, control rod drive lines passing in a longitudinal direction through said heat exchanger section and into said reactor core section, a pressure vessel having a longitudinal axis that is generally coincident with said reactor core axis, said pressure vessel enclosing said reactor core and attached to said heat exchanger section, an end closure to said heat exchanger section, said reactor core section defining with the inner wall of said pressure vessel an annulus, the integral nuclear reactor system being selectively separable at two longitudinally spaced transverse planes, one of said planes located between said pressure vessel and said heat exchanger section and the other of said transverse planes located between said heat exchanger section and said end closure said end closure having guide tubes attached thereto in order to accommodate said control rod drive lines, and a bundle of generally straight tubes disposed in an annular array within said heat exchanger section establishing fluid communication between said annulus and said end closure.

4,072,564

MOTION RESTRAINING APPARATUS FOR A NUCLEAR REACTOR

Felix S. Jabsen, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Sept. 24, 1976, Ser. No. 726,397
Int. Cl.² G21C *3/30*
U.S. Cl. 176—76 **5 Claims**



1. A motion restraining apparatus for a nuclear reactor that has a fuel element support plate spaced from the reactor core coolant discharge side of the fuel element and in which the fuel element has a plurality of fuel rods with longitudinal axes that are generally parallel to the direction of reactor core coolant flow comprising an end fitting for the coolant discharge side of the fuel element, and torsion bar means mounted within said end fitting to bear against the fuel element support plate and restrain motion of the fuel element in the direction of the core coolant flow.

4,072,565

PRODUCTION OF VIRUSES IN TISSUE CULTURE WITHOUT USE OF SERUM

Stefan Adam Weiss; Harry Lester Torney, both of Carmel, and William Joseph Caldwell, Indianapolis, all of Ind., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 4, 1974, Ser. No. 520,574
Int. Cl.² C12B *3/00*; C12K *9/00*; A61K *39/12*
U.S. Cl. 195—1.1 **15 Claims**

1. In a method which comprises inoculating a chemically defined tissue culture medium with living animal cells and incubating the cells and medium in tissure culture until significant cell growth is obtained, and inoculating the cells with virus, the improvement wherein the incubation is carried out in the presence of a cell growth enhancing amount of protamine zinc insulin U.S.P., B.P. dispersed in said medium; removing the medium containing protamine zinc insulin after significant cell growth is obtained from the cells; replacing said medium with a tissue culture maintenance medium essentially free of protamine zinc insulin; prior to virus innoculation and continuing incubation of the cells in tissue culture.

4,072,566

IMMOBILIZED BIOLOGICALLY ACTIVE PROTEINS

Merrill Lynn, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Sept. 27, 1976, Ser. No. 726,592
Int. Cl.² C07G *7/02*
U.S. Cl. 195—63 **6 Claims**

1. A method of bonding a biologically active protein to an inorganic support material, the method comprising the steps of:

a. reacting a high surface area, water insoluble, inorganic support material having a surface isoelectric point less than 7.0 with a solution of p-phenylenediamine under conditions sufficient to adsorb at least a portion of the p-phenylenediamine to the surface of the support via one of the amino groups on the p-phenylenediamine, the support material having been selected from the group consist-

ing of siliceous materials, stannic oxide, titania, manganese dioxide, and zirconia;

b. separating the support material from the solution and washing it to remove substantially all non-adsorbed p-phenylenediamine; and

c. reacting the separated support material with a solution of biologically active proteins under conditions sufficient to covalently bond at least a portion of the proteins to the support via the remaining available amino groups of the adsorbed p-phenylenediamine without significant loss of biological activity.

4,072,567

COMPOUND WATER-INSOLUBLE GLUCAN AND PROCESS FOR THE PRODUCTION THEREOF

Koji Yokobayashi, Okayama; Tadashi Ikeda, Tokyo, and Akira Misaki, Hyoogo, all of Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan

Filed Dec. 10, 1976, Ser. No. 749,520

Claims priority, application Japan, Dec. 11, 1975, 50-147854

Int. Cl.² C12D *13/04*; C07G *3/00*; C08B *37/00*

U.S. Cl. 195—63 **3 Claims**

1. A water-insoluble glucan composed of non-reducing terminal residues, alpha-(1→3)-linkage residues, alpha-(1→6)-linkage residues, alpha-(1→4)-linkage residues and alpha-(1→3)- and alpha-(1→6)-branched linkage residues in the ratio of 2:4:3:1:2.

2. A process for the production of a water-insoluble glucan including alpha-(1→3), (1→4) and (1→6) glucosidic linkages, comprising cultivating *Streptococcus salivarius* TTL-LP, FERM-P No. 3310 on a sucroce-containing medium to form the water-insoluble glucan, and separating and recovering the glucan from the resulting culture broth.

3. A process for the production of water-insoluble glucan including alpha(1→3), (1→4) and (1→6) glucosidic linkages, comprising cultivating *Streptococcus salivarius* TTL-LP, FERM-P No. 3310 on a sucrose-containing medium to form the water-insoluble glucan, allowing the water-insoluble glucan to contact an aqueous sucrose solution to effect reaction of the mixture and to form more of the water-insoluble glucan, and separating and recovering the water-insoluble glucan from the reaction mixture.

4,072,568

METHOD FOR THE PREPARATION OF CHOLESTEROL OXIDASE

Prakash S. Masurekar, Webster, and Charles T. Goodhue, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 629,955, Nov. 7, 1975, Pat. No. 4,035,237. This application Nov. 5, 1976, Ser. No. 739,379

Int. Cl.² C12D *13/10*

U.S. Cl. 195—65 **2 Claims**

1. In a method for the production of cholesterol oxidase by growing a cholesterol oxidase producing micro-organism in a medium comprising a cholesterol oxidase inducer, the improvement wherein said cholesterol oxidase inducer is β-sitosterol.

4,072,569

PREPARATION OF CLAVULANIC USING *STREPTOMYCES JUMONJINENSIS*

Stephen John Box, Roffey, England, assignor to Beecham Group Limited, United Kingdom

Filed Sept. 24, 1976, Ser. No. 726,135

Claims priority, application United Kingdom, Oct. 29, 1975, 41898/75

Int. Cl.² C12D *9/14*

U.S. Cl. 195—80 R **20 Claims**

1. A process for the preparation of clavulanic acid or a salt thereof which process comprises cultivating a strain of Streptomyces jumonjinensis and isolating clavulanic acid or a salt thereof from the culture.

20. A process for the preparation of clavulanic acid or a salt thereof, which process comprises cultivating Streptomyces jumonjinensis NRRL 5741 or a high yielding mutant thereof, and isolating clavulanic acid or a salt thereof from the culture.

4,072,570

PREPARATION OF A TUBERCULOSIS TEST MEDIUM BY RECONSTITUTING A STORAGE STABILIZED DRY POWDERED LOWENSTEIN-JENSEN MEDIUM

Wilmore Williams, Chicago, Ill., assignor to Beatrice Foods Co., Chicago, Ill.

Continuation of Ser. No. 243,078, April 11, 1972, abandoned. This application Feb. 20, 1976, Ser. No. 659,703

Int. Cl.² B01D *1/16*

U.S. Cl. 195—100 **4 Claims**

1. A method for producing a tuberculoses test medium from a reconstituted dry powdered, storage stabilized Lowenstein-Jensen medium comprising preparing a Lowenstein-Jensen medium which includes fresh whole eggs, nutrient salts and stabilizers, spray drying the medium in a spray dryer at an inlet temperature of between 230° F and 280° F and an outlet temperature of between 160° F and 190° F and under dryer conditions consistent with providing the dried powder with a moisture content of less than 9% by weight, recovering and packaging the dried powder, storing the packaged powder under ambient conditions, forming a reconstituted medium having a solids content of between 10–20% by weight from said powder, and inspissating said reconstituted medium to provide a medium used in testing for tuberculoses.

4,072,571

KLEBSIELLA PNEUMONIAE AND ENTEROBACTER BROTH

Sandra F. Gibson, Chesterfield, and Gregory D. Rodgers, Florissant, both of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed May 3, 1976, Ser. No. 682,659

Int. Cl.² C12K *1/06*

U.S. Cl. 195—100 **8 Claims**

1. A broth medium for the detection of Klebsiella or Enterobacter comprising:

a. a nitrogen source,

b. a carbon source,

c. a vitamin source,

d. a mixture of chemical inhibitors which will inhibit the growth of Escherichia Coli while simultaneously promoting the growth of Klebsiella or Enterobacter, said E. coli inhibitors being 3-(α-acetonylbenzyl) -4-hydroxycoumarin and 2,4 dinitrophenyl hydrazone of α-Ketoglutaric acid and

e. an indicator to indicate the presence of Klebsiella or Enterobacter, at a pH of about 8.

6. A broth medium for the detection of Klebsiella or Enterobacter comprising a nitrogen source, a carbon source, a vitamin source, Escherichia Coli inhibitors, and an indicator to indicate the present of Klebsiella or Enterobacter, at a pH of 8.0, comprising a mixture of sodium desoxycholate and the sodium salt of ricinoleic acid.

4,072,572

E. COLI DETECTION BROTH FOR CLINICAL USE WITH AUTOMATED MICROBIAL ANALYZER

James W. Lanham, St. Louis; Gregory D. Rodgers, Florissant, both of Mo., and Michael C. Meyer, O'Fallon, Ill., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed May 3, 1976, Ser. No. 682,651

Int. Cl.² C12K *1/06*

U.S. Cl. 195—100 **8 Claims**

1. A composition for selectively identifying *E. coli* comprising:

a. a source of nutrients,

b. an indicator to show the presence of *E. coli* organism and,

c. means for inhibiting the growth of other coliform-like organisms which normally give positive results in tests for *E. coli* comprising a combination of coumaric acid, 3,4-dihydroxybenzoic acid, and saponin.

4,072,573

PSEUDOMONAS AERUGINOSA BROTH

Clifton Aldridge, Maryland Heights; Sandra F. Gibson, Chesterfield, and Gregory D. Rodgers, Florissant, all of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed May 3, 1976, Ser. No. 682,653

Int. Cl.² C12K *1/06*

U.S. Cl. 195—100 **12 Claims**

1. A broth medium for detection of *Pseudomonas aeruginosa* comprising:

a. a nutrient source,

b. a nitrate salt to assist in growth of Pseudomonas and pigment production in the condition of limited O_2, and

c. cetyl trimethylammonium bromide to inhibit gram-negative organisms.

4,072,574

SYSTEM FOR IN VITRO ASSAY FOR MUTAGENICITY AND/OR CARCINOGENICITY OF CHEMICALS OR OTHER EXOGENOUS AGENTS

Lawrence A. Loeb, Elkins Park, and Michael A. Sirover, Philadelphia, both of Pa., assignors to The Institute for Cancer Research, Fox Chase, Pa.

Filed July 30, 1976, Ser. No. 710,314

Int. Cl.² C12K *1/00*

U.S. Cl. 195—103.5 R **9 Claims**

1. The method of testing in vitro for the likelihood of mutagenic or carcinogenic properties in a given substance which comprises copying polynucleotides of known composition in the presence of the substance by means of DNA polymerases in a solution which also contains correct complementary nucleotides for said polynucleotides and non-complementary nucleotides for said polynucleotides, and also doing the same incorrect copying in the absence of the substance, and measuring the relative accuracy of the respective copying.

4,072,575

BROTH AND METHOD FOR DETECTING *E. COLI* IN MIXED WATER SAMPLES

James W. Lanham, St. Louis; Ralph A. Wilkinson, Florissant, and Victoria A. Dagy, St. Louis, all of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed May 3, 1976, Ser. No. 682,253

Int. Cl.² C12K *1/04*

U.S. Cl. 195—103.5 M **8 Claims**

6. A method of selectively identifying *E. coli* organism comprising the steps of:

a. inoculating a specimen containing an unknown organism into a medium which comprises,

a. a source of nutrients,

b. an indicator to visually show the acid produced by metabolic activity of *E. coli* organism,

c. an inhibitor comprised of a combination of acetazolamide and paracoumaric acid to inhibit the growth of other coliform-like organisms which normally give positive results in tests for *E. coli*, and

d. an enhancer to stimulate activity of damaged E. coli organisms,

b. incubating the inoculated medium at about 35° to about 38° C for about 4 to about 6 hours,

c. further incubating the inoculated medium at about 44° to about 56° C for about 10 to about 12 hours,

d. observing the presence of *E. coli* organisms by change in the color of the medium.

4,072,576

METHOD FOR STUDYING ENZYMATIC AND OTHER BIOCHEMICAL REACTIONS

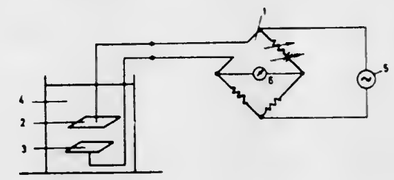
Hans Rune Arwin, V. Frolunda, and Kurt Ingemar Lundstrom, Goteborg, both of Sweden, assignors to AB Kabi, Stockholm, Sweden

Filed Sept. 20, 1976, Ser. No. 724,873

Claims priority, application Sweden, Oct. 6, 1975, 7511148

Int. Cl.² G01N *31/14, 33/16*

U.S. Cl. 195—103.5 R **16 Claims**



1. Method for determining the activity of concentration in a sample, of a biochemical substance which biochemically affects a substrate that is specific for the biochemical substance which comprises:

providing metallic or semiconductor electrodes coated with said substrate,

determining as a control value, the capacitance in a measuring device of said metallic electrodes or semiconductor electrodes coated with said substrate,

introducing the sample to be tested for the determination of the activity or concentration of said substance into said measuring device so as to contact said coated electrodes with said sample,

measuring the change in capacitance due to a change in the amount of biochemically uneffected substrate coated on said electrodes, and thereby obtaining a quantitative measure of the activity or concentration of said substance, present in the sample and affecting the specific substrate on the electrodes.

4,072,577

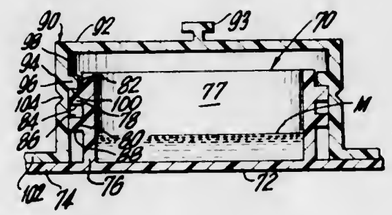
METHOD AND MINIATURIZED APPARATUS FOR CULTIVATING BACTERIA

Yashar Hirshaut, Lawrence, N.Y., assignor to Samson Helfgott, Far Rockaway and Jack W. Benjamin, Rosedale, both of, N.Y.

Filed May 31, 1974, Ser. No. 475,054

Int. Cl.² C12B *1/00*; C12K *1/04*

U.S. Cl. 195—104 **27 Claims**



1. An autoclavable, miniaturized microbiological assembly that is readily transportable both before and after innoculation, said assembly comprising:

a. a dish having a least one well therein;

b. a pre-packaged, sterile culture medium contained within said well;

c. removable cover means mounted on said well;

d. cooperating portions on said dish and on said cover means for defining three separate and distinct physical arrangements of said dish and said cover means with respect to

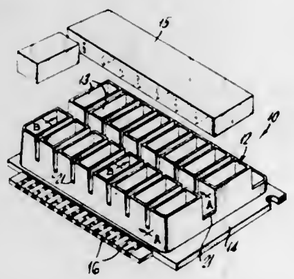
each other, said cooperating portions including integral frangible sealing means for sealing securely said cover means to said dish to define said first arrangement whereby said well is closed and said medium is maintained in a sterile condition prior to the introduction of the bacteria, said second arrangement being such that subsequent contamination of the medium after introduction of bacteria thereto is prevented while only an indirect flow of air to the medium and the bacteria is permitted; and said third arrangement being such that said cover means is temporarily coupled to said dish after introduction of the bacteria and prior to permitting the flow of indirect air thereover to thereby permit transport of said assembly in an unsealed condition without contamination of the medium said integral frangible sealing means being broken in said second and third arrangements.

4,072,578

MULTI-CHAMBERED MODULE FOR USE IN MONITORING GROWTH OF MICROORGANISMS

Paxton Cady; Takeshi Omura; Melvin Rudin, all of Los Altos, and James H. Fleming, Palo Alto, all of Calif., assignors to Bactomatic Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 633,213, Nov. 19, 1975. This application Apr. 22, 1976, Ser. No. 679,385
Int. Cl.² C12K *1/04*
U.S. Cl. 195—127 **14 Claims**



1. A multi-chambered module for use in monitoring growth of microorganisms in nutrient media comprising: an electrically non-conductive base; a plurality of chambers lying supported on one surface of and permanently attached to said base, each chamber having access means for placing sample material therein; and a plurality of electrically conductive leads completely embedded within said base under said chambers and lying flat within the plane of said base, terminal portions at one end of said leads emerging in pairs into said chamber in spaced relationship to each other to form electrodes for galvanic contact with said sample material placed within each chamber, said terminal portions emerging into said chambers in angular disposition with respect to the plane of said base, and terminal portions at the other ends of said leads exposed for contact with an electrical source.

4,072,579

POWER GENERATION AND POTABLE WATER RECOVERY FROM SALINOUS WATER

Don B. Carson, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Nov. 22, 1976, Ser. No. 744,063
Int. Cl.² B01D *3/06*
U.S. Cl. 203—11 **10 Claims**

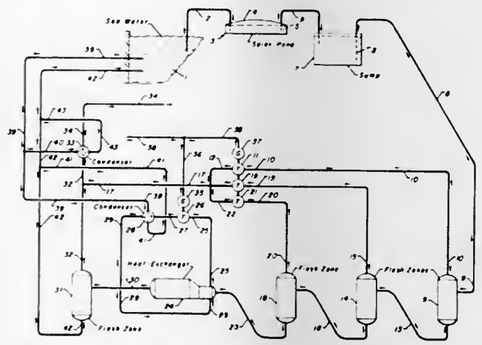
1. A process for the simultaneous generation of power and the recovery of potable water from a source of salinous water which comprises the sequential steps of:

a. introducing a first salinous water portion, obtained from a first depth proximate to the surface of said source, into a solar radiation heat sink;

b. exposing said first salinous water portion, within said solar radiation heat sink, to radiant solar energy for a time sufficient to raise the temperature thereof to a level of at least about 135° F.;

c. introducing the thus-heated salinous water into a plurality of vacuum flash separation zones, each succeeding one of which is maintained at a lower subatmospheric pressure than the preceding zone, (i) to produce substantially non-salinous vaporous phases equal in number to the number of flash separation zones and, (ii) wherein the salinous liquid phase is introduced in series through the plurality of zones;

d. passing each of said non-salinous vapor phases through a separate turbine and (i) condensing the exit vapors via indirect heat-exchange with a second salinous water portion, obtained from a second depth substantially below the surface of said source, to recover liquid potable water, and, (ii) generating power from the resulting motion of said turbines;



e. vaporizing a hydrocarbon, via indirect heat-exchange with the salinous liquid phase emanating from the last flash zone in said plurality, and (i) passing the resulting vaporized hydrocarbon through a turbine, (ii) condensing the exit hydrocarbon vapors, via indirect heat-exchange with said second salinous water portion and, (iii) re-vaporizing the resulting condensed hydrocarbon;

f. generating additional power from the turbine through which said hydrocarbon vapors are passed;

g. introducing said salinous liquid phase, following heat-exchange with said hydrocarbon and at a temperature of at least about 90° F., into a separate vacuum flash zone, maintained at an absolute pressure less than that of the last vacuum flash zone in said plurality; and,

h. condensing the resulting non-salinous vaporous phase, via indirect heat-exchange with said second salinous water portion, and recovering additional liquid potable water.

4,072,580

PROCESS FOR RECOVERING WATER-MISCIBLE SOLVENTS

Helmut Spörk, Altotting; Rudolf Strasser, and Johann Waas, both of Burghausen, all of Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Jan. 26, 1976, Ser. No. 652,009
Claims priority, application Germany, Jan. 29, 1975, 2503619
Int. Cl.² B01D *3/00, 3/40, 3/34*
U.S. Cl. 203—47 **7 Claims**

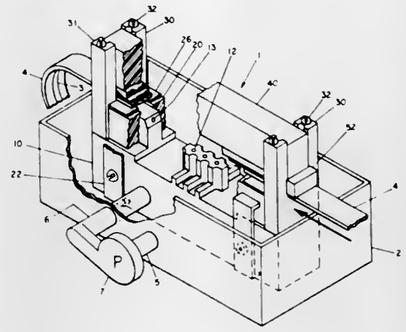
1. A process for removing organopolysiloxane resins from a mixture containing water, a water-miscible organic solvent having a boiling point below that of water and an organopolysiloxane resin which comprises adding an inert organic compound which is a non-solvent for the organopolysiloxane resins and is immiscible with water and has a vapor pressure up to 5 mm Hg (abs.) at 100° C. to the mixture, distilling off the water-miscible organic solvent and thereafter separating the organopolysiloxane resins from the organic compound.

4,072,581

STRIPE ON STRIP PLATING METHOD

Robert M. Allen, Mill Valley, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 619,952, Oct. 6, 1975, Pat. No. 4,030,999. This application Mar. 11, 1977, Ser. No. 776,807
Int. Cl.² C25D *5/02, 7/06, 5/08*
U.S. Cl. 204—15 **3 Claims**



1. A method of plating a stripe of a first material on a strip of a second material comprising the steps of:

transporting said strip continuously over a void having a predetermined length and width while maintaining a fluid-tight seal between said strip and the edges of said void;

jetting a fluid containing said first material substantially perpendicular to said strip face against said strip along a central portion in said void for a predetermined length thereof; and

jetting a fluid containing said first material inwardly in said void from positions at opposite ends of said predetermined length for preventing the escape of spent fluid from said void.

4,072,582

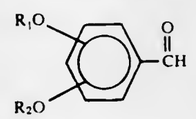
AQUEOUS ACID PLATING BATH AND ADDITIVES FOR PRODUCING BRIGHT ELECTRODEPOSITS OF TIN

William E. Rosenberg, Strongsville, Ohio, assignor to Columbia Chemical Corporation, Cleveland, Ohio

Filed Dec. 27, 1976, Ser. No. 754,177
Int. Cl.² C25D *3/32*
U.S. Cl. 204—54 R **28 Claims**

1. A primary tin electroplating brightener additive, comprising;

a dialkoxy benzaldehyde having the general formula:



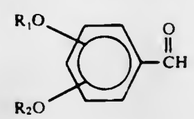
where R_1 and R_2 are methyl, ethyl, propyl or isopropyl, and where one alkoxy group is ortho and the other alkoxy group is meta to the carbonyl group or where both alkoxy groups are meta to the carbonyl group, and

from about 1 to about 97 percent by weight of at least one compound selected from the class consisting of alpha, beta unsaturated carboxylic acids, amides, and esters for producing bright electrodeposits of tin from an aqueous acid plating bath.

15. An aqueous acid electroplating bath containing stannous ions and sulfuric acid for producing bright electrodeposits of tin, comprising;

from about 0.005 to about 0.2 grams/liter of a dialkoxy benzaldehyde brightener dissolved in the bath,

said brightener having the general formula:



where R_1 and R_2 is methyl, ethyl, propyl, or isopropyl, and where one alkoxy group is ortho and the other alkoxy group is meta to the carbonyl group or where both alkoxy groups are meta to the carbonyl group.

4,072,583

ELECTROLYTIC CARBOXYLATION OF CARBON ACIDS VIA ELECTROGENERATED BASES

Richard C. Hallcher, Bridgeton; Manuel M. Baizer, St. Louis, and Donald A. White, Creve Coeur, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 7, 1976, Ser. No. 730,553
Int. Cl.² C25B *3/00, 3/10*
U.S. Cl. 204—59 R **38 Claims**

1. A process for electrolytic carboxylation of carbon acids via electrogenerated bases, which process comprises subjecting an anhydrous aprotic liquid electrolysis medium comprising such carbon acid, a base precursor more easily electroreducible than either the carbon acid or carbon dioxide, anhydrous aprotic solvent, added carbon dioxide, and supporting electrolyte to electrolysis at a cathode potential sufficiently negative to effect electro-reduction of the base precursor to the corresponding electrogenerated base but insufficiently negative to effect electro-reduction of either the carbon acid, added carbon dioxide, anhydrous aprotic solvent, or supporting electrolyte of the electrolysis medium, and thereafter recovering a carboxylated carbon acid.

4,072,584

ELECTROCHEMICAL PRODUCTION OF ORGANIC THIOLS

Divna Cipris, Morristown, N.J., and Dirk Pouli, Williamsville, N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Dec. 21, 1976, Ser. No. 753,051
Int. Cl.² C25B *3/04*
U.S. Cl. 204—73 R **15 Claims**

1. A process for the electrochemical reduction of an organic disulfide, free from other reducible groups in the process, to the corresponding thiol in the presence of halide ion which comprises passing a direct electric current between (1) a stable solid cathode selected from the group consisting of the disulfides and diselenides of titanium, vanadium, molybdenum, tantalum, tungsten, niobium and zirconium, immersed in a catholyte containing the organic disulfide and halide ion, and (2) an anode immersed in an anolyte, wherein the anolyte and catholyte are separated by a membrane.

4,072,585

VALVE METAL ELECTRODE WITH VALVE METAL OXIDE SEMI-CONDUCTIVE COATING HAVING A CHLORINE DISCHARGE CATALYST IN SAID COATING

Giuseppe Bianchi, Milan, Italy; Vittorio de Nora, Nassau, Bahamas; Patrizio Gallone, and Antonio Nidola, both of Milan, Italy, assignors to Diamond Shamrock Technologies S.A., Geneva, Switzerland

Division of Ser. No. 508,232, Sept. 23, 1974, Pat. No. 4,003,817, which is a continuation-in-part of Ser. No. 690,407, Dec. 14, 1967, Pat. No. 3,616,445, and Ser. No. 771,665, Oct. 29, 1968. This application Oct. 5, 1976, Ser. No. 729,688
Int. Cl.² C25B *1/46, 11/08, 11/10, 11/06*
U.S. Cl. 204—98 **22 Claims**

1. The method of effecting an electrolysis process in which

an electrolysis current is passed through a halogen-containing electrolyte between an anode and a cathode and a halogen is released at the anode, which comprises passing the current through a valve metal base from the group consisting of titanium and tantalum, through an electrically conducting electrocatalytic coating on said valve metal base containing an electrocatalytic agent from the group consisting of rhenium, iron, manganese, zinc and the platinum group metals and up to 50% tin, said coating being in the form of oxides of said metals and said percentages being based upon the weight of the metals in said coating, and through the electrolyte to the cathode.

4,072,586

MANGANESE DIOXIDE ELECTRODES

Oronzio De Nora; Antonio Nidola, and Placido M. Spaziante, all of Milan, Italy, assignors to Diamond Shamrock Technologies S.A., Geneva, Switzerland

Filed Apr. 28, 1976, Ser. No. 681,280
Claims priority, application Italy, Dec. 17, 1975, 30142/75
Int. Cl.[2] C25C *7/02, 1/08, 1/12, 1/16*
U.S. Cl. 204—105 M **12 Claims**

1. An electrode consisting essentially of a valve metal base or a base of other electrically-conductive material which is corrosion-resistant to the anodic conditions, having on at least a portion of its outer surface an electrocatalytic coating of β-manganese dioxide chemideposited by thermal decomposition of an alcoholic solution of manganese nitrate, the said β-manganese dioxide coating contains 0.5 to 5% by weight of at least one metal selected from the group consisting of metals of groups IB, IIB, IVA, VA, VB, VIB, VIIB and VIII of the Periodic Table excluding the platinum metals, gold and silver.

10. In an improved method of electrowinning metals from aqueous solutions thereof by passing an electrolysis current through an anode, an aqueous electrolyte containing the metal to be electrowon and a cathode, the improvement comprising using as the anode an electrode of claim 1.

4,072,587

SEPARATE RECOVERY OF SILVER AND GOLD FROM CYANIDE SOLUTIONS

Harold J. Heinen; David G. Peterson, and Roald E. Lindstrom, all of Reno, Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Continuation-in-part of Ser. No. 718,228, Aug. 27, 1976, abandoned. This application Apr. 21, 1977, Ser. No. 789,599
Int. Cl.[2] C01B *1/00*
U.S. Cl. 204—110 **2 Claims**

1. A process for selective recovery of silver and gold from cyanide solutions containing both metals comprising (1) adding to the solution about 0.1 to 2.2 pound CaO per ton of solution, (2) treating the resulting solution with sodium sulfide in an amount of about 110 to 150 percent of the stoichiometric amount to precipitate the silver as silver sulfide, (3) filtering to remove the precipitated silver sulfide, and (4) electrolyzing the filtrate to deposit the gold at the cathode.

4,072,588

METHOD FOR THE ANODIC POLISHING OF SURFACES OF INTERMETALLIC NIOBIUM COMPOUNDS AND NIOBIUM ALLOYS

Heinrich Diepers, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

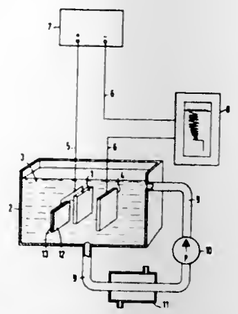
Filed Feb. 15, 1977, Ser. No. 768,829
Claims priority, application Germany, Mar. 8, 1976, 2609549
Int. Cl.[2] C25F *3/26, 7/00*
U.S. Cl. 204—129.43 **4 Claims**

1. A method for the anodic polishing of surfaces of intermetallic niobium compounds and niobium alloys comprising:

a. placing a niobium part as an anode and a cathode, in an electrolyte consisting of 86 to 93% by weight H_2SO_4, 1.5 to 4% by weight HF and 5.5 to 10.0% by weight H_2O with a temperature of between 15° and 50° C;

b. electrically shunting the surface to be polished across the niobium part;

c. adjusting a constant voltage of between 9 and 15 V between the niobium part and the cathode in such a manner that damped current oscillations are superimposed on the electrolyte current;



d. switching off the voltage at the latest after the current oscillations have decayed completely, and keeping it off until the oxide layer built up during the current oscillations is dissolved;

e. subsequently again adjusting a constant voltage between 9 and 15 V so that damped current oscillations occur; and,

f. repeating the sequence of states with the voltage switched on and off several more times.

4,072,589

PROCESS FOR ELECTROLYTIC GRAINING OF ALUMINUM SHEET

Eugene Golda, Monsey; Jen-chi Huang, Yonkers; Ken-ichi Shimazu, Pleasantville, and Simon Long Chu, Dobbs Ferry, all of N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

Filed Apr. 13, 1977, Ser. No. 787,192
Int. Cl.[2] C25F *3/04, 5/00*
U.S. Cl. 204—129.4 **6 Claims**

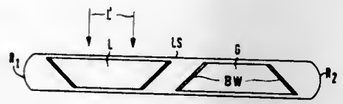
1. A method for electrolytically graining aluminum which comprises immersing the aluminum in an aqueous electrolytic solution containing in combination, one part by weight of hydrochloric acid and from four to six parts by weight of nitric acid as electrolytes, applying thereto an alternating electric current of from 150 to 300 amp. minutes per square foot and maintaining the electrolytic solution at a temperature of 40° C. or above.

4,072,590

METHOD FOR SEPARATING ISOTOPES FROM GASEOUS MIXTURES

Hans-Joachim Niemann; Eberhard Schuster, and Arno Kersting, all of Erlangen, Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed May 15, 1975, Ser. No. 577,897
Claims priority, application Germany, May 20, 1974, 2424728
Int. Cl.[2] B01J *1/10*
U.S. Cl. 204—157.1 R **2 Claims**



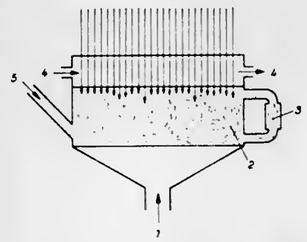
1. A method for chemically separating isotopes from a gaseous mixture containing isotopes and a chemical reaction partner, by a reaction directed by a laser beam having a narrow band of wave lengths molecularly exciting mainly the isotope to be separated and thereby promoting its reaction with the reaction partner; wherein the improvement comprises holding said mixture inside of a laser resonator cavity chamber and forming a resonating wave within the cavity chamber passing through the mixture.

4,072,591

PROCESS FOR CONVERSION OF OLIGOMERS AND HIGHER POLYMERS BY IRRADIATION WITH HIGH-ENERGY ELECTRONS

Armin Ferse, and Harald Grimm, both of Dresden, Germany, assignors to Akademie der Wissenschaften der Deutschen Demokratischen Republik, Berlin, Germany

Filed Sept. 3, 1975, Ser. No. 609,969
Int. Cl.[2] B01J *1/10*
U.S. Cl. 204—159.2 **16 Claims**



1. A process for the production of a fluorine-containing compound of lower molecular weight from a solid polymer of a perfluoroolefin which comprises irradiating with a beam of high-energy electrons at a temperature of between substantially 120–300° C a dispersion of particles of the said solid perfluoroolefin polymer distributed in a perfluoroolefin polymer which is liquid at the reaction temperature and having a lower average molecular weight than the solid perfluoroolefin polymer while a gas that is inert to or reactive with the perfluoroolefin polymers is passed upwardly therethrough so that reactions occur only in the uppermost portions of the dispersion at and directly below the upper surface thereof, and recovering the fluorine compounds that are thus produced.

4,072,592

RADIATION CURABLE COATING

George B. Dué, Pittsburgh, Pa., and John P. Guarino, Trenton, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 551,584, Feb. 20, 1975, abandoned, which is a continuation of Ser. No. 471,412, May 20, 1974, abandoned. This application Sept. 30, 1975, Ser. No. 618,103
Int. Cl.[2] C08F *8/00*
U.S. Cl. 204—159.15 **47 Claims**

1. A radiation curable coating composition that comprises, by weight of said composition, 10–75% of a diacrylate of a diglycidyl ether of a bisphenol, or of a diacrylate of a diglycidyl ether of a bisphenol further esterfied with 0.1–1 mole, per mole of said diacrylate, of a dicarboxylic acid anhydride to form an esterified product having an acid number of 10–40, and 25–90% of an ester of acrylic acid.

4,072,593

PROCESS FOR PRODUCTION OF A RESISTANCE ELEMENT FOR RESISTANCE THERMOMETERS

Walter Diehl, Hanau, and Wolfgang Koehler, Alzenau-Horstein, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Filed Dec. 16, 1976, Ser. No. 751,217
Claims priority, application Germany, Dec. 24, 1975, 2558752
Int. Cl.[2] C23C *15/00*
U.S. Cl. 204—192 F **10 Claims**

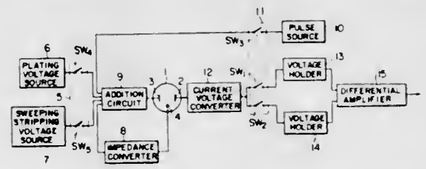
1. A process of producing a resistance element for a resistance thermometer by sputtering, said resistance element consisting essentially of a thin platinum layer as the resistance material on an insulating material as a substrate, the improvement comprising applying the platinum to the substrate by sputtering in a gaseous oxidizing atmosphere consisting essentially of krypton-oxygen or xenon-oxygen.

4,072,594

ANODIC STRIPPING VOLTAMMETRIC APPARATUS

Koremitsu Outsuka, Fukuoka, and Yutaka Tanaka, Kitakyushu, both of Japan, assignors to Mitsubishi Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 3, 1976, Ser. No. 682,784
Claims priority, application Japan, May 13, 1975, 50-56575
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—195 R **4 Claims**



1. Differential pulse anodic stripping voltammetry apparatus comprising:

an electrolytic cell having a working electrode and a counter electrode;

a source of plating voltage, a source of sweeping stripping voltage and a source of pulse voltage for impressing plating voltage, stripping voltage and pulse voltage respectively across the working electrode and the counter electrode;

a current-voltage converter for converting the current flowing through the working electrode into voltage for producing two sample voltages;

two voltage holding means each having a filter circuit with a time constant of 0.01 to 0.1 second for holding the two sample voltages; and

a differential amplifier for amplifying the difference between the two sample voltages held by the voltage holding means.

4,072,595

ANODE SEAL ASSEMBLY FOR ELECTROLYTIC CELLS

Richard F. Chambers, Athens, and John J. Granade, Cleveland, both of Tenn., assignors to Olin Corporation, New Haven, Conn.

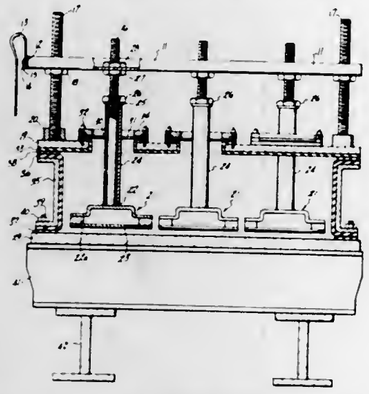
Filed Mar. 7, 1977, Ser. No. 775,127
Int. Cl.[2] C25B *9/00, 1/40*
U.S. Cl. 204—219 **13 Claims**

1. A seal assembly for an electrolytic mercury cell having an adjustable anode post sleeve passing through an anode opening in a cell top lined with a wet chlorine resistant lining turned upwardly through said opening, comprising:

a. a rigid annular disc means, separate from said lining, of wet chlorine resistant material having an inner surface defining a grooved central opening conforming to the exterior of the anode post sleeve, for attachment to the

cell top in sealing contact with said lining so as to occupy a major portion of the anode-to-cell top opening, said opening being of at least twice the diameter of said anode post;

b. connector means for attaching the disc to the cell top and pressing said disc into sealing contact with said lining; and



c. annular wet chlorine resistant elastomeric seal means, adapted to be held within the groove of the central opening of the disc, for continuously sealing between the disc and the anode post sleeve both while the anode is moving and while the anode is stationery.

4,072,596

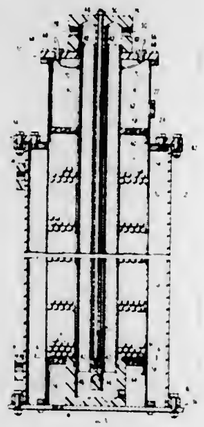
APPARATUS FOR REMOVAL OF CONTAMINANTS FROM WATER

Karl Moeglich, Williamsville, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 573,577, April 30, 1975. This application Mar. 4, 1976, Ser. No. 663,791

Int. Cl.[2] C02B *1/82*; C25B *3/02*

U.S. Cl. 204—241 **23 Claims**



1. An apparatus for the removal of contaminants from aqueous media comprising:

a container having an inlet for admitting said media and an outlet for expelling purified water;

at least one pair of first and second packed beds of particles disposed in said container, said first bed consisting of particles coated with a non-conducting, metal oxide selected from the group consisting of oxides of metals of any of Groups IV*a*, V*a*, VI*b*, and VII*b* and VIII and mixtures thereof, said second bed comprising said metal oxide coated particles and conductive particles said second bed being disposed adjacent said first bed;

first and second pairs of electrodes, disposed, said first pair at least in said first bed, and said second pair at least in said second bed; means coupled to each pair of electrodes for applying alternating current having a frequency of 0.5 to 800 Hz thereto;

means for directing contaminated aqueous media through said inlet and sequentially through each of said beds so that the contaminants therein are subjected to an alternating current electrical field in said beds to decompose and oxidize or reduce said contaminants.

4,072,597

METHOD AND APPARATUS FOR COMPENSATING THE MAGNETIC FIELDS IN ADJACENT ROWS OF TRANSVERSELY ARRANGED IGNEOUS ELECTROLYSIS CELLS

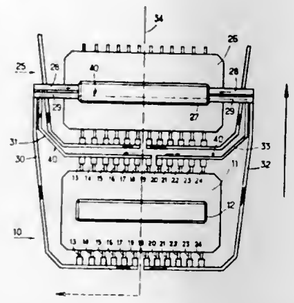
Paul Morel, Le Vesinet, and Jean-Pierre Dugois, Saint Jean-de-Maurienne, both of France, assignors to Aluminum Pechiney, Lyon, France

Filed Nov. 5, 1976, Ser. No. 739,265

Claims priority, application France, Nov. 28, 1975, 75 37675

Int. Cl.[2] C25B *9/04*; C25C *3/16*

U.S. Cl. 204—243 M **6 Claims**



1. A method for compensating the magnetic fields of adjacent rows of transversely arranged igneous electrolysis cells wherein the anode of a downstream cell is fed with current from the cathode of the adjacent upstream cell, the current from the cathode being taken off of inner and outer cathode bars, with the inner cathode bars situated on the side of the adjacent row of cells and the outer cathode bars situated on the side opposite to the adjacent row of cells, superimposing an electrical loop which produces additional magnetic fields substantially equal to that created by the adjacent rows and in the opposite direction by increasing the intensity of the current in the conductor situated on the side of the adjacent row and connecting one of the upstream or downstream ends of the cathode bars of the upstream cell to the anode bar of the downstream cell.

4,072,598

ELECTROLYTIC POLISHING APPARATUS

Lavritz Gudmund Damgaard, Virum, Denmark, assignor to Struers K/S, Copenhagen K, Denmark

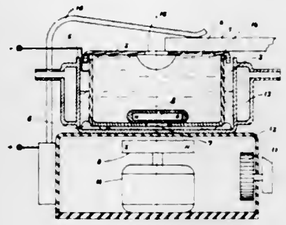
Filed Nov. 11, 1976, Ser. No. 740,970

Claims priority, application Denmark, Nov. 12, 1975, 5102/75

Int. Cl.[2] C25F *3/16, 7/00, 7/02*

U.S. Cl. 204—274 **3 Claims**

1. Electrolytic polishing apparatus comprising: an upwardly open container for receiving a quantity of electrolyte for use in the electrolytic polishing operation, said container having a bottom with a central opening, a cover for said container, said cover having a polishing opening against which a polishing sample can be pressed, a magnetic stirrer being provided in said container above said central opening, said stirrer being rotatable by magnetic means outside said container to set said quantity of electrolyte in rapidly rotating movement to create a flow of electrolyte along the surface of a sample pressed against said polishing opening and at the same time to produce a pressure gradient from said central opening towards the inner



wall of said container, said container being placed in an outer bowl for receiving electrolyte escaping at the top of said container during the polishing operation, the upper face of said cover being located at a higher level than the upper edge of said outer bowl.

4,072,599

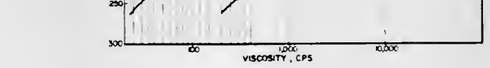
CARBON ELECTRODES HAVING STABILIZED BINDERS DERIVED FROM THE ENTIRE ORGANIC FRACTION OF BITUMINOUS COAL

Vaughn L. Bullough, and Luther O. Daley, both of Florence, Ala., assignors to Reynolds Metals Company, Richmond, Va.

Filed Aug. 28, 1975, Ser. No. 608,645

Int. Cl.[2] C25C *7/02*

U.S. Cl. 204—294 **10 Claims**



1. A carbon electrode for use in electrometallurgical manufacturing which consists essentially of a coke aggregate and a stabilized binder having a softening point between about 100° and 150° C that is prepared by heat-treating a concentrated solution of all of the low-volatile organic materials in a bituminous coal, said concentrated solution containing 16-30% of an aromatic liquid hydrocarbon creosote-oil type solvent for said organic materials.

4,072,600

CATALYTIC CRACKING PROCESS

Albert B. Schwartz, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 440,890, Feb. 8, 1974, abandoned, and Ser. No. 599,920, July 28, 1975, abandoned, each is a continuation-in-part of Ser. No. 399,008, Sept. 20, 1973, abandoned. This application Jan. 15, 1976, Ser. No. 649,261

Int. Cl.[2] C10G *11/04*; B01J *8/24*

U.S. Cl. 208—120 **3 Claims**

1. A process for raising the temperature of a dense bed in the regenerator of a catalytic cracking unit to a predetermined level, said unit comprising a cracking section operating in the absence of added hydrogen and a regenerating section in which CO is combusted in the dilute phase, which unit contains a circulating inventory of solid acidic cracking catalyst; the improvement which comprises:

a. circulating with said catalyst 0.01 to 50 ppm, based on total catalyst inventory, of at least one metal of the group consisting of platinum, palladium, iridium, osmium, rhodium, ruthenium, and rhenium;

b. and causing CO to combust in said dense bed;

c. thereby raising the dense bed temperature to said predetermined level; and

d. maintaining the dense bed temperature at its predetermined level by monitoring the temperature thereof and adding more of said metal when the temperature falls below a set limit.

4,072,601

PROCESS AND APPARATUS FOR PERFORMING ENDOTHERMIC CATALYTIC REACTIONS

Jean Joseph Nicolas Patouillet, Paris, France, assignor to Antar Petroles de l'Atlantique, Paris, France

Filed June 14, 1976, Ser. No. 695,452

Int. Cl.[2] C10G *35/04*

U.S. Cl. 208—134 **14 Claims**

1. In a process for reforming petroleum fractions by endothermic catalytic reactions, consisting of introducing the reaction stream into at least one elongated catalysis zone, constituted by at least one zone containing dilute catalyst and which can itself be preceded by a zone containing an inert catalyst-support, said dilute catalyst zone being followed by a conventional catalysis zone proper, each of said zones being also separable from neighbouring zones by intercalated zones containing no material, and of distributing along said zones heating means capable of providing variable amounts of heat to the reaction stream moving in each of said zones, the improvement consisting essentially of using at the most two zones of dilute catalyst arranged before the pure catalyst zone, if the direction of the reaction stream introduced is considered, and of carrying out the dilution of said dilute catalyst with a bulk material, different from said inert catalyst support and a better heat conductor than said inert catalyst support, which enables the temperature profile to be adapted along the reaction zone to the reaction speed in the latter.

4,072,602

DEHYDROGENATION METHOD AND NONACIDIC MULTIMETALLIC CATALYTIC COMPOSITE FOR USE THEREIN

John C. Hayes, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 442,714, Feb. 14, 1974, Pat. No. 3,928,177, which is a continuation-in-part of Ser. No. 216,739, Jan. 10, 1972, Pat. No. 3,806,446, which is a division of Ser. No. 17,886, March 9, 1070, abandoned. This application Dec. 19, 1975, Ser. No. 642,648

The portion of the term of this patent subsequent to Apr. 23, 1991, has been disclaimed.

Int. Cl.[2] C10G *35/06*

U.S. Cl. 208—138 **18 Claims**

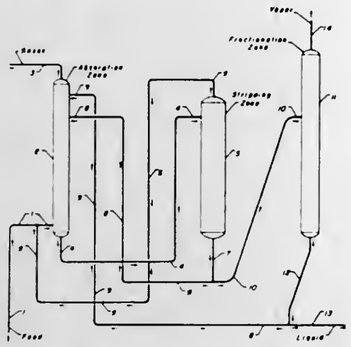
1. A method for dehydrogenating a dehydrogenatable hydrocarbon comprising contacting the hydrocarbon, at dehydrogenation conditions, with a catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.01 to about 5 wt. % germanium and about 0.01 to about 3 wt. % Group VI-B transition metal; wherein the platinum group metal, germanium and Group VI-B transition metal are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the germanium and Group VI-B transition metal are present in an oxidation state above that of the elemental metal; and wherein the atomic ratio of Group VI-B transition metal to platinum group metal is about 0.05:1 to about 4:1.

4,072,603

PROCESS TO MAKE TECHNICAL WHITE OILS

William W. Wentzheimer, Glen Mills, Pa., assignor to Suntech, Inc., Wayne, Pa.

Filed Oct. 29, 1976, Ser. No. 736,783
Int. Cl.[2] C10G *37/06*
U.S. Cl. 208—264 3 Claims



1. A process for making technical white oils in a single hydrogenation and without the need for acid treating to meet white oil specifications which comprises hydrogenating a hydrocracked solvent extracted lubricating oil distilling at 650° to 1050° F, having a SUS/100° F viscosity of about 200 and an aromatic content of less than about 15% in a single step at 600° to 700° F, and at 2000 to 3000 psig in the presence of a catalyst comprising nickel and tungsten supported on silica-alumina, subjecting the hydrogenated solvent lube oil to atmospheric distillation to remove distillates useful as fuels and subjecting the bottoms of said atmospheric distillation to a vacuum distillation to yield technical white oils as products.

4,072,604

PROCESS TO SEPARATE HYDROCARBONS FROM GAS STREAMS

Dennis J. Ward, South Barrington, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 560,854, March 21, 1975, abandoned, which is a continuation-in-part of Ser. No. 453,656, March 21, 1974, abandoned. This application July 19, 1976, Ser. No. 706,859
Int. Cl.[2] C10G *5/04*
U.S. Cl. 208—341 5 Claims

1. A process for the separation of C_3 and C_4 hydrocarbons from a gaseous stream which comprises the steps of:

a. introducing a feed stream comprising C_1-C_4 hydrocarbons into a lower portion of an absorption zone while simultaneously introducing a first lean absorber liquid comprising C_7 hydrocarbons and a second lean absorber liquid comprising C_3 and C_7 hydrocarbons into an upper portion of said zone, the first absorber liquid being introduced at a higher elevation than the second absorber liquid;

b. countercurrently contacting the feed stream with the absorber liquids in the absorption zone at conditions effective to absorb C_3 and C_4 hydrocarbons in the absorber liquids;

c. withdrawing a rich absorber liquid comprising C_2, C_3, C_4 and C_7 hydrocarbons from the lower portion of the absorption zone and withdrawing from the upper portion of the absorption zone a gas stream substantially free of C_3-C_4 hydrocarbons;

d. passing the rich absorber liquid into an upper portion of a stripping column operated at stripping conditions effective to remove C_2 hydrocarbons from the rich absorber liquid and thereby effecting the formation of a stripped liquid comprising substantially all of the C_3, C_4 and C_7 hydrocarbons contained in the rich absorber liquid and a stripping column overhead vapor stream comprising C_2 hydrocarbons but substantially free of C_4 hydrocarbons;

e. passing the stripping column overhead stream into the lower portion of the absorption zone;

f. dividing the stripped liquid into a first portion and a second portion of like composition;

g. introducing the first portion of the stripped liquid into the upper portion of the absorption zone as the second lean absorber liquid;

h. fractionating the second portion of the stripped liquid at conditions effective to provide a bottoms stream comprising a C_7 hydrocarbon and an overhead product comprising C_3 and C_4 hydrocarbons; and,

i. supplying a portion of the bottoms stream to the upper portion of the absorption zone as the first lean absorber liquid.

4,072,605

METHOD OF OBTAINING A PRECIPITATE OF METALLIC IONS FROM SOLUTIONS CONTAINING LOW CONCENTRATIONS OF METAL SALTS

Paul F. Thelander, Minneapolis, Minn., assignor to Automated Medical Systems, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 635,910, Nov. 28, 1975, abandoned. This application May 25, 1976, Ser. No. 690,035
Int. Cl.[2] B01D *21/01*
U.S. Cl. 210—50 7 Claims

1. The method of precipitating salts of metallic elements having multiple valent states and selected from the group consisting of copper, chromium, zinc, cadmium, nickel, lead, platinum, antimony, iron, manganese, aluminum, thorium, tin, mercury, vanadium, rhodium and silver from aqueous solutions of said metallic elements, said method comprising:

a. introducing phosphorous acid and an excess of a halogen selected from the group consisting of iodine, iodide and iodate to said aqueous solution to form a simultaneous oxidative-reductive cycle within said aqueous solution involving said metallic element; and

b. precipitating and removing the salt of the less soluble valence state of said metallic element from said aqueous solution.

4,072,606

METHOD FOR COAGULATING A COLLOIDAL SUSPENSION

Richard Irwin Leavitt, Lower Makefield Township, Philadelphia County, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 418,489, Nov. 23, 1973, Pat. No. 3,989,592. This application June 14, 1976, Ser. No. 696,091
Int. Cl.[2] B01D *21/01*; C07G *7/00*; C12D *13/06*
U.S. Cl. 210—51 7 Claims

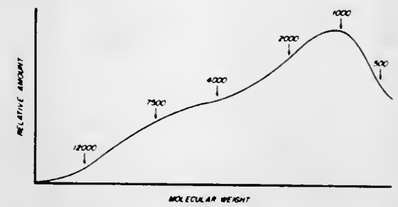
1. A method for coagulating a colloidal suspension, which comprises adding to the colloidal suspension water-soluble nitrogen-containing polymers formed by contacting, under conversion conditions, a water-dispersible protein with the extracellular enzymes formed by the microorganism *Pseudomonas fabricans* No. 492 (A.T.C.C. No. 21984), said water-soluble polymers being further characterized by reversibly thickening in aqueous solution on adjustment of the degree of alkalinity.

4,072,607

PREPARATION OF ANIONIC POLYMERS FOR USE AS SCALE INHIBITORS AND ANTI-PRECIPITANTS

Arthur Maurice Schiller, Stamford; Richard Martin Goodman, Norwalk, and Roger Edgar Neff, Stamford, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 26, 1976, Ser. No. 735,310
Int. Cl.[2] C02B *5/06*
U.S. Cl. 210—58 8 Claims



1. A process for controlling the deposition of adherent scale on the walls of vessels or pipes in a water system, comprising adding to the water in said system an effective amount of an anionic copolymer composed of acrylate and acrylamide linkages in mole ratios of about 20:1 to about 1:1 having a skewed molecular weight distribution such that at least about 60% of said copolymer has a molecular weight of about 500 to 2,000, at least about 10% of said polymer has a molecular weight of about 4,000 to 12,000 and the remainder of said copolymer having a molecular weight of about 2000–4000 on a gel permeation chromatograph wherein the control of said scale is substantially provided by the lower molecular weight material.

4,072,608

POLLUTED WATER PURIFICATION

Floyd Farha, Jr., and E. O. Box, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 13, 1976, Ser. No. 648,687
Int. Cl.[2] C02B *1/34*
U.S. Cl. 210—63 R 9 Claims

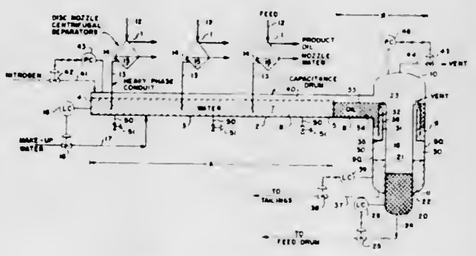
1. A process for the purification of aqueous streams containing organic material impurities dissolved and suspended therein to aqueous products substantially free of organic material which comprises contacting an aqueous stream containing oxidizable organic pollutant impurities and an oxygen-containing gas with an iron group metal promoted solid copper-manganese-oxygen spinel structure catalyst consisting essentially of about 20–65 weight percent copper, about 20–65 weight percent manganese, about 5–50 weight percent iron group metal(s), and the balance oxygen in an amount which is sufficient to meet the valence requirements of the metal components of the finished catalyst under liquid phase oxidation conditions including a temperature ranging from about 300° F to about 575° F and a ratio of water to oxygen ranging from about 5:1 to 200:1 sufficient to convert said organic materials to innocuous materials, thereby converting said aqueous stream to a potable aqueous product which can be safely discarded or reused.

4,072,609

CAPACITANCE SYSTEM FOR HEAVY PHASE DISCHARGE OF SECOND STAGE CENTRIFUGAL SEPARATION CIRCUIT

Thaddeus Eugene Kizior, Edmonton, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of Energy, Mines and Resources, Ottawa; Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources, Alberta Syncrude Equity, Edmonton; Ontario Energy Corporation; Imperial Oil Limited, both of Toronto; Canada-Cities Service, Ltd., Calgary and Gulf Oil Canada Limited, Toronto, all of, Canada

Filed Feb. 10, 1977, Ser. No. 767,516
Int. Cl.[2] B01D *17/02, 33/02*
U.S. Cl. 210—73 R 10 Claims



1. In a second stage centrifugal separator circuit which separates heavy phase fluid from degritted diluted bitumen froth, the improvement which comprises:

a plurality of disc-nozzle centrifugal separators, each separator having a heavy phase centripetal pump means, including an outlet, for removing heavy phase fluid from said separator and, in operation, a diluted bitumen-heavy phase fluid interface whose position can be shifted by a change in the fluid pressure at the pump means outlet;

a capacitance vessel comprising a first section and a second section which is an extension of the first section;

a first weir extending across the interior of the capacitance vessel at the junction of the first and second sections, said first weir and first section combining to form a reservoir chamber for containing a reservoir of heavy phase fluid, said first weir being operative to separate diluted bitumen from the heavy phase fluid in the reservoir chamber thereby preventing an accumulation of diluted bitumen in the reservoir chamber;

means, associated with the vessel, for supplying make-up fluid to the reservoir when required;

conduit means connecting the outlet of each centripetal pump means with the reservoir, the end of each conduit means being submerged in the reservoir;

said first weir being positioned downstream of said conduit means;

means, associated with the capacitance vessel, for pressurizing its contents, to thereby maintain fluid backpressure at the centripetal pump means outlets; and

means, associated with the second section, for removing fluid overflowing the first weir.

4,072,610

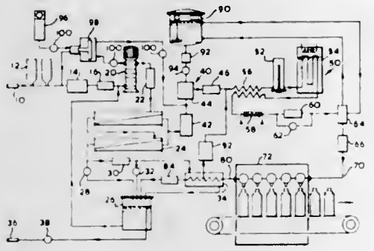
PRODUCTION OF SOLUTIONS

James Gordon Gow, and Alan Gordon England, both of Liverpool, England, assignors to Ingerthorpe Holdings Limited, England

Filed May 1, 1975, Ser. No. 573,503
Int. Cl.[2] B01D *31/00*
U.S. Cl. 210—90 10 Claims

1. An apparatus for the production of an aqueous solution of desired concentration for medical purposes, which comprises a first pump connectible to a source of water, a reverse osmosis

column connected to said first pump, said reverse osmosis column being capable of retaining 100% of bacterial material; a heat steriliser capable of eliminating 100% of bacterial material; a proportioning pump for admixing the pyrogen-free water with a desired material or with a solution of such material of higher concentration than desired to provide said desired concentration; first fluid flow means connecting an outlet of said reverse osmosis column to the proportioning pump;



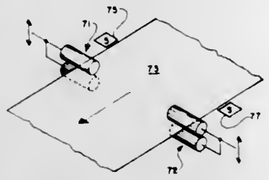
second fluid flow means connecting an outlet of said proportioning pump to an inlet of said steriliser; a filter between the outlet from the reverse osmosis column and the inlet to the steriliser and including means for measuring the pressure differential between the two sides of the filter; and a device for switching off the apparatus in the event that during operation the pressure differential between the two sides of the filter varies from its normal range.

4,072,611

BELT DEWRINKLING AND ALIGNMENT METHOD AND APPARATUS

Steven S. Davis, Bountiful, Utah, assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Jan. 31, 1977, Ser. No. 763,949
Int. Cl.² B01D *33/02*
U.S. Cl. 210—143 **11 Claims**



1. In combination with a filtration machine having an endless belt of thin filter medium trained to travel across a drainage surface, which belt of filter medium does not have a bead on either of its edges, a pair of devices for aligning and dewrinkling the belt of filter medium across the drainage surface, each of said aligning and dewrinkling devices of said pair comprising:

a. mounting means which affix the aligning and dewrinkling device rigidly to the filtration machine adjacent an edge of the traveling endless belt of filter medium;

b. a first arm member rigidly connected to said mounting means;

c. a first cylindrical roller and means affixing the same to said first arm member for rotation about the central axis of said first cylindrical roller, said first cylindrical roller being mounted to said first arm member to extend beneath the adjacent edge of the belt of filter medium in a direction generally parallel to the plane of the belt of filter medium;

d. a second arm member and pivot means which connects said second arm member to said first arm member for rocking movement;

e. a second cylindrical roller and means affixing the same to said second arm member for rotation about the central axis of said second cylindrical roller, said second cylindrical roller being mounted to said second arm member to extend above the adjacent edge of the belt of filter medium in a direction generally parallel to the plane of the belt of filter medium to define a long nip line with said first cylindrical roller along which the filter medium is gripped;

f. biasing means connected between the ends of said first and second arm members opposite the ends to which said first and second cylindrical rollers are affixed to urge said opposite ends away from one another and, hence, to urge said second arm member to rock so as to pinch said first and second cylindrical rollers together; and

g. selectively actuatable pressure means mounted between the ends of said first and second arm members opposite the ends to which said first and second cylindrical rollers are affixed for selectively forcing said opposite ends away from one another.

10. A method for aligning and dewrinkling an endless belt of filter medium trained to travel across a drainage surface, which belt of filter medium does not have a bead formed on either of its edges, comprising the following steps:

a. on each side of the belt of filter medium, gripping the belt from above and below with two generally parallel cylindrical rollers where the longitudinal axes of the rollers are at an angle with respect to the direction of travel of the belt and where the cylindrical rollers are connected for rotation to first and second arm members, respectively, which are connected at a fulcrum point for rocking movement one toward the other;

b. sensing the lateral position of the belt of filter medium with two sensors fixed adjacent the two opposite edges of the belt; and

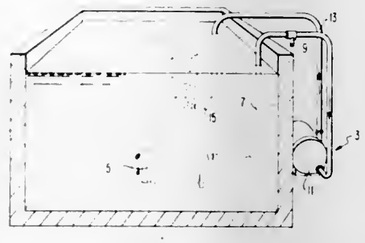
c. forcing the two arm members to pivot to force the rollers toward one another to grip the belt of filter medium according to the lateral position of the filter medium belt determined by said sensor means.

4,072,612

AERATOR FOR BODIES OF WATER

William H. Daniel, Rte. 3, Rogers, Ark. 72756

Continuation of Ser. No. 689,927, May 25, 1976, abandoned. This application Apr. 27, 1977, Ser. No. 791,531
Int. Cl.² C02C *5/06*; B01F *3/04*
U.S. Cl. 210—169 **3 Claims**



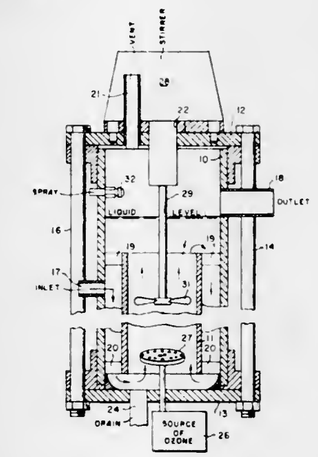
1. In combination with a fish tank, an aerator for the fish tank comprising a centrifugal pump having a central inlet and a peripheral outlet and being of the type adapted to receive substantial quantities of air at its inlet without losing its prime, said pump comprising a casing having a rotor that rotates within said casing, said rotor having thereon a plurality of blades of airfoil configuration, conduit means having an inlet end that rests removably on the bottom of said fish tank for introducing water from the bottom of said fish tank to an elevation above the upper edge of the fish tank and into the pump inlet, means for introducing air into the pump inlet, conduit means having its outlet end disposed adjacent the bottom of the fish tank for discharging mixed air and water from the pump outlet adjacent the bottom of the fish tank, and a filter on said inlet end for introducing water into the pump inlet, said filter resting removably on the bottom of the fish tank, said filter comprising a hollow body, and a conical screen whose apex is directed inwardly of said hollow body.

4,072,613

OZONE REACTOR FOR LIQUIDS

Craig S. Alig, Arnold, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 4, 1976, Ser. No. 729,564
Int. Cl.² C02B *1/38*
U.S. Cl. 210—198 R **5 Claims**



1. An ozone reactor for liquids comprising:

a first means for containing a liquid;

a second means within said first means for producing an inner compartment and an outer compartment within said first means, said compartments being intercommunicating;

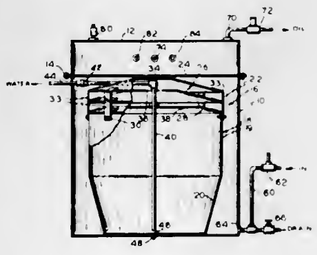
a third means for introducing bubbles containing ozone into said inner compartment to produce a flow of liquid from said outer compartment through said inner compartment and thereby react the liquid with the ozone, wherein said third means comprises a sparger connected to a source of ozone under pressure.

4,072,614

OIL AND WATER SEPARATORS

Frank N. Harris, 4761 SW. Martha St., Portland, Oreg. 97221

Continuation of Ser. No. 551,543, Feb. 21, 1975, abandoned, which is a continuation-in-part of Ser. No. 516,193, Oct. 21, 1974, abandoned. This application Feb. 17, 1976, Ser. No. 658,468
Int. Cl.² B01D *21/02*
U.S. Cl. 210—305 **16 Claims**



1. An oil and water separator,

a vertical vessel having imperforate walls and open at its top,

an outer container surrounding the vessel and forming an annular vertical passage surrounding the vertical vessel,

inlet means near the bottom of the container opening into the container but not the vessel,

a plurality of discs having central openings,

means mounting the discs at the top of the vessel in positions spaced from each other and defining vertically spaced fully annular passages,

means for flowing an oil-water mixture slowly into the inlet means, upwardly through the annular vertical passage and through the vertically spaced fully annular passages,

water outlet means for drawing water continuously from the lower portion of the vessel,

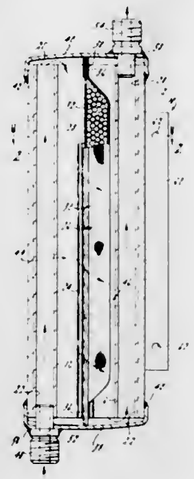
and oil retaining means for trapping and withdrawing oil flowing upwardly from the openings in the discs.

4,072,615

RECEIVER DRYER FOR A REFRIGERATION SYSTEM

William W. McConnell, Hagerstown, Ind., assignor to Ford Aerospace & Communications Corporation, Dearborn, Mich.

Filed Sept. 1, 1976, Ser. No. 719,883
Int. Cl.² B01D *27/02*
U.S. Cl. 210—282 **4 Claims**



1. A receiver dryer for a refrigeration system which comprises:

a receiver dryer body formed in an extrusion operation and having (a) a central axis extending along the interior length thereof, (b) passageway defining means formed as an integral portion of the extruded receiver dryer body for defining at least a pair of open passageways extending along the interior length of said receiver dryer body, and (c) retention rib defining means formed as an integral portion of said extruded receiver dryer body for defining at least two sets of retention ribs extending along the interior length of said receiver dryer body, said two sets of retention ribs defining the lateral edges of a plane which is interposed between said pair of open passageways;

a desiccant receiving device including a planar structural member having a plurality of openings therein and a porous screen portion bonded to said planar structural member and defining therewith an open volume for receiving a granular desiccant therein; said planar structural member having opposite lateral side edges thereof received in opposite sets of said retention ribs of said receiver dryer body and opposite end edges extending beyond both ends of said receiver dryer body whereby said desiccant receiving device defines a barrier between said pair of open passageways;

a granular desiccant located in said open volume of said desiccant receiving device;

a pair of end caps closing off opposite ends of said receiver dryer body, said opposite end edges of said planar structural member of said desiccant receiving device engaging the interior surface of each of said end caps to thereby define first and second separate compartments on each side of said desiccant receiving device with each compartment associated with one of said open passageways;

a first fitting member means secured to one of said end caps for defining a passageway through said one end cap connected to one of said open passageways, whereby a fluid to be treated may flow through said passageway of said first fitting member means and one of said open passageway to reach said first compartment; and

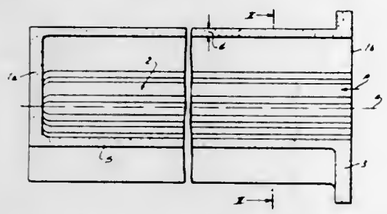
a second fitting member means secured to one of said end caps for defining a passageway through said end cap to said second compartment whereby said fluid in said first compartment can flow through said desiccant receiving device into said second compartment and out from said second compartment through said opening defined by said second fitting member means.

4,072,616

FILTER CARTRIDGE

Rainer Rohlig, Radevormwald, Germany, assignor to Sintermetallwerk Krebsoge GmbH, Radevormwald, Germany

Filed Aug. 10, 1976, Ser. No. 713,192
Claims priority, application Germany, Aug. 14, 1975, 2536271
Int. Cl.² B01D *27/06*
U.S. Cl. 210—493 R **9 Claims**



1. A filter cartridge comprising an elongated porous filter body of sintered metal closed at one end and formed with a plurality of folds in a star-like profile and of uniform cross section and constant wall thickness, said folds extending along the length of said body, and a flange formed unitarily with said body of said sintered metal at the other end of said body, the walls of said folds merging into said flange at said other end, in cross section, each of said folds having a pair of walls bridged externally with a connecting portion and wherein proximal walls of successive folds are bridged by further portions, said folds having a mean width approximately equal to three times the thickness of said walls of said folds.

4,072,617

FINISH FOR ACRYLIC FIBER

Alex K. Jahn, Williamsburg, Va., assignor to Dow Badische Company, Williamsburg, Va.

Filed Apr. 12, 1976, Ser. No. 676,278
Int. Cl.² D06M *13/26*
U.S. Cl. 252—8.9 **8 Claims**

1. A finish for acrylic fiber consisting essentially of:

(A) an alkyl phenol which has been ethoxylated with from about 40 to about 200 moles of ethylene oxide;

(B) the neutralized reaction product of

(1) about 3 moles of an aliphatic monohydric alcohol having from 14 to 22 carbons, and

(2) about 1 mole of P_2O_5; and

(C) a mixture consisting essentially of

(1) about 60 to 80 percent by weight of mineral oil having a viscosity of between about 50 and 150 Saybolt Universal Seconds at 100° F;

(2) about 25 to 10 percent by weight of an aliphatic monohydric alcohol having 10 to 18 carbons, which has been ethoxylated with about 2 to 4 moles of ethylene oxide; and

(3) about 15 to 10 percent by weight of the neutralized reaction product of

(a) about 3 moles of an aliphatic monohydric alcohol having from 8 to 14 carbons, which has been ethoxylated with about 2 to 9 moles of ethylene oxide, and

(b) about 1 mole of P_2O_5;

wherein the amount of component (C) is between about 5 and 70 percent by weight of the composition with the remainder thereof being a composite of components (A) and (B) in a weight ratio of component (A) to component (B) of between about 5/95 and 60/40.

4,072,618

METAL WORKING LUBRICANT

Harry J. Andress, Jr., Wenonah, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 27, 1976, Ser. No. 718,222
Int. Cl.² C10M *1/48, 3/42, 5/24, 7/46*
U.S. Cl. 252—46.6 **4 Claims**

1. A cutting oil composition consisting essentially of a mineral oil and minor amounts, sufficient to provide improved extreme pressure properties thereto, of a component (A) a sulfurized oil and a component (B) the reaction product of a polyalkylenesuccinic anhydride having a molecular weight between about 500 and about 2000 with a polyethyleneglycol or a polypropyleneglycol, having a molecular weight between about 200 and about 1000, in a mole ratio of anhydride to glycol between about 0.5 and about 2, at a temperature between about 150° and about 300° C. for between about 1 hour and about 10 hours to form an intermediate product; and further reacting with said intermediate about 0.01–0.05 part by weight sulfur or about 0.05–0.15 part by weight phosphorus pentasulfide per part by weight intermediate, at a temperature between about 150° and about 250° C. for between about 5 hours and about 10 hours.

4,072,619

ESTER LUBRICANTS CONTAINING POLYOXYALKYLENE PHENOTHIAZINES

Dennis A. Williams, and Robert Carswell, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 30, 1976, Ser. No. 718,641
Int. Cl.² C10M *1/38*
U.S. Cl. 252—47.5 **13 Claims**

1. A lubricant composition comprising an organic ester based synthetic fluid and about 1 to about 90 weight percent of a phenothiazine having an N-substituted polyoxyalkylene group and having a weight average molecular weight range from about 300 to about 5000 wherein the polyoxyalkylene group is derived from an alkylene oxide selected from ethylene, propylene, butylene, styrene oxides or mixtures thereof with the proviso that less than about 85% by weight of said phenothiazine is derived from ethylene oxide when said polyoxyalkylene group is derived from ethylene oxide.

4,072,620

ELECTRICAL INSULATING OIL

Midori Masunaga, Tokyo; Yoshiki Kohno, Kawasaki, and Hiroshi Hasegawa, Yokohama, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Feb. 10, 1976, Ser. No. 656,906
Claims priority, application Japan, Feb. 13, 1975, 50-17480
Int. Cl.² H01B *3/22*
U.S. Cl. 252—63 **6 Claims**

1. An electrical insulating oil consisting essentially of (A) 80 - 99 parts by weight of a refined oil (I) containing not more than 0.25 wt. % of sulphur and more than 25 wt. % to not more than 35 wt. % of aromatic compounds, the refined oil being produced by the steps of:

refining with a solvent capable of selectively dissolving aromatic compounds a distillate contained in a fraction having a boiling range of 230° - 430° C at atmospheric pressure obtained by the distillation of a paraffin or mixed base crude oil at atmospheric pressure or the distillation at a reduced pressure of a bottom oil obtained by the distillation of the crude oil at atmospheric pressure thereby to obtain a raffinate from said distillate,

hydrofining the raffinate so obtained and

dewaxing the thus hydrofined raffinate with a solvent

(B) 1 - 20 parts by weight of an unhydrofined refined oil (II) prepared by treating at least with a solid adsorbent a lubricating oil fraction of a mineral oil having a boiling range of 230° - 460° C at atmospheric pressure obtained from a crude oil thereby to obtain a base oil for the electrical insulating oil, the base oil having a total sulphur content of not more than 0.35 wt. %, and (C) 0.001 - 1.0 part by weight per 100 parts by weight of said base oil, of an essentially amorphous ethylene-propylene copolymer (III) having a weight average molecular weight of 10,000 - 200,000 and a propylene content of 10 - 70 mol %, whereby is obtained the electrical insulating oil having a low pour point as well as excellent oxidation stability, thermal stability, corona resistance and corrosion resistance.

4,072,621

DETERGENT COMPOSITION

Terence James Rose, Tervuren, Belgium, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 11, 1975, Ser. No. 631,030
Claims priority, application United Kingdom, Nov. 13, 1974, 49174/74
Int. Cl.² C02B *1/44*; C11D *1/72, 3/20, 3/37*
U.S. Cl. 252—89 R **12 Claims**

1. A detergent composition capable of rapidly reducing the free polyvalent metal ion content of an aqueous solution, comprising:

(a) from about 5 to about 65% by weight of a water-insoluble metallo-silicate ion exchange material of the formula

$$M_z[(MeO_2)_z . (SiO_2)_y] xH_2O$$

wherein M is a calcium exchangeable cation, Me is either aluminum or boron, z and y are integers; the molar ratio of z to y is in the range from about 1.0 to about 0.5 and x is an integer from about 15 to about 264; said metallo-silicate ion exchange material having a particle size diameter of from about 0.2 micron to about 10 microns; a calcium ion exchange capacity of at least about 200 mg. $CaCO_3$ eq./g.; and a calcium ion exchange rate of at least about 2 grains Ca^{++}/gallon/minute/gram;

(b) from about 10 to about 50% by weight of a nonionic surface-active agent selected from the group consisting of:

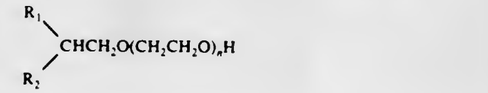
(i) a water-soluble nonionic surface-active agent having the formula $R(OC_xH_{2x})_nOH$ wherein R represents an alkyl or alkenyl group having from 8 to 22 carbon atoms or an alkylated or alkenylated phenyl group having from 6 to 12 carbon atoms in the alkyl or alkenyl group, x is 2 or 3 and n ranges from 1 to 8, said nonionic surface-active agent having a hydrophilic lipophilic balance (HLB) of less than about 10.0.

(ii) a nonionic polyethoxy surface active agent having a HLB in the range from 11:14.5 in conjunction with a component of the formula



wherein R_1 is a straight chain alkyl group, R_2 is H or $-CH_3$, the total number of carbon atoms in R_1 and R_2 is from 10 to 13, R_2 is CH_3 in from 40 to 60% by weight of the corresponding unethoxylated alcohols, and the average degree of ethoxylation n is from 2.5 to 4;

(iii) a nonionic polyethoxy surface-active agent having a HLB in the range from 11:14.5 in conjunction with a nonionic surface-active agent of the formula



wherein R_1 is a straight chain alkyl group, R_2 is H or $-CH_3$, the total number of carbon atoms in R_1 and R_2 is from 10 to 13, R_2 is CH_3 in from 15 to 30% by weight of the unethoxylated alcohols, and the average degree of ethoxylation n is from 3 to 4; and

(iv) mixtures thereof; and

(c) from about 0.10 to about 6% by weight of a water-soluble derivative of a copolymer of

(1) a vinyl compound having the general formula RCH = CHR wherein one R represents a hydrogen atom and the other R represents an alkyl ether radical containing from one to about four carbon atoms and

(2) maleic anhydride; the ratio of (1) to (2) being from 2:1 to 1:2.

4,072,622

STABLE AQUEOUS SUSPENSION OF WATER-INSOLUBLE, CALCIUM-BINDING ALUMINOSILICATES AND ORGANIC SUSPENDING AGENTS

Dieter Kühling, Monheim; Josef Huppertz, Dusseldorf-Holthausen; Peter Krings, Krefeld, and Herbert Reuter, Hilden, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Dusseldorf-Holthausen, Germany

Filed Oct. 7, 1975, Ser. No. 620,387
Claims priority, application Austria, Oct. 10, 1974, 8151/74; Germany, June 19, 1975, 2527388
Int. Cl.² B01F *3/12, 17/00*; B01J *29/06*; C02B *1/44*
U.S. Cl. 252—179 **10 Claims**

1. An aqueous suspension having a pH of between 7 and 12 of water-insoluble, calcium-binding aluminosilicates with an improved stability against settling consisting essentially of (A) from 20% to 50% by weight on the anhydrous basis of at least one crystalline, finely-divided, water-insoluble silicate compound having a calcium-binding power of at least 50 mg CaO/gm of anhydrous active substance and a primary particle size of from 0.1μ to 100μ and having the formula, combined water not shown

$$(M_2O)_x . Me_2O_3 (SiO_2)_y$$

where M is a member selected from the group consisting of sodium and potassium, x is a number of from 0.7 to 1.5, Me is aluminum or boron, and y is a number from 0.8 to 6, and (B) from 0.5% to 6% by weight of at least one organic dispersing agent selected from the group consisting of the free acids and alkali-metal salts of

1. an organic phosphonic acid having at least one further acid group selected from the group consisting of phosphonic acid and carboxyl, and

2. an alkyl acid phosphate emulsifier having from 4 to 10 carbon atoms in the alkyl, in water, said aqueous suspension being capable of being pumped after 24 hours of standing.

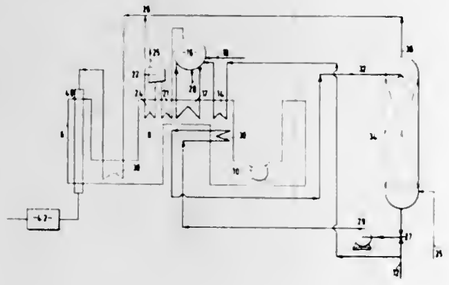
4,072,623
POLYURETHANE FOAM SYSTEM
David E. Hayden, and Millard E. Foucht, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed Nov. 28, 1975, Ser. No. 636,321
Int. Cl.² C08G 18/32, 18/12
U.S. Cl. 252—182 9 Claims

1. A polyol composition comprising at least a first, a second and a third polyol wherein,
a. said first polyol is an oxyalkylated Mannich reaction product of a phenol, an aldehyde and an alkanol amine, reacted to a hydroxyl number within the range of from about 350 to about 650;
b. said second polyol is an oxyalkylated polyamine reacted to a hydroxyl number within the range of from about 600 to about 800; and
c. said third polyol is pentaerythritol oxyalkylated to a hydroxyl number within the range of from about 350 to about 650.

4,072,624
GELATIN COMPOSITION
Ronald John Croome, Rhiwbina, and Donald Beuford Thomas, Creigiau, both of Wales, assignors to P. Leiner & Sons Limited, Treforest, Wales
Filed Oct. 18, 1976, Ser. No. 733,416
Claims priority, application United Kingdom, Oct. 20, 1975, 43012/75
Int. Cl.² C09K 11/00
U.S. Cl. 252—301.35 11 Claims

1. The product of the chemical reaction of a synthetic polymer having a multiplicity of primary amino groups with an optical brightening agent having a single functional group per molecule for reaction with the said primary amino groups of the polymer, said product being capable of forming a homogeneous aqueous solution with gelatin.

4,072,625
STEAM-HYDROCARBON PROCESS
Alwyn Pinto, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England
Filed Feb. 20, 1976, Ser. No. 659,630
Claims priority, application United Kingdom, Mar. 3, 1975, 8732/75; Apr. 9, 1975, 14553/75
Int. Cl.² C01B 2/16
U.S. Cl. 252—373 8 Claims



1. A process of treating hydrocarbons which comprises:
a. reacting a normally gaseous hydrocarbon with steam endothermically over a catalyst at an outlet temperature in the range 700° to 900° C. in a reaction zone heated by a combustion furnace, to give a process gas stream containing hydrogen, carbon monoxide and carbon dioxide;
b. recovering heat by cooling the process gas stream resulting from said reaction of a hydrocarbon with steam in heat exchange in a boiler raising steam at the pressure in the range of 60 to 120 ata. and then with feed water for said boiler, until the temperature of said process gas stream has fallen to 150° to 300° C;
c. transferring heat contained in said process gas stream at 150° to 300° C., to water under pressure; and
d. bringing the resulting hot water under pressure into direct heat exchange with the normally gaseous hydrocarbon to be reacted in step (a), to provide 10 to 30% of the steam to tbe reacted in step (a).

4,072,626
AMINE SALT COMPOSITION USEFUL IN INHIBITING METAL CORROSION
Donald C. Finney, Bellevue, Pa., assignor to A. F. Industries, Inc., Pittsburgh, Pa.
Filed Apr. 12, 1976, Ser. No. 676,158
Int. Cl.² C23F 11/00
U.S. Cl. 252—389 A 8 Claims

1. A composition comprising:
a. dicyclohexylammonium pelargonate; and,
b. a polyphosphate; said (a) and (b) being present in sufficient amounts to inhibit metal corrosion in a saline environment.

4,072,627
URIC ACID DETERMINATION
E. Melvin Gindler, Rockford, Ill., assignor to Pierce Chemical Company, Rockford, Ill.
Filed Aug. 2, 1976, Ser. No. 710,801
Int. Cl.² C09K 3/00; G01N 31/06, 31/22, 33/16
U.S. Cl. 252—408 10 Claims

1. In an aqueous solution useful in connection with a redox type spectrophotometric or colorimetric determination of uric acid in a biologic fluid comprising a multivalent metallic ion reducible to a lower valence state by uric acid and a water soluble chelating compound capable of complexing with said metallic ion after reduction by uric acid to yield, in complexed form, a colored complex; the improvement wherein said solution also contains, as an added constituent, imidazole, or a combination of imidazole and a water soluble alpha-amino acid, said constituent being present in an amount such that, when said solution contains a biologic fluid containing protein and uric acid, a buffer system such that the pH of the solution is 6 to 12, and a multivalent metal ion, said protein in said fluid does not significantly reduce said multivalent ions present in said solution.

4,072,628
REGENERATION OF SUPPORTED RUTHENIUM CATALYST
Walter M. Kruse, and Leon W. Wright, both of Wilmington, Del., assignors to ICI Americas Inc., Wilmington, Del.
Continuation-in-part of Ser. No. 520,926, Nov. 5, 1974, Pat. No. 3,963,788, and Ser. No. 531,972, Dec. 12, 1974, Pat. No. 3,963,789. This application Mar. 30, 1976, Ser. No. 671,966
Int. Cl.² B01J 29/38, 23/96; C07C 31/18
U.S. Cl. 252—415 15 Claims

1. A process for regenerating a supported ruthenium catalyst which has been used to convert a carbohydrate in an aqueous medium at a pH of about 3 to about 7.5 to a polyhydric alcohol or mixture of polyhydric alcohols in the presence of hydrogen under elevated pressure at a temperature in the range of about 100° C. to about 200° C., said process comprising separating said catalyst from the reaction medium and contacting said catalyst with a dilute aqueous solution of a water soluble acid, the concentration of said aqueous solution of said water soluble acid being such as to effectively regenerate said catalyst without dissolving an appreciable portion of the support.

13. A process according to claim 1 in which said carbohydrate is an essentially water soluble water polysaccharide-containing carbohydrate, the catalyst support is carbon or a crystalline aluminosilicate selected from the group consisting of Y type zeolites and acid-activated clays having base exchange capacity, and the acid is a water soluble mineral acid.

14. A process according to claim 13 in which said solution has an acid concentration in the range of about 0.1 N to about 0.5 N, the catalyst support is a Y type zeolite or an acid activated crystalline aluminosilicate clay having base exchange capacity, and said catalyst is contacted with said solution of said acid at approximately room temperature.

4,072,629
REGENERATION OF ALKENE DISPROPORTIONATION CATALYST
Frank J. Janssen, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.
Continuation-in-part of Ser. No. 531,515, Dec. 11, 1974, abandoned. This application Oct. 26, 1976, Ser. No. 735,580
Claims priority, application United Kingdom, Dec. 18, 1973, 58480/73
Int. Cl.² B01J 21/20, 23/92; C07C 3/62
U.S. Cl. 252—416 7 Claims

1. A process for the regeneration of solid alkene disproportionation catalysts selected from the group consisting of oxides of molybdenum, cobalt, tungsten, rhenium and mixtures thereof supported on alumina or silica which have been used to disproportionate alkene feeds containing at least thirty percent of the alkenes in said feed with carbon numbers of twelve or more and which catalysts have been deactivated by the deposition of organic material which process comprises first contacting the deactivated catalyst with a regenerating alkene or mixtures of alkenes having from 2 to about 5 carbon atoms per molecule at a temperature of from about 50° to about 350° C and then contacting the catalyst with an oxygen-containing gas at a temperature between about 100° and 650° C.

2. The process of claim 1 wherein the regenerating alkene is selected from the group consisting of propylene, 2-butene and mixtures thereof.

3. The process of claim 2 wherein the catalysts comprise oxides of molybdenum, cobalt, tungsten, rhenium and mixtures thereof supported on gamma-alumina.

4,072,630
METAL PHTHALOCYANINE CATALYST PREPARATION
Walter M. Douglas, Streamwood, Ill., assignor to UOP Inc., Des Plaines, Ill.
Filed Feb. 17, 1976, Ser. No. 658,791
Int. Cl.² B01J 27/24
U.S. Cl. 252—430 10 Claims

1. A method of preparing a supported metal phthalocyanine catalyst which comprises successively impregnating a solid adsorbent carrier material with a solution of an alkali metal phthalocyanine and with a metal salt solution comprising a metal exchangeable with said alkali metal, said metal salt being in sufficient amount to provide an exchange metal/alkali metal phthalocyanine weight ratio of from about 1.5:1 to about 3.0:1 and effecting a substantially complete metal cationic exchange between said metal salt and said alkali metal phthalocyanine.

4,072,631
VANADYL ALCOHOLATE, ORGANIC TITANATE, POLYHYDRIC ALCOHOL COMPOSITIONS AS ESTERIFICATION/TRANSESTERIFICATION CATALYSTS
Herwart Curt Vogt, Grosse Ile; Manher Parekh, Woodhaven; Moses Cenker, Trenton, and John Thomas Patton, Jr., Wyandotte, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.
Filed Dec. 1, 1976, Ser. No. 746,422
Int. Cl.² B01J 31/12
U.S. Cl. 252—431 R 4 Claims

1. A composition consisting essentially of the reaction product of (A) an organic titanium compound having the formula:

$$Ti(OR)_4$$

wherein R is a radical selected from the group consisting of an aliphatic radical having from 1 to 18 carbon atoms, an alicyclic radical having between 1 and 3 rings, between 5 and 6 carbon atoms per ring, and between 5 and 18 carbon atoms per molecule, an aromatic radical having between 1 and 3 rings and between 6 and 18 carbon atoms per molecule with (B) a vanadyl alcoholate compound having the formula:

$$V(OR)_3$$

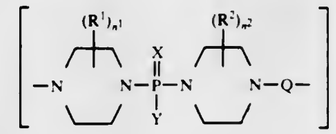
wherein R is a radical selected from the group consisting of an aliphatic radical having from 1 to 18 carbon atoms, an alicyclic radical having between 5 and 6 carbon atoms, and a benzyl radical, and (C) a polyhydric alcohol containing 2 or 3 hydroxy groups selected from the group consisting of aliphatic, alicyclic, and aromatic polyhydric alcohols, and ether compounds of aliphatic and aromatic polyhydric alcohols wherein the mole ratio of the titanium compound to the vanadyl compound to the polyhydric alcohol compound is 1:1:1.

4,072,632
DISHWASHING COMPOSITIONS
David Alan Reed, Wallasey, England, assignor to Lever Brothers Company, New York, N.Y.
Continuation of Ser. No. 345,796, March 28, 1973, abandoned. This application Dec. 10, 1975, Ser. No. 639,498
Claims priority, application United Kingdom, Apr. 6, 1972, 15832/72
Int. Cl.² C11D 1/12, 1/14, 1/28, 1/27
U.S. Cl. 252—541 7 Claims

1. A lather stable dishwashing detergent composition comprising a mixture of:
a. a dialkyl ester salt of a sulphosuccinic acid wherein each alkyl radical is selected from the group consisting of heptyl, octyl and nonyl and the cation is selected from the group consisting of an alkali metal and ammonium; and
b. a sulphate of the formula $R(OC_2H_4)_nOSO_3M$ wherein R contains from 11 to 18 carbon atoms and is selected from the group consisting of linear alkyl, branched alkyl and mixtures of linear and branched alkyl, n is an integer from 1 to 40 when R is derived from a primary alcohol, and 2 to 40 when R is derived from a secondary alcohol; and M is a cation selected from an alkali metal and ammonium;
components (a) and (b) above being present in a weight ratio in the range of from 10:90 to 99:1.

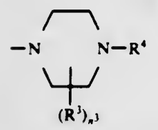
4,072,633
NOVEL PROCESS
Johny C. Hermans, Wespelaar, Belgium, assignor to S.A. Texaco Belgium N.V., Brussels, Belgium
Filed Nov. 3, 1975, Ser. No. 628,286
Claims priority, application United Kingdom, May 21, 1975, 21795/75; May 21, 1975, 21796/75
Int. Cl.² C08G 59/50
U.S. Cl. 260—2 N 17 Claims

1. Polymers containing units of the formula



wherein
X represents an oxygen or sulphur atom, or a group of the formula >N—R in which R represents an aliphatic, cy-

cloaliphatic or aromatic hydrocarbon group or a heterocyclic group, or X may be absent;
Y represents an aliphatic, cycloaliphatic or aromatic hydrocarbon group, or a heterocyclic group;
a group of the formula —NHR or —NR_2 in which R has the meaning given above, or in which the two groups R and the nitrogen atom to which they are attached represent a N-containing heterocyclic group;
a group of the formula —OR in which R has the meaning given above; or
a group of the formula



R^1, R^2, R^3 and R^4 each represents a hydrocarbon substituent on a piperazine ring;
n^1, n^2 and n^3 each represents zero or an integer; and
Q represents the residue of a symmetrical or unsymmetrical bis-epoxide.

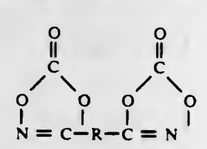
4,072,634

PRODUCTION OF POLYURETHANE FOAMS FROM MODIFIED POLYESTER POLYOL PREPOLYMERS

Alfred E. Borchert, Cherry Hill, N.J., and Charles J. Kremer, Brookhaven, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 12, 1973, Ser. No. 340,406
Int. Cl.² C08G *18/46, 18/10, 18/14*
U.S. Cl. 260—2.5 A **5 Claims**

1. A method of preparing a foam polyurethane composition having improved light and hydrolytic stability comprising:
(a) Forming a modified polyester prepolymer having a hydroxyl functionality between 2 and 3 by reacting a cyclic nitrile carbonate having the structure:



wherein R is a saturated aliphatic or alicyclic organic radical free of reactive hydrogens as determined by the Zerewitinoff Test having up to about 50 carbon atoms with a polyester polyol having a hydroxyl number of about 50 to about 450, the relative amounts of polyester polyol and cyclic nitrile carbonate being sufficient to provide a ratio of hydroxyl groups to cyclic nitrile groups of about 2 to 10:1, and
(b) Reacting the modified polyester polyol with an aromatic polyisocyanate in the presence of an amount of water sufficient to produce a foam of the desired density.

4,072,635

ORGANOSILOXANE GELS

Edward M. Jeram, Burnt Hills, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation-in-part of Ser. No. 160,162, July 6, 1971, abandoned. This application June 6, 1975, Ser. No. 584,392
Int. Cl.² C08J *9/32*
U.S. Cl. 260—2.5 S **18 Claims**

1. A reaction product silicone gel of a mixture comprising reacting (1) an organosiloxane having a viscosity of from 10 to 10,000 centistokes at 25° C, and being a copolymer consisting essentially of units of the formula $R_2ViSiO_{0.5}$, $RViSiO$, R_2SiO and $MeR_2SiO_{0.5}$, where each R is individually selected from the group consisting of methyl and phenyl radicals and Vi represents a vinyl radical, at least 0.50 molar percent of the units in said copolymer being $R_2ViSiO_{0.5}$ units and $RViSiO$ units where the terminal groups are at least 50 mole percent $ViR_2SiO_{0.5}$ units and may have as the rest of the total terminal units $MeR_2SiO_{0.5}$ units, (2) a liquid hydrogen siloxane of the average general formula $XRMeSiO(R_2SiO)_n(RHSiO)_m$. $SiMeRX$, where each R is as above defined and X is selected from the group consisting of H and R, no more than 25 molar percent of the total R radicals present in (1) and (2) being phenyl, and n and m have such average values that the viscosity of the hydrogen siloxane is no more than 10,000 centistokes at 25° C and m is at least 1, in the presence of a platinum or platinum compound catalyst in an amount sufficient to furnish at least 0.1 part per million of platinum based upon the combined weights of (1) and (2); the properties of (1) and (2) being such that prior to reaction there is an average of from 1.4 to 1.8 gram atoms of the silicon-bonded hydrogen atoms in (2) per gram molecular weight of (1) and there being at least one vinyl siloxy unit in (1) for every silicon-bonded hydrogen atom in (2), the molecular weight of (1) being calculated by the equation:

$$\log \text{visc.} = 1.00 + 0.0123M^{.5}$$

where M is the molecular weight and "visc." is the viscosity of (1) in centistokes at 25° C.

4,072,636

PROCESS FOR PREPARING SMOKE-RETARDANT POLYISOCYANURATE FOAM

Kaneyoshi Ashida, Chofu; Masaaki Ohtani, Kawasaki, and Shoichi Ohkubo, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Mar. 3, 1976, Ser. No. 663,503
Claims priority, application Japan, Mar. 7, 1975, 50-27780; Mar. 10, 1975, 50-28853
Int. Cl.² C08G *18/14*
U.S. Cl. 260—2.5 AW **13 Claims**

1. In a process for preparing a smoke-retardant polyisocyanurate foam by reacting an organic polyisocyanate in the presence of a blowing agent and an isocyanate-trimerization catalyst, an improvement characterized in that the reaction is conducted in the presence of from 0.7 to 1.5 wt. %, as Si, of an organosilicate having the formula $Si(OR)_4$ or $R_nSi(OR')_{4-n}$ wherein R and R' are the same or different and represent aliphatic, alicyclic and aromatic hydrocarbon groups having 1 - 12 carbon atoms or substituted derivatives thereof and n is an integer of 1 to 3.

4,072,637

PROCESS FOR THE PRODUCTION OF POLYURETHANE RESINS AND FOAMS UTILIZING SILICO-FORMIC ACID

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 262,485, June 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 71,628, Sept. 11, 1970, abandoned. This application July 25, 1975, Ser. No. 599,000
Int. Cl.² C08G *18/38*
U.S. Cl. 260—2.5 AM **11 Claims**

1. A process for the production of isocyanate-silico-formate compositions which comprises the steps of:
(a) providing about 1 mol of silico-formic acid;
(b) mixing therewith from about 0.5 to about 2 mols of an organic diisocyanate compound;
(c) maintaining said mixture at a temperature of from about 20° C to about 60° C; and
(d) agitating said mixture until a smooth, creamy appearance is obtained.

2. The process according to claim 1, including the further steps of adding a foaming agent to said mixture after step (d) and heating said mixture to a temperature of from about 90° C to about 150° C until said mixture expands in volume at least 4 times, forming a self-sustaining foam.

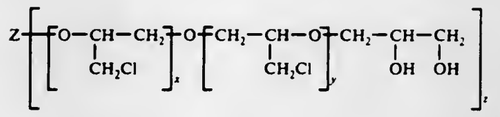
4,072,638

HALOGENATED POLYETHER POLYOLS AND POLYURETHANE FOAMS PRODUCED THEREFROM

Jean-Claude Boulet, Tavaux-Cite, France; René Walraevens, Brussels, Belgium; Gérard Bonnety, Tavaux-Cite, France; Jacques Lolivier, and Paul Trouillet, both of Brussels, Belgium, assignors to Solvay & Cie, Brussels, Belgium

Division of Ser. No. 607,595, Aug. 25, 1975, abandoned, which is a continuation of Ser. No. 353,536, April 23, 1973, abandoned. This application Oct. 4, 1976, Ser. No. 729,424
Claims priority, application Luxembourg, May 15, 1972, 65359; Feb. 12, 1973, 67005
Int. Cl.² C08G *18/50*
U.S. Cl. 260—2.5 AP **15 Claims**

1. A process for the production of rigid and semi-rigid, fire-resisting polyurethane foams which comprises reacting in the presence of a foaming agent and a reaction catalyst an organic polyisocyanate and at least one polyetherpolyol having the general formula:



in which z represents a number between 2 and 6, x and y represent numbers between 0 and 12 such that the means value $\overline{x+y}$ per chain is between 0 and 12, and that $z\,\overline{(x+y)}$, in which $\overline{x+y}$ represents the mean value of $x+y$ in the entire molecule, is between 1 and 72, and Z represents a radical of valence z which is the residue of an organic polyhydroxyl compound initiator having from 2 to 6 hydroxyl groups.

4,072,639

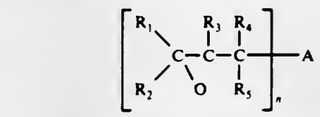
UNDERCOATING COMPOSITION FOR POLYESTERS CONTAINING EPOXY COMPOUNDS

Teruo Yamaguchi, and Hidefumi Sera, both of Ninami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 5, 1976, Ser. No. 664,224
Claims priority, application Japan, Mar. 7, 1975, 50-27785
Int. Cl.² C08L *89/00*
U.S. Cl. 260—6 **6 Claims**

1. An undercoating composition for photographic polyester film wherein the polyester is a condensation product of a dibasic aromatic acid and a glycol which contains (1) a compound having two or more epoxy groups in its molecule and a molecular weight of about 1,000 or less, said compound being represented by general formula (I):

(I)



wherein R_1 to R_5, which may be the same or different, represent a hydrogen atom or an alkyl group having 1 to 3 carbon atoms, n represents an integer of 2 to 6 and A represents a linear or cyclic group having n nitrogen atoms or n oxygen atoms where the nitrogen atoms or oxygen atoms are directly bonded to the glycidyl group, a 5- or 6-membered heterocyclic ring having two or more active nitrogen atoms in the ring, a nitrogen atom, a phosphate group or a sulfate group; and (2) water as a primary solvent or sole solvent.

4,072,640

COPOLYMERIZATION OF VINYL MONOMERS WITH CELLULOSE AND STARCH IN COPPER AMMONIUM SOLUTIONS

Jose M. Sosa, Altos de Pipe, Venezuela, assignor to Instituto Venezolano de Investigaciones Cientificas, Estado Miranda, Venezuela

Filed Jan. 29, 1976, Ser. No. 653,511
Int. Cl.² C08L *1/02, 3/02*
U.S. Cl. 260—17.4 GC **10 Claims**

1. A process for the copolymerization of starch or cellulose with a vinyl monomer or monomers, comprising:
dissolving the starch or cellulose in a copper ammonium solution and adding the vinyl monomer or monomers thereto;
catalyzing polymerization with heat or light until the desired polymer is achieved; and
recovering the polymer so produced.

4,072,641

POLYAMIDE RESINS AND METHOD FOR MANUFACTURE

Melvin L. Loeb, Northbrook, Ill., assignor to Kraftco Corporation, Glenview, Ill.

Filed Oct. 28, 1975, Ser. No. 625,824
Int. Cl.² C08G *69/26*
U.S. Cl. 260—18 N **8 Claims**

1. A polyamide resin resistant to gelling comprising the polycondensation reaction product of a reaction mixture of an alkylene diamine, a polymeric fatty acid and a monocarboxylic fatty acid chain stopping agent, said polymeric fatty acid having less than about 2 percent by weight of monobasic acids, from about 75 to 96 percent by weight of dibasic acids and from about 4 to about 25 percent by weight of tribasic or higher acids, said chain stopping agent including a branched chain monocarboxylic acid which is liquid at room temperature and which is selected from the group consisting of C_{16} - C_{20} saturated and unsaturated fatty acids wherein there are from 1 to 5 total carbons in the branching groups and the branching groups are from C_1 - C_4, the total number of amine groups and hydroxyl groups (if any) in said reaction mixture being substantially equivalent and no more than about 10 percent more or less than the total number of carboxylic groups provided by said polymeric fatty acid and said monocarboxylic fatty acid chain stopping agent, said chain stopping agent contributing from about 8 to about 16 percent of the total carboxylic groups.

4,072,642

ALKYD RESINS

Jurgen Ritz, Mainz-Mombach; Rolf Zimmermann, Wiesbaden, and Hannes Fischer, Taunusstein, Wehen, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed Sept. 2, 1975, Ser. No. 609,709
Claims priority, application Germany, Sept. 2, 1974, 2441922
Int. Cl.² C08G *63/20, 63/48, 63/52*
U.S. Cl. 260—22 CB **11 Claims**

1. A multi-stage process for the preparation of a fatty acid modified alkyd resin which is capable of air-drying in the absence of a peroxide which comprises first forming a reaction product by reacting in a first step A only
(I) at least one α,β-olefinically unsaturated dicarboxylic acid component or a mixture thereof with
(I') a polycarboxylic acid component being free from polymerisable olefinic and acetylenic bonds, the mol percent of (I) being up to 50% of (I) + (I'),
(II) at least one trihydric alcohol or a mixture thereof with a minor amount of a dihydric alcohol and
(III) dicyclopentadiene at a temperature up to 160° C and subsequently in a second step B adding to the product formed in A
(IV) at least one aliphatic monocarboxylic acid component

selected from the group consisting of an unsaturated fatty acid and its esters, and further esterifying and modifying A with (IV) at a temperature of at least 160° C to yield an alkyd resin containing from (1) 10 to 35% by weight of cyclopentadiene units and wherein (2) the amount by weight of the aliphatic monocarboxylic acid components added is between 20 and 60% by weight of the total reaction mixture, but at least as large as the total amount of the polycarboxylic acid component, the latter being calculated as anhyride.

4,072,643

FLAME-RETARDED POLYOLEFIN BLEND WITH GOOD BALANCE OF PROPERTIES

Howard W. Bost, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 2, 1976, Ser. No. 663,007
Int. Cl.² C08K *5/34, 5/51*
U.S. Cl. 260—23 H **10 Claims**

1. A flame-retarded polymeric composition comprising:

a. a polymer blend consisting essentially of from 40 to 50 weight percent of a polypropylene having a melt flow in the range of 10 to 15 g/10 min. and a density in the range of 0.90 to 0.91 g/cc., 25 to 35 weight percent of a polyethylene having a melt flow index in the range of 15–20 g/10 min. and a density in the range of 0.950–0.960, and 20 to 30 weight percent of a substantially amorphous ethylene/-propylene copolymer having a Mooney Viscosity ML (1 + 8 min.) at 260° F in the range of 55–70 and a density of about 0.86 g/cc., having incorporated therein

b. from 10 to 50 parts per 100 parts of said blend of a cured intumescent flame retardant comprising the reaction product of a phosphorus oxide of the formula $P_2O_5 \cdot xH_2O$, wherein x is a number having a value of 0 to 3; a saturated acyclic polyol having from 5 to 15 carbon atoms and from 4 to 8 hydroxyl groups per molecule; a nitrogen compound selected from the group consisting of melamine, dicyandiamide, urea and dimethylurea; and, optionally, a color improving compound of the formula $R—Y_z$, having from 2 to 24 carbon atoms per molecule, wherein Y is selected from the group consisting of —OH, —COOH —NR'_2, z is a number having a value of 1 or 2, R is a hydrocarbyl radical having a valence of z selected from the group consisting of alkyl, cycloalkyl and alkoxy, and R' is —H or —R; which reaction product is thereafter cured by heating.

4,072,644

WATER BASED PRINTING INK

Ross M. Hedrick, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed May 17, 1976, Ser. No. 687,413
Int. Cl.² C08L *23/00*
U.S. Cl. 260—29.6 HN **22 Claims**

1. An aqueous based printing ink comprising ink pigment, water and a polymer solubilized in said ink by a rapid removable solubilizing component, said polymer being capable of forming a water-insensitive gel film upon removal of said rapid removable solubilizing component.

4,072,645

TRANSPARENT PRE-CURE COATING FOR RUBBERY POLYMERS

Richard J. Cogley, Jr., South Gate, Calif., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed July 19, 1976, Ser. No. 706,354
Int. Cl.² C08L *9/10*
U.S. Cl. 260—29.7 M **10 Claims**

1. A pre-cure paint comprising:

a. a rubbery diene polymer,

b. hydrated amorphous silica,

c. a zinc salt or zinc complex which is soluble in the rubbery diene polymer, and

d. a paint vehicle.

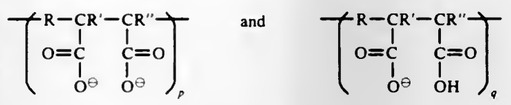
4,072,646

CONJUGATED DIENE-MALEIC ACID DERIVATIVE COMPOSITIONS AND PROCESS FOR PREPARING THE SAME

Hiroyuki Ito, and Hirosuke Imai, both of Yokohama, Japan, assignors to Nippon Oil Company Limited, Tokyo, Japan

Filed Oct. 20, 1975, Ser. No. 624,225
Claims priority, application Japan, Oct. 23, 1974, 49-121522
Int. Cl.² C08L *9/00, 9/10*
U.S. Cl. 260—29.7 H **16 Claims**

1. Novel liquid compositions comprising (A) high-molecular anions from dissociation of a part or the whole of the carboxylic acid group of a conjugated diene-maleic acid derivative copolymer with repeating units represented by the formulae



and

wherein R represents a conjugated diene unit in the copolymer, R' and R'' each represent hydrogen or an organic radical having from 1 to 18 carbon atoms and p and q each are an integer, the degree of dissociation in terms of p : q being in the range from 100 : 0 to 0 : 100,

B. one or more of alkali metal cations selected from Na^+, K^+ and Li^+ or quaternary ammonium cations represented by $R_1R_2N^+R_3R_4$ wherein R_1, R_2, R_3 and R_4 are the same or different and each selected from the group consisting of hydrogen, alkyl radical of from 1 to 18 carbon atoms, cycloalkyl radical and aryl radical, the amount being in the range from 0.5 to 5.0 equivalents, on the basis of the maleic acid derivative unit in the component (A);

C. Mg^{2+} ions in an amount from 0.5 to 2.0 equivalents, on the basis of the maleic acid derivative unit in the component (A);

D. anions of magnesium compound(s) or alkali metal compound(s), the amount being in the range from 0.5 to 7.0 equivalents, on the basis of the maleic acid derivative unit in the component (A); and

E. water in an amount in the range from 1 to 1000 times, the total weight of the componets (A), (B), (C) and (D), said composition being reversibly liquid at lower temperatures and solid at higher temperatures.

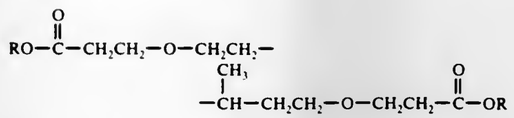
4,072,647

POLYVINYL CHLORIDE PLASTIC COMPOSITIONS

Ronald A. Schneider, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 569,508, April 18, 1975, Pat. No. 3,994,959. This application June 16, 1976, Ser. No. 696,611
Int. Cl.² C08K *5/10*
U.S. Cl. 260—31.8 R **1 Claim**

1. Polyvinyl chloride plastic compositions containing a compound of the formula



wherein the R groups are primary alkyl of from 4 to 12 carbon atoms, in minor amounts sufficient to impart plasticizing properties.

4,072,648

HIGH TENSILE STRENGTH ELASTOMERIC ADHESIVE CEMENTS AND LAMINATES THEREFROM

Charles P. O'Farrell, Clark, and John J. Higgins, Westfield, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 209,414, Dec. 17, 1971, Pat. No. 3,867,247. This application Sept. 12, 1974, Ser. No. 505,341
Int. Cl.² C08K *5/01, 5/05, 5/15;* **C08L** *9/00*
U.S. Cl. 260—33.4 PQ **7 Claims**

1. A liquid adhesive elastomeric contact cement composition consisting of a sulfo derivative of an olefinically unsaturated butyl rubber having a viscosity average molecular weight of about 100,000 to about 450,000 containing between about 0.1 and about 5.0 mole percent of sulfo groups, and, as a tackifier, between about 5 and about 90 parts by weight of at least one organo thermoplastic resin having a softening or melting point of above 50° C., per hundred parts by weight of butyl rubber, dissolved in an organic solvent or mixture of organic solvents, said cement composition containing about 10 to about 50 weight % solids, said solvent or solvents being sufficiently volatile to substantially all evaporate at ambient temperatures and pressures.

4,072,649

PROCESS FOR THE PRODUCTION OF FOUNDRY CORES AND MOLDS

Rolf Kubens, Odenthal-Hahnenberg, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 7, 1975, Ser. No. 602,949
Claims priority, application Germany, Aug. 23, 1974, 2440375
Int. Cl.² C08K *3/34;* **B22C** *1/22;* **B29C** *1/02*
U.S. Cl. 260—37 N **10 Claims**

1. In a process for the production of foundry cores and molds wherein a mixture of inert fillers, polyhydroxyl compounds, polyisocyanates and tertiary amines is cured in a mold, the improvement wherein at least 80% by weight of the polyisocyanate component used consists of polyisocyanates of the diphenyl alkane series which solely contain isocyanate groups sterically hindered by substituents in at least one ortho position.

4,072,650

FRICTION MATERIALS

John B. Littlefield, P.O. Box 243, Belle Haven, Va. 23306

Filed July 11, 1975, Ser. No. 594,953
Int. Cl.² C08K *3/10, 5/01*
U.S. Cl. 260—42.22 **8 Claims**

1. A friction material produced by molding a composition comprising:

A. an elastomer binder consisting of a copolymer of butadiene and styrene;

B. a granular filler

C. partially polymerized cashew nutshell oil resin;

D. at least one curing agent;

E. dicyclopentadienyliron, in sufficient quantity with respect to the binder to insure deposition of carbon at elevated temperatures and reduce the amount of decomposition products which cause fade.

4,072,651

TETRAMETAPHOSPHIMIC ACID AND DERIVATIVES AS FLAME RETARDANTS

David Francis Lawson, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Sept. 20, 1972, Ser. No. 290,588
Int. Cl.² C08K *9/00, 5/16;* **C08L** *7/00*
U.S. Cl. 260—42.44 **9 Claims**

1. A process for preparing a burn-resistant composition which comprises admixing between 0.2 and 20 parts by weight of tetrametaphosphimic acid or its salts with each 100 parts by weight of a burnable synthetic resin or natural material, the burn resistance of which is to be improved.

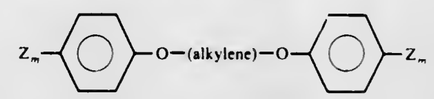
4,072,652

PLASTIC COMPOSITIONS

Arnold L. Anderson, Antioch, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 330,782, Feb. 8, 1973, Pat. No. 4,038,248. This application Jan. 6, 1976, Ser. No. 646,829
The portion of the term of this patent subsequent to July 26, 1984, has been disclaimed.
Int. Cl.² C08K *5/06*
U.S. Cl. 260—45.75 B **21 Claims**

1. A plastic composition comprising a three component system consisting of (1) polyethylene polymer, (2) a bis-phenoxy compound, which functions as a flame retardant for said composition, having the formula



wherein (a) Z is bromine; (b) m and m' are independent and are integers having a value of 5 and (c) alkylene is selected from the group consisting of $—(CH_2)—$, $—(CH_2)_2—$, and $—(CH_2)_3—$, and (3) a flame retardant enhancing agent.

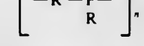
4,072,653

POLYMERIC PHOSPHINE OXIDE FLAME RETARDANTS

Kurt Moedritzer, Webster Groves, Mo., assignor to Monsanto Company, St. Louis, Mo.

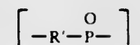
Filed May 20, 1976, Ser. No. 688,205
Int. Cl.² C08K *5/53;* **C07F** *9/02*
U.S. Cl. 260—45.7 P **9 Claims**

1. The combination of an organic polymer together with a polyphosphine oxide corresponding to the formula

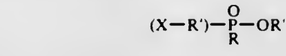


an alkyl group of 1 to 20 carbon atoms or an aryl group of 6 to 20 carbon atoms, R' is a phenylene or naphthylene group, and n is from 2 to 50 units.

9. Process for preparing polyphosphine oxides corresponding to the formula



phenyl or naphthyl group, R is an alkyl group of 1 to 20 carbon atoms or an aryl group of 6 to 20 carbon atoms, and n is from 2 to 50 units, which comprises dehaloalkylating in the presence of a nickel compound at a temperature of 50° C to 300° C a monomeric compound having the general formula



where X is chlorine or bromine, R is an alkyl group of 1 to 20 carbon atoms, or an aryl group of 6 to 20 carbon atoms, R' is phenylene or naphthylene and R'' is an alkyl group of 1 to 20 carbon atoms.

4,072,654

3-(4-ANILINOPHENOXY)-2-HYDROXYPROPYL SULFIDES, ETHERS AND AMINES AS ANTIOXIDANTS

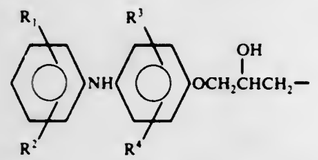
Richard H. Kline, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 17, 1976, Ser. No. 751,495
Int. Cl.² C08K *5/36, 5/18;* **C07C** *79/46, 69/34, 91/16, 91/06*
U.S. Cl. 260—45.9 QB **17 Claims**

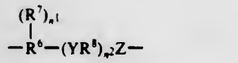
1. A compound having the following structural formula:

AZR

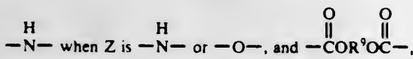
wherein A has the following structure:



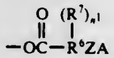
wherein R^1 and R^2 are selected from the group consisting of H, alkyl radicals of 1 to 4 carbons, and alkoxy radicals of 1 to 4 carbons; R^3 and R^4 are selected from the group consisting of H and alkyl radicals of 1 to 4 carbons (1-4C); R is selected from the group consisting of alkyl radicals (1-20C), phenyl or alkyl-substituted phenyl radicals, aralkyl radicals (7-12C); an acyloxyalkyl of the structure $—CH_2(CH_2)_nCOOR^5$, wherein R^5 is an alkyl (1-4C) and n is 0 or 1, the group A, and the group XA wherein X is a moiety of the structure



wherein R^6 is selected from the group consisting of alkylene radicals (1-6C), cycloalkylene radicals (5-12C) and $—R^{11}—R^{10}—(R^{12})_{n3}$ wherein R^{10} is a cycloalkylene (5-12C), R^{11} and R^{12} are alkylene radicals (1-6C) and n^3 is 0 or 1, R^7 is selected from the group consisting of alkyl radicals (1-4C); R^8 is selected from the group consisting of alkylene radicals (1-6C); Y is selected from the group consisting of —O—, —S—, 1,4-phenylene,



wherein R^9 is an alkylene radical (2-6C) which may be substituted by the group



n^1 is 0 to 4; n^2 is 0 or 1 with the proviso that when Y and Z are both



or both —O— then n^2 can be 0-6, and Z is selected from the group consisting of

9. A diene polymer susceptible to oxidative degradation having incorporated therein a compound according to claim 1.

4,072,655

ORGANOSILICON COMPOUNDS AS ADDITIVES FOR CURABLE ORGANOPOLYSILOXANE COMPOSITIONS

Eckhart Louis, Burghausen; Norman Dorsch, Fuchshausen, and Ernst Wohlfarth, Burghausen, all of Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Jan. 12, 1976, Ser. No. 648,429
Claims priority, application Germany, Jan. 15, 1975, 2501441
Int. Cl.² C08G *77/04*
U.S. Cl. 260—46.5 G **9 Claims**

1. In an improved composition which is stable in the absence of moisture, but when exposed to moisture cures to a solid comprising a diorganopolysiloxane having terminal condensable groups, an organosilicon cross-linking agent having at least 3 groups per molecule selected from the class consisting of amino radicals, acylated amino radicals and oximo radicals, said amino radicals and acylated amino radicals are linked to the silicon atom via a nitrogen atom and said oximo radicals are linked to a silicon atom via an oxygen atom, the improvement which comprises that said composition also contains an organosilicon compound in which at least 75 percent of the number of silicon atoms are linked via an oxygen atom to a hydrocarbon radical in which the hydrocarbon radical is linked to one or two hydroxyl groups and the hydrocarbon radical may be linked to the same or different silicon atom via an oxygen atom.

4,072,656

GLYCIDYL ETHERS DERIVED FROM 3,3',5,5'-TETRAALKYL-4,4'-DIHYDROXYBIPHENYL

Ludwig A. Hartmann, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Filed May 24, 1976, Ser. No. 689,157
Int. Cl.² C08G *59/24*
U.S. Cl. 260—47 EN **4 Claims**

1. A curable mixture comprising a glycidyl ether which is the condensation product of a halohydrin and 3,3',5,5'-tetramethyl-4,4'-dihydroxybiphenyl and a curing agent selected from the class consisting of methylene dianiline and m-phenylene diamine.

4,072,657

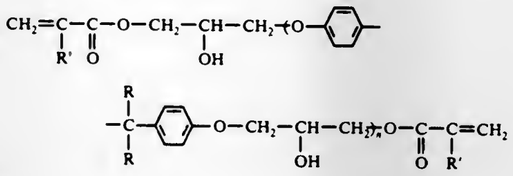
RESIN COMPOSITE FOR PAINT CURABLE BY HIGH ENERGY IONIZING RADIATION

Tadashi Tanaka; Akira Okamoto, both of Yokohama; Takashi Kouno, Machida, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 301,250, Oct. 26, 1972, abandoned.
This application Aug. 21, 1975, Ser. No. 606,606
Claims priority, application Japan, Oct. 26, 1971, 46-85013
Int. Cl.² C08F *220/20*
U.S. Cl. 260—47 UA **1 Claim**

1. A non-volatile resin composite for paint curable in the air by high energy ionizing radiation which comprises:

A. a prepolymer having a terminal active double bond at both terminals, the molecular weight per each of said double bonds being greater than 300, said prepolymer being of the formula



wherein n is an integer of from 2 to 6,
R' is H or $—CH_3$, and
R is —H or $—CH_3$, and

B. a non-volatile polyfunctional polyester oligomer having two or more terminal active double bonds at the terminals and a molecular weight of less than 1000, the molecular weight per each of said double bonds being less than 500, prepared by further esterifying the end of an ester of at least one unsaturated and/or saturated polybasic carboxylic acid with an acid selected from the group consisting of acrylic acid and methacrylic acid, and

the terminal double bond equivalent ratio of A to B being in the range of 5 to 0.5.

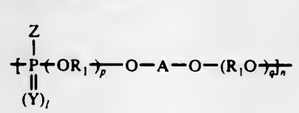
4,072,658

NOVEL PHOSPHORUS- AND BROMINE-CONTAINING POLYMERS

Kazuo Okamoto, Osaka, and Hiroshi Uchio, Settsu, both of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed May 15, 1975, Ser. No. 578,033
Claims priority, application Japan, May 18, 1974, 49-55706; Jan. 8, 1975, 50-5136
Int. Cl.² C08G *65/40, 79/04*
U.S. Cl. 260—49 **15 Claims**

1. A polymer having the formula



(III)

wherein R_1, A, Z, Y, l, p and q have the same meanings as defined hereinafter and n is 3 to 40, obtained by reacting, in the liquid phase, at least one bromine-containing compound having the formula (I)



(I)

wherein R_1 is alkylene having 2 or 3 carbon atoms, p and q are integers of at least 1 and the sum of p and q is an integer of not more than 4 and A is

wherein m is an integer of one to 4 and B is alkylene or alkylidene having one to 6 carbon atoms or sulfone, with at least one phosphorus halide compound having the formula (II)



(II)

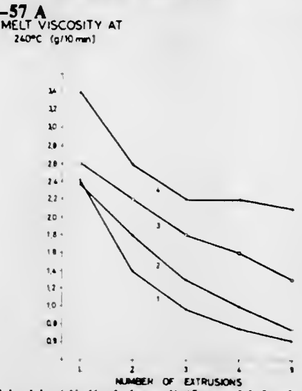
wherein Z is $—R_2$ or $—OR_2$, R_2 is alkyl or aryl, X is chlorine or bromine, Y is sulfur or oxygen and l is zero or 1, wherein the molar ratio of the formula (I) compound:formula (II) compound is 1.0:0.9 to 1.5 and wherein the reaction temperature is from zero to 180° C.

4,072,659

4,4'-THIO-BIS-(DIALKYLPHENOL)/FORMALDEHYDE CONDENSATES AND PROCESS FOR PRODUCING THEM

Hans Feichtinger, Dinslaken; Siegfried Lutze, Gelsenkirchen; Hans-Walter Birnkraut, Oberhausen, and Werner Kluy, Bochum-Stiepel, all of Germany, assignors to Ruhrchemie AG, Oberhausen, Germany

Filed May 5, 1975, Ser. No. 574,811
Claims priority, application Germany, May 17, 1974, 2424201
Int. Cl.² C08G *8/12*
U.S. Cl. 260—57 A **13 Claims**



1. A 4,4'-thio-bis-(dialkylphenol)/formaldehyde condensation product having a molecular weight of 1,000 to 4,000.

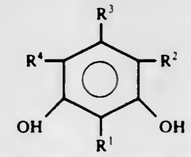
4,072,660

PROCESS FOR THE MANUFACTURE OF RESORCINOLS

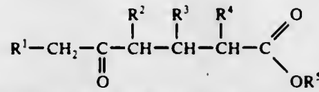
Werner Heinrich Muller, Aldersbach; Hansjörg Hey, Hofheim, Taunus, both of Germany, and Tomas Weil, Sao Paulo, Brazil, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 28, 1976, Ser. No. 709,291
Claims priority, application Germany, July 30, 1975, 2533920
Int. Cl.² C07C *39/08, 39/06, 43/22*
U.S. Cl. 260—621 H **8 Claims**

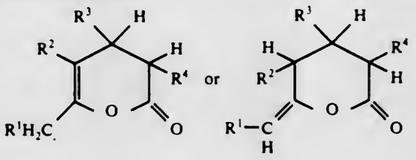
1. In a process for the manufacture of resorcinols of the formula



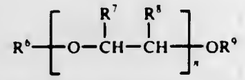
in which the radicals R^1 to R^4, which may be identical or different, represent hydrogen, alkyl groups having up to 12 carbon atoms, R^1 and R^2 can additionally represent alkoxy groups having up to 4 carbon atoms or aryl groups having up to 10 carbon atoms and R^3 can additionally represent a cyano group or carbalkoxy group having up to 6 carbon atoms, by reacting in a first step 4-oxo-carboxylic acid esters of the formula



in which the radicals R^1 to R^4 have the aforesaid meaning and R^5 is an alkyl radical having up to 6 carbon atoms, or δ-enollactones of the formula



in which R^1 to R^4 have the aforesaid meaning, with a strong base selected from the alkali and alkaline earth metals and their alcoholates, oxides, amides and hydroxides to form a cyclohexane dione and in a second step dehydrogenating said cyclohexane dione under a pressure of from 0.1 to 20 atmospheres at a temperature of from 150° to 350° C. in the presence of a catalyst containing a noble metal of the 8th subgroup of the Periodic Table to form said resorcinol, the improvement which comprises carrying out both of said steps without intermediate isolation of said cyclohexane dione in a solvent solution of a solvent which is an ether or a mixture of several ethers of the formula



in which n is in the range of from 1 to 5 and R^6 to R^9, which may be identical or different, represent alkyl groups having 1 to 12 carbon atoms and, with the exception of R^6 and R^9, may also represent hydrogen.

4,072,661

THIN-WALLED OVENABLE PARTS

Gene Herbert Shipman, Cottage Grove, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 22, 1976, Ser. No. 668,912
Int. Cl.² C08G *63/16*
U.S. Cl. 260—75 R **3 Claims**

1. A shaped, thin-walled, ovenable article prepared by the electrostatic deposition of a composition containing, in addition to optionally present inert filler, not less than 80 percent by weight of polybutylene terephthalate and effective amounts of both a stabilizer and an antioxidant, the sum of the amounts of stabilizer and antioxidant therein being not more than about one percent by weight, said composition having
   1. a melt flow factor of about 20 grams per 10 minutes or greater,
   2. a crystallization rate factor (t_{50}) of about 1–3 minutes,
   3. a linear thermal contraction factor of 0.015–0.025 cm/cm,
   4. a logarithmic viscosity number greater than 0.6,
   5. a heat deflection resistance factor of about 100°–200° C at 4.6 kg per square centimeter fiber stress,
   6. a m.p. of 220°–230° C and
   7. a glass transition temperature (T_g) in the range of 20°–40° C.

4,072,662

POLYESTERS

Robert van der Linde; Gerardus Franciscus Meijerink, and Johan Rietberg, all of Zwolle, Netherlands, assignors to Internationale Octrooi Maatschappij "Octropa" B.V., Rotterdam, Netherlands

Filed July 6, 1976, Ser. No. 703,024
Claims priority, application United Kingdom, July 4, 1975, 28310/75
Int. Cl.² C08G *63/12*
U.S. Cl. 260—75 R **7 Claims**

1. A method for preparing a polyester having an acid value below 15 and a hydroxyl value of 130–400, comprising heating and reacting a mixture consisting essentially of 75–100 equivalent percent of a phthalic acid, 0–25 equivalent percent of an aliphatic dicarboxylic acid containing 4–40 carbon atoms and 150–225 equivalent percent based on total carboxylic acid equivalents of an aliphtic diol containing 5–12 carbon atoms in the molecule.

4,072,663

TRANSFER SYSTEM FOR CONVEYING POLYESTER POLYMER

David Pendlebury, Chester, Va., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed Feb. 22, 1977, Ser. No. 770,731
Int. Cl.² C08G *63/70*
U.S. Cl. 260—75 M **10 Claims**

1. In a process for the production of synthetic filaments from a high-molecular weight thermoplastic polymer selected from the group consisting of polyester polymers by melt-spinning, which polymers are subject to thermal decomposition at temperatures above about 270° C., including the steps of supplying a melt of said polymer from a polymer source, and transferring the polymer melt by means of pumps and transfer lines to a melt-spinning system, the improvement which comprises:
   a. continuously supplying said polymer melt at a temperature of 270° to 300° C. and at a rate between 100 and 10,000 pounds per hour to a screw pump, said polymer melt having an intrinsic viscosity of 0.85 to 1.05;
   b. pumping said polymer melt by means of said screw pump through a first pipe zone to a gear pump, the pipe in said first pipe zone being sized so that the rate of flow of the polymer melt in the pipe is maintained in accordance with the limit formula:

$$D_1 = K_1(Q_1)^4$$

   where Q_1 is the rate of flow of polymer melt in the pipe in pounds per hour, D_1 is the inside diameter of the pipe in inches, and K_1 is 0.310 0.380, said polymer melt being maintained at a temperature of 270° to 300° C.;
   c. then pumping said polymer melt by means of said gear pump through a second pipe zone to a metering pump, the pipe in said second pipe zone being sized so that the rate of flow of the polymer melt is maintained in accordance with the limit formula:

$$D_2 = K_2(Q_2)^4$$

   where Q_2 is the rate of flow of the polymer melt in the pipe in pounds per hour, D_2 is the inside diameter of the pipe in inches, and K_2 is about 0.230 to 0.290; said polymer melt being maintained at a temperature of 270° to 300° C.; and
   d. then pumping said polymer melt by means of said metering pump directly to a spinning pot comprising a filter medium and a spinnerette to extrude the polymer melt into a quenching chamber to form filaments.

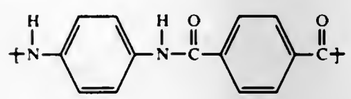
4,072,664

AROMATIC POLYAMIDES FROM N,N'-BIS(P-AMINOBENZOYL)ETHYLENE DIAMINE

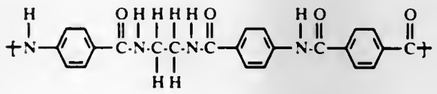
Tuyoshi Konomi; Seiji Endo; Masayasu Yamaguchi, and Kenichi Katsuo, all of Ootsu, Japan, assignors to Toyobo Co., Ltd., Osaka, Japan

Filed Feb. 14, 1975, Ser. No. 550,112
Claims priority, application Japan, Feb. 15, 1974, 49-18736
Int. Cl.² C08G *69/32*
U.S. Cl. 260—78 R **17 Claims**

1. A filament forming aromatic polyamide which consists essentially of (1) a unit of the formula:



and (2) a unit of the formula:



the amount of the unit (2) being from about 0.6 to 50 mol% on the basis of the combined amount of the units (1) and 2).

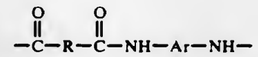
4,072,665

POLYAMIDE FROM ARYLENE DIAMINE, ISOPHTHALIC ACID AND ALKYLENE DICARBOXYLIC ACID

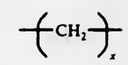
Besir K. Onder, North Haven, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 8, 1976, Ser. No. 664,764
Int. Cl.² C08G *69/26*
U.S. Cl. 260—78 R **6 Claims**

1. A fiber forming copolyamide consisting essentially of the recurring unit



wherein R in 60 to 85 percent of the recurring units is



wherein x represents an integer from 7 to 12 inclusive and in 15 to 40 percent of the recurring units R is m-phenylene, and Ar is 4,4'-methylenediphenylene.

4,072,666

ISOLATION OF CYSTOPLASMIC PROTEINS USING CHITOSAN

Marc Horisberger, Mont-Pelerin, Switzerland, and Mats Olofsson, Astorp, Sweden, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Nov. 13, 1975, Ser. No. 631,474
Claims priority, application United Kingdom, Nov. 15, 1974, 49494/74
Int. Cl.² A23J *1/14*
U.S. Cl. 260—112 R **8 Claims**

1. A process for isolating cytoplasmic proteins from aqueous vegetable materials containing chloroplastic and cytoplasmic proteins which comprises adding chitosan to the vegetable material at a temperature of 10° to 20° C to form a flocculate of the chloroplastic proteins and a supernatant in which the cytoplasmic proteins are retained, separating the flocculate and separating a fraction containing the cytoplasmic proteins from the supernatant.

4,072,667

PROCESS FOR RECOVERING MICROBIAL CELLULAR PROTEINS

Masahiko Ishida; Yoshitaka Oguri; Norio Shimizu, and Tadashi Muroi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 316,896, Dec. 20, 1972, abandoned.
This application Nov. 21, 1974, Ser. No. 525,928
Claims priority, application Japan, Dec. 22, 1971, 46-103683
Int. Cl.² A23J *1/18*
U.S. Cl. 260—112 R **35 Claims**

1. A process for recovering with high purity substantially all of the different microbial cellular proteins having different physico-chemical properties from a solution obtained by extracting microbial cells with an aqueous extraction solution, comprising (1) contacting the solution with a strong cation exchanger at a pH value of less than 4.5 thereby adsorbing the proteins onto said cation exchanger, the cation exchanger being sufficiently swollen by water so that ions of the proteins can easily arrive at exchanging groups present in the cation exchanger, and (2) desorbing the proteins adsorbed by said strong cation exchanger by contacting said cation exchanger with a volatile basic substance in the presence of water to thereby recover substantially all of said different proteins with high purity.

4,072,668

LH-RH ANALOGS

Max S. Amoss, Carlsbad; Michael W. Monahan, San Diego, and Wylie W. Vale, Jr., La Jolla, all of Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Continuation-in-part of Ser. No. 413,314, Nov. 6, 1973, abandoned. This application Sept. 27, 1974, Ser. No. 509,835
Int. Cl.² C07C *103/52*; A61K *37/00*
U.S. Cl. 260—112.5 LH **7 Claims**

1. A peptide which influences the release of gonadotropins by the pituitary gland, said peptide being pGlu-R_1-Trp-Ser-Tyr-R_2-Leu-Arg-Pro-Gly-NH_2 wherein R_1 is either deleted or selected from His, Gly, Asp, Cys and D-Ala and R_2 is D-Ala.

4,072,669

PREPARATION OF PROTEIN ISOLATES FROM SAFFLOWER SEEDS

Antoinette A. Betschart, Albany, Calif., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 7, 1977, Ser. No. 775,227
Int. Cl.² A23J *1/14*
U.S. Cl. 260—123.5 **4 Claims**

1. A process for preparing a protein isolate from safflower seeds, which comprises the steps of
   a. pressing the seeds to remove oil and to form a press-cake,
   b. extracting the press-cake with hexane at 20°–30° C. to remove residual oil,
   c. separating the press-cake from the hexane,
   d. drying the press-cake at 20°–30° C.,
   e. applying an aqueous alkalizer to the press-cake at a pH of 8 to 10,
   f. separating a juice containing soluble proteins therefrom,
   g. acidifying the juice to pH 6.0 to precipitate a protein isolate,
   h. separating the protein isolate therefrom, and
   i. washing the protein isolate with water at pH 6.0 and drying it.

4,072,670

LOY PHYTATE ISOELECTRIC PRECIPITATED SOY PROTEIN ISOLATE

Kenneth C. Goodnight, Jr.; Grant H. Hartman, Jr., and Robert F. Marquardt, all of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Filed Oct. 26, 1976, Ser. No. 735,489
The portion of the term of this patent subsequent to Nov. 30, 1993, has been disclaimed.
Int. Cl.² A23J *1/14*
U.S. Cl. 260—123.5 **24 Claims**

1. The process for preparing a soy protein isolate having low phytate content which comprises in sequence the steps of:
   (a) forming an aqueous solution of soy protein having a pH within the range of pH 10.6 to pH 14 at a temperature in the range of 10°–50° C. during a period sufficient to render phytates and phytic acid insoluble but insufficient to degrade said soy protein, said soy protein being obtained by aqueous extraction at a pH in excess of the isoelectric value of the soy protein of defatted particulate soybean which has not previously been treated with acid;
   (b) separating insoluble material including phytates and phytic acid from said solution to yield a clarified extract containing dissolved protein and dissolved carbohydrate;
   (c) acidifying acid clarified extract to a pH within the isoelectric range of from about pH 4 to about pH 5 thereby precipitating soy protein; and
   (d) separating said precipitated soy protein from said clarified extract.

4,072,671

METHOD FOR EXTRACTING PHENOLS AND OLIGOSACCHARIDES FROM VEGETABLE TISSUES

Giancarlo Sodini, and Marco Canella, both of Rome, Italy, assignors to Snamprogetti, S.p.A., San Donato Milanese, Italy

Filed Feb. 20, 1976, Ser. No. 659,749
Claims priority, application Italy, Jan. 14, 1976, 19240/76; Feb. 21, 1975, 20504/75
Int. Cl.[2] A23J 3/00; A23L 1/20, 1/36
U.S. Cl. 260—123.5 10 Claims

1. A method for the extraction of phenols and oligosaccharides from vegetable protein materials containing said phenols and oligosaccharides consisting in extracting said protein materials selected from the group consisting of flours, concentrates and isolates with an extracting amount of a polar solvent consisting of n-butyl alcohol in miscible combination with an aqueous solution of an electrolyte having an acidic nature selected from the group consisting of organic or inorganic acids and the acidic salts thereof.

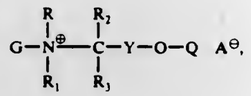
4,072,672

CATIONIC DYES CONTAINING AN ARYLOXY GROUP LINKED THROUGH A BRIDGING RADICAL TO A QUATERNIZED NITROGEN ATOM

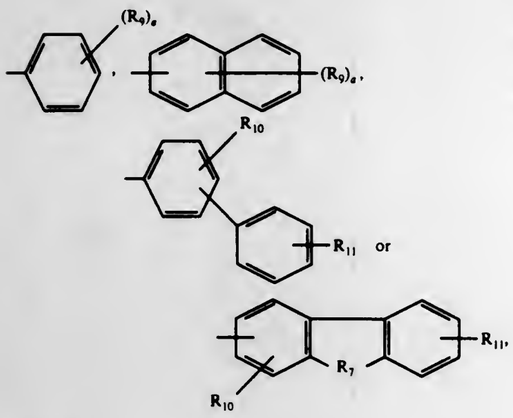
Beat Heuzi, Nevallachwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 383,878, July 30, 1973, abandoned.
This application Nov. 28, 1975, Ser. No. 635,600
Claims priority, application Switzerland, July 31, 1972, 11354/72; Dec. 7, 1972, 17824/72; Feb. 5, 1973, 1618/73; Feb. 21, 1973, 2523/73
Int. Cl.[2] C09B 29/06, 29/10, 29/24
U.S. Cl. 260—205 62 Claims

1. A dye of the formula

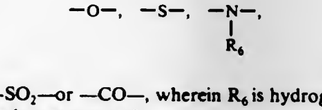


wherein
G is the residue of a carbocyclic monoazo dye
R is alkyl of 1 to 4 carbon atoms, alkyl of 1 to 4 carbon atoms substituted by hydroxy or phenyl, amino or alkoxy of 1 to 4 carbon atoms,
R_1 is alkyl of 1 to 4 carbon atoms or alkyl of 1 to 4 carbon atoms substituted by hydroxy or phenyl,
R_2 is hydrogen or alkyl of 1 to 4 carbon atoms,
R_3 is hydrogen or alkyl of 1 to 4 carbon atoms,
Q is



wherein n

R_7 is



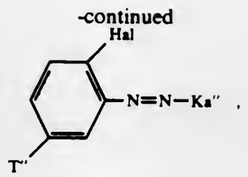
wherein each R_8 is independently alkyl of 1 to 4 carbon atoms,
each R_9 is independently hydroxy, halo, alkyl of 1 to 4 carbon atoms, alkyl of 1 to 4 carbon atoms substituted by halo, hydroxy, cyano, phenyl or phenoxy, alkoxy of 1to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms substituted by halo, hydroxy, cyano, phenyl or phenoxy, cycloalkyl of 5 or 6 carbon atoms, cycloalkyl of 5 or 6 carbon atoms substituted by alkyl of 1 to 4 carbon atoms, trifluoromethyl, cyano, nitro, phenoxy, naphthyloxy, -CO-Ro, —CO-O-Ro, —O-CO-Ro, —CO-NH-Ro, —CO-N(Ro)$_2$, —O-CO-N(Ro)$_2$, -NH-CO-Ro, —SO_2-Ro, -SO_2-NH-Ro or -O-SO_2-N(Ro)$_2$, wherein each Ro is independently alkyl of 1 to 4 carbon atoms or phenyl,
R_{10} is hydrogen, halo or alkyl of 1 to 4 carbon atoms,
R_{11} is hydrogen alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, phenyl, phenoxy, halo, trifluoromethyl, nitro, cyano, -CO-Ro, —CO-O-Ro, —O-CO-Ro, —CO-NH-Ro, —NH-CO-Ro, -SO_2-Ro —SO_2—NH-Ro or -SO_2-N)Ro)$_2$,
wherein each Ro is independently alkyl of 1 to 4 carbon atoms or phenyl, and
a is 0, 1, 2, 3, 4, or 5, with the proviso that when a is 4 or 5 each R_9 must be halo,
Y is

wherein each
R_4 is independently hydrogen or alkyl of 1 to 4 carbon atoms,
R_5 is

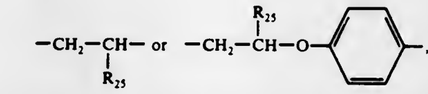
—SO—, —SO_2—or —CO—, wherein R_6 is hydrogen or alkyl of 1 to 4 carbon atoms, and
x is 1 to 6, and
A^- is an anion,
wherein each halo is independently chloro, bromo or iodo, with the proviso that the molecule is free of sulfo groups.

8. A compound of the formula

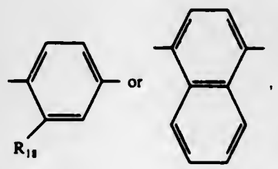
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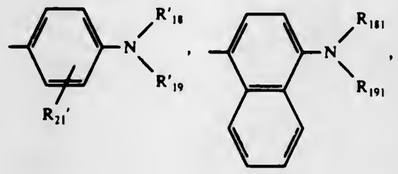
wherein
R_{16} is hydrogen, phenyl, alkyl of 1 to 4 carbon atoms or alkyl of 1 to 4 carbon atoms substituted by halo, hydroxy, cyano, phenyl, phenoxy, alkoxycarbonyl wherein the alkoxy moiety has 1 to 4 carbon atoms, alkylcarbonyloxy wherein the alkyl moiety has 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, benzoyloxy, —CO-N-(Ra)$_2$ or —O-CO-N(Ra)$_2$, wherein each Ra is independently hydrogen or alkyl of 1 to 4 carbon atoms,
R_{17} is



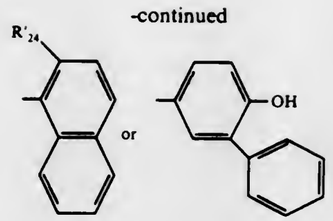
wherein R_{25} is hydrogen or alkyl of 1 to 4 carbon atoms,
R_{19} is hydrogen, nitro, halo, cyano, trifluoromethyl, alkylsulfonyl of 1 to 4 carbon atoms, phenylsulfonyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, -CO-Ro, —COORo, —CO—NHRo or -SO_2-N(R_{21})$_2$,
wherein each R_{21} is independently alkyl of 1 to 4 carbon atoms, and
Ro is alkyl of 1 to 4 carbon atoms or phenyl,
each of
R_{119} and R'_{119} is independently hydrogen, nitro, halo, cyano, alkyl of 1 to 4 carbon atoms, trifluoromethyl, alkylsulfonyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms,
R_{219} is hydrogen, halo, nitro or cyano, with the proviso that at least one of R_{19}, R_{119}, R'_{119} and R_{219} is hydrogen or halo
K' is



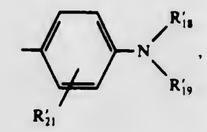
wherein
R_{18} is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or halo,
Ka' is



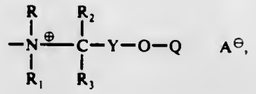
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wherein each of R_{18}' and R_{19}' is independently hydrogen, phenyl, cyclohexyl, alkyl of 1 to 4 carbon atoms or alkyl of 1 to 4 carbon atoms substituted by alkoxycarbonyl wherein the alkoxy moiety has 1 to 4 carbon atoms, benzoyloxy, phenoxy, halo, hydroxy, cyano, alkoxy of 1 to 4 carbon atoms, alkylcarbonyloxy wherein the alkyl moiety has 1 to 4 carbon atoms or N,N-dialkylamino wherein each alkyl independently has 1 to 4 carbon atoms, with the proviso that when one of R_{18}' and R_{19}' is phenyl or cyclohexyl, the other is other than phenyl or cyclohexyl, R_{21}' is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or halo, R_{24}' is hydroxy, amino or anilino, and
each of
R_{181} and R_{191} is independently hydrogen, phenyl, cyclohexyl, alkyl of 1 to 4 carbon atoms or alkyl of 1 to 4 carbon atoms substituted by alkoxycarbonyl wherein the alkoxy moiety has 1 to 4 carbon atoms, benzoyloxy, phenoxy, halo, hydroxy, cyano, alkoxy of 1 to 4 carbon atoms, alkylcarbonyloxy wherein the alkyl moiety has 1 to 4 carbon atoms or N,N-dialkylamino wherein each alkyl independently has 1 to 4 carbon atoms, with the proviso that at least one of R_{181} and R_{191} is hydrogen or alkyl of 1 to 4 carbon atoms,
Ka" is

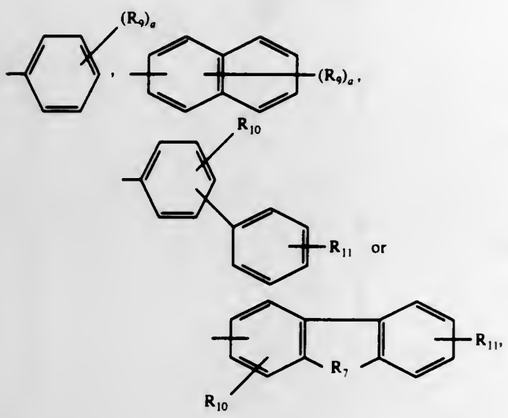


wherein each of
R_{18}' and R_{19}' is independently hydrogen, phenyl, cyclohexyl, alkyl of 1 to 4 carbon atoms or alkyl of 1 to 4 carbon atoms substituted by alkoxycarbonyl wherein the alkoxy moiety has 1 to 4 carbon atoms, benzoyloxy, phenoxy, halo, hydroxy, cyano, alkoxy of 1 to 4 carbon atoms, alkylcarbonyloxy wherein the alkyl moiety has 1 to 4 carbon atoms or N,N-dialkylamino wherein each alkyl independently has 1 to 4 carbon atoms, with the proviso that when one of R_{18}' and R_{19}' is phenyl or cyclohexyl, the other is other than phenyl or cyclohexyl, and
R_{21}' is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or halo,
Z is —CO- or —SO_2,
r is 1 or 2, Hal is halo, and
T" is

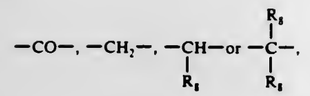


wherein
R is alkyl of 1 to 4 carbon atoms, alkyl of 1 to 4 carbon atoms substituted by hydroxy or phenyl, amino or alkoxy of 1 to 4 carbon atoms,
R_1 is alkyl of 1 to 4 carbon atoms or alkyl of 1 to 4 carbon atoms substituted by hydroxy or phenyl,
R_2 is hydrogen or alkyl of 1 to 4 carbon atoms,

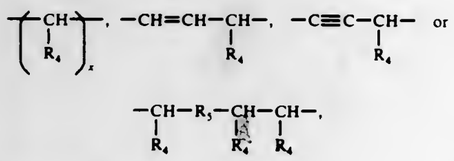
R_3 is hydrogen or alkyl of 1 to 4 carbon atoms,
Q is



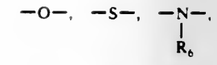
wherein R_7 is



wherein each
R_8 is independently alkyl of 1 to 4 carbon atoms,
each
R_9 is independently hydroxy; halo; alkyl of 1 to 4 carbon atoms; alkyl of 1 to 4 carbon atoms substituted by halo, hydroxy, cyano, phenyl or phenoxy; alkoxy of 1 to 4 carbon atoms; alkoxy of 1 to 4 carbon atoms substituted by halo, hydroxy, cyano, phenyl or phenoxy; cycloalkyl of 5 or 6 carbon atoms; cycloalkyl of 5 or 6 carbon atoms substituted by alkyl of 1 to 4 carbon atoms; trifluoromethyl; cyano; nitro; phenoxy; naphthyloxy; —CO—Ro; —CO—O—Ro; —O—CO—Ro; —CO—NH—Ro; —CO—$N(Ro)_2$; —O—CO—$N(Ro)_2$; —NH—CO—Ro; —SO_2—Ro; —SO_2—NH—Ro or —O—SO_2—$N(Ro)_2$,
wherein each
Ro is independently alkyl of 1 to 4 carbon atoms or phenyl,
R_{10} is hydrogen, halo or alkyl of 1 to 4 carbon atoms,
R_{11} is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, phenyl, phenoxy, halo, trifluoromethyl, nitro, cyano, —CO—Ro, —CO—O—Ro, —O—CO—Ro, —CO—NH—Ro, —NH—CO—Ro, —SO_2—Ro, —SO_2—NH—Ro or —SO_2—$N(Ro)_2$,
wherein each Ro is independently alkyl of 1 to 4 carbon atoms or phenyl, and
a is 0, 1. 2, 3, 4, or 5, with the proviso that when *a* is 4 or 5 each R_9 must be halo,
Y is

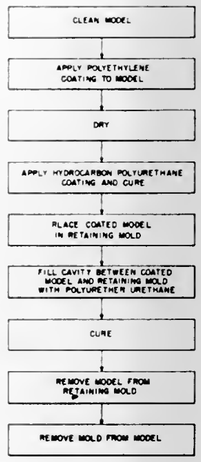


wherein each
R_4 is independently hydrogen or alkyl of 1 to 4 carbon atoms,
R_5 is



—SO—, —SO_2— or —CO—, wherein R_6 is hydrogen or alkyl of 1 to 4 carbon atoms, and
x is 1 to 6, and
A^- is an anion,
wherein each halo is independently chloro, bromo or iodo.

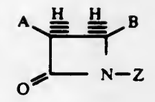
4,072,673
METHOD FOR MAKING A FLEXIBLE MOLD
Peter C. Lammers, Doylestown, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Continuation of Ser. No. 873,656, Nov. 3, 1969, abandoned. This application Nov. 8, 1971, Ser. No. 196,754
Int. Cl.[2] **B29C** *5/00;* **B29D** *9/08*
U.S. Cl. 264—225 **2 Claims**



1. A method of making a flexible mold comprising the steps of
1. forming a film of a hydrocarbon polyurethane of about 10–100 mils in thickness on a model, said hydrocarbon polyurethane comprising the reaction product of a hydrocarbon polyol and an organic polyisocyanate,
2. placing the model with the film thereon in the cavity of a retaining mold having a clearance of at least 0.1 inches between the film on the model and the surface of the cavity of said retaining mold,
3. filling said clearance with a liquid polyetherurethane or polyesterurethane reaction mixture and reacting said mixture to form a polyurethane layer adhered to said film to form a flexible mold, and
4. removing the mold from the retaining mold and model.

4,072,674
CIS-4-OXOAZETIDINE INTERMEDIATES AND METHODS OF PREPARING THEM
John Gerald Gleason, Delran; Kenneth George Holden, Haddonfield, both of N.J., and William Francis Huffman, Malvern, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.
Continuation-in-part of Ser. No. 626,686, Oct. 29, 1975, abandoned, which is a continuation-in-part of Ser. No. 574,225, May 5, 1975, abandoned. This application June 14, 1976, Ser. No. 696,094
Int. Cl.[2] **C07D** *205/08;* **D07D** *403/12;* **C07D** *409/12*
U.S. Cl. 260—239 A **15 Claims**

1. A compound of the structure:



in which:
A is azido, amino, acylamino or blocked amino;
B is —COOY;
Y is hydrogen, lower alkyl, benzyl, methoxybenzyl or 2,2,2-trichloroethyl;
and Z is hydrogen, 2,4-dimethoxybenzyl, benzhydryl or methoxy substituted benzhydryl, said acylamino being any pharmaceutically acceptable group present at the 7-position of known cephalosporins.

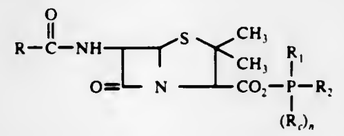
4,072,675
N-PHENYL AMIDINES
Yao Hua Wu, and Walter G. Lobeck, Jr., both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.
Continuation of Ser. No. 466,753, May 3, 1974, abandoned, which is a continuation-in-part of Ser. No. 255,701, May 22, 1972, Pat. No. 3,816,454, which is a continuation-in-part of Ser. No. 47,589, June 18, 1970, abandoned. This application Oct. 24, 1975, Ser. No. 625,796
Int. Cl.[2] **C07D** *207/22, 211/72, 223/12, 405/12*
U.S. Cl. 260—239 BE **23 Claims**

1. A compound selected from the group consisting of:
2-(N-phenylbenzylamino)-1-pyrroline,
5-methyl-2-(N-phenylbenzylamino)-1-pyrroline,
5,5-dimethyl-2-(N-phenylbenzylamino)-1-pyrroline,
2-[N-(m-trifluoromethylphenyl)benzylamino]-1-pyrroline,
2-[3,4-dichloro-N-(2-thenyl)anilino]-5-methyl-1-pyrroline,
5,5-dimethyl-2-[N-(m-trifluoromethylphenyl)benzylamino]-1-pyrroline,
3,4,5,6-tetrahydro-2-(N-phenylbenzylamino)pyridine,
3,4,5,6-tetrahydro-7-(N-phenylbenzylamino)-2H-azepine,
2-[N-(o-methoxyphenyl)benzylamino]-1-pyrroline,
2-[N-(3,4-dichlorophenyl)benzylamino]-1-pyrroline,
5-methyl-2-[N-(m-trifluoromethylphenyl)benzylamino]-1-pyrroline,
2-(N-phenylphenethylamino)-1-pyrroline,
5-methyl-2-(phenylphenethylamino)-1-pyrroline,
5,5-dimethyl-2-(N-phenylphenethylamino)-1-pyrroline,
3,4,5,6-tetrahydro-7-[(N-phenyl)phenethylamino]-2H-azepine,
2-(3-chloro-N-furfurylanilino)-5,5-dimethyl-1-pyrroline,
and pharmaceutically acceptable salts thereof.

4,072,676
PROCESS FOR PREPARATION OF 6-AMINOPENICILLANIC ACID DERIVATIVES
John H. Sellstedt, Pottstown, Pa., assignor to American Home Products Corporation, New York, N.Y.
Filed Feb. 15, 1974, Ser. No. 442,954
Int. Cl.[2] **C07D** *499/04*
U.S. Cl. 260—239.1 **5 Claims**

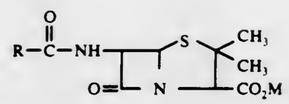
1. A process for the preparation of a compound of the formula:

I



which comprises reacting a compound of the formula:

II

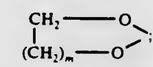


with a phosphorus halide of the formula:

III



in a molar ratio of about 0.5:1 to 3:1 and at a temperature of between about −40° C and about +10° C; wherein R is selected from the class consisting of benzyl, phenoxymethyl, n-heptyl, 2-pentyl, n-amyl, p-hydroxybenzyl and p-aminobenzyl; M is selected from the class consisting of hydrogen, an alkali metal and a tertiary amine; X is halogen; R_1 and R_2 are members selected from the class consisting of C_1 through C_7 (lower)alkoxy, aryl(lower)alkyloxy, aryloxy and halogen; R_1 and R_2 when joined together are

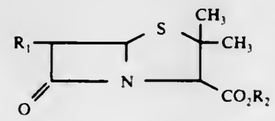


R_3 is =O (oxygen); *n* is either zero or 1; *m* is a number from 0 through 6, said word aryl meaning phenyl or naphthyl.

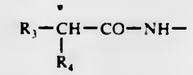
4,072,677
PENICILLIN SYNTHESIS
Sidney Edward Callander, Worthing, England, assignor to Beecham Group Limited, United Kingdom
Filed Nov. 30, 1976, Ser. No. 746,137
Claims priority, application United Kingdom, Dec. 13, 1975, 51136/75
Int. Cl.[2] **C07D** *499/68, 499/70*
U.S. Cl. 260—239.1 **10 Claims**

1. A process for the preparation of a compound of formula (I):

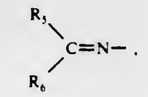
(I)



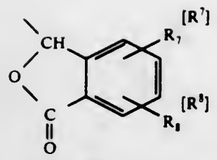
wherein R_1 is a group



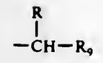
or



wherein R_3 is phenyl, p-hydroxyphenyl, cyclohexadienyl, or 2-or 3-thienyl, R_4 is an amino or *conventional penicillin* protected amino group, R_5 and R_6 are both methyl or, together with the carbon atom to which they are joined, represent a cycloheptyl ring; and R_2 is a group of formula (II) or (IIA):



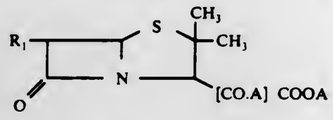
(II)



(IIA)

wherein R_7 and R_8 are the same or different and are hydrogen, methyl or methoxy, R_9 is acetoxy, pivaloyloxy or ethoxycarbonyloxy, and R is hydrogen or methyl;

which process comprises reacting an aqueous solution of a compound of formula (III):



(III)

wherein R_1 has the above meaning and A is a salt-forming ion, with a solution in a water-immiscible organic solvent of a compound R_2OH or a reactive esterifying derivative thereof, in the presence of a phase transfer catalyst which is a compound which increases the solubility of the salt form of the parent penicillin in the water-immiscible solvent.

4,072,678

PROCESS FOR PRODUCING CAPROLACTAM

Fusao Oyama; Sadatomi Murao, and Shizuo Okada, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed June 21, 1976, Ser. No. 698,122

Claims priority, application Japan, June 24, 1975, 50-79198

Int. Cl.² C07D *201/04*

U.S. Cl. 260—239.3 A **9 Claims**

1. A process for producing caprolactam by effecting Beckmann rearrangement of cyclohexanone oxime with a concentrated sulfuric acid or fuming sulfuric acid, neutralizing the rearranged mixture with ammonia and separating ammonium sulfate and caprolactam from the neutralized product, wherein the improvement comprises treating process waste waters after separation of said ammonium sulfate and caprolactam in accordance with the following steps:

(1) first concentrating by distillation at a temperature in the range from 80° to 130° C under a pressure in the range from 400 mm Hg to 2.7 Kg/cm^2 to a water concentration in the range from 85 to 75 wt.%;

(2) then further concentrating by distillation of the concentrate at a temperature in the range from 40° to 80° C under a pressure in the range from 50 to 400 mm Hg to a water concentration in the range from 70 to 15 wt.%;

(3) extracting the caprolactam from the thus obtained concentrate at a pH controlled to a pH between 2.5 and 6 with an aromatic hydrocarbon as an extraction solvent thereby to recover the caprolactam;

(4) conducting oxidative combustion of the extraction residue at a temperature in the range from 800° to 1300° C; and,

(5) converting the thus formed sulfur dioxide to sulfuric acid.

4,072,679

1,4- AND 4,10-DIHYDRO-4-OXO-PYRIMIDO (1,2-a)-BENZIMIDAZOLE-3-CARBOXYLIC ACIDS, ESTERS AND AMIDES

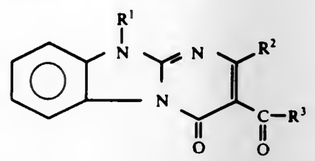
Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed June 15, 1976, Ser. No. 696,329

Int. Cl.² C07D *487/04;* A61K *31/53*

U.S. Cl. 260—256.4 F **18 Claims**

1. A compound of the formula



wherein

R^1 is hydrogen, lower alkyl, phenyl-lower alkyl or lower alkyl



;

R^2 is hydrogen or lower alkyl;

R^3 is hydroxy, lower alkoxy or



;

R^4 and R^5 each is lower alkyl;

R^6 and R^7 each is hydrogen, lower alkyl, phenyl, substituted phenyl wherein the phenyl substituent is halo, lower alkyl or lower alkoxy or phenyllower alkyl; and physiologically acceptable salts thereof.

4,072,680

DERIVATIVES OF PYRAZOLO[1,5-a]PYRIDO[3,2-e]PYRIMIDINE

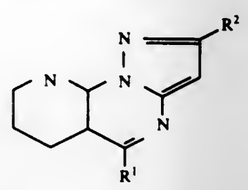
Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 28, 1977, Ser. No. 791,814

Int. Cl.² C07D *471/14;* A61K *31/415*

U.S. Cl. 260—256.4 F **16 Claims**

1. A compound of the formula



wherein R^1 is lower alkoxy, lower alkylthio, amino, lower alkylamino or di(lower alkyl)amino;

R^2 is hydrogen or lower alkyl.

4,072,681

3,7-DIHYDRO- AND 1,7-DIHYDRO-4H-PYRAZOLO[4',3':5,6]PYRIDO[4,3-d]PYRIMIDIN-4-ONES

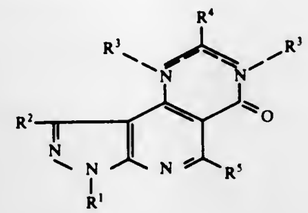
Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 2, 1977, Ser. No. 773,562

Int. Cl.² A61K *31/415;* C07D *471/14*

U.S. Cl. 260—256.4 F **19 Claims**

1. A compound of the formula



wherein

R^1 is hydrogen, lower alkyl or phenyl;

R^2, R^4 and R^5 each is hydrogen or lower alkyl; and

R^3 is hydrogen, lower alkyl, phenyl, substituted phenyl wherein the phenyl substituent is one or two halo, lower alkyl or lower alkoxy groups, phenyl-lower alkyl or di(-lower alkyl)amino-lower alkyl.

4,072,682

NEW 1-(2'-AROYL ETH-1' YL) 2-(4''-ACETAMIDO PIPERAZINE-1'' YL METHYL) BENZIMIDAZOLES, THEIR THERAPEUTICAL APPLICATIONS AND METHOD FOR THEIR PREPARATION

Claude P. Fauran; Michel J. Turin, both of Paris; Thierry F. Imbert, La Celle Saint-Cloud; Guy M. Raynaud, and Nicole A. M. Dorme, both of Paris, all of France, assignors to Delalande S.A., Courbevoie, France

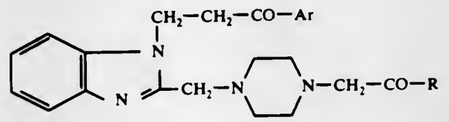
Filed Dec. 22, 1975, Ser. No. 643,490

Claims priority, application France, Jan. 10, 1975, 75 00724

Int. Cl.² C07D *241/04*

U.S. Cl. 260—268 BC **4 Claims**

1. A compound having the formula



wherein Ar is α-furyl, α-thienyl, phenyl or phenyl substituted by one substituent selected from the group consisting of methoxy, alkyl having one to 4 carbon atoms, nitro and chloro, and

R is $-NH_2$, $-NHR^1$ wherein R^1 is alkyl having one to four carbon atoms or cycloalkyl having 5 or 6 carbon atoms, or $-NR_1R_2$ wherein R_1 and R_2 are alkyls having one to 4 carbon atoms or $-NR_1R_2$ is piperidino, pyrrolidino or hexamethyleneimino, and the pharmaceutically acceptable acid addition salts thereof.

4,072,683

3,4-DIHYDROCARBOSTYRIL DERIVATIVES

Kazuyuki Nakagawa, Tokushima; Minoru Uchida, Komatsushima, and Hiroaki Oka, Tokushima, all of Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

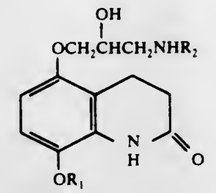
Filed Nov. 10, 1975, Ser. No. 630,631

Claims priority, application Japan, Nov. 8, 1974, 49-129386; Nov. 8, 1974, 49-129387

Int. Cl.² C07D *215/22, 215/26;* A61K *31/47*

U.S. Cl. 260—288 R **8 Claims**

1. A compound of the formula,



wherein R_1 is hydrogen, C_1-C_4 alkyl, benzyl or phenethyl and R_2 is C_1-C_4 alkyl or a pharmaceutically acceptable acid addition salt thereof.

4,072,684

MANUFACTURE OF PYRIDINE AND METHYLPYRIDINES

John Irvine Darragh, Runcorn, England, assignor to Imperial Chemical Industries Limited, Great Britain

Filed Jan. 17, 1977, Ser. No. 760,143

Claims priority, application United Kingdom, Feb. 2, 1976, 3998/76

Int. Cl.² C07D *213/06*

U.S. Cl. 260—290 P **7 Claims**

1. A process for the manufacture of pyridine which comprises the vapour-phase reaction, in the presence of a catalyst comprising alumina-silica and at a temperature in the range from 300° C to 500° C, of 1,3-butadiene and methylamine in the presence of a gaseous diluent wherein there is employed at least 0.5 mole of methylamine per mole of butadiene.

4,072,685

3-(3',4'-DISUBSTITUTED) PHENYL PIPERIDINES

Lucien Nédélec, Le Raincy; Jacques Guillaume, Aulnay-sous-Bois, and Claude Dumont, Nogent-sur-Marne, all of France, assignors to Roussel Uclaf, Paris, France

Filed May 13, 1976, Ser. No. 686,090

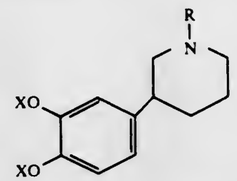
Claims priority, application France, May 16, 1975, 75 15382

The portion of the term of this patent subsequent to Sept. 6, 1994, has been disclaimed.

Int. Cl.² C07D *211/22*

U.S. Cl. 260—293.81 **18 Claims**

1. A compound selected from the group consisting of a compound of the formula



wherein X is selected from the group consisting of hydrogen and acyl of an alkanoic acid of 2 to 6 carbon atoms and R is selected from the group consisting of alkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms and phenylalkyl of 1 to 3 alkyl carbon atoms and their non-toxic, pharmaceutically acceptable acid addition salts.

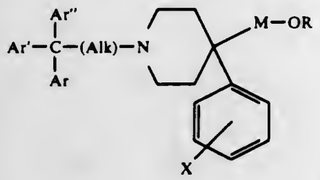
4,072,686

1-(3,3,3-TRIARYLALKYL)-4-PHENYL-PIPERIDINEALKANOLS

Gilbert W. Adelstein, Evanston; Esam Z. Dajani, Buffalo Grove, and Chung Hwai Yen, Skokie, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 568,439, April 16, 1975, Pat. No. 3,998,832. This application Oct. 18, 1976, Ser. No. 733,502
Claims priority, application South Africa, Mar. 18, 1976, 76/1681
Int. Cl.² C07D *401/06, 211/22*
U.S. Cl. 260—293.69 28 Claims

1. A compound of the formula



(I)

and pharmaceutically acceptable acid addition salts thereof wherein the Alk is straight or branched chain alkylene containing 2–4 carbon atoms; M is alkylene having 1–4 carbon atoms; Ar and Ar' are phenyl, alkyl substituted phenyl wherein the alkyl contains from 1–4 carbon atoms or halo substituted phenyl; Ar" is phenyl, alkyl substituted phenyl wherein the alkyl contains 1–4 carbon atoms, halo substituted phenyl or pyridyl; X is hydrogen, halogen, trifluoromethyl or alkyl having from 1–4 carbon atoms; R is hydrogen, alkyl having from 1–7 carbon atoms or alkanoyl having from 2–5 carbon atoms.

12. A compound according to claim 1 which is 1-[3,3-diphenyl-3-(2-pyridyl)propyl]-4-phenyl-4-piperidinemethanol.

4,072,687

PROCESS FOR PRODUCING 2-AMINO-(2)-THIAZOLINE-4-CARBOXYLIC ACID

Kazushi Togo, Yokohama; Fumihide Tamura, Kawasaki; Naohiko Yasuda, Yokosuka; Takehiko Ichikawa, Fujisawa; Konosuke Sano, Machida; Keizo Matsuda, Kawasaki, and Koji Mitsugi, Yokohama, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Nov. 1, 1976, Ser. No. 737,781
Claims priority, application Japan, Nov. 6, 1975, 50-133372; Dec. 16, 1975, 50-149998; Mar. 19, 1976, 51-30537
Int. Cl.² C07D *277/18*
U.S. Cl. 260—306.7 T 7 Claims

1. A process for producing 2-amino-(2)-thiazoline-4-carboxylic acid which comprises dehydrochlorinating S-(β-carboxy-β-chloroethyl) isothiourea by adding it to an aqueous medium maintained at a pH ranging from 5.5 to 7.5 with an alkali.

3. A process for producing 2-amino-(2)-thiazoline-4-carboxylic acid, which comprises:

preparing an alkyl α-chloracrylate by dehydrochlorinating an alkyl α, β-dichloropropionate in water in the presence of an alkali;

preparing a S-(β-carboxy-β-chloroethyl) isothiourea by reacting said alkyl α-chloroacrylate with thiourea in water in the presence of a mineral acid; and

dehydrochlorinating said S-(β-carboxy-β-chloroethyl) isothiourea by adding said S-(β-carboxy-β-chloroethyl) isothiourea to an aqueous medium maintained at a pH ranging from 5.5 to 7.5 with an alkali.

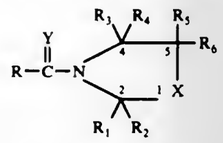
4,072,688

HALOACYL AND THIOHALOACYL ARYL-SUBSTITUTED OXAZOLIDINES AND THIAZOLIDINES-HERBICIDAL ANTIDOTES

Eugene G. Teach, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 550,069, Feb. 14, 1975, abandoned. This application Nov. 3, 1975, Ser. No. 627,986
Int. Cl.² C07D *277/04, 277/06, 263/04*
U.S. Cl. 260—306.7 R 32 Claims

1. A compound according to the formula



in which R is haloalkyl containing from 1 to 6 carbon atoms, inclusive, and the term halo includes chloro and bromo as mono, di, tri and tetra substitutions and chloroalkenyl containing 2 to 4 carbon atoms and the chloro substituents are present as mono, di, tri or tetra substitutions; in which X and Y are independently oxygen or sulfur; R_1 is hydrogen, lower alkyl or phenyl; R_2 is hydrogen or lower alkyl; R_3 is hydrogen or lower alkyl; R_4 is hydrogen or lower alkyl; R_5 is phenyl and R_6 is hydrogen.

4,072,689

MONOAMINO 2,4,5-TRISUBSTITUTED OXAZOLES

Giorgio Tarzia, Rome, Italy, assignor to Gruppo Lepetit S.p.A., Milan, Italy

Continuation of Ser. No. 334,928, Feb. 22, 1973, abandoned. This application Dec. 17, 1975, Ser. No. 641,410
Int. Cl.² C07D *263/34*
U.S. Cl. 260—307 R 5 Claims

1. 5-Carbamoyl-4-methyl-2-phenyloxazole, 4-carbamoyl-5-methyl-2-phenyloxazole, 4-cyclohexylcarbamoyl-5-methyl-2-(p-tolyl)oxazole or 4-carbamoyl-2-(o-fluorophenyl)-5-methyloxazole.

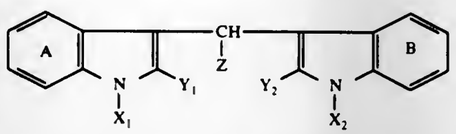
4,072,690

INDOLYL METHYLENE LEUCO DYESTUFFS

Robert Garner, Bury; John Barry Henshall, Manchester, both of England, and Jean-Claude Petitpierre, Kaiseraugst, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 23, 1975, Ser. No. 543,581
Claims priority, application United Kingdom, Feb. 1, 1974, 4687/74
Int. Cl.² C07D *209/20, 403/10, 403/14*
U.S. Cl. 260—326.14 R 8 Claims

1. An indolyl methylene compound of the formula



(I)

wherein X_3 represents alkyl with 2 to 12 carbon atoms or benzyl, Y_3 represents hydrogen, methyl, ethyl or phenyl, Z_1 represents an aralkyl radical selected from benzyl and styryl, an aryl radical selected from phenyl, diphenyl or naphthyl which is unsubstituted or substituted hy halogen, methylenedioxy, nitro, alkyl having 1 to 4 carbon atoms or by alkoxy having 1 to 4 carbon atoms, or indolyl unsubstituted or substituted by halogen, cyano, nitro, alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 4 carbon atoms, alkanoyl with 2 to 4 carbon atoms or phenyl.

4,072,691

PROCESS FOR THE RESOLUTION OF DL-6-CHLOROTRYPTOPHAN

Ichiro Chibata, Suita; Shigeki Yamada, Toyonaka; Masao Yamamoto, Hirakata, and Hisato Sanematsu, Osaka, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Continuation of Ser. No. 538,107, Jan. 2, 1975, abandoned. This application Apr. 29, 1976, Ser. No. 681,426
Claims priority, application Japan, Jan. 12, 1974, 49-6779; July 9, 1974, 49-78881; Aug. 2, 1974, 49-89231
Int. Cl.² C07D *209/20*
U.S. Cl. 260—326.14 T 9 Claims

1. A process for resolving DL-6-chlorotryptophan methanesulfonate into its optically active enantiomers, which comprises the steps of adding a first enantiomer to a solution of DL-6-chlorotryptophan methanesulfonate, whereby a first supersaturated solution with respect to DL-6-chlorotryptophan methanesulfonate is formed, to initiate crystallization of said first enantiomer from said first supersaturated solution, and recovering the crystallized first enantiomer.

4,072,692

TRANS-4-(8-HYDROXYOCTYL)-5-OCTYL-1,3-DITHIOLANE-2-THIONE

Sol Jacob Daum, Albany, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Oct. 15, 1976, Ser. No. 732,651
Int. Cl.² C07D *339/06*
U.S. Cl. 260—327 M 1 Claim

1. The trans-isomer of 4-(8-hydroxyoctyl)-5-octyl-1,3-dithiolane-2-thione.

4,072,693

MACROCYCLIC POLYETHERS

David N. Reinhoudt, and Robin Th. Gray, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 5, 1976, Ser. No. 664,331
Claims priority, application United Kingdom, Mar. 14, 1975, 10744/75
Int. Cl.² C07D *317/00;* A61L *13/00*
U.S. Cl. 260—338 1 Claim

1. The macrocyclic polyether 3,4-benzo-1,6,9,12-tetraoxycyclotetradec-3-ene.

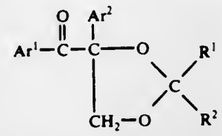
4,072,694

DIOXOLANE DERIVATIVES AND USE AS PHOTOINITIATORS

Alan Joseph Brattesani, Los Angeles, Calif., assignor to Lee Pharmaceuticals, South El Monte, Calif.

Filed Sept. 15, 1975, Ser. No. 613,286
Int. Cl.² C07D *317/10*
U.S. Cl. 260—340.9 R 11 Claims

1. Compounds having the general formula:



wherein R^1 and R^2 are each organic radicals selected from the group consisting of vinyl, hydroperoxy, alkyl or alkenyl groups of up to about 16 carbon atom length, cycloaliphatic groups of lower than 210 molecular weight, phenyl, naphthyl, phenoxy, benzoyl, naphthoxyl, phenylcarboxy, and substituted aliphatic groups of up to 200 molecular weight, and Ar^1 and Ar^2 are each selected from the group consisting of phenyl, naphthyl, non-sterically hindered substituted phenyl, and non-sterically hindered substituted naphthyl in which each substituent is a radical selected from the group consisting of amino, nitro, chloro-, bromo-, iodo-, fluoro-, lower alkylamino-, anilino-, di- lower alkylamino-, diphenylamino, lower alkoxy, carboxy, hydroxy, sulfonyl, acetyl, propionyl, aldehydro, acetoxy, propionoxy, amido, lower alkylamido, vinyl, lower alkenyl, lower alkynyl, lower alkyl, phenyl, benzyl, naphythyl, cyclohexyl, cyclopentyl, lower alkyl amido, di- lower alkyl amido, phenyl amido, and diphenyl amido with the proviso that when Ar^1 and Ar^2 are phenyl or lower alkyl-substituted phenyl and one of R^1 and R^2 is lower alkyl, the other may not be lower alkyl, cycloalkyl or phenyl.

4,072,695

3α,7α-DIHYDROXY-CHOLANIC ACID DERIVATIVES

William H. Saltzman, New Rochelle, N.Y., assignor to Intellectual Property Development Corporation, New Rochelle, N.Y.

Continuation of Ser. No. 660,037, Feb. 2, 1976, Pat. No. 4,014,908, which is a continuation-in-part of Ser. No. 474,735, May 30, 1974, abandoned, which is a continuation of Ser. No. 467,710, May 7, 1974, abandoned, and a continuation-in-part of Ser. No. 417,170, Nov. 19, 1973, Pat. No. 3,916,266, said Ser. No. 467,710, and Ser. No. 417,170, each is a continuation-in-part of Ser. No. 290,910, Sept. 21, 1972, abandoned. This application Sept. 17, 1976, Ser. No. 725,086
Int. Cl.² C07J *5/00*
U.S. Cl. 260—397.1 4 Claims

1. A clathrate consisting of a needle-like crystalline inclusion complex of 3α, 7α-dihydroxy-5β-cholanic acid and as an included compound, an organic solvent selected from the group consisting of, cyclopentane, cyclohexane and cycloheptane.

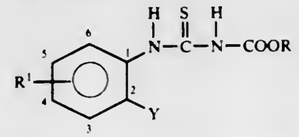
4,072,696

5(6)-BENZENE RING SUBSTITUTED BENZIMIDAZOLE-2-CARBAMATE DERIVATIVES HAVING ANTHELMINTIC ACTIVITY

Colin C. Beard, Palo Alto; John A. Edwards, Los Altos, and John H. Fried, Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 331,852, Feb. 12, 1973, abandoned. This application Jan. 18, 1974, Ser. No. 434,656
Int. Cl.² C07C *147/00, 147/06, 149/40*
U.S. Cl. 260—397.6 51 Claims

1. A compound selected from the group of compounds represented by the formula:



where R is a lower alkyl group having 1 to 4 carbon atoms; R^1 is $—SR^2$, $—SOR^2$, $—OR^2$, —SCN, or $—M'(CH_2)_nMR^7$ where n is 1-4; R^2 is lower alkyl having 1 to 6 carbon atoms, cycloalkyl having 3 to 7 carbon atoms, lower alkenyl or lower alkynyl having 3 to 6 carbon atoms, benzyl or phenyl, provided that when R^1 is $—SO_2R^2$, R^2 is not benzyl or phenyl, provided further that when R^1 is either $—SR^2$ or $—OR^2$, R^2 can not be either alkyl or cycloalkyl; Y is amino, nitro, alkanoylamino having 1 to 6 carbon atoms, $—NHC(O)(CH_2)_mCOOH$ where *m* is 1-6, or —NHC(S)NHCOOR; M and M' are independently O, S or



and R^7 is lower alkyl having 1 to 4 carbon atoms or phenyl; the R^1-substitution being at the 4- or 5-position; and the pharmaceutically acceptable salts thereof.

4,072,697

METHOD FOR DEODORIZING LIQUID LANOLIN

Hisashi Sekine, Mitsukaido; Akira Yamamoto, Funabashi, and Shizuo Hayashi, Saitama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1976, Ser. No. 676,738
Claims priority, application Japan, June 16, 1975, 50-72935
Int. Cl.[2] C07J *9/00*
U.S. Cl. 260—397.25 6 Claims

1. A method for deodorizing liquid lanolin having a cloud point of about 17°–18° C and a solidifying point of about 3°–4° C, which consists essentially of the steps of adding to liquid lanolin containing odor-causing substances and mixing uniformly therein a solvent for said odor-causing substances selected from the group consisting of methanol, ethanol, mixtures of methanol and ethanol, and aqueous solutions thereof containing up to 50% by weight of water, the weight ratio of said solvent to said liquid lanolin being in the range of from 0.5/1.0 to 4.0/1.0, the mixing being carried out at a temperature of from 40° to 80° C and for a period of time effective to dissolve in said solvent the odor-causing substances initially present in the liquid lanolin, then while maintaining the mixture at 40° to 80° C separating and removing the solvent phase containing the odor-causing substances dissolved therein from the liquid lanolin and thereby recovering deodorized liquid lanolin.

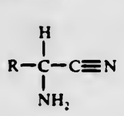
4,072,698

RESOLUTION OF AMINONITRILES

Thomas A. Hylton, Kalamazoo, and Francis L. Shenton, Portage, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Dec. 2, 1976, Ser. No. 746,932
Int. Cl.[2] C07C *121/78, 121/80*
U.S. Cl. 260—465 E 37 Claims

1. A process for producing an optically pure 2-aminonitrile enantiomer of the formula:



III

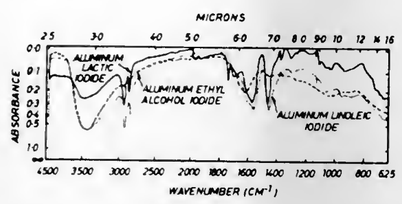
where R is alkyl of 1 thru 6 carbon atoms; cycloalkyl of 3 thru 6 carbon atoms; aromatic of 6 thru 10 carbon atoms, substituted with 0 thru 3 substituents, which may be the same or different and are selected from the group consisting of alkyl of 1 thru 6 carbon atoms, hydroxyl, alkoxy where the alkyl group contains 1 thru 6 carbon atoms, cyclic alkylenedioxy where the alkylene group contains 1 thru 3 carbon atoms, halogen, trifluoromethyl, and cyano; aralkyl of 7 or 8 carbon atoms substituted with 0 thru 3 substituents, which may be the same or different and are selected from the group consisting of alkyl of 1 thru 6 carbon atoms, hydroxyl, alkoxy where the alkyl group contains 1 thru 6 carbon atoms, or cyclic alkylenedioxy where the alkylene group contains 1 thru 3 carbon atoms; 2- or 3-furyl, 2- or 3-thienyl and 2- or 3-indolylmethyl in acid salt form in an amount greater than present in an optically impure 2-aminonitrile (III) mixture which comprises contacting the optically impure 2-aminonitrile (III) mixture with an optically active acid in the presence of a compound of the formula R_1COR_2 (IV), the methyl or ethyl actal, ketal, hemiacetal, or hemi-ketal thereof, where R_1 and R_2 may be the same or different with the proviso that both R_1 and R_2 cannot both be aromatic and where R_1 is alkyl of 1 thru 6 carbon atoms; cycloalkyl of 4 thru 6 carbon atoms; aromatic of 6 thru 10 carbon atoms, substituted with 0 thru 3 substituents selected from the group consisting of alkyl of 1 thru 6 carbon atoms, halogen, alkoxy where the alkyl group contains 1 thru 6 carbon atoms; or aralkyl of 7 or 8 carbon atoms; R_2 is hydrogen or R_1; and when R_2 is not hydrogen, R_1 and R_2 taken together with the attached carbon atom may form a cyclic ketone selected from the group consisting of cyclobutanone, cyclopentanone, cyclohexanone and cycloheptanone, and separating the diastereomeric acid salt of the optically pure 2-aminonitrile (III) enantiomer.

4,072,699

ALUMINUM ORGANOIODIDES

George G. Merkl, 46 Sunset Court, Haworth, N.J. 07641

Division of Ser. No. 345,659, March 28, 1973, Pat. No. 3,856,841. This application Oct. 21, 1974, Ser. No. 516,667
Int. Cl.[2] C11C *1/00;* C07F *5/06*
U.S. Cl. 260—408 10 Claims



1. An aluminum alcohol iodide prepared by contacting and reacting:
   a. iodine;
   b. an alcohol selected from ethyl alcohol, ethenol, ethanolamine, benzyl alcohol, cyclohexanol, furfuryl alcohol, ethylene glycol, sorbitol, phenol, and glycerol; and
   c. a reactive aluminum comprising high purity aluminum metal permeated with from 0.1 to 5.0% by weight of a liquid metal selected from mercury, gallium and indium/-gallium alloys.

3. An aluminum carboxylic iodide prepared by contacting and reacting:
   a. iodine;
   b. a liquid carboxylic acid selected from myristic acid, linoleic acid, lauric acid, formic acid, lactic acid and acrylic acid; and
   c. a reactive aluminum comprising high purity aluminum metal permeated with from 0.1 to 5.0% by weight of a liquid metal selected from mercury, gallium and ind;ium/-gallium alloys.

6. An aluminum alcohol-carboxylic acid iodide complex prepared by contacting and reacting:
   a. iodine;
   b. an alcohol selected from ethyl alcohol, ethenol, ethanolamine, benzyl alcohol, cyclohexanol, furfuryl alcohol, ethylene glycol, sorbitol, phenol, and glycerol and a liquid carboxylic acid selected from myristic acid, linoleic acid, lauric acid, formic acid, lactic acid and acrylic acid; and
   c. a reactive aluminum comprising high purity aluminum metal permeated with from 0.1 to 5.0% by weight of a liquid metal selected from mercury, gallium and indium/-gallium alloys.

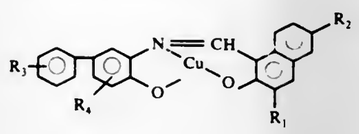
4,072,700

AZOMETHINE COPPER COMPLEXES

Hans Bohler, Rheinfelden, and Rolf Griesser, Binningen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Sept. 9, 1975, Ser. No. 611,615
Claims priority, application Sweden, Sept. 16, 1974, 7412571
Int. Cl.[2] C07F *1/08*
U.S. Cl. 260—438.1 7 Claims

1. A compound of formula I,



I

wherein
R_1 is hydrogen, carboxy, or phenylaminocarbonyl, the phenyl radical of which is unsubstituted or substituted by up to 2 substituents selected from chlorine, bromine, methyl, cyano, nitro, methoxy and ethoxy,
R_2 is hydrogen, chlorine, bromine, methoxy, ethoxy or nitro, and
R_3 and R_4 are, independently, hydrogen, chlorine, bromine, methoxy or ethoxy.

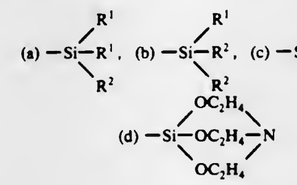
4,072,701

PROCESS FOR THE PRODUCTION OF SULFUR CONTAINING ORGANOSILICON COMPOUNDS

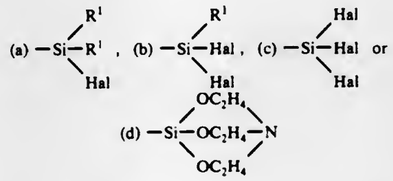
Hans-Dieter Pletka, Hanau, and Rudolf Michel, Freigericht, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Filed Sept. 24, 1976, Ser. No. 730,726
Claims priority, application Germany, Sept. 24, 1975, 2542534
Int. Cl.[2] C07F *7/18*
U.S. Cl. 260—448.8 R 18 Claims

1. A process for the production of a sulfur containing organosilicon compound of the formula (I) Z-Alk-Sx-Alk-Z, where Z is the grouping:



in which R^1 is an alkyl group having 1 to 8 carbon atoms, a cycloalkyl group having 5 to 8 carbon atoms, benzyl, phenyl or phenyl substituted with at least one methyl, ethyl or chloro group and R^2 is alkoxy of 1 to 8 carbon atoms, methoxyethoxy, cycloalkoxy having 5 to 8 carbon atoms, benzyloxy, phenoxy or phenoxy substituted with at least one methyl, ethyl or chloro group, Alk is a divalent hydrocarbon group having 1 to 10 carbon atoms or such a group interrupted once or twice by —O—, —S— or —NH— and x is a number from 2 to 6 comprising reacting a compound of the formula (II) Y-Alk-Hal, where Y is:



where Hal is fluorine, chlorine, bromine or iodine with, when II is (a), (b) or (c), a compound of the formula R^3OH in which R^3 is alkyl of 1 to 8 carbon atoms, methoxyethyl, cycloalkyl having 5 to 8 carbon atoms, benzyl, phenyl or phenyl substituted with at least one methyl, ethyl or chloro group and reacting the resulting product or, when II is (d) reacting II, with a hydrosulfide of the formula III MeSH in which Me is ammonium, an alkali metal atom, an equivalent of an alkaline earth metal or zinc and with sulfur, the amount of sulfur together with the sulfur in MeSH being sufficient to satisfy x in formula I, and removing the ammonium or metal halide.

4,072,702

TRI-FUNCTIONAL ISOCYANATE CROSSLINKING AGENTS FOR HYDROXY-TERMINATED POLYBUTADIENE BINDERS

Chester W. Huskins, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 6, 1976, Ser. No. 752,636
Int. Cl.[2] C07C *119/042, 119/045, 119/048*
U.S. Cl. 260—453 AB 3 Claims

1. A tri-functional isocyanate prepared by the method comprising reacting together in a reflux vessel containing an excess amount of the reacting solvent p-dioxane, three moles of a diisocyanate, and one mole of water selected from distilled water and deionized water, said diisocyanate selected from the group of diisocyanates consisting of isophorone diisocyanate, trimethyl-hexamethylene diisocyanate, and dimeryl diisocyanate, said reacting being carried out under a blanket of dry nitrogen and at reflux conditions for a period of time from about one to about two hours to complete said reacting to form said tri-functional isocyanate in said reacting solvent that is stripped from the reflux vessel to yield said tri-functional isocyanate which is ready for immediate use as a crosslinking agent in a hydroxy-terminated polybutadiene binder system.

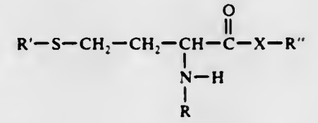
4,072,703

THIOL ESTERS OF HOMOCYSTEINE

Jean Blum, Courbevoie, France, assignor to Chimie & Biologie, France

Filed Apr. 14, 1975, Ser. No. 567,752
Claims priority, application France, Mar. 28, 1974, 74 10913
Int. Cl.[2] C07C *153/07, 153/09, 153/11*
U.S. Cl. 260—455 R 5 Claims

1. A compound having the formula:



wherein
X is oxygen;
R and R' are each selected from the group consisting of p-chlorophenoxy-2-isobutyryl, pivaloyl, m-fluorobenzoyl, trimethoxy-3,4,5 benzoyl, succinoyl, p-chlorophenoxy acetyl, salicyloyl, acetyl-salicyloyl, acetyl, benzoyl, propionyl; and,
R'' is hydrogen or C_1 to C_4 alkyl.

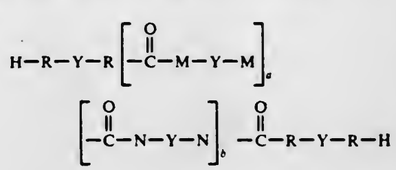
4,072,704

MULTI-BLOCK COUPLED POLYOXYALKYLENE COPOLYMER SURFACTANTS

William K. Langdon, Grosse Ile, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 498,670, Aug. 19, 1974, abandoned. This application Feb. 2, 1976, Ser. No. 654,268
Int. Cl.[2] C07C *69/96;* C08G *63/62*
U.S. Cl. 260—463 2 Claims

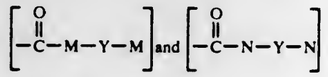
1. A polycarbonate compound having the formula



wherein
Y is the residue of an alkylene glycol containing therein two

terminal hydroxyl groups minus the terminal hydrogen atoms, M is a hydrophilic chain of units selected from the group consisting of oxyethylene and oxyethylene-oxypropylene units wherein the oxyethylene content of said hydrophilic chain is from about 75 to 100 weight percent and the oxypropylene content is from 0 to about 25 weight percent, the number of oxyethylene and oxypropylene groups in M being from about 2 to about 15,

N is a hydrophobic chain of units selected from the group consisting of oxypropylene units and oxyethylene-oxypropylene units wherein the oxypropylene content is from about 75 to 100 weight percent and the oxyethylene content is from 0 to about 25 weight percent, the number of oxyethylene and oxypropylene groups in N being from about 2 to about 10, wherein



are linked together either in a random or an ordered manner, R is M or N, and *a* and *b* are integers from 2 to 20 in a ratio between 1:9 to 9:1.

4,072,705

PHENYLMETHYLPHENOXY PROPIONIC ACID ESTERS

Andre' Mieville, Lausanne, Switzerland, assignor to Orchimed S.A., Fribourg, Switzerland

Filed Feb. 9, 1976, Ser. No. 656,711

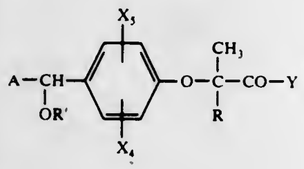
Claims priority, application United Kingdom, Feb. 12, 1975, 5979/75; Dec. 10, 1975, 50630/75

Int. Cl.² C07C *69/76*

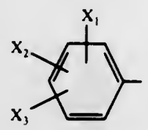
U.S. Cl. 424—308 **8 Claims**

1. A compound of the formula:

(II)



wherein A is



and X_1, X_2 and X_3 are the same or different and are H, Cl, Br, F; Y is OH or alkoxy; each of R, X_4 and X_5 is hydrogen or C_{1-4} alkyl; R' is H, C_{1-4} alkyl or acetyl; or an acid addition salt thereof.

4,072,706

OXIDATION OF PHOSPHONOMETHYLAMINES

Arnold Hershman, Creve Coeur, and James W. Gambell, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 2, 1976, Ser. No. 645,988

Int. Cl.² C07F *9/38*; C07C *85/20*

U.S. Cl. 260—502.5 **15 Claims**

1. A process for production of secondary amines having at least one phosphonomethyl group attached to the amine nitrogen which comprises contacting a tertiary amine having more than one phosphonomethyl group attached to the amine nitrogen and in which other substituents on the nitrogen atom are not more readily removable by oxidation than the phosphonomethyl group, with oxygen at a temperature from ambient to about 250° C and sufficient to oxidize chemically the amine and effect removal of a phosphonomethyl group, and recovering the resulting secondary amine in substantial yield.

4,072,707

PREPARATION OF 3,5-DIALKYL-4-HYDROXYBENZOIC ACID

Vincent Gerard Grosso, Piscataway, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Nov. 3, 1976, Ser. No. 738,215

Int. Cl.² C07C *65/02*

U.S. Cl. 260—521 C **6 Claims**

1. A process for the preparation of sterically hindered 3,5-dialkyl-4-hydroxybenzoic acid wherein at least one of the alkyl groups therein is branched on the alpha carbon atom which comprises reacting a solution in a dry dipolar aprotic solvent of a sterically hindered 2,6-dialkylphenol wherein at least one of the alkyl groups is branched on the alpha carbon with sodium hydride or lithium hydride, the mole ratio of said hydride to said phenol being between about 1.0 and 5; reacting the thus formed phenolate in solution in said dry dipolar aprotic solvent with an excess of carbon dioxide at a temperature of about 70°–80° C.; adding to the resulting reaction mixture sufficient of a lower alcohol to destroy any excess sodium hydride or lithium hydride present therein; forming a two-phase system by adding to the resulting reaction mixture water and a water-immiscible organic solvent; separating the aqueous phase and acidifying to precipitate the 3,5-dialkyl-4-hydroxybenzoic acid.

4,072,708

PROCESS FOR THE PREPARATION OF UNSATURATED ACIDS FROM UNSATURATED ALDEHYDES

James F. White, Akron; Wilfrid G. Shaw, Lyndhurst, and Michael D. Applequist, Mayfield Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 733,737, Oct. 19, 1976. This application Jan. 31, 1977, Ser. No. 764,127

Int. Cl.² C07C *51/32*

U.S. Cl. 260—530 N **18 Claims**

1. In the process for the production of acrylic acid and methacrylic acid by the oxidation of acrolein and methacrolein respectively, with molecular oxygen in the vapor phase at a reaction temperature of about 200° C to about 500° C. in the presence of a catalyst, and optionally in the presence of steam, the improvement comprising using as a catalyst a catalyst of the formula

$$X_aY_bMo_{12}P_cAs_dO_x$$

wherein

X is a rare earth element or a mixture thereof;

Y is at least one of Ag, Tl, Rh, Pd, Ru, Pt, Cd, Al, Au, Cu, alkaline earth metal, Cl, and NH_4;

wherein

a is 0.001 to 10;

b is 0 to 10;

c is 0.01 to 5;

d is 0.01 to 5;

x is the number of oxygens required to satisfy the valence states of the other elements present.

4,072,709

PRODUCTION OF LACTIC ACID

Harold Burnham Tinker, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed May 27, 1975, Ser. No. 581,245

Int. Cl.² C07C *59/08*

U.S. Cl. 260—535 R **24 Claims**

1. The process of preparing lactic acid which comprises hydroformylating a vinyl carboxylate with carbon monoxide and hydrogen in contact with a hydroformylation catalyst to prepare an alpha-acyloxypropionaldehyde, and oxidizing and hydrolyzing the intermediate to obtain lactic acid.

4,072,710

PROCESS FOR PREPARING ACID CHLORIDES

Antonio Luis Palomo Coll, Maestro Perez Cabrero 7, Barcelona, Spain

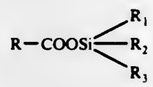
Filed Nov. 7, 1975, Ser. No. 629,786

Claims priority, application Spain, Nov. 9, 1974, 431806; Oct. 8, 1975, 441581

Int. Cl.² C07C *51/58*

U.S. Cl. 260—544 D **6 Claims**

1. A process for the preparation of acid chlorides, wherein there is used a silyl ester of the following general formula:



where R is a substituted or unsubstituted aralkyl, aliphatic, aromatic, or heterocyclic group provided that the substituent is not an amino group, and R_1, R_2 and R_3 are alkyl of 1-3 carbon atoms or phenyl, which is reacted with thionyl chloride in an inert solvent at a temperature of from −15° to 50° C to obtain a compound of the general formula:

R—COCl

where R has the same meaning as given above.

4,072,711

TETRAHYDRO-4-SEMICARBAZONO-1-NAPHTHYLUREAS

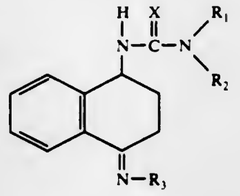
Goro Asato, Titusville, and Terence James Bentley, South Cranbury, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 705,313, July 14, 1976, Pat. No. 4,041,070. This application Mar. 25, 1977, Ser. No. 781,232

Int. Cl.² C07C *133/08, 157/09*; A61K *31/175*

U.S. Cl. 260—554 **4 Claims**

1. A compound of formula:



wherein X is oxygen or sulfur; R_1 is hydrogen or alkyl C_1-C_4; R_2 is hydrogen, alkyl C_1-C_4, 2-propynyl, alkoxy C_1-C_4 or benzyloxy; R_3 is the moiety

the racemic mixtures and the optical isomers thereof.

4,072,712

PROCESS FOR THE PRODUCTION OF CARBODIIMIDES AND CARBODIIMIDE-ISOCYANATE ADDUCTS

Ernst Meisert, Leverkusen-Schlebusch, and Peter Fischer, Cologne-Flittard, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

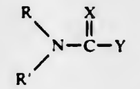
Continuation of Ser. No. 381,102, July 20, 1973, abandoned, which is a continuation of Ser. No. 56,976, July 21, 1970, abandoned, which is a continuation-in-part of Ser. No. 623,818, March 17, 1967, abandoned. This application Dec. 17, 1976, Ser. No. 751,839

Claims priority, application Germany, Mar. 18, 1966, F48694

Int. Cl.² C07C *119/055*

U.S. Cl. 260—566 R **8 Claims**

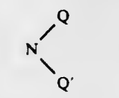
1. A method for preparing carbodiimides which comprises heating an organic isocyanate at a temperature of at least about 150° C. in the presence of a catalytic amount of a catalyst having the formula:



wherein

R and R' are the same or different and represent hydrogen, alkyl, aryl and when joined together form a heterocyclic ring;

Y is hydrogen, alkyl, chloroalkyl, aryl, alkoxyphosphono and



wherein Q is hydrogen, alkyl, or aryl; Q' is hydrogen, alkyl, aryl, COR'' and SO_2R'', wherein R'' is alkyl or aryl, and when Y is joined together with R, they form a heterocyclic ring; and

X is oxygen or sulfur.

4,072,713

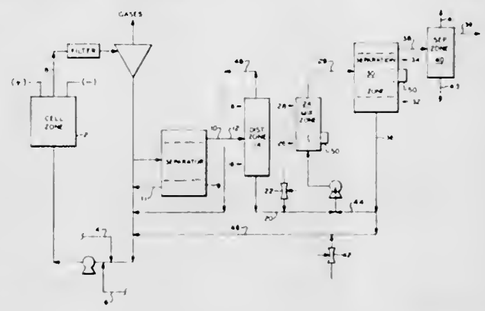
METHOD FOR SEPARATING TETRAALKYLAMMONIUM SALTS

Geir Bjornson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 27, 1972, Ser. No. 275,546

Int. Cl.² C07C *87/32*

U.S. Cl. 260—567.6 M **7 Claims**



1. In a process for the production of adiponitrile wherein acrylonitrile, an aqueous electrolyte, and a tetraalkylammonium salt, each of the alkyl radicals of which has 1-20 carbon atoms and the tetraalkylammonium has 11-25 carbon atoms, are subjected to an electrolysis in an electrohydrodim-

erization cell, and wherein the adiponitrile formed is recovered from a first emulsion coming from said cell,

the improvement which comprises

separating said first emulsion to form a first organic and a first aqueous phase,

distilling said first organic phase to remove acrylonitrile therefrom,

mixing the remaining first organic phase with phosphoric acid to form a second emulsion,

separating said second emulsion into a second aqueous and a second organic phase,

and recovering the adiponitrile from the organic phase and the aqueous phase comprising the tetraalkylammonium phosphate salt.

4,072,714

HYDROGENATION OF ACETYLENE ALCOHOLS

Dieter Voges, Mannheim; Karl Baer, Weinheim; Juergen Boudier, Duerkheim; Siegfried Winderl, Heidelberg-Wieblingen, and Herwig Hoffmann, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Division of Ser. No. 706,471, July 19, 1976, Pat. No. 4,048,116. This application Feb. 4, 1977, Ser. No. 765,762

Claims priority, application Germany, July 19, 1976, 2536273

Int. Cl.[2] C07C *89/00, 29/00*

U.S. Cl. 260—584 R **4 Claims**

1. A process for the manufacture of saturated alcohols by hydrogenation of acetylenically unsaturated alcohols, wherein hydrogenation is carried out in the presence of a catalyst which comprises nickel as the main ingredient, from about 30 to 40% by weight of copper, based on nickel, and from about 1 to 10% by weight of a mixture of manganese and molybdenum oxides, based on the total weight of the catalyst.

4,072,715

OPTICALLY ACTIVE CYCLOHEXANE DERIVATIVES

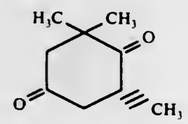
Walter Boguth, Riehen; Hans Georg Wilhelm Leuenberger, Arlesheim; Hans Johann Mayer, Fullinsdorf; Erich Widmer, Munchenstein, and Reinhard Zell, Rodersdorf, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 601,770, Aug. 4, 1975, Pat. No. 3,988,205. This application July 20, 1976, Ser. No. 707,123

Int. Cl.[2] C07C *49/30*

U.S. Cl. 260—586 R **2 Claims**

1. An optically active compound of the formula



4,072,716

BICYCLOALKANE DERIVATIVES

Gerhard Sauer, Berlin; Helmut Hauser, Unna; Gregor Haffer, Berlin; Juergen Ruppert, Berlin; Ulrich Eder, Berlin, and Rudolf Wiechert, Berlin, all of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

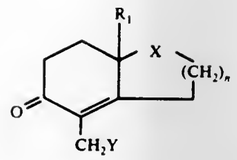
Continuation-in-part of Ser. No. 317,549, Dec. 22, 1972, Pat. No. 4,008,253. This application Dec. 27, 1976, Ser. No. 754,000

Claims priority, application Germany, Dec. 24, 1971, 2165320; Apr. 29, 1972, 2221704; Nov. 2, 1972, 2254175

Int. Cl.[2] C07C *49/54*

U.S. Cl. 260—586 F **14 Claims**

1. A bicycloalkane of the formula



wherein *n* is 1 or 2, R_1 is alkyl of 1–4 carbon atoms, X is carbonyl, hydroxymethylene or alkoxymethylene of 1–10 carbon atoms in the alkyl group, and Y is —S—R_2, —SO_m—R_2, or



wherein *m* is 1 or 2, R_2 is alkyl of 1–12 carbon atoms, R_3 is hydrogen or alkyl of 1–4 carbon atoms, R_4 is aliphatic acyl of 2–16 carbon atoms, and Z is nitro, alkanoyl of 2–4 carbon atoms, alkylsulfinyl of 1–4 carbon atoms or alkylsulfonyl of 1–4 carbon atoms.

4,072,717

MANUFACTURE OF FORMALDEHYDE

Guenter Halbritter, Germersheim; Wolfgang Muehlthaler, Hemsbach; Heinrich Sperber, Ludwigshafen; Hans Diem, Ludwigshafen; Christian Dudeck, Ludwigshafen, and Gunter Lehmann, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Aug. 22, 1975, Ser. No. 606,773

Claims priority, application Germany, Sept. 4, 1974, 2442231

Int. Cl.[2] C07C *45/16*

U.S. Cl. 260—603 C **12 Claims**

1. In a process for the manufacture of formaldehyde by oxidative dehydrogenation of methanol in the presence of a silver catalyst, at an elevated temperature, the improvement wherein the reaction is started at a lower throughput and a lower temperature comprising

(a) a gaseous starting mixture consisting of methanol and steam, containing from 0.1 to 0.7 mole of water per mole of methanol, is passed through a catalyst bed of silver particles, heated to from 250 to 450° C, at a throughput of from 0.04 to 1.0 tonne of methanol per square meter of catalyst bed cross-section per hour, thereafter

(b) air corresponding to from 0.3 to 0.6 mole of oxygen per mole of methanol is thereafter added to the starting mixture at the above temperature, and the silver-catalyzed reaction is started,

(c) at a point in time ranging from just after the start of said reaction to 0.5 hour after the start of said reaction, an off-gas taken from the same or another process for manufacture of formaldehyde by oxidative dehydrogenation of methanol and containing from 0.25 to 1.0 percent by volume of carbon monoxide, from 3.5 to 10 percent by volume of carbon dioxide, from 10 to 25 percent by volume of hydrogen and from 0.02 to 0.1 percent by volume of formaldehyde vapor, is admixed with the starting mixture, in amounts of from 90 to 3,500% by weight of off-gas, based on methanol, and is passed therewith through said catalyst bed,

(d) the throughput of gaseous mixture fed to the catalyst, and the reaction temperature, are both increased and finally

(e) the oxidative dehydrogenation reaction is carried out at from 550° to 800° C, at a throughput of from 1 to 3 tonnes of methanol per square meter of catalyst bed cross-section per hour, using from 0.2 to 0.7 mole of steam and from 0.3 to 0.8 mole of oxygen per mole of methanol, and from 90 to 180% by weight of off-gas, based on methanol.

4,072,718

METHODS OF CONVERTING DITERTIARY ORGANIC SULFIDES TO DITERTIARY ORGANIC DISULFIDES

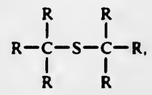
William G. Billings, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 19, 1976, Ser. No. 706,421

Int. Cl.[2] C07C *149/12*

U.S. Cl. 260—608 **16 Claims**

1. A method comprising contacting at least one ditertiary organic sulfide of the formula



wherein each R may be the same or different radical selected from hydrocarbyl radicals having from 1 to 12 carbon atoms, with at least one hydrocarbyl sulfoxide of the formula



wherein each R′ may be the same or different alkyl radical having from 1 to 12 carbon atoms or wherein the two such R′ groups are combined to form a cyclic ring containing the sulfur atom and at least 4 carbons in the cyclic ring, in the presence of a reaction promoting amount of at least one protonic acid, wherein the temperature, the pressure, said at least one ditertiary organic sulfide, said at least one hydrocarbyl sulfoxide and the amounts thereof are such that at least one ditertiary organic disulfide is produced.

4,072,719

4-(2,6,6-TRIMETHYL-2-CYCLOHEXEN-1-YLIDENE)-BUTAN-2-OL

Peter Naegeli, Wettingen, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 664,212, March 5, 1976, Pat. No. 4,011,245. This application Oct. 19, 1976, Ser. No. 733,724

Claims priority, application Switzerland, Mar. 11, 1975, 3053/75; Dec. 30, 1975, 16871/75

Int. Cl.[2] C07C *33/05, 33/02*

U.S. Cl. 260—617 A **1 Claim**

1. 4-(2,6,6-Trimethyl-2-cyclohexen-1-ylidene)-butan-2-ol.

4,072,720

PRODUCTION OF ALCOHOL

Werner O. Haag, Trenton, and Darrell Duayne Whitehurst, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 107,862, Jan. 19, 1971, abandoned, which is a continuation-in-part of Ser. No. 57,796, July 23, 1970, abandoned, and Ser. No. 672,009, Oct. 2, 1967, abandoned, and Ser. No. 860,807, Sept. 24, 1969, abandoned, which is a continuation-in-part of Ser. No. 672,010, Oct. 2, 1967, abandoned, said Ser. No. 57,796, is a continuation-in-part of Ser. No. 672,008, Oct. 2, 1967, abandoned. This application Nov. 5, 1973, Ser. No. 414,612

Int. Cl.[2] C07C *29/14*

U.S. Cl. 260—618 H **20 Claims**

1. A process for producing alcohols comprising reacting a reducible aldehyde or an acetal thereof, said aldehyde having about 3 to 13 carbon atoms, corresponding to said alcohol with about 1 to 20 moles of hydrogen per mole of aldehyde or acetal, in the presence of about 0.1 to 20 moles of carbon monoxide per mole of hydrogen at about 50° to 250° C in contact with an intrinsically porous catalyst which is essentially insoluble in the reaction mixture comprising said aldehyde or acetal and the reaction products thereof with hydrogen, which catalyst comprises an organic polymer selected from the group consisting of cellulose, poly(styrene-divinyl benzene), poly(phenol-formaldehyde), poly(melamine-formaldehyde), poly(ureaformaldehyde), poly(alkylene-formaldehyde) and polystyrene having a tertiary amine having a pK_b of 3 to 7 and containing at least one alkyl substituent bonded thereto; and having a metal moiety selected from the group consisting of cobalt, rhodium and ruthenium bonded to said amine.

4,072,721

PURIFICATION OF HYDROQUINONE

Budd Harvey Sturm, Hartville, and Thomas James Slam, Parma, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 13, 1975, Ser. No. 604,273

Int. Cl.[2] C07C *39/08*

U.S. Cl. 260—621 A **7 Claims**

1. In the method of subjecting technical grade hydroquinone to a process which consists of preparing a water solution of technical grade hydroquinone and subsequently treating such water solution with hydrogen at pressures from about 5 to about 150 psig while in the presence of from about 0.1 to about 1 percent by weight of palladium on a support, at temperatures ranging from about 25 to about 125° C. and recovering photographic hydroquinone from said solution which improvement comprising adjusting the pH of the water solution of hydroquinone to a pH between about 3 and about 6.

4,072,722

PROCESS FOR PREPARING DIHYDRIC PHENOL DERIVATIVES

Sumio Umemura; Nagaaki Takamitsu; Toshikazu Hamamoto, and Nobuyuki Kuroda, all of Ube, Japan, assignors to UBE Industries, Ltd., Ube, Japan

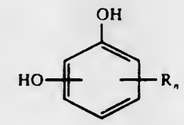
Continuation of Ser. No. 558,699, March 17, 1975, abandoned. This application Nov. 29, 1976, Ser. No. 745,556

Claims priority, application Japan, Apr. 4, 1974, 49-37319; May 7, 1974, 49-49812

Int. Cl.[2] C07C *39/08*

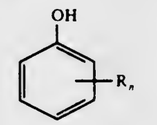
U.S. Cl. 260—621 G **11 Claims**

1. A process for preparing a dihydric phenol having the formula:



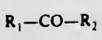
wherein R represents a lower alkyl radical having 1–6 carbon atoms and each R may be the same or different, and *n* represents zero or an integer of 1 to 4 and when *n* is 3 or 4 not all of the 3-, 4- and 6-positions are occupied with the said alkyl radicals,

which comprises oxidizing a monohydric phenol having the formula



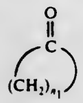
wherein R and *n* have the same meanings as above, with a ketone peroxide at a temperature of from 45° to 200° C. in the absence of a catalyst, the amount of peroxide P per millimole of the monohydric phenol being a value of from 0.01 to 0.50, said ketone peroxide being obtained by reaction of hydrogen peroxide and a ketone selected from the group consisting of (i) and (ii), following:

i. a ketone having 3–20 carbon atoms represented by the following formula:



wherein R_1 and R_2, which may be the same or different, and which represent straight or branched alkyl groups of 1-8 carbon atoms or a phenyl group, or

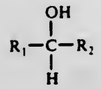
ii. a cycloketone having the following formula:



wherein n_1 represents an integer of 4-11, inclusive,

or a ketone peroxide derived from a secondary alcohol having the following formula:

iii. a secondary alcohol having 3-20 carbon atoms and represented by the following formula:



wherein R and R have the same meanings as above.

4,072,723

PREPARATION OF 2,3,6-TRI-LOWER ALKYL PHENOLS

Pius Anton Wehrli, Verona, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

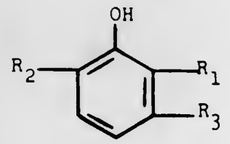
Division of Ser. No. 260,024, June 2, 1972, Pat. No. 3,857,892, which is a division of Ser. No. 805,365, March 7, 1969, Pat. No. 3,692,839. This application Aug. 28, 1974, Ser. No. 501,128

Published under the second Trial Voluntary Protest Program on Feb. 24, 1976, as document No. B 501,128.

Int. Cl.[2] C07C *39/06*

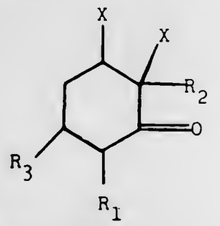
U.S. Cl. 260—621 H **1 Claim**

1. A process of producing a hydroxy compound of the formula:



wherein R_1, R_2 and R_3 are lower alkyl;

comprising treating a compound of the formula:



wherein R_1, R_2 and R_3 are as above;

with a dehydrogenating agent selected from the grôup consisting of dichlorodicyanoquinone, mercuric acetate, and palladium on carbon, said treatment being carried out in the presence or absence of an inert organic solvent and at a temperature of from about 25°C. to about 300°C.

4,072,724

PROCESS FOR PREPARING HINDERED ALKENYL PHENOLS

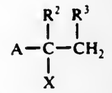
Dane K. Parker, Massillon, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 3, 1975, Ser. No. 628,686

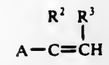
Int. Cl.[2] C07C *39/18, 39/12*

U.S. Cl. 260—624 B **9 Claims**

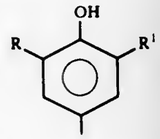
1. A process of preparing a hindered alkenyl phenol comprising reacting (a) an α-haloalkyl phenol with (b) a basic dehydrohalogenation agent, wherein the α-haloalkyl phenol has the following structural formula



and the hindered alkenyl phenol has the following structural formula



wherein A has the structure



and wherein R and R^1 are tertiary alkyl radicals having 4 to 12 carbon atoms, R^2 is selected from the group consisting of hydrogen and methyl, R^3 is selected from the group consisting of hydrogen, alkyl radicals having 1 to 6 carbon atoms and aryl radicals having 6 to 12 carbon atoms, with the proviso that at least one of R^2 and R^3 is hydrogen, and X is a halo radical selected from the group consisting of chloro, bromo and iodo.

4,072,725

DEHYDROPHYTOL

Ralph E. Close, Jacksonville, Fla., and William Oroshnik, Plainfield, N.J., assignors to SCM Corporation, New York, N.Y.

Division of Ser. No. 622,974, Oct. 16, 1975, Pat. No. 4,039,591, which is a division of Ser. No. 560,550, March 20, 1975. This application Feb. 22, 1977, Ser. No. 770,413

Int. Cl.[2] C07C *33/02*

U.S. Cl. 260—632 R **1 Claim**

1. The compound 3,7,11,15-tetramethylhexadeca-2,5-dien-1-ol.

4,072,726

HYDROGENATION OF FLUORINATED ESTERS

Henry Robert Nychka, East Aurora; Richard Elmer Eibeck, Orchard Park; Martin Alvin Robinson, East Amherst, and Edward Stephen Jones, Williamsville, all of N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Jan. 21, 1977, Ser. No. 761,160

Int. Cl.[2] C07C *31/34, 29/00*

U.S. Cl. 260—633 **18 Claims**

1. A method for the preparation of fluorinated alcohols of the formula $C_nH_xF_{2n+1-x}CH_2OH$, wherein $n=1$ to 13 and $x=0$ to 3 but not more than n, comprising passing at between about 200° C and about 325° C a vaporous mixture of hydrogen and a fluorinated ester of the formula $C_nH_xF_{2n+1-x}CO_2CH_2$—$C_mH_yF_{2m+1-y}$, wherein n and x are as described above and $m=1$ to 13 and $y=0$ to 3 but not more than m, over a catalyst consisting essentially of about 50 to 100 percent by weight CuO and 0 to about 50 percent by weight of an inert base or binder, said catalyst being essentially free of chromite, and recovering the fluorinated alcohol.

4,072,727

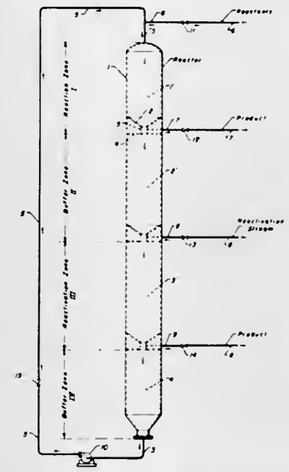
SILVER-CADMIUM-ZINC ALLOY CATALYST FOR HYDROGENATION OF ACROLEIN TO ALLYL ALCOHOL

Thomas H. Vanderspurt, Gillette, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Aug. 13, 1976, Ser. No. 714,057

Int. Cl.[2] C07C *29/14;* B01J *23/60*

U.S. Cl. 260—638 B **10 Claims**



1. A catalyst composition consisting essentially of a silver-cadmium-zinc alloy on a carrier substrate, wherein the atomic ratio of silver to cadmium in the alloy is in the range of between about 0.1 and 3 to 1, and the zinc is contained in the alloy in a quantity between about 0.001 and 30 weight percent, based on the total weight of alloy, and wherein the silver-cadmium-zinc alloy exhibits an X-ray diffraction pattern which is substantially free of detectable unalloyed metal crystallite lines.

10. An improved hydrogenation process for converting acrolein into allyl alcohol which comprises reacting acrolein with hydrogen in the vapor phase at a temperature between about 0° C and 300° C and a pressure between about 15 and 15,000 psi in the presence of a silver-cadmium-zinc alloy on a carrier substrate, wherein the atomic ratio of silver to cadmium in the alloy is in the range of between about 0.1 and 3 to 1, and the zinc is contained in the alloy in a quantity between about 0.001 and 30 weight percent, based on the total weight of alloy, and wherein the silver-cadmium-zinc alloy exhibits an X-ray diffraction pattern which is substantially free of detectable unalloyed metal crystallite lines.

4,072,728

PROCESS FOR THE PREPARATION OF 1,2-DICHLOROETHANE IN TWO REACTION ZONES BY REACTING CHLORINE WITH NOT MORE THAN 102 MOLE PERCENT OF ETHYLENE

Jean-Raymond Costes, Dampierre; Jean-Claude Strini, St-Auban, and Serge Hardouin, Lyon, all of France, assignors to Rhone-Progil, France

Continuation of Ser. No. 427,375, Dec. 21, 1973, abandoned. This application Sept. 29, 1975, Ser. No. 617,409

Claims priority, application France, Dec. 27, 1972, 72.46389

Int. Cl.[2] C07C *17/02, 17/10*

U.S. Cl. 260—660 **9 Claims**

1. In a process for the production of 1,2-dichloroethane in which chlorine and ethylene are reacted at a temperature within the range of 20° to 80° C in the absence of light radiation and in the presence of a Lewis acid catalyst and liquid 1,2-dichloroethane, the improvement comprising continuously introducing to a first homogeneous agitated reaction zone of 1,2-dichloroethane all of the chlorine used in the reaction and a fraction of the total ethylene within the range of 90 to 100 mole percent based on the total amount of chlorine, immediately passing the resulting products from the first zone to a second homogeneous, agitated reaction zone, introducing to the second zone the remaining ethylene countercurrently to the flow of 1,2-dichloroethane, with the total amount of ethylene introduced to the first and second zones not exceeding 102 mole percent of the total chlorine used and with both reaction zones being included in a single vessel, and recovering 1,2-dichloroethane from the second zone while venting not more than 1 mole percent of the ethylene based upon the total amount of ethylene introduced.

4,072,729

SIMULATED MOVING BED REACTION PROCESS

Laurence O. Stine, Western Springs, and Dennis J. Ward, South Barrington, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 587,468, June 16, 1975, Pat. No. 4,028,430. This application Feb. 7, 1978, Ser. No. 768,510

Int. Cl.[2] C07C *3/52*

U.S. Cl. 260—671 R **17 Claims**

1. A continuous fixed bed catalytic alkylation reaction and catalyst reactivation process comprising the steps of:

a. providing a fixed bed of solid catalyst containing four zones having a fluid flow connecting path between said zones to interconnect said zones;

b. arranging said zones in a series and providing fluid flow connecting means between the last zone and the first zone of the series to provide a directional circular flow path through said zones;

c. providing a point between each two successive zones for introducing an inlet stream or withdrawing a product stream;

d. introducing a reactivation stream including alkylatable aromatic hydrocarbon at first point located between two successive zones (zone II and zone III) to effect catalyst reactivation and to provide alkylatable hydrocarbon as a continuous component throughout said fixed bed of solid catalyst;

e. simultaneously withdrawing a first product stream from a second point located between said zone III and the next successive zone in the direction of flow (zone IV);

f. simultaneously introducing reactants including an olefin-acting reactant selected from the group consisting of ethylene, propylene and C_9-C_{15} mono-olefins into said fixed bed of catalyst at a third point located between said zone IV and the next successive zone in the direction of flow (zone I) and reacting said reactants at a temperature of about 200° to about 600° F. to effect an alkylation reaction, a result of which is deactivation of said catalyst, said alkylation and catalyst reactivation being the principal reactions of the process;

g. simultaneously withdrawing a second product stream from a fourth point located between said zone I and the next successive zone in the direction of flow (zone II); and,

h. periodically advancing downstream the points of charging said reactants stream and said reactivation stream, and the points of withdrawal of said product streams to the next successive points for introducing an inlet stream or withdrawing an outlet stream.

2. A continuous fixed bed catalytic alkylation reaction and catalyst reactivation process comprising the steps of:

a. providing a fixed bed of solid catalyst containing three zones having a fluid flow connecting path between said zones to interconnect said zones;

b. arranging said zones in a series and providing fluid flow

connecting means between the last zone and the first zone of the series to provide a directional circular flow path through said zones;

c. providing a point between each two successive zones for introducing an inlet stream or withdrawing a product stream;

d. introducing a reactivation stream including alkylatable aromatic hydrocarbon at a first point located between two successive zones to effect catalyst reactivation and to provide alkylatable hydrocarbon as a continuous component throughout said fixed bed of solid catalyst;

e. simultaneously withdrawing a first product stream from a second point located between another two successive zones;

f. simultaneously introducing reactants including an olefin-acting reactant selected from the group consisting of ethylene, propylene and C_9 -C_{15} mono-olefins into said fixed bed of catalyst at a third point located between the remaining two successive zones and reacting said reactants at a temperature of about 200° to about 600° F to effect an alkylation reaction, a result of which is deactivation of said solid catalyst, said aromatic alkylation and catalyst reactivation being the principal reactions of the process; and,

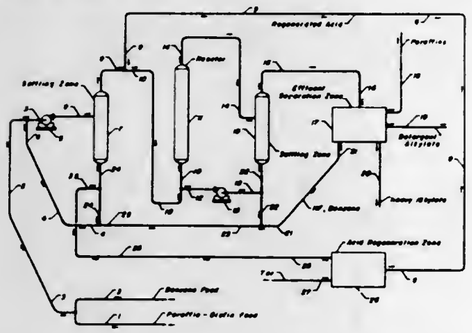
g. periodically advancing downstream the points of charging said reactants stream and said reactivation stream, and the point of withdrawal of said product stream to the next successive points for introducing an inlet stream or withdrawing an outlet stream.

4,072,730

PROCESS FOR ALKYLATING AROMATIC HYDROCARBONS

George R. Winter, III, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 28, 1976, Ser. No. 754,927
Int. Cl.² C07C 3/54
U.S. Cl. 260—671 R 5 Claims



1. In the alkylation of an aromatic hydrocarbon with an olefinic hydrocarbon in contact with hydrogen fluoride catalyst, wherein the resultant reaction mixture is separated in a settling zone into a hydrocarbon phase and a liquid hydrogen fluoride phase, at least a portion of which is recirculated by a centrifugal pump to the alkylation reaction, the improvement which comprises introducing the aromatic and olefinic hydrocarbons to be reacted into the centrifugal pump and therein admixing the same with hydrogen fluoride to partially alkylate said aromatic hydrocarbon with said olefin hydrocarbon, discharging the pump effluent through a restricted transfer line into said settling zone, and continuing the aromatic alkylation during the passage of the pump effluent through said transfer line to the settling zone.

2. The improvement of claim 1 further characterized in that said hydrocarbon phase from the settling zone is admixed with additional hydrogen fluoride catalyst, the mixture maintained at alkylation promoting conditions and thereafter separated into a hydrocarbon phase and a hydrogen fluoride phase, and at least a portion of the latter supplied to said centrifugal pump.

4,072,731

DEHYDROCYCLIZATION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

Richard E. Rausch, Mundelein, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 568,543, April 16, 1975, Pat. No. 3,986,948, which is a continuation-in-part of Ser. No. 480,793, June 19, 1974, Pat. No. 3,898,154, which is a continuation-in-part of Ser. No. 376,841, July 5, 1973, Pat. No. 3,846,283, which is a continuation-in-part of Ser. No. 201,576, Nov. 23, 1971, Pat. No. 3,745,112, which is a continuation-in-part of Ser. No. 807,910, March 17, 1969, Pat. No. 3,740,328. This application Oct. 18, 1976, Ser. No. 734,474
The portion of the term of this patent subsequent to Aug. 5, 1992, has been disclaimed.
Int. Cl.² C07C 5/22
U.S. Cl. 260—673.5 21 Claims

1. A method for dehydrocyclizing a dehydrocyclizable hydrocarbon comprising contacting the hydrocarbon at dehydrocyclization conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to about 2 wt. % rhodium, about 0.01 to about 5 wt. % tin and about 0.1 to about 3.5 wt. % halogen; wherein the platinum or palladium, rhodium and tin are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum or palladium and rhodium are present in the elemental metallic state; and wherein substantially all of the tin is present in an oxidation state above that of the elemental metal and in a particle size which is less than 100 Angstroms in maximum dimension.

4,072,732

CONVERSION OF METHANOL AND DIMETHYL ETHER TO C_2-C_6 MONOOLEFINS USING A PARTIALLY HYDRATED ZIRCONIUM SULFATE CATALYST

Duane C. Hargis, Southfield, and Lawrence J. Kehoe, Huntington Woods, both of Mich., assignors to Ethyl Corporation, Richmond, Va.

Filed Apr. 2, 1976, Ser. No. 672,846
Int. Cl.² C07C 1/20
U.S. Cl. 260—682 6 Claims

1. A process for the conversion of a reactant selected from the class consisting of methanol and dimethyl ether to C_2-C_6 monoolefin, said process comprising contacting said reactant with a partially hydrated zirconium sulfate catalyst at a temperature within the range of about 200° C. to about 400° C.

4,072,733

CONVERSION OF METHANOL AND DIMETHYL ETHER

Duane C. Hargis, Southfield, and Lawrence J. Kehoe, Huntington Woods, both of Mich., assignors to Ethyl Corporation, Richmond, Va.

Filed Apr. 2, 1976, Ser. No. 672,847
Int. Cl.² C07C 1/24
U.S. Cl. 260—682 6 Claims

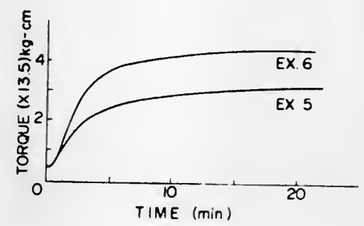
1. Process for conversion of methanol, dimethyl ether, or a mixture of methanol and dimethyl ether, comprising contacting said methanol, dimethyl ether or a mixture of methanol and dimethyl ether with a catalyst at a temperature of from about 200° to about 400° C. to convert said methanol, dimethyl ether or mixture of methanol and dimethyl ether to a higher hydrocarbon having two or more carbon atoms, said catalyst comprising partially hydrated aluminum sulfate.

4,072,734

CURED OR UNCURED COMPOSITIONS OF HOMOPOLYMERS AND COPOLYMERS OF EPIHALOHYDRINS

Tetsuya Nakata, Ibaragi; Nobuo Yamada, Amagasaki; Akira Hashimoto, Itami; Yasuto Takata, and Yukinari Bunnomori, both of Amagasaki, all of Japan, assignors to Osaka Soda Co. Ltd., Osaka, Japan

Filed Sept. 12, 1975, Ser. No. 612,759
Claims priority, application Japan, Aug. 6, 1975, 50-96203
Int. Cl.² C08G 65/32
U.S. Cl. 260—873 21 Claims



1. In a cured or uncured composition consisting essentially of:

I. a polymer which is

A. an epihalohydrin homopolymer, or

B. an epihalohydrin copolymer consisting essentially of:

1. at least 5 mol% of an epihalohydrin monomer; and

2. the remainder being at least one monomer selected from the group consisting of an epihalohydrin other than (1), copolymerizable epoxides other than epihalohydrin, and 5-membered dicarboxylic acid anhydrides;

II. a second polymer blended with polymer I present in 0% to 50% by weight, based on the weight of polymer I, and being selected from at least one member of the group consisting of polychloroprene, polyvinyl chloride, chlorinated polyethylene and acrylic ester-chloroethylvinyl ether copolymer; and

III. a curing amount of a 1,8-diazabicyclo(5,4,0(undecene-7 containing curing agent and a metal compound acid acceptor;

the improvement wherein component III comprises, on a basis of 100 parts by weight, of polymer I:

A. a curing agent consisting of a curing agent which is free from cyclic carboxylic acid anhydride and which is a member selected from the group consisting of

1. from about 1 to 200 parts by weight of an acid salt of (i) 1 mole of polycarboxylic acid with (ii) 1 mole of 1,8-diazabicyclo(5,4,0)undecene-7;

2. 1 to 10 parts by weight of a cyanuric acid salt of 1,8-diazabicyclo(5,4,0)undecene-7; and

3. a mixture of (i) 1 to 200 parts by weight of a polybasic carboxylic acid and (ii) 1 to 10 parts by weight of a neutral salt of 1,8-diazabicyclo(5,4,0)undecene-7; and

B. an acid acceptor comprising from about 1 to 20 parts by weight of at least one metal compound selected from the group consisting of: the oxide, hydroxide, carbonate, silicate, phosphate and carboxylic acid salt of a metal of Group II of the Periodic Table of elements; or the oxide, basic carbonate, basic carboxylic acid salt and basic phosphite of a metal of Group IV-A of the Periodic Table of elements.

4,072,735

HOT MELT PRESSURE SENSITIVE ADHESIVES

Loyce A. Ardemagni, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 3, 1976, Ser. No. 692,404
Int. Cl.² C08L 23/16
U.S. Cl. 260—897 A 9 Claims

1. An adhesive composition capable of being used as a hot melt pressure sensitive adhesive comprising a blend of

1. 5 to 15 weight percent ethylene-propylene rubber,

2. 30 to 60 weight percent of at least one tackifying resin selected from the group consisting of hydrocarbon tackifier resins, polyterpene resins, and rosin esters, and

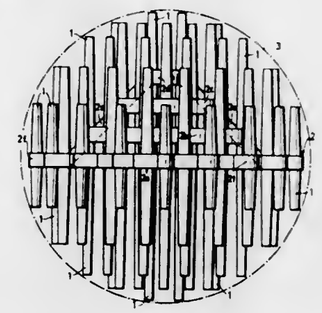
3. 20 to 50 weight percent polybutylene.

4,072,736

PACKING MATERIAL

Volker Fattinger, Ariesheim, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 563,909, March 31, 1975, abandoned. This application Oct. 15, 1976, Ser. No. 732,639
Claims priority, application Switzerland, Apr. 5, 1974, 4844/74
Int. Cl.² B01F 3/04
U.S. Cl. 261—97 4 Claims



1. A packing material unit for positioning in bulk or random relationship within a liquid-gas contact apparatus in order to enlarge the contacting surface of a liquid and a gas flowing through said apparatus, said unit comprising a carrier consisting of rings of staggered diameter which are arranged parallel to each other and spaced apart coaxially, and a plurality of rods positioned on said rings extending from two opposite sides of said carrier and arranged substantially parallel to each other and at least approximately evenly distributed over the whole surface of a cross sectional area perpendicular to said rods, said cross sectional area being of substantially circular or elliptical shape, the length of said rods decreasing from the center of said cross sectional area towards the periphery thereof in such a manner that the unit is substantially spherical or spheroidal.

4,072,737

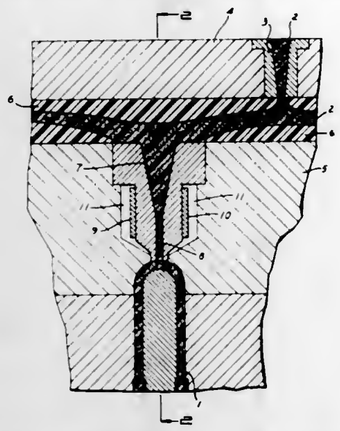
METHOD FOR PRODUCTION OF HOLLOW ARTICLES FROM INJECTION MOLDED PREFORMS USING INSULATED RUNNER SYSTEM

William D. Wolf, Simsbury, Conn., assignor to Monsanto Company, St. Louis, Mo.

Filed Feb. 27, 1976, Ser. No. 662,141
Int. Cl.² B29C 17/07
U.S. Cl. 264—97 10 Claims

1. In the method for the production of hollow articles by thermoforming tubular, elongated reheated injection molded preforms made of thermoplastic material the improvement comprising injection molding said preforms using a mold distribution system having an insulated runner with walls approaching the glass transition temperature of the thermoplastic

material, said runner connecting an inlet sprue with one or more externally heated orifice gate channels, the thermoplastic



material in such channels being above its glass transition temperature.

4,072,738

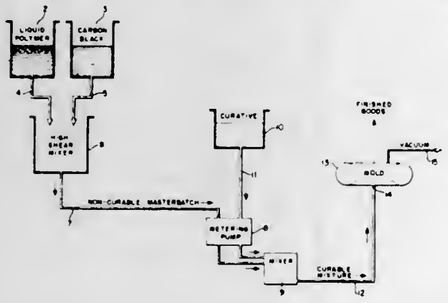
METHOD OF FORMING SHAPED ARTICLES

Robert M. Pierson, Hudson, and John A. Lovell, Munroe Falls, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 198,762, Nov. 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 722,918, April 22, 1968, abandoned. This application Feb. 12, 1975, Ser. No. 549,421

Int. Cl.[2] B29C *5/00;* B29G *3/00*

U.S. Cl. 264—102 6 Claims



1. In a method of forming a shaped article comprising mixing a liquid polymer containing functional end groups with a suitable compounding agent that yields a mixture capable of Newtonion flow at the mixing temperature and moving the mixture under a pressure differential of 10 to 3000 pounds per square inch to a shaper and curing, the improvement wherein the mixture is subjected to mixing in a vacuum in a high shear mixer to convert the mixture from a Newtonion to a non-Newtonion mixture at the mixing temperature, mixing a curative in the non-Newtonion mixture and moving the mixture to shaper at a viscosity at the mixing temperature expressed as 100,000 to 750,000 poises at 60° C.

4,072,739

PROCESS FOR THE REMOVAL OF URANIUM CONTAINED IN HOMO- AND CO-POLYMERS OF MONO- AND DIOLEFINES

Alessandro Béranger; Agostino Balducci, and Silvano Gordini, all of San Donato Milanese, Italy, assignors to Snamprogetti, S.p.A., Milan, Italy

Filed Aug. 1, 1975, Ser. No. 601,205

Claims priority, application Italy, Aug. 2, 1974, 25940/74

Int. Cl.[2] B01D *11/04*

U.S. Cl. 423—8 5 Claims

1. The process of removing the uranium contained in a hydrocarbon solution of polybutadiene prepared in the presence of a catalyst system including tetrallyl uranium or tetramethoxyl uranium, a reducing compound of a metal belonging to the 2nd or 3rd groups of the Periodic System and a Lewis acid, in a hydrocarbon solvent, which comprises thoroughly mixing said hydrocarbon solution with an aqueous solution of ammonium carbonate at a concentration of from 1 to about 5%, and then separating said mixture into an organic phase and an aqueous phase containing all the uranium removed from said butadiene.

4,072,740

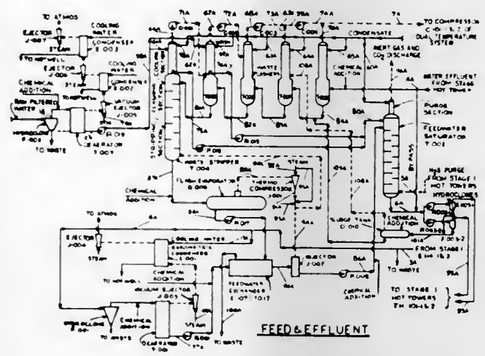
PROCESS FEED AND EFFLUENT TREATMENT SYSTEMS

Jerome S. Spevack, New Rochelle, N.Y., assignor to Deuterium Corporation, White Plains, N.Y.

Division of Ser. No. 489,449, July 17, 1974, Pat. No. 3,984,518, which is a continuation of Ser. No. 126,498, March 22, 1971, abandoned. This application Feb. 13, 1976, Ser. No. 658,058

Int. Cl.[2] C01B *17/16, 5/02*

U.S. Cl. 423—563 5 Claims



1. An improved process for treatment of the liquid water feed and effluent of a gas and liquid contact system, in which system a flow of gas consisting essentially of hydrogen sulfide previously saturated with water vapor and a flow of liquid consisting essentially of water previously saturated with hydrogen sulfide are contacted with each other at elevated temperature and pressure, and from which system a purge stream of said gas is discharged, said water feed contains dissolved minerals of heavy metal capable of conversion to insoluble sulfides and being essentially free of hydrogen sulfide, which treatment process comprises:

(a) treating said water feed prior to its introduction into said system by

(1) heating the water feed by transferring heat thereto from said effluent,

(2) reacting hydrogen sulfide with said dissolved minerals to precipitate insoluble sulfides therefrom,

(3) dissolving hydrogen sulfide in the so heated water feed to an amount essentially corresponding to saturation at said elevated temperature and pressure by countercurrent contact of said heated water feed with said purge stream essentially at said elevated pressure, and

(4) seperating said insoluble sulfides from said water feed,

(b) introducing the so treated water feed into said gas and liquid contact system,

(c) treating said precipitated solid sulfides chemically to form hydrogen sulfide therefrom, and

(d) separately removing and returning to said contact system hydrogen sulfide gas formed in step (c).

4,072,741

METHOD OF CONTROLLING THE GROWTH OF BACTERIA AND FUNGI USING N-HYDROXYMETHYLALKYLENE DIAMINES

Jerry Hoyt Hunsucker, Terre Haute, Ind., assignor to IMC Chemical Group, Inc., Terre Haute, Ind.

Filed Dec. 17, 1976, Ser. No. 752,213

Int. Cl.[2] A01N *9/20*

U.S. Cl. 424—325 5 Claims

1. A method of controlling the growth of bacteria and fungi comprising applying to them or to the environment inhabited by them a growth-inhibiting amount of an N-hydroxymethylalkylene diamine, the alkylene group having from 2 to 4 carbon atoms, or a mixture thereof.

4,072,742

ALUMINUM DERIVATIVES OF 2-PYRIDYL THIOL N-OXIDE, PROCESS FOR PREPARING THE SAME AND ANTIPERSPIRANT-DEODORANT COMPOSITION CONTAINING THE SAME

Claude Bouillon, Eaubonne, and Georges Rosenbaum, Asnieres, both of France, assignors to L'Oreal, Paris, France

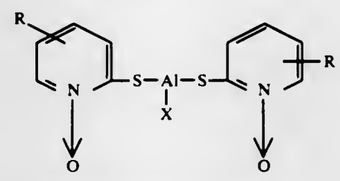
Division of Ser. No. 294,072, Oct. 2, 1972, Pat. No. 3,953,450. This application Nov. 26, 1975, Ser. No. 635,441

Claims priority, application Luxembourg, May 12, 1972, 65350

Int. Cl.[2] A61K *31/555, 7/38;* C07D *213/89*

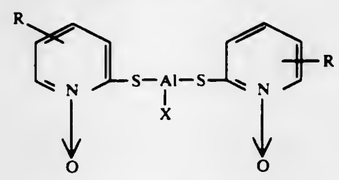
U.S. Cl. 424—47 17 Claims

1. An antiperspirant-deodorant composition comprising in a cosmetic carrier as the active compound to inhibit perspiration and the formation of body odor, an effective amount of a compound having the formula



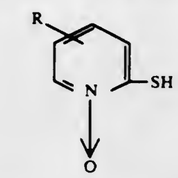
wherein X is selected from the group consisting of chlorine, bromine and R_1SO_3 wherein R_1 is selected from the group consisting of alkyl having from 1 to 4 carbon atoms, phenyl, p-chlorophenyl, p-hydroxyphenyl and 2-oxo 10-bornanyl, and R represents a member selected from the group consisting of chlorine, methyl and methoxy.

14. A compound of the formula



wherein X is R_1SO_3 wherein R_1 represents a member selected from the group consisting of alkyl having from 1 to 4 carbon atoms, phenyl, p-methylphenyl, p-chlorophenyl, p-hydroxyphenyl and 2-oxo 10-bornanyl radical and R represents a member selected from the group consisting of chlorine, methyl and methoxy.

16. A process for preparing a compound of claim 14 comprising reacting in an anhydrous solvent selected from the group consisting of methanol, ethanol, isopropanol, tertiobutyl alcohol, benzene, toluene, chloroform and dichlorethane, a 2-pyridine thiol N-oxide of the formula



wherein R represents a member selected from the group consisting of hydrogen, chlorine, methyl and methoxy, with aluminum isopropylate and reacting the resulting reaction product with sulfonic acid having the formula R_1SO_3H wherein R_1 represents a member selected from the group consisting of alkyl having 1-4 carbon atoms, phenyl, p-methylphenyl, p-chlorophenyl, p-hydroxyphenyl and 2-oxo 10-bornanyl.

4,072,743

N^2-ARYLSULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Shosuke Okamoto, 15-1i, Asahigaoka 3-chome, Tarumi, Kobe, Hyogo, Japan; Akiko Hijikata, Kobe, Japan; Ryoji Kikumoto, Machida, Japan; Yoshikuni Tamao, Yokohama, Japan; Kazuo Ohkubo, Machida, Japan; Tohru Tezuka, Yokohama, Japan, and Shinji Tonomura, Tokyo, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo and Shosuke Okamoto, both of, Japan

Continuation-in-part of Ser. No. 669,743, March 24, 1976, which is a continuation-in-part of Ser. No. 671,568, March 29, 1976, which is a continuation-in-part of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,744

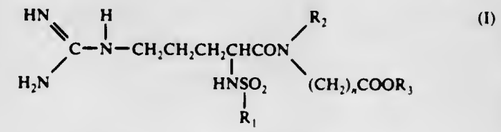
Claims priority, application Japan, Nov. 8, 1974, 49-128774; Nov. 8, 1974, 49-128775; Nov. 29, 1974, 49-136695; Nov. 29, 1974, 49-136697; Feb. 25, 1975, 50-023268; Feb. 26, 1975, 50-023635

The portion of the term of this patent subsequent to Jan. 24, 1995, has been disclaimed.

Int. Cl.[2] A61K *37/00;* C07C *103/52*

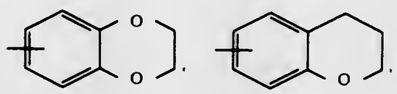
U.S. Cl. 424—177 12 Claims

1. N^2-arylsulfonyl-L-argininamides having the formula (I):

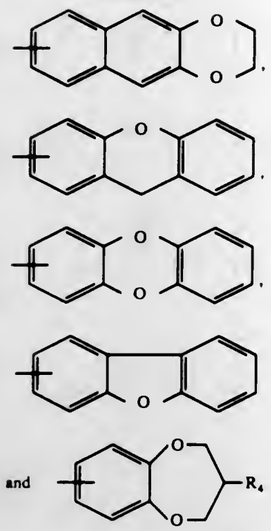


(I)

and the pharmaceutically acceptable salts thereof, wherein R_1 is selected from the group consisting of naphthyl, 5,6,7,8-tetrahydronaphthyl, naphthyl substituted with at least one substituent selected from the group consisting of halo, nitro, cyano, hydroxy, C_1-C_{10} alkyl and C_2-C_{20} dialkylamino, phenyl, phenyl substituted with at least one substituent selected from the group consisting of halo, nitro, cyano, hydroxy, C_1-C_{10} alkyl, C_1-C_{10} alkoxy and C_2-C_{20} dialkylamino, C_7-C_{12} aralkyl,



-continued



wherein R_4 is hydrogen, C_1-C_{10} alkyl or C_1-C_{10} alkoxy; R_2 is selected from the group consisting of C_2-C_{10} alkyl, C_3-C_{10} alkenyl, C_3-C_{10} alkynyl, C_2-C_{10} alkoxyalkyl, C_2-C_{10} alkylthioalkyl, C_2-C_{10} alkylsulfinylalkyl, C_1-C_{10} hydroxyalkyl, C_2-C_{10} carboxyalkyl, C_3-C_{10} alkoxycarbonylalkyl, C_1-C_{10} haloalkyl, C_7-C_{15} aralkyl, C_8-C_{15} α-carboxyaralkyl, C_3-C_{10} cycloalkyl and C_4-C_{10} cycloalkylalkyl; R_3 is hydrogen; and n is an integer of 1, 2 or 3.

4,072,744

N^2-NAPHTHALENESULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Shosuke Okamoto, 15-1i, Asahigaoka 3-chome, Tarumi, Kobe, Hyogo, Japan; Akiko Hijikata, Kobe, Japan; Ryoji Kikumoto, Machida, Japan; Yoshikuno Tamao, Yokohama, Japan; Kazuo Ohkubo, Machida, Japan; Tohru Tezuka, Yokohama, Japan, and Shinji Tonomura, Tokyo, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo and Shosuke Okamoto, both of, Japan

Continuation-in-part of Ser. No. 669,743, March 24, 1976, which is a continuation-in-part of Ser. No. 671,568, March 29, 1976, which is a continuation-in-part of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,585

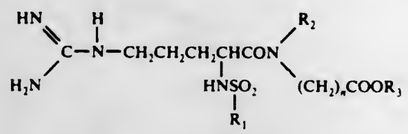
Claims priority, application Japan, Nov. 8, 1974, 49-128774; Nov. 8, 1974, 49-128775; Nov. 29, 1974, 49-136695; Nov. 29, 1974, 49-136697; Feb. 25, 1975, 50-023268; Feb. 26, 1975, 50-023635; Mar. 5, 1975, 50-026768; Mar. 11, 1975, 50-029357; Mar. 11, 1975, 50-029358

The portion of the term of this patent subsequent to Jan. 24, 1995, has been disclaimed.

Int. Cl.² A61K *37/00;* C07C *103/52*

U.S. Cl. 424—177 **11 Claims**

1. N^2-naphthalenesulfonyl-L-arginamides having the formula (I):



(I)

and the pharmaceutically acceptable salts thereof, wherein R_1 is selected from the group consisting of naphthyl, 5,6,7,8-tetrahydronaphthyl and naphthyl substituted with at least one substituent selected from the group consisting of halo, hydroxy, C_1-C_{10} alkyl and C_2-C_{20} dialkylamino; R_2 is selected from the group consisting of C_2-C_{10} alkyl, C_2-C_{10} alkoxyalkyl, C_2-C_{10} alkylthioalkyl, C_7-C_{15} aralkyl, C_3-C_{10} cycloalkyl and C_4-C_{10} cycloalkylalkyl; R_3 is hydrogen; and n is an integer of 1, 2 or 3.

4,072,745

SUBSTITUTED VINYL THIOPHOSPHATE ACTIVATORS

Leland S. Pitt, Greenville, Miss., and George B. Large, Orinda, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

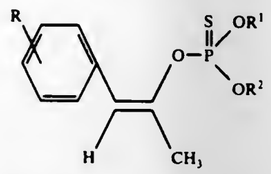
Filed Mar. 11, 1976, Ser. No. 665,987

The portion of the term of this patent subsequent to May 27, 1992, has been disclaimed.

Int. Cl.² A01N *9/36*

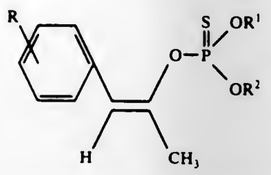
U.S. Cl. 424—200 **32 Claims**

1. A compound having the formula



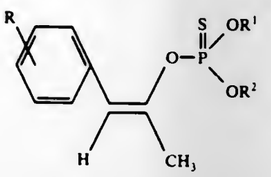
wherein R is selected from the group consisting of chlorine, trifluoromethyl, methoxy, and methylenedioxy; and R^1 and R^2 can be the same or different and are selected from the group consisting of lower alkyl having from 1 to 4 carbon atoms, inclusive.

9. An insecticidally active composition comprising an insecticidally effective amount of an insecticide defined as N-(mercaptomethyl) phthalimide S-(O,O-dimethylphosphorodithioate) and an effective amount of an activator having the formula



wherein R is selected from the group consisting of chlorine, trifluoromethyl, methoxy, and methylenedioxy, and R^1 and R^2 can be the same or different and are selected from the group consisting of lower alkyl having from 1 to 4 carbon atoms, inclusive; said activator being present in an amount ranging between 0.1 and 10 parts by weight per each part by weight insecticide.

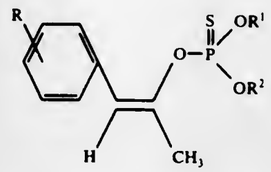
17. A method of controlling insects comprising applying to the habitat thereof an insecticidally effective amount of an insecticidally active composition comprisng an insecticide defined as N-(mercaptomethyl) phthalimide S-(O,O-dimethyl phosphorodithioate) and an effective amount of an activator having the formula



wherein R is selected from the group consisting of chlorine,

trifluoromethyl, methoxy, and methylenedioxy; and R^1 and R^2 can be the same or different and are selected from the group consisting of lower alkyl having from 1 to 4 carbon atoms, inclusive; said activator being present in an amount ranging between 0.1 and 10 parts by weight per each part by weight insecticide.

25. An insecticidally active composition comprising an inert diluent carrier, an insecticidally effective amount of an insecticide defined as N-(mercaptomethyl) phthalimide S-(O,O-dimethylphosphorodithioate) and an effective amount of an activator having the formula



wherein R is selected from the group consisting of chlorine, trifluoromethyl, methoxy, and methylenedioxy; and R^1 and R^2 can be the same or different and are selected from the group consisting of lower alkyl having from 1 to 4 carbon atoms, inclusive; said activator being present in an amount ranging from between 0.1 and 10 parts by weight per each part by weight insecticide.

4,072,746

3-AMINO-5-(PYRIDINYL)-2(1H)-PYRIDINONES

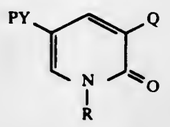
George Y. Lesher, East Greenbush, and Chester J. Opalka, Jr., Schodack, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 621,763, Oct. 14, 1975, Pat. No. 4,004,012. This application July 21, 1976, Ser. No. 707,235

Int. Cl.² A61K *31/44;* C07D *213/56*

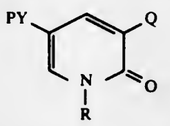
U.S. Cl. 424—263 **21 Claims**

1. A 1-R-3-Q-5-PY-2 (1H)-pyridinone having the formula



where PY is 4- or 3- or 2-pyridinyl or 4- or 3- or 2-pyridinyl having one or two lower-alkyl substituents, R is hydrogen, lower-alkyl or lower-hydroxyalkyl and Q is nitro, amino, lower-alkylamino di-(lower-alkyl)amino, or NHAc where Ac is lower-alkanoyl or lower-carbalkoxy, or pharmaceutically-acceptable acid-addition salt thereof.

16. The method for increasing cardiac contractility in a patient requiring such treatment which comprises administering orally or parenterally in a solid or liquid dosage form to such patient an effective amount of a cardiotonic 1-R-3-Q-5-PY-2 (1H)-pyridinone having the formula



where PY is 4- or 3- or 2-pyridinyl or 4- or 3- or 2-pyridinyl having one or two lower-alkyl substituents, R is hydrogen, lower-alkyl or lower-hydroxyalkyl and Q is amino, lower-alkylamino, di-(lower-alkyl) amino or NHAc where Ac is lower-alkanoyl or lower-carbalkoxy, or pharmaceutically acceptable acid-addition salt thereof.

4,072,747

DERIVATIVES OF 1,2-DIPHENYL-3,5-DIOXO-4-N-BUTYL-PYRAZOLIDINE AND PROCESS FOR MAKING SAME

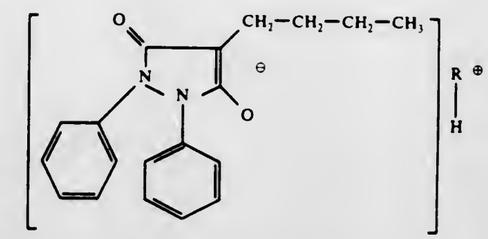
David J. Roberts, and Jacinto Moragues Mauri, both of Barcelona, Spain, assignors to Antonio Gallardo, S.A., Barcelona, Spain

Division of Ser. No. 448,748, March 6, 1974, Pat. No. 3,994,910. This application Sept. 10, 1976, Ser. No. 721,943

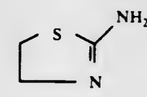
Int. Cl.² A61K *31/425, 31/415;* C07D *277/40, 231/34*

U.S. Cl. 424—270 **24 Claims**

1. A pharmaceutical composition having anti-inflammatory activity in humans as well as in other animals, said composition comprising a therapeutic compound having the formula:

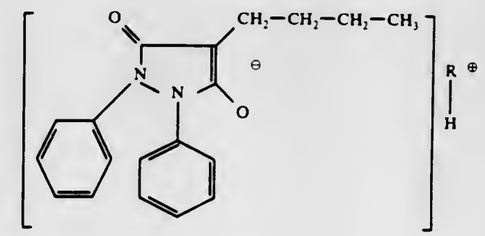


in which R is 2-amino-2-thiazoline having the formula:

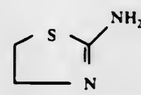


together with a non-toxic pharmaceutically acceptable carrier or diluent therefor, said therapeutic compound present in sufficient amount to exhibit said activity.

7. A pharmaceutical composition having analgesic activity in humans as well as in other animals, said composition comprising a therapeutic compound having the formula:

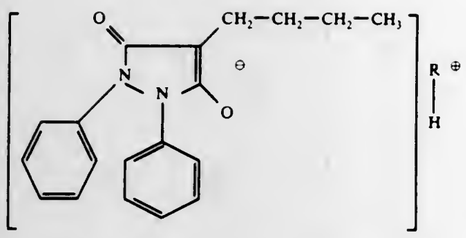


in which R is 2-amino-2-thiazoline having the formula:

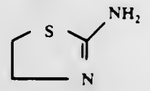


together with a non-toxic pharmaceutically acceptable carrier or diluent therefor, said therapeutic compound present in sufficient amount to exhibit said activity.

13. A pharmaceutical composition having anti-pyretic activity in humans as well as in other animals, said composition comprising a therapeutic compound having the formula:

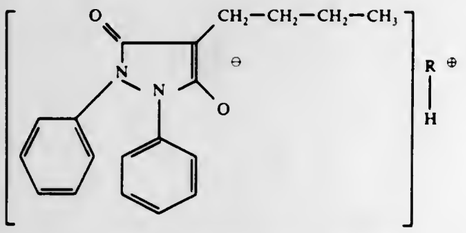


in which R is 2-amino-2-thiazoline having the formula:

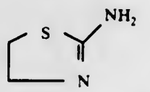


together with a non-toxic pharmaceutically acceptable carrier or diluent therefor, said therapeutic compound present in sufficient amount to exhibit said activity.

19. A pharmaceutical composition for treating rheumatic diseases in humans as well as in other animals, said composition comprising a therapeutic compound having the formula:



in which R is 2-amino-2-thiazoline having the formula:



together with a non-toxic pharmaceutically acceptable carrier or diluent therefor, said therapeutic compound present in an effective amount for carrying out said treatment.

4,072,748

CERTAIN GUANIDINE COMPOUNDS, AND THEIR USE AS INHIBITORS OF HISTAMINE ACTIVITY

Graham John Durant, Welwyn Garden City; John Colin Emmett, Codicote, and Charon Robin Ganellin, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

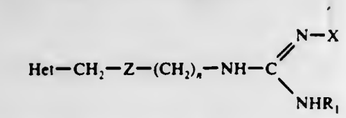
Division of Ser. No. 560,909, March 21, 1975, Pat. No. 4,000,296, which is a division of Ser. No. 384,992, Aug. 2, 1973, abandoned. This application Sept. 24, 1976, Ser. No. 726,331

Claims priority, application United Kingdom, Sept. 5, 1972, 41161/72

Int. Cl.[2] **C07D** *263/32, 275/02, 285/12;* **A61K** *31/425*

U.S. Cl. 424—270 **8 Claims**

1. A compound of the formula:



wherein R_1 is hydrogen or lower alkyl; Het is thiazol-2-yl, isothiazol-3-yl or 5-amino-1,3,4-thiadiazol-2-yl, Z is sulphur, oxygen, NH or a methylene group; *n* is 2 or 3; X is COR_3, CSR_3, SO_2R_4 or when Z is methylene, nitro; R_3 is lower alkyl, lower alkoxy, or amino; R_4 is lower alkyl, trifluoromethyl, amino or phenyl optionally substituted by halogen, lower alkyl or amino; or a pharmaceutically acceptable acid addition salt thereof.

7. A pharmaceutical composition to inhibit H-2 histamine receptors comprising, in an effective amount to inhibit said receptors, a compound according to claim **1** and a non-toxic pharmaceutically acceptable diluent or carrier.

8. A method of inhibiting H-2 histamine receptors which comprises administering to an animal in need thereof, in an effective amount to inhibit said receptors, a compound of claim **1**.

4,072,749

USE OF IPRONIDAZOLE IN COMBATTING CLOSTRIDIAL INFECTIONS

Gian Paolo Maestrone, Staten Island, N.Y., and Milan Mitrovic, Nutley, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed June 1, 1976, Ser. No. 691,793

Int. Cl.[2] **A61K** *31/415*

U.S. Cl. 424—273 R **8 Claims**

1. A method for the treatment of clostridial infections in ruminants which comprises orally administering to animals afflicted therewith feed or drinking water containing from about 0.005% by weight to about 0.03% by weight of a substance selected from the group consisting of ipronidazole and pharmaceutically acceptable acid addition salts thereof.

4,072,750

1,3,5-TRITHIANE AND 1,3,5-OXADITHIANE CARBAMOYLOXIME COMPOUNDS AND INSECTICIDAL AND MITICIDAL COMPOSITIONS AND METHODS EMPLOYING THEM

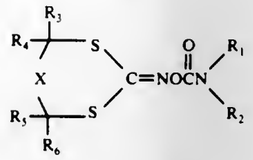
Themistocles D. J. D'Silva, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed June 1, 1976, Ser. No. 691,396

Int. Cl.[2] **C07D** *341/00, 327/00;* **A61K** *31/39, 31/385*

U.S. Cl. 424—276 **44 Claims**

1. A compound of the formula:



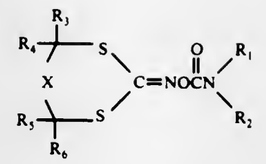
wherein:

R_1 and R_2 are individually hydrogen, alkyl, cycloalkyl or substituted alkyl or cycloalkyl wherein the permissible substituents are one or more fluoro, chloro, bromo, cyano, nitro or alkoxy substituents;

R_3, R_4, R_5 and R_6 are individually hydrogen or alkyl;

X is oxygen, sulfur, sulfinyl or sulfonyl; with the proviso that R_1, R_2, R_3, R_4, R_5 and R_6 substituents may not individually include more than 6 carbons.

16. An insecticidal and miticidal composition comprising an acceptable carrier and an insecticidally or miticidally effective amount of a compound of the formula:



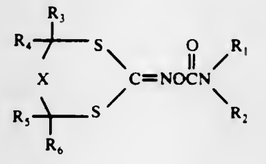
wherein:

R_1 and R_2 are individually hydrogen, alkyl, cycloalkyl or substituted alkyl or cycloalkyl wherein the permissible substitutents are one or more chloro, fluoro, bromo, nitro, cyano or alkoxy substitutents;

R_3, R_4, R_5 and R_6 are individually hydrogen or alkyl;

X is oxygen, sulfur, sulfinyl or sulfonyl; with the proviso that R_1, R_2, R_3, R_4, R_5 and R_6 substituents may not individually include more than six carbons.

30. A method of controlling insects and mites which comprises subjecting them to an insecticidally or miticidally effective amount of a compound of the formula:



wherein:

R_1 and R_2 are individually hydrogen, alkyl, cycloalkyl or substituted alkyl or cycloalkyl wherein the permissible substituents are one or more chloro, bromo, fluoro, cyano, nitro or alkoxy substituents;

R_3, R_4, R_5 and R_6 are individually hydrogen or alkyl;

X is oxygen, sulfur, sulfinyl or sulfonyl;

with the proviso that R_1, R_2, R_3, R_4, R_5 and R_6 substituents may not individually include more than six carbons.

4,072,751

PESTICIDAL N-SUBSTITUTED BIS-CARBAMOYL SULFIDE COMPOUNDS

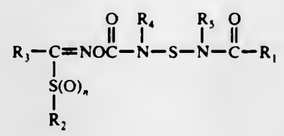
Themistocles Damasceno Joaquim D'Silva, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Sept. 29, 1976, Ser. No. 727,987

Int. Cl.[2] **A01N** *9/00;* **C07C** *119/18*

U.S. Cl. 424—298 **21 Claims**

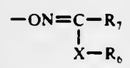
1. A compound of the formula:



wherein:

n is 1 or 2;

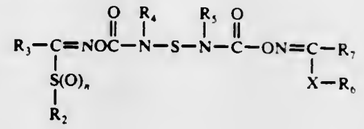
R_1 is fluorine or



X is sulfur, sulfinyl or sulfonyl;

R_2, R_3, R_4, R_5, R_6 and R_7 are individually alkyl having from 1 to 8 carbon atoms.

10. An insecticidally, nematocidally and miticidally active composition comprising an acceptable carrier and an insecticidally, nematocidally or miticidally effective amount of a compound of the formula:



wherein:

n is 1 or 2;

X is sulfur, sulfinyl or sulfonyl;

R_2, R_3, Rhd **4**, R_5, R_6 and R_7 are individually alkyl having from 1 to 8 carbon atoms.

4,072,752

PESTICIDAL BENZASPIRO CARBOXYLATES

Saleem Farooq, Aesch; Jozef Drabek, Allschwil; Laurenz Gsell, Fullinsdorf; Friedrich Karrer, Zofingen, and Willy Meyer, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

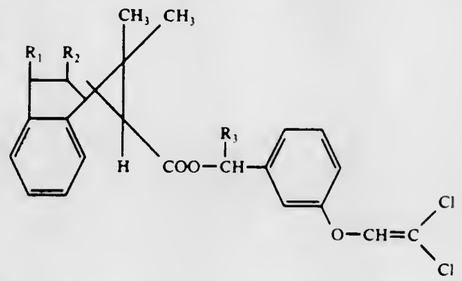
Filed Sept. 17, 1976, Ser. No. 724,141

Claims priority, application Switzerland, Sept. 26, 1975, 12566/75; July 29, 1976, 9736/76; Apr. 29, 1976, 5388/76

Int. Cl.[2] **A01N** *9/20, 9/24;* **C07C** *121/66, 69/76*

U.S. Cl. 424—304 **6 Claims**

1. A compound of the formula



wherein each of R_1 and R_2 represents a hydrogen atom or together represent a carbon to carbon bond, and R_3 represents a hydrogen atom or a cyano group.

6. A method for combatting insects and acarids comprising applying to the locus thereof an insecticidally and acaricidally effective amount of a compound according to claim **1**.

4,072,753

PHARMACEUTICAL METHOD FOR THE THERAPY OF IMMUNE DISEASES

Hamao Umezawa; Tomio Takeuchi, both of Tokyo; Akira Takamatsu, Yokohama, and Shunro Mori, Fujisawa, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Japan

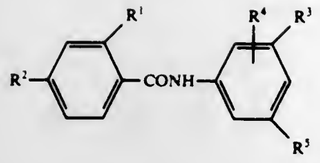
Division of Ser. No. 660,731, Feb. 24, 1976, Pat. No. 4,032,635. This application Feb. 17, 1977, Ser. No. 769,481

Claims priority, application Japan, June 12, 1975, 50-71629

Int. Cl.[2] **A61K** *31/235, 31/24, 31/245*

U.S. Cl. 424—308 **12 Claims**

1. The method for chemotherapeutically treating immune diseases and disorders which comprises administering to a living animal a pharmaceutical composition to suppress the immune response comprising an effective amount of a suppressing compound of the formula



wherein

R^1 is —O—CO—Y with Y being a lower alkyl or phenyl group;

R^2 is hydrogen, chlorine, fluorine, trifluoromethyl or lower alkyl;

R^3 and R^5 are hydrogen, fluorine, bromine, chlorine, nitro, or lower alkyl; and

R^4 is substituted at either the 2' or 4' position and is —O—CO—Y, Y meaning the same as noted above and lower alkyl as used herein is a straight or branched chain saturated hydrocarbon with 1 to 4 carbon atoms in combination with a pharmaceutically acceptable nontoxic carrier.

4,072,754

HYDRATROPIC ACID DERIVATIVES AND PROCESS FOR THE PRODUCTION THEREOF

Erich Schacht; Werner Mehrhof; Zdenek Simane; Herbert Nowak, and Detlev Kayser, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

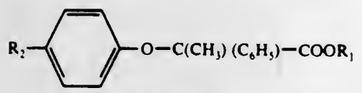
Filed Nov. 25, 1974, Ser. No. 527,089

Claims priority, application Germany, Nov. 26, 1973, 235878

Int. Cl.[2] C07C *65/14, 69/76;* A61K *31/19, 31/235*

U.S. Cl. 424—308 **15 Claims**

1. A hydratropic acid derivative of the formula



wherein R_1 is H, alkyl of 1–4 carbon atoms, 2-acetamidoethyl, or 2,3-dihydroxypropyl, and R_2 is Hal, phenyl, 4-Hal-phenyl, 4-Hal-phenoxy, 4-Hal-phenoxymethyl, 1,2,3,4-tetrahydro-1-naphthyl, Hal being F, Cl, or Br, or a physiologically acceptable salt thereof with an acid or base.

14. A method of lowering from an abnormally high level at least one of cholesterol and triglyceride serum levels which comprises administering systemically to a patient with such abnormally high level an amount of a compound of claim 1 effective to lower substantially said level.

15. A pharmaceutical composition effective for lowering from an abnormally high level at least one of cholesterol and triglyceride serum levels comprising an amount of a compound of claim 1 per unit dosage effective to lower an abnormally high cholesterol or triglyceride serum level, in admixture with a pharmaceutically acceptable carrier.

4,072,755

NOVEL CYCLOPENTANOIC ACID DERIVATIVES

Jean Buendia, Nogent sur Marne; Michel Vivat, Lagny-sur-Marne, and Jeanine Schalbar, Suresnes, all of France, assignors to Roussel UCLAF, Paris, France

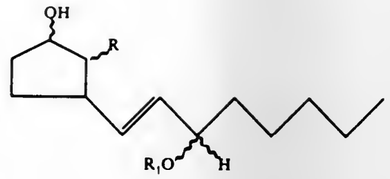
Filed Aug. 24, 1976, Ser. No. 717,049

Claims priority, application France, Aug. 29, 1975, 75 26617

Int. Cl.[2] A01N *9/24;* C09F *5/00*

U.S. Cl. 424—312 **15 Claims**

1. A compound of the formula



wherein R is



R' is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms and a non-toxic, pharmaceutically acceptable cation and R_1 is selected from the group consisting of branched or straight chain, saturated or unsaturated alkyl of 1 to 4 carbon atoms and



and R_2 is selected from the group consisting of straight or branched chain alkyl of 1 to 12 carbon atoms and phenyl with the alkyl and phenyl being optionally substituted with —COOA wherein A is selected from the group consisting of hydrogen, alkali metal, ammonium ion, ion of an organic amine, alkyl and haloalkyl of 1 to 7 alkyl carbon atoms and the OH and R groups on the ring and OR_1 group on the chain may be in either of the two possible positions about the carbon atom to which they are attached.

9. A method of relieving pain and inflammation in warm-blooded animals comprising administering to warm-blooded animals an effective amount of at least one compound of claim 1.

11. The method of claim 9 wherein the compound is ethyl (1RS, 2RS, 5RS, 3'SR) (1'E) 2-hydroxy-5-(3'-decanoyloxy-1'-octenyl)-cyclopentanecarboxylate.

4,072,756

TRICYCLO PIPERIDINO KETONES AND SOPORIFIC COMPOSITIONS THEREOF

Anton Ebnöther, Arlesheim; Jean-Michel Bastian, Therwil; Fulvio Gadient, and André Stoll, both of Birsfelden, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

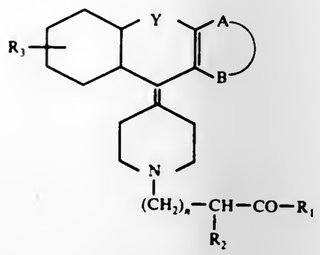
Continuation-in-part of Ser. No. 468,374, May 9, 1974, abandoned. This application May 13, 1976, Ser. No. 686,132

Claims priority, application Switzerland, May 17, 1973, 7048/73; May 17, 1973, 7051/73; May 17, 1973, 7053/73; May 17, 1973, 7054/73; May 17, 1973, 7055/73; May 17, 1973, 7056/73; May 17, 1973, 7057/73

Int. Cl.[2] C07D *495/04, 493/00, 495/00*

U.S. Cl. 424—267 **29 Claims**

1. A compound of the formula,



wherein

n is 1, 2 or 3,

R_1 is lower alkyl,

R_2 is hydrogen or lower alkyl,

R_3 is hydrogen, chlorine, bromine, fluorine, trifluoromethyl, lower alkyl, lower alkoxy or lower alkylthio,

A and B together with the double bond form a benzene ring, or a benzene ring substituted by chlorine, bromine, fluorine, trifluoromethyl, lower alkyl, lower alkoxy or lower alkylthio, or

A is sulphur and

A and B together with the double bond form a thiophene ring, or a thiophene ring substituted in the α position to the sulphur by chlorine, bromine or lower alkyl, and

Y is ethylene or vinylene, when A and B together with the double bond form a benzene ring, or a benzene ring substituted by chlorine, bromine, fluorine, trifluoromethyl, lower alkyl, lower alkoxy or lower alkylthio, or when A is sulphur and A and B together with the double bond form a thiophene ring, or a thiophene ring substituted in the α position to the sulphur by chlorine, bromine or lower alkyl, or

Y is oxygen, methyleneoxy, methylenethio or a group

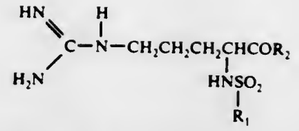


wherein R_4 and R_5 are independently lower alkyl, when A and B together with the double bond form a benzene ring, or a benzene ring substituted by chlorine, bromine, fluorine, trifluoromethyl, lower alkyl, lower alkoxy or lower alkylthio, or

Y is sulphur, when A is sulphur and A and B together with the double bond form a thiophene ring,

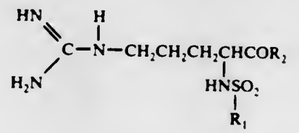
or a pharmaceutically acceptable acid addition salt thereof.

3. A method of promoting sleep in animals which comprises administering to an animal in need of such treatment a therapeutically effective amount of a compound of claim 1.



and the pharmaceutically acceptable salts thereof, wherein R_1 is naphthyl substituted with at least one C_1–C_5 alkoxy; R_2 is piperidino substituted with $—COOR_3$ wherein R_3 is selected from the group consisting of hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–C_{12} aralkyl and 5-indanyl, said substituted piperidino being optionally substituted with one or more substituents which, alike or different, are selected from the group consisting of C_1–C_{10} alkyl, C_1–C_{10} alkoxy, phenyl, alkoxycarbonyl or carboxy; and the $—COOR_3$ radical is at the 2 or 3-position of the piperidine radical.

4. A method for inhibiting activity and suppressing activation of thrombin in vivo, which comprises introducing into a mammal a pharmaceutically effective amount of an N^2-alkoxynaphthylsulfonyl-L-argininamide having the formula:



or the pharmaceutically acceptable salt thereof, wherein R_1 is naphthyl substituted with at least one C_1–C_5 alkoxy; R_2 is piperidino substituted with $—COOR_3$ wherein R_3 is selected from the group consisting of hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–C_{12} aralkyl and 5-indanyl, said substituted piperidino being optionally substituted with one or more substituents, which, alike or different, are selected from the group consisting of C_1–C_{10} alkyl, C_1–C_{10} alkoxy, phenyl, alkoxycarbonyl or carboxy; and the $—COOR_3$ radical is at the 2 or 3-position of the piperidino radical.

4,072,757

N^2ALKOXYNAPHTHYLSULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Shosuke Okamoto, 15-1i, Asahigaoka 3-chome, Tarumi, Kobe, Hyogo, Japan; Akiko Hijikata, Kobe, Japan; Ryoji Kikumoto, Machida, Japan; Yoshikuni Tamao, Yokohama, Japan; Kazuo Ohkubo, Machida, Japan; Tohru Tezuka, Yokohama, Japan, and Shinji Tonomura, Tokyo, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo and Shosuke Okamoto, both of, Japan

Continuation-in-part of Ser. No. 653,217, Jan. 28, 1976, which is a continuation-in-part of Ser. No. 671,436, March 29, 1976, which is a continuation-in-part of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,587

Claims priority, application Japan, Nov. 8, 1974, 49-128774; Nov. 8, 1974, 49-128775; Nov. 29, 1974, 49-136695; Nov. 29, 1974, 49-136697; Feb. 25, 1975, 50-023268; Feb. 26, 1975, 50-023635; Mar. 5, 1975, 50-026768; Mar. 11, 1975, 50-029357; Mar. 11, 1975, 50-029358

The portion of the term of this patent subsequent to Feb. 1, 1994, has been disclaimed.

Int. Cl.[2] A61K *31/445;* C07D *211/60*

U.S. Cl. 424—267 **4 Claims**

1. N^2-alkoxynaphthylsulfonyl-L-argininamides having the formula:

4,072,758

COMPOSITIONS AND METHODS FOR EFFECTING GLUCOREDUCTION

Antonio Carmelo Marin Moga, Barcelona, Spain, assignor to J. Uriach y Cia, S.A., Spain

Division of Ser. No. 466,412, May 2, 1974, Pat. No. 3,957,866, which is a continuation of Ser. No. 182,187, Sept. 20, 1971, abandoned. This application Feb. 6, 1976, Ser. No. 656,070

Claims priority, application Spain, Sept. 23, 1970, 384463

Int. Cl.[2] A61K *31/18*

U.S. Cl. 424—321 **4 Claims**

1. Method of effecting glucoreduction in a patient requiring the same, which comprises administering to such patient a glucoreduction effective amount of N-[4-beta-(o-anisamide-ethyl)-benzenesulphonyl]-N'-cyclopentylcarbamide or a pharmaceutically acceptable salt thereof.

3. Composition for achieving glucoreduction, comprising a pharmaceutical carrier and a glucoreduction effective amount of N-[4-beta-(o-anisamide-ethyl)-benzenesulphonyl]-N'-cyclopentylcarbamide or a pharmaceutically acceptable salt thereof.

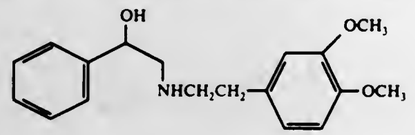
4,072,759

NOVEL BENZYLALCOHOL DERIVATIVES AS ANTIDIABETICS AND CARDIOTONICS

Muneyoshi Ikezaki, Ageo; Nobuo Ito; Yasushi Okazaki; Masao Hoshiyama, all of Tokyo; Taku Nagao, Ageo, and Hiromichi Nakajima, Yono, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Division of Ser. No. 618,355, Oct. 1, 1975, Pat. No. 4,032,575.
This application Nov. 10, 1976, Ser. No. 740,399
Int. Cl.[2] A61K *31/135*
U.S. Cl. 424—330 9 Claims

1. A pharmaceutical composition consisting essentially of an amount of a compound having the following formula:



wherein Ring A is 4-hydroxyphenyl or a pharmaceutically acceptable acid addition salt thereof which is necessary to produce a cardiotonic effect by administration to a warm-blooded animal.

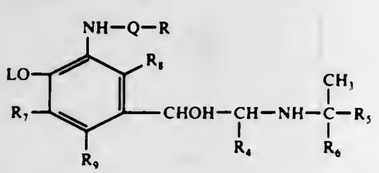
4,072,760

BRONCHOSPASMOLYTIC PHENYLETHANOLAMINES

Kurt Hedegaard, Horsholm, Denmark, assignor to Pharmacia AS, Hillerod, Denmark

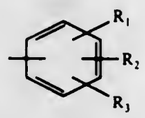
Filed Nov. 17, 1975, Ser. No. 632,211
Claims priority, application United Kingdom, Nov. 20, 1974, 50190/74
Int. Cl.[2] A61K *31/135;* C07C *91/22*
U.S. Cl. 424—330 10 Claims

1. A phenylethanolamine of the formula



I

wherein R is a substituted phenyl group of the formula



wherein R_1, R_2, and R_3 are the same or different and each represent hydrogen, hydroxy, halogen, trifluoromethyl, nitro, lower alkylcarbonyl, lower alkyl, lower alkoxy, hydroxy-lower alkyl, hydroxy-lower alkoxy, lower alkoxy-lower alkoxy, lower alkyl-carbonyl-lower alkoxy, or aryl-lower alkoxy, with the proviso that not all of R_1, R_2, and R_3 are hydrogen, R_4 is hydrogen or lower alkyl, R_5 is hydrogen, lower alkyl, or optionally substituted benzyl, and R_6 is hydrogen or lower alkyl, R_7 is hydrogen, halogen, or lower alkyl, R_8 is hydrogen or lower alkyl, R_9 is hydrogen or lower alkyl, Q is $-CH_2-$, and L is hydrogen and enantiomers and, when more than one asymmetric carbon atom is present, also diastereoisomers, and physiologically acceptable salts thereof.

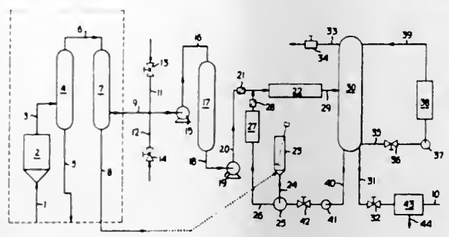
9. A pharmaceutical composition comprising a bronchospasmolytically effective amount of a compound of the formula I as defined in claim 1 or a salt thereof together with a pharmaceutically acceptable carrier.

4,072,761

AROMATIZATION OF COFFEE PRODUCTS

Geoffrey Margolis, Marysville, and Richard Tien-Szu Liu, Worthington, both of Ohio, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Nov. 24, 1975, Ser. No. 634,487
Int. Cl.[2] A23F *1/04*
U.S. Cl. 426—387 14 Claims
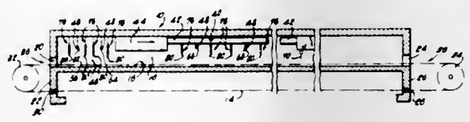


1. A process for aromatizing a coffee product comprising:
a. collecting an aroma gas comprising non-condensible volatiles of coffee;
b. admixing the aroma gas under a pressure of at least 5 kg/cm^2 with a quantity of an absorbent comprising aqueous liquid and liquid edible oil under such conditions as to produce an aroma-emulsion foam; and
c. contacting said aroma-emulsion foam with soluble coffee solids to incorporate aroma in said soluble coffee solids, said foam functioning to provide substantially more liquid surface area than an equal amount of unfoamed absorbent, thereby to absorb a greater volume of said aroma gas in said quantity, than would be absorbed in said amount under similar conditions.

4,072,762

PROCESSES OF COOLING FOODS AND APPARATUS THEREFOR

Ignace Rhodes, c/o Electro Dispersion Corp., 36-16 29th St., Long Island City, N.Y. 11106

Continuation of Ser. No. 806,008, March 3, 1969, abandoned, which is a continuation of Ser. No. 446,859, April 9, 1965, abandoned. This application Apr. 11, 1972, Ser. No. 243,025
Int. Cl.[2] A23L *1/01*
U.S. Cl. 426—510 8 Claims



1. In a process of cooking food, which process includes cooking the food in a chamber, supporting the food in the chamber on a grounded hearth while heating the food in a chamber from a high temperature source within the chamber external to the food and providing steam in the chamber: wherein the improvement comprises creating and maintaining a hot and highly humid atmosphere immediately surrounding the exposed surface of the food in the chamber at an early stage of cooking so as to speed up the cooking process while localizing the steam in the vicinity of said exposed surface of the food as it is being heated, creating and maintaining said aforesaid atmosphere and localizing the steam by suspending in the chamber above the hearth a grid of electrically conductive downwardly extending pins with lower pointed ends, said pins being electrically insulated from the hearth, and connecting a source of high potential DC to said grid sufficient to cause steam to move downwardly to the hearth and food thereon thereby establishing in the chamber, in conductive relationship to the atmosphere above the said surface of the food exposed in the chamber, at an early stage of cooking, a direct current high potential electrostatic field between the grid and the food articles on the grounded hearth.

4,072,763

MEAT PRODUCT AND METHOD OF MAKING SAME

Clyde Mart, 24900 Duffield Road, Beachwood, Ohio 44122

Filed Sept. 20, 1976, Ser. No. 724,567
Int. Cl.[2] A23J *3/00*
U.S. Cl. 426—513 6 Claims

1. A meat product consisting of a flat or planar cut of predetermined thickness and peripheral contour, consisting of thin slices of meat, arranged in a layered structure, in which the layers of the meat extend substantially perpendicular to the flat plane of the cut, and are disposed substantially concentrically about the center or axis of the cut, with the grain of the slices of meat extending along lines substantially perpendicularly to the center or axis of the cut.

4,072,764

EGG YOLK EXTENDER

William B. Chess, Monsey, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Apr. 15, 1976, Ser. No. 677,354
Int. Cl.[2] A21D *13/08;* A23L *1/32*
U.S. Cl. 426—558 45 Claims

1. An egg yolk extender comprising full fat soy flour, a grain flour, lecithin, said grain flour being present in a ratio to said full fat soy flour within the range of from about 1:10 to about 1:1 and said lecithin being present in a ratio to said full fat soy flour within the range of from about 1:100 to about 20:100, all ratios being on a weight basis and from about 1 to about 12 parts of a food grade emulsifier other than lecithin and from about 1 to about 12 parts of a humectant, said parts being by weight per 100 parts of full fat soy flour.

4,072,765

METHOD OF MAKING AN EXTRACTABLE COFFEE SUBSTITUTE

Edward Louis Scarsella, Bedford Hills, N.Y., and Clifford Henry Spotholz, Montvale, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed July 21, 1976, Ser. No. 707,738
Int. Cl.[2] A23F *1/16*
U.S. Cl. 426—596 2 Claims

1. A method of making an extractable beverage composition by combining on a weight basis:
a. 35 to 55% roasted and comminuted raw wheat,
b. 40 to 60% roasted and comminuted coffee, said coffee containing at least 60% high-grade, Arabica coffees and said coffee being roasted to a darker color and comminuted to a finer particle size than the roasted and comminuted wheat of a), and
c. 3 to 6% of an acid or enzymatically hydrolysed starch material having a D.E. of from 5 to 19.

4,072,766

COCOA BUTTER COMPOSITIONS

Francis E. Luddy, Hatboro; James W. Hampson; Samuel F. Herb, both of Philadelphia, and Herbert L. Rothbart, Flourtown, all of Pa., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 642,837, Dec. 22, 1975, Pat. No. 4,049,839, which is a division of Ser. No. 337,789, March 5, 1973, Pat. No. 3,944,585. This application Mar. 23, 1977, Ser. No. 780,567
Int. Cl.[2] A23D *5/00*
U.S. Cl. 426—607 2 Claims

1. A cocoa butter composition consisting essentially of a 50/50 mixture of cocoa butter and a plastic solid tallow fraction having a gas-liquid chromatographic profile indicating a trace %, 30%, 49% and 21% of glycerides having carbon numbers of 48, 50, 52 and 54, respectively, and a thermal profile indicating softening at about 20° C., commencement of rapid melting at about 30° C., and complete melting at about 37° C.

2. A cocoa butter composition consisting essentially of 40% of a plastic solid tallow fraction having a gas-liquid chromatographic profile indicating a trace %, 30%, 49% and 21% of glycerides having carbon numbers of 48, 50, 52 and 54, respectively, and a thermal profile indicating softening at about 20° C., commencement of rapid melting at about 30° C. and complete melting at about 37° C., 10% of a high melting crystalline tallow fraction having a gas-liquid chromatographic profile indicating a composition having 15%, 28%, 36% and 21% of glycerides having carbon numbers of 48, 50, 52 and 54, respectively, and a thermal profile indicating softening and commencement of melting at about 42° C. and complete melting at about 51° C., and 50% cocoa butter.

4,072,767

METHOD FOR CONTROLLING CHEMICAL VAPOR DEPOSITION

Kyo Suda, Hachioji; Katsumi Takami, Tokyo; Akira Shintani, and Shinobu Hase, both of Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed June 7, 1976, Ser. No. 693,312
Claims priority, application Japan, June 6, 1975, 50-67645
Int. Cl.[2] C23C *13/04;* C01B *33/12*
U.S. Cl. 427—8 25 Claims

1. In a process for chemical vapor deposition of particles of a film-forming substance on a substrate wherein the particles result from a reaction of gases of a gaseous mixture in a reactor, the improvement comprising measuring optically the particle size of particles of the film-forming substance formed in the reactor, converting the optically measured value to an electric signal, and controlling the flow rate of at least one gas of the gaseous mixture to be introduced into the reactor in response to the electric signal whereby a good quality film is produced.

4,072,768

METHOD FOR MAKING PATTERNED GOLD METALLIZATION

David Bruce Fraser, Berkeley Heights, and Guenther Wilhelm Kammlott, Watchung, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 23, 1976, Ser. No. 651,634
Int. Cl.[2] H05K *1/00*
U.S. Cl. 427—34 12 Claims

1. A method for making a gold pattern on a substrate, comprising the steps of (1) depositing on said substrate a layer consisting essentially of gold oxide, said layer having a thickness in the range of from 0.01 to 5.0 micrometers, (2) patterning said layer by selectively reducing portions of said layer to metallic gold by irradiation of said portions with electrons or light, and (3) exposing the entire layer to a chemical agent whereby the unreduced portions of said layer are removed.

4,072,769

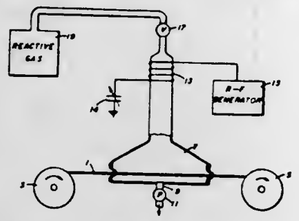
TREATING POLYMERIC SURFACES

Darrel D. Lidel, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 80,482, Oct. 13, 1970, Pat. No. 3,761,299, and a continuation-in-part of Ser. No. 772,745, Nov. 1, 1968, abandoned, and Ser. No. 452, Jan. 2, 1970, abandoned. This application Dec. 7, 1972, Ser. No. 313,029
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl. B05D *3/06*
U.S. Cl. 427/38 15 Claims

1. A process for changing the properties of a surface of a shaped organic polymeric material, said surface containing carbon to hydrogen bonds having a dissociation energy of less than about 100 K cal./mol, said process comprising exposing

said surface to a stream of a mixture of (1) a reactive gas selected from the group consisting of (a) N_2O_3, (b) water vapor and (c) a vapor of an organic compound which is an acid, an alcohol, an ester, an amine, a nitrile or a vinyl compound having a vinyl moiety activated by an adjacent electronegative group, said gas having a partial pressure of at least 0.001 mm. Hg. at a temperature in the range of about 10 to about 150°C., with (2) an activator gas selected from the group consisting of argon, helium, krypton, neon, nitrogen, radon, xenon and mixtures thereof, said stream of gases having been activated by treating with a radio frequency electromagnetic field ranging from about ½ to about 30,000 megahertz and said field being remote from said support, said process being conducted at a



pressure of about 0.01 to about 20 mm Hg., said acid being an aliphatic or aromatic mono- or dicarboxylic acid having up to about 10 carbon atoms, said alcohol being aliphatic mono- or polyol or a phenol having up to about 10 carbon atoms, said ester being an ester being derived from said acid and an aliphatic monohydroxy alcohol having less than 6 carbon atoms, said amine being primary, secondary or tertiary aliphatic or aromatic amine having up to 20 carbon atoms, said nitrile being an aromatic or aliphatic cyano-substituted compound having up to about 10 carbon atoms, and said vinyl compound being a compound having a vinyl, vinylene or vinylidene group attached to a carbonyl, sulfonyl, cyano, formyl, carboxy, halogen or nitro group.

11. A polymeric article treated by the process of claim 1.

4,072,770

U.V. CURABLE POLY(ESTER-URETHANE) POLYACRYLATE POLYMERS AND WET LOOK COATINGS THEREFROM

Vincent Wen-Hwa Ting, Brunswick, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed May 11, 1976, Ser. No. 685,373
Int. Cl.² B05D 3/06
U.S. Cl. 427—54 15 Claims

1. A poly(ester-urethane) polyacrylate polymer comprising the product obtained by reacting a polyurethane intermediate having 4 to 10 terminally-positioned reactive isocyanate groups with 4 to 10 molar equivalents of a hydroxy (lower) acrylate or methacrylate said intermediate resulting from the reaction of 1 to 7 moles of a polyester diol having a molecular weight in the range of 500 to 12,000; 2 to 8 moles of a monomer polyol having 3 to 12 carbon atoms and at least 3 reactive hydroxyl groups; and 6 to 24 moles of an organic diisocyanate.

9. A process for imparting a wet look coating to a substrate which comprises:

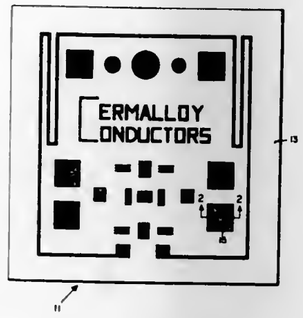
(a) forming a radiation curable composition comprising on a weight percent basis:
  (i) 30 to 70 percent of a polyurethane polymer of claim 1;
  (ii) 10 to 40 percent of a monofunctional acrylate monomer;
  (iii) 5 to 50 percent of a multifunctional acrylate crosslinking agent; and
  (iv) 3 to 5 percent of a photosensitizer said composition totaling 100 percent;
(b) applying said mixture as a 0.1 to 10 mil thick coating to a substrate selected from the group consisting of flat stock metal, wood, fiberboard and floor tile; and
(c) curing said coating substrate in air at ambient temperature by passing the substrate at a rate of from 10 to 1000 foot/minute through an effective field of ultraviolet radiation.

4,072,771

COPPER THICK FILM CONDUCTOR

John D. Grier, Sr., Harleysville, Pa., assignor to Bala Electronics Corporation, Conshohocken, Pa.

Filed Nov. 28, 1975, Ser. No. 636,074
Int. Cl.² B05D 5/12; B32B 17/06; H01B 1/08
U.S. Cl. 427—96 14 Claims



13. A method of making an electrical conductor element consisting essentially of the steps of

taking a powder of fine copper particles,

preoxidizing the copper to form an oxidized copper powder,

mixing the oxidized copper powder with a glass frit comprising about 1-10% by weight of the total solids in the solids mixture,

with the copper oxide being about 1-5% by weight of the total solids in the solids mixture,

mixing the solids mixture with a volatile and decomposable fluid suspending vehicle to form a copper thick film paste,

applying the paste onto an insulating substrate,

drying the paste on the substrate and evaporating the vehicle,

and firing said substrate in an inert, non-oxidizing, non-reducing atmosphere to adehere said copper thereto.

4,072,772

LINEAR CURTAIN SPRAY APPLICATOR

Helmut Franz, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 9, 1973, Ser. No. 387,056
Int. Cl.² B05D 1/02, 1/36, 5/06
U.S. Cl. 427—164 3 Claims

1. In a method of coating a planar surface of an article wherein the surface is coated by displacing the article in a downstream direction along an article movement path lying in a generally horizontal plane with the surface to be coated facing upwardly; applying a liquid rinsing medium to the surface of the article to rinse the surface by directing the rinsing medium downwardly to the surface as a plurality of atomized, conical sprays substantially aligned with and spaced from one another across the article movement path; and applying a liquid coating medium to the rinsed surface of the article to coat the surface; the improvement which comprises:

directing adjacent sprays of said plurality of sprays of rinsing medium toward the surface of the article such that the adjacent portion of the outer periphery of each of the adjacent sprays at the surface of the article is at the centroid of the next adjacent spray and such that the spray closest each marginal edge of the article surface overlies that edge; while

adjusting and maintaining the sprays of rinsing medium to be of substantially equal force such that a peripheral portion of each spray is substantially aligned with a like peripheral portion of each other spray along a common line extending across the article movement path; and wherein the interactions of the adjacent sprays of rinsing medium provide a substantially linear spray front of substantially uniform rinse medium thickness across the surface of the article prior to the application of the coating medium to it.

4,072,773

POROUS SHEET MATERIAL AND ITS PRODUCTION

Osamu Fukushima, Kurashiki, Japan, assignor to Kuraray Co., Ltd., Kurashiki, Japan

Division of Ser. No. 392,137, Aug. 27, 1973. This application Feb. 23, 1976, Ser. No. 660,098
Claims priority, application Japan, Aug. 30, 1972, 47-86988
Int. Cl.² B05D 5/00
U.S. Cl. 427—246 8 Claims

1. A process for producing a porous sheet material made of a polymeric material consisting essentially of a polyurethane elastomer, which comprises applying a polymer composition in solution consisting essentially of a polyurethane elastomer and a cellular structure regulating agent, in an amount of from 3 to 25% by weight based on the weight of the polymer composition, on a support material and treating the resulting sheet material in a first stage coagulation bath at 35° to 65° C to coagulate the surface of said sheet material and then in a second stage coagulation bath at a temperature not less than 5° C lower than the temperature of the said first stage coagulation bath to complete the coagulation to obtain the porous sheet material comprising a base layer of vertically penetrating vesicular structure and a surface layer of microporous structure integrally provided on one of the surfaces of the said base layer.

4,072,774

SEALING METHOD FOR POROUS MATERIAL

Fred R. Youngren, Lexington, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 18, 1975, Ser. No. 587,741
Int. Cl.² B05D 3/00, 3/02
U.S. Cl. 427—294 3 Claims

1. A process for impregnation of a fused silica porous object having pore radii of about 0.5 to about 1 micron with a sealant in an ambient atmosphere comprising:

cleaning contaminants from said object an drying thereof;

immersing said object to a depth of a portion of the shortest dimension thereof in a resin sealant; and

maintaining said atmosphere and said sealant at the temperature of minimum viscosity thereof for three to sixteen hours for substantially complete impregnation of the pores of said object by said sealant to provide a sealed object.

3. An impregnation process as in claim 1 with positive and negative pressures respectively applied to said sealanat and said object for reduction of the time required for said impregnation.

4,072,775

METHOD FOR APPLYING A FOAM BACKING TO FABRIC

Forrest T. James, Burlington, and Stephen L. Guy, Greensboro, both of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

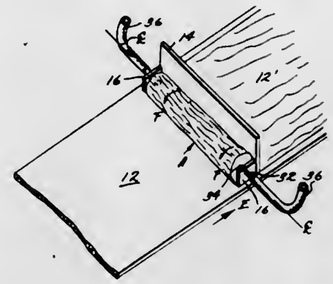
Division of Ser. No. 565,704, April 7, 1975, Pat. No. 4,016,831. This application Dec. 8, 1976, Ser. No. 748,400
Int. Cl.² B05D 7/00
U.S. Cl. 427—373 6 Claims

1. A method of applying foam coating to a fabric to provide a backing therefor, comprising the steps of

a. defining a fluid-foam pillow of a predetermined volume on a web of fabric to be backed by confining the volume on the top, front, and two sides thereof, the fabric web supoorting the pillow bottom,

b. passing fabric of said web past said foam pillow, said pillow generally rolling about a generally horizontal axis which is transverse with respect to said web as said fabric web is moved with respect thereto,

c. allowing only a portion of the foam in said pillow to pass with said web as it moves past the pillow, and



d. continuously replenishing the foam material in said pillow to substantially maintain said predetermined volume thereof by introducing a flow of foam into said pillow at least two spaced points in the interior of said pillow, said flow being introduced generally along said axis of said pillow, one of said points being on each side of said reservoir.

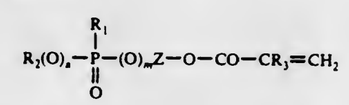
4,072,776

PROCESS FOR THE FLAMEPROOFING OF TEXTILE MATERIALS

Fritz Linke; Walter Dürsch, both of Konigstein, Taunus, and Hans-Jerg Kleiner, Kronberg, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

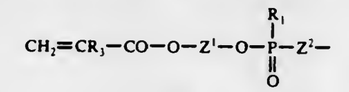
Filed Oct. 10, 1975, Ser. No. 621,502
Claims priority, application Germany, Oct. 19, 1974, 2449465
Int. Cl.² B05D 3/02
U.S. Cl. 427—390 D 6 Claims

1. A process for the flameproofing of fiber material, which comprises applying (meth-)acrylic acid-alkyl-esters of the general formula



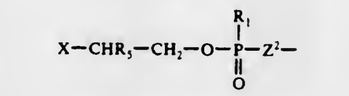
I,

in which n and m and 0 or 1 and $(n+m)$ are 0 or 1, and R_1 stands for a saturated or unsaturated aliphatic hydrocarbon radical having from 1 to 8, preferably from 1 to 4 carbon atoms, which radical may also be substituted, preferably monosubstituted, by chlorine, bromine, the nitrile group, or the radicals $-OR_4$ or $-COOR_4$. R_2 has the same meaning as R_1 and if n is 0 and m is 1 may also be a group of the formula



Ia

or



Ib,

Z, Z^1, Z^2 represent straight-chain or branched (C_1-C_3)-alkylene radicals which may also be substituted, preferably mono-

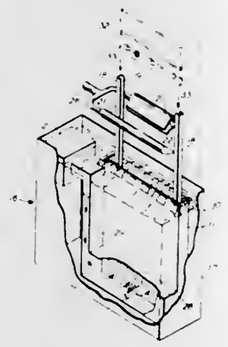
substituted, by chlorine, bromine or the hydroxy group, X stands for a hydrogen, a chlorine or a bromine atom, a hydroxy or a methyl group, R_3 represents a hydrogen atom or a methyl group, and R_4 is a hydrogen atom or an alkyl group having from 1 to 8 carbon atoms, and R_5 is a hydrogen atom, the methyl or the chloromethyl group, onto the fiber material, the said (meth-)acrylic acid-alkyl-esters being dissolved in an inert solvent, and subjecting the latter substances to a polymerization by using radicals.

4,072,777

METHOD AND APPARATUS FOR FORMING A UNIFORM SOLDER WAVE

David Schoenthaler, Lower Makefield Township, Bucks County, Pa., assignor to Western Electric Co., Inc., New York, N.Y.

Filed June 30, 1977, Ser. No. 811,935
Int. Cl.[2] B05D *1/18;* B05C *3/10*
U.S. Cl. 427—433 5 Claims



1. A soldering apparatus arranged to form a uniform overflowing molten solder wave comprising a vessel having a rectangular cross section and which is open at the top, the apparatus further comprising:

means for channeling the molten solder along the outside surface of the vessel; and

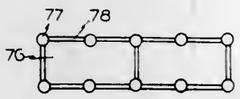
said vessel having an opening therein which decreases in size in the direction of the solder flow to cause the molten solder to flow from the channeling means into the vessel at a constant mass flow rate along the length of said channeling means resulting in a uniform overflow wave of solder from the top of the vessel.

4,072,778

SPACING SYSTEM

Robert Colin Lamb, 8 Lilac Lane, Maungaraki, Lower Hutt, New Zealand

Continuation-in-part of Ser. No. 624,834, Oct. 22, 1975, abandoned. This application July 23, 1976, Ser. No. 708,006
Int. Cl.[2] B32B *7/08*
U.S. Cl. 428—52 7 Claims



1. A spacer unit for preventing extrusion of sealants comprising a plurality of incompressible blocks skeletally interconnected in spaced relationship by incompressible web members, said blocks and webs comprising an arrangement and material resistant to a compressive force normal to the direction of interconnection of said webs and blocks, the cross-sectional area of said blocks and webs being relatively small with respect to the entire cross-sectional area lying within the outer periphery of said spacer unit, said webs and blocks defining openings therebetween for receiving a sealant for preventing extrusion thereof when the spacer unit is subjected to a compressive force normal to the direction of interconnection of said webs and blocks.

4,072,779

POLYETHYLENE TEREPHTHALATE FILM

Kenneth Leith Knox, Circleville, Ohio, and Joseph Kolb Lees, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 284,131, Aug. 28, 1972, abandoned. This application June 30, 1975, Ser. No. 592,075
Int. Cl.[2] C08G *63/70, 63/18*
U.S. Cl. 428—220 2 Claims

1. An article of manufacture suitable for use in optically transparent glass laminar structures comprising a frangible, dimensionally stabilized and optically transparent film structure of crystalline polyethylene terephthalate which is asymmetrically oriented by stretching 1.0 to 1.25 times in one direction in the plane of the film and about from 3 to 4 times in a second direction in the plane of the film, the film having a pneumatic impact strength of less than 10 kg.-cm., a tensile strength at break of less than 12,000 psi in at least one direction of said film and an elongation at break of less than 50% in the same film direction, a shrinkage of less than 5% in any direction at 135° C., an optical retardation of about from 5,000 to 7,000 millimicrons, a thickness of at least 1 mil and a gauge deviation of less than 1% per inch along the surface of said film, wherein said film structure is substantially free of color fringes upon viewing in partially polarized light.

4,072,780

PROCESS FOR MAKING ELECTRICAL COMPONENTS HAVING DIELECTRIC LAYERS COMPRISING PARTICLES OF A LEAD OXIDE-GERMANIUM DIOXIDE-SILICON DIOXIDE GLASS AND A RESIN BINDER THEREFORE

Jack H. Zillman, San Juan Capistrano, Calif., assignor to Varadyne Industries, Inc., Santa Monica, Calif.

Filed Oct. 28, 1976, Ser. No. 736,486
Int. Cl.[2] B32B *5/16, 31/04, 31/18*
U.S. Cl. 428—325 4 Claims

1. An electrical component comprising a stack of flat planar dielectric wafers, each of said wafers having an electrically conductive layer thereon, said wafers being composed of minute particles of glass formed of silicon dioxide, lead oxide and germanium dioxide, in substantially the following proportions by weight: lead oxide (82%), germanium dioxide (11%) and silicon dioxide (7%), and an organic polymeric binder for said particles, and said conductive layer being formed of silver.

2. A process for making an electrical component in the form of a stack of flat planar dielectric wafers, each of said wafers having an electrically conductive layer thereon, said process including the following steps: intermixing lead oxide and germanium dioxide and silicon dioxide in powdered form and in substantially the following proportions by weight: lead oxide (82%), germanium dioxide (11%) and silicon dioxide (7%) and forming minute glass particles from the resulting composition, intermixing the glass particles with an organic polymeric binder, casting the resultant composition into a tape, cutting the tape to form the dielectric wafers, and forming a pattern of silver on each of the dielectric wafers to constitute the electrically conductive layer.

4,072,781

MAGNETIC RECORDING MEDIUM

Ryuji Shirahata; Masaaki Suzuki, and Tatsuji Kitamoto, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 3, 1975, Ser. No. 628,431
Claims priority, application Japan, Nov. 1, 1974, 49-126364
Int. Cl.[2] B05D *5/12*
U.S. Cl. 428—336 7 Claims

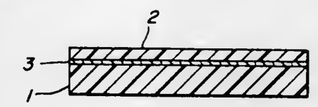
1. A magnetic recording medium comprising a nonmangetizable base having provided thereon a magnetizable layer formed by electroless plating, said magnetizable layer containing a ferromagnetic metal selected from the group consisting of Co, Co-Ni, Co-Fe and Co-Ni-Fe in amounts of greater than 50 wt. % Co, 0 to 50 wt. % Ni, 0 to 30 wt. % Fe based on the total weight of said manetizable layer; said magnetizable layer further containing phosphorus in an amount of 0.5 to 10 wt. % based on the total weight of the magnetizable layer and at least one member selected from the group consisting of copper, lead and silicone in an amount of 0.05 to 1.0 wt. % based on the total weight of said magnetizable layer.

4,072,782

COMPOSITE EROSION RESISTANT OPTICAL WINDOW

William E. Kramer, Plum Borough; Richard H. Hopkins, Monroeville, and Richard A. Hoffman, Franklin, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 7, 1976, Ser. No. 647,025
Int. Cl.[2] B29D *11/00;* G02B *1/00;* B32B *17/06*
U.S. Cl. 428—409 8 Claims



1. An optical window comprising a substrate of material having high transparency over a desired spectral range of infrared radiation, a protective layer of a material of high resistance to rain erosion, said protective layer being thin as compared to the substrate and of such thickness that it does not materially affect the optical properties of the window, and a layer of non-crystalline bonding material joining said protective layer to said substrate, said bonding material being a glass which is transparent in said spectral range, and which has a refractive index close to the refractive index of at least one of the protective layer and the substrate, and a softening temperature below the melting points of the protective layer and the substrate.

4,072,783

METHOD FOR SURFACE TREATMENT OF STEEL SHEET AND STEEL SHEETS OBTAINED THEREFROM

Motoi Yasue; Yoshikazu Tagawa, and Mitsuo Higashi, all of Uenomachi, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 378,412, July 12, 1973, abandoned, which is a continuation-in-part of Ser. No. 170,290, Aug. 9, 1971, abandoned, which is a continuation-in-part of Ser. No. 783,766, Dec. 13, 1968, abandoned. This application May 12, 1975, Ser. No. 576,432
Claims priority, application Japan, Dec. 23, 1967, 42-82562; Dec. 23, 1967, 42-8263; Dec. 23, 1967, 42-8264; Nov. 29, 1968, 43-85019
Int. Cl.[2] B05D *5/04, 7/14;* B32B *15/18*
U.S. Cl. 428—341 19 Claims

1. Method for surface treatment of steel sheet which comprises coating the steel sheet with 5 - 200mg/m^2 of a treating solution consisting essentially of at least one member of the group consisting of linseed oil, cottonseed oil and dioctyl sebacate and a mineral oil, the mineral oil constituting about 0.5 - 15% by volume of the solution whereby said sheet can be directly painted or printed without a prior degreasing.

2. Method for surface treatment of steel sheet which comprises coating the steel sheet with 5 - 200mg/m^2 of a treating solution consisting essentially of dioctyl sebacate, glycol mono-oleate and glycol di-oleate, wherein the glycol portion is a mono or polyvalent alcohol having from 3 to 20 carbon atoms, and a mineral oil, the mineral oil constituting about 0.5 - 15% by volume of the solution whereby said sheet can be directly painted or printed without a prior degreasing.

4,072,784

FIXATION OF MULTIVALENT METAL SALTS OF CARBOXYL-CONTAINING VINYL MONOMERS ON FIBROUS SUBSTRATES

Vidabelle O. Cirino, Hereford, Tex., and Stanley P. Rowland, New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 501,421, Aug. 28, 1974, abandoned. This application Apr. 9, 1976, Ser. No. 675,103
Int. Cl.[2] B44D *1/44*
U.S. Cl. 428—507 7 Claims

1. A process for preparing cellulosic or synthetic fibers having anti-bacterial properties, flame retardancy and sanitizing characteristics comprising:

(a) immersing a cellulosic or synthetic fiber in an aqueous solution containing about 1-40 weight percent of a water soluble polyvalent metal salt of a carboxyl containing acrylic or vinyl monomer, about 0-3 weight percent of a water soluble polyfunctional vinyl monomer, about 0–15 weight percent of a monofunctional vinyl comomomer and about 0.03 to 3.0 weight percent of a free radical initiator;

(b) squeezing the immersed fiber from step (a) to remove the excess solution;

(c) curing the squeezed fiber from step (b) at a temperature of 120°-160° C.;

(d) washing the cured fiber from step (c); and

(e) drying the washed fiber from (d).

4,072,785

DIMENSIONALLY STABLE, NITROCELLULOSE COATED CELLOPHANE

John S. Taylor, Newark, and William G. Grantham, Wilmington, both of Del., assignors to FMC Corporation, Philadelphia, Pa.

Filed July 5, 1974, Ser. No. 486,025
Int. Cl.[2] B44D *1/092*
U.S. Cl. 428—536 12 Claims

1. A process which includes the steps of passing a purified gel regenerated cellulose film through an aqueous solution containing, as a plasticizer for such film, polyethylene glycol having an average molecular weight between 285 and 4,000 and a water-soluble cellulose ether having a concentration not less than about 0.3% by weight in the aqueous solution and selected from the group consisting of methyl cellulose and hydroxyalkyl methyl cellulose and mixtures thereof, and thereafter drying the plasticized gel regenerated cellulose film, the water-soluble cellulose ether in the aqueous solution being sufficient to provide the dried film with an amount thereof which is effective to at least minimize the migration of the plasticizer.

4,072,786

PRODUCTION OF FLOOR TOPPINGS BY FLOWING INORGANIC BINDER SUSPENSIONS OVER POROUS OPEN-CELL UNDERLAYS

Friedrich Hinsche, Leverkusen, and Kurt Schaupp, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 29, 1975, Ser. No. 608,953
Claims priority, application Germany, Sept. 3, 1974, 2442183
The portion of the term of this patent subsequent to Feb. 1, 1994, has been disclaimed.
Int. Cl.[2] E04B *5/00*
U.S. Cl. 428—537 7 Claims

1. In the production of a floor topping by the flow method,

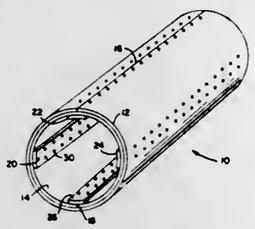
comprising providing a water-absorbing layer on a floor to be topped, pouring a free-flowing mass comprising water and at least one of gypsum and anhydrite onto said water-absorbing layer whereby said mass forms a level floor topping, and allowing said mass to harden, the improvement which comprises emplying as said water-absorbing layer a strong porous open-cell foamed material.

4,072,787

LAMINATED WALL TUBING

Earl C. Ricks, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 3, 1977, Ser. No. 756,319
Int. Cl.² B23K *11/10, 31/06;* B32B *1/08;* F16L *39/00*
U.S. Cl. 428—594 **2 Claims**



1. A laminated tubular structure comprising:
a. first and second sheet members rolled in tubular concentric relation and positioned so that the seam of each rolled sheet is spaced 180° apart;
b. bonding means disposed between said sheets; and
c. reinforcing strips positioned in said second member, a first pair of reinforcing strips disposed adjacent said seams, a second pair of said reinforcing strips being spaced 90° from said first pair of reinforcing strips, said reinforcing strips and said sheet member being resistance welded along the length of said tubular structure.

2. A method of fabricating a tubular structure from a pair of flat members including the steps of:
a. applying a bonding agent on adjacent surfaces of said sheets;
b. rolling and positioning said members in concentric relation with the seams of said members being spaced 180° apart;
c. positioning reinforcing members along the inside surface of the inner said flat member;
d. clamping said rolled flat members and said reinforcing members about a mandrel;
e. progressively moving the tubular structure off the mandrel while resistance welding the tubular structure along the length thereof; and,
f. curing said bonding agent.

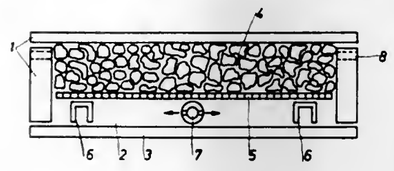
4,072,788

INSULATING ELEMENTS FOR WALLS AND CEILINGS

Peter Herweg, Burscheid, and Werner Barthel, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 727,668, Sept. 29, 1976, abandoned. This application Feb. 28, 1977, Ser. No. 772,805
Claims priority, application Germany, Oct. 3, 1975, 2544280
Int. Cl.² B32B *3/10*
U.S. Cl. 428—139 **6 Claims**

6. The insulating elements for walls and ceilings comprising of: two facing layers which are fixed to a frame, and parallel thereto a perforated foam permeable intermediate layer, the two chambers formed thereby are foam filled and characterized in that one chamber formed by the perforated foam permeable intermediate layer contains a granular material and



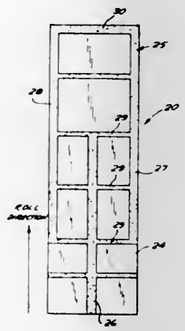
foam which fills the spaces remaining between the granular material and the other chamber contain no granular material.

4,072,789

SHEET MATERIAL

James R. Hammersmith, Jeffersonville, Ind., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Nov. 20, 1972, Ser. No. 308,116
Int. Cl.² A24C *5/48*
U.S. Cl. 428—195 **6 Claims**



1. A sheet material adapted to be spirally wound into a filter rod comprising:
a sheet of porous, self-cohesive filter material;
a predetermined pattern of impervious material deposited on the sheet of porous filter material;
the impervious material being fusible and adapted to be bonded to the filter material;
the pattern of impervious material *comprising a first strip running substantially longitudinally along the sheet from one end thereof and terminating short of the other end, a second strip spaced transversely apart from said first strip and running substantially longitudinally along the sheet and terminating short of the one end, and at least one antispin strip connecting said first and second strips* such that when the sheet material is spirally wound *longitudinally the strips form an* annulet plug *connected by a continuous antispin band* to a disc plug, the outer diameter of the disc being at least as great as the inner diameter of the annulet.

4,072,790

EXTRUDABLE COMPOUNDED POLYVINYL CHLORIDE

Mark D. Creekmore, Akron; Edward T. Vielhaber, Cuyahoga Falls, and Russell P. Carter, Jr., Stow, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 533,583, Dec. 17, 1974, abandoned. This application June 16, 1976, Ser. No. 696,678
Int. Cl.² B32B *27/18*
U.S. Cl. 428—220 **7 Claims**

1. An extruded compounded polyvinyl chloride film having a thickness in the range of about 0.5 to about 4.5 mils prepared by the method which comprises (A) dry blending materials to

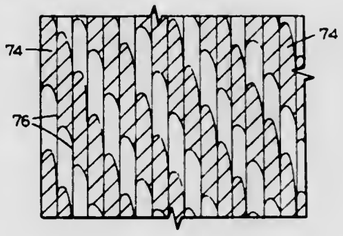
a free flowing granular mixture, (B) pelletizing said mixture and (C) extruding said pellatized mixture, as a melt, through a die having a temperature in the range of about 170° C. to about 220° C., said dry blend materials comprising (1) 100 parts by weight particulate polyvinyl chloride resin, about 20 to 32 parts by weight of at least one plasticizer selected from at least one of di(2-ethylhexyl) adipate, epoxidized soyabean oil, epoxidized linseed oil, acetyl tributylcitrate, butylbenzylphthalate, dibutyl sebacate, butyl stearate, acetyl triethyl citrate, p-tert-butyl-phenyl salicylate, butylphthalyl butyl glycolate, di-(2-ethylhexyl)phthalate, diethyl phthalate, diisobutyl adipate, diisooctyl phthalate, dipehenyl-2-ethylhexyl phosphate, ethylphthalyl ethyl glycolate, glycerol monooleate, monoisopropyl citrate, mono-, di- and tristearyl citrate, triacetin (glycerol triacetate), triethyl citrate, 3-(2-xenoyl)-1,2-epoxypropane, 1,3-butylene glycol adipic acid polyester of about 1700 to about 2200 molecular weight terminated with at least one organic acid selected from myristic, palmitic and stearic acids, dicyclohexyl phthalate, di(2-ethylhexyl)-azelate, di-n-hexyl azelate, dihexyl phthalate, diphenyl phthalate, epoxidized butyl esters of linseed oil fatty acids, diisononyl adipate and iisononyl phthalate, (2) from about 0.1 to about 2.5 parts by weight of a pigment having an average particle size in the range of about 2 to about 10 microns selected from pigments comprised of about 50 to about 100 weight percent silica (SiO_2), and corresponding from none to about 50 weight percent other oxides selected from aluminum, magnesium, calcium, iron, potassium and sodium, (3) from about 0.75 to about 7 parts by weight of a heat stabilizer selected from stannous stearate, magnesium stearate and a mixture comprising zinc stearate and calcium stearate in a zinc to calcium weight ratio of about 1:1 to about 3.9:1, (4) from about 0.25 to about 2.5 parts by weight of tris-nonylphenyl phosphite as the chelator, (5) from about 0.2 to about 1.5 parts by weight of a lubricant selected from alcohol esters, amide waxes, fatty acids fatty acid esters, fatty alcohols, glycerol esters, glycol esters metallic stearates and ricinoleates, paraffin waxes, synthetic waxes, polyethylene waxes, modified polyethylene waxes, vinyl ethers, triglycerides, wax acid, and wax esters; (6) from about 2 to about 9 parts by weight of at least one surfactant selected from: polyoxyethylene(20) sorbitan monooleate, the mono and diglycerides of fat-forming fatty acids, a nonylphenoxy polyoxyethylene ethanol containing 4 to 5 moles of ethoxylate, glycerol monooleate, sorbitan monooleate, polyoxyethylene(9-)monooleate, α-alkyl-, α-alkenyl and α-alkylaryl-omega-hydroxypoly(oxyethylene) comprised of at least one of α-(2,4,6-triisobutylphenol)-omega-hydroxypoly(oxyethylene), α-(Z)-9-octadecenyl-omega-hydroxypoly (oxyethylene), and α-alkyl(C_{16}-C_{18})-omega-hydroxypoly(oxyethylene) α-alkyl-omega-hydroxypoly(oxyethylene) derived from ethylene oxide and C_{11}-C_{15} straight chain secondary alcohols, n-alkyl-sulfonate where said alkyl group has 10–18 carbon atoms, α-di-sec-butylphenyl-omega-hydroxypoly(oxyethylene) derived from ethylene oxide and di-sec-butylphenol, α-dodecyl-omega-hydroxypoly (oxyethylene) mixture of dihydrogen phosphate and monohydrogen phosphate esters derived from esterification of the product of ethylene oxide and n-dodecyl alcohol, α-(p-dodecylphenyl)-omega-hydroxypoly(oxyethylene) derived from ethylene oxide and dodecylphenol α-(p-nonylphenyl)-omega-hydroxypoly(oxyethylene) mixture of dihydrogen phosphate and monohydrogen phosphate esters derived from esterification of α-(p-nonylphenyl)-omega-hydroxypoly(oxyethylene) derived from condensation of nonylphenol and ethylene oxide, α-(p-nonylphenyl)-omega-hydroxypoly(oxyethylene) sulfate, ammonium and sodium salts where said nonyl group is a propylene trimer isomer and said poly(oxyethylene) content averages about 4 moles, poly(oxypropylene) block polymer with poly(oxyethylene) having an average molecular weight of about 11,000 to about 18,000, polyoxyethylene(20)sorbitan monostearate, polyoxyethylene (20) sorbitan tristearate, polyoxyethylene(20) sorbitan monooleate, polyoxyethylene(20) sorbitan trioleate, sodium n-alkyl-benzene-sulfonate where said alkyl group contains an average of about 10 to about 16 carbon atoms, sorbitan monopalmitate, sorbitan monostearate, sorbitan trioleate, sorbitan tristearate, α-]p-(1,1,3,3,-tetramethylbutyl)phenyl]-omega-hydroxy poly-(oxyethylene) derived from ethylene oxide and p-(1,1,3,3,-tetramethylbutyl)phenol, tetrasodium 28 N-(1,2-dicarboxyethyl)-N-octadecyl-sulfosuccinamate, and α-tridecyl-omega-hydroxypoly(oxyethylene) mixture of dihydrogen phosphate and monohydrogen phosphate esters derived from esterification of the product of ethylene oxide and tridecyl alcohol, (7) and from about 0.1 to about 0.6 part by weight of a slip-antiblock agent selected from at least one of the group consisting of ethylene-N,N'-bis-oleamide, hydrofol glyceride, hydrogenated fish oil, calcium ricinoleate and fatty acid amides selected from amides with aliphatic hydrocarbon chains containing in the range of about 16 to 40 even numbered carbon atoms, said hydrocarbon chains being saturated or partly unsaturated with 1 to 2 carbon-to-carbon double bonds of unsaturation.

4,072,791

SHEET MATERIAL WITH MULTICOLOR STRIATED PATTERN

Robert E. Randall, Kensington, Conn., assignor to Rowland, Incorporated, Berlin, Conn.

Division of Ser. No. 593,882, July 7, 1975, Pat. No. 4,011,292, which is a division of Ser. No. 457,770, April 4, 1974, Pat. No. 3,920,366. This application Oct. 18, 1976, Ser. No. 733,000
Int. Cl.² B29F *1/12, 3/12*
U.S. Cl. 428—221 **3 Claims**



1. Differentially colored extruded synthetic thermoplastic sheet material comprising a matrix of synthetic thermoplastic resin and a multiplicity of bands of differentially colored thermoplastic resin encapsulated therein, some of said bands extending angularly to others of said bands so as to intersect therewith and provide a grid pattern, the bands of one angular orientation being disposed at a depth within the matrix different from that of the other angular orientation, a multiplicity of each orientation of said bands being provided across the width of said sheet material, said bands having relatively narrow striations extending longitudinally of the sheet material.

4,072,792

FIBER REINFORCED PLASTIC FLAT PLATES

Kunio Araki; Takashi Sasaki; Yuko Kasahara; Yoshisada Yamashita; Keiichi Yotumoto, all of Takasaki; Hiromi Sunaga, Isezaki; Kiyoshi Tabei, Fujisawa; Kazuo Goto, Takasaki; Kunio Tajiri, Tokyo, and Hirokama Kittaka, Sagamihara, all of Japan, assignors to Nitto Boseki Co., Ltd. and Japan Atomic Energy Research Institute, Tokyo, both of, Japan

Continuation-in-part of Ser. No. 362,306, May 21, 1973, Pat. No. 3,930,098. This application June 25, 1975, Ser. No. 590,067
The portion of the term of this patent subsequent to Dec. 30, 1992, has been disclaimed.
Int. Cl.² B32B *31/28*
U.S. Cl. 428—246 **15 Claims**

1. A process for continuously preparing a fiber reinforced plastic (FRP) flat plate having no warps, comprising:
covering with film-like sheetings both the top and bottom surface of a continuous FRP flat plate molding material comprising a reinforcing fiber material impregnated with a liquid resin material curable by means of an ionizing radiation;

continuously transporting the covered material in the lengthwise direction;

irradiating the covered material as it is being transported by means of an ionizing radiation until said molding material is cured, said ionizing radiation being β-rays, electron beam, or mixtures thereof, wherein the dose rate is about 0.01-20 Mrad/sec with a total dose of about 0.1-50 Mrad; and



applying tensions to the film-like sheeting covering the FRP molding material in both the lengthwise and the widthwise directions before and in the course of the irradiation, said tensions being in a degree sufficient to press and hold the molding material so as to maintain the thickness thereof uniform and the surfaces thereof smooth before and in the course of radiation.

7. A fiber reinforced plastic (FRP) flat plate laminated with a film-like sheeting, which is prepared according to the process of claim 1.

4,072,793

REINFORCED ION-EXCHANGE MEMBRANE

Itaru Watanabe, Yokohama; Yasumichi Yamakoshi, Tokyo; Hirotsugu Miyauchi, Kawasaki; Sakae Tsushima, and Mitsunobu Fukumoto, both of Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed July 15, 1976, Ser. No. 705,431

Claims priority, application Japan, July 23, 1975, 50-101234[U]

Int. Cl.² C08J *5/22*

U.S. Cl. 428—255 **5 Claims**



1. In a reinforced ion-exchange membrane comprising a fabric embedded in said ion-exchange membrane, the improvement which comprises using as the fabric a leno-woven fabric with a weave structure in which the numbers of warp yarns are in the range from 16 to 28 per one centimeter of width and those of filling yarns in the range from 8 to 14 per one centimeter of length, the square root of the denier divided by specific gravity of said warp yarn being in the range from 6 to 11 and that of said filling yarn in the range from 8 to 16.

4,072,794

OIL ADSORBENT AND A METHOD OF PRODUCING SAME

Shigeru Tomita; Yoshindo Matsuda; Kazuki Terajima, and Keiji Abe, all of Tokyo, Japan, assignors to Agency of Industrial Science and Technology of Japan, Tokyo, Japan

Filed Nov. 3, 1976, Ser. No. 738,438

Claims priority, application Japan, Dec. 19, 1975, 50-152071

Int. Cl.² B05D *5/04, 1/38;* B32E *9/04*

U.S. Cl. 428—378 **10 Claims**

6. A method of producing an oil adsorbent which comprises treating natural fibers selected from the group consisting of vegetable fibers and animal fibers with a paraffin emulsion, drying the so treated fibers to form a paraffin layer thereon, treating the resulting coated fibers with a latex and then curing said latex to coat said paraffin layer with a rubber layer.

4,072,795

THIN FILM ELECTROSTATIC EPOXY POWDER COATING PROCESS AND THE RESULTING ARTICLE

Charles M. Noonan, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 468,336, May 8, 1974, Pat. No. 4,009,223. This application Oct. 4, 1976, Ser. No. 729,232

Int. Cl.² B32B *15/02, 15/20*

U.S. Cl. 428—379 **26 Claims**

1. A method of coating a metallic object with a coating powder comprising: (I) applying a coating powder to said metallic object with an electrostatic means selected from the group consisting of a gun and a fluidized bed, said coating powder being made by

(A) dry mixing a composition which comprises:

(1) a first diglycidyl ether of bisphenol A having an E.E.W. of about 400 to about 900 and a melting point of about 70° to about 110° C;

(2) a second diglycidyl ether of bisphenol A having an E.E.W. of about 750 to about 1400 and a melting point of about 100° to about 130° C, where said second diglycidyl ether is different from said first diglycidyl ether and the weight ratio of said first diglycidyl ether to said second diglycidyl ether is about 1 to 1 to about 12 to 1;

(3) about 10 to about 60% by weight based on the weight of the total composition of an epoxy ester, the epoxy portion of said ester being derived from a diglycidyl ether of bisphenol A having an E.E.W. of about 400 to about 900 and a melting point of about 70° to about 110° C, and the ester portion being derived from a dibasic acid having the formula $HOOC-(CH_2)_m-COOH$, where m is about 18 to about 54; and

(4) about 2 to about 8 phr of a curing agent for said diglycidyl ethers;

(B) extruding said composition;

(C) cooling said composition to form a solid; and

(D) grinding said composition into a powder having a particle size of about 15 to about 74 microns; (II) curing said coating powder at about 125° to about 200° C for about 1 to about 10 minutes.

16. An article comprising a substrate having thereon a coating comprising a cured film less than 2 mils thick of a coating powder made by

(A) dry mixing a composition which comprises:

(1) a first diglycidyl ether of bisphenol A having an E.E.W. of about 400 to about 900 and a melting point of about 70° to about 110° C;

(2) a second diglycidyl ether of bisphenol A having an E.E.W. of about 750 to about 1400 and a melting point of about 100° to about 130° C, where said second diglycidyl ether is different from said first diglycidyl ether and the weight ratio of said first diglycidyl ether to said second diglycidyl ether is about 1 to 1 to about 12 to 1;

(3) about 10 to about 60% by weight based on the weight of the total composition of an epoxy ester, the epoxy portion of said ester being derived from a diglycidyl ether of bisphenol A having an E.E.W. of about 400 to about 900 and a melting point of about 70° to about 110° C, and the ester portion being derived from a dibasic acid having the formula $HOOC-(CH_2)_m-COOH$, where m is about 18 to about 54; and

(4) about 2 to about 8 phr of a curing agent for said diglycidyl ethers;

(B) extruding said composition;

(C) cooling said composition to form a solid; and

(D) grinding said composition into a powder having a particle size of about 15 to about 74 microns.

4,072,796

PROCESS FOR HYDROPHOBIZATION OF FINELY DIVIDED SILICA AND SILICATES USING PREPOLYCONDENSED ORGANOSILANE

Helmut Reinhardt, Rodenkirchen; Karl Trebinger, and Gottfried Kallrath, both of Wesseling, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Filed May 29, 1975, Ser. No. 581,890

Claims priority, application Germany, July 25, 1974, 2435860

Int. Cl.² B32B *17/00;* C01B *33/18*

U.S. Cl. 428—405 **14 Claims**

1. In a process for the production of a finely divided hydrophobic silica or silicate by precipitation of an alkali silicate solution with a mineral acid or acidic metal salt solution and treatment of the acidic wet suspension at a temperature of about 50° to about 90° C. with an organohalosilane as a hydrophobizing agent, filtering, washing and drying of the organohalosilane treated precipitate and then tempering at about 300° to 400° C. the improvement comprising employing as the organohalosilane either a prepolycondensed organohalosilane or a prepolycondensed mixture of organohalosilanes, said prepolycondensed organohalosilane or mixture thereof having been prepared by reacting said organohalosilane or mixture of organohalosilanes with a stoichiometrical amount of water said prepolycondensed organo-silane having up to 6 silicon atoms.

4,072,797

DIFFUSION BARRIER AND SEPARATION SUBSTANCE FOR METAL PARTS ADJOINING EACH OTHER IN AN OXYGEN FREE ATMOSPHERE

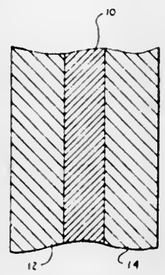
Hans Gass, Neuchatel; Hans Erich Hintermann, Ins, both of Switzerland, and Hartmut Griepentrog, Oberhausen, Germany, assignors to Laboratoire Suisse de Recherches Horlogeres, Switzerland and Gutehoffnungshutte Sterkrade Aktiengesellschaft, Germany

Filed Aug. 4, 1975, Ser. No. 601,538

Claims priority, application Germany, Aug. 28, 1974, 2441260

Int. Cl.² C01B *21/06, 35/08;* B32B *15/04*

U.S. Cl. 428—409 **4 Claims**



1. A diffusion barrier and separation substance for metal parts adjoining each other in an oxygen-free, inert, and preferably in a helium-containing atmosphere such as is used in a closed-cycle high-temperature reactor, comprising first and second metal parts with a hexagonally crystallized boron nitride forming a diffusion barrier and separation between said parts, wherein said hexagonally crystallized boron nitride is applied as a suspension to the adjoining metal parts, said metal parts being of a nickel-containing alloy and having smooth boundary surfaces therebetween, said parts being mounted for sliding relative movement in a thermoelastic suspension.

4,072,798

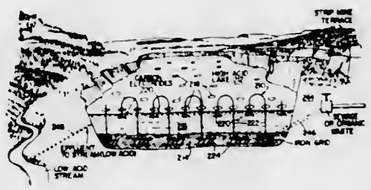
BIOELECTRIC NEUTRALIZATION OF ACID WATERS

Frederick D. Sisler, Washington, D.C., and Frank E. Senftle, Chevy Chase, Md., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed July 26, 1977, Ser. No. 819,518

Int. Cl.² H01M *8/16*

U.S. Cl. 429—2 **24 Claims**



1. A process for the bioelectrical neutralization of a body of water having a bottom of anaerobic mud and an acid supernatant liquid, said liquid consisting essentially of acid sulfate-contaninint water, comprising the step of placing in the body of water an apparatus comprising:

A. a buoy;

B. an upper electrode suspended from the buoy;

C. a flexible insulated electrical conductor conductively attached to the upper electrode; and

D. a lower electrode conductively attached to the insulated electrical conductor;

wherein the buoy rides on the surface of the body of water;

wherein the upper electrode is suspended in the acid supernatant liquid;

wherein the lower electrode is embedded in the anaerobic mud.

4,072,799

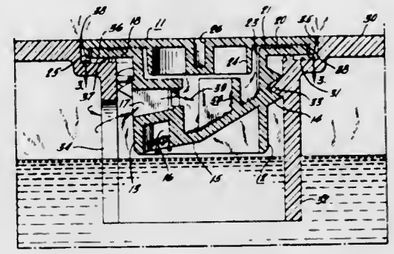
VENT PLUG SYSTEM FOR BATTERIES

Jeffrey S. Leeson, South Euclid, and Joseph F. Szabo, North Olmsted, both of Ohio, assignors to ESB Incorporated, Philadelphia, Pa.

Filed Apr. 13, 1977, Ser. No. 787,020

Int. Cl.² H01M *2/12*

U.S. Cl. 429—82 **19 Claims**



1. A vent plug for insertion into a vent well of an individual cell of a battery, wherein said vent plug is designed to separate the gaseous and liquid phases of the fluid passing through it from the particular battery cell, said vent plug comprising:

a. a body portion for insertion into the vent well, said body portion having a predetermined length;

b. a bottom portion connected to the lower portion of the body portion;

c. at least one drain opening located in or near the bottom portion;

d. cap means secured over the upper portion of the body portion, thereby defining an internal enclosure inside the body portion;

e. inlet means for directing fluid flow from the battery cell

into the internal enclosure in a horizontal direction and at a point above the drain opening;

f. discharge port means located in the upper portion of the vent plug, for permitting fluid within the internal enclosure to enter the atmosphere; and

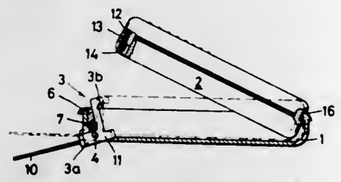
g. vertical baffle means having at least a portion of said means opposite the inlet means, so that as fluid flows into the vent plug enclosure through the inlet opening its flow is diverted by said baffle means, thereby causing the liquid phase of the fluid to be separated from the gaseous phase, with the gaseous phase entering the atmosphere through the discharge port means and the liquid phase returning to the particular cell through the drain opening.

4,072,800

ELECTRIC STORAGE BATTERY ARRANGEMENT FOR USE IN ELECTRICALLY DRIVEN PROSTHETIC DEVICES

Peter Gammer, Duderstadt, Germany, assignor to Otto Bock Orthopadische Industrie K.G., Duderstadt, Germany

Filed Sept. 21, 1976, Ser. No. 725,192
Claims priority, application Germany, Sept. 26, 1975, 2542933
Int. Cl.² H01M *2/10*
U.S. Cl. 429—97 **15 Claims**



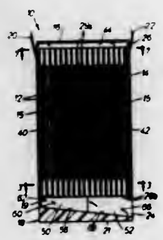
1. An electric storage battery arrangement for use in a prosthetic device of the type having an electric drive and an electric circuit for the same, comprising, in combination, a mounting frame adapted to be mounted on the prosthetic device; a storage battery interchangeably insertable into said mounting frame and having a pair of electric terminals configurated with respective slots; and a pair of electric contacts arranged in the electric circuit and constructed as contact blades receivable in said respective slots for establishing electric contact with said electric terminals of said storage battery when the latter is inserted into said mounting frame.

4,072,801

DEFERRED ACTION BATTERY HAVING IMPROVED BOTTOM PORT COVER

Leonard Joseph Burant, Milwaukee, and James Thomas Daley, Grafton, both of Wis., assignors to Globe-Union Inc., Milwaukee, Wis.

Filed Apr. 4, 1977, Ser. No. 784,254
Int. Cl.² H01M *6/34*
U.S. Cl. 429—110 **8 Claims**



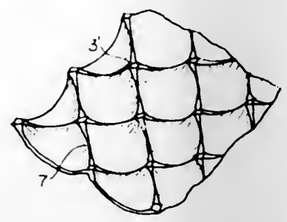
1. A deferred action battery comprising: a casing having a chamber; an electrode assembly disposed within said chamber and including a plurality of stacked parallel electrode plates and spacing means disposed intermediate said electrode plates for maintaining predetermined electrolyte receiving spacings between said electrode plates, and said electrode assembly having opposite ends; and a bottom port cover positioned adjacent one of said opposite ends, said bottom port cover comprising a body having a plurality of sides and an upper surface positioned adjacent said one of said opposite ends, a water inlet opening in one of said sides, and a precipitate receiving cavity in said upper surface and in communication with at least one of said electrolyte receiving spaces for receiving precipitate from said one of said electrolyte receiving spaces, and a channel between said opening and said precipitate receiving cavity, said channel being transverse to said parallel electrode plates, and whereby upon immersion of said batteries in electrolyte, electrolyte may flow through said water inlet opening and said channel into said precipitate receiving cavity and into said spaces and precipitate can be emitted from said battery through said cavity and said water inlet opening.

4,072,802

STORAGE BATTERY, SEPARATOR THEREFOR

Kazuo Murata; Shiro Tanso, and Junzo Yamao, all of Takatsuki, Japan, assignors to Yuasa Battery Company Limited, Takatsuki, Japan

Continuation-in-part of Ser. No. 592,344, July 1, 1975, abandoned. This application Jan. 27, 1977, Ser. No. 763,038
Claims priority, application Japan, July 11, 1974, 49-79916
Int. Cl.² H01M *2/18*
U.S. Cl. 429—147 **18 Claims**



1. A lead-acid storage battery comprising a container, at least one set of battery plates, one plate of the set being a positive plate and another being a negative plate, and a separator interposed between the positive and negative plates, the microporous separator comprising a microporous sheet of heat meltable synthetic resin containing film of less than 0.5 mm in thickness and having submicron micropores, said microporous sheet having a plurality of independent limited embossed parts projecting outwardly from the separator toward the positive plate, each of said projecting embossed parts being substantially less than 1 cm^2 in area and the height of the embossed parts being less than 1.5 mm, the number of embossed parts on the sheet being more than 50 per square 100 cm^2 of sheet, the projecting embossed parts being connected substantially with projecting embossed channels which help gas formed in the cell escape upward out of the cell, the height of the projecting embossed channels being lower than the height of said projecting embossed parts, and the pores of said embossed parts being at least partially closed.

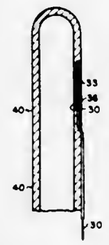
4,072,803

LITHIUM HALIDE CELL

Alan Arthur Schneider, Baltimore, Md., assignor to Catalyst Research Corporation, Baltimore, Md.

Filed Aug. 20, 1976, Ser. No. 716,339
Int. Cl.² H01M *2/26*
U.S. Cl. 429—181 **8 Claims**

1. A lithium halide battery comprising a lithium anode receiving vessel; a cathode current collector having a nonconductive positioning frame and a lead attached thereto, said lead having insulation over a substantial portion and being embedded within the lithium of said vessel throughout a substantial



part of the insulated portion of said lead; a cathode material positioned in contact with said cathode current collector; and a lithium halide electrolyte coextensively positioned between and in contact with said anode receiving vessel and cathode material.

4,072,804

CROSS-LINKABLE EPOXY RESIN CASTING COMPOUNDS

Wolfgang Kleeberg, Erlangen; Heinz Hacker, and Klaus-Robert Hauschildt, both of Nurnberg, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 26, 1975, Ser. No. 617,234
Claims priority, application Germany, Sept. 30, 1974, 2446697
Int. Cl.² C08G *59/42*
U.S. Cl. 526—11.2 **14 Claims**

1. An epoxy casting composition capable of being converted to insoluble and unmeltable crosslinked polymers by polyaddition and polymerization comprising a mixture of a polyepoxide, a polycarboxyl-containing compound selected from the group consisting of a polycarboxylic acid, a polycarboxylic acid anhydride and mixtures thereof, a polymerization-initiating radical former, and maleic acid monoallyl ester, said ester being present in said mixture as:

(a) an adduct to said polyepoxide, said adduct containing free epoxy functions; or

(b) free maleic acid monoallyl ester; or

(c) a combination of (a) and (b).

4,072,805

METHOD FOR PRODUCING POLYMERS

František Hrabák; Milan Bezděk; Vlasta Hynková, and Karel Bouchal, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Continuation of Ser. No. 281,285, Aug. 17, 1972, abandoned, which is a continuation of Ser. No. 187,813, Oct. 8, 1971, abandoned. This application Oct. 7, 1974, Ser. No. 512,428
Claims priority, application Czechoslovakia, Oct. 9, 1970, 6829/70
Int. Cl.² C08F *8/18, 8/34*
U.S. Cl. 526—43 **11 Claims**

1. A process for forming polymer gel by chemically connecting at least two polymeric molecules each of which contains at least one chemically bound tertiary amino group and which polymeric molecules are polymers and copolymers selected from the group consisting of poly (dimethylaminoethyl) methacrylate and poly (dimethylaminoethyl) acrylate, comprising the steps of mixing said polymeric molecules together, contacting the mixture with a material selected from the group consisting of elemental halogens, halogen containing organic compounds and inorganic halogen compounds of the elements of the third, fourth, fifth, sixth, seventh and eighth groups of the Periodic Table in an amount and for a time sufficient to cause substantially complete reaction of the tertiary amino groups in the mixture of polymeric molecules with said contacting material to form a connected polymeric product and thereafter recovering said product.

4,072,806

NOVEL VINYL CHLORIDE POLYMERS AND PROCESS FOR THEIR PRODUCTION

Mani Ravey; Leonard Marshall Shorr, both of Haifa, Israel, and Jacques A. Waterman, deceased, late of Haifa, Israel (by Jacob Frankel, administrator), assignors to IMI (TAMI) Institut for Research and Development, Haifa, Israel

Filed Feb. 23, 1976, Ser. No. 660,250
Claims priority, application Israel, Feb. 21, 1975, 46681
Int. Cl.² C08F *14/06*
U.S. Cl. 526—89 **13 Claims**

1. In a process for the production of thermoplastic vinyl chloride polymers having a Vicat temperature of at least 78° C. and improved flow characteristics, by free radical initiated polymerization of a mixture of monomers consisting of (a) vinyl chloride and (b) a monomer copolymerizable therewith the improvement which comprises employing as (b) from 50 ppm to 1% by weight of the mixture of at least one chain branching agent selected from the group consisting of triallyl cyanurate diallyl phthalate and vinyl crotonate, and conducting the polymerization in the presence of from 500 ppm to 5% by weight of the mixture of at least one chain transfer agent selected from the group consisting of unsubstituted and substituted aliphatic aldehydes, unsubstituted and substituted mercaptans, and C_1 and C_2 hydrocarbons containing 3 or 4 atoms of chlorine or bromine in the molecule.

4,072,807

MOLECULAR WEIGHT REDUCTION OF UNSATURATED POLYMERS

Carl A. Uraneck, and James D. Brown, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 352,741, April 19, 1973, Pat. No. 3,917,576, which is a continuation of Ser. No. 72,241, Sept. 14, 1970, abandoned. This application July 31, 1975, Ser. No. 600,551
Int. Cl.² C08C *19/26;* C08F *8/42*
U.S. Cl. 526—48.1 **38 Claims**

1. The process of decreasing the molecular weight of a polymer wherein said polymer is a polymer of a cyclomonoolefin, wherein said process comprises contacting said polymer with an effective amount of a homogeneous olefin disproportionation catalyst under contacting conditions of temperature and pressure at which said disproportionation catalyst is active for the olefin reaction, whereby the molecular weight of said polymer is decreased,

wherein said homogeneous catalyst comprises (a) a transition metal compound and (b) an organometallic compound in a ratio of said (b):(a) effective to decrease said molecular weight,

wherein said (a) transition metal compound is represented by the formula $(L_aM_cZ_d)_x$ wherein each L represents an organic or inorganic ligand; M is molybdenum, tungsten, rhenium, ruthenium or rhodium; Z is a halide, —CN, —SCN, —OCN, or $-SnCl_3$ radical; a and d each represent a number 1 to 5, c represents a number 1 to 4; x represents a number indicative of the polymeric state of the compound; and wherein at least one of L and Z is present in said $(L_aM_cZ_d)_x$, and

wherein said (b) organometallic adjuvant comprises (1) R_eAlX_f (2) a mixture of compounds of (1), (3) a mixture of one or more of AlX_3 or R_eAlX_f compounds with one or more compounds represented by the formula $R_g{}^1M^1X_h$, (4) $R_gM^1Y_h$ compound, (5) AlX_3 compound, or (6) $M^1M^2H_r$, wherein each R is an aromatic or saturated aliphatic hydrocarbon radical having up to 20 carbon atoms including alkoxy and halo derivatives thereof, wherein each X is halogen, Y is halogen or hydrogen, each M^1 is a metal of Group IA, IIA, IIB, or IIIA, except Al, each M^2 is a metal

of Group IA, IIA, IIB, or IIIA; *e* represents a number of 1 to 3, *f* represents a number of 0 to 2, such that the sum of *e* and *f* equals 3; *g* represents a number of 1 to 3, *h* represents a number of from 0 to 2, such that the sum of *g* and *h* is equal to the valence of M^1, *j* is an integer equal to the sum of the valences of M^1 and M^2.

4,072,808

PROCESS FOR PREPARING ELASTOMERS FOR PRESSURE-SENSITIVE ADHESIVE APPLICATION

Pallavoor R. Lakshmanan, Houston, Tex.; Harold E. Swift, Gibsonia, and Ching Yong Wu, Pittsburgh, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 29, 1976, Ser. No. 755,161
Int. Cl.² C08F *4/70, 240/00*
U.S. Cl. 526—76 **18 Claims**

1. In a process for preparing an elastomer comprising copolymerized C_5-hydrocarbons prepared from a hydrocarbon mixture containing C_5-monoolefinic hydrocarbons, C_5-diolefinic hydrocarbons C_5-paraffins, C_6-paraffins and benzene which comprises (A) heat-soaking said hydrocarbon mixture at a temperature sufficient to dimerize cyclopentadiene; (B) separating the resulting hydrocarbon mixture from the cyclopentadiene dimer; (C) copolymerizing the resulting hydrocarbon mixture in the presence of a catalyst which comprises an iron complex, a trialkyl aluminum and a bidentate ligand capable of both pi and sigma bonding to form an elastomer.

4,072,809

CATALYST AND PROCESS FOR THE POLYMERIZATION OF ALPHA-OLEFINS

John B. Rogan, Glen Ellyn, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 434,486, Jan. 18, 1974, abandoned. This application Mar. 3, 1975, Ser. No. 554,599
Int. Cl.² C08F *4/66, 10/06*
U.S. Cl. 526—136 **22 Claims**

1. A polymerization catalyst composition which comprises:
(a) an alkylaluminum compound selected from the group consisting of a trialkyl aluminum, a mixture of a trialkyl aluminum and an alkylaluminum dichloride or dibromide, a mixture of a trialkyl aluminum and a dialkylaluminum chloride or bromide and a dialkylaluminum chloride or bromide;
(b) an effective amount up to about 10 mol percent of hydrogen sulfide based upon the amount of alkylaluminum compound present;
(c) an activated titanium trichloride; and
(d) an effective amount of an additive which is selected from the group consisting of trihydrocarbylphosphites, sterically hindered, lower alkyl substituted, cyclic, tertiary amines and sterically hindered, lower alkyl substituted, cyclic, amine oxides;
said amounts effective to result in a substantial reduction of alkane solubles while not seriously affecting the total yield of polymer.

4,072,810

COUPLED PEROXIDES

Antonio Joseph D'Angelo, Buffalo; Orville Leonard Mageli, and Chester Stephen Sheppard, both of Kenmore, all of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 737,359, June 17, 1968, Pat. No. 3,725,455. This application Mar. 16, 1973, Ser. No. 342,110
Int. Cl.² C08F *4/00, 112/08*
U.S. Cl. 526—230 **4 Claims**

1. In the process for preparing solid polymers or copolymers by the polymerization of vinyl monomers using a free radical initiator, the improvement which comprises using as said initiator a peroxide of the formula R—W—R' where:
a. W is selected from —C(=O)— or —C(=O)R^4C(=O)—;
b. R and R' are identical and are selected from $R_3OO—C(R_1)(R_2)—R^3O—$, $(R_3OO)_2C(R_4)—R^2O—$, $R_3OOC(=O)R^3O—$, $R_3OOC(=O)OR^3O—$, $R_1OC(=O)OO—C(R_1)(R_2)—R^2O—$, and $R_1C(=O)OO—C(R_1)(R_2)—R^2O—$;
c. R_1 and R_2 are aliphatic having 1-12 carbon atoms, cycloaliphatic having 3-12 carbon atoms, or aromatic having 6-12 carbon atoms;
d. R_3 is aliphatic or cycloaliphatic, each having 4-10 carbon atoms and the carbon atom joined to the peroxy oxygen atom is a tertiary carbon atom;
e. R_4 is aliphatic having 1-10 carbon atoms or cycloaliphatic having 3-12 carbon atoms;
f. R_6 is H or lower alkyl;
g. Y is the diradical O, S, or N-R_6;
h. R^2 is an aliphatic diradical having 1-10 carbon atoms or a cycloaliphatic diradical having 3-12 carbon atoms;
i. R^3 is aliphatic diradical having 1-10 carbon atoms, cycloaliphatic diradical having 3-12 carbon atoms, aromatic diradical having 6-12 carbon atoms, or araliphatic diradical having 7-16 carbon atoms; and
j. R^4 is selected from R^3, YR^3Y, $R^3C(=O)YR^3YC(=O)R^3$, $YR^3YC(=O)YR^3YC(=O)YR^3Y$, $YR^3YC(=O)R^3C(=O)YR^3Y$, $YR^3C(=O)YR^3C(=O)YR^3Y$, $YR^3C(=O)YR^3YC(=O)R^3Y$, $YR^3YC(=O)YR^3Y$, $YR^3YC(=O)R^3Y$ and YR^3YR^3Y.

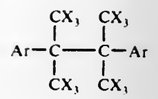
4,072,811

NOVEL CHLORINATED DICUMENE INITIATORS

Hendrik H. J. Oosterwijk, Diepenveen; Eduard P. Magre, Wiersum, and Wilhelmus M. Beyleveld, Olst, all of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Division of Ser. No. 621,985, Oct. 14, 1975, Pat. No. 4,036,898. This application Mar. 11, 1977, Ser. No. 776,794
Claims priority, application Netherlands, Oct. 17, 1974, 7413633
Int. Cl.² C08F *2/00, 12/02, 110/02, 218/18*
U.S. Cl. 526—346 **3 Claims**

1. A method for free-radical polymerization of ethylenically-unsaturated monomers containing at least 50% by weight of an aromatic vinyl group, an allyl compound or ethylene comprising employing as initiator a compound corresponding to the formula:



wherein Ar is an aryl group and X is hydrogen or chlorine and provided that at least 1 but not more than 5 X groups are chlorine.

4,072,812

POLY(HIGHER-1-OLEFIN/PROPYLENE) COPOLYMERS AS HOT-MELT PRESSURE-SENSITIVE ADHESIVES

Richard L. McConnell, Kingsport; Doyle A. Weemes, Greeneville, and Frederick B. Joyner, Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 563,534, March 31, 1975, Pat. No. 3,954,697. This application Feb. 2, 1976, Ser. No. 654,317
The portion of the term of this patent subsequent to May 4, 1993, has been disclaimed.
Int. Cl.² C08F *210/06, 210/08, 210/14*
U.S. Cl. 526—348.2 **12 Claims**

1. A hot melt, pressure sensitive adhesive comprising an amorphous propylene/higher 1-olefin copolymer containing 40 to 60 mole percent higher 1-olefin having a melt viscosity range at 190° C. of 10,000 cp. to 75,000 cp., a density of 0.85 to 0.86, a glass transition temperature of −30° to −45° C., and having no melting point measurable by Differential Scanning Calorimetry, wherein said higher 1-olefin is at least two members of the group consisting of 1-hexene, 1-heptene, 1-octene, 1-nonene and 1-decene.

4,072,813

POLY(HIGHER-1-OLEFIN/1-BUTENE) COPOLYMERS AS HOT-MELT PRESSURE-SENSITIVE ADHESIVES

Richard L. McConnell, Kingsport; Doyle A. Weemes, Greeneville, and Frederick B. Joyner, Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 11, 1976, Ser. No. 657,347
The portion of the term of this patent subsequent to May 4, 1993, has been disclaimed.
Int. Cl.² C08F *210/08, 210/14*
U.S. Cl. 526—348.2 **22 Claims**

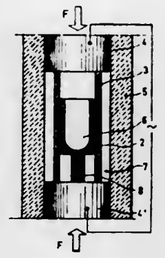
1. A hot melt, pressure sensitive adhesive comprising an amorphous 1-butene/higher 1-olefin copolymer or amorphous 1-butene/propylene/higher 1-olefin copolymer containing 40 to 60 mole percent higher 1-olefin hving a melt viscosity range at 190° C. of 10,000 cp. to 75,000 cp., a density of 0.85 to 0.86, a glass transition temperature of −30° to −45° C., and having no melting point measurable by Differential Scanning Calorimetry, wherein said higher 1-olefin is at least one member of the group consisting of 1-hexene, 1-heptene, 1-octene, 1-nonene and 1-decene.

4,072,814

FURNACE FOR MELTING METAL BY THE JOULE EFFECT

Pierre Gérard Boillot, Le Pecq, France, assignor to Institut de Recherches de la Siderurgie Francaise Irsid, Saint-Germain-en-Laye and Instruments S.A., Ivry-sur-Seine, both of, France

Filed May 10, 1976, Ser. No. 685,049
Int. Cl.[2] H05B *3/40*
U.S. Cl. 13—20 3 Claims



1. A device for melting a metal by Joule effect to enable extraction of the gases which the metal contains, said device comprising:

a hollow, tubular, vertical body constituted of graphite having high mechanical resistance and constituting a heater resistor,

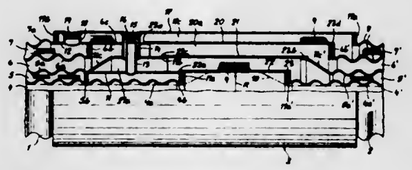
an upper and a lower heating electrode between which said tubular body is clamped, and a crucible of heat-conductive, porous material disposed in the interior of the hollow body and in open electrical circuit with said electrodes, said crucible being hollow for containing metal to be melted and having a bottom for said metal, and means for positioning said bottom above the lower electrode in thermal isolation therewith.

4,072,815

CABLE CONNECTION FOR LOW-TEMPERATURE CABLE

Ullrich Hildebrandt, Munich, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Aug. 6, 1976, Ser. No. 712,321
Claims priority, application Germany, Aug. 8, 1975, 2535487
Int. Cl.[2] H01B *12/00*
U.S. Cl. 174—15 S 10 Claims



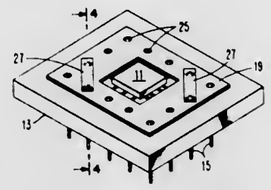
1. A cable junction comprising a first cable end and a second cable end, each of said cable ends comprising a first duct defining a central compartment and an electrical conductor and traversed by a first coolant, a second duct around said first duct and defining therewith an inner vacuum compartment, a third duct surrounding said second duct and defining therewith another coolant-traversed compartment, and a fourth duct surrounding said third duct and defining therewith an outer vacuum compartment; the compartments of one of said cable ends being offset radially outwardly in relation to the compartments of the other of said cable ends, the vacuum compartments of said one cable end axially overlapping the corresponding vacuum compartments of said other cable end, rigid wall means separatng the overlapping vacuum compartments from each other and said rigid wall means forming part of a rigid connection of said ducts of said other cable end from the interior to the exterior.

4,072,816

INTEGRATED CIRCUIT PACKAGE

Ronald Walker Gedney, and John Rasile, both of Endicott, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 13, 1976, Ser. No. 750,056
Int. Cl.[2] H05K *7/02*
U.S. Cl. 174—52 FP 5 Claims



1. A metallized ceramic package for high speed circuitry including

a ceramic substrate,

metallic circuit lines on said substrate,

an integrated circuit chip positioned on said substrate and connected to said circuit lines,

a plurality of connection pins passing through said ceramic substrate, each pin having a connection to one of said circuit lines,

a ground plane of conducting material positioned on top of said substrate, said ground plane having holes therein over said connections and over said integrated circuit chip whereby said ground plane can be in close proximity to a substantial portion of said substrate, and

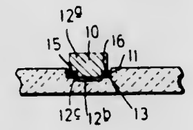
a layer of insulating material between said ground plane and said circuit lines.

4,072,817

METHOD OF MAKING SEMI-CONDUCTOR MOUNTS

John Stuart Waite, Powys, England, assignor to GKN Floform Limited, Powys, Great Britain

Filed Dec. 20, 1976, Ser. No. 752,290
Claims priority, application United Kingdom, Jan. 8, 1976, 597/76
Int. Cl.[2] H05K *5/00*
U.S. Cl. 174—52 H 13 Claims



1. A method of making a mount for a solid state semi-conductor comprising a mounting part secured to a body element comprising the steps of positioning a mounting part in contact with a body element, in a jig, the jig engaging the mounting part and having good thermal conductivity, subjecting the jig to a temperature above the melting point of the body element for a time to cause application of heat to the body element in the region of the interface between the body element and the mounting part by conduction of heat from the jig through the mounting part to the body element to raise the temperature of the region of the interface above its melting point to cause localized melting of the body element only in said region of the interface to cause fusion bonding of the mounting part of the body element and thereafter cooling the jig at a rate such that

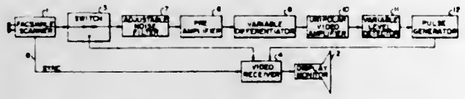
the remainder of the body element remains below its melting point.

4,072,818

SYSTEM FOR CONVERTING TONAL IMAGES TO LINE DRAWINGS

John W. Coviello, Owings Mills, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 10, 1975, Ser. No. 585,641
Int. Cl.² H04N *7/13*
U.S. Cl. 358—284 **6 Claims**



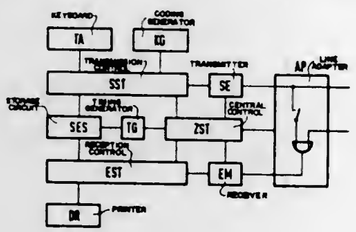
1. A device for electronically and instantaneously converting a tonal image to a line drawing comprising, scanning means to scan said image and produce a time varying video signal representative of the level of intensity of said tonal image as the image is scanned, a passive differentiator responsive to said video signal for producing substantially instantaneously a first intermediate signal which consists of a pulse for each change in level of said video signal, said pulses being representative of the approximate first time derivative of the time varying signal and being positive for any increase in level and negative for any decrease in level, a unipolar amplifier to amplify said first intermediate signal and produce a second intermediate signal, said second intermediate signal consisting of amplified pulses of the same polarity corresponding to the respective ones of positive and negative pulses of said first intermediate signal, an adjustable level detector responsive to all pulses of said second intermediate signal which are above a predetermined adjustable level for producing a third intermediate signal, a pulse generator responsive to said third intermediate signal for producing an output signal consisting of a pulse of constant magnitude and width for each pulse of said third intermediate signal, and a video receiver having video display means responsive to said output signal for displaying a line drawing, said video receiver being synchronized with said scanning means, whereby a line drawing of a tonal image may be instantaneously displayed by a video receiver and the selection of lines in the line drawing in accordance with its respective significance in the tonal image may be instantaneously made by manually adjusting the level detector.

4,072,819

CIRCUIT ARRANGEMENT FOR STORING INFORMATION FORMED OF TELETYPE CHARACTERS

Martin Ludwig, and Wennemar Eickenscheidt, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Oct. 4, 1976, Ser. No. 729,462
Claims priority, application Germany, Dec. 19, 1975, 2557494
Int. Cl.² H04L *13/08*
U.S. Cl. 178—17.5 **13 Claims**



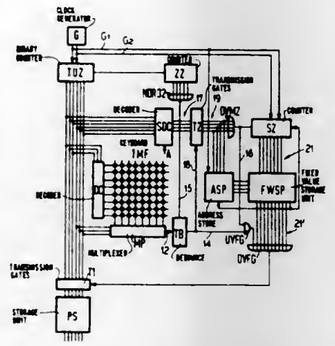
1. A circuit arrangement for storing messages formed of Teletype characters in a Teletype system having a reception control which can be supplied with Teletype characters from a Teletype line and an input device, and which contains a transmission control which can emit Teletype characters towards a Teletype line and the reception control, comprising:
   (a) a read and write memory unit supplied with Teletype characters from received and written-in messages via the reception control; and
   (b) a read and write memory means in said memory unit having electronically triggerable memory elements for storage of Teletype characters which are not changed when an operational voltage feeding the memory unit is switched off, said memory means emitting the Teletype characters of a message which is to be transmitted to the transmission control.

4,072,820

APPARATUS FOR CODING INPUT DATA CHARACTERS

Gerd-Joachim Günther, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 24, 1976, Ser. No. 726,405
Claims priority, application Germany, Sept. 25, 1975, 2542864
Int. Cl.² G06F *3/14*
U.S. Cl. 178—23 R **6 Claims**



1. Apparatus for the input coding of keyboard data characters comprising, a keyboard having a plurality of row lines and a plurality of column lines, means for interconnecting a row line with a column line in response to the depression of a key of the keyboard, counter means for sequentially manifesting coded representations of all of the keys of said keyboard, normally operative means for transmitting a said coded representation to an output at a time corresponding to the representation by said counter means of an operated key of said keyboard, detector means for detecting codes representative of special characters, means for inhibiting transmission of the special character-representative code, an auxiliary counter, means for initiating operation of the auxiliary counter in response to detection of a code representative of a special character, and means interconnected with said auxiliary counter for transmitting coded representations produced by said main counter at times when said representations correspond to plural code representations to be substituted for said special character-representative code.

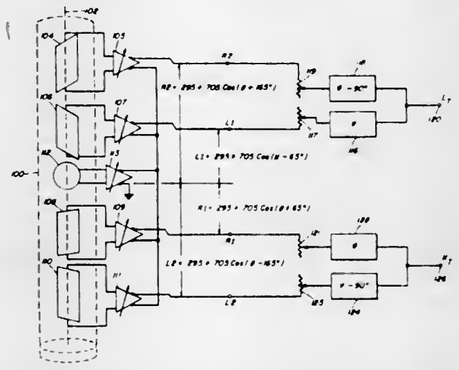
4,072,821

MICROPHONE SYSTEM FOR PRODUCING SIGNALS FOR QUADRAPHONIC REPRODUCTION

Benjamin B. Bauer, Stamford, Conn., assignor to CBS Inc., New York, N.Y.

Filed May 10, 1976, Ser. No. 685,065
Int. Cl.² H04R *5/00*
U.S. Cl. 179—1 GQ **10 Claims**

10. An array of at least four microphones supported in close proximity with each other and each operative to produce when disposed within a field of surround-sound sources an electrical signal defined by a predetermined limacon sensitivity pattern the directions of maximum sensitivity of said at least four microphones being oriented at different predetermined angles relative to a 0° reference direction, a first and a second



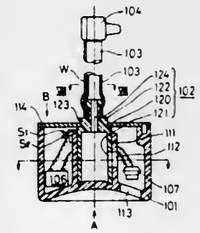
of said signals defining patterns of substantially similar shape whose directions of maximum sensitivity are oriented at about −65° and +65°, respectively, from said reference direction, and a third and a fourth of said signals defining patterns of substantially similar shape whose directions of maximum sensitivity are oriented at about −165° and +165°, respectively, from said reference direction.

4,072,822

TWO-WAY STETHOSCOPE FOR DIRECT AND AMPLIFIED SOUND

Yoshihito Yamada, 2-9, Imagawa 4-chome, Suginami-ku, Tokyo, Japan

Filed Sept. 27, 1976, Ser. No. 727,087
Int. Cl.² A61B *7/04*
U.S. Cl. 179—1.5 T **3 Claims**



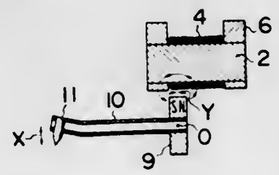
1. A two-way stethoscope, for use selectively with direct and amplified transmission of sound comprising:
   (i) a hollow generally cylindrical contactor body having an end wall with a plurality of sound pickup holes therein, and having an inner cylindrical wall with a plurality of communication holes therein;
   (ii) a hollow cylindrical turn tube having a plurality of communiction holes therein, said turn tube being engaged within said inner cylindrical wall of said contactor body;
   (iii) a sound tube having two ends, said tube being connected at one end to said turn tube and communicating with the interior thereof;
   (iv) at least one earphone provided at the other end of said sound tube, said earphone being hollow and including an electromagnet and a diaphragm;
   (v) a microphone means, for transforming sound entering through said pickup holes into electric signals, arranged in the hollow space of said contactor body;
   (vi) an amplifying means connected to said microphone means;
   (vii) an electric current source for said amplifying means;
   (viii) a conducting lead integral with said sound tube, said lead connecting at one end to said amplifying means and at the other end to said earphone, and
   (ix) a switching means for interrupting the current flow between said current source and said amplifying means, said switching means consisting of a first switch contact mounted on said turn tube and a second switch contact mounted on said contactor body, said first and second contacts being positioned so as not to be in contact with each other when the turn tube is in a position of rotation with respect to the contactor body in which the communication holes of the turn tube coincide with the communication holes of the contactor body, said contacts being adapted to contact each other in another position of relative rotation in which the respective communication holes do not coincide.

4,072,823

MOVING MAGNET PICKUP

Tsugikuma Minamizono, Numazu, Japan, assignor to Kabushiki Kaisha Mitachi Onkyo Seisakusho, Japan

Filed May 28, 1976, Ser. No. 691,077
Claims priority, application Japan, June 6, 1975, 50-68415; Aug. 22, 1975, 50-101755; Apr. 12, 1976, 51-41076; Apr. 19, 1976, 51-44224
Int. Cl.² H04R *11/12*
U.S. Cl. 179—100.41 M **5 Claims**



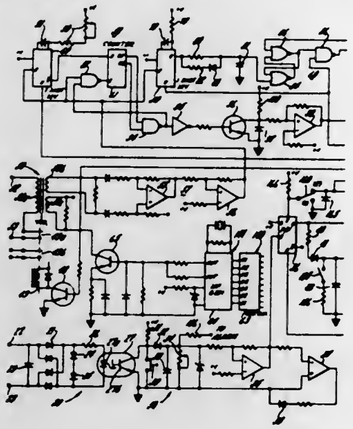
1. An electrodynamic type cartridge comprising
two longitudinally extending coiled bodies each comprised of a pillar-shaped frame or core made of magnetic permeable material and each would by coils along its longitudinal direction, the center axes of said two coiled bodies being positioned in parallel with each other;
a magnet formed integrally with a stylus cantilever, the center axis of which is disposed in parallel with the axes of said two coiled bodies and on the plane dividing equally the distance between the axes of said two coiled bodies, said magnet positioned with respect to said two coiled bodied such that it respectively forms a complete magnetic circuit with each of said cores by utilizing only the respective cores for the major portion of its magnetic path,
the coils of the two coiled bodies being wound through only a portion of its respective core, the magnet being adapted movably whereby the constant flux from the magnet directly cuts the respective coils in a direction substantially perpendicular thereto, and wherein said coils and magnet are cooperatively positioned whereby the induced output voltage from the coils have the same phase.

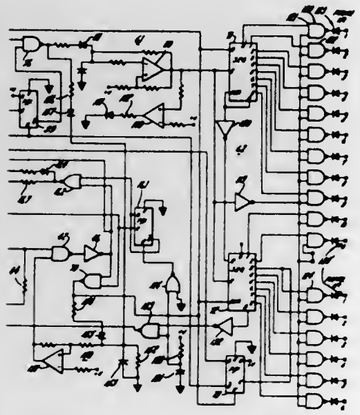
4,072,824

AUTOMATIC DIALER FOR PAGING SYSTEM OR THE LIKE

Robert C. Phillips, Chicago, Ill., assignor to Gimix, Inc., Chicago, Ill.

Filed Apr. 26, 1976, Ser. No. 680,200
Int. Cl.[2] H04M 3/42
U.S. Cl. 179—18 B 40 Claims





1. An automatic dialer for use with an automatic telephone answering machine and a central paging system, wherein the answering machine is connected to a telephone line for automatically answering calls and recording messages and the central system is of the type accessible by dialing a telephone number assigned thereto, the central system after answering a call placed thereto being adapted to accept dialed digits corresponding to the number assigned to a pager and to respond thereto by signaling that pager, said automatic dialer comprising in combination, means coupled to said telephone line for detecting the busy/idle status of the answering machine and producing an activating signal in response to a message left with said answering machine, calling cycle means responsive to said activating signal for performing a calling cycle comprising.

means for seizing a telephone line, means for detecting dial tone on said seized line, programmed telephone number dialing means initiated by said dial tone detecting means for dialing the number of said central system, means for sensing a responsive signal on said seized line indicating that the central system has answered, programmed pager number dialing means initiated by said responsive signal sensing means for dialing the number of said pager thereby to instruct the central system to signal the associated pager, and means for resetting

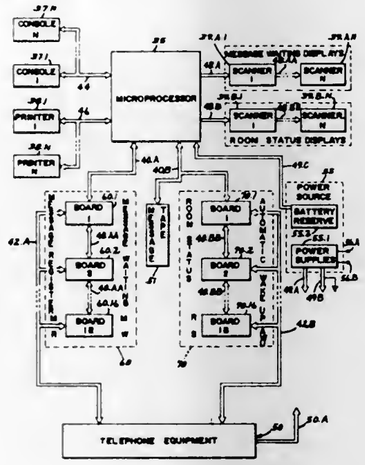
said calling cycle means after completion of a calling cycle, and reinitiating means for releasing said seized line and reinitiating a calling cycle if said calling cycle is aborted.

4,072,825

HOTEL/MOTEL AUTOMATIC CONTROL SYSTEM

Gerald M. McLay, St. Paul; Calvin D. Houdek, Lake Elmo, both of Minn., and Charles B. Yancey, Los Angeles, Calif., assignors to Mi-Tronics, Inc., St. Paul, Minn.

Filed June 30, 1976, Ser. No. 701,430
Int. Cl.[2] H04M 3/42; H04Q 3/54
U.S. Cl. 179—18 B 19 Claims



1. An automated monitoring and control system for establishments of the type having a plurality of occupant rooms each having at least one telephone set, an equipment bay for housing telephone control circuit means for the room telephone sets, and at least one pair of telephone signal conductors interconnecting each of the room telephone sets to the telephone control circuit means within the equipment bay, said control system comprising:

a. a plurality of feature circuit means operatively connected with the telephone control circuit means within the equipment bay for detecting the electrical status of a plurality of different occupant and room status related parameters, and for providing output control functions related to said parameters in response to received digital command signals; said plurality of feature circuit means comprising at least one electronically addressable feature circuit operatively identifiable with each of the occupant rooms and associated with said parameters thereof, wherein each said feature circuit is operatively connected for signal communication with the telephone set within that room with which it is identifiably associated;

b. microprocessor control means operatively connected to said plurality of feature circuits, and suitable for operative connection to one or a plurality of remotely located desk consoles, for automatically electronically monitoring and controlling in response to firmware program execution said plurality of occupant and room status parameters, on an individual room basis; said microprocessor control means being operable to sequentially and selectively electronically address individual ones of said feature circuits, to interrogate and process said electrical status conditions of said addressed feature circuits and to provide as a result of said processing, said digital command signals to said addressed feature circuits, said microprocessor control means comprising:

i. central processing means for performing, in response to firmware program instructions, arithmetic, logical and manipulative operations on and in response to digital information;

ii. firmware read only memory means operatively connected to said central processing means, for storing hardwired program instructions, and subroutines and routines comprising a plurality of said program instructions;

iii. random access memory means operatively connected with said central processing means for storing digital information under direction of said central processing means; and

iv. input/output circuit means connecting in circuit said processing means with said plurality of feature circuit means for operatively transmitting digital information including said detected electrical status signals and said digital command signals therebetween;

c. at least one personalized desk console means configured for manual activation by an operator for providing an input/output communication link between the operator and said microprocessor control means; said desk console means comprising a portable chassis member suitable for placement upon a desk surface, said chassis member including a plurality of push-button input selector switching means for generating encoded digital input signals for said microprocessor control means in response to manual activation stimuli, and electronic visual display means responsive to said digital command signals from said microprocessor control means for providing visual output indications of the real-time status of said plurality of parameters on an individual room basis; and

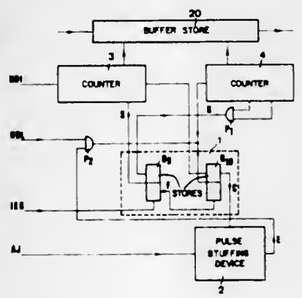
d. signal flow path means operatively connecting said personalized desk console means with said input/output circuit means of said microprocessor control means for transferring said encoded digital signals and said digital command signals therebetween.

4,072,826

PULSE STUFFING DEMAND GENERATING DEVICE

André Auguste Aveneau, Clamart, France, assignor to Scholeman-Siemag Aktiengesellschaft, Germany

Filed Mar. 30, 1976, Ser. No. 671,822
Claims priority, application France, Apr. 18, 1975, 75 12178
Int. Cl.[2] H04J 3/06
U.S. Cl. 179—15 AF 2 Claims



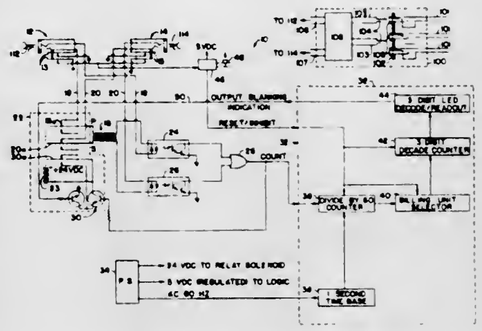
1. A pulse stuffing demand generating device of the kind comprising means for comparing the phases of the write clock signals HDI and the read clock signals HDL of a buffer store in which are written and read multiplexed digital information, the said store having a capacity of n binary digits, wherein the said means comprise first means for comparing the phases of the rising edges of signals HDL and HDI, the said first means supplying a pulse stuffing demand signal when the rising edge of signal HDL is located in the "one" portion of the HDI signal, and second means for supplying a signal authorising the operation of the said first means, the said signal being supplied when one among n rising edges of the HDI signal is located in the "zero" portion of a signal resulting from the division by n of the HDL signal and the duration of which is equal to one binary digit time slot.

4,072,827

TELEPHONE PATCHING APPARATUS

Robert C. Oman, 120 Pierce St., #4, San Francisco, Calif. 94117

Continuation-in-part of Ser. No. 723,385, Sept. 15, 1976, abandoned. This application Feb. 3, 1977, Ser. No. 765,174
Int. Cl.[2] H04M 5/04
U.S. Cl. 179—42 8 Claims



1. Apparatus for coupling external calls through a telephone switchboard comprising:

first and second signal lines;

jack means for connecting a phone plug to each of said signal lines;

transformer means for inductively coupling said first and second signal lines:

switching means in each of said signal lines for making and breaking the signal path through said lines;

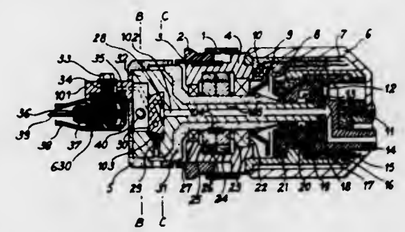
call sensing means for independently detecting continuity in each of said signal lines and for providing a binary signal indicating, in a first state, the joint energization of said signal lines and, in a second state, the absence of energization of either of said signal lines; means for registering said joint energization after a preselected period provided by a delay means; and means for automatically activating said switching means to break said signal paths in response to said binary signal in said second state after said binary signal in said first state.

4,072,828

ROTATIVE WELDING GUN

Paul Thome, Saint-Cloud, France, assignor to Mecazo, Feuquieres en Vimeu, France

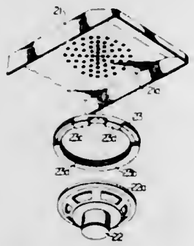
Filed Dec. 10, 1976, Ser. No. 749,500
Claims priority, application France, Dec. 10, 1975, 75 37801
Int. Cl.[2] B23K 9/12
U.S. Cl. 219—137.31 11 Claims



1. A rotative welding gun comprising:

a welding torch adjustably mounted on a movable block and rotatively mounted on a gun body;
a flat pancake motor with annular stator and rotor members for rotating said movable block with respect to said gun body;
a front portion of said movable block carrying said torch and being directly exposed outside said body so as to face a workpiece to be welded;
a rear portion of said movable block passing axially through said annular rotor member of said motor within said body, said rear portion being rigidly connected with said rotor member whereas said stator member of said motor is rigidly connected with said body.

4,072,829
ATTACHMENT FOR LOUDSPEAKER
Kenzo Ogihara, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Aug. 30, 1976, Ser. No. 718,927
Claims priority, application Japan, Sept. 1, 1975, 50-120506[U]
Int. Cl.² H04R *1/02*
U.S. Cl. 179—146 R **4 Claims**

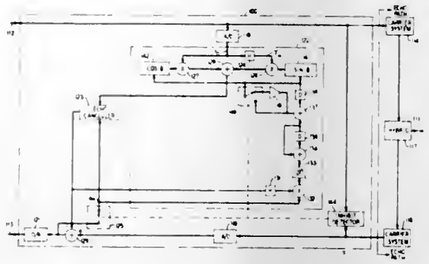


1. An attachment for a loudspeaker comprising a resilient mounting frame of a configuration conforming to the outer periphery of a loudspeaker and extending around an opening thereof, a groove formed in the inner circumferential surface of the frame for receiving the peripheral flange of the loudspeaker has a tight fit, and means for bonding the frame to a loudspeaker mounting surface;
the said frame is annular in configuration, the edge of the groove which is remote from the edge bonded to the mounting surface comprising a semi-circular edge portion and at least one sector-shaped edge portion spaced from the semi-circular portion and subtending an angle of the order of 10°.

2. An attachment for a loudspeaker comprising a resilient mounting frame of a configuration conforming to the outer periphery of a loudspeaker and extending around an opening thereof, a groove formed in the inner circumferential surface of the frame for receiving the peripheral flange of the loudspeaker has a tight fit, and means for bonding the frame to a loudspeaker surface;
the width of the said groove increasing with depth, with an edge of the groove which is remote from the edge being bonded to the mounting surface having an inclined inner surface.

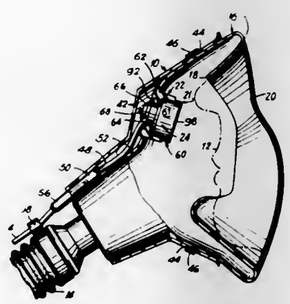
4,072,830
VARIABLE PHASE SHIFTER FOR ADAPTIVE ECHO CANCELLERS
Richard Dennis Gitlin, Monmouth Beach, and John Stewart Thompson, Tinton Falls, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Oct. 4, 1976, Ser. No. 729,004
Int. Cl.² H04B *3/24*
U.S. Cl. 179—170.2 **9 Claims**

1. Echo cancelling apparatus comprising a variable phase shifter and an adaptive echo canceller connected in series and forming a shunt signal path across an echo path containing an echo signal which includes a time-varying phase shift, said shunt path producing an output signal formed by the serial signal processing of said phase shifter and said canceller, subtracting means for producing a residual echo as the difference between the output signal and the echo signal, said canceller



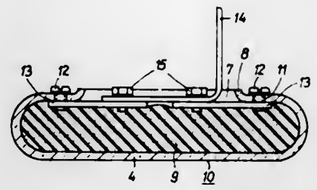
responsive to the residual echo by changing the output signal to reduce the residual echo, and said phase shifter responsive to the residual echo and the output signal for producing a time-varying phase shift in the output signal corresponding to the time-varying phase shift of the cho signal to minimize the residual echo signal.

4,072,831
VOICE TRANSMITTING APPARATUS FOR A BREATHING MASK
Edwin Joscelyn, Commack, N.Y., assignor to Instrument Systems Corporation, Huntington, N.Y.
Filed Sept. 10, 1976, Ser. No. 722,251
Int. Cl.² H04R *1/08*
U.S. Cl. 179—188 **11 Claims**



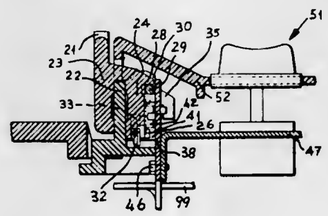
1. An apparatus, constructed to be mounted in a breathing mask adapted to be worn on the face of a human being for transmitting the wearer's voice outside said mask, said breathing mask having a hollow generally cup-shaped mask body adapted to cover at least the mouth and nose region of the wearer's face, comprising:
a microphone adapted to be connected in communication with a point outside said mask, said microphone having a diaphragm constructed and arranged to be set into vibration to generate an electrical signal; and
a protective sheath substantially encasing said microphone and including a thin, pliable wall in contact with said diaphragm, the wearer's voice being effective to set said wall into vibration so that said diaphragm is made to vibrate therewith, whereby an electrical signal representing the wearer's voice is generated by said microphone, said protective sheath being an integral pocket formed in said main body and extending into the interior of said mask, said pocket having an opening extending outside said main body.

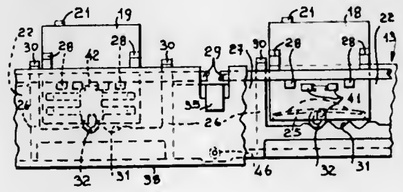
4,072,832
CONTROL ELECTRODE FOR HIGH-VOLTAGE APPARATUS
Paul Küenzle, and Ulrich Baumgärtl, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany
Filed Aug. 28, 1975, Ser. No. 608,756
Claims priority, application Germany, Sept. 3, 1974, 2442405
Int. Cl.² H01H *9/30, 33/02*
U.S. Cl. 200—48 R **7 Claims**



1. In a high-voltage switching apparatus wherein an electric field is present between parts of the switching apparatus separated by an insulating gas, the improvement comprising: a control electrode comprising: a body of conductive plastic foam material mounted so as to lie in said electric field, said body being formed to have a contour for reducing the intensity of said electric field.

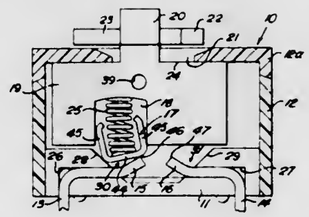
4,072,833
KEYBOARD SELECTOR SWITCH ASSEMBLY FOR A CALCULATING MACHINE
Ugo Carena, Ivrea (Turin), Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy
Filed Apr. 22, 1976, Ser. No. 679,407
Claims priority, application Italy, May 2, 1975, 68114/75
Int. Cl.² H01H *9/00, 15/00*
U.S. Cl. 200—5 R **1 Claim**





1. A selector switch assembly for a keyboard of calculating, account and similar machines of the type having a frame mounting the keyboard and a cover, wherein the cover is provided with a first wall from which project the keys of the keyboard and a second wall substantially perpendicular to said first wall and comprising a plurality of aligned windows; the selector switch assembly comprising:
a plurality of sliders, each said slider comprising a pair of U-shaped arms, one of said pair of arms comprising first and second shoulder means;
a common support including a plurality of spaced coplanar guide walls for guiding the U-shaped arms of said sliders, a series of support walls, and transverse walls connecting said support walls with said guide walls for holding said guide walls displaced from said support walls along a plane parallel to said guide walls, said support walls having notches and hook members thereon;
a rod member fixedly mounted in the notches of said transverse walls and engaged with the first shoulder means of said sliders for holding said sliders in slidable engagement with said guide walls;
a printed circuit support plate engaged by the hook members of said support walls so that said printed circuit support plate bears against said support walls, said printed circuit support board bearing against said rod member to hold said rod member engaged with the notches of said transverse walls, said printed circuit support plate including a plurality of areas associated with said sliders and each including conductive tracks;
a plurality of conductive laminae each engaged by the second shoulder means of each slider and slidable over the conductive track of the associated area; and
means for fixing said assembly to the frame of the machine so that said guide walls are substantially parallel with said second wall of said cover and aligned with said windows, so that said sliders project from said windows.

4,072,834
ELECTRIC SLIDE SWITCH HAVING SLIDING CONTACT WITH CLEANING ACTION
Nelson Frederick John Godfrey, Studham, England, assignor to ERG Industrial Corporation Limited, England
Filed July 2, 1976, Ser. No. 702,151
Claims priority, application United Kingdom, Oct. 30, 1975, 45038/75
Int. Cl.² H01H *1/60, 15/02*
U.S. Cl. 200—16 C **7 Claims**



1. An electrical switch comprising a housing, at least first and second upstanding spaced-apart fixed terminals mounted in a wall of the housing, a slider disposed within the housing for movement along the direction joining the terminals and having a blind recess in a surface of the slider adjacent the terminals, a bridging element of U-shaped cross-section having a pair of arms joined by a curved bottom, the bridging element being disposed within the recess with its curved bottom projecting out of the recess towards the terminals, a helical spring disposed between the arms of the bridging element and acting between the inside of said curved bottom of the bridging element and the blind end of the recess to urge the curved bottom into contact with the terminals, the recess having a first wall which, when an operating force is applied to the slider, pushes the bridging element so that it slides over said first terminal, the recess also having a second wall facing said first wall of the recess and being so disposed as to permit the curved bottom to slip forwardly over said first terminal under the action of said spring and engage removably between said first and second terminals, the slider being movable a further amount up to a limiting position, and when the slider is so moved in operation

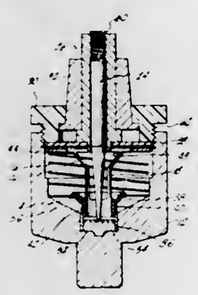
of the switch, said first wall of the recess pushes on the adjacent arm of the bridging element whereby the bridging element tilts forwardly through an angle, determined by the slope and disposition of said first wall, while the curved bottom remains in contact with and slides backwardly relative to said terminals resulting in a cleaning of the contact interfaces, and wherein said curved bottom of the bridging element constitutes a detent projection for removable engagement between said first and second terminals to provide a detent action for the switch.

4,072,835

FLUID TYPE INERTIA SWITCH HAVING RESETTABLE PLUNGER AND CONE SHAPED RETAINER

Courtney L. Burke, Simi Valley, Calif., assignor to Albert M. Eisner, Los Angeles, Calif., a part interest

Filed July 6, 1976, Ser. No. 702,540
Int. Cl.² H01H *35/14, 29/20*
U.S. Cl. 200—61.47 **15 Claims**



1. A resettable switch comprising
a casing having a well in the base thereof,
a first slotted retainer maintained in a substantially press fit relation in said well and having a cone shaped lip extending above said well, a reservoir of high viscosity electrically conductive liquid contained within said first slotted retainer, a second slotted retainer having a lower tubular portion and an upper rim of a greater diameter than said tubular portion, an electrically insulating cap maintained in sealed relation with respect to said casing and having an electrically conductive plunger housing extending therethrough, an electrically conductive plunger supported within said plunger housing, an insulating washer affixed to said plunger such that a portion of said electrically conductive plunger extends through said washer, and
a spring positioned between the base of said casing and said second retainer so as to maintain said second retainer in a telescoped relation with respect to said first retainer to prevent the escape of said electrically conductive liquid from said retainer, whereby an electrically conductive path is formed between said casing and said plunger housing only when said electrically conductive liquid is in said well.

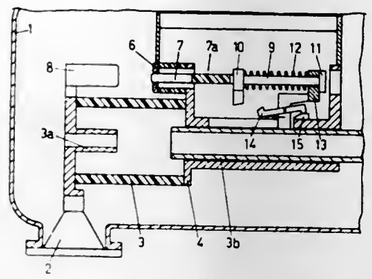
4,072,836

ELECTRICAL SWITCH WITH MEANS FOR SWITCHING AN AUXILIARY RESISTANCE INTO THE CIRCUIT CONTROLLED THEREBY

Walter Bischofberger, Zurich, and Gerhard Mauthe, Birmenstorf, both of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Nov. 12, 1975, Ser. No. 631,215
Claims priority, application Switzerland, Nov. 22, 1974, 15552/74
Int. Cl.² H01H *33/16*
U.S. Cl. 200—144 AP **3 Claims**

1. In an electrical switch comprising a set of main contacts one of which is stationary and the other movable thereby to effect engagement and dis-engagement therebetween, the improvement which comprises a resistor and a set of auxiliary contacts for connection of said resistor between said set of main contacts prior to engagement therebetween during a switching-in operation and disconnection of said resistor not later than disengagement of said set of main contacts during a switching-out operation, one of said auxiliary contacts being electrically connected to said stationary main contact and the other of which is slidable relative to said movable main contact and insulatively coupled thereto by means of a follower device, one end of said resistor being electrically connected to said movable main contact and the other end electrically connected to said slidable auxiliary contact, said follower device



including a carrier member therefor secured to said movable main contact, a rod slidable in said carrier member, a latch member secured to said rod, a compression spring surrounding said rod between said latch member and said carrier member for actuating said rod, said rod including an electrically insulating section to which is joined said slidable auxiliary contact, and a latching lever on said carrier member cooperative with said latch member for engaging the latter when said spring has been compressed upon engagement between said set of a auxiliary contacts prior to engagement of said main contacts, said latching lever being dis-engaged from said latch member upon a return of said movable main contact to its dis-engaged position.

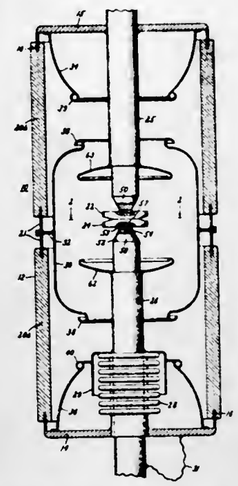
4,072,837

HIGH CONTINUOUS CURRENT VACUUM-TYPE CIRCUIT INTERRUPTER

Donald W. Crouch, Newtown Square, and Donald R. Kurtz, West Chester, both of Pa., assignors to General Electric Company, Philadelphia, Pa.

Filed Dec. 29, 1975, Ser. No. 645,111
Int. Cl.² H01H *33/66*
U.S. Cl. 200—144 B **10 Claims**

1. In a vacuum-type circuit interrupter having a continuous current rating of several thousand amperes,
a. a highly evacuated envelope,
b. a pair of disc-shaped contacts primarily of beryllium within said envelope that are relatively movable into and out of engagement with each other,
c. a pair of conductive contact rods having their inner ends located within said envelope,
d. mounting means for respectively mounting said contacts on the inner ends of said contact rods,
e. said mounting means for each contact comprising a backing member of truncated, generally-conical form, said backing member comprising (i) a base of a predetermined diameter attached to the inner end of an associated contact rod, (ii) an opposite end of relatively small diameter compared to that of said base attached to the associated disc-shaped contact in a location disposed generally centrally of said disc-shaped contact, and (iii) a body portion extending between said base and said opposite end,
f. each of said disc-shaped contacts projecting radially outward past the outer periphery of said opposite end of the associated backing member,



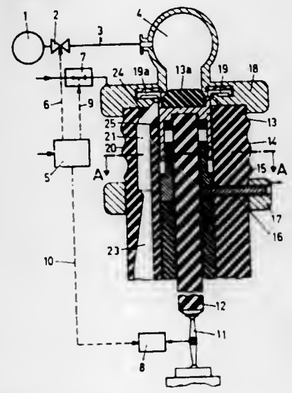
g. the region immediately surrounding the outer periphery of said body portion of the backing member being substantially free of metal structure.

4,072,838

ELECTRICAL POWER SWITCH WITH PRESSURIZED GAS BLASTING DEVICE FOR LENGTHENING THE SWITCHING ARC

Lutz Niemeyer, Staretschwil, and Klaus Ragaller, Neuenhof, both of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Nov. 26, 1975, Ser. No. 635,351
Claims priority, application Switzerland, Dec. 10, 1974, 16358/74
Int. Cl.² H01H *33/54*
U.S. Cl. 200—148 R **4 Claims**



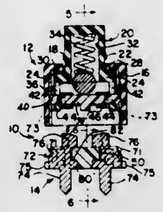
1. In an electric power switch which provides for lengthening of the circuit-breaking arc by blasting it with a pressurized gas the improvement characterized by the following features in combination:
a. the quenching gas is stored under very high pressure in an intermediate tank, its cubic capacity designed for at least one circuit-breaking operation,
b. travel rails for the arc feet are provided in an annular space, with the arc lengthening taking place at these rails under the influence of the flow of the pressurized gas,
c. a multitude of insulating nozzles are provided for the subsequent, additional arc lengthening,
d. the quenching gas serves simultaneously for the drive of the movable switch contact part.

4,072,839

SLIDE SWITCH TYPE ASSEMBLY HAVING TWO PART HOUSING

Joseph J. Spedale, Chicago, Ill., assignor to Chicago Switch, Inc., Chicago, Ill.

Filed June 14, 1976, Ser. No. 695,936
Int. Cl.² H01H *9/00, 21/04*
U.S. Cl. 200—295 **14 Claims**



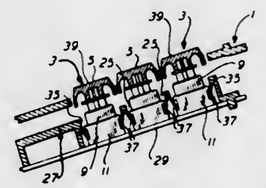
1. In a switch construction wherein opposed contacts are positioned on a base, a slider, and a bridging contactor in assembly with said slider, the slider assembly being mounted in an enclosure, the enclosure being adapted for attachment to the base for sliding movement of the slider assembly relative to the base and within the enclosure whereby the contactor shifts between a first position completing a circuit between the contacts and a second position whereat the contactor is out of engagement with at least one contact, and including a resilient means carried by the slider normally applying force to the contactor for pressing the contactor against the contacts on the base during switch operation, the improvement wherein said slider assembly includes means for holding the slider and contactor together whereby the assembly thereof remains intact when separated from the base, said holding means including ledge means defined by the slider, wings carried by said contactor, said resilient means in the assembly pressing the wings of the contactor against the ledge means when the assembly is separated from the base, and means projecting outwardly from said base for engaging the contactor when the assembly is connected to the base for thereby forcing the contactor wings out of engagement with the ledge means in opposition to said resilient means.

4,072,840

REMOVABLE KEYBOARD SWITCH

Phillip R. Daigle, Glenridge, N.J., assignor to Litton Business Systems, Inc., Morristown, N.J.

Division of Ser. No. 519,617, Oct. 31, 1974, abandoned. This application Sept. 19, 1975, Ser. No. 615,038
Int. Cl.² H01H *9/08*
U.S. Cl. 200—296 **5 Claims**



1. A keyboard assembly comprising:
a keyboard switch retainer including a first substantially flat plate having at least one aperture adapted for inserting a

keyboard switch therein, said aperture having a generally rectangular configuration and having two opposite walls which are substantially flat and at least two opposite portions of said other walls having angularly depending flexible tabs;

a keyboard switch adapted for being seated into said aperture, said switch having a housing assembly having four walls, two of said opposite walls being substantially flat and the other two walls having relieved openings therein;

said tabs being deformed to a first position by the edges of said walls having relieved openings therein during seating of said keyboard switch thereby permitting said keyboard switch to be seated into said aperture;

said tabs being received by said relieved openings and assuming a second position once said keyboard switch has been seated thereby retaining said keyboard switch in a seated position;

said keyboard switch being removable through said aperture by moving said tabs away from said relieved openings thereby freeing said keyboard switch from its seated position;

said tabs being movable away from said relieved openings by the insertion of a member through said aperture to deform said tabs to said first position.

4,072,841

ELECTRICAL SWITCHES

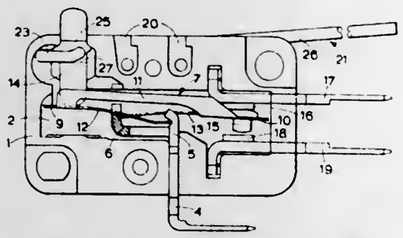
John Courtney Corfield, Waltham St. Lawrence, England, assignor to Unimax Switch Limited, Maidenhead, England

Filed Sept. 29, 1976, Ser. No. 727,851

Claims priority, application United Kingdom, Oct. 1, 1975, 40110/75

Int. Cl.² H01H *3/04*

U.S. Cl. 200—332 **12 Claims**



1. A snap-action switch comprising a casing, a slide member which is movable longitudinally of itself in the switch casing between non-operated and operated positions, an electrical switching element within the casing which is engaged by the slide member and is moved from a first to a second switching position respectively as the slide member is moved from the non-operated to the operated position, and a pivoted actuator which extends externally of the casing and controls movement of the slide member from the non-operated position to the operated position, the actuator comprising a length of wire which is pivoted in a hole in the switch casing and which has a bent end portion within the casing which is connected to the slide member so that pivoting of the actuator in one particular sense causes the slide member to move from the non-operated to the operated position.

4,072,842

ELECTRO-EROSION MACHINE TOOL AND A PULSE GENERATOR FOR USE IN SUCH A MACHINE TOOL

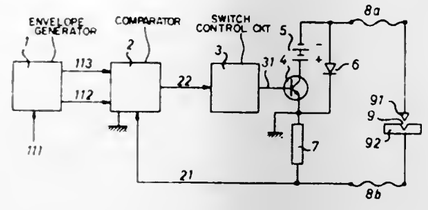
Werner Ullmann, Locarno, and Ernst Bühler, Tenero, both of Switzerland, assignors to A.G. fur Industrielle Elektronik, Losone near Locarno, Switzerland

Filed June 10, 1976, Ser. No. 694,569

Claims priority, application Switzerland, June 17, 1975, 7855/75; Apr. 29, 1976, 5420/76

Int. Cl.² B23P *1/08*

U.S. Cl. 219—69 C **17 Claims**



1. A pulse generator for forming electrical pulses which are to be passed across a working gap between a workpiece and a tool electrode in an electro-erosion machine tool so as to machine the workpiece by eroding it, the pulse generator comprising:

envelope signal forming means (**1**) for forming respective signals having waveforms which define an upper and lower envelope curve (**16** and **17**) having shapes corresponding to the envelope shape of the pulse to be generated;

current supply means for supplying electrical current to said working gap, the supply means including a switch (**4**) for turning the supply current on and off;

gap current representative signal forming means (**7**) for forming a signal representative of the gap current passing across said gap;

comparing means (**2**) which is connected to said envelope signal forming means (**1**) and said gap current representative signal forming means (**7**) and is operable for comparing the gap current representative signal with each envelope signal;

control means (**3**) which is connected to be responsive to the output of the comparator means and to control said switch for turning said supply current on and off in dependence upon the comparison; and

diode means (**6**) connected to said supply means to form a circuit (via **6**, **7**, **8***a* and **8***b*) which includes the said work gap when the generator is in use and in which residual current can flow when said supply current is turned off by said switch (**4**).

4,072,843

APPARATUS AND METHOD FOR WELD BONDING

Robert L. Szabo, San Diego, Calif., assignor to General Dynamics Corporation, San Diego, Calif.

Filed June 16, 1976, Ser. No. 696,603

Int. Cl.² B23K *11/10*

U.S. Cl. 219—91.21 **7 Claims**

7. Method of welding together a pair of conductors separated by a thermo-plastic insulation material comprising the steps of:

applying a first pre-selected level of pressure to said pair of conductors positioned between a pair of electrodes;

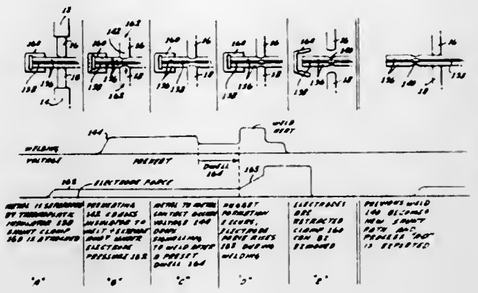
passing a first level of current through said electrodes and said pair of conductors;

sensing electrical contact through said thermo-plastic insulation and said pair of conductors between said pair of electrodes;

maintaining said first level of current for a pre-selected length of time after sensing said electrical contact;

terminating said first level on current after said pre-selected length of time;

passing a second higher level of current at the termination of



first level of current through said electrodes and said pair of conductors between said electrodes; and

increasing progressively from said first pre-selected level of pressure to a second pre-selected higher level of pre-selected pressure during at least a portion of the flow of said second higher level of current.

4,072,844

APPARATUS FOR ELECTRON BEAM MACHINING IN VACUUM

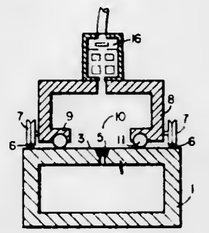
Georges Sayegh, Montrouge, France, assignor to Sciaky Bros., Inc., Chicago, Ill.

Filed June 28, 1976, Ser. No. 700,090

Claims priority, application France, Feb. 7, 1976, 75 20838

Int. Cl.² B23K *15/00*

U.S. Cl. 219—121 EB **7 Claims**



1. A vacuum machining facility incorporating a first large chamber including a longitudinal gap having a V-shaped cross section which determines a leakproof area around the machining line of the parts to be machined; a flexible strip to plug this gap; a second leakproof chamber which houses a machining tool, this second chamber including an orifice located close to the gap; sealing systems located around the orifice between both chambers, a drive unit to move the said second chamber on the first chamber and along the gap; a system designed to move the plugging strip away from the gap close to the orifice, this arrangement being featured by the fact that the strip is fully housed inside the gap, its upper face being level with the outer face of the first chamber.

4,072,845

WELDING ELECTRODE

Herbert Charles Buckingham, St. Albans, and Raymond Elliott, Boreham Wood, both of England, assignors to BOC Limited, London, England

Filed July 28, 1975, Ser. No. 599,584

Int. Cl.² B23K *35/00*

U.S. Cl. 219—146.3 **13 Claims**

1. In an electrode for gas-shielded electric open-arc welding and hard facing wherein an electrode is in the form of a flux-cored wire having a tubular casing of which the main constituent is iron and which casing contains dry core material comprising an intimate mixture of powdered metal, deoxidant and flux forming agent, the improvement comprising providing an improved metal deposition rate by provision of an electrode containing by weight of the total electrode:

about 0.08 to about 1.2% of the flux-forming agent;

about 1 to about 5.25% of deoxidant;

the weight of the core being about 24 to about 35% of the total weight of the electrode, the balance being provided by the tubular casing; and

the core being about at least 80% iron powder by weight.

4,072,846

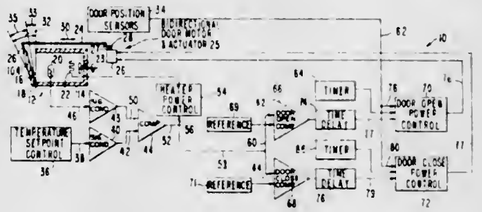
CONTROL SYSTEM FOR A CHROMATOGRAPHY APPARATUS OVEN DOOR

Urs Christen, Walnut Creek, and Dewayne C. Guidinger, Concord, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Mar. 1, 1976, Ser. No. 662,769

Int. Cl.² H05B *1/02*

U.S. Cl. 219—497 **7 Claims**



1. In a chromatography apparatus of the type including an oven for a chromatography column and electric heater means for controllably heating said oven, an improved system for controllably opening and closing the door of said oven to enable stabilization of the temperature in said oven at a desired set point, said system comprising:

means for generating an electrical signal that indicates by first or second conditions, respectively, whether the oven temperature is above or below said set point;

heater power control means for receiving said oven temperature indicative signal, said heater power control means being enabled by said first temperature indicative signal condition to effect heating of said oven and being inactive in response to said second temperature indicative signal condition;

bi-directional motor and actuator means for opening and closing said oven door over a prescribed operating range; and

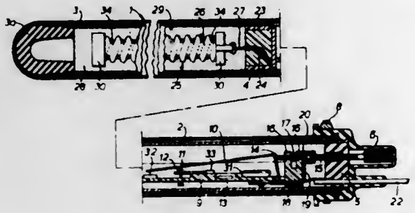
means for enabling said motor and actuator means to operate for a predetermined actuation period when said temperature indicative signal in either said first or second condition departs from a preset threshold value for each condition for a predetermined time interval, whereby to effect opening or closing of said door in incremental steps.

4,072,847

ELECTRICAL HEATER FOR HEATING LIQUID

John Leslie Craven, Leigh-on-Sea, England, assignor to Liquifry Company Limited, England

Filed Dec. 16, 1976, Ser. No. 751,339
Claims priority, application United Kingdom, Dec. 16, 1975, 51509/75
Int. Cl.² H05B 3/80; H01C 1/02
U.S. Cl. 219—523 7 Claims



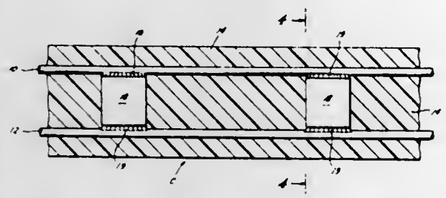
1. An electrical heater for heating a liquid, the heater comprising: a pair of conductors for applying electrical energy to the heater; an electrical heating element coupled across said conductors; a temperature-sensitive device coupled between said heating element and one of said conductors for feeding of current to said heating element to control the operating temperature of said element as a function of ambient temperature; a tubular enclosure sealed against ingress of water and formed by a metal tube closed against ingress of water at one end, an electrically insulative plastics tube joined at one of its ends in water-tight manner to the other end of said metal tube, and a sealing plug through which said conductors extend and which seals the other of the ends of said plastics tube, said heating element being within said metal tube and said temperature-sensitive device being within said plastics tube; electrical insulating means electrically insulating said heating element from said metal tube; and a glass tube containing said tubular enclosure and which is closed against ingress of moisture at one end and is sealed against ingress of water at its other end by sealing means through which said conductors pass.

4,072,848

ELECTRICAL HEATING CABLE WITH TEMPERATURE SELF-LIMITING HEATING ELEMENTS

Ben C. Johnson, San Marcos; J. Scott Thornton, Austin; Donald E. Glowe, Austin; Patrick E. Cassidy, Austin, and Robert E. Anderson, San Marcos, all of Tex., assignors to Thermon Manufacturing Company

Continuation-in-part of Ser. No. 707,648, July 22, 1976. This application Aug. 16, 1976, Ser. No. 714,574
Int. Cl.² H05B 3/56
U.S. Cl. 219—528 6 Claims



1. A temperature self-limiting electrical heating cable or tape to provide heat to pipes, tanks and the like, comprising:

(a) first conductor means and second conductor means extending in proximity to each other along the length of the cable for conveying electrical current;

(b) insulating means, comprising:

(1) insulating material mounted between said first and second conductor means along the length of the cable for insulating said first and second conductor means from each other;

(2) said insulating material mounted between said first and second conductor means having portions thereof removed at spaced intervals thereof to form pockets;

(3) said pockets being spaced from each other along the length of the cable in accordance with the heat to be generated by the cable; and

(4) insulating material enclosing said first and second conductor means and serving as a protective covering therefor; and

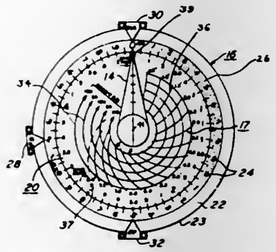
(c) heating means comprising a plurality of chips of variable resistance heating material mounted in said pockets in said insulating material and being electrically connected between said first and second conductor means for producing heat when current flows therethrough, said variable resistance chips substantially increasing in resistance when a temperature limit is reached to reduce the current flowing through said heating means and control the heat output of the cable.

4,072,849

APPARATUS AND METHOD FOR CALCULATING VEHICLE MOVEMENT PARAMETERS

William J. Camp, 14 B Glendale Manor, Pleasantville, N.J. 08232

Filed Aug. 13, 1971, Ser. No. 171,456
Int. Cl.² G06K 1/00
U.S. Cl. 235—61 NV 15 Claims



1. An aircraft navigational computing apparatus comprising:

a. means for indicating time during a specified time interval, said means including a powered rotary pointer,

b. a clock face mounted adjacent said time indicating means and having a first set of navigational indicia including time and distance indicia, said clock face means being stationary,

c. annular means mounted toward the periphery of said clock face means which may be manually rotated to a predetermined setting, said annular means having altitude indicia formed thereon, and

d. a plurality of tabs mounted in proximity to said annular means for indicating predetermined points thereupon, said plurality of tabs including a tab for indicating the minimum altitude and the final approach altitude.

4,072,850

VEHICLE USAGE MONITORING AND RECORDING SYSTEM

Daniel R. McGlynn, 329-84th St., Brooklyn, N.Y. 11209

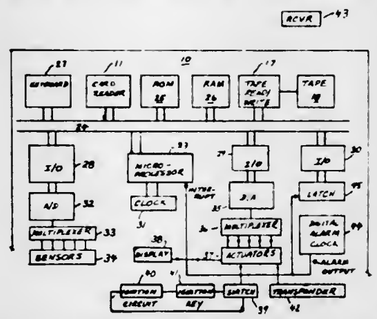
Continuation-in-part of Ser. No. 538,356, Jan. 3, 1975, Pat. No. 4,013,875, which is a continuation-in-part of Ser. No. 432,691, Jan. 11, 1974, abandoned. This application Sept. 10, 1975, Ser. No. 612,195
Int. Cl.² B60K 26/00; G08B 21/00
U.S. Cl. 364—424 20 Claims

1. A digital control system for use in a vehicle for selecting one of a plurality of operational modes at a perdetermined time, comprising

means in said vehicle for selecting an operational mode of said vehicle, having an input for designating a predetermined one of said modes;

means for activating operation of said vehicle in said selected one mode, having an input for initiating activation thereof;

a digital alarm clock in said vehicle for storing a representation of a first predetermined time at which a first predetermined one of said operational modes should be activated, having an input for resetting said stored time, and having an output connected to said input of said activating means for supplying a signal when said first predetermined time occurs; and



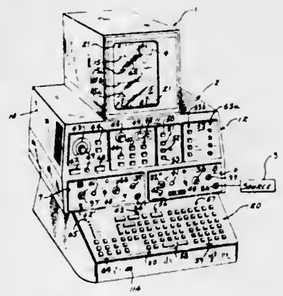
means connected to said input of said digital alarm clock for automatically resetting said digital alarm clock to a representation of second predetermined time in response to said output signal of said clock.

4,072,851

WAVEFORM MEASURING INSTRUMENT WITH RESIDENT PROGRAMMED PROCESSOR FOR CONTROLLED WAVEFORM DISPLAY AND WAVEFORM DATA REDUCTION AND CALCULATION

Frederick A. Rose, Fort Atkinson, Wis., assignor to Norland Corporation, Fort Atkinson, Wis.

Filed Mar. 26, 1976, Ser. No. 670,703
Int. Cl.² H01J 29/70; G01R 23/16
U.S. Cl. 364—487 65 Claims



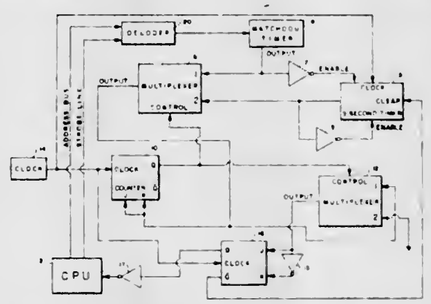
1. A waveform measuring and analyzing instrument having a visual display means comprising digitized memory array means for storage of the coordinates for the visual display means in digitized form, a data acquisition means connected to said memory means for establishing a digitized representation of a waveform, a programmed processor having a program memory, and an interactive user operated control means having a plurality of keystroke means for each of a plurality of basic arithmetic functions of addition, subtraction, multiplication and division and for each of a plurality of compound mathematical functions for reduction and calculation involving the waveform data signals in the memory array means, said program memory including programs for each of said keystroke means, and said processor including means responsive to actuation of said keystroke means to invoke the corresponding program.

4,072,852

DIGITAL COMPUTER MONITORING AND RESTART CIRCUIT

James A. Hogan, Hatfield, and Morton Sklaroff, Fort Washington, both of Pa., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 23, 1976, Ser. No. 716,709
Int. Cl.² G06F 11/04
U.S. Cl. 235—303.1 6 Claims



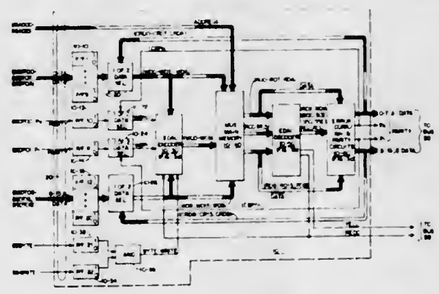
1. A method of monitoring the operation of a digital computer comprising the steps of detecting the presence of periodic output signals from the digital computer generated in response to a computer program, generating a restart signal if a predetermined number of said output signals is missing, applying the restart signal to the digital computer to restart the operation thereof, concurrently starting a predetermined time interval measurement to generate a control signal at the end of said time interval, detecting the presence of said output signals from the computer following the application of said restart signal to the digital computer and interrupting said measurement of said time interval to inhibit the generation of said control signal as an indication of a continued improper computer operation upon the detection of further missing ones of said output signals from the digital computer.

4,072,853

APPARATUS AND METHOD FOR STORING PARITY ENCODED DATA FROM A PLURALITY OF INPUT/OUTPUT SOURCES

George J. Barlow, Tewksbury, and Chester M. Nibby, Jr., Peabody, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Sept. 29, 1976, Ser. No. 727,821
Int. Cl.² G11C 29/00; G06F 11/12
U.S. Cl. 235—312 27 Claims



1. A data processing system including a plurality of data handling devices, each connected in common to receive and

transfer groups of signals over a bus network, said system further including a memory subsystem comprising:

a memory for storing said groups of signals;

input means coupled to said bus for receiving said groups of signals from any one of said data handling devices for storage in said memory during a memory cycle of operation, each said group of signals including a plurality of unchecked data bit signals and at least one parity bit signal for indicating the validity of said data bit signals;

encoder means coupled to said input means and to said memory, said encoder means for generating a group of check code bits derived from a group of said unchecked data bit signals and said one parity bit signal, said encoder means forcing a number of said check code bit signals to predetermined states when said one parity bit signal designates that said unchecked data bit signals are in error;

means connected to said encoder means and to said input means for applying said unchecked data bit signals and group of check code bit signals to said memory for said storage during said memory cycle of operation; and,

decoder means coupled to said memory, said decoder means for generating a plurality of syndrome signals for locating an error in said data bit signals, the location of said error being established by said unchecked data bit signals and said check code bit signals read out from said memory during a subsequent cycle of operation, said plurality of syndrome signals having a first predetermined characteristic for signaling when said group of unchecked data signals from any one of said data handling devices have incorrect parity when written into said memory enabling the storage of said signals from said bus to proceed without decreasing the operating speed of said system.

4,072,854

SHEET COUNTING APPARATUS

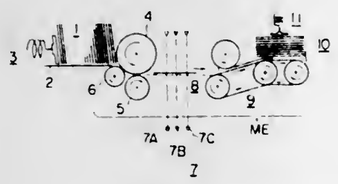
Takeo Oshima, and Takashi Kondō, both of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Hyogo, Japan

Filed July 6, 1976, Ser. No. 703,116

Claims priority, application Japan, July 30, 1975, 50-92941; Aug. 1, 1975, 50-93772; Aug. 5, 1975, 50-94742

Int. Cl.² G06M *7/06*

U.S. Cl. 235—92 SB **2 Claims**



1. A sheet counting apparatus wherein sheets loaded therein are successively separated and conveyed and the number of conveyed sheets is counted, which apparatus comprises:

(a) a plurality of sheet passage detecting means positioned along the path along which said sheets are conveyed for respectively producing detecting signals having levels corresponding to different numbers of thicknesses of sheets being conveyed;

(b) a plurality of sheet number detecting means coupled to the respective sheet passage detecting means for comparing the level of the detection signals from the respective sheet passage detecting means with respective reference signals having predetermined levels for detecting whether a number of sheets from one through *n* overlapped sheets are being conveyed past said sheet passage detecting means and each producing an outpt when the comparison indicates the passage of the corresponding number of sheets, *n* being at least the integer 2;

(c) a pulse forming circuit means coupled to said plurality of sheet number detecting means for forming a number of pulses equal to the number of outputs from said sheet detecting means; and

(d) pulse counting means coupled to said pulse forming circuit means for counting the number of pulses from said pulse forming means,

whereby even when the sheets are overlapped when they are being conveyed, pulses are formed corresponding to the number of the overlapped sheets to correctly count all of the sheets which are conveyed.

4,072,855

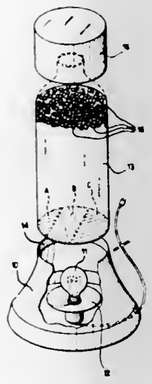
LAMP WITH CHANGING LUMINOUS EFFECTS

Ludovico Marchese, Strada alla Morana 6, Casale Monferrato (Alessandria), Italy (15033)

Filed Jan. 27, 1976, Ser. No. 652,811

Int. Cl.² A47G *33/16*

U.S. Cl. 362—101 **16 Claims**



1. A lamp with changing luminous effects comprising means to provide heat and light and a transparent container located adjacent said means to provide heat and light; said container being filled with a mixture of liquids, the density of the liquid mixture varying with the temperature of said means to provide heat, the liquid mixture having metallized platelets dispersed therein which have a thickness which, related to the surface thereof and to the density of the liquid mixture at room temperature, is such that said platelets float on said liquid at room temperature, but do not float when said liquid has been heated by said heating means; the platelets each having at least one face which has been polished to reflect the rays emitted by the means to provide light; the means to provide heat and light generating a movement of the platelets within the liquid and sparkling of the luminous rays, due to the reflection produced by the polished faces of said platelets, the motion of the platelets resulting from convection currents in the liquid mixture and variation in density in the liquid due to the heating effect of said means to provide heat.

4,072,856

DAYLIGHT-SIMULATING INCANDESCENT LAMP LIGHT FIXTURE, PARTICULARLY FOR MEDICAL AND DENTAL USE

Hans Eligehausen, Hanau am Main, Germany, assignor to W. C. Heraeus GmbH, Hanau am Main, Germany

Filed Jan. 25, 1977, Ser. No. 762,415

Claims priority, application Germany, Feb. 9, 1976, 2604921

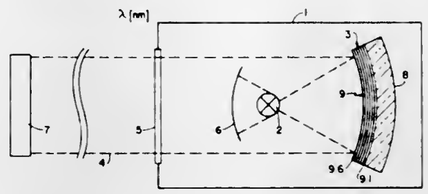
Int. Cl.² F21M *7/00*

U.S. Cl. 362—2 **13 Claims**

1. Reflector structure to provide reflected light matching at least approximately daylight when illuminated by a source of radiation having a color temperature of about 3000° K, comprising

a substrate carrier (8) of a material highly pervious to infra-

red radiation and having an index of refraction n_d of between about 1.425 to 1.575;



and a series of layers (**9.1 - 9.6**) applied to at least one side of said carrier substrate, in increasing distance from said substrate carrier,

said layers comprising

Layer No.	Index of Refraction n_d	Thickness of Layer A	Material
9.1	about 1.9 to/2.1	about 1020 to/1120	tantalum, niobium or zirconium oxide
9.2	about 1.4 to/1.5	about 665 to/735	silicon dioxide or magnesium fluoride
9.3	about 2.4 to/2.6	about 400 to/440	zinc sulfide or titanium oxide
9.4	about 1.4 to/1.5	about 665 to/735	silicon dioxide or magnesium fluoride
9.5	about 2.4 to/2.6	about 400 to/440	titanium oxide or zinc sulfide
9.6	about 1.4 to/1.6	about 1050 to/1155	silicon dioxide or magnesium fluoride

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4,072,857

ARTIFICIAL TREE

Guy A. DeVicaris, 957 Bristol Pike, A-6, Andalusia, Pa. 19020

Filed May 10, 1976, Ser. No. 684,753

Int. Cl.² F21S *1/12*

U.S. Cl. 362—123 **21 Claims**

1. An artificial tree capable of conducting an electric current comprising:

base means;

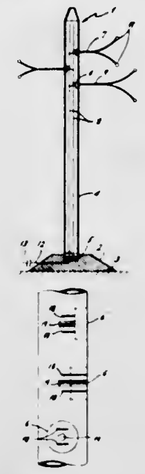
artificial trunk means connected to said base means and having first electrical conductor means extending therewithin and further having at least one first connector means electrically connected to said first electrical conductor means, said first connector means extending through an outside wall of said trunk means; and

at least one artificial limb means having second electrical conductor means extending therewithin and second connector means electrically connected to said second electrical conductor means;

wherein said first connector means is a first female-type electrical connector comprising first narrow slit means, wherein said second connector means is a first male-type electrical connector comprising first narrow prong means corresponding in shape to said slit means such that said limb means can be detachably and electrically connected to said trunk means,

wherein one of said first female-type electric connector and said first male-type electric connector is provided with first auxiliary structural support means, and

wherein the other of said connectors is provided with first



auxiliary opening means corresponding in shape with said first structural support means such that said structural support means can be inserted into said first opening means in use.

4,072,858

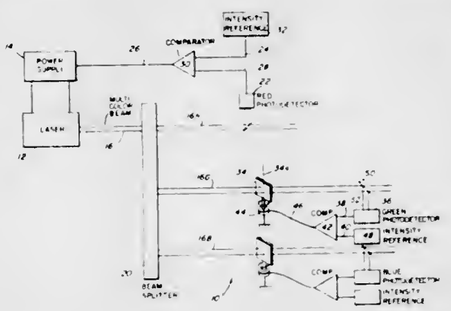
LASER BEAM INTENSITY REGULATOR

Samuel M. Stone, Lynnfield, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed July 26, 1976, Ser. No. 708,652

Int. Cl.² G01J *1/32*

U.S. Cl. 250—205 **9 Claims**



1. A laser beam intensity regulator comprising:

means for generating a reference signal representing a desired beam intensity;

a dielectric coated mirror having a passband whose sloping edge includes the beam bandwidth and mounted in the beam path to attenuate the beam;

photodetecting means responsive to the attenuated beam intensity for generating an intensity-related signal;

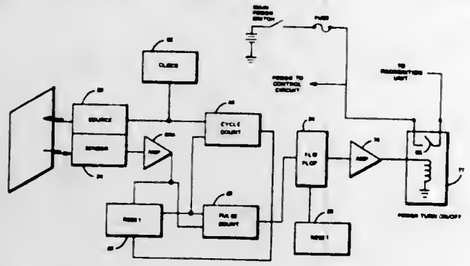
means for varying the angle of the beam incidence on the mirror in accordance with the difference between the reference and intensity-related signals so that the beam intensity is maintained at essentially the desired attenuated level.

4,072,859

WAND TURN-ON CONTROL

Lynn D. McWaters, Irving, Tex., assignor to Recognition Equipment Incorporated, Dallas, Tex.

Filed Oct. 4, 1976, Ser. No. 729,531
Int. Cl.[2] H01J 39/12
U.S. Cl. 250—214 R 11 Claims



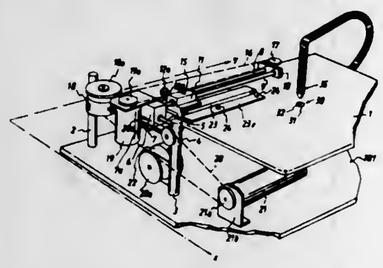
7. A control circuit for conserving power in a battery powered system comprising: a source of pulsed radiated energy, a detector for receiving reflected pulses of said radiated energy, a clock circuit for producing pulses, a first counting circuit for receiving and counting clock pulses, a second counting circuit for receiving and counting said received reflected pulses, said first and second counting circuits each programmed to count down from a different predetermined number, a reset circuit for resetting both said counters when said first counter counts down before said second counter counts down, and a power control circuit triggered by said second count circuit when said second counting circuit counts down before said first counting circuit.

4,072,860

APPARATUS FOR OPTICAL SCANNING OF MICROFILMS OR THE LIKE

Boris Koleff, Munich, and Wilfried Hofmann, Taufkirchen, both of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed May 10, 1976, Ser. No. 685,088
Claims priority, application Germany, May 30, 1975, 2524154
Int. Cl.[2] H01J 3/14
U.S. Cl. 250—216 19 Claims



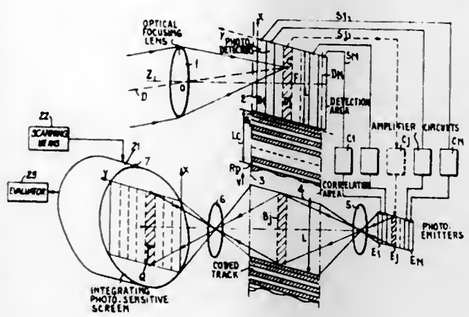
1. Apparatus for optically scanning flexible sheet-like light-transmitting carriers of information, particularly microfilms or test films, comprising a support having a substantially horizontal upper side; first elongated quide means provided on said support; a first carriage movable along said guide means; second elongated quide means provided on said first carriage; a second carriage movable along said second guide means, said first and second guide means being at least substantially parallel to said upper side; coupling means provided on said second carriage and including a supporting surface for a portion only of the margin of a carrier of information and means for separably retaining such portion of the margin in contact with said surface, said surface being parallel with and closely adjacent to said upper side; means for moving said carriage along the respective guide means through distances sufficient to place any portion of information on a carrier which is coupled to said second carriage in register with a predetermined portion of said upper side; and optical scanning means including means for illuminating that portion of information on a carrier which register with said predetermined portion of said upper side, and an annular member in said support in register with said illuminating means, said annular member having a portion extending above said upper side to the general level of said supporting surface to provide a rest for a carrier which is coupled to said second carriage.

4,072,861

OPTICAL TRACKING SYSTEM

Georges Couderc; Claude Andre Payen; Jean Dansac, and Leonidas Symaniec, all of Paris, France, assignors to Thomson-CSF, Paris, France

Continuation-in-part of Ser. No. 203,186, Nov. 30, 1971, abandoned. This application Oct. 18, 1973, Ser. No. 407,443
Claims priority, application France, Dec. 4, 1970, 70.43739
Int. Cl.[2] G01D 5/36; G06F 15/34; G06G 7/19
U.S. Cl. 250—233 7 Claims



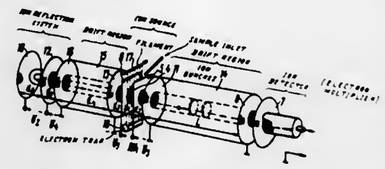
1. An optical tracking system comprising:
an optical objective having an axis centered on a field of view;
a code carrier partly located in a detection area substantially in a focal plane of said objective;
drive means for continuously moving said code carrier in a direction transverse to said axis, said code carrier being subdivided into a multiplicity of juxtaposed strip zones parallel to its direction of motion, each strip zone forming a pseudo-random binary optical code pattern and at least one replica thereof following one another in said direction, the code patterns of said strip zones being longitudinally coextensive, whereby continuous luminous radiation from a distant target within said field of view is converted into a pulsed light beam, the combined width of said strip zones equaling the width of said detection area transverse to said direction;
conversion means transforming said pulsed light beam into a train of luminous pulsations in the rhythm of the beam pulses;
projection means directing said pulsations onto said code carrier in a correlation area of said code carrier having the same dimensions as said detection area, the centers of said detection area and said correlation area being separated in said direction by a whole number of lengths of said code patterns whereby said areas are traversed by correlated optical patterns at each instant; and
focusing means for projecting light from said correlation area onto a receiving surface.

4,072,862

TIME-OF-FLIGHT MASS SPECTROMETER

Boris Alexandrovich Mamyrin, prospekt Toreza, 9, kv. 89; Valery Ivanovich Karataev, Grazndansky prospekt, 70, kv. 36, and Dmitry Viktorovich Shmikk, Olginskaya ulitsa, 12, kv. 27, all ofLeningrad, U.S.S.R.

Continuation of Ser. No. 598,026, July 22, 1975, abandoned. This application June 14, 1976, Ser. No. 695,409
Int. Cl.[2] H01J 39/34
U.S. Cl. 250—286 17 Claims



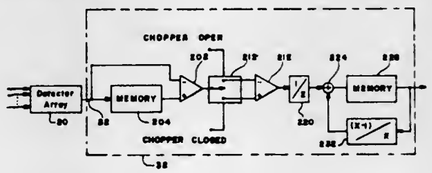
1. A time-of-flight mass spectrometer, comprising: a vacuum analyzer chamber having an axis; means to maintain vacuum in said chamber; a pulsed ion source in said analyzer chamber; electrodes of said pulsed ion source which are transparent to the ions studied; an ion detector disposed in coaxial relationship with said ion source in said analyzer chamber; a drift space in said analyzer chamber disposed between said ion source and said ion detector; an ion reflecting system disposed in said analyzer chamber in coaxial relationship with said ion source on the side thereof facing away from said ion detector and a gap defined in said analyzer chamber between said reflecting system and said ion source.

4,072,863

PYROELECTRIC INFRARED DETECTION SYSTEM

Carlos B. Roundy, 1379 Juniper Drive, Logan, Utah 84321

Filed Oct. 26, 1976, Ser. No. 735,457
Int. Cl.[2] H01J 31/50
U.S. Cl. 250—332 9 Claims



9. A pyroelectric infrared detection system comprising
a pyroelectric detector array having a plurality of individual detector elements spaced apart at a distance of from 0.5 millimeters to 25 microns, each detector element adapted to detect infrared radiation applied to the array and to produce signals representative of detected radiation,
means for successively interrupting the application of radiation to the array at a rate of from 30 to 1000 Hertz,
output conductor means, and
means for applying the signals produced by the detector array to the output conductor means.

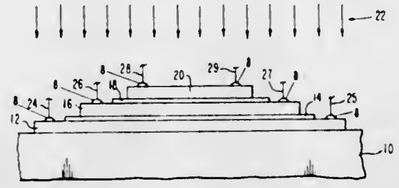
4,072,864

MULTILAYERED SLANT-ANGLE THIN FILM ENERGY DETECTOR

Robert Jacob von Gutfeld, New York, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1976, Ser. No. 752,695
Int. Cl.[2] G01J 1/00
U.S. Cl. 250—338 19 Claims

1. A detector of electromagnetic waves comprising:
a substrate, of at least average thermal conductivity dielectric material
a first thin film deposit of electrically and thermally conductive material having an induced anisotropy,
a second thin film deposit of an electrically insulating, thermally conductive material,
a third thin film deposit of electrically and thermally conductive material having an induced anisotropy,



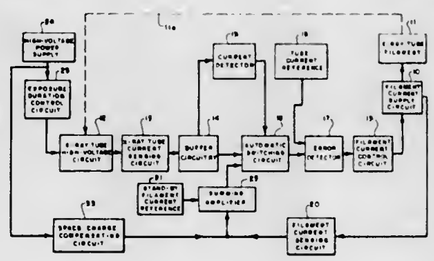
each of said first and third thin film deposits being connected electrically to at least a pair of contacts for developing an electrical signal between said contacts, and means for establishing a temperature gradient in said deposits in a direction normal to the planes of the surfaces of said deposits.

4,072,865

AUTOMATIC CONTROL SYSTEM

James R. Craig, Glenview, and Steven F. Nerge, Elgin, both of Ill., assignors to American Radiologic Systems, Inc., Melrose Park, Ill.

Filed June 24, 1976, Ser. No. 699,444
Int. Cl.[2] H05G 1/34, 1/58
U.S. Cl. 250—409 9 Claims



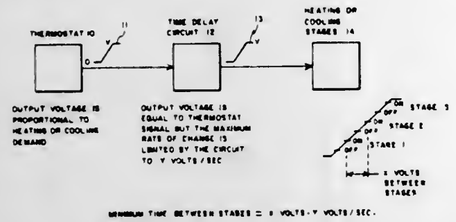
1. An automatic control system for regulating the emission of an X-ray tube of the type which is activated by the heating of a cathode filament by passing current through said filament, and which emits X-ray radiation systematically in accordance with the amount of tube current flowing between the anode and cathode of the tube, said system comprising: circuit means for passing current through said filament; tube current sensing means coupled to said X-ray tube for developing a tube current signal representative of the magnitude of said tube current; means coupled to said tube current sensing means and responsive to said tube current signal for generating a filament current control signal; filament current control means coupled between said filament current control signal generating means and said circuit means and responsive to said filament current control signal for regulating the amount of current passed through said filament; current detector means coupled to said X-ray tube for generating a switching signal in response to the flow of said tube current; said switching means coupled between said tube current sensing means and said filament current control signal generating means and responsive to said switching signal for selectively applying said tube current signal to said filament control signal generating means, whereby the filament circuit of the X-ray tube is automatically switched from a standby mode to an operational only mode when tube current flow in the X-ray tube.

4,072,866

PROPORTIONAL TEMPERATURE CONTROL SYSTEM INCORPORATING A LINEAR DELAY

John L. Kabat, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 1, 1976, Ser. No. 746,378
Int. Cl.² H02J 3/14
U.S. Cl. 307—41 **11 Claims**



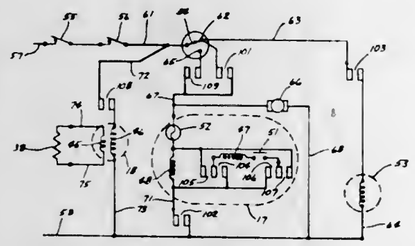
8. A proportional temperature control system, including: thermostat means generating an output voltage proportional to an ambient temperature; comparator means having input circuit means and output circuit means with said input circuit means coupled to said thermostat means output voltage; voltage limiting means connected to said comparator output circuit means to receive an output voltage from said comparator means with said output voltage being limited in amplitude in both a positive and a negative sense with respect to a reference voltage; integrating amplifier means having an input connected to said voltage limiting means and further having output circuit means; said integrating amplifier means including capacitor means; and said integrating amplifier output circuit means connected to said comparator means input circuit means wherein said comparator means compares an input voltage with an integrating amplifier output voltage; said integrating amplifier output voltage being delayed with respect to time by said capacitor means whenever said input voltage of said comparator means changes an amount greater than a level set by said voltage limiting means to prevent said temperature control system from shifting at an undesirable rate.

4,072,867

MOTOR ENERGIZED LATCH MECHANISM

John D. Goodlaxson, Colfax, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed Apr. 23, 1976, Ser. No. 679,737
Int. Cl.² H01H 27/06
U.S. Cl. 307—118 **7 Claims**



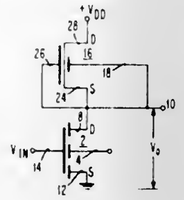
1. A bimetal actuated latch mechanism for an apparatus including an electric motor operable under control of first circuit means during predetermined portions of a cycle of operations, the combination comprising: a bimetal element having a displaceable portion; means for heating said bimetal element to effect movement of said displaceable portion and including a pair of electric terminals; an auxiliary winding on said electric motor for inductively generating a low voltage current when said electric motor is energized; second circuit means for connecting said auxiliary winding to said pair of terminals, said second circuit means being independent of said first circuit means and responsive to said motor operation to effect heating of said bimetal element and to induce movement of said displaceable portion; and latch means responsive to the movement of said displaceable portion.

4,072,868

FET INVERTER WITH ISOLATED SUBSTRATE LOAD

Francisco H. De La Moneda, Reston, and Harish N. Kotecha, Manassas, both of Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 16, 1976, Ser. No. 723,678
Int. Cl.² H03K 19/08, 19/40; H01L 27/08, 29/78
U.S. Cl. 307—214 **6 Claims**



1. An IGFET static inverter having an improved load current characteristic, comprising:

an enhancement mode IGFET active device in a main portion of a semiconductor substrate, having its drain connected to an output node, its source connected to a source potential and its gate connected to an input signal source;

said main portion of said substrate connected to a first substrate potential;

a depletion mode IGFET load device in a portion of said semiconductor substrate electrically isolated from said main portion, having its drain connected to a drain potential, its source and gate connected to said output node, and said isolated substrate connected to said output node;

whereby the rise in source-to-substrate bias during the turn off transition is eliminated in said depletion mode load device, providing an improved load characteristic for the inverter circuit.

4,072,869

HAZARD-FREE CLOCKED MASTER/SLAVE FLIP-FLOP

George B. Gillow, Bonita, Calif., assignor to NCR Corporation, Dayton, Ohio

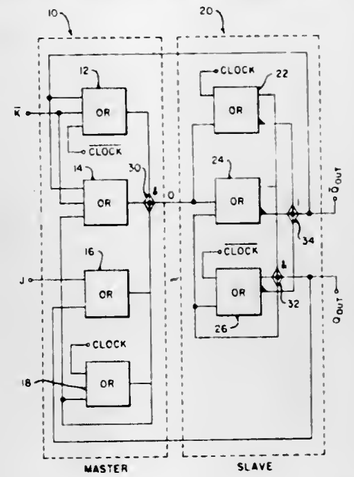
Filed Dec. 10, 1976, Ser. No. 749,490
Int. Cl.² H03K 3/286
U.S. Cl. 307—291 **10 Claims**

1. A clocked master/slave flip-flop comprising:

a. a master portion for receiving at least data and clock inputs, said master portion comprising plural similar logic elements, each element providing an output to be associated in a manner dissimilar from the manner of logic association of said inputs, the result comprising the output of said master portion responsive to synchronized clock pulses;

b. a slave portion comprising plural similar logic elements, certain ones for receiving as inputs the output of said master portion and said clock inputs, each element providing an output to be associated in a manner dissimilar from the manner of logic association of said inputs to said slave portion to provide the true output of the flip-flop, and similar to the manner of logic association of said inputs to said slave portion to provide the true and complementary outputs of the flip-flop responsive to synchronized clock pulses, said true and complementary outputs providing additional inputs to certain ones of said elements of said master portion, said true output providing additional inputs to certain ones of said elements of said slave portion;

c. a first redundant logic element defining an additional similar logic element of said master portion, receiving as inputs thereto a data input, an output of said master portion and an output of the flip-flop, and providing an output to be associated in a manner dissimilar from the manner of logic association of said inputs to said first redundant logic element, the result comprising the output of said master portion upon occurrence of a clock skew; and,



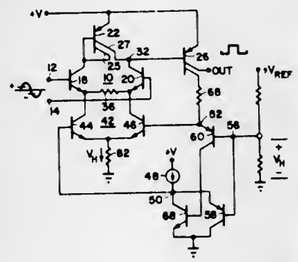
d. a second redundant logic element defining an additional similar logic element of said slave portion, interconnected with said master portion to receive the output thereof, with an output of the flip-flop to receive at an input thereto the output thereof, and providing an output to be associated in a manner dissimilar from the manner of logic association of said inputs to said second redundant logic element, the result comprising an output of the flip-flop upon occurrence of a clock skew.

4,072,870

COMPARISON CIRCUIT HAVING PROGRAMMABLE HYSTERESIS

William F. Davis, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed June 30, 1976, Ser. No. 701,461
Int. Cl.² H03K 5/20
U.S. Cl. 307—350 **15 Claims**



1. A comparison circuit having symmetrical hysteresis, comprising:

a differential input stage including a pair of differentially coupled devices each having first, second and input terminals, and circuit means coupled between said first terminals of said devices for establishing a hysteresis voltage thereacross in response to a current of predetermined magnitude being selectively steered therethrough, said devices receiving first and second applied input signals at said respective input terminals;

output circuit means coupled to said second terminals of said devices being responsive to said input signals for providing a two discrete level output signal at first and second outputs respectively; and

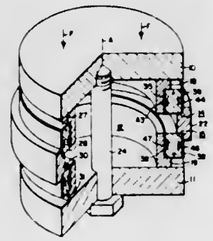
current steering means coupled from said first output of said output circuit means across said circuit means for selectively steering said current through said circuit means in first and second directions depending upon the operating state of said output signal from said output circuit means.

4,072,871

ELECTROACOUSTIC TRANSDUCER

Charles R. Wilson, Glen Burnie, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 20, 1974, Ser. No. 471,922
Int. Cl.² H01L 41/04
U.S. Cl. 310—333 **5 Claims**



1. An electroacoustic transducer comprising:

A. a head mass;

B. a tail mass;

C. piezoelectric type oscillatory material which is active in the shear mode of operation coupled to and supported between said head and tail masses;

D. said oscillatory material being in the form of a plurality of piezoelectric rings each having inner, outer and end planar surfaces;

E. a first support member coupled to said head mass;

F. a second support member coupled to said tail mass;

G. said first and second support members having shoulder portions for respective engagement with a first and second one of said piezoelectric rings; and

H. a third support member common to both said first and second piezoelectric rings.

4,072,872

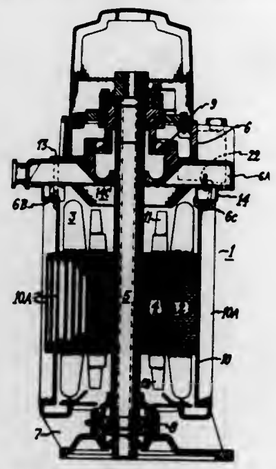
VENTILATING AIR BAFFLE AND DEFLECTOR FOR A DYNAMOELECTRIC MACHINE

Robert F. Gleichman, San Jose, Calif., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 7, 1975, Ser. No. 602,612
Int. Cl.² H02K 9/00
U.S. Cl. 310—53 **11 Claims**

1. A combination baffle and deflector for guiding ventilating air in and around an electric machine, comprising an annulus formed of moldable material, said annulus having a generally U-shaped configuration in cross-section on a radial plane through the central axis and one side thereof, said generally U-shaped configuration consisting of a base portion, an outer leg portion substantially vertically disposed relative to the base portion, an inner leg portion sloped toward the center of the annulus away from said base, a rim portion comprising a plurality of spokes disposed in a plane extending substantially perpendicularly outward from said outer leg portion from an

area thereof closely adjacent the junction of the outer leg portion and said base portion, said base portion and said inner and outer leg portions being formed as an integral unit and



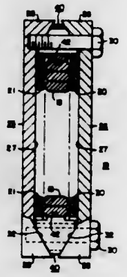
being substantially impervious to air, and wall means defining apertures through said rim portion to enable air to pass therethrough.

4,072,873

BIAXIAL COMPRESSION PHASE LEAD CONNECTOR

Lawrence D. Nottingham, North Huntingdon, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 9, 1975, Ser. No. 594,479
Int. Cl.² H02K *11/00*
U.S. Cl. 310—71 6 Claims



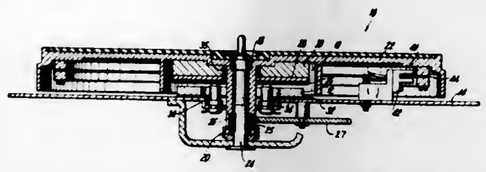
1. In a dynamoelectric machine having a stator member and a plurality of coils constituting a stator winding, each of said coils comprising two conductors spaced apart on the strator member and having end portions disposed adjacent to each other for connection to a phase lead, said end portions of said apart conductors being assembled in overlapping relation with said phase lead, the combination with the union of said coil end portions and said phase lead of a connector comprising a pair of spaced apart plate members, a pair of spaced apart wedge members, and means, for positively securng said plate and wedge members together in assembled relationship and in compressive engagement with said coil end portions and said phase lead; said plate and wedge members having surfaces for uniform engagement with said overlapping conductors, said wedge members being disposed in surface-to-surface contact with said conductors and in sliding engagement with said plate members, said wedge members being displaced inwardly upon said overlapping conductors in a direction normal to the direction of the force of compressive engagement provided by said securing means, whereby biaxial compression of said overlapping conductors is provided as said plate members are forced against said conductors by said securing means.

4,072,874

DIRECT DRIVE FOR TURNTABLES

Frank Arnold, Jr., Locust Valley, N.Y., assignor to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Oct. 14, 1975, Ser. No. 622,450
Int. Cl.² H02K *1/28*
U.S. Cl. 310—268 11 Claims



1. A direct drive for turntables of the type having a platter coupled to a shaft for rotation of the platter relative to the deck of the turntable, wherein the improvement comprises:

a disk-shaped armature having a plurality of insulated layers of windings thereon and concentrically arranged about the shaft and fixedly coupled to the platter;

flux return means fixedly coupled to said platter between said disk-shaped armature and said platter;

magnet means fixedly coupled to the deck for providing magnetic flux to said disk-shaped armature and said flux return means;

brushes spaced from said magnet means and fixedly coupled to the deck and arranged for continuous contact with said disk-shaped armature so that when current is applied to said brushes a circuit is completed through said disk-shaped armature with the current in said disk-shaped armature coacting with the magnetic flux from said magnet means to apply rotational forces to said disk-shaped armature for rotating the platter coupled thereto; and

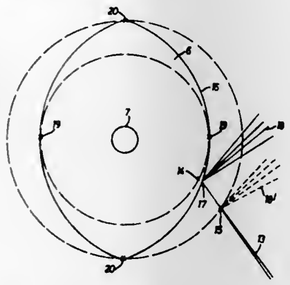
an inertia means coupled between said flux return means and the platter for increasing the inertia of the platter.

4,072,875

X-RAY TUBE

Reginald Sidney Webley, Hillingdon, England, assignor to EMI Limited, Hayes, England

Filed Oct. 18, 1976, Ser. No. 733,220
Claims priority, application United Kingdom, Oct. 18, 1975, 42867/75
Int. Cl.² H01J *35/10*
U.S. Cl. 313—60 9 Claims



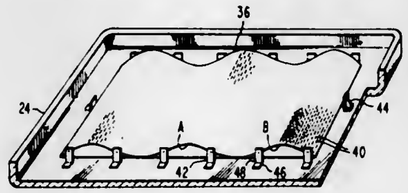
1. An X-ray tube including an envelope and an anode movable with respect thereto, a source of a beam of energy, for example an electron beam, arranged to impinge on said anode to generate X-radiation substantially at a region of contact with said anode and means for moving said anode in a predetermined manner relative to said tube envelope to move said region of contact relative to said tube envelope to scan the generated X-radiation in a predetermined manner relative to said tube envelope.

4,072,876

CORRUGATED SHADOW MASK ASSEMBLY FOR A CATHODE RAY TUBE

Albert Maxwell Morrell, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 4, 1976, Ser. No. 729,349
Int. Cl.² H01J *29/07, 29/02*
U.S. Cl. 313—403 28 Claims



1. In a shadow mask type cathode-ray tube, the improvement comprising,

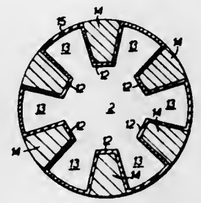
a shadow mask corrugated in one direction having two corrugated sides and two other sides and at least partially suspended in said tube by support means attached at a plurality of points along the corrugated sides of said mask, said mask including a plurality of slit-shaped apertures aligned in columns and the peak-to-peak wavelength dimension of corrugations in the mask being at least twice as great as the spacing between aperture columns.

4,072,877

TRAVELLING WAVE TUBES

Peter Robert Davis, Chelmsford, England, assignor to English Electric Valve Co., Ltd., England

Filed July 30, 1976, Ser. No. 710,130
Int. Cl.² H01J *25/34*
U.S. Cl. 315—3.5 8 Claims



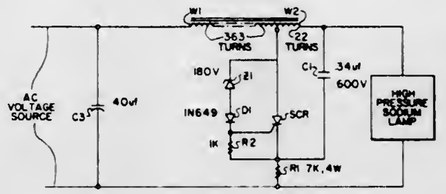
1. A traveling wave tube including a sequence of clover-leaf cavities coupled together for the fundamental mode of operation by coupling plates, each plate having a central aperture through which passes the electron beam path and each clover-leaf cavity having outward radial extensions having permanent magnets between the radial outward extensions thereof in order to provide magnetic focussing for the electron beam.

4,072,878

STARTING AND OPERATING APPARATUS FOR HIGH PRESSURE SODIUM LAMP BALLASTS

Joseph C. Engel, Monroeville, and Gary F. Saletta, Irwin, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 10, 1975, Ser. No. 540,185
Int. Cl.² H05B *37/00*
U.S. Cl. 315—205 4 Claims



1. A starting and operating apparatus for connection across an AC source for starting and then operating a high-pressure sodium discharge lamp, said apparatus comprising:

(a) input terminals adapted to be connected across said AC source, output terminals adapted to have said sodium discharge lamp connected thereacross, a power factor correction capacitor connected across said input terminals, a ballast inductor winding having a tap intermediate the ends thereof, and said ballast inductor connected in series at its ends between one of said input terminals and one of said output terminals, and the other of said input terminals electrically connected to the other of said output terminals;

(b) gate-controlled solid-state switching means connected in series with an energy storage capacitor between one end of said ballast inductor and said ballast inductor tap, resistor means connected between said other input terminal and a point in the line between said series-connected solid-state switching means and said energy storage capacitor, and an additional resistor connecting between gate and cathode of said switching means; and

(c) zener diode means, which has a zener voltage greater than the operating voltage for said lamp, connecting across said energy storage capacitor so that the voltage build-up thereacross before said lamp is started is applied across said zener diode means, and said zener diode means also connecting across the gate and anode of said solid-state switching means to gate said switching means when the zener voltage of said zener diode means is exceeded; whereby when said switching means is gated, said energy storage capacitor is discharged through a portion of said ballast inductor to cause the auto-transformer action thereof to apply a lamp starting pulse across said output terminals to start the lamp connected thereacross, and after said lamp is started, the zener voltage of said zener diode means is not exceeded so that the lamp starting portion of said apparatus is rendered inoperative.

4,072,879

TURN-OFF INTERLOCK FOR TAPE AND FILM MACHINES

Edward R. Wadleigh, Star Rte. Box 279, Hemet, Calif. 92343

Filed Apr. 2, 1976, Ser. No. 672,925
Int. Cl.² B65H *59/38*
U.S. Cl. 318—57 2 Claims

1. In a film ot tape machine having a power switch for supplying power to the machine, high speed drive means for driving film or tape, and a high speed drive switch connected in series with said power switch to cause power to be supplied to said high speed drive means, a power interlock circuit comprising:

a first relay having first switch contacts and second switch

contacts and a coil, said coil being connected to said high speed drive switch to be energized by the operation thereof, and said first switch contacts being connected between said power switch and said high speed drive means to supply power thereto when said coil is energized,
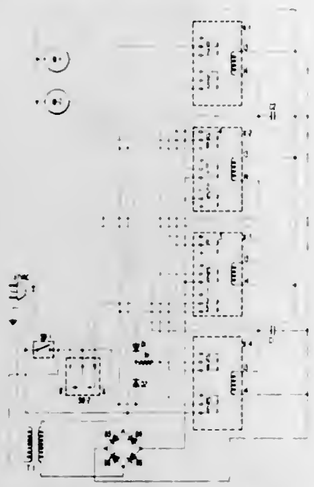
a first source of rectified voltage,

a second relay having first switch contacts and a coil, said second switch contacts of said first relay being connected between said first source of rectified voltage and the coil of said second relay to supply power thereto when said first relay coil is energized, said first contacts of said second relay being connected in shunt with said power switch,

a first capacitor connected across the coil of said second relay,

said high speed drive means comprising first and second high speed motors for driving film or tape in forward and reverse directions, respectively, said first high speed motor being connected to receive power from first switch contacts of said first relay, said interlock circuit further comprising:

a third relay having first switch contacts and second switch contacts and a coil, said coil being connected to said high speed drive switch to be energized by the operation



thereof, the energization of the coils of said first and third relays being mutually exclusive, and said first switch contacts being connected between said power switch and said second high speed motor to supply power thereto when said coil is energized,

a fourth relay having first switch contacts and a coil, said second switch contacts of said third relay being connected between said first source of rectified voltage and the coil of said fourth relay to supply power thereto when said third relay coil is energized, said first contacts of said second relay being connected in shunt with said power switch,

a second capacitor connected across the coil of said fourth relay,

said first relay having third switch contacts, said second relay having second switch contacts, said third relay having third switch contacts, and said fourth relay having second switch contacts, said interlock circuit further comprising:

first brake means for stopping said second high speed motor, said third switch contacts of said first relay and said second switch contacts of said second relay being connected in series between said power switch and said first brake means to supply power thereto when the coil of said first relay is unenergized and the coil of said second relay is energized, and

second brake means for stopping said first high speed motor, said third switch contacts of said third relay and said second switch contacts of said fourth relay being connected in series between said power switch and said second brake means to supply power thereto when the coil of said third relay is unenergized and the coil of said fourth relay is energized.

4,072,880

STARTING CONTROL APPARATUS FOR AC LOAD

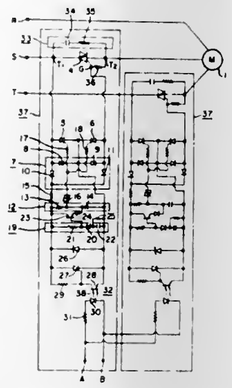
Selichi Oshima, and Mamoru Miyamoto, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed July 28, 1976, Ser. No. 709,511

Claims priority, application Japan, July 28, 1975, 50-91743; Aug. 13, 1975, 50-98193

Int. Cl.² H02K *17/02*

U.S. Cl. 318—227 **16 Claims**



1. A starting control apparatus for an AC load which comprises:

a bidirectional triode thyristor switching device connected in series between an AC power source and the load;

a rectifying circuit connected in parallel to the bidirectional triode thyristor switching device;

a first time constant circuit connected between output terminals of the rectifying circuit which discharges to turn on the bidirectional triode thyristor switching device when the charged potential reaches a predetermined potential;

a second time constant circuit connected between the output terminals of the rectifying circuit and having a time constant larger than the time constant of the first time constant circuit and maintaining the charged potential in the ON state of the bidirectional triode thyristor switching device; and

a speedy charging device which rapidly increases the charged potential to the sustaining potential of the second time constant circuit during the recharging period for the first time constant circuit while recovering the controlling ability of the bidirectional triode thyristor switching device and which gradually decreases the period for charging the first time constant circuit to the predetermined potential.

4,072,881

AXIAL-AIR-GAP TYPE SEMICONDUCTOR ELECTRIC MOTOR

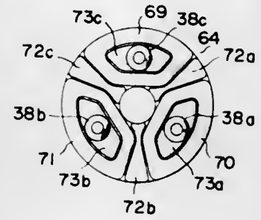
Itsuki Ban, 829, Higashioizumi, Nerima, Tokyo, Japan

Filed Sept. 17, 1976, Ser. No. 724,259

Claims priority, application Japan, Nov. 6, 1975, 50-132471; Dec. 20, 1975, 50-151245

Int. Cl.² H02K *29/00*

U.S. Cl. 318—138 **17 Claims**



1. An axial-air-gap type semiconductor motor comprising:

a disc-shaped rotor fixed coaxially to a shaft mounted for rotation to a casing for the motor, the disc of said rotor comprising a field magnet having a plurality of magnetic poles formed of portions of said disc located in the circular direction at equal pitches, said magnetic poles being magnetized alternately in opposite polarization directions along the rotating axis of said rotor;

a first magnetic-material disc and a second magnetic material disc coaxially located respectively adjacent the opposite faces of said rotor with air-gaps therebetween and being fixed to said casing;

a plurality of armature coils arranged in turn at angular pitches of a predetermined proportion of the angular width of the pole of said field magnet, odd-numbered ones of said armature coils being affixed to the face of said first magnetic-material disc which faces said rotor, and even-numbered ones of said armature coils being affixed to the face of said second magnetic-material disc which faces said rotor;

a control band rotatable synchronously with said rotor;

position-detector means located at fixed positions along the rotating path of said control band for detecting rotational position of said rotor in cooperation with said control band to generate an output corresponding to the rotational position of said rotor; and

a current control semiconductor circuit for controlling, in response to the output from said position-detector means, current flowing through said armature coils.

4,072,882

FREQUENCY CURRENT CONVERTER FOR ENERGIZING AN AC MACHINE

Albert Charles Wiart, Sannois, and Pierre Jacques de la Jonquiere, Fontainebleau, both of France, assignors to Jeumont-Schneider, Puteaux, France

Filed June 10, 1976, Ser. No. 694,493

Claims priority, application France, June 16, 1975, 75 18861

Int. Cl.² H02P *7/62*

U.S. Cl. 318—227 **13 Claims**

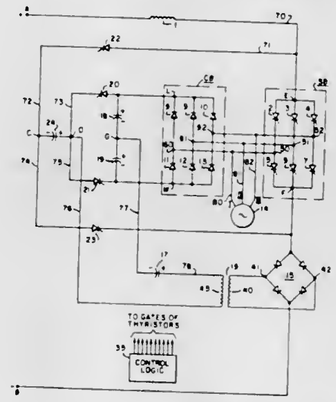
1. A variable frequency current converter for energizing an alternating current polyphase motor from an adjustable direct current source comprising:

a direct current power supply;

a current-fed inverter responsive to said direct current power supply including a plurality of paired main thyristors mounted in a bridge between corresponding phases of said motor and two pole terminals;

a commutation bridge including a plurality of paired diodes mounted in a bridge between corresponding phases of said motor and two commutation poles;

a common commutation capacitor operatively controlled concurrently with firing of an on-coming one of said paired main thyristors for turning off and off-going one of said paired main thyristors, said on-coming and off-going main thyristors being associated with a common one of said pole terminals and the commutation process being caused by said commutation capacitor through one of said paired diodes of said commutation bridge associated with



the one of said commutation poles opposite to said one pole terminal;

with capacitor means connected between said commutation poles and charged during the commutation process for transferring energy from the motor phase related to said off-going main thyristor to the motor phase related to said on-coming main thyristor via said one diode of said commutation bridge.

4,072,883

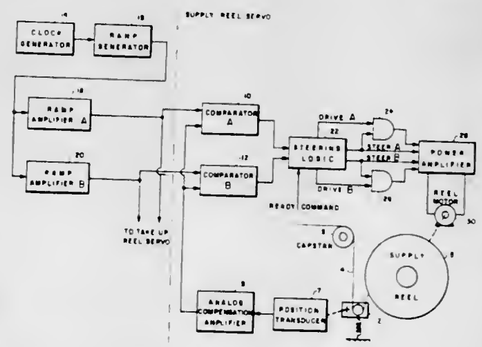
BI-DIRECTIONAL MOTOR DRIVE SERVO

Glenn A. Belter, Louviers, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 26, 1976, Ser. No. 690,295

Int. Cl.² G05B *11/28*

U.S. Cl. 318—257 **5 Claims**



1. A motor drive system comprising

signal generating means for producing a first polarity repetitive ramp signal and a second polarity repetitive ramp signal,

error signal generating means for producing an output signal having a polarity representative of a desired motor drive direction,

a first comparator means arranged to compare said output signal with said first ramp signal to produce a first constant amplitude motor drive signal pulse for each of said

first ramp signals with a duration equal to the time during the rise time of said first ramp signal that said output signal is greater than said first ramp signal,

a second comparator means arranged to compare said output signal with said secod ramp signal to produce a second constant amplitude motor drive signal pulse for each of said second ramp signals with a duration equal to the time during the rise time of said second ramp signal that said output signal is greater than said second ramp signal,

signal steering logic means responsive to said first and second motor drive signals to produce one of a pair of mutually exclusive motor control signals for each motor drive signal and to gate one of said first and second motor drive signals in response to said one of said pair of motor control signals, and

motor power amplifier means responsive to a gated one of said first and second drive signals and to said one of said pair of motor control signals to supply power to a motor to produce a motor drive operation in response thereto whereby the motor is driven in a direction determined by said motor control signals to produce a motor drive torque controlled by said motor drive signals.

4,072,884

BRUSHLESS PHASE LOCKED SERVO DRIVE

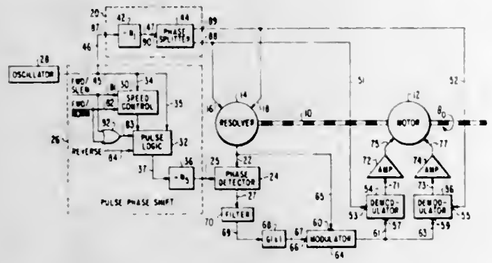
Richard Julian Treadwell, Belle Mead, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 19, 1976, Ser. No. 659,267

Claims priority, application United Kingdom, Mar. 25, 1975, 12395/75

Int. Cl.² H02P *5/00*

U.S. Cl. 318—314 **9 Claims**



5. A system for controlling the rate and direction of shaft rotation of a brushless D-C motor having first and second control coils in response to a source of reference clock pulses, said motor shaft adapted for rotation in first and second directions comprising:

a. two phase drive means including phase splitter means responsive to said reference pulses for generating first and second output signals, said first and second signals being in phase quadrature;

b. resolver means having a shaft directly coupled to said motor shaft responsive to said first and second phase drive means output signals for generating an output signal having a constant amplitude and a phase equal to the product of the number of resolver pole pairs and the angle of said resolver shaft;

c. phase shift means responsive to said reference clock pulses and a plurality of control signals for generating an output signal having a phase which varies as a function of time, said control signals indicative of shaft rate and direction of rotation;

d. phase detection means responsive to said resolver means output signal and said phase shifting means output signal for generating an output signal having an amplitude equal to the phase difference between said resolver means and phase shifting means output signals;

e. modulation means having an output and first and second inputs thereof; said second input being coupled to the output of said resolver means;

f. shaping means coupling the output of said phase detector to said first input of said modulation means;

g. first demodulation means responsive to the modulation means output signal and said two phase drive means first output signal for generating an output signal to energize said first motor control coil, and

h. second demodulation means responsive to said modulation means output signal and said two phase drive means second output signal for generating an output signal to energize said second motor control coil; thereby commutating said motor coils.

4,072,885

CONTROL SYSTEM AND METHOD FOR REMOVAL OF COKE FROM A COKE OVEN

Lawrence W. Emark, Jr., McCandless Township, Pittsburgh County, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 3, 1975, Ser. No. 628,441

Int. Cl.² C10B *35/00*

U.S. Cl. 318—600 **27 Claims**

1. A control system for providing incremental position regulation of a first apparatus in relation to the positional movement of a second apparatus, including the combination of,

means for providing a position control signal in accordance with the desired position of said first apparatus,

means responsive to said position control signal for providing first signal pulses at a first rate for controlling the actual positonal movement of said first apparatus

means responsive to said first signal pulses for providing second signai pulses at a second rate in accordance with the desired positional movement of said second apparatus,

means responsive to the actual positional movement of said second apparatus for providing third signal pulses in accordance with said actual positional movement of said second apparatus, and

means responsive to said second signal pulses and said third signal pulses for controlling the actual positional movement of said second apparatus.

4,072,886

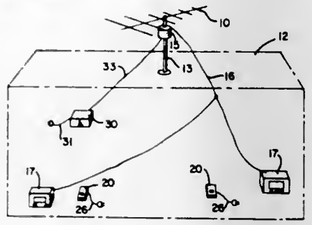
APPARATUS FOR REMOTE CONTROL OF ANTENNA ROTATORS

Ned E. Dammeyer, New Bremen, Ohio, assignor to Crown Controls Corporation, New Bremen, Ohio

Filed Sept. 27, 1976, Ser. No. 726,766

Int. Cl.² G05B *19/28*

U.S. Cl. 318—602 **9 Claims**



1. Apparatus for controlling from a remote location the position of an antenna rotator including

a control unit comprising

antenna position selecting means,

control transmitter means responsive to said position selecting means for providing a first output signal containing the selected antenna position information,

means for initiating the transmission of output signals from said control transmitter means,

holding circuit means for continuing the output of said selected antenna position information from said control transmitter means, and

first receiver means responsive to a second output signal for terminating the operation of said holding circuit means;

and an antenna rotator control circuit associated with said antenna rotator and comprising

second receiver means responsive to the first output signal of said control transmitter for providing an electrical signal representing the selected antenna position,

means for comparing electrical signals representing the actual position of said antenna rotator with said electrical signal representing said selected position,

means responsive to said comparing means for causing said antenna rotator to rotate to the selected position, and

release transmitter means responsive to said antenna rotator reaching its selected location for producing a second output signal to terminate the operation of said holding circuit means.

4,072,887

APPARATUS FOR ADJUSTING THE MUTUAL DISTANCES OF SEVERAL ELEMENTS ARRANGED SIDE BY SIDE, PARTICULARLY PAIRS OF BLADES FOR THE STRAIGHT-LINE CUTTING OF SHEET MATERIAL

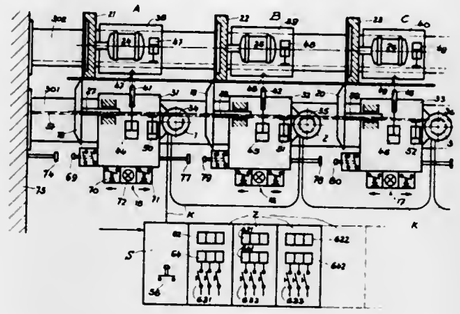
Gerhard Buschmann, Dusseldorf, and Reinhard Spohr, Dusseldorf-Nord, both of Germany, assignors to Jagenberg-Werke AG, Dusseldorf, Germany

Filed Jan. 27, 1976, Ser. No. 652,930

Claims priority, application Germany, July 11, 1974, 2433302

Int. Cl.² G05B *11/01*

U.S. Cl. 318—675 **7 Claims**



1. In an apparatus for adjusting and maintaining the mutual distances between a first movable element and a second movable element wherein each of said movable elements is connected to a drive means therefor, each of said drive means, in turn, is connected to a control unit, the improvement wherein said control unit comprises measuring means for measuring the distance said first element is moved by said first drive means, said measuring means operable to generate a signal and feed the same to a distance travel regulating means, said distance travel regulating means connected to said second drive means whereby said second element is moved, in transpositioning direction, precisely the same distance that said first element is moved, wherien said first element has a first sensor responsive to a fixed stop position, said second element has a second sensor responsive to said first element, each of said sensors connected to said control unit and to feed a signal thereto, each of said drive means is provided with a reverse phase, said control unit includes a first reversing means for reversing the direction of travel of said drive means and controlling the distance by which said drive means moves in response to a predetermined value, a second reversing means attached to said second sensor and to said second drive means and responsive to the position of said first element, whereby when said second sensor is activated it generates a signal in said control unit activating said second reversing means whereby the travel of said second element is reversed, first reposition measuring means which determines the distance by which said first element moves from said fixed stop position to its new position of predetermined value, and second reposition measuring means connected to said second reversing means, said second reposition measuring means connected to and responsive to the signal of said first reposition measuring means whereby to limit the reverse travel of said second element from the first element's new position so that it is precisely the distance between said fixed stop position and said new position.

4,072,888

METHOD OF CONTROLLING A STEPPER MOTOR

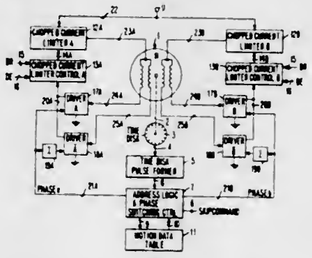
Bastian Bechtle, Stuttgart; Claus Schuenemann, Schoenaich; Gisbert Skudelny, Echterdingen; Wilhelm Spruth, Dagersheim; Helmut Weis, Waldenbuch, and Volker Zimmermann, Sindelfingen, all of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 28, 1975, Ser. No. 572,593

Claims priority, application Germany, May 2, 1974, 2421219

Int. Cl.² G05B *19/40*

U.S. Cl. 318—685 **13 Claims**



1. A method of controlling a stepping motor that is generating feedback pulses indicative of position comprising the steps of:

establishing in a memory a sequence of predetermined time delay values for successive motor advance pulses for a predetermined velocity-position profile for said motor; and

applying said feedback pulses representation of the current position of said motor to select corresponding ones of said time delay values for generating subsequent motor advance pulses.

4,072,889

ELECTRONICALLY STABILIZED FEEDER DEVICE FOR THE SUPPLY OF DC CURRENT

Kurt Witmer, Zollikon, and Roland Cachin, Zurich, both of Switzerland, assignors to Dr. K. Witmer Elektronik AG, Erlenbach, Switzerland

Filed Sept. 2, 1976, Ser. No. 719,926

Claims priority, application Switzerland, Sept. 3, 1975, 11391/75

Int. Cl.² G05F *1/58, 1/62, 1/64*

U.S. Cl. 323—9 **21 Claims**

1. An electrically stabilized feeder device for supplying direct current to a load through a load circuit comprising:

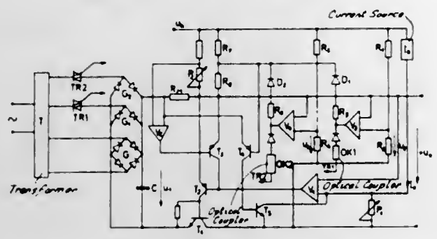
power supply means for supply DC voltage to said load circuit;

regulating means connected at least partly seially in said load circuit;

control selecting means connected to operate said regulating means;

an adjustable load current controlling means connected to said control selecting means, said load current controlling

means operating to limit the current to said load circuit to a selected predetermined value;
an adjustable load voltage controlling means connected to said control selecting means, said load voltage controlling means operating to maintain, under certain conditions, the load voltage at a selected predetermined value;
and power controlling means connected to said control selecting means, said power controlling means being responsive to output power, formed by the product of said current in said load circuit and of said load voltage;



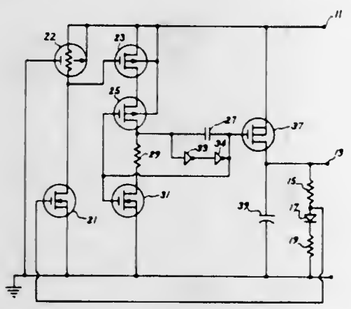
said control selecting means effecting operation of said regulating means when said power controlling means senses a power which is at least approximately like a specified maximum power limit, to automatically alter either the load voltage value or the value of said current in the load circuit, in dependency of which of these values being externally set to ensure that the maximum power limit is not exceeded.

4,072,890

VOLTAGE REGULATOR

L. V. Westbrook, Hopkins, and R. L. Payne, Crystal, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 18, 1976, Ser. No. 733,450
Int. Cl.² G05F 1/56
U.S. Cl. 323—22 R **4 Claims**



1. An integrated circuit voltage regulator for converting an unregulated potential applied to an input conductor into a regulated potential supplied to an output conductor comprising, in combination:
at least first, second and third insulated-gate field-effect transistors each having a gate electrode and a transconductive channel,
means for applying a potential having an amplitude related to said regulated potential to the gate of said first transistor,
a timing capacitor,
means for charging said timing capacitor through the series combination of the channels of said first and second transistors,
means for discharging said timing capacitor through the series combination of a substantially constant resistance and the channel of said third transistor,
and means for reversing the conductivity states of said second and third transistors when the voltage across said timing capacitor reaches a predetermined value.

4,072,891

TIMING DISPLAY IGNITION PLATE ASSEMBLY

Monty A. Campbell, 1518 NW. Vivian Road, Kansas City, Mo. 64118

Filed June 21, 1976, Ser. No. 698,478
Int. Cl.² F02P 17/00
U.S. Cl. 324—16 T **6 Claims**



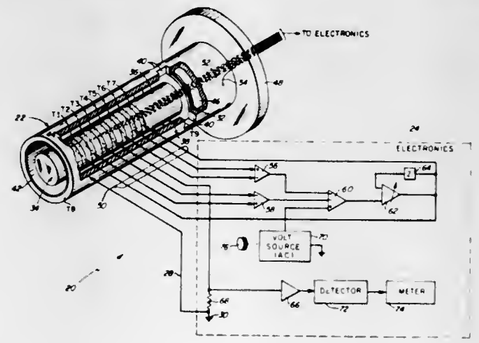
1. An ignition assembly for use on a multi-cylinder internal combustion engine having a spark ignition system including electrical power means, a coil with primary and secondary elements, a spark plug for each cylinder, a rotating cam having a first and second timing mark thereon and a reference timing mark fixedly disposed on said engine, said ignition assembly comprising:
a. an ignition plate having a central aperture therethrough and mountable on said engine whereby said cam is disposed within and protruding from said aperture;
b. a first and second pair of adjustable breaker points mounted on said ignition plate and respectively adapted for timing a first and second cylinder of said engine;
c. one point of each of said pairs of breaker points comprising a first portion fixedly attached to said ignition plate with a first point member adjustable on said fixedly attached first portion; a threaded bolt operably connected between said fixedly attached first portion and said first point member to effect an adjustment therebetween in response to rotation of said threaded bolt;
d. the other point of each of said pairs of breaker points comprising a second point member pivotally mounted at a point fixed with respect to said ignition plate and having a spring loaded arm portion adapted for slidable cam engagement to open and close said first and second point members; said threaded bolt, in effecting said adjustment, adjusting the dwell between said first and second point members;
e. built-in dynamic stroboscopic illumination means having mechanical connection with said ignition plate and electrical connection with said first and second pair of breaker points whereby in operation in said engine said illumination means produces a flash of light in response to engine operated breaker point function;
f. said built-in illumination means including a multiple position switch having electrical connection between said first and second pair of breaker points and said illumination means, said switch being selectively movable from an off position wherein said illumination means is rendered inoperative to a respective first and second on position wherein said first and second pairs of breaker points selectively actuate said illumination means;
g. timing mark viewing means associated with said ignition plate, said built-in illumination means being located on said ignition plate in conjunction with said viewing means to illuminate and expose to view said first and second timing marks and reference timing mark during engine operation, whereby said first and second pairs of breaker points are independently adjustable in absence of external equipment and during engine operation by selectively moving said switch to the respective on positions and rotating the respective bolts until said first and second timing marks are properly aligned with said reference timing mark.

4,072,892

ELECTROLYTIC MEASUREMENT SYSTEM WITH AN INNER POST AND AN OUTER CYLINDRICAL SHIELD FLUID BOUNDARY

Earl R. Lind, Portsmouth, R.I., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 644,499, Dec. 29, 1975, abandoned. This application Feb. 22, 1977, Ser. No. 772,362
Int. Cl.² G01N 27/42
U.S. Cl. 324—30 B **4 Claims**



1. An electrolytic measurement system comprising:
a passage for fluid having a boundary formed of an inner post and an outer cylindrical shield,
a plurality of electrodes flush-mounted along the surface of said post within said boundary for making contact with said fluid, said electrodes being positioned in a serial arrangement along an axis of said passage;
means for electrically energizing a plurality of outer ones of said electrodes which are symmetrically positioned about a center of said arrangement;
means including pairs of said electrodes symmetically positioned between said outer electrodes and an inner one of said electrodes for signaling the presence of an electric current flowing between said outer electrodes and said inner electrode, said signaling means being coupled to said energizing means for maintaining a constant magnitude of electric field between said outer electrodes and said inner electrode independently of electrode resistance of said inner and outer electrodes;
means coupled between said outer electrodes and said inner electrode for measuring electric current flow between said outer electrodes and said inner electrode.

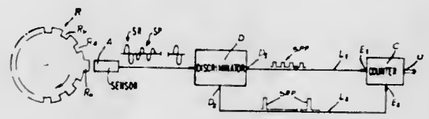
4,072,893

APPARATUS FOR DETERMINING THE ANGULAR POSITION OF A ROTATING MEMBER USING REFERENCE AND POSITION ELEMENTS THAT GENERATE OPPOSITE POLARITY BIPOLAR SIGNALS

Franco Huwyler, Monza (Milan), Italy, assignor to Fabbrica Italiana Magneti Marelli S.p.A., Milan, Italy

Filed June 30, 1976, Ser. No. 701,148
Claims priority, application Italy, Oct. 10, 1975, 28152/75
Int. Cl.² G01R 33/12
U.S. Cl. 324—208 **6 Claims**

1. Apparatus for determining the angular position of a rotating member, said member having a reference element and a plurality of position elements, the structure of said reference element being different from the structure of said position elements, said elements being angular spaced about said rotating member in the direction of rotation said apparatus comprising:
sensor means responsive to the relative structure of the reference and position elements for generating a bipolar reference signal each time said reference element moves past a reference point and for generating a bipolar position signal each time one of said position elements moves past said reference point, each of said bipolar reference and position signals comprising an alternating positive and negative pulse, the order of occurrence of said positive and negative pulses of said bipolar reference signal being opposite to that of the bipolar position signals;



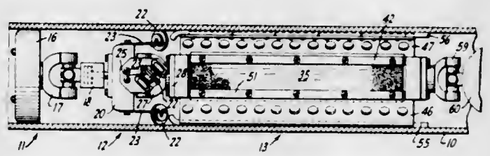
discriminator means responsive to the order of said positive and negative pulses of said bipolar reference and said bipolar position signals for distinguishing between said bipolar reference and said bipolar position signals and, for generating a unipolar reference signal or a unipolar position signal each time said sensor means generates one of said bipolar reference or one of said bipolar position signals, respectively;
signal generating means responsive to said unipolar reference and unipolar position signals for generating an output signal indicative of the angular position of said rotating member relative to said reference point.

4,072,894

ROTATING PIPELINE INSPECTION APPARATUS

Robert D. Barton, Houston, Tex., assignor to AMF Incorporated, White Plains, N.Y.

Continuation of Ser. No. 299,009, Oct. 19, 1972, abandoned, which is a continuation of Ser. No. 56,491, July 20, 1972, abandoned. This application Sept. 19, 1975, Ser. No. 615,003
Int. Cl.² G01R 33/12
U.S. Cl. 324—221 **16 Claims**



1. Apparatus for nondestructively inspecting a pipeline by means of inspection apparatus which is propelled through the interior of the pipeline by a fluid which is being transported therethrough, said apparatus comprising
means extending longitudinally within a portion of said pipeline and spaced from the wall thereof for establishing a magnetic field directed transversely to the axis of said portion of pipeline,
magnetic pole means circumferentially spaced about the wall of the pipeline for directing said magnetic field into the wall of said portion of pipeline to establish a circumferentially directed magnetic flux field therein,
a longitudinally extending fin or flap of elastomeric material secured along its longitudinal dimension to said apparatus in the same portion thereof as said means for establishing the magnetic field, said fin extending outwardly with a curved shape toward said wall in a region of the pipeline

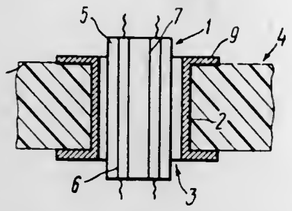
circumferentially spaced from said magnetic pole means and occupying a circumferential section less than 180°,
flux leakage detection means disposed longitudinally along the length of said fin at its outwardly extending portion,
said curved fin or flap urging said detection means into firm but resilient contact with the wall of the pipeline,
means operable in response to the movement of said apparatus through the pipeline to impart a rotary motion to said apparatus, whereby said detection means follows a helical path along the wall of the pipeline.

4,072,895

EDDY CURRENT CONVERTER FOR NON-DESTRUCTIVE TESTING OF ELECTRICALLY CONDUCTING COATING IN HOLES OF PRINTED CIRCUIT BOARDS

Viktor Igorevich Rogachev, Jurievsky pereulok, 22, korpus 2, kv.55.; Vasily Vasilievich Sukhorukov, 2, Vladimirskaya, 50, korpus 2, kv.51., and Petr Nikolaevich Shkatov, Lefortovsky val, 7/6, korpus 4, kv.69., all of Moscow, U.S.S.R.

Filed Jan. 27, 1976, Ser. No. 652,891
Int. Cl.² G01R *33/12*
U.S. Cl. 324—238 **3 Claims**



1. An eddy current converter for non-destructive testing of electrically conducting coating in holes of printed circuit boards, comprising:
a cylindrical frame inserted in a hole being tested of a printed circuit board;
a winding enveloping said cylindrical frame, said winding being inserted for testing together with said cylindrical frame into said hole of the printed circuit board being tested, said winding when energized inducing eddy currents in said coating and sensing the induced eddy currents; and
conductors of said winding extending in an axial direction all over the surface of said cylindrical frame the axial length of the conductors and cylinder being greater than the depth of the holes of the printed circuit boards.

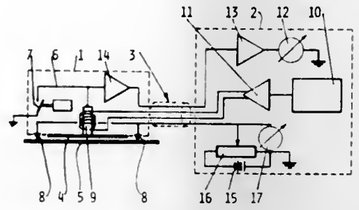
4,072,896

APPARATUS FOR MEASURING THE ELECTRON ESCAPE POTENTIAL OF METAL SURFACES

Paul Frederik Adriaan Bijlmer, Nieuw-Vennep, Netherlands, assignor to Fokker-VFW B.V., Schiphol-Oost, Netherlands

Filed June 23, 1976, Ser. No. 699,204
Claims priority, application Netherlands, June 23, 1975, 7507475
Int. Cl.² G01R *27/26*
U.S. Cl. 324—61 P **2 Claims**

1. In apparatus for measuring the electron escape potential of a metal surface which includes a conductive plate disposed is closely spaced parallel relation to a metal surface at which the electron escape potential is to be measured; means for vibrating said conductive plate in a direction vertical to said metal surface; circuit means connected to said conductive plate for measuring the potential difference between said metal surface and said conductive plate and including first mechanism for indicating such potential difference; the improvement which comprises:
external circuit means including a source of potential, divider means connected across said source of potential and including an adjustable tap connected to said metal surface, and second mechanism for indicating the potential difference between said tap and said source of potential; and
switch means for temporarily connecting said conductive plate to said source of potential prior to measurement to



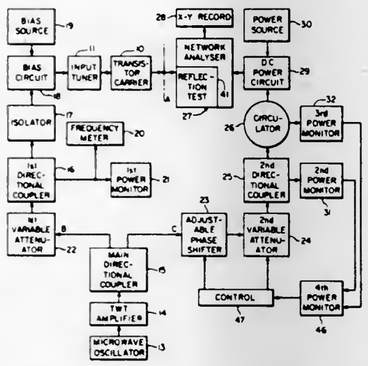
charge the capacitor defined by said conductive plate and said metal surface;
said adjustable tap being adjusted during measurement to zero the indication of said first mechanism whereby said second mechanism directly indicates the electron escape potential of said metal surface independent of the precise spacing between said conductive plate and said metal surface.

4,072,897

EQUIVALENT LOAD-PULL CHARACTERIZATION OF MICROWAVE TRANSISTORS

Yoichiro Takayama, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Oct. 21, 1976, Ser. No. 734,422
Claims priority, application Japan, Oct. 23, 1975, 50-127673
Int. Cl.² G01R *31/22, 27/04*
U.S. Cl. 324—158 T **4 Claims**



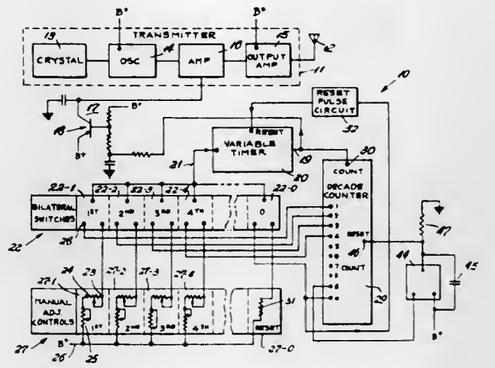
1. A method for measuring, by the use of a microwave signal, load characteristics of a microwave transistor having an input and an output terminal pair, comprising the steps of: branching a first and a second signal from said microwave signal; adjusting the amplitude and phase of said second signal to provide an adjusted signal; supplying said first signal through an input tuner network to said input terminal pair; supplying said adjusted signal to said output terminal pair simultaneously with supplying said first signal to said input pair to make said transistor produce a reflected signal across said output terminal pair; and measuring said adjusted signal and said reflected signal.

4,072,898

REMOTE CONTROL RADIO SYSTEM

Robert R. Hellman, Bridgeport, and Douglas M. French, Clinton, both of Conn., assignors to Westport International, Milford, Conn.

Filed June 9, 1975, Ser. No. 585,249
Int. Cl.² H04B *1/00*
U.S. Cl. 325—37 **11 Claims**



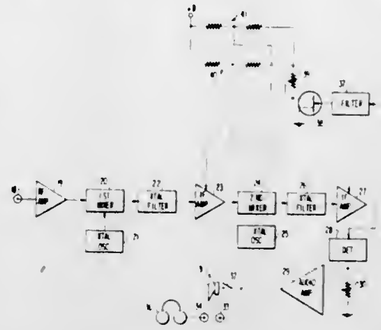
1. A remote radio control system for positioning a servo unit in accordance with the setting of an adjustable control comprising broadcast means for broadcasting a radio wave upon energization, means for energizing the broadcast means to provide a broadcast period and for effecting deenergization of the broadcast means to provide a silent period with a broadcast period and a silent period constituting a segment, means interconnected with the adjustable control for adjusting the duration of the silent period in accordance with the setting of the adjustable control; radio wave receiving means for remotely receiving the wave and providing a detected signal having one state for an extent essentially corresponding to the broadcast period and another state for an extent essentially corresponding to the silent period, means connected to receive the detected signal and interconnected with the servo unit for producing and applying a control signal to the servo unit that is related to the extent of the another state with the servo unit assuming a position dictated by the control signal; in which the system has a pluraity of servo units, in which there is at least one individually adjustable control for each servo unit, in which the means for energizing the broadcast means causes a plurality of successive segments with the plurality of segments constituting a sequence and in which there are means for associating each adjustable control with only one segment in the sequence, in which the radio wave receiving means provides a detected signal for each segment, in which the means for producing and applying produces a segment control signal for each segment detected signal and applies each segment control signal to only one servo unit whereby each segment in the sequence dictates through its segment control signal the position of a servo unit in accordance with the setting of its associated one of the adjustable controls, in which there are means for energizing and deenergizing the broadcast means to produce a reset broadcast period in each sequence, and in which the last named causes the duration of each broadcast period of each segment to be essentially constant and to have the duration of the reset broadcast period be a multiple of the duration of a broadcast period for a segment.

4,072,899

RF LEAK DETECTOR

Richard L. Shimp, Waynesboro, Va., assignor to Comsonics, Inc., Harrisonburg, Va.

Filed Apr. 26, 1976, Ser. No. 680,412
Int. Cl.² H04B *17/00*
U.S. Cl. 325—67 **12 Claims**



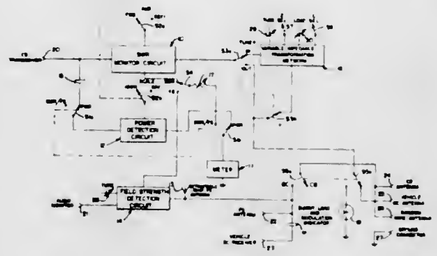
1. A method of detecting RF leaks due to defects in the shielding of a coaxial RF communications medium comprising the steps of:
applying an RF signal, which is modulated by a unique signal, to the coaxial RF communications medium, and
detecting said unique signal with a narrow band receiver and antenna to thereby detect small amounts of RF leakage from the coaxial RF communications medium at the locations of defects in the shielding.

4,072,900

CB RADIO ACCESSORY UNIT

Carl L. Ray, 218 Woodland Hills Drive, Biloxi, Miss.

Filed May 23, 1977, Ser. No. 799,785
Int. Cl.² H04B *17/00*
U.S. Cl. 325—67 **7 Claims**



1. A CB radio accessory unit comprising:
an indicating meter means;
a first connector means for connecting to a CB radio;
an SWR monitor circuit connected to said first connector means to provide signals capable of being indicated on said meter means;
a power detection circuit switchably coupled to said first connector means to provide signals capable of being indicated on said meter means;
a field strength detection circuit having an RF input to provide signals capable of being indicated on said meter means;
a first switching means connected to said meter means for selectively connecting said SWR monitor circuit, said power detection circuit and said field strength detection circuit to said meter means to indicate said signals;
a second connector means for connecting to a vehicle broadcast band receiver and coupled to said RF input;

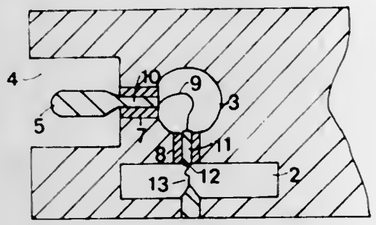
a third connector means for connecting to an antenna usable with a CB radio;
an impedance transformation network connected between said first connector means and said third connector means;
a second switching means connected to said SWR monitor circuit, said impedance transformation network and said third connector means for selectively connecting said impedance transformation network to said third connector means and said SWR monitor circuit or connecting said SWR monitor circuit to said third connector means; and
a third switching means connected to said third connector means and to said second switching means for connecting said third connector means to said RF input.

4,072,901

MICROWAVE CRYSTAL HOLDER

Jean-René Mahieu, and Michel Robin, both of Paris, France, assignors to Societe Lignes Telegraphiques et Telephoniques, Paris, France

Filed July 14, 1976, Ser. No. 705,030
Claims priority, application France, July 18, 1975, 75 22594
Int. Cl.² H04B *1/26;* H01P *1/00*
U.S. Cl. 325—445 **3 Claims**



1. A wafer crystal holder for frequency converters operating at millimeter wavelength, comprising a high conductivity metallic body having a square slot in an end face thereof, and a rectangular aperture in a side face thereof through which a modulated carrier frequency and a local frequency are propagated, a cylindrical aperture on said side face, two coaxial stubs, one quarter wavelength at carrier frequency, the first one located between said rectangular aperture and said cylindrical aperture, the second one between said cylindrical aperture and said square slot, an output standard coaxial connection for intermediate frequency positioned within said slot, a wafer crystal located in said rectangular aperture in contact with one end of the first of said stubs, and means connecting the ends of said stubs in said cylindrical aperture by a wire the length of which is an odd number of quarter wavelengths at said carrier frequency and the diameter of which is selected so that the output impedance at the intermediate frequency is matched to the characteristic impedance of said standard coaxial output connection.

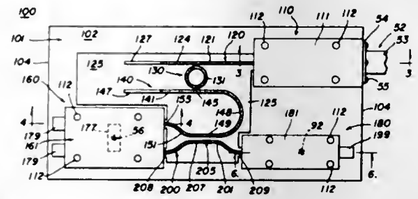
4,072,902

RECEIVER MODULE AND MIXER THEREOF

Robert M. Knox, La Grange, and Peter P. Toulios, Westchester, both of Ill., assignors to Epsilon Lambda Electronics Corporation, Batavia, Ill.

Division of Ser. No. 592,065, June 30, 1975, Pat. No. 3,995,238.
This application Nov. 8, 1976, Ser. No. 740,014
Int. Cl.² H04B *1/26*
U.S. Cl. 325—446 **11 Claims**

1. A mixer for use in the frequency range from about 1 GHz to about 1,000 GHz comprising a base plate defining a conductive image plane, a housing mounted on said plate and cooperating therewith to define a cavity, a mixer diode mounted within said cavity and having an output coupling therefor extending out of said cavity, an elongated high permittivity dielectric waveguide of finite cross section adjacent to said image plane and extending into said cavity, and a thin film of synthetic organic resin disposed between and secured to both said image plane and said dielectric waveguide and extending laterally thereof, said thin film being low loss in character and having a low permittivity compared with that of said dielectric waveguide, the ratio between the thickness of said thin film



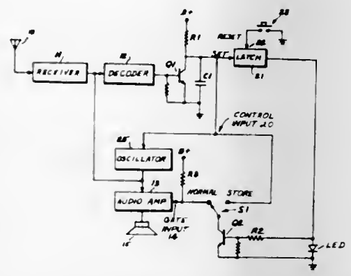
and the square root of the cross-sectional area of said dielectric waveguide being in the range from about 0.02 to about 1.0, the end of said dielectric waveguide extending into said cavity being tapered toward said diode to provide impedance matching and mode transformation of the energy transmitted between said cavity and said dielectric waveguide.

4,072,903

STORAGE CIRCUIT FOR PAGING RADIO RECEIVERS

Raymond W. Harris, Rustburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Dec. 10, 1976, Ser. No. 749,390
Int. Cl.² H04M *11/02*
U.S. Cl. 325—466 **9 Claims**



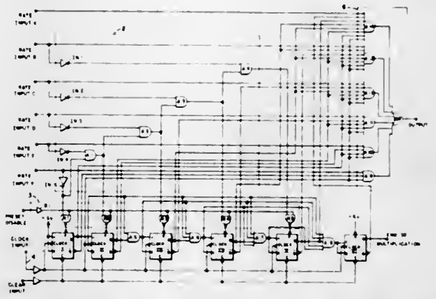
1. An improved paging receiver circuit comprising:
a. first means for connection to said receiver and having an output for producing a paging signal in response to a predetermined signal received by said receiver;
b. a latch having an input connected to said first means output, and having an output for producing a latched signal in response to said paging signal;
c. audio means having a control input connected to said first means output, having a gate input, and having an output, said audio means producing an audible signal at said output in response to the presence of said paging signal or said latched signal at said control input and in response to said latched signal at said gate input;
d. switching means connected to said latch output for selectively supplying said latched signal to said gate input or said control input of said audio means;
e. and second means connected to said control input of said audio means for causing said audio means to produce an audible sound in response to said switching means transferring said latch output from said control input of said audio means to said gate input of said audio means.

4,072,904

PRESETTABLE RATE MULTIPLIER

Paul G. Casner, Ellicott City, and Edward J. McDevitt, Laurel, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 23, 1976, Ser. No. 725,746
Int. Cl.² H03K *21/00, 23/06*
U.S. Cl. 328—39 **11 Claims**



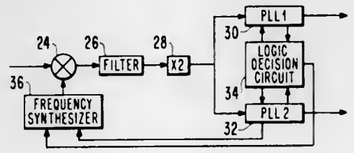
1. A rate multiplier, having a plurality of ordered rate inputs and a clock input, for generating an output frequency f_{out} which is a fraction of an input frequency f_{in}, comprising:
a series of connected counting stages, each counting stage being clocked by the input clock and having a preset input which, when enabled, locks the counting stage into a given output state which inhibits the counting stage from counting when clocked, and
logic circuit means, having the ordered rate inputs as inputs and having outputs connected to the series of connected counting stages, for controlling the enabling of the preset input of each counting stage so that no preset input can be enabled unless the preset inputs of all previous counting stages in the series are also enabled.

4,072,905

WIDE ACQUISITION RANGE MSK DEMODULATOR INPUT CIRCUIT

James Malcolm Keelty, Montreal, Canada, assignor to RCA Corporation, New York, N.Y.

Filed Mar. 9, 1977, Ser. No. 775,861
Int. Cl.² H03D *3/00*
U.S. Cl. 329—122 **7 Claims**



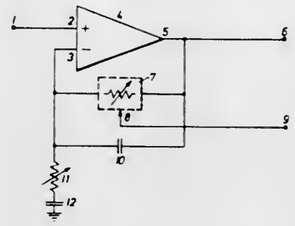
5. In combination,
input means providing a signal having first and second discrete spectral lines in the frequency spectrum,
a pair of phase locked loops (PLL) coupled to said input means each settable to at least two operating frequencies,
means coupled to said input means for scanning the frequency of said signal until one of said PLLs locks to one of said spectral lines, and
decision circuit means responsive to the locking of said one PLL to one of said spectral lines to cause said second PLL to assume one or the other of its operating frequencies to lock said second PLL to said second spectral line.

4,072,906

VARIABLE GAIN AMPLIFIER WITH ADJUSTABLE UPPER FREQUENCY LIMIT

Ernst Schröder, Hannover, Germany, assignor to Licentia Patent-Verwaltungs G.m.b.H., Frankfurt am Main, Germany

Filed Sept. 27, 1976, Ser. No. 727,372
Claims priority, application Germany, Sept. 25, 1975, 2542745
Int. Cl.² H03F *1/36*
U.S. Cl. 330—86 **2 Claims**



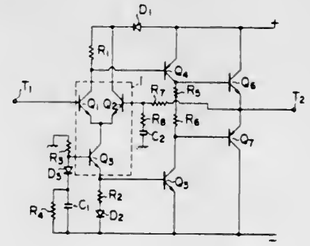
1. In an amplifier circuit arranged to be connected in a useful signal path and having a variable transmission factor and an effective transmission frequency band delimited by a lower limit frequency which can be varied as a function of a control voltage, the circuit including an amplifier member and circuit components defining a feedback path connected between the output of the amplifier member and an input thereof which is inverting with respect to the output signals of the amplifier member, the components defining the feedback path including an electronically voltage-controllable resistor having a control voltage input and a first frequency dependent impedance connected in parallel with the resistor, and the circuit further including a second frequency dependent impedance connected between the inverting input of the amplifier member and a point at the circuit reference potential, and means for supplying the control voltage to the control voltage input of the controllable resistor, the improvement comprising means defining a resistive impedance connected in series with said second frequency dependent impedance for setting the upper limit frequency of the effective transmission band of said circuit at a selected value.

4,072,907

AMPLIFIER CIRCUIT

Mamoru Sekiya, and Nobuyuki Sakabe, both of Nagoya, Japan, assignors to Shin-Shirasuna Electric Corporation, Nagoya, Japan

Filed Nov. 11, 1976, Ser. No. 740,979
Claims priority, application Japan, Nov. 14, 1975, 50-136906; Nov. 14, 1975, 50-136907
Int. Cl.² H03F *3/45*
U.S. Cl. 330—261 **2 Claims**



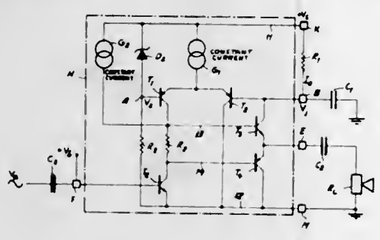
1. An amplifier circuit including a differential amplifier circuit comprising a first transistor, a second transistor and a third transistor, the emitters of said first and second transistors being connected to each other, the collector of said third transistor being coupled to the connection between the emitters of said first and second transistors; a fourth transistor

having the base thereof connected with the collector of said first transistor and having the emitter thereof coupled to one terminal of a power source; a fifth transistor having the base thereof connected with the emitter of said third transistor and having the emitter thereof coupled to the other terminal of said power source; voltage drop producing means; the collectors of said fourth and fifth transistors being connected with each other via said voltage-drop producing means; and a single-ended push-pull amplifier circuit comprising at least two transistors one of which has the base thereof connected with the collector of said fourth transistor and the other one of which has the base thereof connected with the collector of said fifth transistor; a first resistor connected between the collector of said first transistor and said one terminal of said power source, and a second resistor connected between the emitter of said third transistor and said other terminal of said power source, the values of said first and second resistors being selected so that the voltage across said first resistor and the voltage across said second resistor are equal to each other.

4,072,908
AUDIO AMPLIFIER WITH CONSTANT CURRENT CONSUMPTION

Bruno Murari, Monza (Milan), and Pietro Menniti, Milan, both of Italy, assignors to SGS-ATES Componenti Elettronici S.p.A., Agrate Brianza (Milan), Italy

Filed Jan. 21, 1977, Ser. No. 761,404
Claims priority, application Italy, Jan. 22, 1976, 19468/76
Int. Cl.² H03F *3/183*
U.S. Cl. 330—265 **8 Claims**

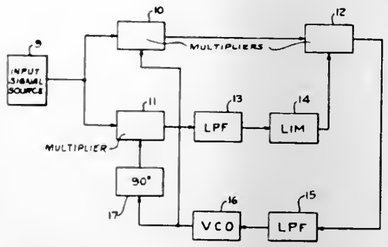


1. An amplifier for audio signals, comprising:
a source of direct current having a first and a second terminal:
an output resistor and a constant-current generator connected to said first terminal;
a preliminary stage including pilot transistor means connected between said constant-current generator and said second terminal;
a final stage including a first and a second power transistor serially connected between said output resistor and said second terminal, said first power transistor forming a junction with said output resistor;
input means for feeding audio signals to said pilot transistor means;
a biasing circuit extending from said preliminary stage to said final stage for controlling the conduction of said power transistors in response to said audio signals;
a load circuit connected across said second power transistor for energization by said final stage; and
current-sensing means connected between said final stage and said preliminary stage for modifying the control of said conduction by said biasing circuit to maintain a substantially constant flow of direct current in said final stage, said current-sensing means comprising a feedback transistor with an input tied to said junction, said feedback transistor being connected between said constant-current generator and said second terminal in parallel with said pilot transistor means.

4,072,909
AUTOMATIC PHASE AND FREQUENCY CONTROL SYSTEM

Richard W. Citta, Oak Park, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Sept. 27, 1976, Ser. No. 727,095
Int. Cl.² H03B *3/04*
U.S. Cl. 331—12 **8 Claims**

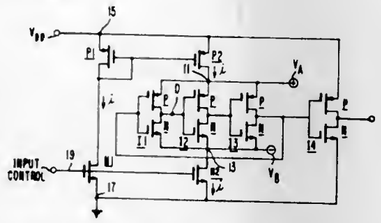


1. An automatic phase and frequency control system for producing phase and frequency synchronism between a locally generated signal and an input signal comprising:
oscillator means producing an oscillatory signal having a frequency responsive to a control signal;
generating means producing first and second beat signals between said input signals and said oscillatory signal, said beat signals having a substantially quadrature relationship;
translating means converting said first beat signal to a constant amplitude signal having a phase relative to said second beat signal which varies in a predetermined relationship to said beat signal frequency, said translating means being capable of coupling a D.C. signal;
first multiplying means multiplying said second beat signal and the output signal of said translating means to develop a control signal, said second beat signal being applied to said multiplying means such that the relative amplitude of said output signal of said translating means and said second beat signal remain substantially constant and the relative phase therebetween varies as a function of beat signal frequency; and
first filter means coupling said control signal to said oscillator means.

4,072,910
VOLTAGE CONTROLLED OSCILLATOR HAVING EQUALLY CONTROLLED CURRENT SOURCE AND CURRENT SINK

Andrew Gordon Francis Dingwall, Bridgewater, N.J., and Bruce David Rosenthal, Mountain View, Calif., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 1, 1977, Ser. No. 783,657
Claims priority, application United Kingdom, Apr. 9, 1976, 14608/76
Int. Cl.² H03B *5/02, 5/12*
U.S. Cl. 331—57 **8 Claims**



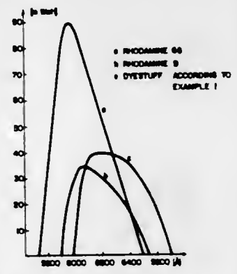
1. The combination comprising:
an oscillator, having two voltage terminals, whose output frequency varies as a function of the voltage applied across said two voltage terminals;
first and second power terminals for the application therebetween of an operating voltage;

a current source connected between said first power terminal and one of said two voltage terminals;
a current sink connected between said second power terminal and the other one of said two voltage terminals;
an input control terminal adapted to receive a control signal;
control means coupled between the input control terminal and said current source and current sink responsive to the amplitude of the signal at said control terminal for maintaining the amplitude of the current through said current source substantially equal to that through said current sink for monotonically varying the amplitude of said current through said current source and sink and monotonically altering said oscillator output frequency as a function of said control signal.

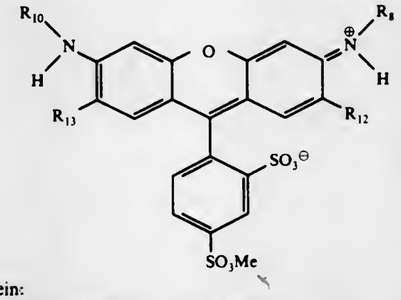
4,072,911
DYESTUFF LASER

Herbert Walther, Junkersdorf; Wolfgang Hartig, Bornheim-Hersel; Adolf Friedrich, and Roderich Raue, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 1, 1975, Ser. No. 573,785
Claims priority, application Germany, May 4, 1974, 2421607
Int. Cl.² H03F *3/00; F21K 2/00*
U.S. Cl. 331—94.5 L **4 Claims**



1. Dyestuff laser capable of generating a coherent emission in a wavelength range of 550 to 680 nm consisting of a reservoir containing a laser dyestuff solution and a pumping light source coupled thereto capable of exciting the dyestuff solution so that it emits, in which said dyestuff solution comprises a solvent which does not interfere with the emission and a concentration sufficient to emit laser beams of a dyestuff of the formula



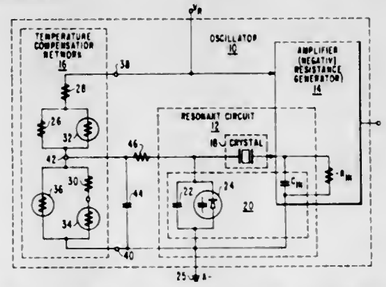
wherein:
R_8 and R_{10} are alkyl of 1–4 C atoms;
R_{12} and R_{13} are hydrogen or alkyl of 1–4 C atoms; and Me is hydrogen, potassium, sodium, ammonium monoalkylammonium, dialkylammonium or trialkylammonium ions, said alkyl containing 1–4 C atoms.

4,072,912
NETWORK FOR TEMPERATURE COMPENSATION OF AN AT CUT QUARTZ CRYSTAL OSCILLATOR

Bortolo Mario Pradal, Pittsburgh, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 12, 1976, Ser. No. 741,405
Int. Cl.² H03B *5/04, 5/32*
U.S. Cl. 331—116 R **9 Claims**

1. In a crystal oscillator of the type including a resonant circuit and means for sustaining oscillations in said resonant circuit, said resonant circuit including in loop connection a voltage variable capacitance device and a crystal, said crystal having a temperature dependent self-resonant frequency, and a predetermined frequency drift characteristic, said oscillator further including means for generating a bias signal having an aplitude varying in accordance with temperature, said bias signal being applied to said voltage variable capacitance device to vary the capacitance of said device to compensate for temperature dependent changes in said crystal self-resonant frequency,
said bias signal matching a predetermined theoretical compensation voltage versus temperature curve at a plurality of predetermined temperatures within a predetermined range of temperatures,
said means for generating said bias signal comprising a temperature dependent potential dividing network means, responsive to a fixed bias potential applied across first and second terminals, for providing said bias signal between said second terminal and a third terminal, the improvement wherein:



said crystal has a frequency drift characteristic approximately in accordance with an equation of the third degree in temperature change having upper and lower inflection points within said predetermined range of temperatures; and
said temperature dependent potential dividing means comprises first, second, third, fourth, fifth and sixth resistances, said first, second and third resistances exhibiting substantially zero temperature coefficients and said fourth, fifth and sixth resistance exhibiting predetermined negative temperature coefficients;
a parallel connection of said first and said fourth resistances;
said parallel connection being serially coupled with said second resistance between said first and third terminals;
said third and said fifth resistances being serially coupled between said second and third terminals; and
said sixth resistance being coupled between said second and third terminals.

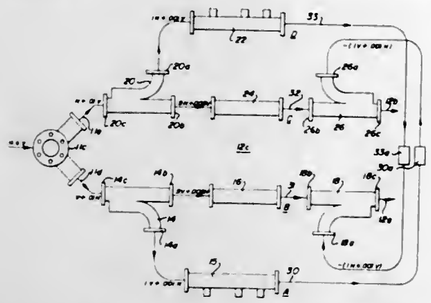
4,072,913
FEED FORWARD PASSIVE COUPLING SYSTEM AND METHOD

Richard V. Snyder, Old Bridge, N.J., assignor to Harvard Industries, Inc., Farmingdale, N.J.

Filed Feb. 3, 1976, Ser. No. 654,989
Int. Cl.² H01P *5/12, 1/16*
U.S. Cl. 333—6 **17 Claims**

1. A feed forward passive coupling system for separation of at least a first and a second signal portion into at least first and second signal components of differing frequencies where said first and second signal portions have a majority of said second and first components respectively and a minority of said first and second components respectively comprising
first means for combining a predetermined second sample of said second signal portion and a predetermined part of said first signal portion to produce substantially said second component, means for coupling out and reversing the sign of said second sample of said second signal portion and producing a predetermined part of said second signal portion, and

second means for combining a predetermined first sample of said first signal portion and said predetermined part of said



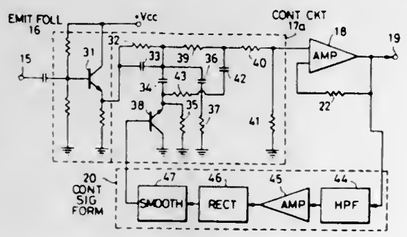
second signal portion to produce substantially said first component.

4,072,914

COMPRESSION AND EXPANSION SYSTEM WITH ENLARGED DYNAMIC RANGE

Yutaka Haramoto, Zama; Kazunori Nisikawa, Fujisawa, and Masami Yamazaki, Zama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Apr. 28, 1976, Ser. No. 681,255
Claims priority, application Japan, Apr. 30, 1975, 50-51261
Int. Cl.² H04B *1/64*
U.S. Cl. 333—14 **7 Claims**



1. A compression system comprising:

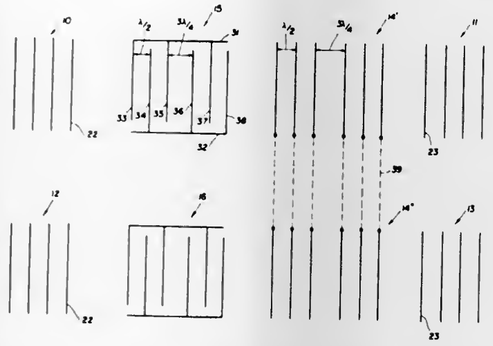
means for changing a flat frequency characteristic to a characteristic which raises from said flat characteristic in a high-frequency range to a characteristic which lowers from the flat characteristic in a high-frequency range, said changes occurring in a manner such that said frequency characteristic approaches said raised characteristic as the level of an input signal becomes smaller and approaches said lowered characteristic as the level of the input signal becomes larger, said frequency characteristic changing means including a variable impedance element having an impedance which is varied responsive to a control signal, a variable high-frequency range increasing circuit means responsive to the variation of the impedance of said variable impedance element for relatively increasing the high-frequency component of the input signal in comparison with the low-frequency component thereof when said input signal is of a low level, and a variable high-frequency range decreasing circuit means responsive to the variation of the impedance of said variable impedance element for relatively decreasing the high-frequency component of said input signal in comparison with the low-frequency component thereof when said input signal is of a high level, said variable high-frequency range increasing circuit means and said variable high-frequency range decreasing circuit means being commonly connected to said single variable impedance element; and means for forming said control signal responsive to the level of said input signal of said frequency characteristic changing means and for applying said control signal to said variable impedance element of the control circuit means, thereby varying the impedance thereof.

4,072,915

ACOUSTIC SURFACE WAVE DEVICES

Richard F. Mitchell, Merstham, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 10, 1976, Ser. No. 721,967
Claims priority, application United Kingdom, Sept. 19, 1975, 38577/75
Int. Cl.² H03H *9/04, 9/26, 9/32*; H01L *41/04*
U.S. Cl. 333—72 **14 Claims**



1. An acoustic surface wave resonator device comprising, a substrate having a surface layer of piezoelectric material, a pair of spaced apart reflectors on the piezoelectric surface forming a resonant cavity capable of supporting an acoustic surface standing wave at or near a predetermined frequency, and means for coupling with acoustic surface standing wave energy in the resonator, the coupling means including two similar arrays of parallel conductive strips on the piezoelectric surface transverse to the length of the cavity and located between the pair of reflectors, the strips of each array having a centre-to-centre spacing of half a wavelength or an odd integral multiple of half a wavelength of acoustic surface waves at said predetermined frequency, the spacing between the two arrays being a quarter wavelength or an odd integral multiple of a quarter wavelength of acoustic surface waves at said predetermined frequency, and a point mid-way between the two arrays being at the centre of the resonant cavity or displaced from the centre of the resonant cavity by half a wavelength or an integral multiple of a half wavelength of acoustic surface waves at said predetermined frequency.

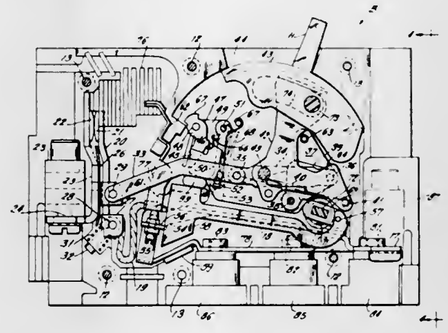
4,072,916

STACKED CIRCUIT BREAKERS HAVING HIGH INTERRUPTING CAPACITY

Frank W. Kussy, Randallstown, Md., assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed Dec. 19, 1975, Ser. No. 642,497
Int. Cl.² H01H *75/00*
U.S. Cl. 335—16 **12 Claims**

1. A circuit breaker including stationary contact means; movable contact means operable into and out of engagement with said stationary contact means to respectively close and open said circuit breaker; an operating mechanism for moving said movable contact means to open and close said circuit breaker; automatic trip means to actuate said mechanism to open said circuit breaker when said circuit breaker is subjected to fault current conditions; first and second spaced terminals; circuit means, including said movable and fixed contact means, extending between said terminals; said circuit means also including first and second elongated sections with said first section constituting at least part of an arm mounting said movable contact means and connected to said mechanism to be movable thereby for opening and closing said circuit breaker; with said circuit breaker closed, said sections being in confronting closely spaced relationship with currents flowing therethrough in opposite directions to create a magnetic blow-off force tending to open said circuit breaker prior to actuation of said mechanism to open said circuit breaker; said operating mechanism including a toggle connected to said arm and including first and second links connected at a movable knee which, for all positions of said arm, remains on the same side of a straight line extending between pivots at opposite ends of said toggle; said mechanism also including main spring means connected to said toggle at said knee to provide power for opening and closing said circuit breaker; said first section being pivoted to a pivot at one end thereof and mounting the movable contact means at the other end thereof; said second section at one end thereof mounting said stationary contact means and said first terminal being at the other end thereof; said first terminal being disposed in the general vicinity of said one end of said first section.

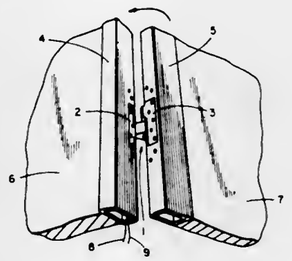


4,072,917

SWITCH ACTUATING HINGE

Michael Haag, Chicago, and Herman P. Pichler, Franklin Park, both of Ill., assignors to Rixson-Firemark, Inc., Franklin Park, Ill.

Filed Apr. 5, 1976, Ser. No. 673,603
Int. Cl.² H01H *9/00*
U.S. Cl. 335—205 **6 Claims**



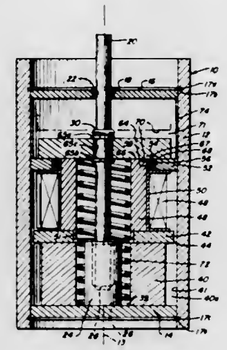
1. In a switch actuating hinge in which the hinge has a door leaf and a jamb leaf both having mounting screw holes with each hole adapted to receive the head of an associated mounting screw, the improvement comprising a magnet actuated switch carried by the jamb leaf, a permanent magnet carried by the door leaf, an adjusting screw retained within one of the door leaf mounting holes and having a head substantially identical to that of the mounting screws, and means coupling the adjusting screw to the magnet whereby adjustment of the screw from the exposed face of the door leaf when mounted effects the relative positioning of the magnet and the switch with a resultant change in switch actuating sensitivity.

4,072,918

BISTABLE ELECTROMAGNETIC ACTUATOR

Reginald A. Read, Jr., Brookfield, Ill., assignor to Regdon Corporation, Brookfield, Ill.

Filed Dec. 1, 1976, Ser. No. 746,338
Int. Cl.² H01F *3/12, 7/08*
U.S. Cl. 335—236 **13 Claims**



1. Magnetic apparatus comprising:

a hollow housing of highly magnetically permeable material, having a principal axis and an inner wall, said housing being closed at one end;

a magnet in in close magnetic contact with said closed end of said housing, and substantially axially aligned with said principal axis, said magnet forming a gap of at least a first dimension with said inner wall;

a shunt piece, of highly magnetically permeable material, in close magnetic contact with said magnet and substantially axially aligned with said principal axis, said shunt piece forming a gap with said inner wall of substantially a second dimension, said second dimension being less than said first dimension;

a coil;

a core, of highly permeable magnetic material, in close magnetic contact with said shunt piece and substantially axially aligned with said principal axis, said coil being disposed about said core and said core including a portion extending axially beyond said coil;

a pole piece, of highly magnetically permeable material, disposed adjacent said coil and about that portion of said core extending beyond said coil, in close magnetic contact with said inner wall of said housing and forming a gap between an inner surface of said pole piece and said portion of said core;

armature means, including an armature plate, of highly magnetically permeable material, disposed for reciprocal movement in said housing between first and second positions, along said principal axis, said plate being disposed to overlie, in close magnetic contact, said core and said pole piece in said first position, and to have a gap of at least a third dimension with at least one of said pole piece and said core in said second position; and

means for urging said armature plate to said second position.

4,072,919

SOLENOID CONSTRUCTION

John G. Clary, Pasadena, Calif., assignor to Addmaster Corporation, San Gabriel, Calif.

Filed Nov. 3, 1976, Ser. No. 738,452
Int. Cl.² H01F *7/16*
U.S. Cl. 335—257 **5 Claims**

1. A solenoid comprising a bearing sleeve, a stop element of

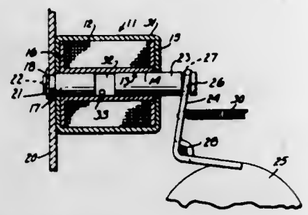
magnetic material in said sleeve adjacent one end of said sleeve,

said stop element forming a first flat sphere engaging surface,

an armature of magnetic material slidable endwise within said sleeve adjacent the opposite end of said sleeve,

said armature forming a second flat sphere engaging surface,

means for inducing magnetic flux between said stop element and said armature whereby to attract said armature towards said stop element, and



a shock absorbing sphere of elastomeric material within said sleeve intermediate said armature and said stop element,

said sphere being freely mounted between said armature and said stop element and being compressible between said first and second sphere engaging surfaces whereby to arrest said armature,

said sphere engaging surfaces being parallel to each other and at right angles to the direction of movement of said armature.

4,072,920

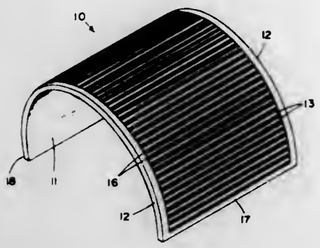
MAGNETIC HOLDING DEVICE

Theodore D. Wright, St. Paul, Minn., assignor to K & F Manufacturing Co., Inc., Granger, Ind.

Continuation of Ser. No. 556,686, March 10, 1975, abandoned. This application Mar. 26, 1976, Ser. No. 670,829

Int. Cl.² H01F 7/20

U.S. Cl. 335—285 **10 Claims**



1. A magnetic device for holding a printing plate or the like comprising:

a base plate made of rigid, substantially non-magnetic material, said base plate exhibiting an arcuately curved outer surface,

a plurality of spaced-apart rigid strips of magnetic material arranged at the outer surface of the base plate,

magnet strips located in respective spaces between said rigid strips, and

mechanical locking means for holding said rigid strips and said magnet strips in position at said base plate, said locking means including recess means at said base plate which are lockingly engageable over the respective extreme axial end portions of said rigid strips and said magnet strips to hold said strips against movement both radially outwardly of said base plate and axially in the direction of said strips.

4,072,921

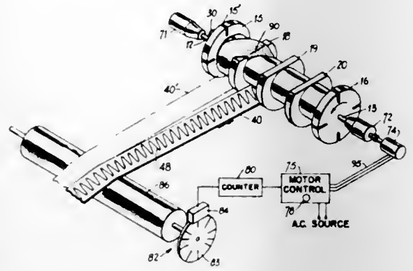
LOW INDUCTANCE PRECISION RESISTOR DEPOSITED ON AN ADHESIVE BACKING AND WOUND ON A BOBBIN

Peter John Sacchetti, Manchester, N.H., assignor to AMF Incorporated, White Plains, N.Y.

Filed Apr. 27, 1976, Ser. No. 680,717

Int. Cl.² H01C 3/02

U.S. Cl. 338—61 **16 Claims**



1. The method of making a low inductance precision resistor comprising the steps

advancing along a path a continuous length of thin, flexible tape of electrical insulating material,

depositing a continuous length of resistor wire in a sinuous pattern on a surface of side said advancing tape,

winding said tape with the resistor wire thereon onto the axial extending portion of a bobbin that includes radially extending flanges at each end, the side of the tape having the wire thereon being placed in contact with the bobbin when commencing the winding.

4,072,922

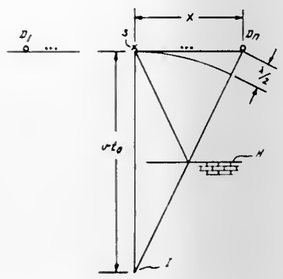
METHOD FOR SEISMIC EXPLORATION FOR ENHANCED RESULTS IN SIMULATED CYLINDRICAL OR PLANE WAVES

M. Turhan Taner; Robert E. Sheriff, and H. Neal Reeves, all of Houston, Tex., assignors to Seiscom Delta Inc.

Filed Nov. 13, 1975, Ser. No. 631,715

Int. Cl.² G01V 1/20, 1/16

U.S. Cl. 340—15.5 CP **12 Claims**



1. A method of seismic surveying to simulate travel of a seismic wave through seismic horizons in the earth, comprising the steps of:

a. establishing a seismic source at a position to emit seismic waves into the earth;

b. establishing seismic sensors along at least one line sensor array of length greater than or equal to the diameter of a circular region for the deepest horizon of interest in which all raypaths for seismic waves from the seismic source at a highest frequency of interest differ in phase from each other by less than one-half wavelength at such highest frequency of interest;

c. emitting seismic waves from the seismic source; and

d. sensing the response of the seismic horizons to the emitted waves at the sensors so that the responses sensed at the receivers contribute to, and supplement each other due to the difference in their phase.

4,072,923

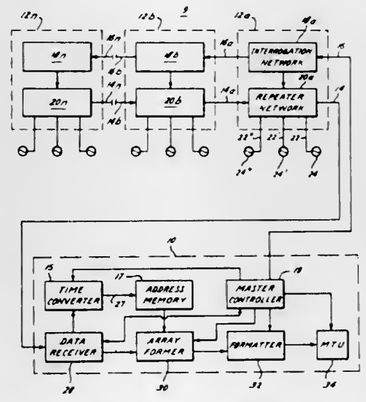
MULTICHANNEL SEISMIC TELEMETER SYSTEM AND ARRAY FORMER

Lee E. Siems, and Paul M. Morgan, both of Houston, Tex., assignors to Western Geophysical Co. of America, Houston, Tex.

Filed Mar. 8, 1976, Ser. No. 664,617

Int. Cl.² G01V 1/22

U.S. Cl. 340—15.5 TS **4 Claims**



1. In a seismic data system comprising a central station; a plurality of remote transceivers, each having a plurality of input channels; a broadband transmission link including an interrogation channel connecting said transceivers in series to said central station; means in each said transceiver, coupled to said interrogation channel for applying a fixed delay to said interrogation signals, for regenerating said interrogation signals, and for transmitting said interrogation signals down-link to the next-in-series transceiver, the fixed delay being less than the sum of the digital-data-word length plus the two-way signal propagation delay through the interrogation channel; a plurality of spaced elemental seismic sensor units connected to supply analog seismic signals to corresponding input channels in each said transceiver; means in each said transceiver for sampling input seismic signals and for converting the amplitudes and polarities thereof into multibit, self-clocking, floating-point, phase encoded digital data words having a predetermined length in time, the respective bit values being defined by coded phase reversals, each said digital data word being divided into a number of bit intervals having a width equal to an integral submultiple of the digital data word length; control means in each said transceiver coupled to said interrogation channel for applying digital data words from each channel of each said transceiver to said broadband transmission link, in constant current mode, in response to interrogation signals received from said central station over said interrogation channel, the improvement wherein:

the leading edge of the leading bit of each said data word always has the same given polarity trend, the improvement further including:

first means in each said transceiver for receiving digital data words from respective down-link transceivers, and for regenerating and retransmitting said digital data words up-link;

second means in said central station for receiving digital data words from said respective transceivers; and

sensing means included in said first means and said second means for sensing said given polarity trend as the beginning of a digital data word and means for detecting the end of a digital data word by counting the number of phase reversals in the direction of said given polarity trend that occur within a prescribed multiple of the bit interval.

4,072,924

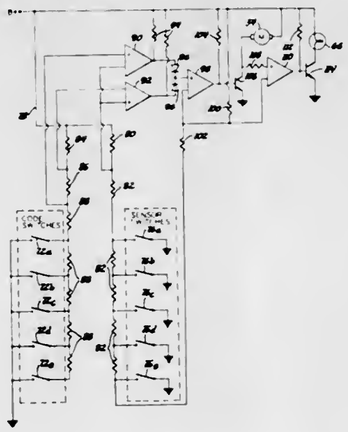
AUTOMOTIVE PRIORITY MESSAGE DISPLAY

Allen J. Pomerantz, Bancroft, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 12, 1975, Ser. No. 576,617

Int. Cl.² G08B 19/00

U.S. Cl. 340—52 F **3 Claims**



1. A system for singly indicating the occurrence of any of a plurality of events in a motor vehicle and for indicating only the event of most significance when more than one event occurs concurrently, comprising

a display device for selecting messages for display and for singly displaying messages corresponding to the events,

code means controlled by the display device for producing a first electrical signal having a different voltage magnitude for each selected message,

a plurality of sensors each comprising a switch actuated in response to an event,

means for producing a second electrical signal in response to sensor actuation, the voltage magnitude of the second signal for each sensor being distinctive and having a predetermined correspondence to the magnitude of the first electrical signal for the message appropriate to the sensed event, the magnitudes of the second electrical signal being arranged in order of priority of the significance of the events, and including means for preferentially producing the signal magnitude of highest priority when a plurality of sensors are actuated concurrently,

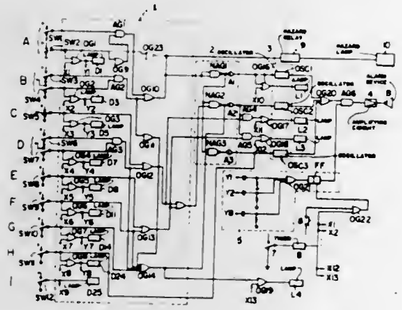
and voltage level comparator means comparing the first and second electrical signals to determine correspondence between the selected message and the sensed event of highest priority and for controlling the display device to select and display the message corresponding to the sensed event of highest priority.

4,072,925

WARNING SYSTEM FOR VEHICLES

Michio Yashima, Kawagoe; Takaya Senzaki, Iruma, and Norimitsu Kurihara, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan

Filed Dec. 18, 1975, Ser. No. 642,136
Claims priority, application Japan, Dec. 23, 1974, 49-147877
Int. Cl.² G08B 19/00
U.S. Cl. 340—52 F **7 Claims**



1. A warning system for vehicles which comprises in combination:

(a) a plurality of abnormality detecting means disposed at various parts of the vehicle to be inspected;

(b) a plurality of abnormality indicator means to be actuated instantaneously upon receipt of a detection signal from said abnormality detecting means to thereby indicate abnormality which has taken place at any part of the vehicle;

(c) a plurality of action indicator means to notify a vehicle driver of the action to be taken depending on the degree of danger or emergency in the abnormal situation taken place; and

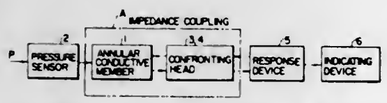
(d) a preferential circuit provided in a connecting circuit between said plurality of abnormality detecting means and said plurality of action indicator means, and to introduce preferentially a detection signal having the highest degree of emergency out of a plurality of detection signals from said abnormality detecting means into said action indicator means corresponding to such detection signal.

4,072,926

TIRE PRESSURE WARNING APPARATUS

Yoichi Shimahara, and Takashi Shimada, both of Takatsuki, Japan, assignors to The Toyo Rubber Industry Co., Ltd., Osaka, Japan

Continuation of Ser. No. 426,737, Dec. 20, 1973, abandoned.
This application Sept. 24, 1975, Ser. No. 616,360
Claims priority, application Japan, Dec. 30, 1972, 48-2836; Apr. 20, 1973, 48-45455
Int. Cl.² B60C 23/02
U.S. Cl. 340—58 **2 Claims**



1. A tire pressure warning apparatus for a vehicle having a pneumatic tire mounted on a rotatable wheel fixed to an axle of the vehicle, and comprising:

pressure sensor means supported in said tire for sensing the tire air pressure;

switch means coupled to said pressure sensor means and switchable between an open-circuit state and a closed circuit state in response to the sensing of an abnormal value of tire air pressure;

an annular conductive member secured to said wheel and electrically connected in series with said switch means;

a pair of spaced confronting heads fixed to a stationary portion of said vehicle such that said heads are stationary when said tire and wheel are rotating, said heads being disposed adjacent to said annular conductive member and adapted to form an electrical non-resonant impedance coupling (A) therewith when said switch means is in said closed circuit state;

response circuit means mounted on said stationary portion and electrically coupled to said confronting heads for producing an output signal only when said switch means is switched from one of its states to the other in response to said abnormal value of tire pressure to form said impedance coupling; and

indicator means coupled to said response circuit means for producing a warning signal in response to said output signal;

wherein said annular conductive member is an elctromagnetic coil, and said confronting heads are electrically unconnected electromagnetic heads which are spaced along said coil and which are mutually inductively coupled via said impedance coupling when said switch means is in closed circuit state; and wherein

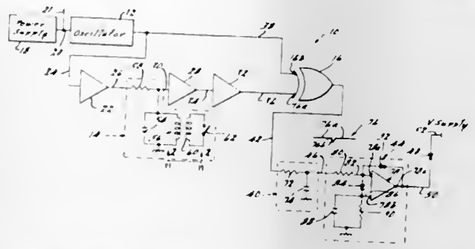
said response circuit means comprises continuously operating transmitter means coupled to only one of said heads for continuously applying an A.C. signal thereto to induce in said coil a voltage which causes a current to flow in said coil only when said switch means is in said closed circuit state, and receiver means coupled to only the other of said heads for producing said output signal, the continuous operation of said transmitter means being independent of the state of said switch means.

4,072,927

TIRE PRESSURE MONITOR

Walter K. O'Neil, Southfield, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 15, 1977, Ser. No. 768,810
Int. Cl.² B60C 23/02
U.S. Cl. 340—58 **10 Claims**



1. A monitoring system for activating a warning device in response to a change in condition of an object, said system comprising:

means for producing a first cyclic signal;

a resonant circuit including reactive means, said resonant circuit excited by said first cyclic signal and operative to produce a second cyclic signal shiftable in phase relative to said first cyclic signal in response to changes in effective impedance of said resonant circuit;

means associated with said reactive means and operative in response to said change in condition of said object to change the effective impedance of said resonant circuit and shift the phase of said second cyclic signal relative to said first cyclic signal; and

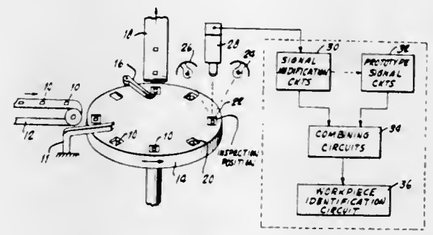
detector means operative to produce an output signal representative of the difference in phase between said first and second cyclic signals and operative in response to a change in said output signal to activate said warning device.

4,072,928

INDUSTRIAL SYSTEM FOR INSPECTING AND IDENTIFYING WORKPIECES

Joseph Wilder, Princeton, N.J., assignor to Sangamo Weston, Inc., Springfield, Ill.

Filed Oct. 10, 1975, Ser. No. 621,638
Int. Cl.² G06K 9/00
U.S. Cl. 340—146.3 H **46 Claims**



1. A method of inspecting articles comprising the steps of:

detecting optoelectrically each article to derive an electrical signal and including a component for each point of a multpoint array which overlaps the article;

combining successive components of the electrical signal to derive a quantized signal which identifies selected characteristics of the electrical signal but is substantially different from the electrical signal;

transforming the quantized signal to derive selected components only of a multicomponent transformed signal, each of the transformed signal components being a combination of a selected multiplicity of components of the quantized signal, and forming said selected components of the transformed signal into an extracted signal representing selected features only of the article, said selected features emphasizing more of the lower than of the higher resolution characteristics of the article;

providing a plurality of prototype signals corresponding to similarly derived selected features of a plurality of sample articles; and

combining the extracted signal with the prototype signals to detect correspondence therebetween.

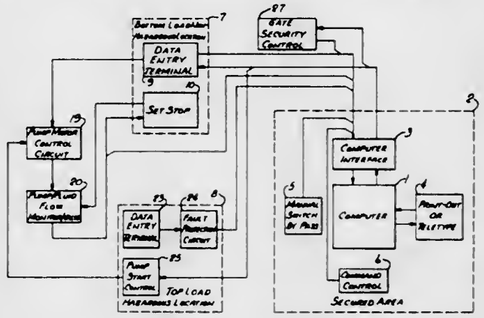
4,072,929

COMPUTER CONTROLLED BULK STORAGE FLUID DISPENSING TERMINAL

Victor H. Garmong, Kennerdell, Pa., assignor to George Edwin Wolfe, Kennerdell, Pa.

Filed Feb. 23, 1976, Ser. No. 660,361
Int. Cl.² H04Q 5/00
U.S. Cl. 340—147 A **7 Claims**

1. A computer controlled bulk storage fluid dispensing terminal comprising at least one vehicle fluid loading station, an electronic computer housed within a secured area and having memory means programmed to permit dispensing of allocated types and quantities of fluid to authorized customers, multiple digit input data entry means positioned at each of said at least one loading station and connected to said computer for coded customer identification data entry by hand manipulation of the multiple digit input, indication means connected to said computer to indicate to the operator upon command from said computer that he has been recognized by said computer as an authorized customer and permit him to proceed to fill a vehicle with an allocated quantity and type of fluid at the selected station, means at each of said at least one station and connected to said computer to pump the selected quantity of the allocated amount and type of fluid from a bulk storage into a vehicle at the selected station only after said indication means indicates valid customer recognition by said computer, printout means connected to said computer to automatically print out fluid dispensing information after completion of the dispensing operation, and including command control means housed within said secured area and connected to said computer for data entry, said command control means including a hand manipulated multiple digit input for entry into said computer of a multiple digit code to bring into function a corresponding question and answer computer programming routine on said printout means to change the data with which the basic program of said computer works while preventing the capability of changing the basic program itself.

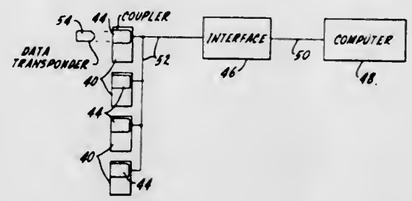


4,072,930

MONITORING SYSTEM FOR USE WITH AMUSEMENT GAME DEVICES

Andres R. Lucero, Reno, Nev.; Roy E. Gilbert, Diamond Bar, and Jack H. Stevens, South Pasadena, both of Calif., assignors to Bally Manufacturing Corporation, Chicago, Ill.

Continuation of Ser. No. 505,782, Sept. 13, 1974, abandoned.
This application Aug. 20, 1976, Ser. No. 716,102
Int. Cl.² G06K 5/02; G06F 7/00; H04Q 9/00
U.S. Cl. 340—152 T **19 Claims**



1. A system for monitoring the operation of a plurality of amusement game devices, the system being adapted for use with a computer and comprising the combination:

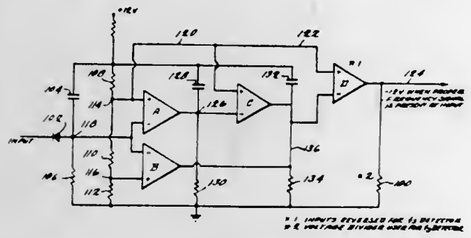
coupler means associated with and electrically connected to each of said devices being monitored, said coupler means being adapted to generate electrical signals indicating the identity of the machine to which it is associated and the identity of predetermined winning conditions,

interface means electrically connected to each of said coupler means and adapted to selectively communicate with the computer and with said coupler means and transponder means, said interface means sequentially generating address identification signals for polling individual portable transponder units,

at least one portable transponder means adapted to communicate with said interface means and with one of said coupler means when connected thereto, said transponder means responding to its unique address identification signal when connected to one of said coupler means by transmitting information to the interface means and the computer concerning the game device identification and,

transponder means identification, predetermined winning condition identification of the game device.

4,072,931
RADIO FREQUENCY ALARM SYSTEM INCLUDING TRANSMITTING, CODING AND DECODING CIRCUITRY
Glenn A. Davis, Lilburn, Ga., assignor to Scientific-Atlanta, Inc., Atlanta, Ga.
Division of Ser. No. 618,239, Sept. 30, 1975. This application July 30, 1976, Ser. No. 710,154
Int. Cl.[2] H03D *3/00*; H03K *1/16*
U.S. Cl. 340—171 R **9 Claims**



1. A frequency detector for detecting the occurrence of a predetermined chosen band of frequencies in an electrical signal component which includes a train of relatively short pulses which may occur at a frequency or repetition rate above, below or within said band of frequencies, said frequency detector comprising:

first and second toggling means connected to receive said signal component and to toggle between two output states at the repetition rate of said short pulses and as a function at the frequency of said one signal component wherein both of said toggling means are caused to toggle or not to toggle at said repetition rate whenever the frequency of said signal component is above or below said predetermined chosen frequency band and wherein only said first toggling means is caused to toggle at said repetition rate whenever the frequency of said one signal component is within said predetermined chosen frequency band, and

toggle detecting means connected to said first and second toggling means for detecting the condition wherein only said first toggling means is toggling at said repetition rate and for producing an output in response to such detection thereby indicating the presence of a frequency within said predetermined frequency band in said signal component.

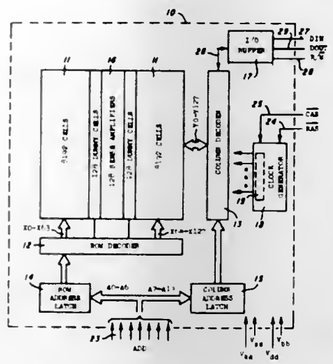
4,072,932
CLOCK GENERATOR FOR SEMICONDUCTOR MEMORY
Norihisa Kitagawa, and Lionel Stuart White, Jr., both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Aug. 23, 1976, Ser. No. 716,907
Int. Cl.[2] G11C *11/40*; H03K *17/00*
U.S. Cl. 365—233 **12 Claims**

1. A semiconductor memory comprised of:

a. an array of memory cell means for storing binary information,

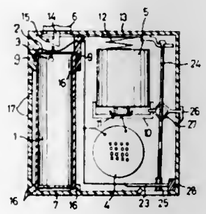
b. a plurality of sense amplifier means coupled to said array of memory cell means for reading selectable portions of said memory information in response to control signals, and

c. read-clock generator means for generating output signals indicating when said plurality of sense amplifier means has stabilized during said reading wherein said generator means includes timing circuit means having inputs coupled to receive said control signals and having substantially the same architecture as said sense amplifier means for simulating during said reading the transient operation



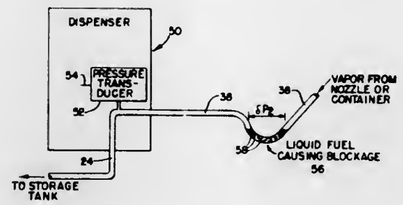
of said sense amplifiers and for generating said output signals indicating when said timing circuit is stable.

4,072,933
FIRE HEAT DETECTOR AND/OR BURGLAR ALARM
Kwok-Wah Pun, Kowloon, Hong Kong, assignor to Cheung King Fung, Kowloon, Hong Kong
Filed Dec. 30, 1975, Ser. No. 645,439
Claims priority, application United Kingdom, Jan. 6, 1975, 369/75
Int. Cl.[2] G08B *17/04*
U.S. Cl. 340—229 **15 Claims**



1. A detecting device comprising a thermally conductive container having an open end, a resilient diaphragm mounted across the open end to close the container and for expansion in response to pressure changes in the container corresponding to variation of temperature externally of the container, said diaphragm having an outer peripheral portion in close-fit non-hermetic sealing engagement with the peripheral surface of the container at its open end to form an annular venting passageway between said surface and the peripheral portion of the diaphragm, the open end of the container terminating in a circumferential rim which is provided with an annular protruding lip for engagement with said outer peripheral portion of the diaphragm, and indicating means responsive to expanding movements of said diaphragm for translating the movements into audible sound, said indicating means comprising a conductive plate member mounted for actuation by expanding movements of said diaphragm, a buzzer connected at one end to said conductive plate and at another end to an electrical power supply mounted vicinal to said container and said buzzer, and a switch for connecting said conductive plate to the electrical power supply to actuate the buzzer.

4,072,934
METHOD AND APPARATUS FOR DETECTING A BLOCKAGE IN A VAPOR FLOW LINE
Trueman W. Hiller, Bettendorf, and David C. Hamstra, Clinton, both of Iowa, assignors to Wylain, Inc., Dallas, Tex.
Filed Jan. 19, 1977, Ser. No. 760,716
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—243 **24 Claims**



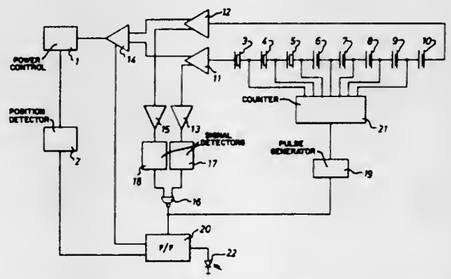
1. A method for detecting blockage in a vapor flow line adapted to communicate vapor from a container adapted to hold a variable amount of fluid to a point remote from the container, said method comprising the steps of:

obtaining a first signal representative of the pressure in the vapor flow line;

producing a second signal representative of the rate of change with time of said first signal; and

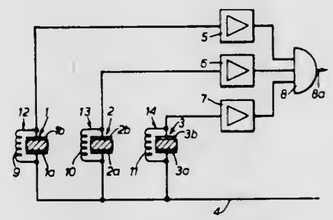
detecting if the frequency of the variations in said second signal exceeds a first preset limit to detect a blockage in the vapor flow line.

4,072,935
APPARATUS FOR INDICATING WHETHER ONE OR MORE OBJECTS ARE IN MOTION
Sten-Åke Olaus Rydborn, Kloxhultsvagen 21, 343 00 Almhult, Sweden
Filed May 4, 1976, Ser. No. 683,146
Claims priority, application Sweden, May 5, 1975, 7505161
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—259 **6 Claims**



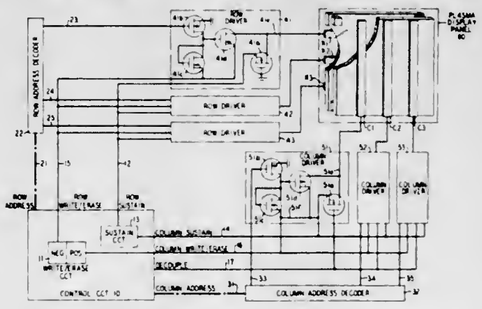
1. Apparatus for indicating whether one or more objects, for example, threads, strips or the like, are in motion, said apparatus including a plurality of signal generating means, one signal generating means associated with each object to be detected, each signal generating means generating an electric signal upon detection of movement of its associated object; means connecting said plurality of signal generating means together in a series circuit; a first signal amplifier coupled to the first end of said series circuit; a second signal amplifier coupled to the second end of said series circuit; a coupling device connected to said connecting means to successively ground the connections between the signal generating means in said series circuit; first gate means having a first input connected to the output of said first signal amplifier, a second input connected to the output of said second signal amplifier, and an output connected to said coupling device, said first gate means interrupting the successive grounding of the connections between the signal generating means upon simultaneous receipt of a signal at both inputs of said first gate means, which indicates a signal from at least one signal-generating means on each side of the grounded connection.

4,072,936
METHOD OF AND APPARATUS FOR DETECTING DAMAGE TO A FRANGIBLE OBJECT
Ernst Spirig, Movenstrasse 37, CH-8640 Rapperswil, Switzerland
Filed Feb. 11, 1977, Ser. No. 767,941
Claims priority, application Switzerland, Sept. 9, 1976, 11466/76
Int. Cl.[2] G08B *13/04*
U.S. Cl. 340—274 R **12 Claims**



4. Apparatus for detecting breakage of a frangible object, comprising a plurality of ultrasonic transducers coupled to said object to respond to ultrasonic vibrations in different respective frequency ranges occurring therein, circuit means yielding a breakage-denotive output signal in response to the simultaneous application of signals to a plurality of inputs thereof and means applying the signal from each said transducer to a respective input of said circuit means whereby said breakage-denotive output signal is developed.

4,072,937
MOS TRANSISTOR DRIVER CIRCUITS FOR PLASMA PANELS AND SIMILAR MATRIX DISPLAY DEVICES
William Wing-Yen Chu, Matawan, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Jan. 15, 1976, Ser. No. 649,239
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—324 M **10 Claims**



1. Driver circuitry for extending signals to first and second coordinate conductors associated with a predetermined cell of a matrix display device comprising

first and second MOS transistors each comprised of a first conductivity type semiconductor layer and second conductivity type drain and source regions disposed in said layer and defining a channel region therein,

means for connecting the drain regions of said first and second transistors to said first and second conductors, respectively, and

means for concurrently coupling respective signals at first and second potentials to the source region of said first transistor and the semiconductor layer of said second

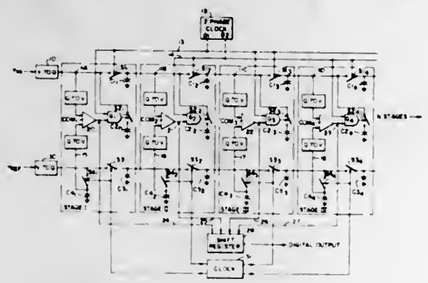
transistor, respectively, and for thereafter concurrently coupling said signals to the source region of said second transistor and the semiconductor layer of said first transistor, respectively.

4,072,938

BUCKET BRIGADE ANALOG-TO-DIGITAL CONVERTER

James E. Buchanan, Bowie, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 25, 1975, Ser. No. 607,413
Int. Cl.[2] H03K *13/17*
U.S. Cl. 340—347 AD **12 Claims**



1. An analog-to-digital converter for providing a binary output indicative of an analog input at precise repetitive time intervals, comprising:

a plurality of series connected electronic switches, each switch defining an individual stage of successive converter stages,

a single electronic storage device for each individual stage, each device being coupled to store an unknown charge in response to the closing of a switch defining its associated stage,

a reference source for each stage, each said reference source being of a different predetermined value in accordance with the reference source for the preceding stage,

a comparator for each individual stage, each comparator being coupled at one input to one side of the electronic switch defining its respective stage and coupled at the other input to the reference source for its respective stage to compare the reference source with the unknown charge stored in the preceding stage upon the closure of the electronic switch for its respective stage,

means for each stage governed by the comparator coupling the comparator at its output to the single electronic storage device of the stage at times when the electronic switch for such stage is closed, to either store the entire charge of the storage device of the preceding stage or a charge equivalent to the reference source for the associated stage,

a parallel to serial shift register,

means coupling the shift register to each one of the stages to receive a binary value from each stage upon the closure of an associated electronic switch in accordance with the output of the comparator for each stage, and

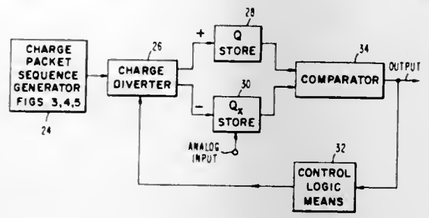
clock means coupled to each of the electronic switches operative to close and open the electronic switches of alternate stages to transfer the charge from one stage to the next at precise times.

4,072,939

ANALOG-TO-DIGITAL AND DIGITAL-TO-ANALOG CONVERTER CIRCUITS EMPLOYING CHARGE REDISTRIBUTION

Lawrence Griffith Heller, Brewster, and Lewis Madison Terman, South Salem, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 1, 1976, Ser. No. 662,626
Int. Cl.[2] H03K *13/03*
U.S. Cl. 340—347 AD **4 Claims**



1. An analog-to-digital converter circuit of the type employing successive approximation binary search techniques comprising:

a source of analog input signal,

a sequence generating circuit for generating a binarily decreasing sequence of electrical charge quantities of the form $Q = Q_R/2, Q_R/4, Q_R/8$ up to $Q_R/2^N$ where Q_R is a predetermined quantity of electrical charge and N is a positive integer,

a first storage means for sequentially accumulating a first plurality of first selected ones of said charge quantities from said sequence of electrical charge quantities.

a second storage means for storing said input analog signal and for sequentially accumulating and adding to said analog signal a second plurality of other selected ones of said charge quantities from said sequence of electrical charge quantities,

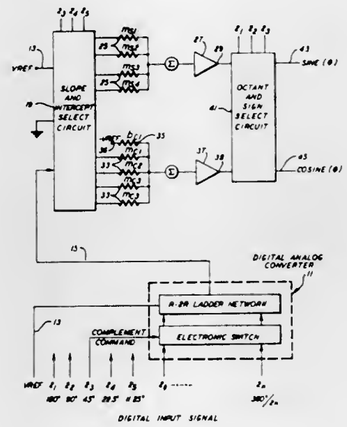
and means including an electrical charge diverting means, a comparator circuit and a logic control means connected to said sequence generating circuit, and said first and second storage means for sequentially comparing said accumulated charge quantities in said first and second storage means and for directing said charge quantities to said first and second storage means in accordance with said comparisons to produce an output signal representative of said comparisons, said logic control means being responsive to the output of said comparison means to provide an input signal to said diverting means such that when a comparison between the quantity stored in said first electrical charge storage means and the quantity stored in said second electrical charge storage means indicates that the quantity stored in said first electrical charge storage means is greater than the quantity stored in said second electrical charge storage means, a "0" binary value is manifested and said logic control means controls said electrical charge diverting means to direct the next successive one of said binarily decreasing sequence of electrical charge quantities to said second electrical charge storage means for addition to the quantity stored therein, and that when a comparison between the quantities stored in said first and second electrical charge storage means indicates that the quantity stored in said second electrical charge storage means is greater than the quantity stored in said first electrical charge storage means, a "1" binary value is manifested and said logic control means controls said electrical charge diverting means to direct the next successive one of said binarily decreasing sequence of electrical charge quantities to said first electrical charge storage means for addition to the quantity stored therein, said comparison, diverting and storage operations continuing for N occurrences, where N is said positive integer, to provide an N bit digital signal representative of said input analog signal.

4,072,940

DIGITAL TO ANALOG RESOLVER CONVERTER

David Julian Simon, Saddle Brook, and Edward Charles Costello, Paterson, both of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed June 1, 1976, Ser. No. 691,272
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 SY **10 Claims**



1. In a method utilizing electronic circuitry for converting an m bit digital voltage signal representing an angle over an octant which is a portion of an *n* bit digital voltage signal representing an angle from 0° to 360° into an analog voltage signal representing a continuous periodic function of the angle to be used as an output of a digital to analog resolver converter comprising:

a. dividing the continuous periodic function of the angle into an even number *p* of equal angular segment each segment having a slope with the same sign over the full segment where $\log_2 p$ is a non-negative integer;

b. determining and storing average slope and intercept information of each slope segment in electronic circuitry;

c. converting the r least significant bits of the digital signal into an analog value in a digital to analog converter where $r = m - \log_2 p$;

d. selecting in said electronic circuitry slope and intercept values in accordance with the remaining $\log_2 p$ bits of the *m* bit digital voltage signal and the $(m-1)$ th bit; and

e. carrying out multiplication of the converted analog value by a selected slope and addition of selected intercept values in electronic circuitry, the improvement comprising;

f. determining and storing in said electronic circuitry, as a first intercept, the intercept of a line segment subtending one of said angular segments;

g. determining and storing the slopes of line segments subtending each of said angular segments in said electronic circuitry;

h. selecting one of the slopes as the slope multiplier in accordance with the remaining $\log_2 p$ bits in said electronic circuitry;

i. determining a partial intercept value in said electronic circuitry; and

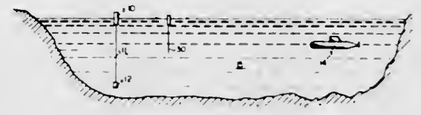
j. multiplying the analog value by the selected slope multiplier and adding to the results the partial intercept value and the first intercept in said electronic circuitry.

4,072,941

UNDERWATER MONITORING

Michael A. Hamid, Winnipeg, and Oscar A. Sandoz, Ottawa, both of Canada, assignors to The Minister of National Defence of Her Majesty's Canadian Government, Ottawa, Canada

Filed July 15, 1976, Ser. No. 705,493
Claims priority, application Canada, July 17, 1975, 231687
Int. Cl.[2] G01S *9/02*
U.S. Cl. 343—5 NA **9 Claims**



1. Apparatus for detecting the presence of an underwater object, comprising:

means for generating a first electrical signal of varying frequency;

a monopole antenna;

means for applying said first electrical signal of varying frequency to said monopole antenna for transmission of said signal by said monopole antenna as an electromagnetic signal propagated through a body of water to said object;

said means for applying also receiving reflections of said electromagnetic signal sensed by said monopole antenna and providing a sound electrical signal corresponding to said reflections;

means for comparing said first and second electrical signals to provide an output signal corresponding to variation in the input impedance of said monopole antenna; and

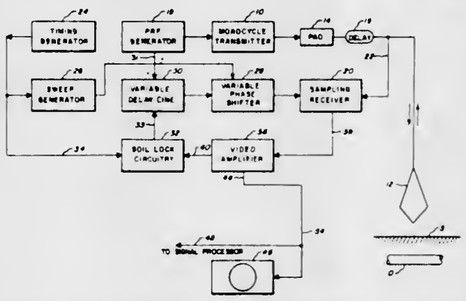
means for indicating said output signal.

4,072,942

APPARATUS FOR THE DETECTION OF BURIED OBJECTS

Anthony V. Alongi, Niagara Falls, N.Y., assignor to Calspan Corporation, Buffalo, N.Y.

Continuation of Ser. No. 659,883, Feb. 20, 1976, abandoned, which is a continuation of Ser. No. 504,571, Sept. 9, 1974, abandoned. This application Nov. 11, 1976, Ser. No. 741,312
Int. Cl.[2] G01S *9/02*
U.S. Cl. 343—5 NA **18 Claims**



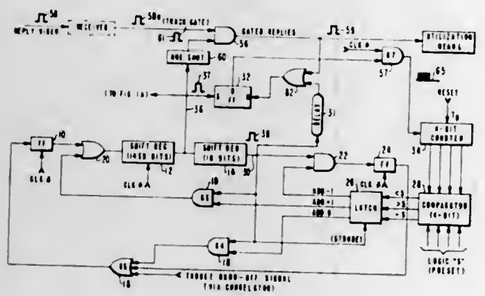
1. Apparatus for detecting objects buried below the surface of the earth, comprising:

(a) transmitter means for generating short, monocycle pulses of signals,

(b) antenna means spaced from and movable over said surface for radiating said signals to and receiving reflections from said surface, said reflections comprising a plurality of signals spaced in time each of which having a characteristic waveshape,

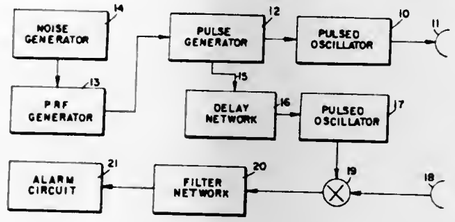
(c) receiver means connected to said antenna means for generating an output signal in response to said reflections,
(d) soil lock circuit means responsive to the receiver means output signal for detecting the center of a symmetrical waveshape comprised within said reflections which represents the signal reflected from the surface of the earth, said soil lock circuit means developing as an output an error signal, and
(e) means for controlling said receiver means in response to said error signal.

4,072,943
MULTI-TARGET TRACKER
Jeffrey Ellis Miller, Dallas, Tex., assignor to RCA Corporation, New York, N.Y.
Filed Dec. 22, 1975, Ser. No. 643,481
Claims priority, application United Kingdom, Apr. 14, 1975, 15220/75
Int. Cl.² G01S 9/56
U.S. Cl. 343—6.5 LC **3 Claims**



1. In a radar tracking system of the transponder type wherein reply signals from one or more remote stations are respectively responsive to interrogation signals having a predetermined repetition rate during a selected period, said period being defined by a predetermined number of said interrogation signals, said system including correlator means including means for generating said interrogation signals, and for correlating replies thereto to identify remote stations and to provide, only during a preselected period prior to said selected period, a hand-over signal representing each of such remote stations,
a tracker for tracking said reply signals comprising:
track gate means normally disabled responsive when enabled to said reply signals from remote vehicles respondng to said interrogation signals to generate a digital reply signal representing said remote vehicle;
sequential storage means, having a plurality of storage stages, responsive to said hand-over signals to store in one of said storage stages a signal representing each of said remote vehicles in the sequence received and corresponding to the relative range to each of said remote vehicles as manifested by the time of receipt of said hand-over signals, and to advance in a clocked sequence indicative of range following each interrogation signal each said stored signal from one stage to another through a given maximum number of stages representing a predetermined maximum range;
means responsive to said stored signals to generate a track gate enable signal to enable said track gate means at a time substantially coincident with the time of expected reply for each of said remote vehicle reply signals; and
servo means further responsive to said stored signals and to said reply signals to generate control signals to servo sequential movement of said stored signals in said storage means such that the relative storage stage of said stored signal is changed to reduce errors of coincidence in the expected reply signal and said track gate enable signal;
said sequential storage means being a shift register clocked at a predetermined rate and having a plurality of stages, including an input and output stage, each stage in sequence corresponding to an increment of range, whereby a plurality of digital reply signals are stored simultaneously in a sequence and location corresponding to the range of each of said remote vehicles, and said track gate enable signal is generated at said output stage of said shift register and coupled to said track gate means.

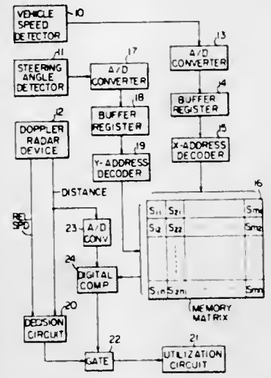
4,072,944
IMMINENT COLLISION DETECTION APPARATUS
Joseph F. Bianco, Wakefield; Nicholas Senio, Bedford, both of Mass.; Russell B. Hawes, Nashua, N.H., and Donald B. Strang, Harvard, Mass., assignors to Sanders Associates, Inc., Nashua, N.H.
Continuation of Ser. No. 628,805, March 29, 1967, abandoned. This application Feb. 20, 1969, Ser. No. 808,034
Int. Cl.² F42C 13/04; G01S 9/42
U.S. Cl. 343—7 PF **12 Claims**



11. A method for detecting imminent collision of a first object with a second object, comprising the steps of:
transmitting a pulsed energy signal having a predetermined starting phase;
receiving an echo of said pulsed energy signal from said second object;
separately generating a pulsed energy reference signal coherent to said transmitted signals said reference signal having the same starting phase as said transmitted signal; and
mixing said reference and received signals for producing a doppler signal.

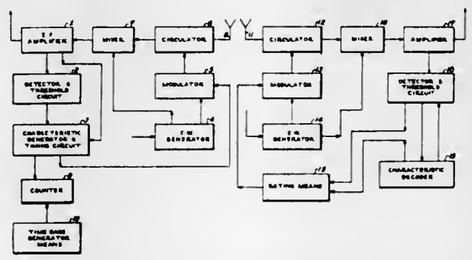
4,072,945
RADAR-OPERATED COLLISION AVOIDANCE SYSTEM FOR ROADWAY VEHICLES USING STORED INFORMATION FOR DETERMINATION OF VALID OBJECTS
Masaaki Katsumata, and Norio Fujiki, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan
Filed Dec. 2, 1976, Ser. No. 746,742
Claims priority, application Japan, Dec. 2, 1975, 50-142376
Int. Cl.² G01S 9/02; B60T 17/18
U.S. Cl. 343—7 VM **5 Claims**

4. A collision avoidance system for a roadway vehicle having a steering wheel, including a radar device for sensing the distance from the vehicle to an object and the speed of the vehicle relative to said object, a decision making circuit responsive to said sensed distance and said sensed relative speed to determine when the vehicle is approaching the object at a dangerously high speed, and a utilization circuit responsive to an output from said decision making circuit, wherein the improvement comprises:
means for detecting the speed of the vehicle relative to roadway;
means for detecting the magnitude of angular movement of said steering wheel;
a plurality of memory matrices each storing information representing a minimum allowable distance from said vehicle to said object for a particular set of input variables within an array of rows and columns;
means for selectively reading the stored information from one of said memory matrices in response to said detected vehicle speed and to said detected magnitude of angular movement of said steering wheel as a set of said input variables;



means for comparing the distance sensed by said radar device and the minimum allowable distance represented by the information read out from said one of the memory matrices to generate an inhibit signal when said sensed distance is greater than said allowable distance; and
means for disabling said output signal from said decision making circuit in response to said inhibit signal.

4,072,946
METHOD AND APPARATUS FOR MEASURING THE DISTANCE BETWEEN TWO STATIONS
Wim Bernard Samuel Maria Kneefel, Koningin Astrid Boulevard 56, Noordwijk, Netherlands
Continuation of Ser. No. 397,518, Sept. 17, 1973, abandoned. This application Aug. 6, 1976, Ser. No. 712,053
Claims priority, application Netherlands, Sept. 26, 1972, 7212991
Int. Cl.² G01S 9/08, 9/56
U.S. Cl. 343—12 R **1 Claim**



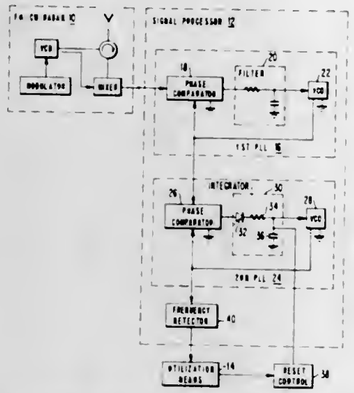
1. Apparatus for measuring the distance between two continuous data link stations at least one of which is movable, comprising:
a. a first carrier wave generator at said first station and including an input terminal for receiving the data to be transferred, and first and second output terminals,
b. a first modulator having first and second input terminals and an output terminal, said first input terminal being connected with said first output terminal of said first carrier wave generator,
c. a first antenna at said first station,
d. first circulator means connected with said first antenna and including an input terminal connected with the output terminal of said first modulator, and an output terminal,
e. a first mixer having a first input terminal connected with the output terminal of the first circulator means, a second input terminal connected with the second output terminal of the first carrier wave generator, and an output terminal,
f. an IF amplifier including an input terminal connected with the output terminal of said first mixer, and first, second and third output terminals,
g. detector and threshold circuit means including an input terminal connected with the first output terminal of said IF amplifier, and an output terminal,
h. characteristic generator and timing circuit means including a first input terminal connected with the output terminal of said detector and threshold circuit means, a second input terminal connected with the second output terminal of said IF amplifier, and a first output terminal connected with the second input terminal of said first modulator,
i. counter means having a first input terminal connected with the second output terminal of said characteristic generator and timing circuit, and second input terminal,
j. time base generator means connected with the second input terminal of said counter means,
k. a second carrier wave generator at said second station and including a data input terminal and first and second output terminals,
l. a second modulator having a first input terminal connected with the first output terminal of said carrier wave generator, a second input terminal, and an output terminal,
m. a second antenna at said second station,
n. second circulator means connecting the output terminal of said second modulator with said second antenna, said second circulator means including an output terminal,
o. a second mixer including a first input terminal connected with the output terminal of said second circulator means, a second input terminal connected with the second output terminal of said second carrier wave generator, and an output terminal,
p. a second IF amplifier having an input terminal connected with the output terminal of said second mixer, and first and second output terminals,
q. a second detector and threshold circuit having a first input terminal connected with the first output terminal of said second IF amplifier, a second input terminal, and first and second output terminals,
r. characteristic decoder means including an input terminal connected with the first output terminal of said second detector and threshold circuit, a first output terminal connected with the second input terminal of said detector and threshold circuit, and a second output terminal, and
s. gating means including first and second input terminals connected with the second output terminals of said detector and threshold circuit and said characteristic decoder means, respectively, and an output terminal connected with the second input terminal of said second modulator,
t. said first modulator being operable to produce an interruption in the carrier wave generated by said first carrier wave generator and also a characteristic signal which occurs prior to the interruption, and
u. the characteristic decoder and said second detector and threshold circuit being operable to detect said interruption and to introduce a corresponding interruption in the carrier wave of said second carrier wave generator, which second interruption is detected in said first detector and threshold circuit to afford a measure of the distance between said stations.

4,072,947

MONOTONICALLY RANGING FM-CW RADAR SIGNAL PROCESSOR

Henry Charles Johnson, Neshanic, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 11, 1976, Ser. No. 741,068
Int. Cl.[2] G01S *9/24*
U.S. Cl. 343—14 **4 Claims**



1. In a continuous wave radar ranging system of the type wherein a signal is transmitted in the direction of a target and is reflected from said target back to the source of said transmitted signal, the range of said target from said ranging system varying monotonically, said transmitted signal being frequency modulated in accordance with a given periodic waveform, said ranging system including means for deriving from said transmitted signal and said reflected signal a difference signal indicative of the frequency difference of said reflected signal from the instantaneous frequency of said transmitted signal, and signal processor means, responsive to said difference signal, for generating an output signal indicative of the range of said target; the improvement wherein said signal processor comprises:

first frequency tracking means, responsive to said difference signal, for generating an output signal having continuous phase velocity at a frequency indicative of said difference frequency; and

second frequency tracking means, responsive to said first frequency tracking means output signal, for generating an output signal indicative of the value of a predetermined frequency extremum attained by said difference signal, said second frequency tracking means output signal being indicative of said range.

4,072,948

LIGHT WEIGHT RADAR REFLECTOR

William A. Drews, Bethesda, Md.; Charles L. Padgett, Alexandria, and Ray Anthony Pinna, Woodbridge, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 24, 1977, Ser. No. 761,553
Int. Cl.[2] H01Q *15/18*
U.S. Cl. 343—18 C **4 Claims**

1. A lightweight radar reflector employed beneath a weather balloon to aid in radar tracking of a sonde comprising:

an array of eight trihedral corner reflectors;

a lanyard swivel suspension system permitting said array to swivel freely; and wherein said

array of eight trihedral corner reflectors comprises:

a 1st precut panel of reflective material having a high stiffness to weight ratio in the shape of a square and having four identical slots extending from the midpoint of each edge toward the center of said panel about one-fifth the distance thereof;

a 2nd precut panel of said material of the same size and including a slot which extends from the center of said 2nd panel for a distance of about four-fifths thereof toward the midpoint of the edges of said 2nd panel along the center line, and further including a crease line along the orthogonal center line of said 2nd panel for enabling folding of said 2nd panel to an angle of about ninety degrees;

a 3rd precut panel identical to said 2nd panel, wherein said 2nd and 3rd panels are foldably affixed in a symmetrical fashion to said 1st panel by engagement of said slots;



a plurality of cross shaped clips for fastening said precut panels at the six intersection points inherent in said array;

a plurality of eyeletted lanyard passages placed so that said array will be oriented to aim said corner reflectors into the eight quadrants of a three-dimensional coordinate system aligned vertically when fastened to a lanyard assembly; and

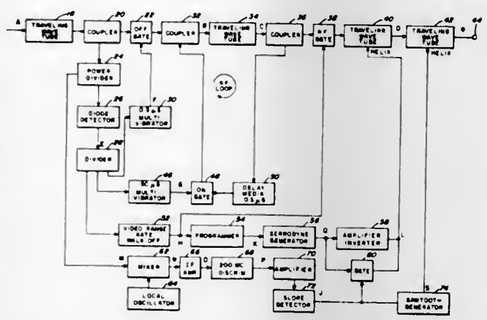
at least three spin vanes attached to said array in a symmetrical fashion to produce a spin torque when said array ascends.

4,072,949

RANGE GATE WALK-OFF OF COMPRESSIVE RADAR

LeRoy B. Van Brunt, Fairfax, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 17, 1970, Ser. No. 20,440
Int. Cl.[2] G01S *7/38*; H04K *3/00*
U.S. Cl. 343—18 E **7 Claims**



1. A range gate walk off device to be used as a countermeasure to radar reception, comprising:

input terminal means for receiving enemy radar signals;

a plurality of traveling wave tubes connected in series to receive, modify and amplify the signals;

delay means and gating means connected in series with each other and in parallel with one of the traveling wave tubes to comprise an RF memory loop;

detection means, connected to the gating means, for detecting the received signals and opening the gating means when a signal is received; and

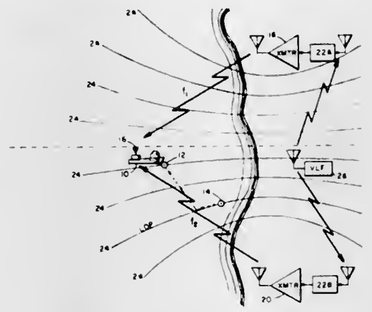
output terminal means for transferring the modified signal to another device.

4,072,950

LF/MF NAVIGATION SYSTEM

Eric R. Swanson, 640 Silvergate Ave., San Diego, Calif. 92106

Filed Sept. 13, 1976, Ser. No. 722,456
Int. Cl.[2] G01S *1/30*
U.S. Cl. 343—105 R **12 Claims**



1. Apparatus for a navigation system employing a hyperbolic phase grid, said apparatus comprising:

a. means for transmitting a plurality of signals having different frequencies in the LF/MF range each of said signals being transmitted from a different and known location;

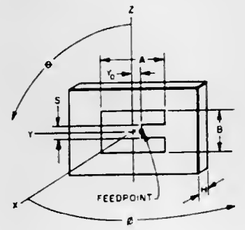
b. receiver indicator means receiving a first and a second of said transmitted signals for translating said first signal from its transmitted frequency to a first frequency comprising the sum of a common frequency and a first residual frequency error, for translating said second signal from its transmitted frequency to a second frequency comprising the sum of said common frequency and a second residual frequency error, and for indicating the phase difference between said first and second signals, the quotient of the absolute value of the difference between said first residual frequency error and said second residual frequency error and said common frequency not exceeding a selected limit.

4,072,951

NOTCH FED TWIN ELECTRIC MICRO-STRIP DIPOLE ANTENNAS

Cyril M. Kaloi, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 10, 1976, Ser. No. 740,690
Int. Cl.[2] H01Q *1/38, 1/48*
U.S. Cl. 343—700 MS **20 Claims**



1. A notched fed twin electric microstrip dipole antenna structure, comprising:

a. a dielectric substrate;

b. a twin pair of thin rectangular radiating elements disposed one each on opposite sides of said dielectric substrate which electrically separates the twin radiating elements;

c. the radiating element on one side of said dielectric substrate being directly opposite to and the mirror image of the radiating element on the other side of said dielectric substrate;

d. each of said twiin radiating elements being operable to be excited to radiate in a microstrip mode, and each of said twin radiating elements acting as a ground plane for the other;

e. the broadside fields of each of the antenna twin radiating elements being excited in identical modes of oscillation, radiating independently of each other with respective fields on opposite sides of the dielectric substrate being 180° out of phase with one another;

f. said twin radiating elements each having a feed point located along the centerline of the length thereof; said feed points being directly opposite to each other;

g. said twin radiating elements each having a notch extending into the element along the centerline of the length from one end thereof to said feed point;

h. the length of said twin radiating elements determining the resonant frequency of the antenna;

i. the antenna input impedance being variable to match most practical impedances as said feed points are moved along the element centerline without affecting the antenna radiation pattern;

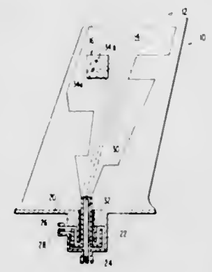
j. the antenna bandwidth being variable with the width of the twin radiating elements and the spacing between said twin radiating elements, the width of the notch being a factor as to the effective width of said twin elements, said spacing between the twin radiating elements having somewhat greater effect on the bandwidth than the width of the elements.

4,072,952

MICROWAVE LANDING SYSTEM ANTENNA

Paul S. Demko, Bricktown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 4, 1976, Ser. No. 729,431
Int. Cl.[2] H01Q *1/28, 1/38*
U.S. Cl. 343—700 MS **11 Claims**



1. An antenna configuration for aircraft having a VHF/UHF antenna means enclosed within a dielectric radome which has an airfoil configuration attached to a base, the VHF/UHF antenna means being a blade type comprising a pair of like planar radiator elements located on opposite faces of a planar dielectric member, said base being adapted for mounting on the aircraft and acting as a ground plane, and having a VHF/UHF antenna and communications apparatus within the aircraft, the improvement comprising:

microwave antenna means for the Microwave Landing System comprising a pair of like microwave antenna elements located within said radome outside opposite faces of said dielectric member, a microwave signal feed point in

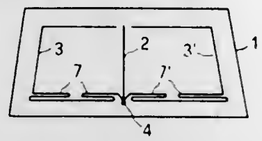
said base, microwave feed means disposed interiorly of said radome coupling the microwave signal feed point to the microwave antenna elements, with the microwave feed means including phasing means to feed the microwave antenna elements in a desired phase relation, the phase relation and the location of the microwave antenna elements being that which produces a desired omnidirectional pattern as required for the Microwave Landing System.

4,072,953

MULTIBAND ANTENNA FOR WINDOW PANES

Mauro Comastri, Monza, and Giorgio Ciarniello, Vasto (Chieti), both of Italy, assignors to Societa Italiana Vetro Siv S.p.A., Vasto, Italy

Filed Aug. 6, 1976, Ser. No. 712,342
Int. Cl.² H01Q 1/32
U.S. Cl. 343—713 6 Claims



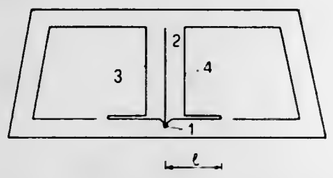
1. A multiband antenna for window panes, the antenna comprising a fishpole-type antenna component and a frame-type antenna component having a common terminal, at least one leg of said frame-type antenna component bordering one window rim and including a succession of series-connected horizontally directed S-shaped loops in a single conductor adjacent said one window rim, each said S-shaped loop having a length corresponding to an uneven multiple of a quarter wave length corresponding to the central frequency of the metric wave band.

4,072,954

MULTIBAND ANTENNA FOR WINDOW PANES

Mauro Comastri, Monza, and Giorgio Ciarniello, Vasto (Chieti), both of Italy, assignors to Societa Italiana Vetro Siv S.p.A., Vasto (Chieti), Italy

Filed July 26, 1976, Ser. No. 708,760
Claims priority, application Italy, July 24, 1975, 50650/75
Int. Cl.² H01Q 1/32
U.S. Cl. 343—713 11 Claims



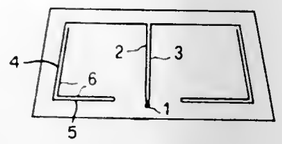
1. In a multi-band windshield or window antenna having a fishpole-type conductor for metric wave band signal reception and having a free upper end portion extendng to a given level, and at least one conductor running along in close vicinity to a periphery of the windshield or windowpane for the reception of medium wave band signals, all conductors conjoining at a common terminal located adjacently to a first rim of the windshield or window, the improvement wherein each conductor for medium wave signals extends in a generally horizontal direction from said common terminal for a distance adjacent said first rim, then doubles back on itself to form a first loop, at the end of which it bends upward into a generally first vertical leg running parallel to and in close vicinity to said fishpole-type conductor, until substantially reaching said given level of said free end portion of said fishpole-type conductor, to bend thereat away from said fishpole-type conductor and run along adjacent to at least a portion of a second rim of said windshield or window, and then bends downwardly and extends toward said first rim, running along adjacent to a third rim of said windshield or window to define a second vertical leg, whereby the at least one conductor for the reception medium wave band signals also participates in picking up of the metric wave band signals and the fishpole-type conductor also participates in picking up of the medium wave band signals.

4,072,955

MULTIBAND ANTENNA FOR WINDOW PANES

Mauro Comastri, Monza, and Giorgio Ciarniello, Vasto (Chieti), both of Italy, assignors to Societa Italiana Vetro Siv S.p.A., Vasto (Chieti), Italy

Filed July 26, 1976, Ser. No. 708,762
Claims priority, application Italy, July 24, 1975, 50647/75
Int. Cl.² H01Q 1/32
U.S. Cl. 343—713 17 Claims



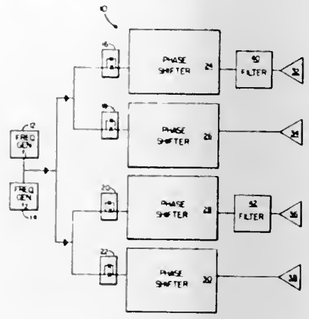
1. A multiband antenna as applied to a window pane, particularly a windshield, for reception of radio signals for a radio receiver having a single antenna input, the antenna comprising: a terminal for connection of the antenna to the receiver; and two conductors electrically connected to said terminal and extending in a generally vertical direction substantially parallel to one another up to a distance a few centimeters from a first rim of said pane, each one of said conductors respectively bending thereafter substantially 90° in opposite directions, so as to define a pair of first legs which extend parallel to said first rim, each one of said conductors being thereafter substantially a second 90° in the vicinity of respective second and third rims of said pane so as to define a pair of second legs, each one of said conductors being respective third and fourth legs running respectively substantially parallel to at least said pair of second legs.

4,072,956

MULTIFREQUENCY ARRAY USING COMMON PHASORS

Joseph H. Provencher, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 17, 1976, Ser. No. 686,855
Int. Cl.² H01Q 3/22
U.S. Cl. 343—844 10 Claims



1. A phased array antenna system comprising:

first means including a plurality of frequency generators for simultaneously outputting a plurality of frequency signals, each said frequency signal being an approximate multiple of the one of said plurality of frequency signals having the lowest frequency;

a plurality of phase shifters connected to the output of said first means, each of said phase shifters being operably coupled to each of said frequency generators and each of said phase shifters introducing a different phase increment in response to each of said plurality of frequency signals;

a plurality of radiating elements each being operably coupled to one of said plurality of phase shifters;

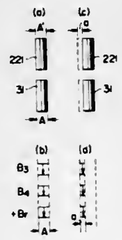
whereby in response to each of said frequency signals, said plurality of radiating elements simultaneously generates a plurality of beams, each said beam having a different beam pointing angle.

4,072,957

NON-IMPACT PRINTING SYSTEM WITH MAGNETIC RECORDING APPARATUS AND METHOD

Norio Kokaji, and Toshihiro Urano, both of Tokyo, Japan, assignors to Iwatsu Electric Company, Ltd., Japan

Filed Jan. 22, 1976, Ser. No. 651,227
Claims priority, application Japan, Mar. 13, 1975, 50-30567
Int. Cl.² G03G 19/00; G11B 5/02
U.S. Cl. 346—74.1 8 Claims



1. A method for magnetic recording comprising:

recording a first magnetic latent image of a predetermined width on the surface of a recording medium with a recording head having the predetermined width at a first position,

recording a second magnetic latent image on the surface of the recording medium to overlap only a portion of the first magnetic latent image on the surface of the recording medium with a recording head at a second position displaced from the first position to form a continuous narrowed first magnetic latent image on the surface of the recording medium having a width less than the predetermined width,

rendering visible the portion of the first magnetic latent image not overlapped by the second magnetic latent image.

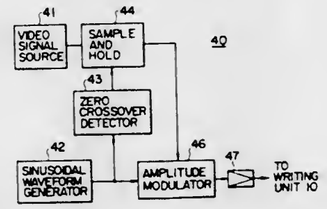
4,072,958

INK INJECTION TYPE WRITING SYSTEM USING AMPLITUDE-MODULATED ELECTRICAL SIGNALS

Heijiro Hayami; Hiroyoshi Tsuchiya; Kunio Yoshida; Yukifumi Tsuda, and Yoshimitsu Kanno, all of Kawasaki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Apr. 2, 1976, Ser. No. 673,132
Claims priority, application Japan, Apr. 11, 1975, 50-44613
Int. Cl.² G01G 15/18
U.S. Cl. 346—140 R 7 Claims

1. An ink ejection system comprising a writing unit including a chamber, means defining an inlet channel connected in use to a source of liquid for introducing the liquid into the chamber, means defining an outlet channel connected to the chamber, and an electromechanical transducer for generating pressure rises in the liquid in the chamber to discharge the liquid in a series of droplets through the outlet channel onto a surface, means for generating an alternating sinusoidal signal of constant amplitude and frequency higher than the highest instantaneous frequency of a video signal, means for detecting a zero crossover point of said alternating signal, and generating a sampling signal in step with each zero crossover point, sample-and-hold circuit means effective to sample the instantaneous value of the video signal in response to said sampling signal and to hold the sampled video signal until the next sampling signal occurs, and means for modulating the amplitude of the sinusoidal alternating signal in accordance with the output from the sample-and-hold circuit means.

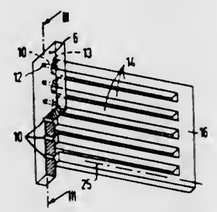


4,072,959

RECORDER OPERATING WITH DROPS OF LIQUID

Rune Elmqvist, Bromma, Sweden, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 29, 1976, Ser. No. 681,525
Claims priority, application Germany, June 20, 1975, 2527647
Int. Cl.² G01D 15/18; H01V 7/00
U.S. Cl. 346—140 R 8 Claims



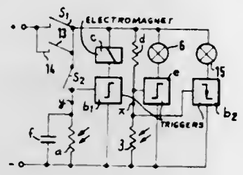
1. A recorder operating with drops of liquid for point-by-point recording of analog curves or alphanumerical characters and of images, comprising in combination, a plurality of nozzles positioned next to one another in rows in a common member for producing the individual points, said nozzles having inlet openings and exit openings contacted piezoelectric transducer positioned in front of said inlet openings and arranged so that as a result of electrical potential variations at the contacts, ink is expelled from the nozzle; recording means to which the expelled ink is applied located in front of the exit openings of the nozzles; said transducers comprising rod-shaped piezoelectric transducers for generating piezoelectric movements, said transducers being arranged in the form of teeth of a comb having base ends commonly joined together with unjoined free end zone of each of the rods assigned to the respective inlet opening of each of the nozzles.

4,072,960

CAMERA WITH BATTERY TESTING DEVICE

Willi Meixner, Bunde, Germany, assignor to Balda-Werke Photographische Gerate und Kunststoff GmbH & Co. KG., Bunde, Germany

Filed Sept. 22, 1975, Ser. No. 615,335
Claims priority, application Germany, Sept. 26, 1974, 2445991
Int. Cl.² G03B 7/00
U.S. Cl. 354—60 L **14 Claims**



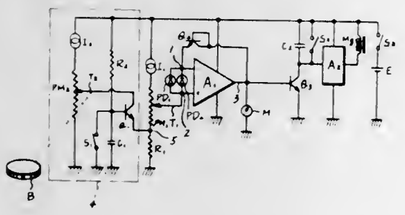
1. An improvement in a camera having a lens, a first photosensitive element for measuring the level of light incident thereon, a battery and circuit means for operably connecting said element and said battery, said circuit means including a warning lamp and first trigger means, wherein said improvement comprises actuation means having a closed position, an open position and a battery-test position, said circuit means including switch means for selectively connecting said battery across said warning lamp and first trigger means in series, said actuation means being so constructed that in said closed position said element is screened from all sources of light and said switch means is open, in said open position said lens and element are exposed to incident light and said switch means is open, and in said battery-test position said element is screened from all sources of light and said switch means is closed for connecting said warning lamp and first trigger means in series with said battery, and for rendering said first trigger means conductive so that said battery can drive current through said warning lamp, said warning lamp being positioned so that light output therefrom is visible when said actuation means is in said battery-test position, the light output of said warning lamp serving to indicate the state of charge of said battery.

4,072,961

LIGHT MEASURING CIRCUIT FOR AUTOMATIC EXPOSURE CONTROL

Seiji Yamada, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 5, 1976, Ser. No. 711,919
Claims priority, application Japan, Aug. 6, 1975, 50-96088
Int. Cl.² G03B 7/08
U.S. Cl. 354—24 **7 Claims**



1. In an automatic exposure control circuit including a focal plane shutter member opened to initiate exposure and closed to terminate the exposure, an integrating capacitor for timing closing of the focal plane shutter member, a light measuring circuit having at least one photocell for measuring scene light passing through the camera objective and reflected by the film surface and/or the surface of the shutter member located at the focal plane of the camera objective, the combination comprising:

first means for generating photoelectric current representative of light incident on said at least one photocell;

second means for amplifying said photoelectric current and having an amplification factor commensurate with the reflection factor of the film surface, said first and second means being coupled with said integrating capacitor to charge the latter with the respective currents generated thereby;

third means for actuating said first means in response to opening of said shutter member; and

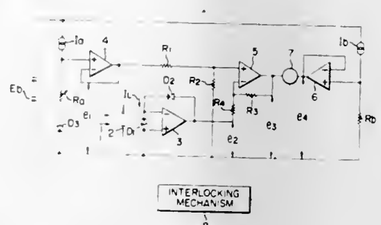
fourth means for actuating said second means when said shutter member has been opened to a predetermined extent.

4,072,962

METERING DEVICE

Osamu Maida, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed June 29, 1976, Ser. No. 700,849
Claims priority, application Japan, July 3, 1975, 50-81449; July 24, 1975, 50-89610
Int. Cl.² G03B 7/08; G05B 1/06; G01J 1/42; H03K 5/20
U.S. Cl. 354—24 **9 Claims**



1. A metering device comprising:

a photoelectric converter circuit for generating a first voltage corresponding to the brightness of a subject to be photographed, said photoelectric converter circuit including a photoelectric converter element and a first conductor element for logarithmically converting the output of said photoelectric converter element;

a voltage generating circuit including a semiconductor element and a current source for providing a current proportional to an absolute temperature to a resistor connected in series to said second semiconductor element, said voltage generating circuit being effective to generate a second voltage comprising the sum of the voltages generated in said resistor and said second semiconductor element;

a differential amplifier for amplifying the voltage difference between said first and second voltage;

a voltage generating circuit for generating a third voltage proportional to the absolute temperature;

a comparator circuit for comparing the output voltage of said differential amplifier with said third voltage; and

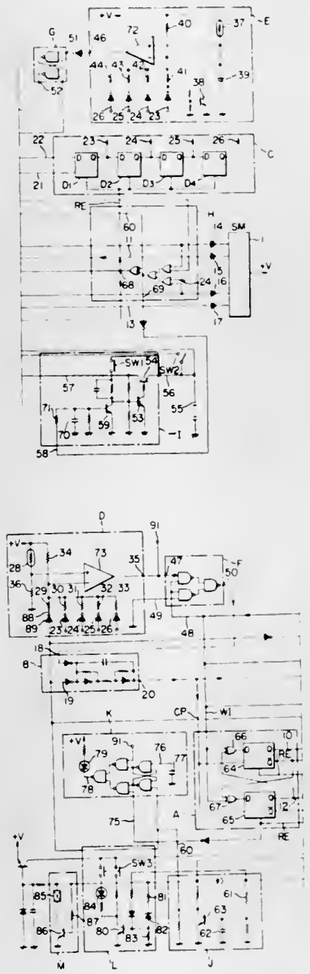
means for equalizing the output voltage of said differential amplifier and said third voltage by the output of said comparator circuit.

4,072,963

PROGRAMME-CONTROLLED SHUTTER

Hiroshi Iwata, Osaka, and Katsuji Ishikawa, Higashi-Osaka, both of Japan, assignors to West Electric Co., Ltd., Japan

Filed Apr. 26, 1976, Ser. No. 679,996
Claims priority, application Japan, Apr. 30, 1975, 50-52982
The portion of the term of this patent subsequent to Dec. 14, 1993, has been disclaimed.
Int. Cl.² G03B 7/08
U.S. Cl. 354—31 **21 Claims**



1. A programme-controlled shutter comprising

a. an exposure control mechanism comprising

a stepping motor, and

a plurality of shutter blades which function also as aperture setting blades and which are mechanically coupled to said stepping motor in such a way that when said stepping motor is driven, said shutter blades are opened and closed;

b. a motor control circuit with a first input terminal to which are applied the pulse signals for driving said stepping motor and a second input terminal to which is applied the signal for determining the direction of rotation of said stepping motor;

c. a pulse generator circuit for generating said driving pulses in succession;

d. a memory circuit having a plurality of output terminals and generating the output signals at said plurality of output terminals in response to the number of the pulse signals transmitted thereto from said pulse generator circuit;

e. a first control means including a first photometric circuit for measuring the brightness of a subject, said first control means controlling said pulse generator circuit by the comparison of the output signal from said first photometric circuit with the output signals from said output terminals of said memory circuit; and

f. a second control means including a second photometric circuit for measuring the brightness of a subject, said second photometric circuit being actuated in response to the output signals from said output terminals of said memory circuit,

said second control means generating the closing signal for closing said shutter blades when the light brightness detection quantity measured by said second photometric circuit reaches a predetermined level.

said closing signal being applied to said second input terminal of said motor control circuit and to said first control means, whereby said shutter blades are closed.

4,072,964

SCENE LIGHT RESPONSIVE VARIABLE QUENCH TIME DELAY FOR QUENCH STROBE

William R. Pope, and William A. Shelton, both of Cambridge, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed May 13, 1976, Ser. No. 686,020
Int. Cl.² G03B 7/16
U.S. Cl. 354—33 **20 Claims**



1. A photographic camera apparatus comprising:

a housing;

means for mounting an objective lens on said housing;

means associated with said housing for receiving a source of electrical energy;

a source of artificial illumination;

means within said housing for defining a film exposure plane;

a blade assembly mounted and arranged within said housing for displacement from an initial closed arrangement wherein said blade assembly precludes scene light from impinging on said exposure plane to a second arrangement wherein said blade assembly defines a maximum aperture through which scene light is permitted to impinge on said exposure plane and then to a final closed arrangement wherein said blade assembly again precludes scene light from impinging on said exposure plane, such a displacement of said blade assembly serving to define an exposure interval during which scene light is incident upon said film exposure plane;

scene light detecting means energizable by the source of electrical energy for providing an output signal in correspondence to the amount of scene light detected; and

means, at least in part energizable by the source of electrical energy, for initiating the displacement of said blade assembly from its said initial closed arrangement towards its second arrangement thereby commencing the exposure interval and for initiating the energization of the source of artificial illumination to effect the firing thereof subsequent to the initiating of the exposure interval, and then responsive to said output signal of said scene light detecting means reaching a predetermined value indicative of a select film exposure value for effecting the displacement of said blade assembly into its said final closed arrange-

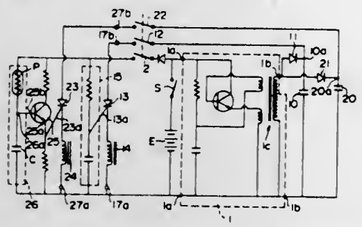
ment and for initiating the deenergization of the source of artificial illumination to effect the termination of the firing thereof subsequent to the expiration of a select time delay, said last stated means further including means for progressively varying said select time delay in a gradual manner through a plurality of incrementally changing time values in a determinate time range with each of said time delay values corresponding directly to a discrete value of a characteristic of said output signal of said scene light detecting means, said characteristic also varying in a gradual manner through a plurality of incrementally changing values in a determinate range.

4,072,965

ELECTRONIC SHUTTER CONTROL CIRCUIT

Toshihiro Kondo, Chofu, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 15, 1976, Ser. No. 666,614
Claims priority, application Japan, Mar. 19, 1975, 50-33195
Int. Cl.² G03B *7/08, 9/08*
U.S. Cl. 354—51 **6 Claims**



1. An electric control circuit for use in a photographic camera comprising

a shutter release member,

a plurality of movable members disposed within said photographic camera,

a plurality of electromagnetic coils respectively associated with said movable members,

a DC power source,

means for increasing the voltage level of said DC power source,

a plurality of capacitors responsive to said voltage level increasing means and being charged by the voltage produced thereby,

a plurality of controllable switching means respectively connected to said plurality of capacitors, said plurality of electromagnetic coils being respectively responsive to said plurality of controllable switching means,

a plurality of timing circuits respectively connected to said plurality of controllable switching means for applying control signals thereto, each timing circuit having a timing period established thereby,

first switching means for connecting said DC power source to said plurality of timing means to initiate the respective timing periods thereof,

a plurality of further switching means for respectively connecting said plurality of capacitors to said plurality of controllable switching means,

said first switching means and plurality of further switching means being responsive to the actuation of said shutter release member of said photographic camera to

a. initiate said timing periods by connecting said DC power source to said plurality of timing means via said first switching means so that a first of said control signals is applied to a first of said controllable switching means after a first of said timing periods elapses and a second of said control signals is applied to a second of said controllable switching means after a second of said timing periods elapses,

b. discharge a first of said capacitors through said first controllable switching means and its associated electromagnetic coil via a first of said further switching means in response to said first control signal being applied to said first controllable switching means so that upon the energization of said last-mentioned electromagnetic coil a first of said movable members of said photographic camera is moved, and

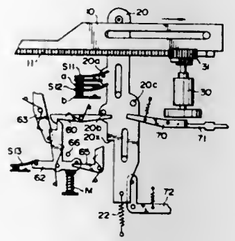
c. discharge a second of said capacitors through said second controllable switching means and its associated electromagnetic coil via a second of said further switching means in response to said second control signal being applied to said second controllable switching means so that upon the energization of said last-mentioned electromagnetic coil a second of said movable members of said photographic camera is moved.

4,072,966

PHOTOGRAPHIC CAMERA WITH BUILT-IN GENERATOR

Seiji Asano, Okegawa, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Apr. 22, 1976, Ser. No. 679,373
Claims priority, application Japan, Apr. 24, 1975, 50-50015
Int. Cl.² G03B *7/08*
U.S. Cl. 354—60 R **13 Claims**



1. A photographic camera comprising a built-in generator, an electric shutter control circuit connected with said generator, an operating member for rotating said generator to produce electricity to be supplied to said electric shutter control circuit in response to a shutter release operation, a power switch interposed between said generator and said exposure control circuit for energizing the control circuit when it is in the closed position, and means operatively connected with said operating member for closing said switch only when the operating member is moved by a predetermined distance to rotate the generator for a time longer than the rising time of the output current of the generator, whereby only a stable current is supplied to the exposure control circuit from the generator.

4,072,967

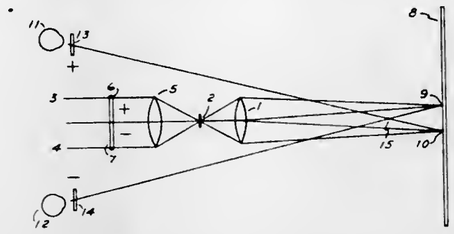
STEREOSCOPIC PROJECTION MICROSCOPY

Leslie Peter Dudley, 11088 Ophir Drive, No. 307, Los Angeles, Calif. 90024

Filed May 4, 1976, Ser. No. 683,191
Int. Cl.² G03B *21/00*
U.S. Cl. 354—79 **10 Claims**

1. A stereo microscopic projection system comprising the following elements: a monocular microscope for examining a specimen; a substage condenser included in the microscope on one side of the plane of support of the specimen; and objective lens included in the microscope on the other side of the plane of the specimen; a light source positioned to direct a beam of light through said substage condenser, said beam being converged by said substage condenser in the plane of support of the specimen for illuminating the specimen, and said beam entering said objective lens as a divergent beam; a beam splitter comprising complementary filters located in the light path between the light source and the substage condenser, said

beam splitter causing said divergent beam to comprise two disparate aspects of the specimen to cause said objective lens to



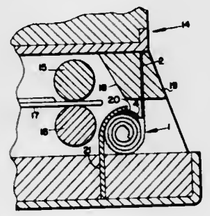
produce a pair of disparate images of the specimen; and means on which the disparate images are materialized.

4,072,968

SELF-RETRACTING IMBIBITION CHAMBER FOR CAMERAS AND METHOD OF MAKING THE SAME

Edwin H. Land, Cambridge; Albert J. Bachelder, Lexington, both of Mass., and Sarah H. Perry, Northfield, Minn., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 27, 1976, Ser. No. 680,781
Int. Cl.² G03B *17/50*
U.S. Cl. 354—86 **11 Claims**



1. In combination with a camera having a pair of processing rolls through which a film unit may be advanced for processing, a tightly coiled helix of springy opaque material having inturned film retaining flanges fluted with adjacent regions of said material to permit coiling without creasing, said coiled helix being mounted in said camera in front of said rolls with portions of said flanges spread from a projecting end flap of said helix to receive the end of a film unit passing out between said rolls.

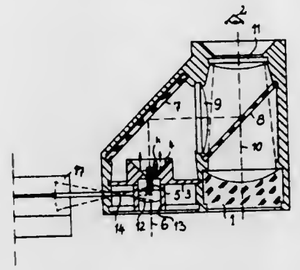
4,072,969

RANGING SYSTEM FOR CAMERA VIEWFINDER

Michael Cheavin, Enger, Germany, assignor to Balda-Werke Photographische Geräte und Kunststoff GmbH & Co. KG., Bunde, Germany

Filed Nov. 16, 1976, Ser. No. 742,517
Claims priority, application Germany, July 16, 1976, 2632143
Int. Cl.² G03B *13/20*
U.S. Cl. 354—166 **10 Claims**

1. An improved ranging system for an encased camera of the type having an objective lens mounted in said camera casing, and focusing means therefor, said ranging system being of the type including an optically aligned eyepiece and viewfinder lens defining a field of view for an operator looking through said system, said field of view including the scene to be photographed, said improving ranging system comprising, in combination, a luminous marking means lying substantially in the plane of said viewfinder lens, said marking means including a movably mounted masking means, said masking means being axially movable substantially at an angle normal to said plane of said marking means, said movable masking means including a reflective surface which is angularly oriented at about 45° to said axis of movement thereof, said marking means including a mirrored surface corresponding to said reflective surface which is similarly angularly oriented; means for axially moving said masking means, said moving means being operatively connected to said focusing means for axially displacing said masking means in correspondence to a focusing movement;



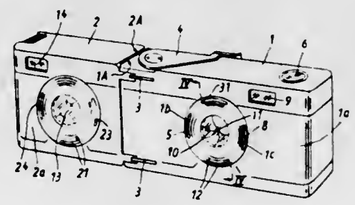
and means for superposing an image of said marking means in the line of sight between said eyepiece and said viewfinder lens, said means translating an axial movement of said masking means into a laterally displaced image transfer in the line of sight between said eyepiece and said viewfinder lens.

4,072,970

STILL CAMERA

Alfred Winkler, Munich, Germany, assignor to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed June 22, 1976, Ser. No. 698,743
Claims priority, application Germany, June 25, 1975, 2528221
Int. Cl.² G03B *17/04*
U.S. Cl. 354—187 **27 Claims**



1. In a photographic apparatus, particularly in a still camera, a combination comprising a camera body including a first section and a second section, each of said sections having a first side and a second side adjacent to the respective first side; means for articulately connecting said sections with each other so that one of said sections is movable with respect to the other of said sections between a first position in which said first sides are adjacent to each other and a second position in which said second sides are adjacent to each other, said first section having a film-receiving chamber which fully confines the film in either position of said one section; and means for releasably holding said one section in at least one of said positions.

4,072,971

FOCUS ADJUSTMENT AND DETERMINATION MEANS

Makoto Kuboshima, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 8, 1975, Ser. No. 603,225
Claims priority, application Japan, Aug. 14, 1974, 49-93595
Int. Cl.² G03B *3/00*
U.S. Cl. 354—201 **12 Claims**

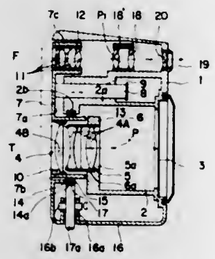
1. A photographic camera which comprises, in combination: first and second focusing optical systems of different focal length, one of said first and second optical systems being

used for directing rays of light, carrying an image of an object to be photographed, towards a photosensitive material and the other of said first and second optical systems being used for directing said rays of light towards a viewfinder arrangement for finding the position of the focal point of said one of said first and second optical systems;

said first optical system including a movable lens assembly and a fixed lens assembly optically aligned with said movable lens assembly, said movable and fixed lens assemblies having a common optical axis directed towards the object to be photographed;

said second optical system composed only of a movable lens assembly having an optical axis directed towards the object to be photographed and also having a focal length equal to the focal length of said movable lens assembly of said first optical system;

means for moving one of said movable lens assembly of said first optical system and said movable lens assembly of said



second optical system in a direction towards and away from the object to be photographed; and

linkage means for transmitting the movement of said either one of said movable lens assembly of said first optical system and said movable lens assembly of said second optical system to the other of said movable lens assembly of said first optical system and said movable lens assembly of said second optical system thereby to cause said other of said movable lens assembly of said first optical system and said movable lens assembly of said second optical system to move along its optical axis a distance equal to the distance of movement of said either one of said movable lens assembly of said first optical system and said movable lens assembly of said second optical system, the image of the object being focused on the photosensitive material when the same image of the object is visually sharply represented to the eyes of a photographer through the viewfinder arrangement.

4,072,972

PHOTOGRAPHIC FILM CASSETTE

Nicholas Gold, Arlington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 485,795, July 5, 1974, abandoned. This application Mar. 31, 1976, Ser. No. 672,168

Int. Cl.² G03B *17/26*

U.S. Cl. 354—275 **31 Claims**

1. Photographic film apparatus comprising:

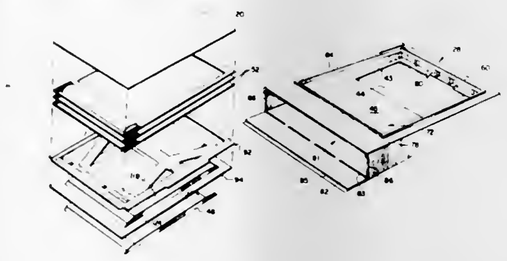
opaque means for defining a film chamber of substantially shallow depth, said chamber defining means including a first wall having a light transmitting section and a second wall spaced from said first wall by a distance establishing said shallow depth;

a plurality of substantially flat unexposed film units disposed in a stacked array within said chamber and stacked depthwise of said chamber in alignment with said light transmitting section to facilitate the sequential exposure of said film units to actinic radiation entering said chamber through said light transmitting section, said chamber defining means further including means for defining an opening through which said film units may be sequentially advanced from said chamber following their exposure;

means for at least initially light sealing said opening, said opening light sealing means being displaceably mounted with respect to said opening to facilitate the advancement of said film units from said chamber through said opening;

displaceably mounted means for at least initially light sealing said light transmitting section, said chamber defining means, said opening light sealing means and said light transmitting section light sealing means being arranged to initially in combination preclude actinic radiation from impinging upon said stacked array of unexposed film units disposed within said chamber;

a substantially flat battery having a thickness substantially less than the shortest distance between said first and sec-



ond walls, said battery including a pair of terminals on one of its two major surfaces; and

means for positioning said battery on the opposide side of said second wall from said stacked array of film units with the other of its said two major surfaces facing said second wall, the dimensions of said flat battery being selected so that no portion of its said major surfaces extend beyond the periphery of said second wall, said positioning means being structured and arranged to expose said battery terminals exteriorly of said apparatus when said battery is located on the opposite side of said second wall from said stacked array of film units by said positioning means and further structured and arranged to facilitate the ready manual replacement of said flat battery from said apparatus with another similar flat battery.

4,072,973

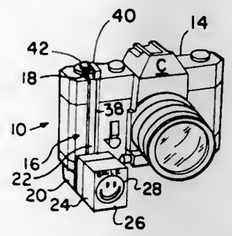
CAMERA SIGNAL SYSTEM FOR PORTRAIT TAKING

William D. Mayo, Green Glade Road, Phoenix, Md. 21131

Filed Jan. 26, 1976, Ser. No. 652,308

Int. Cl.² G03B *17/56*

U.S. Cl. 354—295 **6 Claims**



1. In a system for use with a camera having a motion-actuable shutter release for taking exposures of animate subjects and the like, means for signalling said subjects before taking exposures, and means for energizing the system, the improvement comprising: the means for signalling including at least one signal remotely projectable for detection by said subject, means for insuring that said at least one signal will be given prior to taking an exposure, including a switch element positionable for covering a said shutter release and having connection for switching-on the means for signalling, and the motion for actuating a said shutter release being impartable through the switch element.

4,072,974

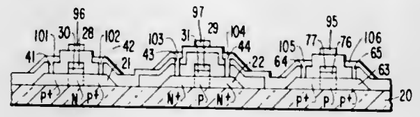
SILICON RESISTIVE DEVICE FOR INTEGRATED CIRCUITS

Alfred Charles Ipri, Marlton, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 491,115, July 23, 1974, abandoned. This application Nov. 18, 1976, Ser. No. 742,852

Int. Cl.² H01L *27/02, 27/12, 29/04*

U.S. Cl. 357—23 **4 Claims**



1. In an integrated circuit of the type comprising a shift register cell comprised of a first complementary symmetry metal-oxide-semiconductor transmission gate, a first complementary symmetry metal-oxide-semiconductor inverter having a common gate electrode connected to the output of the first gate, a second complementary symmetry metal-oxide-semiconductor transmission gate having an input connected to the output of the first inverter and a second complementary symmetry metal-oxide-semiconductor inverter having a common gate electrode connected to the output of the second complementary symmetry metal-oxide-semiconductor gate, the improvement comprising a resistive device comprised of an island of polycrystalline silicon having three regions of the same conductivity type, two of the regions having a high impurity concentration with conductive contacts connected thereto, the other regions separating the first mentioned regions and having a moderate impurity concentration, the resistive device being connected between the output of the second complementary sgymmetry metal-oxide-semiconductor inverter and the input of the first complementary symmetry metal-oxide-semiconductor inverter.

4,072,975

INSULATED GATE FIELD EFFECT TRANSISTOR

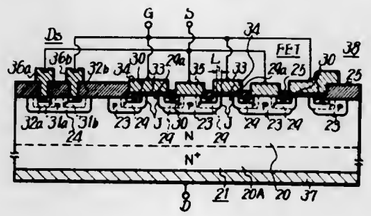
Akiyasu Ishitani, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 22, 1977, Ser. No. 790,089

Claims priority, application Japan, Apr. 29, 1976, 51-48967

Int. Cl.² H01L *29/78, 27/02, 29/06*

U.S. Cl. 357—23 **4 Claims**



1. An insulated gate field effect transistor comprising:

a semiconductor substrate;

a drain region in said substrate of a first conductivity type facing both of the major surfaces of said semiconductor substrate;

a frame region of a second conductivity type facing one of said major surfaces of said semiconductor substrate;

a base region of the second conductivity type facing said one major surface and connected to said frame region, said base region forming a PN junction with said drain region;

a source region of the first conductivity type facing said one major surface and formed in said base region whereby said source region is surrounded by said base region;

a source electrode on said frame region and said source region;

a drain electrode on said drain region facing the other of said major surfaces of said substrate;

a gate insulating layer; and

a gate electrode on said gate insulating layer facing said one major surface through said gate insulating layer.

4,072,976

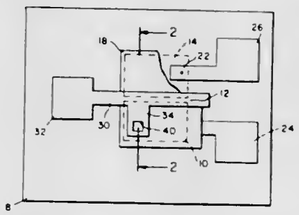
GATE PROTECTION DEVICE FOR MOS CIRCUITS

Eliyahou Harari, Irvine, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 28, 1976, Ser. No. 754,932

Int. Cl.² H01L *29/78, 27/02*

U.S. Cl. 357—23 **6 Claims**



1. In an improved MOS device of the type having at least one field effect transistor with source, channel and drain regions formed in a semiconductor substrate, a metallic gate electrode and a gate dielectric layer which insulates said gate electrode from said source, gate and drain regions, source and drain electrodes connected to said source and drain regions respectively through ohmic connections, the improvement which comprises:

a. a predetermined section of said gate dielectric which is relatively thin with respect to the remaining portion of said dielectric layer;

b. a predetermined portion of said metallic gate electrode which is relatively thin with respect to the remaining portion of said gate electrode and is adjoining said relatively thin section of said gate dielectric whereby when an excessive voltage pulse is applied on said gate electrode it will cause a rupture in said thin dielectric region and a part of the metal of said relatively thin portion of said gate electrode will cause a temporary electrical short circuit between said gate electrode and said semiconductor substrate and said Joule heat produced in the vicinity removes said metal from said point of rupture and thus said short circuit is eliminated.

4,072,977

READ ONLY MEMORY UTILIZING CHARGE COUPLED DEVICE STRUCTURES

Robert T. Bate, Richardson, and John Millard Caywood, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

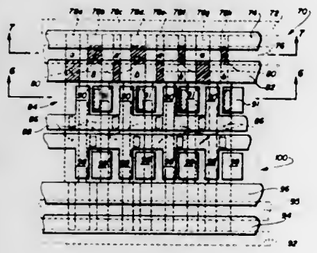
Continuation of Ser. No. 497,162, Aug. 13, 1974, abandoned. This application July 9, 1976, Ser. No. 703,736

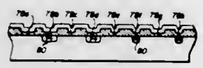
Int. Cl.² H01L *29/78*

U.S. Cl. 357—24 **7 Claims**

1. A read only memory comprising a charge coupled device shift register having a semiconductor substrate defining a channel overlaid by phase electrodes spanned and insulated from

said channel for serial propagation along toward an output end of said channel of charge packets introduced in said channel; said shift register having a plurality of stages each defined by a plurality of adjacent phase electrodes; charge source means spaced from and extending lengthwise of said channel; first charge storage means including first respective charge storage regions defined between said charge source means and a first phase electrode of each of said stages, said first respective charge storage regions being arranged in a first predetermined pattern of different charge storage capacities; second charge storage means including second respective charge storage regions defined between said charge source means and a second phase electrode of each of said stages, said second respective charge storage regions being arranged in a second predetermined pattern of different charge storage capacities; said first and second charge storage means also including first and second storage gate means respectively; said first storage gate





means overlying and insulated from said first storage regions, said second storage gate means overlying and insulated from said second storage regions; transfer gate means insulated from said substrate; said transfer gate means and said first storage gate means together enabling simultaneous transfer of charge from said charge source means to said first charge storage regions, said transfer gate means and said second storage gate means together enabling simultaneous transfer of charge from said charge source means to said second charge storage regions; said first storage gate means and said first phase electrodes together enabling subsequent simultaneous transfer of said charge packets from said first storage regions to said channel beneath corresponding ones of said first phase electrodes, said second storage gate means and said second phase electrodes together enabling subsequent simultaneous transfer of said charge packets from said second storage region into said channel beneath corresponding ones of said second phase electrodes.

4,072,978

CCD INPUT AND NODE PRESET METHOD

Dennis Darcy Buss, Richardson; Stephen P. Emmons, and James Brockman Barton, both of Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

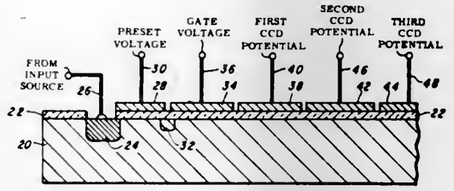
Continuation of Ser. No. 617,451, Sept. 29, 1975, abandoned, which is a continuation of Ser. No. 373,567, June 25, 1973, abandoned. This application July 11, 1977, Ser. No. 814,528

Int. Cl.² H01L *29/78*

U.S. Cl. 357—24 **9 Claims**

1. A method of inputting charge packets into a charge coupled device structure comprising a semiconductor substrate, a minority carrier charge source region disposed in said substrate near one surface thereof, a minority carrier charge storage region in said substrate near said one surface and spaced apart from said charge source region, an insulating layer disposed on said one surface, and a signal electrode disposed on said insulating layer over said space between said source region and said storage region, wherein each of said charge packets comprises a quantity of charge inversely proportional to the magnitude of an analog input signal comprising the steps of:

a. simultaneously applying: a source voltage to said charge source of a magnitude smaller than the smallest magnitude of said analog input signals, and a predetermined voltage



to said signal electrode of a magnitude which prevents charge flow between said charge source and said charge storage region; then

b. applying said analog input signal to said signal electrode; and then

c. increasing the magnitude of said source signal to a value greater than that of the magnitude of said input signal to thereby trap a minority carrier charge packet in said charge storage region of a magnitude inversely proportional to the magnitude of said input signal.

4,072,979

INTEGRATED POWER AMPLIFIER

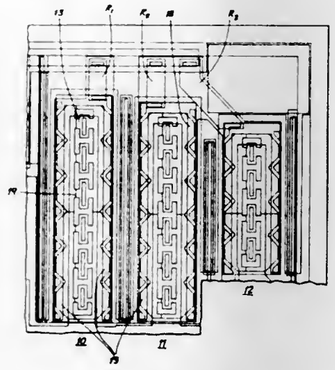
Sergio Palara, San Martino di Ferrara, Italy, assignor to SGS-ATES Componenti Elettronici S.p.A., Agrate Brianza (Milan), Italy

Filed June 10, 1976, Ser. No. 694,791

Claims priority, application Italy, June 10, 1975, 24160/75

Int. Cl.² H01L *29/72;* **H03F** *3/14*

U.S. Cl. 357—36 **3 Claims**



1. In an integrated transistor structure wherein a semiconductor body comprises a base layer of one conductivity type, a collector layer of the opposite conductivity type adjoining said base layer, and an emitter layer of said opposite conductivity type on a surface of said base layer, said emitter layer forming a multiplicity of emitter areas arrayed in at least one row and constituting respective elemental transistors with corresponding portions of said base and collector layers, each emitter area including a central zone flanked by a pair of lateral zones which are connected with said central zone by narrower transverse zones, said central zones being interconnected by a conductor strip extending to a common emitter terminal at one end

of said row, said collector and base layers being respectively connected to a common collector terminal and to a common base terminal, the improvement wherein the widths of said transverse zones decrease progressively from a first elemental transistor at said one end of said row to a last elemental transistor at the other end thereof with a corresponding increase in the resistances of said transverse zones for substantially equalizing the current distribution among the elemental transistors of said row.

4,072,980

THYRISTOR

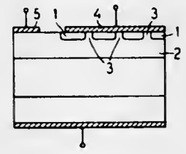
Fritz Kirschner, Lohhof, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

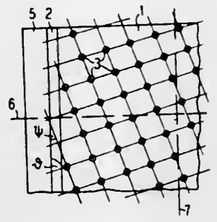
Filed May 4, 1976, Ser. No. 683,206

Claims priority, application Germany, May 6, 1975, 2520134

Int. Cl.² H01L *29/74*

U.S. Cl. 357—38 **5 Claims**





1. A rectangular semiconductor thyristor element having at least four zones of alternate conductivity type with an outer zone forming an emitter and with an adjacent inner zone forming a base, said emitter zone extending over a substantial portion of said base zone and spaced from one marginal edge of said base zone, an emitter electrode in contact with said emitter zone and covering a substantial portion thereof, a strip control electrode on said base adjacent said one marginal edge thereof, said emitter having a large number of openings therethrough through which portions of said base extend into contact with said emitter electrode thereby providing shunts for disruptive discharges during operation, said shunts being located in a series of equally spaced first lines which form an angle with said control electrode of from 0° to 45°, said shunts also being along a series of equally spaced parallel second lines which make a second angle smaller than 90° and larger than 45° with respect to said strip shaped control electrode, each of said shunts lying in both a first line and in a second line, said arrangement of said first and second lines forming a grid-like pattern.

4,072,981

FAST SWITCHING DARLINGTON CIRCUIT

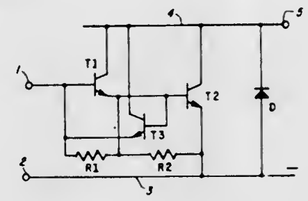
Christopher T. Black, Bedford, and Anthony Lear, Huntingdon, both of England, assignors to Texas Instruments Incorporated, Dallas, Tex.

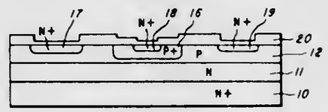
Division of Ser. No. 669,585, March 23, 1976, Pat. No. 4,028,561. This application Nov. 15, 1976, Ser. No. 742,050

Claims priority, application United Kingdom, Mar. 25, 1975, 12373/75

Int. Cl.² H01L *27/02;* **H03K** *3/33*

U.S. Cl. 357—46 **7 Claims**





1. A fast switching darlington output circuit comprising first and second superposed semiconductor layers of first conductivity type, said second layer having a higher resistivity than said first layer; a third semiconductor layer having opposite conductivity type on said second layer; said second and third layers providing a common collector and base region respectively for each of first, second and third transistors; a first region of said opposite conductivity type in said third layer and extending to the outer surface thereof, said first region having said opposite conductivity type and lower resistivity than said third layer; three further regions having said first conductivity type, first and second ones of said further regions located in said third layer and extending to said outer surface thereof, the third further region disposed in said first region and extending to the outer surface of said third layer; said two further regions providing emitter regions of said first and second transistors respectively and said third further region providing an emitter region of said third transistor.

4,072,982

SEMICONDUCTOR COMPONENT WITH DIELECTRIC CARRIER AND ITS MANUFACTURE

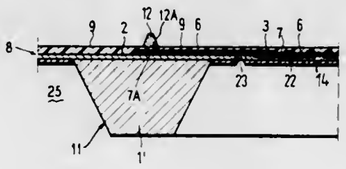
Karl-Ulrich Stein, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 2, 1975, Ser. No. 592,526

Claims priority, application Germany, July 4, 1974, 2432544

Int. Cl.² H01L *27/12, 23/14*

U.S. Cl. 357—49 **4 Claims**



1. In a component assembly incorporating a flattened, inte-

grated semiconductor circuit structure of the type having a plurality of discrete sites of doped, semiconductor material which discrete sites are interconnected together in a predetermined manner by thin layered paths of conductive material, the improvements which comprise:

(A) a dielectric carrier layer generally continuously overlying, and integrally bonded to, surface portions of such flattened integrated semiconductor circuit structure on one side thereof, said carrier layer being comprised of a polyimide resin,

(B) a semiconductor wall member generally continuously perimetrically circumscribing such integrated semiconductor circuit and integrally associated therewith on the opposed side of such flattened integrated semiconductor circuit structure,

(C) such flattened integrated semiconductor circuit structure having said layered paths of conductive material therein located in adjacent relationship to said dielectric carrier layer on said one side thereof,

(D) such flattened integrated semiconductor circuit structure further having said discrete sites of doped semiconductor material located in laterally spaced relationship to said wall member, and

(E) said carrier layer having a thickness at least sufficient to provide mechanical support for said circuit structure and said thin layered paths.

4,072,983

SECAM IDENTIFICATION CIRCUIT

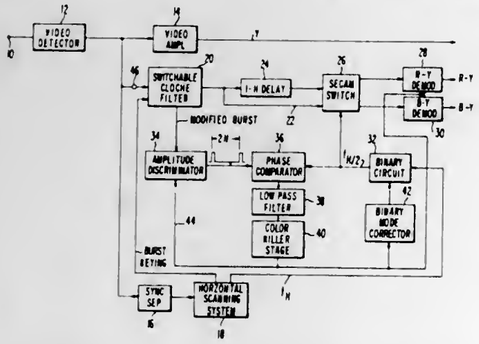
Felix Aschwanden, Thalwil, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Jan. 7, 1977, Ser. No. 757,556

Claims priority, application United Kingdom, Feb. 24, 1976, 07247/76

Int. Cl.² H04N *9/46, 9/49*

U.S. Cl. 358—19 **10 Claims**



1. In a system for processing color television signals of the SECAM type in which a binary circuit for producing a substantially square wave output recurring at one-half of the image line scanning rate is included for synchronizing the demodulation of at least first and second color signal carriers of different frequencies recurring alternately in a line-by-line sequence and modulated during line scanning intervals with respective color image information signals, said SECAM type signal further including first and second synchronizing burst components having frequencies corresponding, respectively, to those of said carriers and occurring during line retrace intervals adjacent in time to an associated color carrier, a color signal identification circuit comprising:

signal filtering means exhibiting a bell-shaped amplification versus frequency response during said line scanning intervals for processing said color signal carriers prior to demodulation thereof;

switching means coupled to said filtering means for modifying said bell-shaped response during said line retrace intervals to increase relatively the response at one of said burst component frequencies with respect to the response at the other of said burst component frequencies;

detection means coupled to said filtering means, responsive to burst components of increased amplitude coupled from said filtering means and relatively unresponsive to said other burst components, for producing output pulses at one-half said line scanning rate in timed relation with said increased amplitude burst components;

phase comparator means responsive to said pulses and to said square wave for providing an error correction signal representative of the time relation of said pulses and said square wave; and

means coupled to said binary circuit and responsive to said error correction signal for synchronizing the operation of said binary circuit with respect to the time sequence of said first and second carriers so as to provide proper recovery of said color information signals.

4,072,984

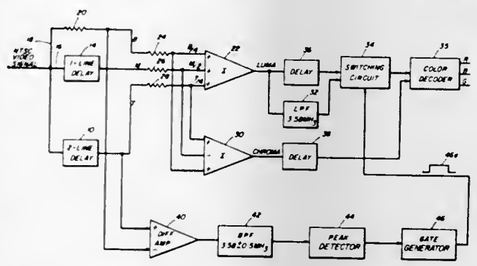
CHROMINANCE-LUMINANCE SEPARATOR

Arthur Kaiser, Trumbull, Conn., assignor to Thomson-CSF Laboratories, Inc., Stamford, Conn.

Filed Apr. 14, 1975, Ser. No. 567,730

Int. Cl.² H04N *9/535*

U.S. Cl. 358—31 **10 Claims**



6. In an apparatus for processing received television input signals containing luminance and chrominance components, said apparatus including separation means for combining different scanlines of the received television signal to derive the luminance component therefrom; a system for removing spurious chrominance components from the derived luminance signal while substantially maintaining the bandwidth of the derived luminance signal, comprising:

means for detecting vertical chrominance transitions within a television picture of said television input signal and for generating a control signal as a function of the transitions;

means for filtering the derived luminance signal; and

switching means for receiving the derived luminance signal and the filtered luminance signal and responsive to said control signal for selecting as its output one of said derived luminance signal or said filtered luminance signal.

4,072,985

VIDEO DISC WITH A DIELECTRIC LAYER FORMED FROM STYRENE AND NITROGEN

Grzegorz Kaganowicz, Princeton, N.J., and John Walter Robinson, Levittown, Pa., assignors to RCA Corporation, New York, N.Y.

Filed May 4, 1977, Ser. No. 793,872

Int. Cl.² H04N *1/28;* B32B *3/02, 15/08, 15/20*

U.S. Cl. 358—128 **10 Claims**

1. A capacitive recording means comprising a disc having a spiral groove on the face thereof with audio/video information in the form of geometric variations in said groove, a thin conductive layer thereon and a thin dielectric layer formed from styrene and nitrogen in a glow discharge on said conductive layer.

4,072,986

MESSAGE SYNTHETIZER

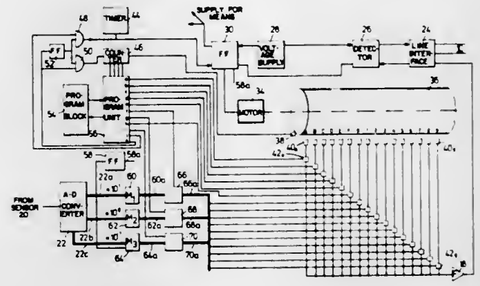
Lars Heidergren, Lidingo, Sweden, assignor to AB Gylling & Co., Bromma, Sweden

Filed Aug. 1, 1975, Ser. No. 601,199

Claims priority, application Sweden, Aug. 9, 1974, 7410212

Int. Cl.² G11B *5/00*

U.S. Cl. 360—12 **4 Claims**



1. Message synthetizer device for providing a message consisting of a number of separate digits, terms etc. indicating aspects and features of a sensed quantity condition in response to an interrogation signal, said device comprising: an interrogation detecting device connected to a communication circuit; a sensor means for sensing the value of said condition; an A-D-converter connected to said sensor means having an output for delivering the digital value of said sensed quantity; recorder means with a plurality of endless tracks with recordings of information including said digits, terms etc.; a plurality of read-out devices, one for each of said tracks; an output circuit individually connected from each read-out and each including a controlled switch device connected to a common signal line adapted to be connected to said communication circuit; means for continuously moving said endless tracks past said read-out devices; controlled memory devices connected to receive and, upon detection of an interrogation signal, to store said digital value from the A-D-converter and having controlled output circuits responsive to programmed signal sequence connected to selected ones of said controlled switch device for predeterming the path of control signals to selected controlled switch devices for connection of appropriate digit track read-out devices, one at a time, for read-out and transmission of the corresponding track recordings to said common signal line; a program device having output control connections to the controlled counter output circuits and selected ones of said controlled switch devices for controlling delivery of recorded track information in a predetermined sequence to said common output signal line; means connected to and initiated by said interrogation device for energizing the components of said synthetizer device providing a store command signal to said memory devices and starting said program device; and logic circuit means, connected to and controlled by said program device and having output control connections to said program devices and to said means for energizing said synthetizer components, for enabling at least one repeat transmission of the same synthetized message by said program device and then terminating transmission.

4,072,987

DIGITAL STORAGE SYSTEMS

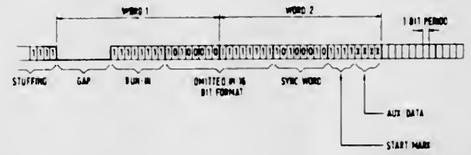
Ian Clive Walker, Newbury, England, assignor to Micro Consultants Limited, England

Continuation-in-part of Ser. No. 670,935, March 26, 1976, Pat. No. 4,045,613. This application July 7, 1976, Ser. No. 703,172

Claims priority, application United Kingdom, Mar. 26, 1975, 12607/75

Int. Cl.² G11B *5/09*

U.S. Cl. 360—48 **23 Claims**



1. Apparatus for inserting synchronising data between blocks of serial data, said apparatus comprising:

(a) synchronising data generating means for producing a predetermined data sequence;

(b) selector means connected to said data generator and an input receiving said serial data for selecting either said serial data or said synchronising data;

(c) coding means connected to said selector means for encoding both said serial data and said synchronising data, and

(d) control means connected to an output of said coding means for producing an identification gap of a length equivalent to N bits of data before the start of the synchronising data whereby the signal produced at an output of said control means comprises a data gap followed by said synchronising data and said serial data.

4,072,988

CASSETTE LOADING DEVICE IN A CASSETTE TAPE RECORDER

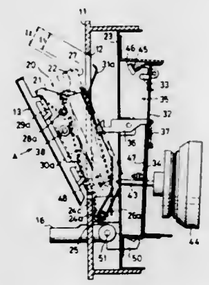
Manabu Sato, Yokohama, and Shigeru Matumoto, Hiratsuka, both of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Mar. 23, 1976, Ser. No. 669,630

Claims priority, application Japan, Apr. 22, 1975, 50-54088[U]

Int. Cl.² G11B *23/08, 15/00*

U.S. Cl. 360—96 **5 Claims**



1. In a cassette tape recorder having a loading space for accommodating a cassette loaded thereinto, an opening through which the cassette is inserted and taken out, and a capstan adapted to enter relatively into a capstan receiving opening in the cassette and to drive a tape within the cassette, said cassette loading device comprising:

a cassette holder for receiving and holding the cassette inserted thereinto;

a cassette holder supporting member rotatably supporting said cassette holder by means of a first pivot shaft;

a second pivot shaft for rotatably supporting said cassette holder supporting member between the loading space and an outside of the cassette tape recorder through the opening, said second pivot shaft being disposed at a fixed position in the vicinity of the capstan such that the distance between the second pivot shaft and said capstan is less than the distance between said capstan and the rear end of the cassette inserted into said cassette holder;

first spring means for urging said cassette holder supporting member to rotate about said second pivot shaft toward the outside of the cassette tape recorder;

second spring means for urging said cassette holder to rotate about said first pivot shaft toward a direction which is reverse to the direction of the torque of said first spring means;

pushing means for pushing said cassette holder supporting member so as to rotate about said second pivot shaft toward the loading space against said first spring means;

means, operating in response to the rotation of said cassette holder together with said cassette holder supporting member about said second pivot shaft by said pushing means, for rotating said cassette holder about said first pivot shaft in the direction opposite to the urging direction of said second spring means; and

locking means responsive to the accommodation of said cassette holder into the loading space for locking said cassette holder supporting member.

4,072,989

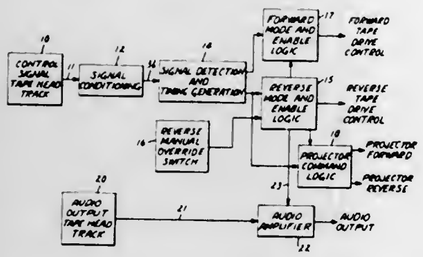
AUDIO-VISUAL PRESENTATION DEVICE

Robert Eugene Grant, Shoreview, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 7, 1976, Ser. No. 647,200

Int. Cl.² G03B *31/00*; G11B *31/00*

U.S. Cl. 360—80 **12 Claims**



1. An audio-visual presentation device including magnetic tape drive means adapted to move a magnetic recording tape in a forward and a reverse direction at first and second speeds with said second speed being greater than said first speed, said tape having at least one region in which a series of audio signal portions is recorded with each of said audio signal portions being preceded by a visual advance control signal, said device providing audio output in response to said audio signal portions and adapted for providing electrical control of the cycling of an optical projector having a remotely and electrically controllable single frame advance mechanism in response to one of said visual advance signals whereby during a normal automatic forward operation of said tape drive means at said first speed said device provides audio output and optical projector control such that said audio output and a display by said optical projector remain in synchronization with the visual advance signal preceding each of such audio signal portions initiating a single frame cycle command to the optical projector, said device including a first manually actuated switch means having first and second positions, said switch means when in said first position providing normal automatic forward operation at said first tape drive speed and when in said second position providing reverse direction control to said tape drive means at said second tape drive speed with the visual advance signals on the tape automatically controlling reverse cycling of said optical projector, wherein the improvement comprises:

first circuit means responsive to each of said visual advance control signals for providing a logic control signal that indicates whether a visual advance control signal is being detected; and

second circuit means operatively connected to said first switch means for responding to the position of said first switch and operatively connected to said first circuit means for responding to said logic control signal to provide a reverse control signal, when said first switch means is in said second position, for use in initiating reverse movement for the magnetic tape and for use with the single frame cycle commands in initiating reverse operation of the optical projector, provided said logic control signal indicates a visual advance control signal is not being detected, whereby synchronization of said audio output and said optical projector display is not lost due to operation of said first switch means to its second position at the time said logic control signal indicates a visual advance control signal is being detected.

4,072,990

SERVO POSITIONING SYSTEM FOR DATA STORAGE APPARATUS

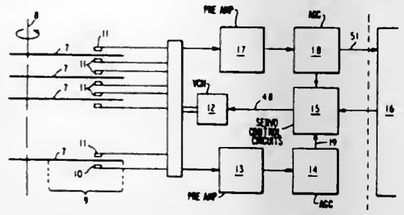
William John Philip Case, Winchester, and Robert Duncan Commander, Eastleigh, both of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 19, 1976, Ser. No. 706,313

Claims priority, application United Kingdom, July 24, 1975, 30922/75

Int. Cl.² G11B *5/56, 21/10, 17/00*

U.S. Cl. 360—77 **4 Claims**



1. In a servo positioning system for maintaining a data transducer centered on a selected one of a plurality of concentric data tracks on an information bearing disk rotatable in a disk file, said data tracks including interleaved servo position reference sectors and data sectors,

sampling means for sampling signals from said data transducer at times corresponding to said servo sectors;

means connected to said sampling means and responsive to said sampled signals to generate a first position error signal indicating deviations of said data transducer from said data track center, said first position error signal being limited in bandwidth by the frequency of occurrence of said servo sectors;

a servo disk, rotatable coaxially with said information bearing disk, and having continuous servo position reference information recorded thereon in a plurality of concentric servo tracks corresponding to said data tracks;

a servo transducer, movable conjointly with said data transducer, for sensing said servo information on said servo tracks as said servo disk rotates; and

means connected to said servo transducer and responsive to said sensed servo information signals to generate a second position error signal indicating deviations of said servo transducer from said servo tracks, said deviations corresponding nominally to said deviations of said data transducer from said data tracks but being subject to low frequency differential effects which reduce the accuracy of said second position error signal, the improvement comprising;

means connected to both said position error signal generating means for combining low frequency components only of said first position error signal with high frequency components only of said second position error signal to provide a hybrid position error signal of increased bandwidth over said first position error signal and of greater accuracy than said second position error signal, and

actuator means for moving said data and servo transducers, said actuator means being connecting to receive said hybrid position error signal and being responsive thereto to maintain said data transducer centered over said selected data track.

4,072,991

AUTOMATIC MAGNETIC-TAPE CASSETTE CHANGING DEVICE

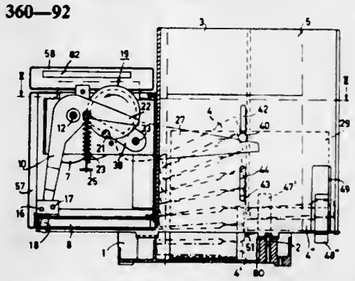
Cornelis Hendrik Kok, Wassenaar, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 19, 1975, Ser. No. 633,218

Claims priority, application Netherlands, Dec. 2, 1974, 7415667

Int. Cl.² G11B *15/68*

U.S. Cl. 360—92 **4 Claims**



1. An automatic magnetic tape cassette changing device comprising

a mounting frame,

a feed-in magazine for the temporary storage of a juxtaposed stack of cassettes to be fed to a tape recorder in the sequence of stacking, mounted to said frame,

a feed-out magazine mounted to said frame and arranged directly adjoining the feed-in magazine, for temporary storage in the reverse sequence of a number of cassettes moved away from said tape recorder,

a cassette pusher,

means for movably mounting the cassette pusher with respect to said magazine such that said pusher is movable to transfer a lowermost cassette of a stack of cassettes in the feed-in magazine to a position underneath cassettes stacked in the feed-out magazine,

a drive mechanism arranged for operative movement, and

means for actuating the cassette pusher in response to movement of the drive mechanism,

wherein the improvement comprises means for lifting and lowering cassettes present in the feed-in magazine between a lower position in which, said device being mounted on a tape recorder, a lowermost cassette of a stack of juxtaposed cassettes is in the position for operative engagement by the tape recorder, and a higher position in which the lowermost cassette is positioned in line with the cassette pusher, and for lifting juxtaposed cassettes present in the feed-out magazine from a lower position to a higher position, in said higher position a lowermost cassette in said feed-out magazine being disposed at least one cassette thickness higher than a corresponding position of the lowermost cassette in the feed-in magazine when said feed-in magazine has been lifted to its higher position,

wherein said lifting and lowering means includes:

a lifting element mounted for motion with respect to said frame between a higher and a lower position in the direction of stacking of the cassettes, and a cassette carrier element connected to said lifting element, and arranged to engage a lower surface of the lowermost cassette in the feed-in magazine, and

a resilient element connected to the lifting element and having a bent portion so arranged that, upon movement of the feed-out magazine from the lower position to the higher position the lowermost cassette in the feed-out magazine is engaged so as to lift the stack of cassettes in the feed-out magazine; and so connected and arranged that, a cassette having been moved by the pusher member into position underneath the stack of cassettes in the feed-out magazine, upon movement of the lifting element from the higher position to the lower position the resilient element is displaced by said cassette underneath such that the bent portion moves past said cassette underneath to a lower position for engagement with said cassette underneath.

4,072,992

CONTINUOUS LOOP TAPE CARTRIDGES

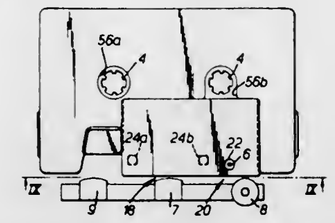
Edward Alexander Leshik, 122 Princess Court, Queensway, London W2, England

Filed Oct. 22, 1976, Ser. No. 734,730

Claims priority, application United Kingdom, Oct. 28, 1975, 44415/75

Int. Cl.² G11B *23/10*

U.S. Cl. 360—94 **14 Claims**



1. An adaptor and miniature tape module assembly adapted for use with a tape recording and/or play-back apparatus of the cassette type having reference boss means (2) for locating a magnetic tape cassette on a support surface of the apparatus, parallel spaced capstan (6) and pinch wheel means (8) arranged normal to said support surface for transporting the cassette tape along a given path relative to said support surface, sensing head means (7) arranged adjacent said given tape path, and a pair of parallel spaced drive spindles (4) arranged parallel to said support surface, said adaptor and miniature tape module assembly comprising

(a) an adaptor member having bottom, top, side and end wall surfaces, one of said side wall surfaces containing a recess (50);

(b) a hollow tape module housing having bottom, side and end walls, means for removably mounting said tape module housing in said recess with one of its side walls coincident with the said one side wall of said adaptor member, thereby to define an adaptor member and tape module assembly, the bottom wall of said module housing containing first apertures (24*a*, 24*b*) for receiving the reference boss means of the apparatus, said adaptor member containing second apertures (56*a*, 56*b*) for freely receiving in concentrically spaced relation the drive spindles of the apparatus; and

(c) a length of tape (11) mounted in said tape module housing, said tape module including guide means (14, 16) for guiding said tape along a path parallel with and adjacent the inner surface of said one housing side wall;

(d) the bottom wall of said tape module housing containing a capstan aperture (22) on the side of said tape path remote

from said one housing side wall, said aperture being adapted to receive the drive capstan of the apparatus;

(e) the said one side wall of said housing containing a pinch wheel opening (20) adjacent said capstan opening, whereby the tape may be gripped between the pinch wheel and the drive capstan, the said one side wall of said housing also containing a sensing head opening (18) adjacent said tape path for receiving the sensing head during tape recording or play-back operation of the apparatus.

4,072,993

MULTI-ELEMENT MAGNETIC HEAD

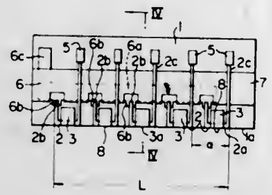
Noboru Nomura, Kyoto; Kenji Kanai, Neyagawa; Nobuyuki Kaminaka, Moriguchi, and Norimoto Nouchi, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 7, 1975, Ser. No. 629,981

Claims priority, application Japan, Nov. 12, 1974, 49-130787; Nov. 12, 1974, 49-130788; Nov. 12, 1974, 49-130789; Dec. 31, 1974, 50-1690; Dec. 31, 1974, 50-1691; Dec. 31, 1974, 50-1692

Int. Cl.[2] G11B *5/27, 5/20, 5/22*

U.S. Cl. 360—121 **9 Claims**



1. A multi-element magnetic head comprising a ferromagnetic material constituting a base; a yoke section including a plurality of thin plates made of a ferromagnetic material, each of said plates having a portion thereof in contact with said ferromagnetic base and arranged at the end thereof, said ferromagnetic base and each of said yoke sections forming a plurality of head gaps; a plurality of coils having first and second ends each made of a non-magnetic conductive layer and arranged adjacent each of said head gaps; and a common electrode layer commonly connected to the first end of each of said coils, said common electrode layer crossing the other end of each of said coils and being located on said base at a position remote from said gaps.

4,072,994

READ-AFTER-WRITE HEAD

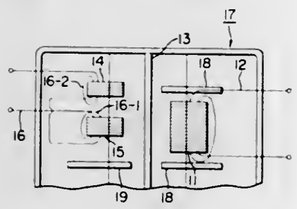
Hideo Takashima, Chichibu, Japan, assignor to Canon Kabushiki Kaisha, Tokyo and Canon Denshi Kabushiki Kaisha, both of, Japan

Filed Dec. 22, 1975, Ser. No. 643,330

Claims priority, application Japan, Dec. 28, 1974, 50-2493; Dec. 28, 1974, 50-2494

Int. Cl.[2] G11B *5/20*

U.S. Cl. 360—124 **33 Claims**



1. A read-after-write head comprising:

a recording core provided with an information write-in winding for writing information and consisting of two tracks;

a reading core provided with an information read-out winding for reading information and consisting of two tracks;

first shielding means for magnetically separating said recording core and said reading core;

means provided on the reading core side with respect to said shield means and respectively at the outside of said two tracks of said reading core for eliminating electric potential induced in said reading core by the cross-field from said recording core; and

a casing for covering said recording core, said reading core, said first shield means and said eliminating means.

4,072,995

TAPE VIEWING SYSTEM FOR MICRO-CASSETTE TAPE RECORDER

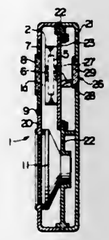
Masaaki Sato, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 11, 1976, Ser. No. 741,154

Claims priority, application Japan, Nov. 21, 1975, 50-158324[U]; Dec. 15, 1975, 50-169838[U]; Dec. 18, 1975, 50-171277[U]; Dec. 18, 1975, 50-171278[U]

Int. Cl.[2] G11B *23/08, 23/38*

U.S. Cl. 360—137 **8 Claims**



1. A tape viewing system for a micro-cassette tape recorder having a cassette receiving chamber; said chamber having a bottom surface and a lid opposite said bottom surface; said lid having a transparent viewing window; said cassette having a tape viewing section; said window being aligned with said tape viewing section when said cassette is inserted in said chamber;

a light transmitting opening in said bottom surface of said cassette receiving chamber and located within the boundaries of said tape viewing section and said tape viewing window, external light incident on at least portion of the casing of the recorder being led through the light transmitting opening to be incident on the rear side of the tape cassette, thereby facilitating a tape viewing through the tape viewing window.

4,072,996

METHOD AND ARRANGEMENT FOR ARC QUENCHING IN ARRESTERS

Rene Rudolph, Zurich, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

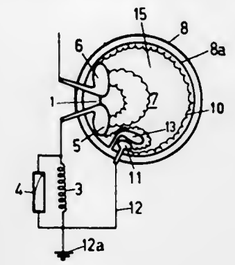
Filed June 15, 1976, Ser. No. 696,228

Claims priority, application Switzerland, July 29, 1975, 9845/75

Int. Cl.[2] H02H *9/06*

U.S. Cl. 361—134 **4 Claims**

1. An electrical arrester comprising at least one pair of electrodes disposed within an arc quenching chamber and forming a current-limiting quenched spark gap connected in series with an associated blow-out coil for magnetically influencing the arc in said quenching chamber, an auxiliary electrode disposed in said quenching chamber in the vicinity of that one of said electrodes which is conductively connected to one end of said blow-out coil, and the other end of said blow-out coil being conductively connected to said auxiliary electrode which latter functions to short-circuit said coil during the quenching



operation, and a screen interposed between said auxiliary short-circuiting electrode and that one of said electrodes which is conductively connected to one end of said blow-out coil.

4,072,997

OVERTEMPERATURE PROTECTIVE CIRCUIT FOR SWITCHING DEVICES

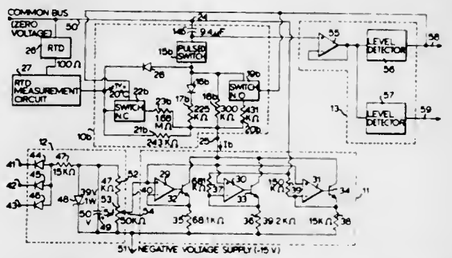
David Richard Boothman, Ennismore; Robert Henry Rehder, and Everett Charles Elgar, both of Peterborough, all of Canada, assignors to Canadian General Electric Company Limited, Toronto, Canada

Filed Oct. 8, 1976, Ser. No. 730,856

Claims priority, application Canada, Dec. 18, 1975, 242342

Int. Cl.[2] H02H *5/04*

U.S. Cl. 361—103 **10 Claims**



1. A circuit for monitoring the temperature of the contacts of an electrical switching device, said circuit comprising: an electrical, resistance-capacitance analogue circuit of the thermal system of said switching device; at least one switch for modifying said analogue circuit to account for different methods of cooling said switching device; a current controller in series circuit relationship with said analogue circuit for controlling the flow of current through said analogue circuit; a load sensing means, both for obtaining a control signal that is proportional to the magnitude of the current conducted by said switching device, and for applying said signal to said controller for controlling the current conduction thereof; and at least one voltage level detector connected across the capacitance of said analogue circuit for measuring the voltage level thereof, said voltage level being representative of the temperature of the contacts of said switching device.

4,072,998

OVER-VOLTAGE PROTECTION DEVICE

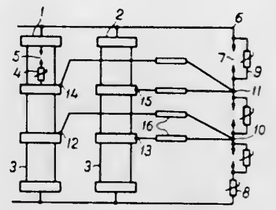
Asle Schei, Trondheim, Norway, assignor to ASEA Aktiebolag, Vasteras, Sweden

Filed Feb. 19, 1976, Ser. No. 659,507

Claims priority, application Sweden, Mar. 18, 1975, 7503020

Int. Cl.[2] H02H *3/22*

U.S. Cl. 361—117 **5 Claims**



1. Over-voltage protection device comprising a plurality of stacks (1, 2) of series-connected, identical surge arrester sections (3), mutually electrically connected at their upper and lower ends, in which each arrester section (3) comprises an insulating casing containing a voltage-dependent resistor (4) series-connected with a spark gap assembly (5), and a triggering circuit (7, 8, 16) in parallel with the arrester stacks (1, 2), said triggering circuit comprising a plurality of series-connected control spark gaps (7), corresponding to the number of arrester sections (3) in each arrester stack (1, 2), and a triggering resistor (8) connected in series with the control sparks gaps, and cross-sections containing triggering impedances (16) from a connection point (10, 11) between two control spark gaps (7) only to a corresponding connection point (12, 13 and 14, 15, respectively) between two arrester sections (3) of each of the parallel arrester stacks (1, 2), said triggering circuit having a higher resistance and a lower ignition voltage than said arrester stacks.

4,072,999

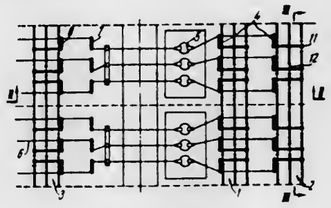
OUTDOOR HIGH-VOLTAGE SWITCHGEAR ASSEMBLY

Mikhail Yakovlevich Volman, Lunny pereulok, 2, kv. 14; Vladimir Yakovlevich Grinshtein, ulitsa Sverdlova, 132, kv. 31, both of Odessa; Mikhail Leonidovich Zhukov, kvartal 3, dom 28, kv. 5, Kuibyshev; Ivan Anatolievich Kuchuk, ulitsa Engelsa, 36, kv. 1, Odessa, and Evgeny Petrovich Polovinkin, kvartal 1, dom 8, kv. 10, Kuibyshev, all of U.S.S.R.

Filed July 16, 1976, Ser. No. 705,895

Int. Cl.[2] H02B *1/20*

U.S. Cl. 361—333 **7 Claims**



1. An outdoor high-voltage switchgear assembly comprising:

rigid sectionalized busbars;

busbar compensators made of flexible current-conducting members connected to said rigid sectionalized busbars;

bases of an open configuration mounting in said rigid sectionalized busbars;

insulating supports carrying said bases;

electrical apparatuses connected through branches to said rigid sectionalized busbars;

said bases, each of them having legs forming said open con-

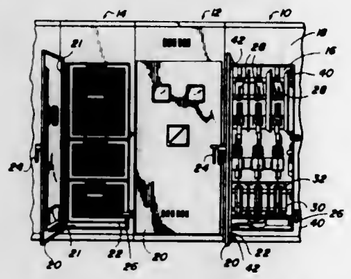
figuration which is substantially U-shaped, said legs being positioned in the planes parallel to the longitudinal axes of the rigid sectionalied busbars, each base being secured on said insulating supports so that the ends of the base legs are higher than the horizontal plane going through the point common for said legs, each said busbar compensator being fastened by its ends to the adjacent sections of the rigid sectionalized busbars, which are secured on the ends of said legs of the base and positioned between the longitudinal axes of these legs.

4,073,000

ELECTRICAL INTERLOCK APPARATUS FOR ELECTRICAL EQUIPMENT

Richard E. Krejsa, Des Plaines, Ill., assignor to S & C Electric Company, Chicago, Ill.

Filed June 30, 1976, Ser. No. 701,065
Int. Cl.² H02B *1/04*
U.S. Cl. 361—344 **3 Claims**



1. In metal-enclosed high voltage switchgear including a hollow metal enclosure having an access opening in a side thereof, a hinged door overlying the access opening for preventing access to the interior of the enclosure when closed, a hinged screen door overlying the access opening between the access opening and the hinged door for preventing access to the interior of the enclosure when closed but allowing access to the interior of the enclosure when opened, and electrical components within the interior of the enclosure having a source of electrical energy connected thereto; an improvement comprising:

a switch housing mounted within the enclosure adjacent the access opening, said switch housing having a key opening formed through a front surface of said switch housing facing the access opening;

an electrical switch means mounted within said housing connected between the source of electrical energy and the electrical components for electrically connecting the components when closed and electrically disconnecting the components when opened;

an operating means positioned adjacent said key opening for closing said switch means when engaged and opening said switch means when disengaged;

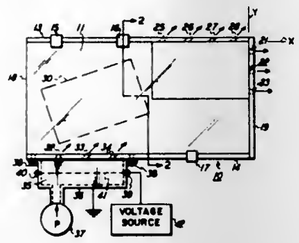
a key projection mounted on the screen door positioned to project through said key opening and thereby align the screen door so that said key projection will engage said operating means when the screen door is closed over the access opening and disengage said operating means so that the source of electrical energy to the components is disconnected when the screen door is opened.

4,073,001

APPARATUS FOR NEUTRALIZING AND REGISTERING AN ELECTROSTATICALLY CHARGED SHEET

Klaus K. Stange, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 31, 1975, Ser. No. 627,641
Int. Cl.² H05F *3/06*
U.S. Cl. 361—214 **8 Claims**



1. Apparatus for neutralizing and registering an electrostatically charged rectangular sheet with respect to perpendicularly related theoretical axes, the sheet having a length within predetermined ranges, comprising:

a. a sleeve for internally accommodating said sheet, at least one point on an inner narrow wall of the sleeve being coincident with one of the axes:

b. a stop located at one end of the sleeve, the stop having at least one point coincident with the other of the axes; and

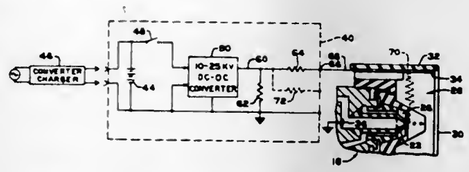
c. means for providing in the sleeve an ionized fluid stream having velocity components normal to each of the axes, whereby when a charged sheet is in the sleeve, the stream neutralizes and moves the sheet into abutment with each of said points said means including an ion source, means for directing a fluid past the ion source and into the sleeve, at least one port in the stop, and at least one port in the narrow wall, said ports providing an exit for fluid in the sleeve.

4,073,002

SELF-ADJUSTING POWER SUPPLY FOR INDUCTION CHARGING ELECTRODE

James E. Sickles, Glenshaw, and Richard M. Tepper, Allison Park, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 2, 1976, Ser. No. 737,889
Int. Cl.² B05B *5/02*
U.S. Cl. 361—227 **9 Claims**



1. In an electrostatic induction spray system including a spray nozzle, electrode means adjacent the nozzle and spaced therefrom to define an induction charging zone, and a power supply having a voltage source for supplying a DC voltage to said electrode to produce within said charging zone an electrostatic field which surrounds the discharge ports of said nozzle, the improvement comprising:

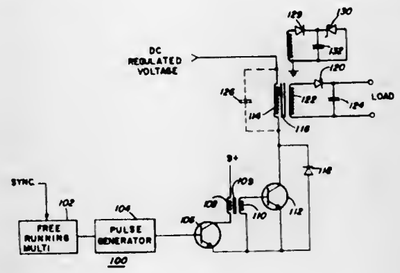
control impedance means connected between said voltage source and said electrode means, said control impedance means including a control resistance in effective series circuit relationship with the internal spacial impedance across said charging zone to regulate the voltage applied to said electrode means.

4,073,003

POWER SUPPLY

Derek Chambers, Framingham, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 478,484, June 12, 1974, abandoned, which is a continuation of Ser. No. 291,123, Sept. 21, 1972, abandoned, which is a division of Ser. No. 397,562, Sept. 14, 1973, Pat. No. 3,836,813, which is a continuation of Ser. No. 224,202, Feb. 7, 1972, abandoned. This application Dec. 22, 1975, Ser. No. 643,735
Int. Cl.² H02M *3/335*
U.S. Cl. 363—20 **17 Claims**



1. In combination:

a transformer, said transformer having a primary winding and first and second secondary windings;

a single transistor switching element;

means for a DC current to said switching element through said primary winding; and

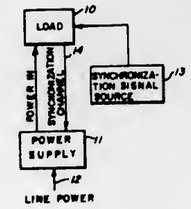
means for turning said switching element ON and OFF at a predetermined rate, said turning said switching element ON and OFF occurring only when the voltage across said switching element is substantially zero, a high voltage being produced across a load coupled to said first secondary winding when said switching element is OFF and a low voltage being produced across a load coupled to said second secondary winding when said switching element is ON, all input current for producing said high voltage and low voltage flowing through said single transistor switching element.

4,073,004

POWER SUPPLY WITH VOLTAGE PROTECTION CIRCUIT

Derek Chambers, Framingham, Mass., and A. Leonard Harley, Norwalk, Conn., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 436,307, Jan. 24, 1974, Pat. No. 3,967,181, which is a division of Ser. No. 34,932, May 6, 1970, Pat. No. 3,818,128. This application Apr. 12, 1976, Ser. No. 676,080
Int. Cl.² H02M *7/00*
U.S. Cl. 363—79 **3 Claims**



1. In combination:

a power supply including a synchronizing oscillator;

a voltage detector including first and second sensing circuits for sensing magnitudes of voltage above and below first and second reference magnitudes, said detector comprising an oscillatory circuit producing a cyclical signal in response to a sensed magnitude of said voltage; and

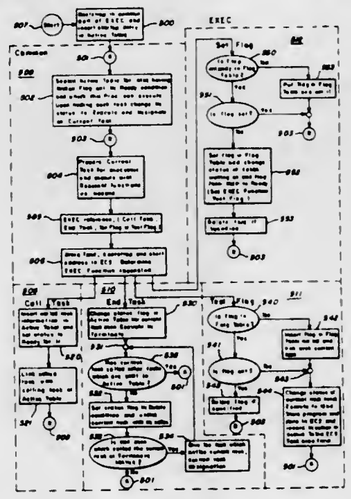
means driven by said cyclical signal for cyclically de-energizing said synchronizing oscillator, thereby turning off said power supply.

4,073,005

MULTI-PROCESSOR COMPUTER SYSTEM

Thomas Randall Parkin, Edina, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Jan. 21, 1974, Ser. No. 435,356
Int. Cl.² G06F *9/18, 9/16, 13/08*
U.S. Cl. 364—200 **9 Claims**



1. Apparatus for processing a plurality of discrete computing tasks, each expressed as a sequence of digital computer instructions, at least one task including a call instruction requesting the performance of a task specified by the call instruction, and at least one task including a task suspension instruction, comprising:

(A) an addressable main memory recording digit sequences contained in a record signal responsive thereto at the address specified by an address signal, and supplying in a data signal the digit sequence recorded at the address specified by the address signal responsive to a retrieve signal, and storing within predetermined areas a plurality of tasks and a task description table specifying the information necessary for activation and execution of each task;

(B) a storage access unit having a plurality of associated pairs of input and output channels, and supplying record, retrieve and address signals to the main memory responsive to record and retrieve-specifying function codes accompanied by data and an address signal on any one of the plurality of input channels; and supplying retrieved data sequences on the output channel associated with the input channel receiving the function code specifying the retrieve function; and

(C) a plurality of local processors whose elements can store and retrieve data in the main memory via a preselected input and output channel pair of the storage access unit, each processor comprising:

(1) an addressable local memory accessible to all other elements of the local processor and including a current task cell;

(2) task activation means receiving a call task signal identifying a task for forming responsive thereto an active table entry specifying the location of the identified task in main memory and containing a multi-state status flag

indicating a ready state, and for issuing signals to the storage access unit causing the active table entry to be stored in an unused area of an active table in the main memory, each said area identified by an associated index;

(3) task selection means for issuing signals to the storage access unit to cause at least one active table entry to be retrieved from the main memory responsive to an idle signal, for examining the status flag in each active table entry retrieved, and for, responsive to the ready state of the status flag in any retrieved active table entry, setting the current task cell to the index of the active table entry having such a status flag, and thereafter issuing signals to the storage access unit for

(a) changing the status flag in the active table entry in the main memory indexed by the contents of the current task cell to an execute state and, next,

(b) retrieving the task whose location is specified by the active table entry indexed by the contents of the current task cell and storing it in the local memory; and

(4) task execution means for

(a) executing each task indexed by the current task cell responsive to its storage in local memory,

(b) supplying the idle signal to the task selection means responsive to detection of a task suspension instruction, and

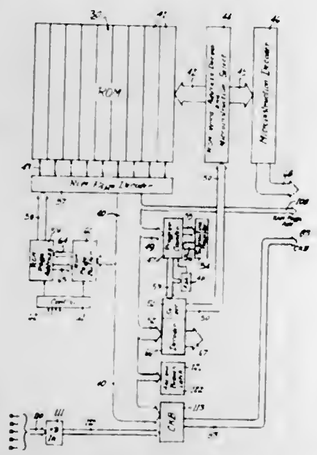
(c) supplying the call task signal to the task activation means responsive to detection of a call instruction.

4,073,006

DIGITAL PROCESSOR SYSTEM WITH SIMULTANEOUS BRANCH AND OP CODE FUNCTION

Graham S. Tubbs, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed July 19, 1976, Ser. No. 706,719
Int. Cl.² G06F *9/18, 9/20*
U.S. Cl. 364—200 **8 Claims**



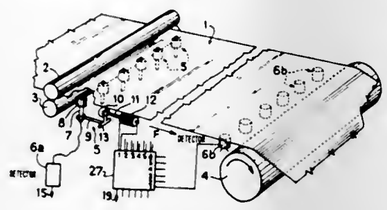
1. An electronic digital processor fabricated in a single LSI semiconductor device, including a large read-only-memory for storing instruction codes of word length of N bits, addressing circuitry for generating addresses having a given number of bits greater than N/2 for the read-only-memory by either sequencing a program counter when a branch instruction is not present or by branching to an address contained in a branch instruction code when present, the processor including an arithmetic unit having an input, a data memory having an output, and logic means responsive to an opcode for controlling transfer of data from the output of said data memory to the input of the arithmetic unit the improvement comprising means for generating an opcode at the same time that a branch instruction code is executed in the addressing circuitry, wherein parts of the branch instruction code used for the branch address also function as said opcode thereby causing data to be transferred from the output of the data memory to the input of the arithmetic unit by said logic means.

4,073,007

METHOD AND APPARATUS FOR MEASURING STRESS IN A BAND SUBJECTED TO TENSION AND APPLICATIONS THEREOF, IN PARTICULAR FOR THE MEASUREMENT OF THE STATE OF PLANARITY OF SUCH A BAND

Pierre André Boivin, Gueugnon, France, assignor to Forges de Gueugnon, Paris, France

Filed Apr. 29, 1976, Ser. No. 681,756
Claims priority, application France, May 2, 1975, 75 13817
Int. Cl.² G01L *5/10*
U.S. Cl. 364—508 **26 Claims**



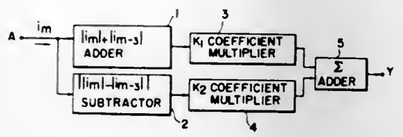
1. A method for measuring the tensile stress in a band subjected to tension, comprising producing a disturbance in the band transversely of the band, measuring the time that said disturbance takes to travel through a predetermined distance along the band, calculating the velocity of propagation c of said disturbance, and calculating the tensile stress σ in the band from the formula $\sigma = p.c.^2$ in which p is the volumic mass of the band.

4,073,008

APPARATUS FOR CALCULATING AMPLITUDE VALUES

Fumio Andow, Hachioji; Tetsuo Matsushima, Fuchu, and Minoru Iwasaki, Kokubunji, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha and Tokyo Denryoku Kabushiki Kaisha, both of, Japan

Filed Aug. 26, 1976, Ser. No. 717,942
Claims priority, application Japan, Aug. 29, 1975, 50-104054; Aug. 29, 1975, 50-104055
Int. Cl.² G06F *15/20;* H03K *5/20*
U.S. Cl. 364—602 **5 Claims**



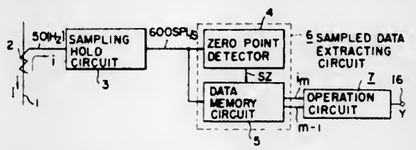
1. An apparatus for calculating the amplitude value of a sinusoidal wave comprising a terminal for receiving signals representing absolute values of two data samples which are sampled from said sinusoidal wave at two points spaced 90° electrical apart by a sampling frequency which is an integer multiple of the frequency of said sinusoidal wave, and operating means coupled to said terminal for receiving said signals representing absolute values of said two data samples and for producing therefrom an electrical signal which is proportional to the amplitude of said sinusoidal wave.

4,073,009

APPARATUS FOR CALCULATING AMPLITUDE VALUES OF SINUSOIDAL WAVES

Fumio Andow, Hachioji; Tetsuo Matsushima, Fuchu, and Minoru Iwasaki, Kokubunji, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha and Tokyo Denryoku Kabushiki Kaisha, both of, Japan

Filed Aug. 26, 1976, Ser. No. 717,939
Claims priority, application Japan, Aug. 29, 1975, 50-104056
Int. Cl.² G06F *15/20;* G01R *19/04*
U.S. Cl. 364—602 **14 Claims**



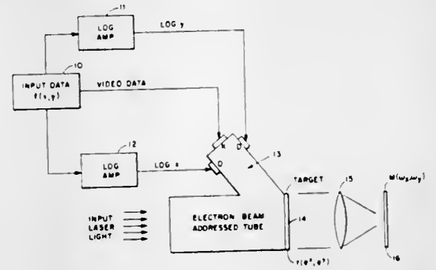
1. Apparatus for calculating an amplitude value of a sinusoidal wave, comprising means for sampling the amplitude of said sinusoidal wave, a data sample extracting circuit including a zero point detector connected to the output of said data sampling means for comparing the sign of a present data sample with that of a data sample immediately preceding said present data sample to produce a zero point detection signal when the compared signs are not equal, circuit means responsive to said zero point detection signal for providing two other data samples sampled by said sampling means at two points spaced from the peak value of said sinusoidal wave, and an operation circuit responsive to the absolute values of said two other data samples for calculating therefrom the amplitude value of said sinusoidal wave.

4,073,010

CORRELATION METHODS AND APPARATUS UTILIZING MELLIN TRANSFORMS

David Paul Casasent, Pittsburgh, Pa., and Demetri Psaltis, Thessaloniki, Greece, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 23, 1976, Ser. No. 707,977
Int. Cl.² G06G *7/19, 9/00*
U.S. Cl. 364—822 **8 Claims**



6. A scale and shift invariant optical correlator for processing input and reference data, comprising in combination

a film transparency having recorded therein as variations in its transmittance a pattern which contains the conjugate Mellin transform of said reference data;

means for illuminating said film transparency with a light distribution pattern that corresponds to the Mellin transform of said input data,

said illumination producing a product light distribution pattern which corresponds to that obtained by multiplying the conjugate Mellin transform of the reference data and the Mellin transform of said input data;

means for Fourier transforming said product light distribution pattern; and

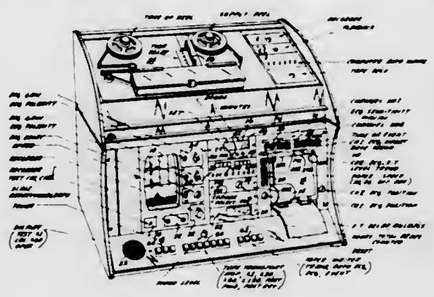
means for recording the results of said Fourier transformation.

4,073,011

ELECTROCARDIOGRAPHIC COMPUTER

Isaac Raymond Cherry, Mission Viejo, and Donald L. Anderson, Huntington Beach, both of Calif., assignors to Del Mar Avionics, Irvine, Calif.

Filed Aug. 25, 1976, Ser. No. 717,651
Int. Cl.² A61B *5/04;* G06F *15/42*
U.S. Cl. 364—900 **57 Claims**



1. A dynamic multispeed ECG computer for reproducing ECG information contained on a recording medium recorded at a particular speed, including:

first means for moving the recording medium past at least one fixed predetermined real time readout position and at least one fixed predetermined high speed readout position,

second means coupled to the first means for controlling the first means to move the recording medium at a selected one of a plurality of speeds including the particular speed and including more than one speed appreciably greater than the particular speed, to provide real time and high speed playbacks respectively of the recorded information,

third means located at the fixed predetermined high speed readout position for reproducing the recorded information when the first means moves the recording medium to provide high speed playback,

fourth means located at the fixed predetermined real time readout position for reproducing the recorded information when the first means moves the recording medium to provide real time playback,

fifth means coupled to the third means and responsive to the reproduced signals at high speed playback for producing output signals in accordance with the trend of particular characteristics of the ECG complexes at high speed playback,

sixth means coupled to the third means and responsive to the reproduced signals for producing control signals indicative of the occurrence of the predetermined events within the characteristics of the ECG complexes, and

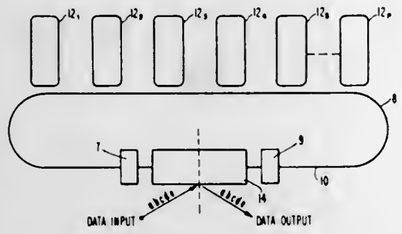
seventh means coupled to the sixth means and the second means and responsive to the control signals provided by the sixth means for controlling the second means to move the recording medium at the real time playback speed upon the occurrence of the predetermined events within the characteristics of the ECG complexes.

4,073,012

FAULT-TOLERANT MEMORY ORGANIZATION

Suran Ohnigian, Upper Darby, Pa., and Jerold A. Seitchik, Dallas, Tex., assignors to Sperry Rand Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 565,894, April 7, 1975, abandoned. This application June 24, 1976, Ser. No. 699,554
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—1 5 Claims



1. The method of storing information in a memory device having at least one defective storage area comprising the steps of,

a. providing a serial input data bit stream for storing information in said memory device;

b. adding bits to said data stream to modify said stream in accordance with predetermined information which indicates the location of said defective storage areas;

c. storing said modified data stream in said memory device such that the input data bits are not stored in said defective areas;

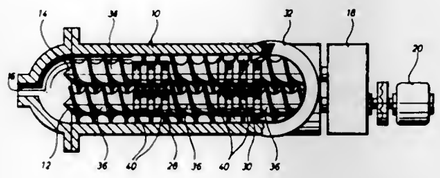
d. recovering said input serial data bit stream from said memory device by removing the added bits from the modified bit stream as read out from the memory device.

4,073,013

SCREW MACHINE FOR HOMOGENIZING MATERIALS OF SOLID, LIQUID AND PASTY CONSISTENCY

Josef A. Blach, Sucystrasse 24, D 7210 Bietigheim, Germany

Filed Nov. 9, 1976, Ser. No. 740,107
Claims priority, application Germany, Nov. 13, 1975, 2550969
Int. Cl.[2] B29B *1/10*
U.S. Cl. 366—83 15 Claims



1. Screw machine for homogenizing solid, liquid and viscous material, having at least two screw shafts engaging with one another and rotatable in an operational direction, each of which comprises a screw section, a core shaft section, and an annular disc on said core shaft section, the shape of the annular disc differing from a circular cylinder concentric to the shaft axis, said annular disc being rotatable relative to the core shaft section in at least the operational direction of rotation of the respective screw shaft to adjust the angular position of said annular disc relative to the respective core shaft,

and means for coupling said annular disc with the core shaft section rotating in said operational direction of rotation,

said annular discs of the screw shafts engaging with one another and overlapping one another in radial direction, and having peripheral zones of reduced width in the overlapping region.

DESIGNS

FEBRUARY 7, 1978

247,136

SHOE

Tetsuro Mizoguchi, Fort Lee, N.J., assignor to Sanyei Corporation, Tokyo, Japan

Filed Mar. 3, 1976, Ser. No. 663,533
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—309

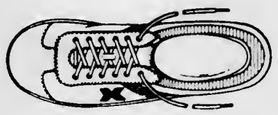


247,137

SPORT SHOE

Morris L. Krome, 9 Roland Mews, Baltimore, Md. 21210

Filed Apr. 23, 1976, Ser. No. 679,830
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310



247,138

SPORT SHOE

Morris L. Krome, 9 Roland Mews, Baltimore, Md. 21210

Filed Apr. 28, 1976, Ser. No. 680,974
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310



247,139

SHOE SOLE

Leonard Ralph Sorge, Fairfield, Conn., assignor to Eltra Corporation, Wilmington, Mass.

Filed Mar. 25, 1976, Ser. No. 670,536
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320

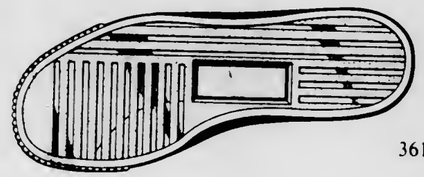


247,140

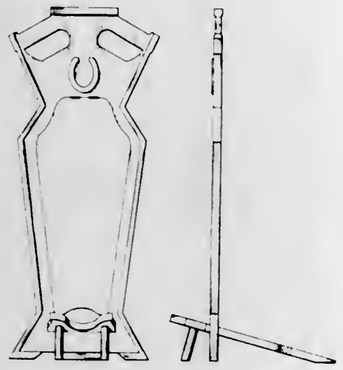
SHOE SOLE

Leonard Ralph Sorge, Fairfield, Conn., assignor to Eltra Corporation, Wilmington, Mass.

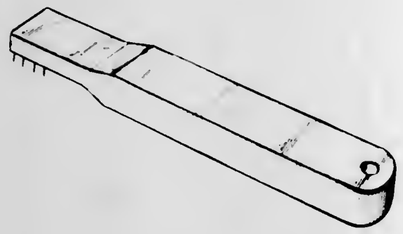
Filed Mar. 25, 1976, Ser. No. 670,537
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320



247,141
BOOT JACK
G. R. Jack Bailey, 1712 E. 10th, Odessa, Tex. 79761
Filed Dec. 12, 1975, Ser. No. 640,056
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D2—378.2



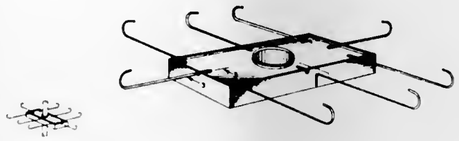
247,142
RIBBON SPLITTING TOOL
Eric Paul Parent, 217 E. Nottingham, Hoffman Estates, Ill. 60195
Filed Jan. 8, 1976, Ser. No. 639,835
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D3—19 R



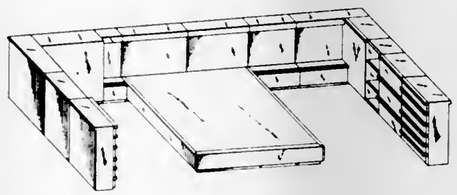
247,143
GUMMED LINT LIFTER
Henry Rivas, 1422 Cable Ave., Hacienda Heights, Calif. 91745
Filed Sept. 7, 1976, Ser. No. 720,714
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—23.1



247,144
RACK FOR DISPLAYING AND STORING PACKAGED MERCHANDISE
Walter Nathan, Glencoe, IL, assignor to RTC Industries, Inc., Chicago, Ill.
Filed Oct. 28, 1975, Ser. No. 626,295
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—85



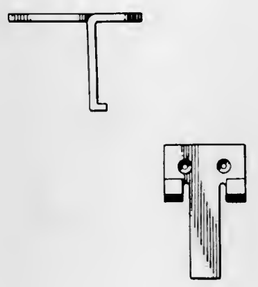
247,145
COMBINED BED, SHELF AND CABINET UNIT
Franz Hero, and Karl Odermatt, both of Hinwil im Tobel, Switzerland, assignors to Interlubke Gebr. Lubke K G, Rheda, Wiedenbruck, Germany
Filed Dec. 4, 1975, Ser. No. 637,860
Claims priority, application Germany, June 4, 1975, 762
The portion of the term of this patent subsequent to Oct. 11, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D06—*05*
U.S. Cl. D6—50



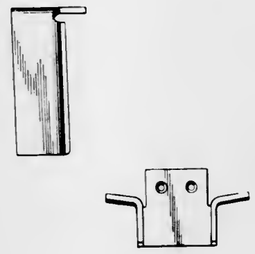
247,146
GARMENT HOOK
William Doyle Watt, Jr., 2820 Leelanau Drive, NE., Grand Rapids, Mich. 49505
Filed Feb. 17, 1976, Ser. No. 658,505
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—122



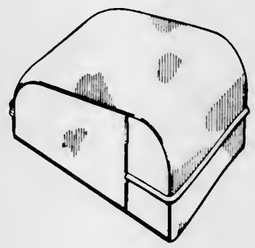
247,147
RACKET RACK
Dennis D. Dicks, 1918 N. Sedgwick St., Chicago, Ill. 60614, and T. William Fejer, 617 Madison St., Oak Park, Ill. 60302
Filed Aug. 19, 1976, Ser. No. 716,007
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—125



247,148
RACKET RACK
Dennis D. Dicks, 1918 N. Sedgwick St., Chicago, Ill. 60614, and T. William Fejer, 617 Madison St., Oak Park, Ill. 60302
Filed Aug. 19, 1976, Ser. No. 716,006
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—125



247,149
PHYSICAL THERAPY CUSHION
James N. Woog, 11572 65th Place North, Maple Grove, Minn. 55369
Filed Sept. 12, 1975, Ser. No. 612,706
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D6—201



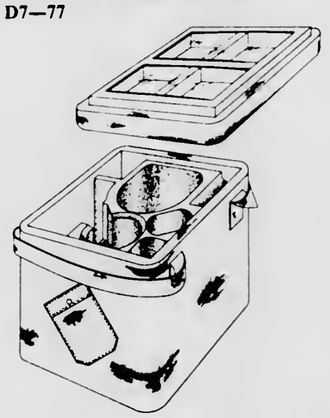
247,150
GARMENT HANGER BODY
Everett L. Duester, Holland, Mich., assignor to John Thomas Batts, Inc., Zeeland, Mich.
Filed Aug. 18, 1976, Ser. No. 715,371
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—257



247,151
CONDIMENT SHAKER
James W. McBride, Seattle, Wash., assignor to Fabrik, Inc., Seattle, Wash.
Filed Mar. 26, 1976, Ser. No. 670,731
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—54



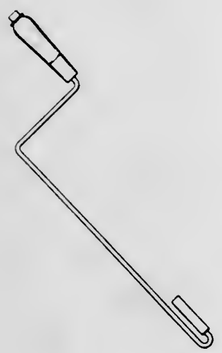
247,152
COMBINED CARRIER COOLER AND SEAT
Donald K. Rayfield, No. 9 Crestwood Drive, Oneonta, Ala. 35121
Filed Feb. 18, 1976, Ser. No. 659,121
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D7—77



247,153
COMBINED SPOON AND FORK
Robert P. Julius, Mount Vernon, N.Y., assignor to Nice-Pak Products, Inc., Mount Vernon, N.Y.
Filed Feb. 3, 1976, Ser. No. 654,745
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—148



247,154
CLOTH WRINGER
Gerald J. Curtis, 8806 Glen Loch, Houston, Tex. 77017
Filed Sept. 29, 1975, Ser. No. 617,412
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—161



247,155
HAND HELD CABLE CUTTER
William H. Hayes, P.O. Box 514, Phelham, Ala. 35124
Filed Apr. 23, 1976, Ser. No. 679,766
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—57



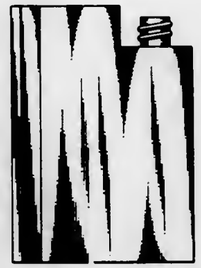
247,156
ONE PIECE WALL BRACKET WITH PERFORATED WALL PENETRATING PROJECTION
Richard M. Yensh, 1901 E. Missouri, Phoenix, Ariz. 85016
Filed Aug. 9, 1976, Ser. No. 712,526
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—371



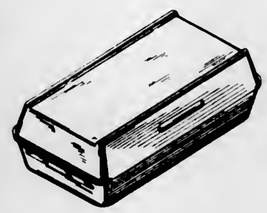
247,157
ONE PIECE WALL BRACKET
Richard M. Yensh, 1901 E. Missouri, Phoenix, Ariz. 85016
Filed Aug. 9, 1976, Ser. No. 712,528
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—371



247,158
BOTTLE
Bisked U. Evangelista, 1363 Skyhawk Circle, and Eugenio D. Caburian, 1362 Skyhawk Circle, both of Virginia Beach, Va. 23454
Filed Jan. 15, 1976, Ser. No. 649,572
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—59



247,159
PACKAGING CONTAINER FOR SHOES OR THE LIKE
Juan Carlos Schidlowski, P.O. Box 14, Sedalia, Colo. 80135, and Stephen F. Walker, 2722 S. Oakland Circle East, Denver, Colo. 80323
Filed Dec. 3, 1975, Ser. No. 637,285
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—183



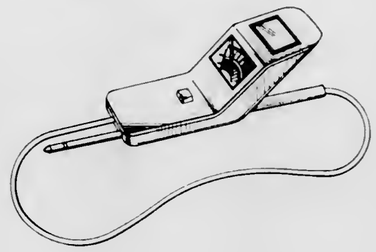
247,160
COMBINED CAN AND CLOSURE
Leonard Thomas LaCroce, Paramus, and Charles Stephan Radtke, Little Ferry, both of N.J., assignors to American Can Company, Greenwich, Conn.
Filed Sept. 29, 1975, Ser. No. 617,400
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—218



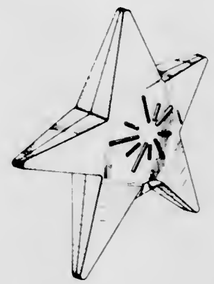
247,161
SOUND LEVEL METER
Mario F. Fernandez, and Bruce J. Rubin, both of Minneapolis, Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.
Filed Jan. 30, 1976, Ser. No. 653,653
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—46



247,162
MOISTURE AND LIGHT METER FOR PLANT LIFE
Salvatore Vanasco, Huntington, N.Y., assignor to LMC Data, Inc., Ronkonkoma, N.Y.
Filed Feb. 5, 1976, Ser. No. 655,405
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—56



247,163
FIRE ALARM
Donald A. White, 4701 E. Kessler View, Indianapolis, Ind. 46220
Filed Feb. 9, 1976, Ser. No. 656,617
Term of patent 14 years
Int. Cl. D10—*05*; D11—*05*
U.S. Cl. D10—106



247,164
COMBINED SMOKE DETECTOR AND BAFFLE ASSEMBLY
Benjamin W. Lowell, 45 Log Cabin Drive, Ladue, Mo. 63124
Filed Nov. 22, 1976, Ser. No. 743,844
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



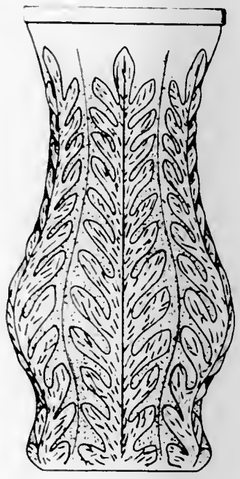
247,165
PLANTER AND SUPPORT THEREFOR
James W. Hart, Sealy, Tex., assignor to Verti-Garden, Inc., Sealy, Tex.
Filed Jan. 27, 1977, Ser. No. 762,859
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—144



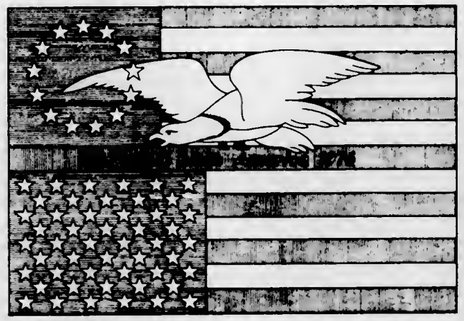
247,166
BUD VASE
Arthur L. Harshman, Dunkirk, Ind., and James I. Messmer, Detroit, Mich., assignors to Florists' Transworld Delivery Association
Filed May 17, 1976, Ser. No. 687,185
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—146



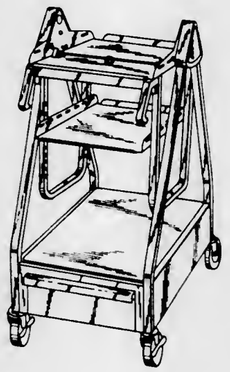
247,167
VASE
Arthur L. Harshman, Dunkirk, Ind., and James I. Messmer, Detroit, Mich., assignors to Florists' Transworld Delivery Association
Filed May 17, 1976, Ser. No. 687,183
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—151



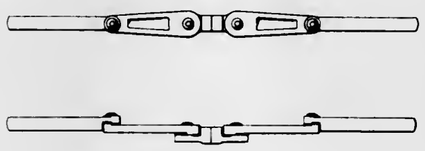
247,168
BICENTENNIAL FLAG
Elizabeth Mattocks, P.O. Box 223, Middlebury, Ind. 46540
Filed Jan. 13, 1976, Ser. No. 648,741
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—173



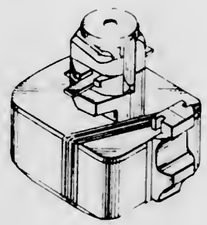
247,169
INSTRUMENT CART
Phillip Weston Sheeley, Aloha, and Howard Michael Meehan, Portland, both of Oreg., assignors to Tektronix, Inc.
Filed July 14, 1976, Ser. No. 705,238
Claims priority, application Japan, Jan. 29, 1976, 51-2482
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—29



247,170
ADJUSTABLE HANDLEBARS FOR BICYCLE
Larry P. Heber, 188 N. West, Vacaville, Calif. 95688
Filed July 15, 1976, Ser. No. 705,453
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—178

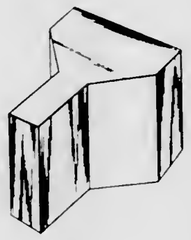


247,171
TRACK LIGHTING SYSTEM FIXTURE CONNECTOR
Hans Peter Berkenhoff, Ludenscheid, Germany, assignor to Lightcraft of California, Los Angeles, Calif.
Filed Mar. 22, 1976, Ser. No. 669,252
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24

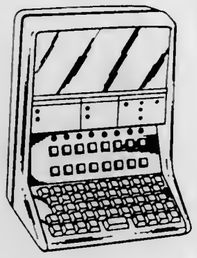


247,172
SPEAKER ENCLOSURE
Warren Ripple, 2839 Sterling Lane, Sarasota, Fla. 33581
Filed Jan. 29, 1976, Ser. No. 653,428
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—33

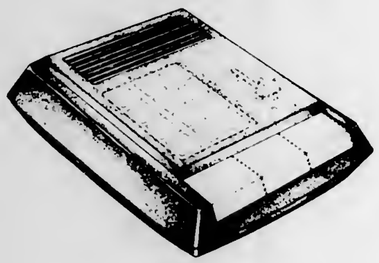




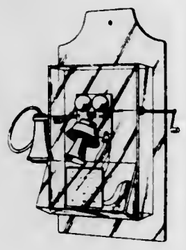
247,173
VEHICLE DATA TERMINAL
Harley D. Peter; Richard D. Miller; David D. Williams, and Fred M. Gore, all of Dallas, Tex., assignors to E-Systems, Inc., Dallas, Tex.
Filed Sept. 7, 1976, Ser. No. 720,729
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—43



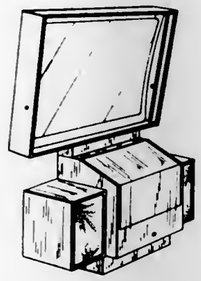
247,174
HOUSING FOR A LOUDSPEAKING TELEPHONE
George M. Janda, Westchester, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.
Filed Feb. 3, 1976, Ser. No. 654,836
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—57



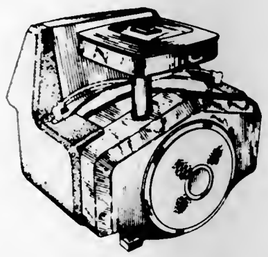
247,175
TRANSISTORIZED RADIO
Gloria Oliney, 6725 Sherbourne Drive, Los Angeles, Calif. 90056
Filed Oct. 6, 1975, Ser. No. 619,959
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—69



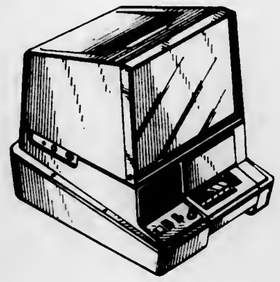
247,176
TELEVISION PROJECTION UNIT
LeRoy S. Girson, 9900 Georgia Ave., No. 612, Silver Spring, Md. 20902, and Jack Goldberg, 10919 Breewood Road, Silver Spring, Md. 20901
Filed Jan. 22, 1976, Ser. No. 651,581
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—79



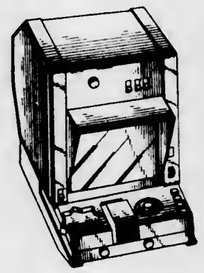
247,177
INTERNAL COMBUSTION ENGINE
Clifford Brooks Stevens, Milwaukee, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.
Filed Oct. 29, 1976, Ser. No. 736,853
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D15—1



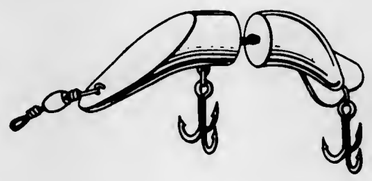
247,178
FILMSTRIP PROJECTOR
Norman R. Kubnick, Skokie, and Dennis J. Erber, Palatine, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.
Continuation-in-part of Ser. No. 539,877, Jan. 9, 1975, abandoned. This application Jan. 7, 1976, Ser. No. 647,294
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D16—14



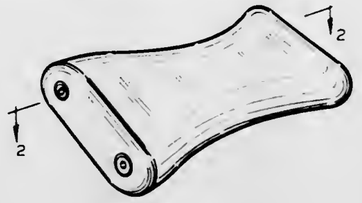
247,179
MICROFILM READER/PRINTER
Thomas J. Persha, Juneau, Wis., assignor to Bell & Howell Company, Chicago, Ill.
Filed May 4, 1976, Ser. No. 683,131
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—28



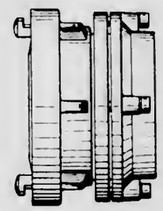
247,180
FISHING LURE
Richard A. Bohan, 136 Leland Way, Tiburon, Calif. 94965
Filed Nov. 22, 1976, Ser. No. 743,986
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27



247,181
ARROWHEAD EXTRACTOR
Anthony J. Hoggard, Merrill, Mich., assignor to Tomar Corporation, Indian River, Mich.
Filed Aug. 2, 1976, Ser. No. 710,632
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—99



247,182
COUPLING
Karl Ebert, 7928 Giengen, Brenz, Giengen, Germany
Filed Sept. 4, 1975, Ser. No. 610,149
Claims priority, application Germany, July 31, 1975, 9675
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—44



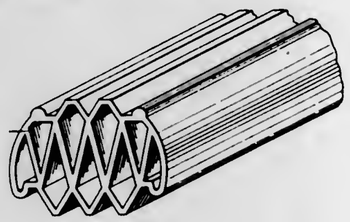
247,183
DISCOTHEQUE BUILDING
James A. Cosentino, Cheektowaga, N.Y., assignor to The Executive, A Motor Hotel of Buffalo, Inc., Buffalo, N.Y.
Filed Dec. 5, 1975, Ser. No. 637,942
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—11



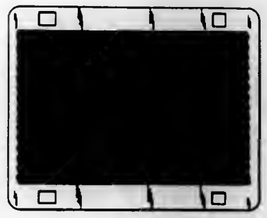
247,184
SHELF SUPPORT POST
Joseph J. Clement, Bradenton, Fla., assignor to The Mead Corporation, Dayton, Ohio
Filed Apr. 29, 1976, Ser. No. 681,549
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—75



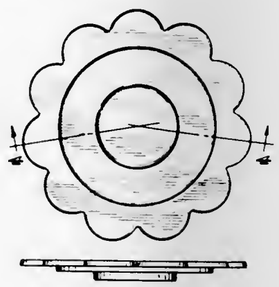
247,185
CONCOURSE SEAL
Guy S. Puccio, Snyder, N.Y., assignor to Acme Highway Products Corporation, Buffalo, N.Y.
Filed June 23, 1976, Ser. No. 698,821
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—75



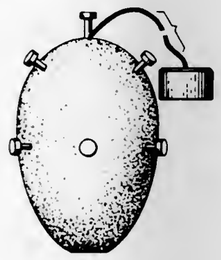
247,186
OUTER BLADE FOR ELECTRIC SHAVER
Satoshi Sakai, Hirakata; Norio Shimizu, Neyagawa, and Junji Nomura, Takatsuki, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan
Filed Dec. 31, 1974, Ser. No. 537,685
Claims priority, application Japan, July 4, 1974, 49-22785
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—49



247,187
BIRDBATH BASIN
George J. Hartinger, 3906 Thomas Ave. North, Minneapolis, Minn. 55412
Continuation-in-part of Ser. No. 744,684, Nov. 24, 1976. This application June 2, 1977, Ser. No. 802,953
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—18



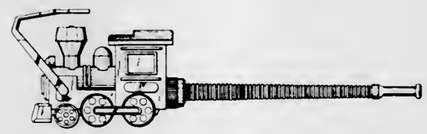
247,188
SPINNING TOY
Barbara J. Callaghan, 5925 Garces Ave., San Jose, Calif. 95123
Filed Oct. 9, 1975, Ser. No. 621,056
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 CT



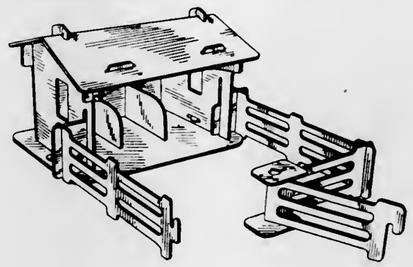
247,189
TENNIS RACKET
Michel Charpentier, Saint-Germain-en-Laye, France, assignor to Ciegeco S.A., Paris, France
Filed Apr. 26, 1976, Ser. No. 680,298
Claims priority, application France, Oct. 24, 1975, 75 74258
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 ST



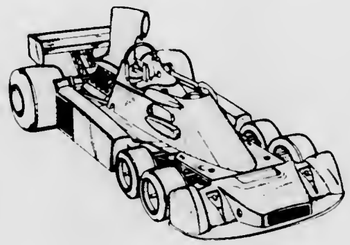
247,190
TOY LOCOMOTIVE
Iesato Watanabe, Misato, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Jan. 22, 1976, Ser. No. 651,237
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 H



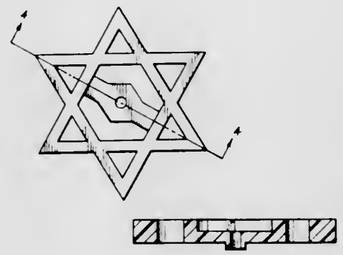
247,191
TOY STABLE AND CORRAL
William Donald Gordon, Sr., Glenview, Ill., assignor to Arvey Corporation
Filed Jan. 28, 1976, Ser. No. 652,904
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 LL



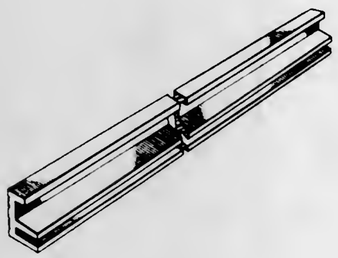
247,192
MODEL RACING CAR
Derek Gardner, West Horsley, England, assignor to Tyrrell Racing Organisation Limited, Woking, England
Filed Sept. 7, 1976, Ser. No. 720,769
Claims priority, application United Kingdom, Mar. 8, 1976, 974802/76
Term of patent 14 years
Int. Cl. D21—*01*; D12—*08*
U.S. Cl. D34—15 AJ



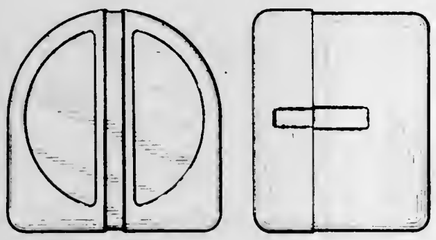
247,193
BUOYANT WICK HOLDER
Donald James Maxwell, London, England, assignor to Rizla Limited, Pontypridd, Wales
Filed May 13, 1976, Ser. No. 685,790
Claims priority, application United Kingdom, Nov. 17, 1975, 973268/75
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D48—2



247,194
CEILING LIGHT FIXTURE DIFFUSER END RAIL
Murray M. Win, 1223 S. Roxbury Drive, Los Angeles, Calif. 90035
Filed Nov. 4, 1976, Ser. No. 738,665
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 A



247,195
DRUM CASE
Daniel Stanley Mikosz, Arlington Heights, Ill., assignor to Ludwig Industries, Chicago, Ill.
Filed July 16, 1976, Ser. No. 705,903
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D56—1 B

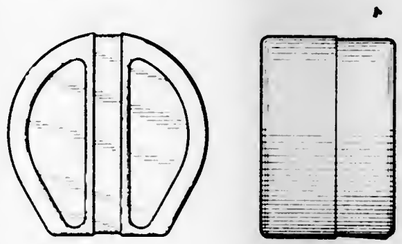


247,196
DRUM CASE
Daniel Stanley Mikosz, Arlington Heights, Ill., assignor to Ludwig Industries, Chicago, Ill.
Filed July 16, 1976, Ser. No. 705,907
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D56—1 B

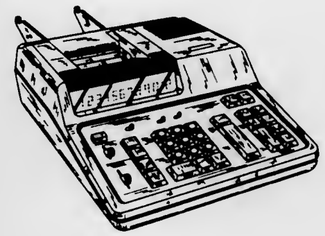




247,197
DRUM CASE
Daniel Stanley Mikosz, Arlington Heights, Ill., assignor to Ludwig Industries, Chicago, Ill.
Filed July 16, 1976, Ser. No. 705,908
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D56—1 B

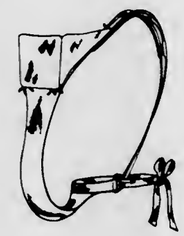


247,198
ELECTRONIC CALCULATING MACHINE
Yoshihisa Ohie, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed July 30, 1976, Ser. No. 710,335
Claims priority, application Japan, Feb. 5, 1976, 51-3618
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 B

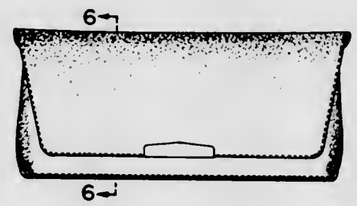


247,199
INFANT CARRIER
Kathleen T. Carter, 4307 Fifth St., Riverside, Calif. 92501
Filed Feb. 20, 1976, Ser. No. 659,692
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 A





247,200
SPECTACLE CASE
Robert Marks, 761 Montague Ave., San Leandro, Calif. 94577
Filed Jan. 5, 1977, Ser. No. 757,078
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—9



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TO WHOM

PATENTS WERE ISSUED ON THE 7TH DAY OF FEBRUARY, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. E. Staley Manufacturing Company: *See—*
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A/S GYRO: *See—*
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Heidergren, Lars, 4,072,986, Cl. 360-12.000.

AB Kabi: *See—*
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Abe, Masahiro, to Glory Kogyo Kabushiki Kaisha. Coin sorting device. 4,072,156, Cl. 133-3.00F.

ACF Industries, Incorporated: *See—*
Kemp, Willard E., 4,072,126, Cl. 116-125.000.

Adams, Ladd M., to Entek Corporation. Rotary valve with spring biased valve member. 4,072,291, Cl. 251-181.000.

Addmaster Corporation: *See—*
Clary, John G., 4,072,919, Cl. 335-257.000.

Adelstein, Gilbert W.; Dajani, Esam Z.; and Yen, Chung Hwai, to G. D. Searle & Co. 1-(3,3,3-Triarylalkyl)-4-phenyl-piperidinealkanols. 4,072,686, Cl. 260-293.690.

Advance Machine Corporation: *See—*
Lodge, Robert H., 4,072,187, Cl. 165-48.000.

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Steyns, Emile B.; and Miller, Jerry H., 4,072,252, Cl. 222-341.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
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Agency of Industrial Science and Technology of Japan: *See—*
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AGFA-Gevaert Aktiengesellschaft: *See—*
Koleff, Boris; and Hofmann, Wilfried, 4,072,860, Cl. 250-216.000.
Winkler, Alfred, 4,072,970, Cl. 354-187.000.

AGFA-GEVAERT, N.V.: *See—*
Pollet, Robert Joseph; Sels, Francis Jeanne; and Vandeputte, Camille Angelina, 4,072,523, Cl. 96-22.000.
Sels, Jeanne Francis Jeanne; Pollet, Robert Joseph; Vandeputte, Camille Angelina; and Willems, Jozef Frans, 4,072,526, Cl. 96-66.300.

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Aichi Steel Works, Limited: *See—*
Morita, Kazuo; Asano, Seiichi; and Masuma, Shigeharu, 4,071,958, Cl. 33-178.00B.

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Air-Tex Wire Harness, Inc.: *See—*
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Ajinomoto Co., Inc.: *See—*
Togo, Kazushi; Tamura, Fumihide; Yasuda, Naohiko; Ichikawa, Takehiko; Sano, Konosuke; Matsuda, Keizo; and Mitsugi, Koji, 4,072,687, Cl. 260-306.70T.

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Ferse, Armin; and Grimm, Harald, 4,072,591, Cl. 204-159.200.

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Inoue, Takehisa; Ogawa, Yutaka; Sugita, Hiroaki; and Watanabe, Namio, 4,072,217, Cl. 188-73.600.

Akerson, David Wallace, to Conwed Corporation. Non-combustible hardboard sheet. 4,072,558, Cl. 162-145.000.

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Perdahl, Orn Gunnar; and Santen, Sven Oscar, 4,072,504, Cl. 75-40.000.

Aktiebolaget Tudor: *See—*
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A.G. fur industrielle Elektronik: *See—*
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Akzona Incorporated: *See—*
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Aldred, Edward John, to Ransomes Sims & Jefferies Limited. Mowing machines. 4,072,001, Cl. 56-7.000.

Aldridge, Clifton; Gibson, Sandra F.; and Rodgers, Gregory D., to McDonnell Douglas Corporation. *Pseudomonas aeruginosa* broth. 4,072,573, Cl. 195-100.000.

Alexandrov, Adolf Moritsovich: *See—*
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Alig, Craig S., to United States of America, Navy. Ozone reactor for liquids. 4,072,613, Cl. 210-198.00R.

Alivoivodich, Miro Khristoforovich: *See—*
Brusako, Jury Ivanovich; Rzhavin, Sergei Alexandrovich; Kiselev, Vasily Pavlovich; Tarasov, Mikhail Sergeevich; Rapoport, Vladimir Mendeleevich; Timofeev, Vladimir Vasilievich; Ragulina, Raisa Ivanovna; Alivoivodich, Miro Khristoforovich; Kucherenko, Anatoly Gavrilovich; Varjushenkov, Anatoly Mikhailovich; Isaeva, Elena Pavlovna; Berezhnoi, Ivan Arkhipovich; Rumyantsev, Vasily Petrovich; Shpak, Grigory Safronovich; Guz, Dmitry Semenovich; Ilinkov, Dmitry Vladimirovich; Volpin, Pavel Ilich; Avdeev, Mikhail Pavlovich; Artemenko, Stanislav Arsentievich; and Khrennikova, Ljudmila Pavlovna, 4,072,512, Cl. 75-148.000.

Allen, Robert M., to National Semiconductor Corporation. Stripe on strip plating method. 4,072,581, Cl. 204-15.000.

Allied Chemical Corporation: *See—*
Berenbaum, Morris B.; Evans, Francis E.; Eibeck, Richard E.; and Robinson, Martin A., 4,072,027, Cl. 62-112.000.
Cipris, Divna; and Pouli, Dirk, 4,072,584, Cl. 204-73.00R.
Cooksey, James Judson; and Turner, Garland Linwood, 4,072,457, Cl. 425-192.00S.
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Hansen, Kenneth N., 4,072,357, Cl. 301-1.000.
Vaughan, Warren R., 4,072,238, Cl. 214-15.00E.

Alongi, Anthony V., to Calspan Corporation. Apparatus for the detection of buried objects. 4,072,942, Cl. 343-5.0NA.

Alsberg, Dietrich Anselm, to Bell Telephone Laboratories, Incorporated. Fault inspection system. 4,072,427, Cl. 356-241.000.

Alt, Robert M.: *See—*
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Aluminum Pechiney: *See—*
Morel, Paul; and Dugois, Jean-Pierre, 4,072,597, Cl. 204-243.00M.

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Amano, Yoshinari: *See—*
Motoyoshi, Kenya; Kume, Masahiro; and Amano, Yoshinari, 4,072,515, Cl. 75-173.00A.

Amato, Carmelo J.: *See—*
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Amberg, Ralph G.: *See—*
Amberg, Stephen; and Amberg, Ralph G., 4,072,549, Cl. 156-86.000.

Amberg, Stephen; and Amberg, Ralph G., to Owens-Illinois, Inc. Method and apparatus for fabricating thermoplastic containers. 4,072,549, Cl. 156-86.000.

American Air Filter Company, Inc.: *See—*
Mutchler, Paul A., 4,072,329, Cl. 285-187.000.

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Asato, Goro; and Bentley, Terence James, 4,072,711, Cl. 260-554.000.
Grosso, Vincent Gerard, 4,072,707, Cl. 260-521.00C.
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Hoffman, John Ronald; and Marsland, Peter John, 4,072,041, Cl. 72-416.000.
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Hett, John H., 4,072,147, Cl. 128-006.000.
American Home Products Corporation: *See—*
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Amesbury, Maurice G. Camera periscope with louvers for controlling light scattering. 4,072,406, Cl. 350-173.000.
Amess, Colin Lawrence, to Xerox Corporation. Electrostatographic reproduction methods and machines. 4,072,413, Cl. 355-3.0CH.
AMF Incorporated: *See—*
Barton, Robert D., 4,072,894, Cl. 324-221.000.
Sacchetti, Peter John, 4,072,921, Cl. 338-61.000.
Ammann, Ernst. Expansion joint for roofs and the like. 4,071,994, Cl. 52-573.000.
Amoss, Max S.; Monahan, Michael W.; and Vale, Wylie W., Jr., to Salk Institute for Biological Studies, The. LH-RH Analogs. 4,072,668, Cl. 260-112.5LH.
AMP Incorporated: *See—*
Shannon, Suel Grant, 4,072,376, Cl. 339-17.00C.
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Anderson, Arnold L., to Velsicol Chemical Corporation. Plastic compositions. 4,072,652, Cl. 260-45.75B.
Anderson, Donald L.: *See—*
Cherry, Isaac Raymond; and Anderson, Donald L., 4,073,011, Cl. 364-900.000.
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Johnson, Ben C.; Thornton, J. Scott; Glowe, Donald E.; Cassidy, Patrick E.; and Anderson, Robert E., 4,072,848, Cl. 219-528.000.
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Andow, Fumio; Matsushima, Tetsuo; and Iwasaki, Minoru, to Tokyo Shibaura Denki Kabushiki Kaisha; and Tokyo Denryoku Kabushiki Kaisha. Apparatus for calculating amplitude values. 4,073,008, Cl. 364-602.000.
Andow, Fumio; Matsushima, Tetsuo; and Iwasaki, Minoru, to Tokyo Shibaura Denki Kabushiki Kaisha; and Tokyo Denryoku Kabushiki Kaisha. Apparatus for calculating amplitude values of sinusoidal waves. 4,073,009, Cl. 364-602.000.
Andress, Harry J., Jr., to Mobil Oil Corporation. Metal working lubricant. 4,072,618, Cl. 252-46.600.
Andress, John Barney. Method and means for removing dental plaque by ultrasonic vibrations. 4,071,956, Cl. 32-58.000.
Antar Petroles de l'Atlantique: *See—*
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Ashida, Kaneyoshi; Ohtani, Masaaki; and Ohkubo, Shoichi, to Mitsubishi Chemical Industries Limited. Process for preparing smoke-retardant polyisocyanurate foam. 4,072,636, Cl. 260-2.5AW.
Astafiev, Anatoly Alexandrovich: *See—*
Zorev, Nikolai Nikolaevich; Astafiev, Anatoly Alexandrovich; Loboda, Alexandr Sergeevich; Savukov, Vladimir Pavlovich; Runov, Andrei Efimovich; Belov, Vladimir Alexandrovich; Sobolev, Jury Vasilievich; Sobolev, Valentin Vasilievich; Pavlov, Nikolai Mikhailovich; Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Balandin, Jury Fedorovich; Gorynin, Igor Vasilievich; Zvezdin, Jury Ivanovich; Ivanov, Kuzma Makeevich; Ignatov, Viktor Alexandrovich; and Emelyanenko, July Georgievich, 4,072,509, Cl. 75-124.000.
Atlantic Richfield Company: *See—*
Borchert, Alfred E.; and Kremer, Charles J., 4,072,634, Cl. 260-2.50A.
Atomic Energy of Canada Limited: *See—*
Pauluis, Gerard J. C. A., 4,072,469, Cl. 23-260.000.
Auer, Josef. Safety device for use in a vehicle having a seat. 4,072,348, Cl. 297-386.000.
Automated Medical Systems, Inc.: *See—*
Thelander, Paul F., 4,072,605, Cl. 210-50.000.
Automotive Products Limited: *See—*
Hales, Eric Charles, 4,072,361, Cl. 303-6.00C.
Avdeev, Mikhail Pavlovich: *See—*
Brusako, Jury Ivanovich; Rzhavin, Sergei Alexandrovich; Kiselev, Vasily Pavlovich; Tarasov, Mikhail Sergeevich; Rapoport, Vladimir Mendeleevich; Timofeev, Vladimir Vasilievich; Ragulina, Raisa Ivanovna; Alivoivodich, Miro Khristoforovich; Kucherenko, Anatoly Gavrilovich; Varjushenkov, Anatoly Mikhailovich; Isaeva, Elena Pavlovna; Berezhnoi, Ivan Arkhipovich; Rumyantsev, Vasily Petrovich; Shpak, Grigory Safronovich; Guz, Dmitry Semenovich; Ilinkov, Dmitry Vladimirovich; Volpin, Pavel Ilich; Avdeev, Mikhail Pavlovich; Artemenko, Stanislav Arsentievich; and Khrennikova, Ljudmila Pavlovna, 4,072,512, Cl. 75-148.000.
Aveneau, Andre Auguste, to Scholeman-Siemag Aktiengesellschaft. Pulse stuffing demand generating device. 4,072,826, Cl. 179-15.0AF.
Babcock & Wilcox Company, The: *See—*
Jabsen, Felix S., 4,072,564, Cl. 176-76.000.
McDonald, Bertrand N.; and Schluderberg, Donald C., 4,072,563, Cl. 176-65.000.
Sankovich, Melvin F., 4,072,562, Cl. 176-50.000.
Bachelder, Albert J.: *See—*
Land, Edwin H.; Bachelder, Albert J.; and Perry, Sarah H., 4,072,968, Cl. 354-86.000.
Bactomatic Corporation: *See—*
Cady, Paxton; Omura, Takeshi; Rudin, Melvin; and Fleming, James H., 4,072,578, Cl. 195-127.000.
Baer, Karl: *See—*
Voges, Dieter; Baer, Karl; Boudier, Juergen; Winderl, Siegfried; and Hoffmann, Herwig, 4,072,714, Cl. 260-584.00R.
Baer, Martin Alfred, to Illinois Tool Works Inc. Method of producing drill screws. 4,071,918, Cl. 10-10.00R.
Bagnasco, Dante Victor. Molded safety pin. 4,071,927, Cl. 24-156.000.
Baizer, Manuel M.: *See—*
Hallcher, Richard C.; Baizer, Manuel M.; and White, Donald A., 4,072,583, Cl. 204-59.00R.
Bala Electronics Corporation: *See—*
Grier, John D., Sr., 4,072,771, Cl. 427-96.000.
Balandin, Jury Fedorovich: *See—*
Zorev, Nikolai Nikolaevich; Astafiev, Anatoly Alexandrovich; Loboda, Alexandr Sergeevich; Savukov, Vladimir Pavlovich; Runov, Andrei Efimovich; Belov, Vladimir Alexandrovich; Sobolev, Jury Vasilievich; Sobolev, Valentin Vasilievich; Pavlov, Nikolai Mikhailovich; Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Balandin, Jury Fedorovich; Gorynin, Igor Vasilievich; Zvezdin, Jury Ivanovich; Ivanov, Kuzma Makeevich; Ignatov, Viktor Alexandrovich; and Emelyanenko, July Georgievich, 4,072,509, Cl. 75-124.000.
Balda-Werke Photographische Gerate und Kunststoff GmbH & Co. KG.: *See—*
Cheavin, Michael, 4,072,969, Cl. 354-166.000.
Meixner, Willi, 4,072,960, Cl. 354-60.00L.
Balducci, Agostino: *See—*
Beranger, Alessandro; Balducci, Agostino; and Gordini, Silvano, 4,072,739, Cl. 423-8.000.
Balfanz, Fred: *See—*
Pfeuffer, Alfred; Rudolf, Herbert; and Balfanz, Fred, 4,072,300, Cl. 266-50.000.
Balland, Jean, to Manufacture de Produits Chimiques Protex. Epoxypropyl ammonium salt and boric acid assisted dyeing process. 4,072,464, Cl. 8-84.000.
Bally Manufacturing Corporation: *See—*
Lucero, Andres R.; Gilbert, Roy E.; and Stevens, Jack H., 4,072,930, Cl. 340-152.00T.
Balston, John C., to Rucker Company, The. Mooring and release device. 4,072,122, Cl. 114-230.000.
Ban, Itsuki. Axial-air-gap type semiconductor electric motor. 4,072,881, Cl. 318-138.000.
Banon, Gabriel J. C., to Societe Industrielle d'Etudes et de Realisations Scientifiques S.I.E.R.S. Diaphragm valve. 4,072,292, Cl. 251-331.000.
Barbareschi, Aldo. Fluid pressure actuated operator cylinder with incorporated stress converter. 4,072,013, Cl. 60-563.000.
Barber, Walter G.: *See—*
Loxley, Ted A.; Barber, Walter G.; Combs, Walter W.; and Webb, John M., 4,072,489, Cl. 65-18.000.
Barker, Joseph K. Trailer construction. 4,072,337, Cl. 296-27.000.
Barlow, George J.; and Nibby, Chester M., Jr., to Honeywell Information Systems Inc. Apparatus and method for storing parity encoded data from a plurality of input/output sources. 4,072,853, Cl. 235-312.000.
Barnaby, Bernard Sydney; Coe, Cyril Walter; Hall, Godfrey Stephen; and Leworthy, John Harwood, to General Electric Company Limited, The. Printing devices. 4,072,224, Cl. 197-1.00R.
Barrall, Jeffery L.; and Reed, William R., to Armstrong Cork Company. Lightweight, non-cementitious building material. 4,072,533, Cl. 106-84.000.
Bartel, Wieland: *See—*
Kleeberg, Wolfgang; Rubner, Roland; and Bartel, Wieland, 4,072,524, Cl. 96-35.100.
Bartel, William J.; and Burton, Robert S., III, to Occidental Oil Shale, Inc. Multi-stage method of operating an in situ oil shale retort. 4,072,350, Cl. 299-2.000.
Bartels, Hermann; Schurmann, Werner; and Sigg, Max, to Mettler Instruments AG. Sample preparation device. 4,072,275, Cl. 241-79.000.
Barthel, Werner: *See—*
Herweg, Peter; and Barthel, Werner, 4,072,788, Cl. 428-139.000.
Barton, David W., to Ford Motor Company. Dual function heater core. 4,072,186, Cl. 165-43.000.
Barton, James Brockman: *See—*
Buss, Dennis Darcy; Emmons, Stephen P.; and Barton, James Brockman, 4,072,978, Cl. 357-24.000.
Barton, Robert D., to AMF Incorporated. Rotating pipeline inspection apparatus. 4,072,894, Cl. 324-221.000.
BASF Aktiengesellschaft: *See—*
Daeuble, Manfred, 4,072,465, Cl. 8-169.000.
Halbritter, Guenter; Muehlthaler, Wolfgang; Sperber, Heinrich; Diem, Hans; Dudeck, Christian; and Lehmann, Gunter, 4,072,717, Cl. 260-603.00C.
Voges, Dieter; Baer, Karl; Boudier, Juergen; Winderl, Siegfried; and Hoffmann, Herwig, 4,072,714, Cl. 260-584.00R.
BASF Wyandotte Corporation: *See—*
Langdon, William K., 4,072,704, Cl. 260-463.000.
Vogt, Herwart Curt; Parekh, Manher; Cenker, Moses; and Patton, John Thomas, Jr., 4,072,631, Cl. 252-431.00R.
Bastian, Jean-Michel: *See—*
Ebnother, Anton; Bastian, Jean-Michel; Gadient, Fulvio; and Stoll, Andre, 4,072,756, Cl. 424-267.000.
Bate & Ramey, Inc.: *See—*
Seyle, Robert Alan, 4,072,040, Cl. 72-406.000.
Bate, Robert T.; and Caywood, John Millard, to Texas Instruments Incorporated. Read only memory utilizing charge coupled device structures. 4,072,977, Cl. 357-24.000.
Bates, P. A.; Folsom, L. R.; and Haberstroh, A. J., to General Electric Company. Recoil converter. 4,072,082, Cl. 89-162.000.
Batson, Paul E., to Crown American Irrigation, Inc. Irrigation system. 4,072,205, Cl. 180-66.00R.
Bauer, Benjamin B., to CBS Inc. Microphone system for producing signals for quadraphonic reproduction. 4,072,821, Cl. 179-1.0GQ.
Baumgartl, Ulrich: *See—*
Kuenzle, Paul; and Baumgartl, Ulrich, 4,072,832, Cl. 200-48.00R.
Baxter Travenol Laboratories, Inc.: *See—*
Frederick, Warren Phillip, 4,072,128, Cl. 118-3.000.
Bayer Aktiengesellschaft: *See—*
Herweg, Peter; and Barthel, Werner, 4,072,788, Cl. 428-139.000.
Hinsche, Friedrich; and Schaupp, Kurt, 4,072,786, Cl. 428-537.000.
Kubens, Rolf, 4,072,649, Cl. 260-37.00N.
Meisert, Ernst; and Fischer, Peter, 4,072,712, Cl. 260-566.00R.
Rohe, Lothar; Schramm, Jurgen; Klauke, Erich; Eue, Ludwig; and Schmidt, Robert Rudolf, 4,072,500, Cl. 71-98.000.

Walther, Herbert; Hartig, Wolfgang; Friedrich, Adolf; and Raue, Roderich, 4,072,911, Cl. 331-94.50L.
BBC Brown, Boveri & Company Limited: *See—*
Bischofberger, Walter; and Mauthe, Gerhard, 4,072,836, Cl. 200-144.0AP.
Niemeyer, Lutz; and Ragaller, Klaus, 4,072,838, Cl. 200-148.00R.
Rudolph, Rene, 4,072,996, Cl. 361-134.000.
Beam, Dale R. Control apparatus for a card game simulator. 4,072,310, Cl. 273-1.00E.
Beard, Colin C.; Edwards, John A.; and Fried, John H., to Syntex (U.S.A.) Inc. 5(6)-Benzene ring substituted benzimidazole-2-carbamate derivatives having anthelmintic activity. 4,072,696, Cl. 260-397.600.
Beatrice Foods Co.: *See—*
Williams, Wilmore, 4,072,570, Cl. 195-100.000.
Becdelievre, Charles; Kaiser, Victor; and Paradowski, Henri, to Compagnie Francaise d'Etudes et de Construction - Technip. Method of and arrangement for processing through low temperature heat exchanges and in particular for treating natural gases and cracked gases. 4,072,485, Cl. 62-23.000.
Bechtle, Bastian; Schuenemann, Claus; Skudelny, Gisbert; Spruth, Wilhelm; Weis, Helmut; and Zimmermann, Volker, to International Business Machines Corporation. Method of controlling a stepper motor. 4,072,888, Cl. 318-685.000.
Beck, Erich. Spiral-line press for thermoplastic synthetics. 4,072,455, Cl. 425-133.100.
Becker, Herbert: *See—*
Rampel, Hans; Hess, Peter; and Becker, Herbert, 4,071,978, Cl. 49-348.000.
Becker, Otto Alfred. Construction unit. 4,071,992, Cl. 52-223.00R.
Becker, Werner; and Schrotz, Kurt. Label printing and dispensing apparatus. 4,072,105, Cl. 101-288.000.
Beecham Group Limited: *See—*
Box, Stephen John, 4,072,569, Cl. 195-80.00R.
Callander, Sidney Edward, 4,072,677, Cl. 260-239.100.
Beisel, Hermann: *See—*
Junghans, Rudi; and Beisel, Hermann, 4,072,106, Cl. 101-425.000.
Beiter, Glenn A., to Honeywell Inc. Bi-directional motor drive servo. 4,072,883, Cl. 318-257.000.
Bell & Howell Company: *See—*
Watson, Charles J., 4,072,419, Cl. 355-83.000.
Bell Telephone Laboratories, Incorporated: *See—*
Alsberg, Dietrich Anselm, 4,072,427, Cl. 356-241.000.
Chu, William Wing-Yen, 4,072,937, Cl. 340-324.00M.
DeWinter, John Christian; Nahory, Robert Edward; and Pollack, Martin Alan, 4,072,544, Cl. 148-171.000.
Fraser, David Bruce; and Kammlott, Guenther Wilhelm, 4,072,768, Cl. 427-34.000.
Gitlin, Richard Dennis; and Thompson, John Stewart, 4,072,830, Cl. 179-170.200.
Bellehache, Pierre; and Le Troadec, Yves, to Pont-A-Mousson S.A. Valve structure for a spraying container. 4,072,162, Cl. 137-71.000.
Belov, Vladimir Alexandrovich: *See—*
Zorev, Nikolai Nikolaevich; Astafiev, Anatoly Alexandrovich; Loboda, Alexandr Sergeevich; Savukov, Vladimir Pavlovich; Runov, Andrei Efimovich; Belov, Vladimir Alexandrovich; Sobolev, Jury Vasilievich; Sobolev, Valentin Vasilievich; Pavlov, Nikolai Mikhailovich; Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Balandin, Jury Fedorovich; Gorynin, Igor Vasilievich; Zvezdin, Jury Ivanovich; Ivanov, Kuzma Makeevich; Ignatov, Viktor Alexandrovich; and Emelyanenko, July Georgievich, 4,072,509, Cl. 75-124.000.
Benbow, Eugene C., to Westinghouse Electric Corporation. Meter encoding register having an improved pointer shaft assembly. 4,072,267, Cl. 235-112.000.
Bendix Corporation, The: *See—*
Ewald, Jerome T., 4,072,011, Cl. 60-555.000.
Gardner, Delbert J., 4,072,014, Cl. 60-575.000.
Pauwels, Edward M., 4,072,365, Cl. 303-115.000.
Waldron, Clifford R.; Yonkers, Karl W.; Goebeler, Robert; Frear, David L.; and Bright, Edward J., 4,072,394, Cl. 339-276.00T.
Benjamin, Jack W.: *See—*
Hirshaut, Yashar, 4,072,577, Cl. 195-104.000.
Benthake, Heinrich, to WGW Westdeutsche Getriebe- und Kupplungswerke GmbH. Planetary gearing with closed housing. 4,072,067, Cl. 74-789.000.
Bentley Engineering Company Limited, The: *See—*
Harlow, David Arthur; and Wood, Gillies, 4,072,029, Cl. 66-154.00R.
Bentley, Terence James: *See—*
Asato, Goro; and Bentley, Terence James, 4,072,711, Cl. 260-554.000.
Benzon, William. Method of cleaning raw ore. 4,072,539, Cl. 134-25.00R.
Beranger, Alessandro; Balducci, Agostino; and Gordini, Silvano, to Snamprogetti, S.p.A. Process for the removal of uranium contained in homo- and co-polymers of mono- and diolefines. 4,072,739, Cl. 423-8.000.
Berenbaum, Morris B.; Evans, Francis E.; Eibeck, Richard E.; and Robinson, Martin A., to Allied Chemical Corporation. Stabilized heat activated heat exchange absorption pair. 4,072,027, Cl. 62-112.000.
Berezhnoi, Ivan Arkhipovich: *See—*
Brusako, Jury Ivanovich; Rzhavin, Sergei Alexandrovich; Kiselev, Vasily Pavlovich; Tarasov, Mikhail Sergeevich; Rapoport, Vladimir Mendeleevich; Timofeev, Vladimir Vasilievich; Ragulina, Raisa Ivanovna; Alivoivodich, Miro Khristoforovich; Ku-

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Berg, Philip R. Inhibiting spray dispersion: method and apparatus. 4,072,269, Cl. 239-1.000.

Berger, Henry D., to Kimberly Rose Company, Inc. Hand truck with retractable frame. 4,072,319, Cl. 280-47.37R.

Berglund, Kjell: *See—*
Nordlund, Karl Signar; and Berglund, Kjell, 4,072,086, Cl. 91-418.000.

Bergwerksverband GmbH: *See—*
Busbach, Willi, 4,072,239, Cl. 214-35.00R.

Bermudez Munoz, Francisco, to Diego Zamora S.A. Modular display device. 4,072,235, Cl. 211-71.000.

Bertin & Cie: *See—*
Sagner, Max; and Souquet, Jacques, 4,072,170, Cl. 137-599.000.

Bertucci, Shirley J. Index finger positioning device for tennis racket handles. 4,072,311, Cl. 273-75.000.

Bessho, Satoshi: *See—*
Muto, Kiyoshi; Hisada, Toshihiko; Ohmori, Nobutsugu; Bessho, Satoshi; Mori, Naoharu; and Ishikawa, Katsuhiko, 4,071,996, Cl. 52-741.000.

Betschart, Antoinette A., to United States of America, Agriculture. Preparation of protein isolates from safflower seeds. 4,072,669, Cl 260-123.500.

Beyerstedt, Ronald: *See—*
Coyle, John D., 4,072,511, Cl. 75-130.00R.

Beyleveld, Wilhelmus M.: *See—*
Oosterwijk, Hendrik H. J.; Magre, Eduard P.; and Beyleveld, Wilhelmus M., 4,072,811, Cl. 526-346.000.

Bezdek, Milan: *See—*
Hrabak, Frantisek; Bezdek, Milan; Hynkova, Vlasta; and Bouchal, Karel, 4,072,805, Cl. 526-43.000.

Bianchi, Giuseppe; de Nora, Vittorio; Gallone, Patrizio; and Nidola, Antonio, to Diamond Shamrock Technologies S.A. Valve metal electrode with valve metal oxide semi-conductive coating having a chlorine discharge catalyst in said coating. 4,072,585, Cl. 204-98.000.

Bianco, Joseph F.; Senio, Nicholas; Hawes, Russell B.; and Strang, Donald B., to Sanders Associates, Inc. Imminent collision detection apparatus. 4,072,944, Cl. 343-7.0PF.

Bieganski, Zdzislaw. Wire stripping tools. 4,072,069, Cl. 81-9.50A.

Big Elk Wood Corporation: *See—*
Smitherman, Stephen N.; and Dougherty, Lemuel A., 4,072,094, Cl. 100-3.000.

Bijlmer, Paul Frederik Adriaan, to Fokker-VFW B.V. Apparatus for measuring the electron escape potential of metal surfaces. 4,072,896, Cl. 324-61.00P.

Billings, William G., to Phillips Petroleum Company. Methods of converting ditertiary organic sulfides to ditertiary organic disulfides. 4,072,718, Cl. 260-608.000.

Birkestrand, Orville J. Machine for cutting pipe and tubing. 4,072,073, Cl. 82-92.000.

Birnkraut, Hans-Walter: *See—*
Feichtinger, Hans; Lutze, Siegfried; Birnkraut, Hans-Walter; and Kluy, Werner, 4,072,659, Cl. 260-57.00A.

Bischofberger, Walter; and Mauthe, Gerhard, to BBC Brown, Boveri & Company Limited. Electrical switch with means for switching an auxiliary resistance into the circuit controlled thereby. 4,072,836, Cl. 200-144.0AP.

Bishop, Richard T., to Revertex (South Africa) (Proprietary) Limited. Soil treatment method. 4,072,020, Cl. 61-36.00C.

Bjornson, Geir, to Phillips Petroleum Company. Method for separating tetraalkylammonium salts. 4,072,713, Cl. 260-567.60M.

Blach, Josef A. Screw machine for homogenizing materials of solid, liquid and pasty consistency. 4,073,013, Cl. 366-83.000.

Black, Christopher T.; and Lear, Anthony, to Texas Instruments Incorporated. Fast switching Darlington circuit. 4,072,981, Cl. 357-46.000.

Black, John W., to Pemco-Kalamazoo, Inc. Wheel construction. 4,072,373, Cl. 308-191.000.

Blackmon, Anthony D.: *See—*
Miller, Walter E., Jr.; Sitton, Robert L.; and Blackmon, Anthony D., 4,072,281, Cl. 244-3.160.

Blazek, George A.: *See—*
Smith, Garland Y.; Scott, Gerald R.; Blazek, George A.; and Kowalski, John L., 4,072,437, Cl. 407-118.000.

Block, Thomas S., to Clarke-Gravely Corporation. Sweeper. 4,071,920, Cl. 15-49.00C.

Blouin, Michel; and Mercier, Leo. Combined pacifying nipple and mouth thermometer device. 4,072,054, Cl. 73-343.00R.

Blount, David H. Process for the production of polyurethane resins and foams utilizing silico-formic acid. 4,072,637, Cl. 260-2.5AM.

Blum, Jean, to Chimie & Biologie. Thiol esters of homocysteine. 4,072,703, Cl. 260-455.00R.

BOC Limited: *See—*
Buckingham, Herbert Charles; and Elliott, Raymond, 4,072,845, Cl. 219-146.300.

Bock, Erik, to Superfos Emgallage A/S. Method of mounting a handle on a pail. 4,071,939, Cl. 29-434.000.

Boeing Company, The: *See—*
Weiland, Richard Herschel, 4,072,283, Cl. 244-135.00A.

Bogdan, Raymond G.: *See—*
Fletcher, C. Hugh; Bogdan, Raymond G.; Wright, Robert W.; and Cheuvront, Robert M., 4,072,103, Cl. 101-151.000.

Bogorad, Alissa Pam. Device for applying or removing support stockings. 4,072,255, Cl. 223-111.000.

Boguth, Walter; Leuenberger, Hans Georg Wilhelm; Mayer, Hans Johann; Widmer, Erich; and Zell, Reinhard, to Hoffmann-La Roche Inc. Optically active cyclohexane derivatives. 4,072,715, Cl. 260-586.00R.

Bohler, Hans; and Griesser, Rolf, to Sandoz Ltd. Azomethine copper complexes. 4,072,700, Cl. 260-438.100.

Boillot, Pierre Gerard, to Institut de Recherches de la Siderurgie Francaise Irsid; and Instruments S.A. Furnace for melting metal by the Joule effect. 4,072,814, Cl. 13-20.000.

Boisset, Bernard, to Societe Industrielle Bertrand Faure Brieres-les-Scelles. Seat sliding runner. 4,072,347, Cl. 297-385.000.

Boivin, Pierre Andre, to Forges de Gueugnon. Method and apparatus for measuring stress in a band subjected to tension and applications thereof, in particular for the measurement of the state of planarity of such a band. 4,073,007, Cl. 364-508.000.

Bolis, Gary W. Mechanic's stand. 4,072,209, Cl. 182-116.000.

Bollinger, Frederic G.; and D'Amico, John J., to Monsanto Company. Use of pyridyl phthalimides as plant growth regulants. 4,072,499, Cl. 71-94.000.

Bolton, Wilbur Monroe: *See—*
Conant, Louis A.; Bolton, Wilbur Monroe; and Wilson, James Ellsworth, 4,072,243, Cl. 215-12.00R.

Bonnety, Gerard: *See—*
Boulet, Jean-Claude; Walraevens, Rene; Bonnety, Gerard; Lolivier, Jacques; and Trouillet, Paul, 4,072,638, Cl. 260-2.5AP.

Boone, Jack L., to Snap-on Tools Corporation. Drawer slide assembly with tapered runner. 4,072,375, Cl. 312-338.000.

Boothman, David Richard; Rehder, Robert Henry; and Elgar, Everett Charles, to Canadian General Electric Company Limited. Overtemperature protective circuit for switching devices. 4,072,997, Cl. 361-103.000.

Borchert, Alfred E.; and Kremer, Charles J., to Atlantic Richfield Company. Production of polyurethane foams from modified polyester polyol prepolymers. 4,072,634, Cl. 260-2.50A.

Borg-Warner Corporation: *See—*
Sheth, Rajesh N., 4,072,452, Cl. 418-266.000.

Bosche, Eugene R., to Ex-Cell-O Corporation. Two station sonic sealing apparatus and method. 4,072,089, Cl. 93-44.1GT.

Bost, Howard W., to Phillips Petroleum Company. Flame-retarded polyolefin blend with good balance of properties. 4,072,643, Cl. 260-23.00H.

Bouchal, Karel: *See—*
Hrabak, Frantisek; Bezdek, Milan; Hynkova, Vlasta; and Bouchal, Karel, 4,072,805, Cl. 526-43.000.

Boudier, Juergen: *See—*
Voges, Dieter; Baer, Karl; Boudier, Juergen; Winderl, Siegfried; and Hoffmann, Herwig, 4,072,714, Cl. 260-584.00R.

Bouillon, Claude; and Rosenbaum, Georges, to L'Oreal. Aluminum derivatives of 2-pyridyl thiol N-oxide, process for preparing the same and antiperspirant-deodorant composition containing the same. 4,072,742, Cl. 424-47.000.

Boulet, Jean-Claude; Walraevens, Rene; Bonnety, Gerard; Lolivier, Jacques; and Trouillet, Paul, to Solvay & Cie. Halogenated polyether polyols and polyurethane foams produced therefrom. 4,072,638, Cl. 260-2.5AP.

Bourns, Inc.: *See—*
Munson, Ramon Jon; Hurd, Claude Calvert; and Weigl, James, 4,072,148, Cl. 128-142.200.

Bowes, Peter. Core and beam suspension system for a building construction and method of construction. 4,071,988, Cl. 52-127.000.

Bowles, Romald E. System for articulate drying and transport. 4,071,960, Cl. 34-57.00A.

Box, E. O., Jr.: *See—*
Farha, Floyd, Jr.; and Box, E. O., Jr., 4,072,608, Cl. 210-63.00R.

Box, Stephen John, to Beecham Group Limited. Preparation of clavulanic using *Streptomyces jumonjinensis*. 4,072,569, Cl. 195-80.00R.

Boyd-Dunlop, Percy. Disc cultivator with curved spacer structure. 4,072,197, Cl. 172-349.000.

Bradley, Charles Duane, Jr., to Pneumo Corporation. Poppet relief valve. 4,072,165, Cl. 137-493.000.

Braker, Frederick Williams; Heckman, Russell William; Nickey, George Allen; and Potter, Terry Clair, to Owens-Illinois, Inc. Apparatus controlling shrinkage of a sleeve wrap on a container. 4,072,553, Cl. 156-423.000.

Brand, Derek A.: *See—*
Terzian, Rouben T.; and Brand, Derek A., 4,072,429, Cl. 401-146.000.

Brandstatter, Hans G.: *See—*
Smellie, Allan M.; and Brandstatter, Hans G., 4,072,510, Cl. 75-130.500.

Bratt, Martin Daniel, to Du Pont de Nemours, E. I., and Company. Oxygen barrier layers for photopolymerizable elements. 4,072,528, Cl. 96-87.00R.

Brattesani, Alan Joseph, to Lee Pharmaceuticals. Dioxolane derivatives and use as photoinitiators. 4,072,694, Cl. 260-340.90R.

Braun, Egon, to Maschinenfabrik Niehoff KG. Wire drawing machines. 4,072,038, Cl. 72-289.000.

Braunlinger, Konrad: *See—*
Heiser, Joachim; Hoheisel, Rainer; Flaschar, Heinz; Gand, Heinz; Kleinschmidt, Heinz; Braunlinger, Konrad; Sopha, Klaus;

Schempp, Roland; and Sanzenbacher, Hermann, 4,072,169, Cl. 137-596.130.

Braunschweigische Maschinenbauanstalt: *See—*
Dietzel, Walter; and Matusch, Siegfried, 4,071,961, Cl. 34-108.000.
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Brazeway, Inc.: *See—*
Zolman, Junior O.; and Griewahn, Carl O., 4,071,934, Cl. 29-157.30A.

Brenner, Bernd: *See—*
Fahn, Rudolf; Brenner, Bernd; and Buckl, Hans, 4,072,538, Cl. 127-37.000.

Bright, Alfred William; Overton, Michael Anthony Mersham; and Parker, Ian Frederick, to National Research Development Corporation. Electrostatic powder deposition. 4,072,129, Cl. 118-629.000.

Bright, Donald Ray: *See—*
Bright, Jerd; and Bright, Donald Ray, 4,072,325, Cl. 280-772.000.

Bright, Edward J.: *See—*
Waldron, Clifford R.; Yonkers, Karl W.; Goebeler, Robert; Frear, David L.; and Bright, Edward J., 4,072,394, Cl. 339-276.00T.

Bright Engineering, Incorporated: *See—*
Bright, Jerd; and Bright, Donald Ray, 4,072,325, Cl. 280-772.000.

Bright, Jerd; and Bright, Donald Ray, to Bright Engineering, Incorporated. Pendulum stabilized ground vehicles. 4,072,325, Cl. 280-772.000.

Brother Kogyo Kabushiki Kaisha: *See—*
Sugiyama, Akira; Yamamoto, Yoshikazu; and Yamada, Shiro, 4,072,114, Cl. 112-121.120.

Brouwer, Frans, to Stewart-Warner Corporation. Tracing head and drive. 4,072,301, Cl. 266-60.000.

Brown, Donald J., to Knox Manufacturing Co. Control mechanism for positioning projection screen in closed position. 4,072,404, Cl. 350-117.000.

Brown, James D.: *See—*
Uraneck, Carl A.; and Brown, James D., 4,072,807, Cl. 526-48.100.

Brown, Michael A.; and Mol, Hans C., to Pitney-Bowes, Inc. Collator system. 4,072,304, Cl. 270-58.000.

Brown & Williamson Tobacco Corporation: *See—*
Hammersmith, James R., 4,072,789, Cl. 428-195.000.

Brueckner, Keith A.; and Lewis, John H., to Xonics, Inc. Axial tomography. 4,072,289, Cl. 250-445.00T.

Brusako, Jury Ivanovich; Rzhavin, Sergei Alexandrovich; Kiselev, Vasily Pavlovich; Tarasov, Mikhail Sergeevich; Rapoport, Vladimir Mendeleevich; Timofeev, Vladimir Vasilievich; Ragulina, Raisa Ivanovna; Alivoivodich, Miro Khristoforovich; Kucherenko, Anatoly Gavrilovich; Varjushenkov, Anatoly Mikhailovich; Isaeva, Elena Pavlovna; Berezhnoi, Ivan Arkhipovich; Rumyantsev, Vasily Petrovich; Shpak, Grigory Safronovich; Guz, Dmitry Semenovich; Ilinkov, Dmitry Vladimirovich; Volpin, Pavel Ilich; Avdeev, Mikhail Pavlovich; Artemenko, Stanislav Arsentievich; and Khrennikova, Ljudmila Pavlovna. Charge for manufacturing aluminium-silicon alloys. 4,072,512, Cl. 75-148.000.

Brysch, Gottfried, to Eppendorf Geratebau Netheler & Hinz GmbH. Slip-on pipette tip member and pipette device therefor. 4,072,330, Cl. 285-239.000.

Buchanan, James E., to Westinghouse Electric Corporation. Bucket brigade analog-to-digital converter. 4,072,938, Cl. 340-347.0AD.

Buckingham, Herbert Charles; and Elliott, Raymond, to BOC Limited. Welding electrode. 4,072,845, Cl. 219-146.300.

Buckl, Hans: *See—*
Fahn, Rudolf; Brenner, Bernd; and Buckl, Hans, 4,072,538, Cl. 127-37.000.

Budmiger, Hermann, to Revue Thommen AG. Light filter for welder's mask. 4,071,912, Cl. 2-8.000.

Buendia, Jean; Vivat, Michel; and Schalbar, Jeanine, to Roussel UCLAF. Novel cyclopentanoic acid derivatives. 4,072,755, Cl. 424-312.000.

Buhler, Ernst: *See—*
Ullmann, Werner; and Buhler, Ernst, 4,072,842, Cl. 219-69.00C.

Bulang, Siegfried: *See—*
Regehr, Ulrich; and Bulang, Siegfried, 4,072,478, Cl. 55-440.000.

Bullough, Vaughn L.; and Daley, Luther O., to Reynolds Metals Company. Carbon electrodes having stabilized binders derived from the entire organic fraction of bituminous coal. 4,072,599, Cl. 204-294.000.

Bunker Ramo Corporation: *See—*
Cameron, John Keith; and Krolak, Ronald Francis, 4,072,383, Cl. 339-59.00R.

Bunnomori, Yukinari: *See—*
Nakata, Tetsuya; Yamada, Nobuo; Hashimoto, Akira; Takata, Yasuto; and Bunnomori, Yukinari, 4,072,734, Cl. 260-873.000.

Buran, Vojtech; and Horn, Vladimir, to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi. Loom with means for shed forming. 4,072,175, Cl. 139-455.000.

Burant, Leonard Joseph; and Daley, James Thomas, to Globe-Union Inc. Deferred action battery having improved bottom port cover. 4,072,801, Cl. 429-110.000.

Burgdorf, Jochen; Eikenberg, Dieter; Stoka, Roberto; and Marianu, Vlod, to ITT Industries, Incorporated. Spot type disc brake for a pair of independent yoke biasing spring elements. 4,072,215, Cl. 188-72.400.

Burke, Courtney L., to Eisner, Albert M., a part interest. Fluid type inertia switch having resettable plunger and cone shaped retainer. 4,072,835, Cl. 200-61.470.

Burkhart, James G.; Burkhart, Montgomery P.; and Coley, James D., to Air-Tex Wire Harness, Inc. Tractor-trailer electrical connector system. 4,072,381, Cl. 339-29.00R.

Burkhart, Montgomery P.: *See—*
Burkhart, James G.; Burkhart, Montgomery P.; and Coley, James D., 4,072,381, Cl. 339-29.00R.

Burlington Industries, Inc.: *See—*
James, Forrest T.; and Guy, Stephen L., 4,072,775, Cl. 427-373.000.

Burns, Thagrus A. Clippings catcher for a hedge trimmer. 4,071,951, Cl. 30-132.000.

Burton, Robert S., III: *See—*
Bartel, William J.; and Burton, Robert S., III, 4,072,350, Cl. 299-2.000.

Busbach, Willi, to Bergwerksverband GmbH; and Didier Engineering GmbH. Arrangement for charging a furnace in a gastight and dust-tight manner. 4,072,239, Cl. 214-35.00R.

Buschmann, Gerhard; and Spohr, Reinhard, to Jagenberg-Werke AG. Apparatus for adjusting the mutual distances of several elements arranged side by side, particularly pairs of blades for the straight-line cutting of sheet material. 4,072,887, Cl. 318-675.000.

Buss, Dennis Darcy; Emmons, Stephen P.; and Barton, James Brockman, to Texas Instruments Incorporated. CCD input and node preset method. 4,072,978, Cl. 357-24.000.

Butler, Robert J. Electrical connector. 4,072,402, Cl. 339-136.00M.

Butterfield, Max E.; Alt, Robert M.; and March, James E., to Caterpillar Tractor Co. Door latch having three-way actuation means. 4,072,331, Cl. 292-173.000.

Byers, Jimmy F. Deep towing cable and handling system. 4,072,123, Cl. 114-254.000.

Bylo, John J. Marine transport. 4,072,120, Cl. 114-72.000.

Byrnes, Francis R. Tamperproof lock with shock absorber. 4,072,163, Cl. 137-296.000.

C.C. Egelhaaf, Firma: *See—*
Wagner, Theodor, 4,072,174, Cl. 139-54.000.

C.G. Conn, Ltd.: *See—*
Shallenberger, Larry R.; and Southard, James S., 4,072,078, Cl. 84-1.030.

C-R-O, Inc.: *See—*
Pfeuffer, Alfred; Rudolf, Herbert; and Balfanz, Fred, 4,072,300, Cl. 266-50.000.

Cachin, Roland: *See—*
Witmer, Kurt; and Cachin, Roland, 4,072,889, Cl. 323-9.000.

Cady, Paxton; Omura, Takeshi; Rudin, Melvin; and Fleming, James H., to Bactomatic Corporation. Multi-chambered module for use in monitoring growth of microorganisms. 4,072,578, Cl. 195-127.000.

Caflisch, Jerry A., to Pako Corporation. Roller drive assembly for photographic processors. 4,072,061, Cl. 74-67.000.

Calderon, Albert. Method and apparatus for basic oxygen steel making employing the off-gas principle of pre-heating purposes. 4,072,299, Cl. 266-44.000.

Caldwell, William Joseph: *See—*
Weiss, Stefan Adam; Torney, Harry Lester; and Caldwell, William Joseph, 4,072,565, Cl. 195-1.100.

Calgon Corporation: *See—*
Sinha, Rabindra Kumar; Wagner, Norman J.; and Joyce, Ronald S., 4,072,479, Cl. 55-73.000.
Wagner, Norman J., 4,072,480, Cl. 55-73.000.

Callander, Sidney Edward, to Beecham Group Limited. Penicillin synthesis. 4,072,677, Cl. 260-239.100.

Callerhorn, Bo Allan: *See—*
Kohli, Martti Ilmari; Eklund, Fjalar Ernst Erik; and Callerhorn, Bo Allan, 4,072,092, Cl. 99-389.000.

Calspan Corporation: *See—*
Alongi, Anthony V., 4,072,942, Cl. 343-5.0NA.

Cameron, John Keith; and Krolak, Ronald Francis, to Bunker Ramo Corporation. Electrical connector insert retention assembly. 4,072,383, Cl. 339-59.00R.

Camp, Roger D.: *See—*
Servin, Arturo; and Servin, Jose, 4,072,042, Cl. 72-457.000.

Camp, William J. Apparatus and method for calculating vehicle movement parameters. 4,072,849, Cl. 235-61.0NV.

Campbell, Monty A. Timing display ignition plate assembly. 4,072,891, Cl. 324-16.00T.

Campbell, Willis R.; and Waldrop, Thomas W., to Sperry Rand Corporation. Twine wrapping mechanism for a roll forming machine. 4,072,095, Cl. 100-5.000.

Canada-Cities Service, Ltd.: *See—*
Kizior, Thaddeus Eugene, 4,072,609, Cl. 210-73.00R.

Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources: *See—*
Kizior, Thaddeus Eugene, 4,072,609, Cl. 210-73.00R.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Hamid, Michael A.; and Sandoz, Oscar A., 4,072,941, Cl. 343-5.0NA.

Canadian General Electric Company Limited: *See—*
Boothman, David Richard; Rehder, Robert Henry; and Elgar, Everett Charles, 4,072,997, Cl. 361-103.000.

Canella, Marco: *See—*
Sodini, Giancarlo; and Canella, Marco, 4,072,671, Cl. 260-123.500.

Canon Denshi Kabushiki Kaisha: *See—*
Takashima, Hideo, 4,072,994, Cl. 360-124.000.

Canon Kabushiki Kaisha: *See—*
Hirata, Noritsugu; Takigawa, Tomoshi; and Ishikawa, Kazuo, 4,072,409, Cl. 352-174.000.
Kitajima, Tadayuki; and Tohyama, Yoshikuni, 4,072,211, Cl. 185-40.00R.
Suda, Masashi; and Kubo, Shunichi, 4,072,412, Cl. 355-3.0TR.
Takashima, Hideo, 4,072,994, Cl. 360-124.000.

Tanaka, Nobuyoshi; Takeda, Mitsuo; and Matsumoto, Kazuya, 4,072,422, Cl. 356-108.000.
Capitol Hardware Manufacturing Company, Inc.: *See—*
Levy, Paul M., 4,072,432, Cl 403-170.000.
Cardiac Pacemakers, Inc.: *See—*
Anderson, Jon A.; and Malin, Wendell R., 4,072,154, Cl. 128-419.00P.
Carena, Ugo, to Ing. C. Olivetti & C., S.p.A. Keyboard selector switch assembly for a calculating machine. 4,072,833, Cl. 200-5.00R.
Carl Canzler, Firma: *See—*
Kranz, Berthold, 4,072,298, Cl. 266-44.000.
Carlson, Elmer Carl, to T & H Mfg. Co., Inc. Hoe attachment for edgers. 4,072,195, Cl. 172-15.000.
Carlson, Robert E., to TRW Inc. Pump assembly. 4,072,450, Cl. 418-133.000.
Carre, Christian; Guibet, Jean-Pierre; Rebours, Albert; and Rigal, Andre, to Air Industrie. Bag filter. 4,072,484, Cl. 55-379.000.
Carroll, Luther E.; and Clement, James C., to General Motors Corporation. Hydraulic pressure brake system with spring apply pressure release parking brake mode. 4,072,360, Cl. 303-2.000.
Carson, Don B., to UOP Inc. Power generation and potable water recovery from salinous water. 4,072,579, Cl. 203-11.000.
Carswell, Robert: *See—*
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Carter, Russell P., Jr.: *See—*
Creekmore, Mark D.; Vielhaber, Edward T.; and Carter, Russell P., Jr., 4,072,790, Cl. 428-220.000.
Casasent, David Paul; and Psaltis, Demetri, to United States of America, Navy. Correlation methods and apparatus utilizing mellin transforms. 4,073,010, Cl. 364-822.000.
Case, William John Philip; and Commander, Robert Duncan, to International Business Machines Corporation. Servo positioning system for data storage apparatus. 4,072,990, Cl. 360-77.000.
Casner, Paul G.; and McDevitt, Edward J., to United States of America, Navy. Presettable rate multiplier. 4,072,904, Cl. 328-39.000.
Cassidy, Patrick E.: *See—*
Johnson, Ben C.; Thornton, J. Scott; Glowe, Donald E.; Cassidy, Patrick E.; and Anderson, Robert E., 4,072,848, Cl. 219-528.000.
Castine, William A., Jr., to PPG Industries, Inc. Glass bending lehr with pre-heat hood. 4,072,492, Cl. 65-107.000.
Catalyst Research Corporation: *See—*
Schneider, Alan Arthur, 4,072,803, Cl. 429-181.000.
Caterpillar Tractor Co.: *See—*
Butterfield, Max E.; Alt, Robert M.; and March, James E., 4,072,331, Cl. 292-173.000.
Goloff, Alexander, 4,072,088, Cl. 92-220.000.
Griffith, Bobby D., 4,072,324, Cl. 280-759.000.
Habiger, Cyril W., 4,072,167, Cl. 137-535.000.
Isaia, Robert L., 4,072,332, Cl. 292-228.000.
Klett, Gene R., 4,071,967, Cl. 37-141.00T.
Lawrence, Dean M.; and Simpson, Fred E., 4,072,338, Cl. 296-28.00C.
Lee, Emil B., 4,071,965, Cl. 37-4.000.
Meza, Gonzalo Dario Vidal, 4,072,343, Cl. 297-93.000.
Mueller, James P., 4,072,087, Cl. 91-461.000.
Nauman, Harold Joseph, 4,072,063, Cl. 74-405.000.
Staebler, Paul J., 4,072,449, Cl. 418-87.000.
Young, D. Craig, 4,072,327, Cl. 285-137.00R.
Caywood, John Millard: *See—*
Bate, Robert T.; and Caywood, John Millard, 4,072,977, Cl. 357-24.000.
CBS Inc.: *See—*
Bauer, Benjamin B., 4,072,821, Cl. 179-1.0GQ.
Meshulam, Avram; and Rebold, Jerome I., 4,071,952, Cl. 30-151.000.
Sharp, Paul H., 4,072,079, Cl. 84-1.240.
Celanese Corporation: *See—*
Vanderspurt, Thomas H., 4,072,727, Cl. 260-638.00B.
Cenker, Moses: *See—*
Vogt, Herwart Curt; Parekh, Manher; Cenker, Moses; and Patton, John Thomas, Jr., 4,072,631, Cl. 252-431.00R.
Cernauskas, Larry V.; and Foss, Harry B., to Continental Group, Inc., The. Inside stripe by intermittent exterior spray guns. 4,072,127, Cl. 118-2.000.
Cesal, Jiri. Milling head. 4,072,083, Cl. 90-11.00A.
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Hrabak, Frantisek; Bezdek, Milan; Hynkova, Vlasta; and Bouchal, Karel, 4,072,805, Cl. 526-43.000.
Chaix, Jean Edmond; Fajeau, Maurice; Le Borgne, Edmond; and Zerouki, Aime, to Commissariat a l'Energie Atomique. Immersion-tube heat exchanger. 4,072,189, Cl. 165-142.000.
Chambers, Alan F., to Nylite Skate Company of Canada Ltd. Method of making composite skate assembly. 4,071,938, Cl. 29-423.000.
Chambers, Derek, to Raytheon Company. Power supply. 4,073,003, Cl. 363-20.000.
Chambers, Derek; and Harley, A. Leonard, to Raytheon Company. Power supply with voltage protection circuit. 4,073,004, Cl. 363-79.000.
Chambers, Richard F.; and Granade, John J., to Olin Corporation. Anode seal assembly for electrolytic cells. 4,072,595, Cl. 204-219.000.
Champayne, Roy J. Portable abrading machine with dust collecting system. 4,071,981, Cl. 51-170.0MT.
Cheavin, Michael, to Balda-Werke Photographische Gerate und Kunststoff GmbH & Co. KG. Ranging system for camera viewfinder. 4,072,969, Cl. 354-166.000.
Cheng, Dah Yu, to International Power Technology, Inc. Pressure staged heat exchanger. 4,072,182, Cl. 165-1.000.
Cheng, Paul J., to Phillips Petroleum Company. Apparatus for the production of carbon black from coal. 4,072,468, Cl. 23-259.500.
Chernewski, Albert J., to House of Hints Corporation. Holding device. 4,071,976, Cl. 47-39.000.
Cherry, Isaac Raymond; and Anderson, Donald L., to Del Mar Avionics. Electrocardiographic computer. 4,073,011, Cl. 364-900.000.
Chess, William B., to Stauffer Chemical Company. Egg yolk extender. 4,072,764, Cl. 426-558.000.
Cheuvront, Robert M.: *See—*
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Chevron Research Company: *See—*
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Chibata, Ichiro; Yamada, Shigeki; Yamamoto, Masao; and Sanematsu, Hisato, to Tanabe Seiyaku Co., Ltd. Process for the resolution of DL-6-chlorotryptophan. 4,072,691, Cl. 260-326.14T.
Chicago Pneumatic Tool Company: *See—*
Amtsberg, Lester A., 4,072,198, Cl. 173-10.000.
Chicago Switch, Inc.: *See—*
Spedale, Joseph J., 4,072,839, Cl. 200-295.000.
Chien, Chao C. Compressor. 4,072,210, Cl. 184-5.000.
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Murakado, Hiroshi; Nakata, Kazuhiro; Usui, Eiki; Tamiya, Tetsuo; Chikuda, Masahiro; Kitao, Yoshinobu; and Fujiwara, Akira, 4,072,542, Cl. 148-11.50A.
Chimie & Biologie: *See—*
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Christen, Urs; and Guidinger, Dewayne C., to Varian Associates, Inc. Control system for a chromatography apparatus oven door. 4,072,846, Cl. 219-497.000.
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Golda, Eugene; Huang, Jen-chi; Shimazu, Ken-ichi; and Chu, Simon Long, 4,072,589, Cl. 204-129.400.
Chu, William Wing-Yen, to Bell Telephone Laboratories, Incorporated. MOS transistor driver circuits for plasma panels and similar matrix display devices. 4,072,937, Cl. 340-324.00M.
Chuss, John T.; Krechel, Henry H.; and Purvis, Joseph R., to Western Electric Co., Inc. Adhesively and magnetically holding an article. 4,071,944, Cl. 29-574.000.
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Ciba-Geigy Corporation: *See—*
Farooq, Saleem; Drabek, Jozef; Gsell, Laurenz; Karrer, Friedrich; and Meyer, Willy, 4,072,752, Cl. 424-304.000.
Fattinger, Volker, 4,072,736, Cl. 261-97.000.
Garner, Robert; Henshall, John Barry; and Petitpierre, Jean-Claude, 4,072,690, Cl. 260-326.14R.
Cipris, Divna; and Pouli, Dirk, to Allied Chemical Corporation. Electrochemical production of organic thiols. 4,072,584, Cl. 204-73.00R.
Cirino, Vidabelle O.; and Rowland, Stanley P., to United States of America, Agriculture. Fixation of multivalent metal salts of carboxyl-containing vinyl monomers on fibrous substrates. 4,072,784, Cl. 428-507.000.
Citta, Richard W., to Zenith Radio Corporation. Automatic phase and frequency control system. 4,072,909, Cl. 331-12.000.
Clampitt, Richard L., to Phillips Petroleum Company. Fire floor process. 4,072,191, Cl. 166-261.000.
Clark, George B.; and Lehnhoff, Terry F., to University of Missouri, The Curators of the. Thrust-impact rock-splitter. 4,072,353, Cl. 299-22.000.
Clarke-Gravely Corporation: *See—*
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Clary, John G., to Addmaster Corporation. Solenoid construction. 4,072,919, Cl. 335-257.000.
Claypoole, Stewart A.; and Wilhelm, Daniel C., to Corning Glass Works. Buffered optical waveguide fiber. 4,072,400, Cl. 350-96.300.
Clemens, John E. Harness racing hitch. 4,072,000, Cl. 54-2.000.
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Clifford Industries PTY., Ltd.: *See—*
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Close, Ralph E.; and Oroshnik, William, to SCM Corporation. Dehydrophytol. 4,072,725, Cl. 260-632.00R.
Coal Industry (Patents) Limited: *See—*
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Barnaby, Bernard Sydney; Coe, Cyril Walter; Hall, Godfrey Stephen; and Leworthy, John Harwood, 4,072,224, Cl. 197-1.00R.
Cogley, Richard J., Jr., to Goodyear Tire & Rubber Company, The. Transparent pre-cure coating for rubbery polymers. 4,072,645, Cl. 260-29.70M.
Cohen, Nathan. Apparatus for removing snow from roadway. 4,071,966, Cl. 37-12.000.
Coho, Ralph W.; Kugle, John L.; and Futty, Robert C., to IRL Daffin Associates, Inc. Method and apparatus for maintaining highways. 4,072,435, Cl. 404-110.000.
Colby, Richard A., to Sperry Rand Corporation. Tier counter means responsive to tier pattern storage cam position. 4,072,237, Cl. 214-6.00B.
Coldren, Arthur P.; Tither, Geoffrey; and Doane, Douglas V., to Amax Inc. Dual-phase hot-rolled steel strip. 4,072,543, Cl. 148-12.00F.
Cole, Robert Clay; Koch, Ronney R.; and Ramos, Joseph, to Halliburton Company. Pumpable epoxy resin composition. 4,072,194, Cl. 166-295.000.
Coley, James D.: *See—*
Burkhart, James G.; Burkhart, Montgomery P.; and Coley, James D., 4,072,381, Cl. 339-29.00R.
Coll, Antonio Luis Palomo. Process for preparing acid chlorides. 4,072,710, Cl. 260-544.00D.
Colorflo Limited: *See—*
Farrow, Harold Frederick, 4,072,102, Cl. 101-151.000.
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Comastri, Mauro; and Ciarniello, Giorgio, to Societa Italiana Vetro Siv S.p.A. Multiband antenna for window panes. 4,072,953, Cl. 343-713.000.
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Combs, Walter W.: *See—*
Loxley, Ted A.; Barber, Walter G.; Combs, Walter W.; and Webb, John M., 4,072,489, Cl. 65-18.000.
Cominco Ltd.: *See—*
Higgins, John Tyson, 4,072,024, Cl. 62-50.000.
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Communications Satellite Corporation: *See—*
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Compagnie Francaise d'Etudes et de Construction - Technip: *See—*
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Comsonics, Inc.: *See—*
Shimp, Richard L., 4,072,899, Cl. 325-67.000.
Conant, Louis A.; Bolton, Wilbur Monroe; and Wilson, James Ellsworth, to Intertec Associates, Inc. Metal coated brittle containers, conduits and other objects for laboratory and industry. 4,072,243, Cl. 215-12.00R.
Concordia Development AB: *See—*
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Condes Corporation: *See—*
Martin, Thomas R., 4,072,099, Cl. 101-44.000.
Conibear, Frank, to Woodstream Corporation. Frame and filament trigger for animal traps. 4,071,972, Cl. 43-92.000.
Conlin, Daniel. Sheet music page turning device. 4,072,080, Cl. 84-486.000.
Connell, David G., to Falk Corporation, The. Indexing coupling. 4,072,028, Cl. 64-24.000.
Continental Disc Corporation: *See—*
Hansen, Franklin A., 4,072,160, Cl. 137-68.00R.
Continental Group, Inc., The: *See—*
Cernauskas, Larry V.; and Foss, Harry B., 4,072,127, Cl. 118-2.000.
Control Data Corporation: *See—*
Parkin, Thomas Randall, 4,073,005, Cl. 364-200.000.
Conwed Corporation: *See—*
Akerson, David Wallace, 4,072,558, Cl. 162-145.000.
Cook, Franklin F. Unloading tailgate for self-unloading forage wagon. 4,072,242, Cl. 214-522.000.
Cooksey, James Judson; and Turner, Garland Linwood, to Allied Chemical Corporation. Spin pot with improved top cap. 4,072,457, Cl. 425-192.00S.
Coon, George M. Single stroke control system. 4,072,222, Cl. 192-131.00R.
Corfield, John Courtney, to Unimax Switch Limited. Electrical switches. 4,072,841, Cl. 200-332.000.
Corning Glass Works: *See—*
Claypoole, Stewart A.; and Wilhelm, Daniel C., 4,072,400, Cl. 350-96.300.
Illig, Edwin J., 4,072,490, Cl. 65-30.00R.
Love, Roy E., 4,072,399, Cl. 350-96.160.
Lynn, Merrill, 4,072,566, Cl. 195-63.000.
Cortese, Salvatore: *See—*
Fields, Cary Lynn; Fernandez, John Anthony; and Cortese, Salvatore, 4,071,919, Cl. 15-21.00R.
Costello, Edward Charles: *See—*
Simon, David Julian; and Costello, Edward Charles, 4,072,940, Cl. 340-347.0SY.
Costes, Jean-Raymond; Strini, Jean-Claude; and Hardouin, Serge, to Rhone-Progil. Process for the preparation of 1,2-dichloroethane in two reaction zones by reacting chlorine with not more than 102 mole percent of ethylene. 4,072,728, Cl. 260-660.000.
Couderc, Georges; Payen, Claude Andre; Dansac, Jean; and Symaniec, Leonidas, to Thomson-CSF. Optical tracking system. 4,072,861, Cl. 250-233.000.
Coviello, John W., to Westinghouse Electric Corporation. System for converting tonal images to line drawings. 4,072,818, Cl. 358-284.000.
Cox, John Patrick Anthony, to P.C. Cox (Mastic Appliances) Limited. Dispensing guns. 4,072,254, Cl. 222-391.000.
Coyle, John D., to Huston, Harold; and Beyerstedt, Ronald. Method of producing silicon containing cast iron. 4,072,511, Cl. 75-130.00R.
Coyne, Lawrence J.; George, Wilberdan V.; and Groner, Warren, to Technicon Instruments Corporation. Method and apparatus for optical discrimination of particles. 4,072,421, Cl. 356-39.000.
Craig, James R.; and Nerge, Steven F., to American Radiologic Systems, Inc. Automatic control system. 4,072,865, Cl. 250-409.000.
Craven, John Leslie, to Liquifry Company Limited. Electrical heater for heating liquid. 4,072,847, Cl. 219-523.000.
Creekmore, Mark D.; Vielhaber, Edward T.; and Carter, Russell P., Jr., to Goodyear Tire & Rubber Company, The. Extrudable compounded polyvinyl chloride. 4,072,790, Cl. 428-220.000.
Critchley Bros. Limited: *See—*
David, James Earle, 4,072,234, Cl. 211-41.000.
Crompton & Knowles Corporation: *See—*
Nelson, Alden W., 4,072,185, Cl. 165-30.000.
Croome, Ronald John; and Thomas, Donald Beuford, to P. Leiner & Sons Limited. Gelatin composition. 4,072,624, Cl. 252-301.350.
Crouch, Donald W.; and Kurtz, Donald R., to General Electric Company. High continuous current vacuum-type circuit interrupter. 4,072,837, Cl. 200-144.00B.
Crown American Irrigation, Inc.: *See—*
Batson, Paul E., 4,072,205, Cl. 180-66.00R.
Crown Controls Corporation: *See—*
Dammeyer, Ned E., 4,072,886, Cl. 318-602.000.
Cruson, Doyle D. Retractable unitary compact spare tire carrier assembly for underbody mounting to a pickup truck or the like. 4,072,258, Cl. 224-42.210.
Curtis, Gary Martin; and Wagner, David Prugh, to Illinois Tool Works Inc. Tension indicating washer unit. 4,072,081, Cl. 85-62.000.
Curtiss-Wright Corporation: *See—*
Loyd, Robert W., Jr., 4,072,448, Cl. 418-60.000.
Cusanelli, Dominic C.: *See—*
Rajcevic, Harold P.; Opie, William R.; and Cusanelli, Dominic C., 4,072,507, Cl. 75-74.000.
D. B. Enterprises, Inc.: *See—*
Sweet, Robert P.; and Stember, Daniel L., 4,071,926, Cl. 24-136.00R.
Dabal, Dennis Joseph; and Williams, Joseph James, to Hoffman-La Roche Inc. Novel dosage form. 4,072,551, Cl. 156-378.000.
Daebler, Donald H., to GTE Automatic Electric Laboratories Incorporated. Die set for forming axial leads of electrical component into hairpin lead pattern. 4,072,177, Cl. 140-105.000.
Daeuble, Manfred, to BASF Aktiengesellschaft. Dyeing polyester fibers. 4,072,465, Cl. 8-169.000.
Dagy, Victoria A.: *See—*
Lanham, James W.; Wilkinson, Ralph A.; and Dagy, Victoria A., 4,072,575, Cl. 195-103.50M.
Daicel Ltd.: *See—*
Tanaka, Kazunobu; Kusumoto, Masahiko; and Watanabe, Shoji, 4,071,975, Cl. 47-9.000.
Daigle, Phillip R., to Litton Business Systems, Inc. Removable keyboard switch. 4,072,840, Cl. 200-296.000.
Dajani, Esam Z.: *See—*
Adelstein, Gilbert W.; Dajani, Esam Z.; and Yen, Chung Hwai, 4,072,686, Cl. 260-293.690.
Daley, James Thomas: *See—*
Burant, Leonard Joseph; and Daley, James Thomas, 4,072,801, Cl. 429-110.000.
Daley, Luther O.: *See—*
Bullough, Vaughn L.; and Daley, Luther O., 4,072,599, Cl. 204-294.000.
Damgaard, Lavritz Gudmund, to Struers K/S. Electrolytic polishing apparatus. 4,072,598, Cl. 204-274.000.
D'Amico, John J.: *See—*
Bollinger, Frederic G.; and D'Amico, John J., 4,072,499, Cl. 71-94.000.
Dammeyer, Ned E., to Crown Controls Corporation. Apparatus for remote control of antenna rotators. 4,072,886, Cl. 318-602.000.
D'Angelo, Antonio Joseph; Mageli, Orville Leonard; and Sheppard, Chester Stephen, to Pennwalt Corporation. Coupled peroxides. 4,072,810, Cl. 526-230.000.
Daniel, William H. Aerator for bodies of water. 4,072,612, Cl. 210-169.000.
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Couderc, Georges; Payen, Claude Andre; Dansac, Jean; and Symaniec, Leonidas, 4,072,861, Cl. 250-233.000.
Darragh, John Irvine, to Imperial Chemical Industries Limited. Manufacture of pyridine and methylpyridines. 4,072,684, Cl. 260-290.00P.
Daschievici, Stefan; and Ferat, Cezar, to Institutul de Cercetari si Proiectari Pentru Utilaje de Constructii de Drumuri(I.C.P.U.C.) Braila. Pressure system for driving the wheels of a vehicle. 4,072,009, Cl. 60-484.000.
Daum, Sol Jacob, to Sterling Drug Inc. Trans-4-(8-hydroxyoctyl)-5-octyl-1,3-dithiolane-2-thione. 4,072,692, Cl. 260-327.00M.
David, James Earle, to Critchley Bros. Limited. Location of card frame guide members. 4,072,234, Cl. 211-41.000.
Davidson, Charles Patrick Duncan: *See—*
Leighton, Peter Watson; and Davidson, Charles Patrick Duncan, 4,072,204, Cl. 180-34.000.

Davies, John W., III; Enters, Edward W.; and DuPas, Eugene A., to Gilson Brothers Company Foldable handle. 4,071,922, Cl. 16-112.000.
Davis, Glenn A., to Scientific-Atlanta, Inc. Radio frequency alarm system including transmitting, coding and decoding circuitry. 4,072,931, Cl. 340-171.00R.
Davis, Peter Robert, to English Electric Valve Co., Ltd. Travelling wave tubes. 4,072,877, Cl. 315-3.500.
Davis, Steven S., to Envirotech Corporation. Belt dewrinkling and alignment method and apparatus. 4,072,611, Cl. 210-143.000.
Davis, William F., to Motorola, Inc. Comparison circuit having programmable hysteresis. 4,072,870, Cl. 307-350.000.
Dawson, Graham Robert; and Sansome, Dennis Hugh, to National Research Development Corporation. Method and apparatus for forming material by forcing through a die orifice. 4,072,034, Cl. 72-56.000.
de la Jonquiere, Pierre Jacques: *See*—
Wiart, Albert Charles; and de la Jonquiere, Pierre Jacques, 4,072,882, Cl. 318-227.000.
De La Moneda, Francisco H., to International Business Machines Corporation. Raised source and drain igfet device fabrication. 4,072,545, Cl. 148-187.000.
De La Moneda, Francisco H.; and Kotecha, Harish N., to International Business Machines Corporation. FET inverter with isolated substrate load. 4,072,868, Cl. 307-214.000.
Decker, John W.; and Tubbs, Myron W., to Eagle-Picher Industries, Inc. Three-piece heat resistant gasket. 4,072,316, Cl. 277-235.00B.
DeCola, Charles R.: *See*—
Polizzi, Charles J.; and DeCola, Charles R., 4,071,968, Cl. 40-473.000.
Del Mar Avionics: *See*—
Cherry, Isaac Raymond; and Anderson, Donald L., 4,073,011, Cl. 364-900.000.
Delalande S.A.: *See*—
Fauran, Claude P.; Turin, Michel J.; Imbert, Thierry F.; Raynaud, Guy M.; and Dorme, Nicole A. M., 4,072,682, Cl. 260-268.0BC.
Del Fabro, Marcello. Bending machine. 4,072,036, Cl. 72-217.000.
Demko, Paul S., to United States of America, Army. Microwave landing system antenna. 4,072,952, Cl. 343-700.0MS.
De Nora, Oronzio; Nidola, Antonio; and Spaziante, Placido M., to Diamond Shamrock Technologies S.A. Manganese dioxide electrodes. 4,072,586, Cl. 204-105.00M.
de Nora, Vittorio: *See*—
Bianchi, Giuseppe; de Nora, Vittorio; Gallone, Patrizio; and Nidola, Antonio, 4,072,585, Cl. 204-98.000.
Densen, Karl Thure. Tubular fence. 4,072,294, Cl. 256-24.000.
Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. 1,4- and 4,10-dihydro-4-oxo-pyrimido (1,2-A)-benzimidazole-3-carboxylic acids, esters and amides. 4,072,679, Cl. 260-256.40F.
Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. Derivatives of pyrazolo[1,5-a]pyrido[3,2-e]pyrimidine. 4,072,680, Cl 260-256.40F.
Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. 3,7-Dihydro- and 1,7-dihydro-4H-pyrazolo[4',3':5,6]pyrido[4,3-d]pyrimidin-4-ones. 4,072,681, Cl. 260-256.40F.
Depew, Noel F.: *See*—
Towne, Gary L.; Depew, Noel F.; and Fowler, Charles A., 4,072,379, Cl. 339-17.0LM.
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Petterson, Stig Arvid; Lindstad, Tor; Dyvik, Froystein; and Steintveit, Georg, 4,072,503, Cl. 75-14.000.
Deuterium Corporation: *See*—
Spevack, Jerome S., 4,072,740, Cl. 423-563.000.
Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Diehl, Walter; and Koehler, Wolfgang, 4,072,593, Cl. 204-192.00F.
Pletka, Hans-Dieter; and Michel, Rudolf, 4,072,701, Cl. 260-448.80R.
Reinhardt, Helmut; Trebinger, Karl; and Kallrath, Gottfried, 4,072,796, Cl. 428-405.000.
Deutzmann, Klaus, to Goetzewerke Friedrich Goetze AG. Apparatus for distributing annular workpieces. 4,071,948, Cl. 29-809.000.
DeVicaris, Guy A. Artificial tree. 4,072,857, Cl. 362-123.000.
de Vries, Jan Willem. Conical mixing apparatus having support structure for the mixing screw provided below the bottom of the mixing vessel. 4,072,297, Cl. 366-287.000.
DeWinter, John Christian; Nahory, Robert Edward; and Pollack, Martin Alan, to Bell Telephone Laboratories, Incorporated. Growth of III-V layers containing arsenic, antimony and phosphorus. 4,072,544, Cl. 148-171.000.
Diamond International Corporation: *See*—
Radkowski, Stanley J.; Lawrence, John M.; Naggar, Enever; and Dunham, Raymond W., 4,072,473, Cl. 44-46.000.
Diamond Shamrock Technologies S.A.: *See*—
Bianchi, Giuseppe; de Nora, Vittorio; Gallone, Patrizio; and Nidola, Antonio, 4,072,585, Cl. 204-98.000.
De Nora, Oronzio; Nidola, Antonio; and Spaziante, Placido M., 4,072,586, Cl. 204-105.00M.
Didier Engineering GmbH: *See*—
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Diego Zamora S.A.: *See*—
Bermudez Munoz, Francisco, 4,072,235, Cl. 211-71.000.
Diehl, Walter; and Koehler, Wolfgang, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for production of a resistance element for resistance thermometers. 4,072,593, Cl. 204-192.00F.
Diem, Hans: *See*—
Halbritter, Guenter; Muehlthaler, Wolfgang; Sperber, Heinrich; Diem, Hans; Dudeck, Christian; and Lehmann, Gunter, 4,072,717, Cl. 260-603.00C.
Diepers, Heinrich, to Siemens Aktiengesellschaft. Method for the anodic polishing of surfaces of intermetallic niobium compounds and niobium alloys. 4,072,588, Cl. 204-129.430.
Diesel Kiki Co., Ltd.: *See*—
Kokubo, Toshihiro, 4,072,207, Cl. 180-108.000.
Dietzel, Walter; and Matusch, Siegfried, to Braunschweigische Maschinenbauanstalt. Drying drum for fluid materials. 4,071,961, Cl. 34-108.000.
Dietzel, Walter, to Braunschweigische Maschinenbauanstalt. Centrifuge, especially for the sugar industry. 4,072,266, Cl. 233-2.000.
Diggs, Richard E. Safety groove drill press and attachments. 4,072,439, Cl. 408-90.000.
Dingwall, Andrew Gordon Francis; and Rosenthal, Bruce David, to RCA Corporation. Voltage controlled oscillator having equally controlled current source and current sink. 4,072,910, Cl. 331-57.000.
Dixon, Leonard Fox: *See*—
Vellins, Cyril Eric; and Dixon, Leonard Fox, 4,072,462, Cl. 8-2.50A.
Doane, Douglas V.: *See*—
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Dr. K. Witmer Elektronik AG: *See*—
Witmer, Kurt; and Cachin, Roland, 4,072,889, Cl. 323-9.000.
Donnelly Mirrors, Inc.: *See*—
Morgan, Cleon C., 4,072,340, Cl. 296-84.00R.
Doom, Lewis G. Motionless mixer. 4,072,296, Cl. 366-337.000.
Dorme, Nicole A. M.: *See*—
Fauran, Claude P.; Turin, Michel J.; Imbert, Thierry F.; Raynaud, Guy M.; and Dorme, Nicole A. M., 4,072,682, Cl. 260-268.0BC.
Dorsch, Norman: *See*—
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Dougherty, Lemuel A.: *See*—
Smitherman, Stephen N.; and Dougherty, Lemuel A., 4,072,094, Cl. 100-3.000.
Douglas, Walter M., to UOP Inc. Metal phthalocyanine catalyst preparation. 4,072,630, Cl. 252-430.000.
Dove, Michael David, to Wainco Products Limited. Apparatus for transporting an elongate piece of material. 4,072,260, Cl. 226-173.000.
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Jahn, Alex K., 4,072,617, Cl. 252-8.900.
Dow Chemical Company, The: *See*—
Hoornstra, Clayton W.; and Stevens, Violete L., 4,072,529, Cl. 96-115.00R.
Lao, Binneg Yanbing, 4,072,046, Cl. 73-574.000.
Weiss, Stefan Adam; Torney, Harry Lester; and Caldwell, William Joseph, 4,072,565, Cl. 195-1.100.
Williams, Dennis A.; and Carswell, Robert, 4,072,619, Cl. 252-47.500.
Doyle, Dewey I., Jr., to Doyle Vacuum Cleaner Company. Vacuum cleaners. 4,072,483, Cl. 55-372.000.
Doyle Vacuum Cleaner Company: *See*—
Doyle, Dewey I., Jr., 4,072,483, Cl. 55-372.000.
Drabek, Jozef: *See*—
Farooq, Saleem; Drabek, Jozef; Gsell, Laurenz; Karrer, Friedrich; and Meyer, Willy, 4,072,752, Cl. 424-304.000.
Drews, William A.; Padgett, Charles L.; and Pinna, Ray Anthony, to United States of America, Army. Light weight radar reflector. 4,072,948, Cl. 343-18.00C.
Drossel, Rolf: *See*—
Neidl, Herbert; Kaspar, Gunther; and Drossel, Rolf, 4,072,559, Cl. 176-19.0LD.
D'Silva, Themistocles D. J., to Union Carbide Corporation. 1,3,5-Trithiane and 1,3,5-oxadithiane carbamoyloxime compounds and insecticidal and miticidal compositions and methods employing them. 4,072,750, Cl. 424-276.000.
D'Silva, Themistocles Damasceno Joaquim, to Union Carbide Corporation. Pesticidal N-substituted bis-carbamoyl sulfide compounds. 4,072,751, Cl. 424-298.000.
DuBose, Jesse K.: *See*—
Naizer, Kenneth C.; and DuBose, Jesse K., 4,072,043, Cl. 73-23.000.
Ducon Company, Inc., The: *See*—
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Dudeck, Christian: *See*—
Halbritter, Guenter; Muehlthaler, Wolfgang; Sperber, Heinrich; Diem, Hans; Dudeck, Christian; and Lehmann, Gunter, 4,072,717, Cl. 260-603.00C.
Dudley, Leslie Peter. Stereoscopic projection microscopy. 4,072,967, Cl. 354-79.000.
Due, George B.; and Guarino, John P., to Mobil Oil Corporation. Radiation curable coating. 4,072,592, Cl. 204-159.150.
Dugois, Jean-Pierre: *See*—
Morel, Paul; and Dugois, Jean-Pierre, 4,072,597, Cl. 204-243.00M.
Dumont, Claude: *See*—
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Dunham, Raymond W.: *See*—
Radkowski, Stanley J.; Lawrence, John M.; Naggar, Enever; and Dunham, Raymond W., 4,072,473, Cl. 44-46.000.
Dunn, David M., to Marquette Electronics, Inc. Anti-snag device for electrode lead clips. 4,072,388, Cl. 339-103.00R.

DuPas, Eugene A.: *See*—
Davies, John W., III; Enters, Edward W.; and DuPas, Eugene A., 4,071,922, Cl. 16-112.000.
Du Pont de Nemours, E. I., and Company: *See*—
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Fan, Roxy, 4,072,527, Cl. 96-87.00R.
Knox, Kenneth Leith; and Lees, Joseph Kolb, 4,072,779, Cl. 428-220.000.
Niederhauser, Donald Olcott, 4,071,931, Cl. 28-101.000.
Du Quesne, Francis. Device used for detaching the beads of a tire from the wheel rim. 4,072,178, Cl. 157-1.170.
Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, to Smith Kline & French Laboratories Limited. Certain guanidine compounds, and their use as inhibitors of histamine activity. 4,072,748, Cl. 424-270.000.
Dursch, Walter: *See*—
Linke, Fritz; Dursch, Walter; and Kleiner, Hans-Jerg, 4,072,776, Cl. 427-390.00D.
Durst, Karlheinz: *See*—
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Dyvik, Froystein: *See*—
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E. R. Squibb & Sons, Inc.: *See*—
Denzel, Theodor; and Hoehn, Hans, 4,072,679, Cl. 260-256.40F.
Denzel, Theodor; and Hoehn, Hans, 4,072,680, Cl. 260-256.40F.
Denzel, Theodor; and Hoehn, Hans, 4,072,681, Cl. 260-256.40F.
Eagle-Picher Industries, Inc.: *See*—
Decker, John W.; and Tubbs, Myron W., 4,072,316, Cl. 277-235.00B.
Eastman Kodak Company: *See*—
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Frank, Lee Fitzpatrick; and Kaukeinen, Joseph Yorks, 4,072,411, Cl. 353-121.000.
Lidel, Darrel D., 4,072,769, Cl. 117-93.10R.
Masurekar, Prakash S.; and Goodhue, Charles T., 4,072,568, Cl. 195-65.000.
McConnell, Richard L.; Weemes, Doyle A.; and Joyner, Frederick B., 4,072,812, Cl. 526-348.200.
McConnell, Richard L.; Weemes, Doyle A.; and Joyner, Frederick B., 4,072,813, Cl. 526-348.200.
Eaton Corporation: *See*—
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O'Neil, Walter K., 4,072,927, Cl. 340-58.000.
Ebnother, Anton; Bastian, Jean-Michel; Gadient, Fulvio; and Stoll, Andre, to Sandoz Ltd. Tricyclo piperidino ketones and soporific compositions thereof. 4,072,756, Cl. 424-267.000.
Eckerdt, George H. Key holder. 4,072,033, Cl. 70-456.00B.
Ecolaire Incorporated: *See*—
Walters, Thomas, Jr., 4,072,253, Cl. 222-368.000.
Eder, Ulrich: *See*—
Sauer, Gerhard; Hauser, Helmut; Haffer, Gregor; Ruppert, Juergen; Eder, Ulrich; and Wiechert, Rudolf, 4,072,716, Cl. 260-586.00F.
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Ehara, Takuhisa: *See*—
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Ehrentraut, Otto, to Miba Gleitlager Aktiengesellschaft. Sliding-surface bearing and process of manufacturing the same. 4,072,368, Cl. 308-3.00R.
Eibeck, Richard E.: *See*—
Berenbaum, Morris B.; Evans, Francis E.; Eibeck, Richard E.; and Robinson, Martin A., 4,072,027, Cl. 62-112.000.
Eibeck, Richard Elmer: *See*—
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Eibofner, Eugen, to Kaltenbach & Voigt. Turbine insert for the head of a dental turbine elbow. 4,071,954, Cl. 32-27.000.
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Eigenmann, Ludwig. Retro-reflecting assembly. 4,072,403, Cl. 350-105.000.
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Eimen, Shawn H.: *See*—
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Einbinder, Seymour K.: *See*—
Saxe, Frederick E.; and Einbinder, Seymour K., 4,072,107, Cl. 102-4.000.
Eisner, Albert M.: *See*—
Burke, Courtney L., 4,072,835, Cl. 200-61.470.
Ekenstam, Bo Thuresson Af; and Nordqvist, Erik Gustaf Percy, to Landstingens Inkopscentral. Container suitable for smaller quantities of fluid or semifluid substances. 4,072,249, Cl. 222-95.000.
Eklund, Fjalar Ernst Erik: *See*—
Kohli, Martti Ilmari; Eklund, Fjalar Ernst Erik; and Callerhorn, Bo Allan, 4,072,092, Cl. 99-389.000.
Elgar, Everett Charles: *See*—
Boothman, David Richard; Rehder, Robert Henry; and Elgar, Everett Charles, 4,072,997, Cl. 361-103.000.
Eligehausen, Hans, to W. C. Heraeus GmbH. Daylight-simulating incandescent lamp light fixture, particularly for medical and dental use. 4,072,856, Cl. 362-2.000.
Elkem-Spigerverket A/S: *See*—
Pedersen, Thor; and Kristiansen, Aksel Erik, 4,072,250, Cl. 222-326.000.
Elliott, David Robert, to Hepworth Plastics Limited. Pipe couplings. 4,072,328, Cl. 285-169.000.
Elliott, Raymond: *See*—
Buckingham, Herbert Charles; and Elliott, Raymond, 4,072,845, Cl. 219-146.300.
Elliott, Stanley B. Visual-type temperature-responsive device. 4,072,055, Cl. 73-356.000.
Elmqvist, Rune, to Siemens Aktiengesellschaft. Recorder operating with drops of liquid. 4,072,959, Cl. 346-140.00R.
Emark, Lawrence W., Jr., to Westinghouse Electric Corporation. Control system and method for removal of coke from a coke oven. 4,072,885, Cl. 318-600.000.
Emelyanenko, July Georgievich: *See*—
Zorev, Nikolai Nikolaevich; Astafiev, Anatoly Alexandrovich; Loboda, Alexandr Sergeevich; Savukov, Vladimir Pavlovich; Runov, Andrei Efimovich; Belov, Vladimir Alexandrovich; Sobolev, Jury Vasilievich; Sobolev, Valentin Vasilievich; Pavlov, Nikolai Mikhailovich; Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Balandin, Jury Fedorovich; Gorynin, Igor Vasilievich; Zvezdin, Jury Ivanovich; Ivanov, Kuzma Makeevich; Ignatov, Viktor Alexandrovich; and Emelyanenko, July Georgievich, 4,072,509, Cl. 75-124.000.
EMI Limited: *See*—
Webley, Reginald Sidney, 4,072,875, Cl. 313-60.000.
Emmett, John Colin: *See*—
Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 4,072,748, Cl. 424-270.000.
Emmons, Stephen P.: *See*—
Buss, Dennis Darcy; Emmons, Stephen P.; and Barton, James Brockman, 4,072,978, Cl. 357-24.000.
Endo, Seiji: *See*—
Konomi, Tuyoshi; Endo, Seiji; Yamaguchi, Masayasu; and Katsuo, Kenichi, 4,072,664, Cl. 260-78.00R.
Energy Absorption Systems, Inc.: *See*—
Seegmiller, Wan; Young, Bruce O.; and Story, Joe A., 4,072,334, Cl. 293-71.00R.
Energy Development Associates: *See*—
Symons, Philip C., and Amato, Carmelo J., 4,072,540, Cl. 429-70.000.
Engel, Joseph C.; and Saletta, Gary F., to Westinghouse Electric Corporation. Starting and operating apparatus for high pressure sodium lamp ballasts. 4,072,878, Cl. 315-205.000.
England, Alan Gordon: *See*—
Gow, James Gordon; and England, Alan Gordon, 4,072,610, Cl. 210-90.000.
English Electric Valve Co., Ltd.: *See*—
Davis, Peter Robert, 4,072,877, Cl. 315-3.500
Jones, Eric, 4,072,467, Cl. 23-254.00E.
Entek Corporation: *See*—
Adams, Ladd M., 4,072,291, Cl. 251-181.000.
Enters, Edward W.: *See*—
Davies, John W., III; Enters, Edward W.; and DuPas, Eugene A., 4,071,922, Cl. 16-112.000.
Envirotech Corporation: *See*—
Davis, Steven S., 4,072,611, Cl. 210-143.000.
Eppendorf Geratebau Netheler & Hinz GmbH: *See*—
Brysch, Gottfried, 4,072,330, Cl. 285-239.000.
Epsilon Lambda Electronics Corporation: *See*—
Knox, Robert M.; and Toulios, Peter P., 4,072,902, Cl. 325-446.000.
ERG Industrial Corporation Limited: *See*—
Godfrey, Nelson Frederick John, 4,072,834, Cl. 200-16.00C.
ESB Incorporated: *See*—
Leeson, Jeffrey S.; and Szabo, Joseph F., 4,072,799, Cl. 429-82.000.
Etablissements Genoud & Cie: *See*—
Neyret, Guy, 4,072,290, Cl. 251-127.000.
Ethyl Corporation: *See*—
Hargis, Duane C.; and Kehoe, Lawrence J., 4,072,732, Cl. 260-682.000.
Hargis, Duane C.; and Kehoe, Lawrence J., 4,072,733, Cl. 260-682.000.
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Rohe, Lothar; Schramm, Jurgen; Klauke, Erich; Eue, Ludwig; and Schmidt, Robert Rudolf, 4,072,500, Cl. 71-98.000.
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Evans, Francis E.: *See*—
Berenbaum, Morris B.; Evans, Francis E.; Eibeck, Richard E.; and Robinson, Martin A., 4,072,027, Cl. 62-112.000.
Ewald, Jerome T., to Bendix Corporation, The. Hydraulic brake booster. 4,072,011, Cl. 60-555.000.
Ewing, William D., to Foxon Packaging Corporation. Ultraviolet blister sealing means. 4,072,552, Cl. 156-380.000.
Ex-Cell-O Corporation: *See*—
Bosche, Eugene R., 4,072,089, Cl. 93-44.1GT.
Exxon Research & Engineering Co.: *See*—
O'Farrell, Charles P.; and Higgins, John J., 4,072,648, Cl. 260-33.4PQ.

Schlosberg, Richard H.; Wright, Franklin J.; and Hartgerink, Ronald L., 4,072,475, Cl. 48-210.000.
Ezaki, Norio. Cake cutter. 4,072,075, Cl. 83-153.000.
Fabbrica Italiana Magneti Marelli S.p.A.: *See—*
Huwyler, Franco, 4,072,893, Cl. 324-208.000.
Fabrique Nationale Herstal S.A.: *See—*
Kaiser, Georges J., 4,072,444, Cl. 417-269.000.
Fahn, Rudolf; Brenner, Bernd; and Buckl, Hans, to Sud-Chemie AG. Process for the two-stage decomposition of hemi-celluloses to xylose. 4,072,538, Cl. 127-37.000.
Fajeau, Maurice: *See—*
Chaix, Jean Edmond; Fajeau, Maurice; Le Borgne, Edmond; and Zerouki, Aime, 4,072,189, Cl. 165-142.000.
Falk Corporation, The: *See—*
Connell, David G., 4,072,028, Cl. 64-24.000.
Phinney, John M., 4,072,221, Cl. 192-.098.
Fan, Roxy, to Du Pont de Nemours, E. I., and Company. Oxygen barrier layers for photopolymerizable elements. 4,072,527, Cl. 96-87.00R.
Farha, Floyd, Jr.; and Box, E. O., Jr., to Phillips Petroleum Company. Polluted water purification. 4,072,608, Cl. 210-63.00R.
Farmer, Melville E. Wall construction member. 4,071,995, Cl. 52-729.000.
Farooq, Saleem; Drabek, Jozef; Gsell, Laurenz; Karrer, Friedrich; and Meyer, Willy, to Ciba-Geigy Corporation. Pesticidal benzaspiro carboxylates. 4,072,752, Cl. 424-304.000.
Farrow, Harold Frederick, to Colorflo Limited. Fluid applying plate. 4,072,102, Cl. 101-151.000.
Farwell, Allen C.; Farwell, Dale E.; and Farwell, Duane C. Liquid level controller and soil test instrument. 4,072,044, Cl. 73-38.000.
Farwell, Dale E.: *See—*
Farwell, Allen C.; Farwell, Dale E.; and Farwell, Duane C., 4,072,044, Cl. 73-38.000.
Farwell, Duane C.: *See—*
Farwell, Allen C.; Farwell, Dale E.; and Farwell, Duane C., 4,072,044, Cl. 73-38.000.
Fattinger, Volker, to Ciba-Geigy Corporation. Packing material. 4,072,736, Cl. 261-97.000.
Fauran, Claude P.; Turin, Michel J.; Imbert, Thierry F.; Raynaud, Guy M.; and Dorme, Nicole A. M., to Delalande S.A. New 1-(2'-aroyl eth-1' yl) 2-(4"-acetamido piperazine-1" yl methyl) benzimidazoles, their therapeutical applications and method for their preparation. 4,072,682, Cl. 260-268.0BC.
Feichtinger, Hans; Lutze, Siegfried; Birnkraut, Hans-Walter; and Kluy, Werner, to Ruhrchemie AG. 4,4'-Thio-bis-(dialkylphenol)/formaldehyde condensates and process for producing them. 4,072,659, Cl. 260-57.00A.
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Honegger, Werner; and Muller, Erwin, 4,072,228, Cl. 198-459.000.
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Ferguson, Richard; and Troutman, Kenneth W., to Terrell Machine Company, The. Textile bobbin hoist. 4,072,240, Cl. 214-313.000.
Fernandez, John Anthony: *See—*
Fields, Cary Lynn; Fernandez, John Anthony; and Cortese, Salvatore, 4,071,919, Cl. 15-21.00R.
Ferse, Armin; and Grimm, Harald, to Akademie der Wissenschaften der Deutschen Demokratischen Republik. Process for conversion of oligomers and higher polymers by irradiation with high-energy electrons. 4,072,591, Cl. 204-159.200.
Fiber Materials, Inc.: *See—*
Pepper, Roger T.; and Zack, Thomas A., 4,072,516, Cl. 75-229.000.
Fields, Cary Lynn; Fernandez, John Anthony; and Cortese, Salvatore. Waste chute cleaning apparatus. 4,071,919, Cl. 15-21.00R.
Fillios, Jean-Pierre; and Kergueno, Joseph, to Multifluid-Energie, Societe Anonyme. Prefabricated ventilating panel including heat transfer means. 4,072,141, Cl. 126-270.000.
Finn, Arthur Francis, to United States of America, Navy. Remote access washer with bolt alignment tool. 4,072,070, Cl. 81-71.000.
Finney, Donald C., to A. F. Industries, Inc. Amine salt composition useful in inhibiting metal corrosion. 4,072,626, Cl. 252-389.00A.
Firestone Tire & Rubber Company, The: *See—*
Lawson, David Francis, 4,072,651, Cl. 260-42.440.
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Fisons Limited: *See—*
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Flaschar, Heinz: *See—*
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Fleming, James H.: *See—*
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Fletcher, C. Hugh; Bogdan, Raymond G.; Wright, Robert W.; and Cheuvront, Robert M., to Vandersons Corporation. Gravure press for making multicolor proofs. 4,072,103, Cl. 101-151.000.
FMC Corporation: *See—*
Taylor, John S.; and Grantham, William G., 4,072,785, Cl. 428-536.000.
Focke, Heinz, to Focke & Pfuhl. Pack and blank for making the pack and web of packing material for making the blanks. 4,072,263, Cl. 229-37.00R.
Focke & Pfuhl: *See—*
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Folk, Craig L., to United States of America, Agriculture. Apparatus for forming textile lap. 4,071,925, Cl. 19-296.000.
Folsom, L. R.: *See—*
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Foncannon, William S. Garbage can support. 4,072,286, Cl. 248-154.000.
Ford Aerospace & Communications Corporation: *See—*
McConnell, William W., 4,072,615, Cl. 210-282.000.
Ford Motor Company: *See—*
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Boivin, Pierre Andre, 4,073,007, Cl. 364-508.000.
Fosroc International Limited: *See—*
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Cernauskas, Larry V.; and Foss, Harry B., 4,072,127, Cl. 118-2.000.
Foster Wheeler Energy Corporation: *See—*
Romanowski, Chester J., 4,072,276, Cl. 241-117.000.
Foucht, Millard E.: *See—*
Hayden, David E.; and Foucht, Millard E., 4,072,623, Cl. 252-182.000.
Fowler, Charles A.: *See—*
Towne, Gary L.; Depew, Noel F.; and Fowler, Charles A., 4,072,379, Cl. 339-17.0LM.
Fox, Roy W., to Fox, Roy W. Electrical connector. 4,072,390, Cl. 339-176.0MF.
Foxon Packaging Corporation: *See—*
Ewing, William D., 4,072,552, Cl. 156-380.000.
Fraas, Arthur P., to United States of America, Energy. Heat exchanger with intermediate evaporating and condensing fluid. 4,072,183, Cl. 165-11.000.
Frank, Lee Fitzpatrick; and Kaukeinen, Joseph Yorks, to Eastman Kodak Company. Display device having image sense reversal capability. 4,072,411, Cl. 353-121.000.
Frankel, Jacob, administrator: *See—*
Ravey, Mani; Shorr, Leonard Marshall; and Waterman, Jacques A., deceased, 4,072,806, Cl. 526-89.000.
Franz, Helmut, to PPG Industries, Inc. Linear curtain spray applicator. 4,072,772, Cl. 427-164.000.
Fraser, David Bruce; and Kammlott, Guenther Wilhelm, to Bell Telephone Laboratories, Incorporated. Method for making patterned gold metallization. 4,072,768, Cl. 427-34.000.
Frear, David L.: *See—*
Waldron, Clifford R.; Yonkers, Karl W.; Goebeler, Robert; Frear, David L.; and Bright, Edward J., 4,072,394, Cl. 339-276.00T.
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Frederick, Warren Phillip, to Baxter Travenol Laboratories, Inc. Liquid applying device. 4,072,128, Cl. 118-3.000.
Freehauf, Eugene G., to Zero Corporation. Dual inline integrated circuit socket. 4,072,380, Cl. 339-17.0CF.
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French, Douglas M.: *See—*
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Friedrich, Hans-Jurgen, to Interatom, Internationale Atomreaktorbau GmbH. Bottom cooler for nuclear reactors. 4,072,561, Cl. 176-38.000.
Friend, Lindsay Carlton, to Ingersoll-Rand Company. Automatic wire handling and wrapping apparatus. 4,072,176, Cl. 140-93.00R.
Fuchs, Dietrich; and Luttner, Albin, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Axle suspension systems for a vehicle. 4,072,322, Cl. 280-713.000.
Fuchs, Francis Joseph, Jr., to Western Electric Co., Inc. Apparatus and methods for forming a plurality of elongated members. 4,072,037, Cl. 72-261.000.
Fuji Chemical Industries Company: *See—*
Hirame, Yasutel; and Nakamura, Youichi, 4,072,530, Cl. 106-44.000.
Fuji Electric Co., Ltd.: *See—*
Yasuhara, Takeshi; Tamai, Mitsuru; and Yuhara, Tadanori, 4,072,057, Cl. 73-718.000.
Fuji Photo Film Co., Ltd.: *See—*
Inouye, Kozo; Yokota, Yukio; and Nakazyo, Kiyoshi, 4,072,525, Cl. 96-55.000.
Kondo, Toshihiro, 4,072,965, Cl. 354-51.000.
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Shirahata, Ryuji; Suzuki, Masaaki; and Kitamoto, Tatsuji, 4,072,781, Cl. 428-336.000.
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Fuji Photo Optical Co., Ltd.: *See—*
Asano, Seiji, 4,072,966, Cl. 354-60.00R.

Fujiki, Norio: *See—*
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Fujiwara, Akira: *See—*
Murakado, Hiroshi; Nakata, Kazuhiro; Usui, Eiki; Tamiya, Tetsuo; Chikuda, Masahiro; Kitao, Yoshinobu; and Fujiwara, Akira, 4,072,542, Cl. 148-11.50A.
Fujizuka, Kaoru, to Rank Xerox Ltd. Device for preventing movement of an original document on a reciprocating copier platen. 4,072,418, Cl. 355-75.000.
Fukumoto, Mitsunobu: *See—*
Watanabe, Itaru; Yamakoshi, Yasumichi; Miyauchi, Hirotsugu; Tsushima, Sakae; and Fukumoto, Mitsunobu, 4,072,793, Cl. 428-255.000.
Fukuoka, Sadao. Ventilated footwear. 4,071,963, Cl. 36-3.00B.
Fukushima, Osamu, to Kuraray Co., Ltd. Porous sheet material and its production. 4,072,773, Cl. 427-246.000.
Fulker, John Leslie; Hall, David John; and Lock, Robert Christopher, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Supercritical aerofoils. 4,072,282, Cl. 244-35.00R.
Funabiki, Kyohei; and Tokunaga, Tetsuya, to Sumitomo Durez Company, Ltd. Plugging compositions for blast furnace tap holes. 4,072,531, Cl. 106-56.000.
Fung, Cheung King: *See—*
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Futty, Robert C.: *See—*
Coho, Ralph W.; Kugle, John L.; and Futty, Robert C., 4,072,435, Cl. 404-110.000.
G. D. Searle & Co.: *See—*
Adelstein, Gilbert W.; Dajani, Esam Z.; and Yen, Chung Hwai, 4,072,686, Cl. 260-293.690.
Gachot, Jean; and Lekarski, Simeon. Pneumatic timing device. 4,072,172, Cl. 137-624.200.
Gadient, Fulvio: *See—*
Ebnother, Anton; Bastian, Jean-Michel; Gadient, Fulvio; and Stoll, Andre, 4,072,756, Cl. 424-267.000.
Gallagher, John F. Fireplace heat loss shield. 4,072,140, Cl. 126-140.000.
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Bianchi, Giuseppe; de Nora, Vittorio; Gallone, Patrizio; and Nidola, Antonio, 4,072,585, Cl. 204-98.000.
Gambell, James W.: *See—*
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Gammer, Peter, to Otto Bock Orthopadische Industrie K.G. Electric storage battery arrangement for use in electrically driven prosthetic devices. 4,072,800, Cl. 429-97.000.
Gand, Heinz: *See—*
Heiser, Joachim; Hoheisel, Rainer; Flaschar, Heinz; Gand, Heinz; Kleinschmidt, Heinz; Braunlinger, Konrad; Sopha, Klaus; Schempp, Roland; and Sanzenbacher, Hermann, 4,072,169, Cl. 137-596.130.
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Garcia Corporation, The: *See—*
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Garcia, Joe La; Griffing, Brandt Mead; Hu, Paul Yu-Fei, and Millington, Richard George, to International Business Machines Corporation. Linear actuator printer carriage. 4,072,101, Cl. 101-93.150.
Gardner, Delbert J., to Bendix Corporation, The. Control means for a two stage servomotor. 4,072,014, Cl. 60-575.000.
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Smith, Garland Y.; Scott, Gerald R.; Blazek, George A.; and Kowalski, John L., 4,072,437, Cl. 407-118.000.
Garlinghouse, Leslie H. Machine for controlled conditioning of liquids and mixture. 4,072,030, Cl. 68-23.00R.
Garmong, Victor H., to Wolfe, George Edwin. Computer controlled bulk storage fluid dispensing terminal. 4,072,929, Cl. 340-147.00A.
Garner, Robert; Henshall, John Barry; and Petitpierre, Jean-Claude, to Ciba-Geigy Corporation. Indolyl methylene leuco dyestuffs. 4,072,690, Cl. 260-326.14R.
Gartner, Klaus: *See—*
Phillips, Peter J., 4,072,032, Cl. 70-339.000.
Gaspar, Peter. Alternating piston rotary apparatus. 4,072,447, Cl. 418-36.000.
Gass, Hans; Hintermann, Hans Erich; and Griepentrog, Hartmut, to Laboratoire Suisse de Recherches Horlogeres; and Gutehoffnungshutte Sterkrade Aktiengesellschaft. Diffusion barrier and separation substance for metal parts adjoining each other in an oxygen free atmosphere. 4,072,797, Cl. 428-409.000.
Gates, Peter Stuart; Gillon, John; and Saggers, David Thomas, to Fisons Limited. 5-Benzofuranyl esters as herbicides and plant growth regulants. 4,072,495, Cl. 71-76.000.
Gau, Georg, to Kronseder, Hermann. Label extracting and transferring device. 4,072,555, Cl. 156-571.000.
Gaylord, Edson C., to Gaylord Industries, Inc. Double inlet kitchen ventilator. 4,072,143, Cl. 126-299.00D.
Gaylord Industries, Inc.: *See—*
Gaylord, Edson C., 4,072,143, Cl. 126-299.00D.
Gazzard, Warwick Henry; and Kearin, Roger Michael, to James Hardie & Coy. Pty. Limited. Embossed patterning of asbestos-cement and like sheets. 4,072,460, Cl. 425-471.000.
Gedney, Ronald Walker; and Rasile, John, to International Business Machines Corporation. Integrated circuit package. 4,072,816, Cl. 174-52.0FP.
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General Dynamics Corporation: *See—*
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Gleichman, Robert F., 4,072,872, Cl. 310-53.000.
Harris, Raymond W., 4,072,903, Cl. 325-466.000.
Jeram, Edward M., 4,072,635, Cl. 260-2.50S.
Kenworthy, Milton James; and Woltmann, Ivan Elmer, 4,072,008, Cl. 60-261.000.
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General Electric Company Limited, The: *See—*
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Gerson, Howard S.; and Gerson, Bernard. Panel door and method of construction. 4,072,548, Cl. 156-79.000.
Gibson, Sandra F.; and Rodgers, Gregory D., to McDonnell Douglas Corporation. *Klebsiella pneumoniae* and Enterobacter broth. 4,072,571, Cl. 195-100.000.
Gibson, Sandra F.: *See—*
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Gilbert, Roy E.: *See—*
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Gillon, John: *See—*
Gates, Peter Stuart; Gillon, John; and Saggers, David Thomas, 4,072,495, Cl. 71-76.000.
Gillow, George B., to NCR Corporation. Hazard-free clocked master/-slave flip-flop. 4,072,869, Cl. 307-291.000.
Gilson Brothers Company: *See—*
Davies, John W., III; Enters, Edward W.; and DuPas, Eugene A., 4,071,922, Cl. 16-112.000.
Gimix, Inc.: *See—*
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Gindler, E. Melvin, to Pierce Chemical Company. Uric acid determination. 4,072,627, Cl. 252-408.000.
Gitlin, Richard Dennis; and Thompson, John Stewart, to Bell Telephone Laboratories, Incorporated. Variable phase shifter for adaptive echo cancellers. 4,072,830, Cl. 179-170.200.
Givaudan Corporation: *See—*
Naegeli, Peter, 4,072,719, Cl. 260-617.00A.
GKN Floform Limited: *See—*
Waite, John Stuart, 4,072,817, Cl. 174-52.00H.
Glassman, Jacob A. Double-duty diaper and insert therefor. 4,072,150, Cl. 128-284.000.
Gleason, John Gerald; Holden, Kenneth George; and Huffman, William Francis, to SmithKline Corporation. Cis-4-oxoazetidine intermediates and methods of preparing them. 4,072,674, Cl. 260-239.00A.
Gleichman, Robert F., to General Electric Company. Ventilating air baffle and deflector for a dynamoelectric machine. 4,072,872, Cl. 310-53.000.
Globe-Union Inc.: *See—*
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Glover, Robert L. Guide attachment for portable power drills. 4,072,440, Cl. 408-112.000.
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Godfrey, Nelson Frederick John, to ERG Industrial Corporation Limited. Electric slide switch having sliding contact with cleaning action. 4,072,834, Cl. 200-16.00C.
Godrick, Joseph A.; and Sliney, Joseph Leo, to Kennecott Copper Corporation. Method of fabricating a solar heating unit. 4,072,262, Cl. 228-265.000.
Goebeler, Robert: *See—*
Waldron, Clifford R.; Yonkers, Karl W.; Goebeler, Robert; Frear, David L.; and Bright, Edward J., 4,072,394, Cl. 339-276.00T.
Goetzewerke Friedrich Goetze AG: *See—*
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Goffe, William L.; and Mammino, Joseph, to Xerox Corporation. Migration imaging method. 4,072,517, Cl. 96-1.0PS.

Gold, Nicholas, to Polaroid Corporation. Photographic film cassette. 4,072,972, Cl. 354-275.000.

Golda, Eugene; Huang, Jen-chi; Shimazu, Ken-ichi; and Chu, Simon Long, to Polychrome Corporation. Process for electrolytic graining of aluminum sheet. 4,072,589, Cl. 204-129.400.

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Goloff, Alexander, to Caterpillar Tractor Co. Light-weight piston assemblies. 4,072,088, Cl. 92-220.000.

Goodhart, Rupert Richard Francis Gerard Heron, to Imperial Chemical Industries Limited. Method and apparatus for seismic prospecting. 4,072,208, Cl. 181-401.000.

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Schiller, Arthur Maurice; Goodman, Richard Martin; and Neff, Roger Edgar, 4,072,607, Cl. 210-58.000.

Goodnight, Kenneth C., Jr.; Hartman, Grant H., Jr.; and Marquardt, Robert F., to Mead Johnson & Company. Loy phytate isoelectric precipitated soy protein isolate. 4,072,670, Cl. 260-123.500.

Goodyear Tire & Rubber Company, The: *See—*
Cogley, Richard J., Jr., 4,072,645, Cl. 260-29.70M.
Creekmore, Mark D.; Vielhaber, Edward T.; and Carter, Russell P., Jr., 4,072,790, Cl. 428-220.000.
Kline, Richard H., 4,072,654, Cl. 260-45.9QB.
Lammers, Peter C., 4,072,673, Cl. 264-225.000.
Parker, Dane K., 4,072,724, Cl. 260-624.00B.
Pierson, Robert M.; and Lovell, John A., 4,072,738, Cl. 264-102.000.
Stalter, Joseph F., Jr., 4,072,550, Cl. 156-123.00R.
Sturm, Budd Harvey; and Slam, Thomas James, 4,072,721, Cl. 260-621.00A.

Gordini, Silvano: *See—*
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Goto, Kazuo: *See—*
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Goto, Toshihiro: *See—*
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Gould Inc.: *See—*
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Gow, James Gordon; and England, Alan Gordon, to Ingerthorpe Holdings Limited. Production of solutions. 4,072,610, Cl. 210-90.000.

Granade, John J.: *See—*
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Granzow, Robert H.; and Marvin, Richard P., to NCR Corporation. Method and apparatus for embossing diffraction gratings on a record medium. 4,072,098, Cl. 101-32.000.

Gray, Robin Th.: *See—*
Reinhoudt, David N.; and Gray, Robin Th., 4,072,693, Cl. 260-338.000.

Green, David Frederick: *See—*
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Greenwood, Edward L. Dumpable rain gutter system. 4,072,285, Cl. 248-48.200.

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Griepentrog, Hartmut: *See—*
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Grier, John D., Sr., to Bala Electronics Corporation. Copper thick film conductor. 4,072,771, Cl. 427-96.000

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Griffith, Bobby D., to Caterpillar Tractor Co. Shear pin assembly for counterweights. 4,072,324, Cl. 280-759.000.

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Grosso, Vincent Gerard, to American Cyanamid Company. Preparation of 3,5-dialkyl-4-hydroxybenzoic acid. 4,072,707, Cl. 260-521.00C.

Groswith, Charles T., III; and Woodley, Ralph M., to Velo-Bind, Inc. Wrap-around cover for books. 4,072,326, Cl. 281-29.000.

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Gryga, John J., Jr.: *See—*
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Gsell, Laurenz: *See—*
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GTE Automatic Electric Laboratories Incorporated: *See—*
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Morgan, John H., 4,072,077, Cl. 83-418.000.

GTE Laboratories Incorporated: *See—*
Stone, Samuel M., 4,072,858, Cl. 250-205.000.

Guarino, John P.: *See—*
Due, George B.; and Guarino, John P., 4,072,592, Cl. 204-159.150.

Gudat, Wolfgang; and Ruhnau, Gerhard, to WABCO Westinghouse GmbH. Compensating circuit arrangement in a wheel anti-skid brake control system to obtain corresponding measured values of the duration of the half cycle alternations of a wheel generated voltage. 4,072,364, Cl. 303-95.000.

Guibet, Jean-Pierre: *See—*
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Guidinger, Dewayne C.: *See—*
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Guillaume, Jacques: *See—*
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Gujer, Hans. Method and device for the wet composting of organic sludge. 4,072,494, Cl. 71-9.000.

Gulf Oil Canada Limited: *See—*
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Gulf Research & Development Company: *See—*
Lakshmanan, Pallavoor R.; Swift, Harold E.; and Wu, Ching Yong, 4,072,808, Cl. 526-76.000.

Gunn, Jerome A.: *See—*
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Gunther, Gerd-Joachim, to Siemens Aktiengesellschaft. Apparatus for coding input data characters. 4,072,820, Cl. 178-23.00R.

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Guttman, Thomas, to United States of America, Army. Method of indicating the relative roughness of a surface. 4,072,425, Cl. 356-209.000.

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Haag, Michael; and Pichler, Herman P., to Rixson-Firemark, Inc. Switch actuating hinge. 4,072,917, Cl. 335-205.000.

Haag, Werner O.; and Whitehurst, Darrell Duayne, to Mobil Oil Corporation. Production of alcohol. 4,072,720, Cl. 260-618.00H.

Haberstroh, A. J.: *See—*
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Haffer, Gregor: *See—*
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Hahm, Heinz Guenter; and Neef, Klaus, to ITT Industries, Incorporated. Multi-part disc brake. 4,072,219, Cl. 188-218.0XL.

Halbritter, Guenter; Muehlthaler, Wolfgang; Sperber, Heinrich; Diem, Hans; Dudeck, Christian; and Lehmann, Gunter, to BASF Aktiengesellschaft. Manufacture of formaldehyde. 4,072,717, Cl. 260-603.00C.

Hales, Eric Charles, to Automotive Products Limited. Valve devices for use in liquid pressure braking systems of vehicles. 4,072,361, Cl. 303-6.00C.

Hall, David John: *See—*
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Hall, Godfrey Stephen: *See—*
Barnaby, Bernard Sydney; Coe, Cyril Walter; Hall, Godfrey Stephen; and Leworthy, John Harwood, 4,072,224, Cl. 197-1.00R.

Hall, Robert Eugene. Load carrying apparatus. 4,072,257, Cl. 224-29.00R.

Hallcher, Richard C.; Baizer, Manuel M.; and White, Donald A., to Monsanto Company. Electrolytic carboxylation of carbon acids via electrogenerated bases. 4,072,583, Cl. 204-59.00R.

Halliburton Company: *See—*
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Hamada, Hideo, to Nissan Motor Company, Limited. Apparatus for controlling actuating fluid pressure on vehicular friction clutch with compensation for decrease in friction coefficient at elevated temperature. 4,072,220, Cl. 192-.075.

Hamamoto, Toshikazu: *See—*
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Hamid, Michael A.; and Sandoz, Oscar A., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence Underwater monitoring. 4,072,941, Cl. 343-5.0NA.

Hamilton, James T., to Jaham Mfg. Co., Inc. Grain probe. 4,072,059, Cl. 73-423.00R.

Hamilton, Willard C.: *See—*
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Hampson, James W.: *See—*
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Hamstra, David C.: *See—*
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Hansen, Franklin A., to Continental Disc Corporation. Scored reverse buckling rupture disc assembly. 4,072,160, Cl. 137-68.00R.

Hansen, Kenneth N., to Allis-Chalmers Corporation. Clamp style wheel bushing. 4,072,357, Cl. 301-1.000.

Hanson, Donald N.; and Wilke, Charles R., to University of California, The Regents of the. Electrostatic precipitation process. 4,072,477, Cl. 55-10.000.

Hanson, William J., to Xerox Corporation. Screen for an electrophotographic printing machine. 4,072,414, Cl. 355-4.000.

Haraikawa, Tetsuo; and Karasudani, Yasuo, to Tokico Ltd. Disc brake with non-deformable yoke. 4,072,214, Cl. 188-72.400.

Haraikawa, Tetsuo, to Tokico Ltd. Disc brake guiding and support structure. 4,072,216, Cl. 188-73.300.

Haramoto, Yutaka; Nisikawa, Kazunori; and Yamazaki, Masami, to Victor Company of Japan, Ltd. Compression and expansion system with enlarged dynamic range. 4,072,914, Cl. 333-14.000.

Harari, Eliyahou, to Hughes Aircraft Company. Gate protection device for MOS circuits. 4,072,976, Cl. 357-23.000.

Harb, Mitchell A. Dual tire cutting machine. 4,072,072, Cl. 82-86.000.

Harco Products, Inc.: *See—*
Harder, Dane Jay, 4,072,272, Cl. 239-676.000.

Harder, Dane Jay, to Harco Products, Inc. Multi-purpose spreader. 4,072,272, Cl. 239-676.000.

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Harger, Virginia Ruth: *See—*
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Hargis, Duane C.; and Kehoe, Lawrence J., to Ethyl Corporation. Conversion of methanol and dimethyl ether to C_2-C_6 monoolefins using a partially hydrated zirconium sulfate catalyst. 4,072,732, Cl. 260-682.000.

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Harley, A. Leonard: *See—*
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Harlow, David Arthur; and Wood, Gillies, to Bentley Engineering Company Limited, The. Racking mechanisms. 4,072,029, Cl. 66-154.00R.

Harmansky, Absolon: *See—*
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Harmony, Richard C., to Harmony Emitter Company, Inc. Shower head aerator. 4,072,270, Cl. 239-428.500.

Harris, Frank N. Oil and water separators. 4,072,614, Cl. 210-305.000.

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Hartig, Wolfgang: *See—*
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Hartmann, Ludwig A., to ICI Americas Inc. Glycidyl ethers derived from 3,3',5,5'-tetraalkyl-4,4'-dihydroxybiphenyl. 4,072,656, Cl. 260-47.0EN.

Harvard Industries, Inc.: *See—*
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Hattori, Tadashi; Takada, Akira; Nakase, Takamichi; and Sugi, Fumio, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Air-to-fuel ratio adjusting system for an internal combustion engine. 4,072,137, Cl. 123-119.0DB.

Hauschildt, Klaus-Robert: *See—*
Kleeberg, Wolfgang; Hacker, Heinz; and Hauschildt, Klaus-Robert, 4,072,804, Cl. 526-11.200.

Hausen, Peter; and Schulz, Klaus-Dieter, to Hoesch Werke Aktiengesellschaft. Method of slagging molten metal. 4,072,505, Cl. 75-61.000.

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Hawkins, Clyde C.; and Hawkins, Jesse R., to Hawkins Enterprises, Inc. Fuel system. 4,072,138, Cl. 123-122.00E.

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Hawkins, Jesse R.: *See—*
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Hay, Johnny L. Rotary gas pressure engine system. 4,072,445, Cl. 417-379.000.

Hayami, Heijiro; Tsuchiya, Hiroyoshi; Yoshida, Kunio; Tsuda, Yukifumi; and Kanno, Yoshimitsu, to Matsushita Electric Industrial Co., Ltd. Ink injection type writing system using amplitude-modulated electrical signals. 4,072,958, Cl. 346-140.00R.

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Hayden, David E.; and Foucht, Millard E., to Owens-Corning Fiberglas Corporation. Polyurethane foam system. 4,072,623, Cl. 252-182.000.

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a press and method and jig for installing the same. 4,071,940, Cl. 29-468.000.
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Heiser, Joachim; Hoheisel, Rainer; Flaschar, Heinz; Gand, Heinz; Kleinschmidt, Heinz; Braunlinger, Konrad; Sopha, Klaus; Schempp, Roland; and Sanzenbacher, Hermann, to Robert Bosch GmbH. Hydraulic control system. 4,072,169, Cl. 137-596.130.
Heisler, Raymond A. Apparatus and method for automatically feeding and erecting folded cartons. 4,072,090, Cl. 93-53.00M.
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Heller, Larry E.; Shriver, Joe E.; and Lindblom, Curtis H., to Sperry Rand Corporation. Rotary severing mechanism for a row crop header. 4,072,002, Cl. 56-53.000.
Heller, Lawrence Griffith; and Terman, Lewis Madison, to International Business Machines Corporation. Analog-to-digital and digital-to-analog converter circuits employing charge redistribution. 4,072,939, Cl. 340-347.0AD.
Hellman, Robert R.; and French, Douglas M., to Westport International. Remote control radio system. 4,072,898, Cl. 325-37.000.
Helms, Hosea W. Corner protector. 4,072,231, Cl. 206-453.000.
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Hermann, David Trimble, to American Cyanamid Company. Cellulosic textile treated with low formaldehyde fully etherified methylolated melamine with urea-formaldehyde-glyoxal. 4,072,466, Cl. 8-183.000.
Hermans, Johny C., to S.A. Texaco Belgium N.V. Novel process. 4,072,633, Cl. 260-2.00N.
Hershman, Arnold; and Gambell, James W., to Monsanto Company. Oxidation of phosphonomethylamines. 4,072,706, Cl. 260-502.500.
Herweg, Peter; and Barthel, Werner, to Bayer Aktiengesellschaft. Insulating elements for walls and ceilings. 4,072,788, Cl. 428-139.000.
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Rampel, Hans; Hess, Peter; and Becker, Herbert, 4,071,978, Cl. 49-348.000.
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Hickman, John B., to W. P. Hickman Company, Inc. Gravel stop. 4,071,987, Cl. 52-94.000.
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Higgins, John Tyson, to Cominco Ltd. Recovery of ammonia from underground storage. 4,072,024, Cl. 62-50.000.
Hijikata, Akiko: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,072,743, Cl. 424-177.000.
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Hildebrandt, Ullrich, to Linde Aktiengesellschaft. Cable connection for low-temperature cable. 4,072,815, Cl. 174-15.00S.
Hill, Joseph Henry; and Green, David Frederick, to Vandervell Products Limited. Bearings for railway vehicle axles. 4,072,371, Cl. 308-56.000.
Hiller, Trueman W.; and Hamstra, David C., to Wylain, Inc. Method and apparatus for detecting a blockage in a vapor flow line. 4,072,934, Cl. 340-243.000.
Hinkle, Richard E., to American Hydrotherm Corporation. Process and apparatus for the cyclic heating and cooling of processing equipment. 4,072,184, Cl. 165-18.000.
Hinsche, Friedrich; and Schaupp, Kurt, to Bayer Aktiengesellschaft. Production of floor toppings by flowing inorganic binder suspensions over porous open-cell underlays. 4,072,786, Cl. 428-537.000.
Hintermann, Hans Erich: *See—*
Gass, Hans; Hintermann, Hans Erich; and Griepentrog, Hartmut, 4,072,797, Cl. 428-409.000.
Hirame, Yasutel; and Nakamura, Youichi, to Fuji Chemical Industries Company. Refractory furnace wall coating. 4,072,530, Cl. 106-44.000.
Hirasaka, Toshio: *See—*
Tsuto, Keiichi; Majima, Kanji; and Hirasaka, Toshio, 4,072,470, Cl. 23-284.000.
Hirata, Noritsugu; Takigawa, Tomoshi; and Ishikawa, Kazuo, to Canon Kabushiki Kaisha. Release device of motion picture camera. 4,072,409, Cl. 352-174.000.
Hirshaut, Yashar, to Helfgott, Samson; and Benjamin, Jack W. Method and miniaturized apparatus for cultivating bacteria. 4,072,577, Cl. 195-104.000.
Hisada, Toshihiko: *See—*
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Hitachi, Ltd.: *See—*
Ishida, Masahiko; Oguri, Yoshitaka; Shimizu, Norio; and Muroi, Tadashi, 4,072,667, Cl. 260-112.00R.
Suda, Kyo; Takami, Katsumi; Shintani, Akira; and Hase, Shinobu, 4,072,767, Cl. 427-8.000.
Hoechst Aktiengesellschaft: *See—*
Idstein, Hermann, 4,072,306, Cl. 271-3.000.
Kramer, Karl; and Durst, Karlheinz, 4,072,233, Cl. 206-634.000.
Linke, Fritz; Dursch, Walter; and Kleiner, Hans-Jerg, 4,072,776, Cl. 427-390.00D.
Muller, Werner Heinrich; Hey, Hansjorg; and Weil, Tomas, 4,072,660, Cl. 260-621.00H.
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Rochlitz, Jurgen; and Schon, Gunter, 4,072,520, Cl. 96-1.50R.
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Denzel, Theodor; and Hoehn, Hans, 4,072,680, Cl. 260-256.40F.
Denzel, Theodor; and Hoehn, Hans, 4,072,681, Cl. 260-256.40F.
Hoehn, Robert A., to Mid-West Conveyor Company, Inc. Conveyor carrier with actuated dog. 4,072,111, Cl. 104-172.00S.
Hoesch Werke Aktiengesellschaft: *See—*
Hausen, Peter; and Schulz, Klaus-Dieter, 4,072,505, Cl. 75-61.000.
Kowallik, Josef, 4,071,942, Cl. 29-469.500.
Hoffman, John Ronald; and Marsland, Peter John, to American Cyanamid Company. Short-crimp surgical needle. 4,072,041, Cl. 72-416.000.
Hoffman-La Roche Inc.: *See—*
Dabal, Dennis Joseph; and Williams, Joseph James, 4,072,551, Cl. 156-378.000.
Hoffman, Richard A.: *See—*
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Tanaka, Tadashi; Okamoto, Akira; Kouno, Takashi; Kramer, William E.; Hopkins, Richard H.; and Hoffman, Richard A., 4,072,657, Cl. 260-47.0UA.
Hoffmann, Herwig: *See—*
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Hoffmann-La Roche Inc.: *See—*
Boguth, Walter; Leuenberger, Hans Georg Wilhelm; Mayer, Hans Johann; Widmer, Erich; and Zell, Reinhard, 4,072,715, Cl. 260-586.00R.
Maestrone, Gian Paolo; and Mitrovic, Milan, 4,072,749, Cl. 424-273.00R.
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Hogan, James A.; and Sklaroff, Morton, to Honeywell Inc. Digital computer monitoring and restart circuit. 4,072,852, Cl. 235-303.100.

Hoheisel, Rainer: *See—*
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Holmes, John, to William Machinery Limited. Breaker apparatus. 4,072,354, Cl. 299-37.000.
Homuth, Kenneth C. Hydraulic cylinder with concentricaly maintained piston and rod. 4,072,434, Cl. 403-263.000.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Yashima, Michio; Senzaki, Takaya; and Kurihara, Norimitsu, 4,072,925, Cl. 340-52.00F.
Honegger, Werner; and Muller, Erwin, to Ferag AG. Apparatus for evening an imbricated stream of printed products. 4,072,228, Cl. 198-459.000.
Honeywell Inc.: *See—*
Beiter, Glenn A., 4,072,883, Cl. 318-257.000.
Hogan, James A.; and Sklaroff, Morton, 4,072,852, Cl. 235-303.100.
Kabat, John L., 4,072,866, Cl. 307-41.000.
Westbrook, L. V.; and Payne, R. L., 4,072,890, Cl. 323-22.00R.
Whitehead, Robert C., Jr., 4,072,058, Cl. 73-720.000.
Honeywell Information Systems Inc.: *See—*
Barlow, George J.; and Nibby, Chester M., Jr., 4,072,853, Cl. 235-312.000.
Wilson, Edward A.; and Fredenberg, James D., 4,072,188, Cl. 165-80.000.
Hoornstra, Clayton W.; and Stevens, Violete L., to Dow Chemical Company, The. Gelled photopolymer composition and methods of making them. 4,072,529, Cl. 96-115.00R.
Hopkins, Richard H.: *See—*
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Horisberger, Marc; and Olofsson, Mats, to Societe d'Assistance Technique pour Produits Nestle S.A. Isolation of cystoplasmic proteins using chitosan. 4,072,666, Cl. 260-112.00R.
Horiuchi, Takeshi. Variable delivery hydraulic pump. 4,072,442, Cl. 417-218.000.
Horn, Herwig, to Pluss-Staufer AG; and Zentrum fur Elektronemikroskopie. Method and apparatus for determining the reflective properties of surfaces, especially coated surfaces. 4,072,426, Cl. 356-212.000.
Horn, Vladimir: *See—*
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Hoshiyama, Masao: *See—*
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Houdek, Calvin D.: *See—*
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Hoult, Frederick Herbert, to W. H. Booth & Co. Limited. Process and mould for casting multiple articles. 4,072,180, Cl. 164-130.000.
House of Hints Corporation: *See—*
Chernewski, Albert J., 4,071,976, Cl. 47-39.000.
Howes, Randolph M. Venous catheter device. 4,072,146, Cl. 128-2.05D.
Hrabak, Frantisek; Bezdek, Milan; Hynkova, Vlasta; and Bouchal, Karel, to Ceskoslovenska akademie ved. Method for producing polymers. 4,072,805, Cl. 526-43.000.
Hu, Paul Yu-Fei: *See—*
Garcia, Joe La; Griffing, Brandt Mead; Hu, Paul Yu-Fei; and Millington, Richard George, 4,072,101, Cl. 101-93.150.
Huang, Barney K. Automatic seed singulating and dispensing apparatus. 4,072,251, Cl. 222-333.000.
Huang, Jen-chi: *See—*
Golda, Eugene; Huang, Jen-chi; Shimazu, Ken-ichi; and Chu, Simon Long, 4,072,589, Cl. 204-129.400.
Hudimac, George S., to Mechanical Service Company, Inc. Stacked, plug-in relays. 4,072,389, Cl. 339-119.00R.
Huffman, William Francis: *See—*
Gleason, John Gerald; Holden, Kenneth George; and Huffman, William Francis, 4,072,674, Cl. 260-239.00A.
Hughes Aircraft Company: *See—*
Harari, Eliyahou, 4,072,976, Cl. 357-23.000.
Hulligan, Jeffrey A., to J. P. Suggins Mobile Welding. Slip joint for disposal chute. 4,071,991, Cl. 52-204.000.
Hung, Jui Jung. Electric plug formed by squeezing assembly. 4,072,391, Cl. 339-196.00R.
Hunsucker, Jerry Hoyt, to IMC Chemical Group, Inc. Method of controlling the growth of bacteria and fungi using N-hydroxymethylalkylene diamines. 4,072,741, Cl. 424-325.000.
Huppertz, Josef: *See—*
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Huskins, Chester W., to United States of America, Army. Tri-functional isocyanate crosslinking agents for hydroxy-terminated polybutadiene binders. 4,072,702, Cl. 260-453.0AB.
Huston, Harold: *See—*
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Hutter, Charles G., III, to Physical Systems, Inc. Removable door-locking device. 4,072,333, Cl. 292-292.000.
Huwyler, Franco, to Fabbrica Italiana Magneti Marelli S.p.A. Apparatus for determining the angular position of a rotating member using reference and position elements that generate opposite polarity bipolar signals. 4,072,893, Cl. 324-208.000.
Hylton, Thomas A.; and Shenton, Francis L., to Upjohn Company, The. Resolution of aminonitriles. 4,072,698, Cl. 260-465.00E.
Hynkova, Vlasta: *See—*
Hrabak, Frantisek; Bezdek, Milan; Hynkova, Vlasta; and Bouchal, Karel, 4,072,805, Cl. 526-43.000.
I-T-E Imperial Corporation: *See—*
Kussy, Frank W., 4,072,916, Cl. 335-16.000.
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ICI Americas Inc.: *See—*
Hartmann, Ludwig A., 4,072,656, Cl. 260-47.0EN.
Kruse, Walter M.; and Wright, Leon W., 4,072,628, Cl. 252-415.000.
Idel, Vladimir Viktorovich. Band saw teeth working machine. 4,072,068, Cl. 76-58.000.
Idstein, Hermann, to Hoechst Aktiengesellschaft. Sheet feed apparatus. 4,072,306, Cl. 271-3.000.
Ignatov, Viktor Alexandrovich: *See—*
Zorev, Nikolai Nikolaevich; Astafiev, Anatoly Alexandrovich; Loboda, Alexandr Sergeevich; Savukov, Vladimir Pavlovich; Runov, Andrei Efimovich; Belov, Vladimir Alexandrovich; Sobolev, Jury Vasilievich; Sobolev, Valentin Vasilievich; Pavlov, Nikolai Mikhailovich; Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Balandin, Jury Fedorovich; Gorynin, Igor Vasilievich; Zvezdin, Jury Ivanovich; Ivanov, Kuzma Makeevich; Ignatov, Viktor Alexandrovich; and Emelyanenko, July Georgievich, 4,072,509, Cl. 75-124.000.
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Ikezaki, Muneyoshi; Ito, Nobuo; Okazaki, Yasushi; Hoshiyama, Masao; Nagao, Taku; and Nakajima, Hiromichi, to Tanabe Seiyaku Co., Ltd. Novel benzylalcohol derivatives as antidiabetics and cardiotonics. 4,072,759, Cl. 424-330.000.
Ilinkov, Dmitry Vladimirovich: *See—*
Brusako, Jury Ivanovich; Rzhavin, Sergei Alexandrovich; Kiselev, Vasily Pavlovich; Tarasov, Mikhail Sergeevich; Rapoport, Vladimir Mendeleevich; Timofeev, Vladimir Vasilievich; Ragulina, Raisa Ivanovna; Alivoivodich, Miro Khristoforovich; Kucherenko, Anatoly Gavrilovich; Varjushenkov, Anatoly Mikhailovich; Isaeva, Elena Pavlovna; Berezhnoi, Ivan Arkhipovich; Rumyantsev, Vasily Petrovich; Shpak, Grigory Safronovich; Guz, Dmitry Semenovich; Ilinkov, Dmitry Vladimirovich; Volpin, Pavel Ilich; Avdeev, Mikhail Pavlovich; Artemenko, Stanislav Arsentievich; and Khrennikova, Ljudmila Pavlovna, 4,072,512, Cl. 75-148.000.
Illig, Edwin J., to Corning Glass Works. Apparatus and process for producing a gradient photochromic ophthalmic lens. 4,072,490, Cl. 65-30.00R.
Illinois Tool Works Inc.: *See—*
Baer, Martin Alfred, 4,071,918, Cl. 10-10.00R.
Curtis, Gary Martin; and Wagner, David Prugh, 4,072,081, Cl. 85-62.000.
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Ravey, Mani; Shorr, Leonard Marshall; and Waterman, Jacques A., deceased, 4,072,806, Cl. 526-89.000.
Imler, Vaughn R., to PPG Industries, Inc. Method and apparatus for reshaping glass sheets. 4,072,493, Cl. 65-107.000.
Imperial Chemical Industries Limited: *See—*
Darragh, John Irvine, 4,072,684, Cl. 260-290.00P.
Goodhart, Rupert Richard Francis Gerard Heron, 4,072,208, Cl. 181-401.000.
Pinto, Alwyn, 4,072,625, Cl. 252-373.000.
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Smith, John Lionel, 4,071,936, Cl. 29-237.000.
Imperial Oil Limited: *See—*
Kizior, Thaddeus Eugene, 4,072,609, Cl. 210-73.00R.
Ing. C. Olivetti & C., S.p.A.: *See—*
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Ingersoll-Rand Company: *See—*
Friend, Lindsay Carlton, 4,072,176, Cl. 140-93.00R.
Ingerthorpe Holdings Limited: *See—*
Gow, James Gordon; and England, Alan Gordon, 4,072,610, Cl. 210-90.000.
Inoue, Kazuya; and Katano, Yukio, to Kabushiki-Kaisha K I P. Apparatus of generating control signals for controlling an operation of an electrophotographic copying machine. 4,072,415, Cl. 355-14.000.
Inoue, Takehisa; Ogawa, Yutaka; Sugita, Hiroaki; and Watanabe, Namio, to Akebono Brake Industry Co., Ltd. Discs brake of floating caliper type. 4,072,217, Cl. 188-73.600.
Inouye, Kozo; Yokota, Yukio; and Nakazyo, Kiyoshi, to Fuji Photo Film Co., Ltd. Silver halide photographic material containing two-equivalent color coupler. 4,072,525, Cl. 96-55.000.
Institut de Recherches de la Siderurgie Francaise Irsid: *See—*
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Institut Francais du Petrole: *See—*
Sarda, Jean-Paul; and Le Tirant, Pierre, 4,072,193, Cl. 166-280.000.
Institute for Cancer Research, The: *See—*
Loeb, Lawrence A.; and Sirover, Michael A., 4,072,574, Cl. 195-103.50R.
Instituto Venezolano de Investigaciones Cientificas: *See—*
Sosa, Jose M., 4,072,640, Cl. 260-17.4GC.
Institutul de Cercetari si Proiectari Pentru Utilaje de Constructii de Drumuri(I.C.P.U.C.) Braila: *See—*
Daschievici, Stefan, and Ferat, Cezar, 4,072,009, Cl. 60-484.000.
Instone, John C., to SGL Industries, Inc. Mounting arrangement for cased electrical components. 4,072,401, Cl. 339-125.00R.
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Joscelyn, Edwin, 4,072,831, Cl. 179-188.000.
Instrumentation Specialties Company: *See—*
Lederer, Louis Franklin, 4,072,052, Cl. 73-215.000.
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Saltzman, William H., 4,072,695, Cl. 260-397.100.
Interatom, Internationale Atomreaktorbau GmbH: *See—*
Friedrich, Hans-Jurgen, 4,072,561, Cl. 176-38.000.
Interdyne Company: *See—*
Lewis, Richard A., 4,072,279, Cl. 242-192.000.
Lewis, Richard A., 4,072,280, Cl. 242-195.000.
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Bechtle, Bastian; Schuenemann, Claus; Skudelny, Gisbert; Spruth, Wilhelm; Weis, Helmut; and Zimmermann, Volker, 4,072,888, Cl. 318-685.000.
Case, William John Philip; and Commander, Robert Duncan, 4,072,990, Cl. 360-77.000.
De La Moneda, Francisco H., 4,072,545, Cl. 148-187.000.
De La Moneda, Francisco H.; and Kotecha, Harish N., 4,072,868, Cl. 307-214.000.
Garcia, Joe La; Griffing, Brandt Mead; Hu, Paul Yu-Fei; and Millington, Richard George, 4,072,101, Cl. 101-93.150.
Gedney, Ronald Walker; and Rasile, John, 4,072,816, Cl. 174-52.0FP
Heller, Lawrence Griffith; and Terman, Lewis Madison, 4,072,939, Cl. 340-347.0AD
Manning, Donald Franklin; and Ryan, Robert Allan, 4,072,225, Cl. 197-133.00R.
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Phillips, Carmen S., 4,072,096, Cl. 100-53.000.
International Power Technology, Inc.: *See—*
Cheng, Dah Yu, 4,072,182, Cl. 165-1.000.
International Telephone & Telegraph Corporation: *See—*
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Internationale Octrooi Maatschappij "Octropa" B.V.: *See—*
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Conant, Louis A.; Bolton, Wilbur Monroe; and Wilson, James Ellsworth, 4,072,243, Cl. 215-12.00R.
Inubushi, Masanobu; Yamamoto, Hajime; and Nagata, Osamu, to Kawasaki Jukogyo Kabushiki Kaisha. Chemical reaction furnace system. 4,072,006, Cl. 60-39.250.
Ipri, Alfred Charles, to RCA Corporation. Silicon resistive device for integrated circuits. 4,072,974, Cl. 357-23.000
IRL Daffin Associates, Inc.: *See—*
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Irrigation Engineering & Specialties: *See—*
Voss, Hubert E.; and Roth, Ronald W., 4,072,271, Cl. 239-541.000.
Irwin, Gordon A., to Steiger Tractor Inc. Air conditioning apparatus for tractor cab. 4,072,487, Cl. 62-244.000.
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Isaia, Robert L., to Caterpillar Tractor Co. Door latch having overcenter spring. 4,072,332, Cl. 292-228.000.
Ishida, Masahiko; Oguri, Yoshitaka; Shimizu, Norio; and Muroi, Tadashi, to Hitachi, Ltd. Process for recovering microbial cellular proteins. 4,072,667, Cl. 260-112.00R.
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Ishitani, Akiyasu, to Sony Corporation. Insulated gate field effect transistor. 4,072,975, Cl. 357-23.000.
Israels, Sylvan H.: *See—*
Lewis, William; Weldon, Peter J.; Hagedorn, Henry, Jr.; Hayes, Thomas E.; and Israels, Sylvan H., 4,072,108, Cl. 102-70.20R.
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Ito, Hiroyuki; and Imai, Hirosuke, to Nippon Oil Company Limited. Conjugated diene-maleic acid derivative compositions and process for preparing the same. 4,072,646, Cl. 260-29.70H.
Ito, Nobuo: *See—*
Ikezaki, Muneyoshi; Ito, Nobuo; Okazaki, Yasushi; Hoshiyama, Masao; Nagao, Taku; and Nakajima, Hiromichi, 4,072,759, Cl. 424-330.000.
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ITT Industries, Incorporated: *See—*
Burgdorf, Jochen; Eikenberg, Dieter; Stoka, Roberto; and Marianu, Vlod, 4,072,215, Cl. 188-72.400.
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Iwasaki, Minoru: *See—*
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Andow, Fumio; Matsushima, Tetsuo; and Iwasaki, Minoru, 4,073,009, Cl. 364-602.000.
Iwata, Hiroshi; and Ishikawa, Katsuji, to West Electric Co., Ltd. Programme-controlled shutter. 4,072,963, Cl. 354-31.000.
Iwatsu Electric Company, Ltd.: *See—*
Kokaji, Norio; and Urano, Toshihiro, 4,072,957, Cl. 346-74.100.
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Waly, Adnan, 4,072,416, Cl. 355-46.000.
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Schiel, Christian, 4,072,557, Cl. 162-111.000.
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Hulligan, Jeffrey A., 4,071,991, Cl. 52-204.000.
J. Uriach y Cia, S.A.: *See—*
Marin Moga, Antonio Carmelo, 4,072,758, Cl. 424-321.000.
Jabsen, Felix S., to Babcock & Wilcox Company, The. Motion restraining apparatus for a nuclear reactor. 4,072,564, Cl. 176-76.000.
Jagenberg-Werke AG: *See—*
Buschmann, Gerhard; and Spohr, Reinhard, 4,072,887, Cl. 318-675.000.
Jaham Mfg. Co., Inc.: *See—*
Hamilton, James T., 4,072,059, Cl. 73-423.00R.
Jahn, Alex K., to Dow Badische Company. Finish for acrylic fiber. 4,072,617, Cl. 252-8.900.
James, Forrest T.; and Guy, Stephen L., to Burlington Industries, Inc. Method for applying a foam backing to fabric. 4,072,775, Cl. 427-373.000.
James Hardie & Coy. Pty. Limited: *See—*
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James, Henry: *See—*
Johnson, Carl B.; and James, Henry, 4,072,342, Cl. 297-84.000.
James Perris Co., Inc., The: *See—*
Perris, James, 4,072,268, Cl. 236-78.00C.
Janelid, Erik Ingvar. Method for mining of rock or ore according to the block caving principle in massive formations. 4,072,352, Cl. 299-19.000.
Janssen, Frank J., to Shell Oil Company. Regeneration of alkene disproportionation catalyst. 4,072,629, Cl. 252-416.000.
Japan Atomic Energy Research Institute: *See—*
Araki, Kunio; Sasaki, Takashi; Kasahara, Yuko; Yamashita, Yoshisada; Yotumoto, Keiichi; Sunaga, Hiromi; Tabei, Kiyoshi; Goto, Kazuo; Tajiri, Kunio; and Kittaka, Hirokama, 4,072,792, Cl. 428-246.000.
Jayawant, Bhalchandra Vinayak, to University of Sussex, The. Electromagnetic suspension assembly. 4,072,110, Cl. 104-148.0MS.
Jen-Shuy, Ren. Automatic noodle machine. 4,072,454, Cl. 425-101.000.
Jeram, Edward M., to General Electric Company. Organosiloxane gels. 4,072,635, Cl. 260-2.50S.
Jeumont-Schneider: *See—*
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Johnson, Ben C.; Thornton, J. Scott; Glowe, Donald E.; Cassidy, Patrick E.; and Anderson, Robert E., to Thermon Manufacturing Company. Electrical heating cable with temperature self-limiting heating elements. 4,072,848, Cl. 219-528.000.
Johnson, Carl B.; and James, Henry, to Pontiac Furniture Industries, Inc. Recliner chair. 4,072,342, Cl. 297-84.000.
Johnson, Henry Charles, to RCA Corporation. Monotonically ranging FM-CW radar signal processor. 4,072,947, Cl. 343-14.000.
Johnson, Joe, Jr., to Coats & Clark Inc. Noise reducing inserts for spindle tape idlers. 4,072,367, Cl. 308-18.000.
Johnston, William C., to Kysor Industrial Corporation. Air defrost reach-in refrigerated display cabinet. 4,072,488, Cl. 62-282.000.
Jones, Edward Stephen: *See—*
Nychka, Henry Robert; Eibeck, Richard Elmer; Robinson, Martin Alvin; and Jones, Edward Stephen, 4,072,726, Cl. 260-633.000.
Jones, Eric, to English Electric Valve Co., Ltd. Combustible gas detectors. 4,072,467, Cl. 23-254.00E.
Jones, Richard S. Signaling device for mailboxes. 4,072,265, Cl. 232-35.000.
Joscelyn, Edwin, to Instrument Systems Corporation. Voice transmitting apparatus for a breathing mask. 4,072,831, Cl. 179-188.000.
Joseph, Ruth. See-through, smoked gray, plexiglass refrigerator door. 4,072,486, Cl. 62-131.000.
Joyce, Ronald S.: *See—*
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McConnell, Richard L.; Weemes, Doyle A.; and Joyner, Frederick B., 4,072,813, Cl. 526-348.200.
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Julius, Robert P., to Nice-Pak Products, Inc. Highly absorbent sponge. 4,071,955, Cl. 32-34.000.
Junghans, Rudi; and Beisel, Hermann, to Heidelberger Druckmaschinen AG. Washing device for cleaning the blanket cylinder of an offset printing press. 4,072,106, Cl. 101-425.000.
Jury, Daniel E., to Raymond Lee Organization, Inc., The, a part interest. Disposable grease absorbing mill. 4,071,921, Cl. 15-227.000.
K & F Manufacturing Co., Inc.: *See—*
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Kabat, John L., to Honeywell Inc. Proportional temperature control system incorporating a linear delay. 4,072,866, Cl. 307-41.000.
Kabel-und Metallwerke: *See—*
Ziemek, Gerhard; and Schatz, Friedrich, 4,072,035, Cl. 72-209.000.
Kabushiki Kaisha Daini Seikosha: *See—*
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Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo: *See—*
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Kabushiki Kaisha Tokyo Kikai Seisakusho: *See—*
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Kaden, Walter Erich. Diaphragm operated float controlled valve. 4,072,164, Cl. 137-414.000.
Kaganowicz, Grzegorz; and Robinson, John Walter, to RCA Corporation. Video disc with a dielectric layer formed from styrene and nitrogen. 4,072,985, Cl. 358-128.000.
Kahn, Benjamin. Tennis racquet handle constructions. 4,072,312, Cl. 273-75.000.
Kaiser, Arthur, to Thomson-CSF Laboratories, Inc. Chrominance-luminance separator. 4,072,984, Cl. 358-31.000.
Kaiser, Georges J., to Fabrique Nationale Herstal S.A. Axial piston pumps. 4,072,444, Cl. 417-269.000.
Kaiser, Victor: *See—*
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Kajima Kensetsu Kabushiki Kaisha: *See—*
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Kaloi, Cyril M., to United States of America, Navy. Notch fed twin electric micro-strip dipole antennas. 4,072,951, Cl. 343-700.0MS.
Kaltenbach & Voigt: *See—*
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Kamaike, Hiroshi: *See—*
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Kaminaka, Nobuyuki: *See—*
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Kanebo, Ltd.: *See—*
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Kao Soap Co., Ltd.: *See—*
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Karataev, Valery Ivanovich: *See—*
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Karrer, Friedrich: *See—*
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Kasahara, Yuko: *See—*
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Kaspar, Gunther: *See—*
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Katano, Yukio: *See—*
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Katsumata, Masaaki; and Fujiki, Norio, to Nissan Motor Company, Limited. Radar-operated collision avoidance system for roadway vehicles using stored information for determination of valid objects. 4,072,945, Cl. 343-7.0VM.
Katsuo, Kenichi: *See—*
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Kaukeinen, Joseph Yorks: *See—*
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Kawakami, Susumu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Dual-system master cylinder. 4,072,012, Cl. 60-562.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See—*
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Kawasaki Steel Corporation: *See—*
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Kayser, Detlev: *See—*
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Kearin, Roger Michael: *See—*
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Keelty, James Malcolm, to RCA Corporation. Wide acquisition range MSK demodulator input circuit. 4,072,905, Cl. 329-122.000.
Kehoe, Lawrence J.: *See—*
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Hargis, Duane C.; and Kehoe, Lawrence J., 4,072,733, Cl. 260-682.000.
Kemp, Willard E., to ACF Industries, Incorporated. Visual indicator for safety systems. 4,072,126, Cl. 116-125.000.
Kennecott Copper Corporation: *See—*
Godrick, Joseph A.; and Sliney, Joseph Leo, 4,072,262, Cl. 228-265.000.
Kent, David W. Security apparatus for vehicle communications accessory. 4,072,031, Cl. 70-58.000.
Kenworthy, Milton James; and Woltmann, Ivan Elmer, to General Electric Company. Variable area bypass injector system. 4,072,008, Cl. 60-261.000.

Kepic, Stefan: *See—*
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Kergueno, Joseph: *See—*
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Kersting, Arno: *See—*
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Kesl, Elmer M.: *See—*
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Kikumoto, Ryoji: *See—*
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Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,072,744, Cl. 424-177.000.
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Kimberly Rose Company, Inc.: *See—*
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Kimura, Yoshiaki; and Ito, Hiroshi, to Konishiroku Photo Industry Co., Ltd. Light interference device with low degree of spacial coherence. 4,072,423, Cl. 356-109.000.
Kinoshita, Yoshio; and Iguchi, Masayuki, to Glory Kogyo Kabushiki Kaisha. Control system of coin-operated locker. 4,072,223, Cl. 194-54.000.
Kirschner, Fritz, to Siemens Aktiengesellschaft. Thyristor. 4,072,980, Cl. 357-38.000.
Kiselev, Vasily Pavlovich: *See—*
Brusako, Jury Ivanovich; Rzhavin, Sergei Alexandrovich; Kiselev, Vasily Pavlovich; Tarasov, Mikhail Sergeevich; Rapoport, Vladimir Mendeleevich; Timofeev, Vladimir Vasilievich; Ragulina, Raisa Ivanovna; Alivoivodich, Miro Khristoforovich; Kucherenko, Anatoly Gavrilovich; Varjushenkov, Anatoly Mikhailovich; Isaeva, Elena Pavlovna; Berezhnoi, Ivan Arkhipovich; Rumyantsev, Vasily Petrovich; Shpak, Grigory Safronovich; Guz, Dmitry Semenovich; Ilinkov, Dmitry Vladimirovich; Volpin, Pavel Ilich; Avdeev, Mikhail Pavlovich; Artemenko, Stanislav Arsentievich; and Khrennikova, Ljudmila Pavlovna, 4,072,512, Cl. 75-148.000.
Kitagawa, Norihisa; and White, Lionel Stuart, Jr., to Texas Instruments Incorporated. Clock generator for semiconductor memory. 4,072,932, Cl. 365-233.000.
Kitai, Mitsuo; and Yamashita, Koichi, to Kabushiki Kaisha Tokyo Kikai Seisakusho. Apparatus for sampling printed sheets from a continuous stream of such sheets. 4,072,060, Cl. 73-423.00R.
Kitajima, Tadayuki; and Tohyama, Yoshikuni, to Canon Kabushiki Kaisha. Driving device for a moving body. 4,072,211, Cl. 185-40.00R.
Kitamori, Teruaki: *See—*
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Kitamoto, Tatsuji: *See—*
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Kitao, Yoshinobu: *See—*
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Kittaka, Hirokama: *See—*
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Kizior, Thaddeus Eugene, to Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources; Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources, Alberta Syncrude Equity; Ontario Energy Corporation; Imperial Oil Limited; Canada-Cities Service, Ltd.; and Gulf Oil Canada Limited. Capacitance system for heavy phase discharge of second stage centrifugal separation circuit. 4,072,609, Cl. 210-73.00R.
Klauke, Erich: *See—*
Rohe, Lothar; Schramm, Jurgen; Klauke, Erich; Eue, Ludwig; and Schmidt, Robert Rudolf, 4,072,500, Cl. 71-98.000.
Kleeberg, Wolfgang; Rubner, Roland; and Bartel, Wieland, to Siemens Aktiengesellschaft. Mixtures yielding thermally stable photo-cross-linkable layers and foils. 4,072,524, Cl. 96-35.100.
Kleeberg, Wolfgang; Hacker, Heinz; and Hauschildt, Klaus-Robert, to Siemens Aktiengesellschaft. Cross-linkable epoxy resin casting compounds. 4,072,804, Cl. 526-11.200.
Kleiner, Hans-Jerg: *See—*
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Kleinschmidt, Heinz: *See—*
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Klett, Gene R., to Caterpillar Tractor Co. Quick change corner tooth assembly for loader buckets. 4,071,967, Cl. 37-141.00T.
Kline, Richard H., to Goodyear Tire & Rubber Company, The. 3-(4-Anilinophenoxy)-2-hydroxypropyl sulfides, ethers and amines as antioxidants. 4,072,654, Cl. 260-45.9QB.
Kluy, Werner: *See—*
Feichtinger, Hans; Lutze, Siegfried; Birnkraut, Hans-Walter; and Kluy, Werner, 4,072,659, Cl. 260-57.00A.
Kmita, Tatyana Georgievna: *See—*
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Kneefel, Wim Bernard Samuel Maria. Method and apparatus for measuring the distance between two stations. 4,072,946, Cl. 343-12.00R.
Knieser, James J., to Xerox Corporation. Corner sheet stripper. 4,072,307, Cl. 271-174.000.
Knight, Charles E., Jr.; Kovach, Louis; and Hurst, Jonn S., to United States of America, Energy. Graphite fiber reinforced structure for supporting machine tools. 4,072,084, Cl. 90-11.00A.
Knox, Kenneth Leith; and Lees, Joseph Kolb, to Du Pont de Nemours, E. I., and Company. Polyethylene terephthalate film. 4,072,779, Cl. 428-220.000.
Knox Manufacturing Co.: *See—*
Brown, Donald J., 4,072,404, Cl. 350-117.000.
Knox, Robert M.; and Toulios, Peter P., to Epsilon Lambda Electronics Corporation. Receiver module and mixer thereof. 4,072,902, Cl. 325-446.000.
Kobe Steel, Ltd.: *See—*
Murakado, Hiroshi; Nakata, Kazuhiro; Usui, Eiki; Tamiya, Tetsuo; Chikuda, Masahiro; Kitao, Yoshinobu; and Fujiwara, Akira, 4,072,542, Cl. 148-11.50A.
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Koehler, Wolfgang: *See—*
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Kohli, Martti Ilmari; Eklund, Fjalar Ernst Erik; and Callerhorn, Bo Allan, to Concordia Development AB. Method of and an apparatus for preparing a food product. 4,072,092, Cl. 99-389.000.
Kohno, Yoshiki: *See—*
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Kok, Cornelis Hendrik, to U.S. Philips Corporation. Automatic magnetic-tape cassette changing device. 4,072,991, Cl. 360-92.000.
Kokaji, Norio; and Urano, Toshihiro, to Iwatsu Electric Company, Ltd. Non-impact printing system with magnetic recording apparatus and method. 4,072,957, Cl. 346-74.100.
Kokubo, Toshihiro, to Diesel Kiki Co., Ltd. Automotive speed control device. 4,072,207, Cl. 180-108.000.
Koleff, Boris; and Hofmann, Wilfried, to AGFA-Gevaert Aktiengesellschaft. Apparatus for optical scanning of microfilms or the like. 4,072,860, Cl. 250-216.000.
Kollmorgen Technologies Corporation: *See—*
Arnold, Frank, Jr., 4,072,874, Cl. 310-268.000.
Kondo, Takashi: *See—*
Oshima, Takeo; and Kondo, Takashi, 4,072,854, Cl. 235-92.0SB.
Kondo, Toshihiro, to Fuji Photo Film Co., Ltd. Electronic shutter control circuit. 4,072,965, Cl. 354-51.000.
Kondo, Toshiyuki, to Aisin Seiki Kabushiki Kaisha. Anti-skid control apparatus. 4,072,366, Cl. 303-116.000.
Konishiroku Photo Industry Co., Ltd.: *See—*
Kimura, Yoshiaki; and Ito, Hiroshi, 4,072,423, Cl. 356-109.000.
Konomi, Tuyoshi; Endo, Seiji; Yamaguchi, Masayasu; and Katsuo, Kenichi, to Toyobo Co., Ltd. Aromatic polyamides from N,N'-bis(p-aminobenzoyl)ethylene diamine. 4,072,664, Cl. 260-78.00R.
Kopito, Louis, to Ovutime, Inc. Viscometer for indicating rheological properties of fluids having high and low viscosity components. 4,072,045, Cl. 73-54.000.
Kornis, Gabriel: *See—*
Moon, Malcolm W.; and Kornis, Gabriel, 4,072,498, Cl. 71-92.000.
Korrenn, Heinz; Teich, Wolfgang; and Heimrich, Helmut, to Kugelfischer Georg Schafer & Co. Heavy-duty swivel bearing. 4,072,372, Cl. 308-72.000.
Kostura, Michal; Pandula, Jan; Harmansky, Absolon; Smiga, Slavomir; and Kepic, Stefan, to Vihorlat, narodny podnik. Apparatus for regulating the temperature of a casting mold. 4,072,181, Cl. 164-154.000.
Kotecha, Harish N.: *See—*
De La Moneda, Francisco H.; and Kotecha, Harish N., 4,072,868, Cl. 307-214.000.
Kouno, Takashi: *See—*
Tanaka, Tadashi; Okamoto, Akira; Kouno, Takashi; Kramer, William E.; Hopkins, Richard H.; and Hoffman, Richard A., 4,072,657, Cl. 260-47.0UA.
Kovach, Louis: *See—*
Knight, Charles E., Jr.; Kovach, Louis; and Hurst, Jonn S., 4,072,084, Cl. 90-11.00A.
Kovanov, Pavel Vasilievich; Torochkov, Ivan Mikhailovich; Zonenko, Ivan Timofeevich; Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Tsimbler, Jury Abramovich; Kantor, Ilya Solomonovich; Topolyansky, Jury Arnoldovich; and Lurie, Mikhail Vladimirovich. Pneumatically conveyed container with air tight sealing and guide means. 4,072,109, Cl. 104-138.00R.
Kowallik, Josef, to Hoesch Werke Aktiengesellschaft. Method of and device for inter-connecting individual profiled plates to be connected to each other end-to-end, and a structural connection effected thereby. 4,071,942, Cl. 29-469.500.
Kowalski, John L.: *See—*
Smith, Garland Y.; Scott, Gerald R.; Blazek, George A.; and Kowalski, John L., 4,072,437, Cl. 407-118.000.
Kraftco Corporation: *See—*
Loeb, Melvin L., 4,072,641, Cl. 260-18.00N.
Kraftwerk Union Aktiengesellschaft: *See—*
Niemann, Hans-Joachim; Schuster, Eberhard; and Kersting, Arno, 4,072,590, Cl. 204-157.10R.
Seidelberger, Emmerich, 4,072,560, Cl. 176-38.000.
Kramer, Heinz; Peretti, Norbert; and Waschneck, Helmut, to Owens-Illinois, Inc. Method for producing blown hollow glass objects. 4,072,491, Cl. 65-72.000.
Kramer, Karl; and Durst, Karlheinz, to Hoechst Aktiengesellschaft. Container with frangible piercing point. 4,072,233, Cl. 206-634.000.
Kramer, William E.; Hopkins, Richard H.; and Hoffman, Richard A., to Westinghouse Electric Corporation. Composite erosion resistant optical window. 4,072,782, Cl. 428-409.000.
Kramer, William E.: *See—*
Tanaka, Tadashi; Okamoto, Akira; Kouno, Takashi; Kramer, William E.; Hopkins, Richard H.; and Hoffman, Richard A., 4,072,657, Cl. 260-47.0UA.
Kranz, Berthold, to Carl Canzler, Firma. Method of cooling a quenching bath of melted salt. 4,072,298, Cl. 266-44.000.
Kranz, Richard, to Tension Envelope Corporation. Duplex mailing envelope. 4,072,264, Cl. 229-72.000.
Kratcoski, Frank L.; and Hausmann, Herbert H., to Oce'-Industries, Inc. Convertible input reader-printer. 4,072,410, Cl. 353-68.000.
Krechel, Henry H.: *See—*
Chuss, John T.; Krechel, Henry H.; and Purvis, Joseph R., 4,071,944, Cl. 29-574.000.
Krejsa, Richard E., to S & C Electric Company. Electrical interlock apparatus for electrical equipment. 4,073,000, Cl. 361-344.000.
Kremer, Charles J.: *See—*
Borchert, Alfred E.; and Kremer, Charles J., 4,072,634, Cl. 260-2.50A.
Krings, Peter: *See—*
Kuhling, Dieter; Huppertz, Josef; Krings, Peter; and Reuter, Herbert, 4,072,622, Cl. 252-179.000.
Kristiansen, Aksel Erik: *See—*
Pedersen, Thor; and Kristiansen, Aksel Erik, 4,072,250, Cl. 222-326.000.
Krolak, Ronald Francis: *See—*
Cameron, John Keith; and Krolak, Ronald Francis, 4,072,383, Cl. 339-59.00R.
Kronseder, Hermann: *See—*
Gau, Georg, 4,072,555, Cl. 156-571.000.
Kruglov, Igor Ivanovich: *See—*
Karatsjuba, Anatoly Prokofievich; Kmita, Tatyana Georgievna; Kruglov, Igor Ivanovich; Kurinny, Vladimir Ivanovich; Kurnosov, Anatoly Ivanovich; Ryzhikov, Igor Veniaminovich; and Judin, Vladimir Vasilievich, 4,071,945, Cl. 29-578.000.
Kruse, Walter M.; and Wright, Leon W., to ICI Americas Inc. Regeneration of supported ruthenium catalyst. 4,072,628, Cl. 252-415.000.
Kubens, Rolf, to Bayer Aktiengesellschaft. Process for the production of foundry cores and molds. 4,072,649, Cl. 260-37.00N.
Kubo, Shunichi: *See—*
Suda, Masashi; and Kubo, Shunichi, 4,072,412, Cl. 355-3.0TR.
Kubo, Yoshiki, to Toyo Kogyo Co., Ltd. Honing machine provided with a power controller. 4,071,980, Cl. 51-165.870.
Kuboshima, Makoto, to Fuji Photo Film Co., Ltd. Focus adjustment and determination means. 4,072,971, Cl. 354-201.000.
Kucharski, Leonard J.: *See—*
McConnell, Lorne D.; and Kucharski, Leonard J., 4,072,392, Cl. 339-258.00R.
Kucherenko, Anatoly Gavrilovich: *See—*
Brusako, Jury Ivanovich; Rzhavin, Sergei Alexandrovich; Kiselev, Vasily Pavlovich; Tarasov, Mikhail Sergeevich; Rapoport, Vladimir Mendeleevich; Timofeev, Vladimir Vasilievich; Ragulina, Raisa Ivanovna; Alivoivodich, Miro Khristoforovich; Kucherenko, Anatoly Gavrilovich; Varjushenkov, Anatoly Mikhailovich; Isaeva, Elena Pavlovna; Berezhnoi, Ivan Arkhipovich; Rumyantsev, Vasily Petrovich; Shpak, Grigory Safronovich; Guz, Dmitry Semenovich; Ilinkov, Dmitry Vladimirovich; Volpin, Pavel Ilich; Avdeev, Mikhail Pavlovich; Artemenko, Stanislav Arsentievich; and Khrennikova, Ljudmila Pavlovna, 4,072,512, Cl. 75-148.000.
Kuchuk, Ivan Anatolievich: *See—*
Volman, Mikhail Yakovlevich; Grinshtein, Vladimir Yakovlevich; Zhukov, Mikhail Leonidovich; Kuchuk, Ivan Anatolievich; and Polovinkin, Evgeny Petrovich, 4,072,999, Cl. 361-333.000.
Kudchadker, Mohan V.; and Weiss, Walter J., to Texaco Inc. Sulfomethylated lignite salt as a sacrifical agent in oil recovery processes. 4,072,192, Cl. 166-273.000.
Kuenzle, Paul; and Baumgartl, Ulrich, to Siemens Aktiengesellschaft. Control electrode for high-voltage apparatus. 4,072,832, Cl. 200-48.00R.

Kugelfischer Georg Schafer & Co.: *See—*
Korrenn, Heinz; Teich, Wolfgang; and Heimrich, Helmut, 4,072,372, Cl. 308-72.000.
Kugle, John L.: *See—*
Coho, Ralph W.; Kugle, John L.; and Futty, Robert C., 4,072,435, Cl. 404-110.000.
Kuhling, Dieter; Huppertz, Josef; Krings, Peter; and Reuter, Herbert, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Stable aqueous suspension of water-insoluble, calcium-binding aluminosilicates and organic suspending agents. 4,072,622, Cl. 252-179.000.
Kuhn, Robert R.; and Machleder, Warren H., to Rohm and Haas Company. Motor fuel composition. 4,072,474, Cl. 44-58.000.
Kulson, Walter A., to Wit-Son Carbide Tool, Inc. Automatic loader. 4,072,476, Cl. 51-215.00H.
Kume, Masahiro: *See—*
Motoyoshi, Kenya; Kume, Masahiro; and Amano, Yoshinari, 4,072,515, Cl. 75-173.00A.
Kuraray Co., Ltd.: *See—*
Fukushima, Osamu, 4,072,773, Cl. 427-246.000.
Kurataro, Kuze. Water closet seat warmer and ventilator 4,071,915, Cl. 4-217.000.
Kurihara, Norimitsu: *See—*
Yashima, Michio; Senzaki, Takaya; and Kurihara, Norimitsu, 4,072,925, Cl. 340-52.00F.
Kurinny, Vladimir Ivanovich: *See—*
Karatsjuba, Anatoly Prokofievich; Kmita, Tatyana Georgievna; Kruglov, Igor Ivanovich; Kurinny, Vladimir Ivanovich; Kurnosov, Anatoly Ivanovich; Ryzhikov, Igor Veniaminovich; and Judin, Vladimir Vasilievich, 4,071,945, Cl. 29-578.000.
Kurnosov, Anatoly Ivanovich: *See—*
Karatsjuba, Anatoly Prokofievich; Kmita, Tatyana Georgievna; Kruglov, Igor Ivanovich; Kurinny, Vladimir Ivanovich; Kurnosov, Anatoly Ivanovich; Ryzhikov, Igor Veniaminovich; and Judin, Vladimir Vasilievich, 4,071,945, Cl. 29-578.000.
Kuroda, Nobuyuki: *See—*
Umemura, Sumio; Takamitsu, Nagaaki; Hamamoto, Toshikazu; and Kuroda, Nobuyuki, 4,072,722, Cl. 260-621.00G.
Kurosawa, Toyoki Emergency valve incorporating thermal foamable plastic material. 4,072,159, Cl. 137-67.000.
Kurrle, Frederick L., to Westvaco Corporation. Composite silicate pigment. 4,072,537, Cl. 106-288.00B.
Kurtz, Donald R.: *See—*
Crouch, Donald W.; and Kurtz, Donald R., 4,072,837, Cl. 200-144.00B.
Kurz GmbH: *See—*
Kurz, Rudolf, 4,072,341, Cl. 297-27.000.
Kurz, Rudolf, to Kurz GmbH Adjustable chair. 4,072,341, Cl. 297-27.000.
Kussy, Frank W., to I-T-E Imperial Corporation. Stacked circuit breakers having high interrupting capacity. 4,072,916, Cl. 335-16.000
Kusumoto, Masahiko: *See—*
Tanaka, Kazunobu; Kusumoto, Masahiko; and Watanabe, Shoji, 4,071,975, Cl. 47-9.000.
Kysor Industrial Corporation: *See—*
Johnston, William C., 4,072,488, Cl. 62-282.000.
L. B. Holliday & Company Limited: *See—*
Vellins, Cyril Eric; and Dixon, Leonard Fox, 4,072,462, Cl. 8-2.50A.
L. K. Van Keuren Company, Inc.: *See—*
Mulligan, Vincent R., 4,072,230, Cl. 206-334.000.
Laboratoire Suisse de Recherches Horlogeres: *See—*
Gass, Hans; Hintermann, Hans Erich; and Griepentrog, Hartmut, 4,072,797, Cl. 428-409.000.
L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
Thibault, Jean-Jacques, 4,072,025, Cl. 62-55.500.
Lakshmanan, Pallavoor R.; Swift, Harold E.; and Wu, Ching Yong, to Gulf Research & Development Company. Process for preparing elastomers for pressure-sensitive adhesive application. 4,072,808, Cl. 526-76.000.
Lamb, Robert Colin. Spacing system. 4,072,778, Cl. 428-52.000.
Lambert Brake Corporation: *See—*
Van Anrooy, John A., 4,072,362, Cl. 303-7.000.
Lambertus, Friedrich, to Werner & Pfleiderer. Nozzle for a granulating device for granulating synthetic plastics material. 4,072,459, Cl. 425-464.000.
Lammers, Peter C., to Goodyear Tire & Rubber Company, The. Method for making a flexible mold. 4,072,673, Cl. 264-225.000.
Land, Edwin H.; Bachelder, Albert J.; and Perry, Sarah H., to Polaroid Corporation. Self-retracting imbibition chamber for cameras and method of making the same. 4,072,968, Cl. 354-86.000.
Landstingens Inkopscentral: *See—*
Ekenstam, Bo Thuresson Af; and Nordqvist, Erik Gustaf Percy, 4,072,249, Cl. 222-95.000.
Langdon, William K., to BASF Wyandotte Corporation. Multi-block coupled polyoxyalkylene copolymer surfactants. 4,072,704, Cl. 260-463.000.
Lanham, James W.; Rodgers, Gregory D.; and Meyer, Michael C., to McDonnell Douglas Corporation. *E. coli* detection broth for clinical use with automated microbial analyzer. 4,072,572, Cl. 195-100.000.
Lanham, James W.; Wilkinson, Ralph A.; and Dagy, Victoria A., to McDonnell Douglas Corporation. Broth and method for detecting *E. coli* in mixed water samples. 4,072,575, Cl. 195-103.50M.
Lao, Binneg Yanbing, to Dow Chemical Company, The. Acoustic pycnometer. 4,072,046, Cl. 73-574.000.

LaPointe, Gabriel M., to Parker Manufacturing Company. Hole saw. 4,072,441, Cl. 408-204.000.
Large, George B.: *See—*
Pitt, Leland S.; and Large, George B., 4,072,745, Cl. 424-200.000.
Larrow, Kenneth. House assembly with prefabricated elements. 4,071,984, Cl. 52-79.100.
Larsen, Herbert; Zeidler, Guenter; and Schicketanz, Dieter, to Siemens Aktiengesellschaft. Communication cable. 4,072,398, Cl. 350-96.230.
Larson, Gerald L.; Pi, Alberto; and Uitvlugt, Martin W., to Eaton Corporation. Device for regulating vehicle road speed. 4,072,206, Cl. 180-105.00E.
Lasco Toys International Inc.: *See—*
Rosen, Beverly; and Tepper, Sidney A., 4,072,314, Cl. 273-161.000.
Laune, Pierre, to Eurolando. Baby carriage. 4,072,318, Cl. 280-42.000.
Laval, Claude C., Jr. Device for separating multiple phase fluid systems according to the relative specific gravities of the phase. 4,072,481, Cl. 55-177.000.
Lawrence, Dean M.; and Simpson, Fred E., to Caterpillar Tractor Co. Openable dual windshield arrangement for construction vehicles. 4,072,338, Cl. 296-28.00C.
Lawrence, John M.: *See—*
Radkowski, Stanley J.; Lawrence, John M.; Naggar, Enever; and Dunham, Raymond W., 4,072,473, Cl. 44-46.000.
Lawson, David Francis, to Firestone Tire & Rubber Company, The. Tetrametaphosphimic acid and derivatives as flame retardants. 4,072,651, Cl. 260-42.440.
Lear, Anthony: *See—*
Black, Christopher T.; and Lear, Anthony, 4,072,981, Cl. 357-46.000.
Leavitt, Richard Irwin, to Mobil Oil Corporation. Method for coagulating a colloidal suspension. 4,072,606, Cl. 210-51.000.
Le Borgne, Edmond: *See—*
Chaix, Jean Edmond; Fajeau, Maurice; Le Borgne, Edmond; and Zerouki, Aime, 4,072,189, Cl. 165-142.000.
Leder, Lewis B., to Xerox Corporation. Method of making trigonal selenium interlayers by glow discharge. 4,072,518, Cl. 96-1.50R.
Lederer, Louis Franklin, to Instrumentation Specialties Company. Flow proportioner. 4,072,052, Cl. 73-215.000.
Lee, Arnold St. Jacques, to Varian Associates, Inc. Fluid containment structure for transducer system. 4,072,056, Cl. 73-706.000.
Lee, Emil B., to Caterpillar Tractor Co. Pivoted ejector with hinged door for earthmoving scrapers. 4,071,965, Cl. 37-4.000.
Lee Pharmaceuticals: *See—*
Brattesani, Alan Joseph, 4,072,694, Cl. 260-340.90R.
Lees, Joseph Kolb: *See—*
Knox, Kenneth Leith; and Lees, Joseph Kolb, 4,072,779, Cl. 428-220.000.
Leeson, Jeffrey S.; and Szabo, Joseph F., to ESB Incorporated. Vent plug system for batteries. 4,072,799, Cl. 429-82.000.
Lehmann, Gunter: *See—*
Halbritter, Guenter; Muehlthaler, Wolfgang; Sperber, Heinrich; Diem, Hans; Dudeck, Christian; and Lehmann, Gunter, 4,072,717, Cl. 260-603.00C.
Lehnhoff, Terry F.: *See—*
Clark, George B.; and Lehnhoff, Terry F., 4,072,353, Cl. 299-22.000.
Leighton, Peter Watson; and Davidson, Charles Patrick Duncan, to Lucas Industries Limited. Cycle gear selector. 4,072,204, Cl. 180-34.000.
Lekarski, Simeon: *See—*
Gachot, Jean; and Lekarski, Simeon, 4,072,172, Cl. 137-624.200.
Lesher, George Y.; and Opalka, Chester J., Jr., to Sterling Drug Inc. 3-Amino-5-(pyridinyl)-2(1H)-pyridinones. 4,072,746, Cl. 424-263.000.
Leshik, Edward Alexander. Continuous loop tape cartridges. 4,072,992, Cl. 360-94.000.
Le Tirant, Pierre: *See—*
Sarda, Jean-Paul; and Le Tirant, Pierre, 4,072,193, Cl. 166-280.000.
Le Troadec, Yves: *See—*
Bellehache, Pierre; and Le Troadec, Yves, 4,072,162, Cl. 137-71.000.
Leuenberger, Hans Georg Wilhelm: *See—*
Boguth, Walter; Leuenberger, Hans Georg Wilhelm; Mayer, Hans Johann; Widmer, Erich; and Zell, Reinhard, 4,072,715, Cl. 260-586.00R.
Lever Brothers Company: *See—*
Murphy, John E.; and Wolf, Chester, 4,072,248, Cl. 222-56.000.
Reed, David Alan, 4,072,632, Cl. 252-541.000.
Levine, Faye E. Sanitary napkin. 4,072,151, Cl. 128-290.00R.
Levy, Paul M., to Capitol Hardware Manufacturing Company, Inc. Connector for tubular frame members. 4,072,432, Cl. 403-170.000.
Lewis, Claude I.: *See—*
Mc Geady, JaYong C.; and Lewis, Claude I., 4,072,155, Cl. 131-140.00P.
Lewis, John H.: *See—*
Brueckner, Keith A.; and Lewis, John H., 4,072,289, Cl. 250-445.00T.
Lewis, Richard A., to Interdyne Company. Belt drive for tape transport, with floating rotor drive pressure application. 4,072,279, Cl. 242-192.000.
Lewis, Richard A., to Interdyne Company. Tape and/or film handling mechanism. 4,072,280, Cl. 242-195.000.
Lewis, William; Weldon, Peter J.; Hagedorn, Henry, Jr.; Hayes, Thomas E.; and Israels, Sylvan H., to United States of America, Army. Fuze encoder device. 4,072,108, Cl. 102-70.20R.
Leworthy, John Harwood: *See—*
Barnaby, Bernard Sydney; Coe, Cyril Walter; Hall, Godfrey Stephen; and Leworthy, John Harwood, 4,072,224, Cl. 197-1.00R.
Li, Chou H. Convectively air-ventilated furniture. 4,072,344, Cl. 297-180.000.
Licentia Patent-Verwaltungs G.m.b.H.: *See—*
Schroder, Ernst, 4,072,906, Cl. 330-86.000.
Lidel, Darrel D., to Eastman Kodak Company. Treating polymeric surfaces. 4,072,769, Cl. 117-93.10R.
Lillkvist, Salomo, to A/S GYRO. Device for maneuvering the discharge tube of a harvesting machine. 4,072,359, Cl. 302-34.000.
Limburg, William W.: *See—*
Pearson, James M.; Williams, David J.; and Limburg, William W., 4,072,519, Cl. 96-1.50R.
Lind, Earl R., to Raytheon Company. Electrolytic measurement system with an inner post and an outer cylindrical shield fluid boundary. 4,072,892, Cl. 324-30.00B.
Lindblom, Curtis H.: *See—*
Heller, Larry E.; Shriver, Joe E.; and Lindblom, Curtis H., 4,072,002, Cl. 56-53.000.
Linde Aktiengesellschaft: *See—*
Hildebrandt, Ullrich, 4,072,815, Cl. 174-15.00S.
Oberpriller, Jakob; and Hofmann, Dolf Dieter, 4,072,026, Cl. 62-63.000.
Springmann, Helmut, 4,072,023, Cl. 62-13.000.
Lindros, Chester A., to Mighty-Mini Rotary Engine, Limited. Rotary internal combustion engine. 4,072,132, Cl. 123-8.130.
Lindstad, Tor: *See—*
Petterson, Stig Arvid; Lindstad, Tor; Dyvik, Froystein; and Steintveit, Georg, 4,072,503, Cl. 75-14.000.
Lindstrom, Roald E.: *See—*
Heinen, Harold J.; Peterson, David G.; and Lindstrom, Roald E., 4,072,587, Cl. 204-110.000.
Linehan, John H. Orthopedic cryosurgical apparatus. 4,072,152, Cl. 128-303.100.
Linke, Fritz; Dursch, Walter; and Kleiner, Hans-Jerg, to Hoechst Aktiengesellschaft. Process for the flameproofing of textile materials. 4,072,776, Cl. 427-390.00D.
Linn, Marvin. Method and implement for cleaning spring-contacts of a tuner. 4,071,982, Cl. 51-241.00S.
Liquifry Company Limited: *See—*
Craven, John Leslie, 4,072,847, Cl. 219-523.000.
Littlefield, John B. Friction materials. 4,072,650, Cl. 260-42.220.
Litton Business Systems, Inc.: *See—*
Daigle, Phillip R., 4,072,840, Cl. 200-296.000.
Liu, Richard Tien-Szu: *See—*
Margolis, Geoffrey; and Liu, Richard Tien-Szu, 4,072,761, Cl. 426-387.000.
Livio, Knut M. A., to Intertack Anstalt. Pistol apparatus for driving tacks, nails and the like into material. 4,072,261, Cl. 227-130.000.
Lloyd, Peter; and Zoell, Bob. Record album cover. 4,072,229, Cl. 206-309.000.
Lloyd, Wayne B.; and Staehlin, John H., to Westinghouse Electric Corporation. Anti-backlash gear assembly. 4,072,064, Cl. 74-409.000.
Lobeck, Walter G., Jr.: *See—*
Wu, Yao Hua; and Lobeck, Walter G., Jr., 4,072,675, Cl. 260-239.0BE.
Loboda, Alexandr Sergeevich: *See—*
Zorev, Nikolai Nikolaevich; Astafiev, Anatoly Alexandrovich; Loboda, Alexandr Sergeevich; Savukov, Vladimir Pavlovich; Runov, Andrei Efimovich; Belov, Vladimir Alexandrovich; Sobolev, Jury Vasilievich; Sobolev, Valentin Vasilievich; Pavlov, Nikolai Mikhailovich; Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Balandin, Jury Fedorovich; Gorynin, Igor Vasilievich; Zvezdin, Jury Ivanovich; Ivanov, Kuzma Makeevich; Ignatov, Viktor Alexandrovich; and Emelyanenko, July Georgievich, 4,072,509, Cl. 75-124.000.
Lock, Robert Christopher: *See—*
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Lockbrunner, Eduard; and Schnepf, Dietmar, to Robert Bosch GmbH. Protectively covered mounting for a plug-in electronic apparatus of a motor vehicle. 4,072,378, Cl. 339-17.00C.
Lodge, Robert H., to Advance Machine Corporation. Compact heating and cooling system. 4,072,187, Cl. 165-48.000.
Loeb, Lawrence A.; and Sirover, Michael A., to Institute for Cancer Research, The. System for in vitro assay for mutagenicity and/or carcinogenicity of chemicals or other exogenous agents. 4,072,574, Cl. 195-103.50R.
Loeb, Melvin L., to Kraftco Corporation. Polyamide resins and method for manufacture. 4,072,641, Cl. 260-18.00N.
Lof, George, to Solaron Corporation. Heat absorber for solar energy. 4,072,142, Cl. 126-270.000.
Lolivier, Jacques: *See—*
Boulet, Jean-Claude; Walraevens, Rene; Bonnety, Gerard; Lolivier, Jacques; and Trouillet, Paul, 4,072,638, Cl. 260-2.5AP.
Loomba, Yogendra Singh, to Allied Chemical Corporation. Mounting for buckle. 4,071,929, Cl. 24-230.00A.
L'Oreal: *See—*
Bouillon, Claude; and Rosenbaum, Georges, 4,072,742, Cl. 424-47.000.
Lorillard: *See—*
Mc Geady, JaYong C.; and Lewis, Claude I., 4,072,155, Cl. 131-140.00P.
Louis, Eckhart; Dorsch, Norman; and Wohlfarth, Ernst, to Wacker-Chemie GmbH. Organosilicon compounds as additives for curable organopolysiloxane compositions. 4,072,655, Cl. 260-46.50G.
Love, Roy E., to Corning Glass Works. Passive optical coupler. 4,072,399, Cl. 350-96.160.
Lovell, John A.: *See—*
Pierson, Robert M.; and Lovell, John A., 4,072,738, Cl. 264-102.000.
Loxley, Ted A.; Barber, Walter G.; Combs, Walter W.; and Webb, John M., to Sherwood Refractories, Inc. Vacuum process for avoiding devitrification damage to transparent slip-cast silica crucibles. 4,072,489, Cl. 65-18.000.
Loyd, Robert W., Jr., to Curtiss-Wright Corporation. Built-up mainshaft for multi-unit rotary mechanisms and method of manufacture thereof. 4,072,448, Cl. 418-60.000.
Lucas Industries Limited: *See—*
Heath, Ronald Alfred, 4,072,443, Cl. 417-218.000.
Leighton, Peter Watson; and Davidson, Charles Patrick Duncan, 4,072,204, Cl. 180-34.000.
Lucero, Andres R.; Gilbert, Roy E.; and Stevens, Jack H., to Bally Manufacturing Corporation. Monitoring system for use with amusement game devices. 4,072,930, Cl. 340-152.00T.
Luddy, Francis E.; Hampson, James W.; Herb, Samuel F.; and Rothbart, Herbert L., to United States of America, Agriculture. Cocoa butter compositions. 4,072,766, Cl. 426-607.000.
Ludwig, Martin; and Eickenscheidt, Wennemar, to Siemens Aktiengesellschaft. Circuit arrangement for storing information formed of teletype characters. 4,072,819, Cl. 178-17.500.
Lukes, Jerome A. Production of high purity salt from high sulfate salt deposits. 4,072,472, Cl. 23-297.000.
Lundstrom, Kurt Ingemar: *See—*
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McMullan, James P.; and Stevens, Albert. Optical device for measuring the turbidity of a liquid. 4,072,424, Cl. 356-208.000.
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McWhirter, Ralph A., to General Motors Corporation. Intake manifold with internal passages arranged to simplify coring. 4,072,133, Cl. 123-52.0MV.
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Meisert, Ernst; and Fischer, Peter, to Bayer Aktiengesellschaft. Process for the production of carbodiimides and carbodiimide-isocyanate adducts. 4,072,712, Cl. 260-566.00R.
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Merkl, George G. Aluminum organoiodides. 4,072,699, Cl. 260-408.000.
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Mohon, Windell N., to United States of America, Navy. Microscope. 4,072,395, Cl. 350-33.000.
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Moon, Malcolm W.; and Kornis, Gabriel, to Upjohn Company, The. Pyrazole amides. 4,072,498, Cl. 71-92.000.
Moore, Marvin W., to Microdot Inc. Lamp socket. 4,072,384, Cl. 339-59.00L.
Morel, Paul; and Dugois, Jean-Pierre, to Aluminum Pechiney. Method and apparatus for compensating the magnetic fields in adjacent rows of transversely arranged igneous electrolysis cells. 4,072,597, Cl. 204-243.00M.
Morgan, Charles R., Jr.; and Snyder, Paul W., Jr., to Mobil Oil Corporation. Catalytic converter for removing noxious components from a gaseous stream. 4,072,471, Cl. 23-288.0FB.
Morgan, Cleon C., to Donnelly Mirrors, Inc. Window assembly. 4,072,340, Cl. 296-84.00R.
Morgan, John H., to GTE Automatic Electric Laboratories Incorporated. Printed circuit board protector. 4,072,077, Cl. 83-418.000.
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Morling, Roy W.; Mackert, Robert J.; and Kesl, Elmer M., to International Harvester Company. Self-cleaning sprocket. 4,072,062, Cl. 74-243.00R.
Morrell, Albert Maxwell, to RCA Corporation. Corrugated shadow mask assembly for a cathode ray tube. 4,072,876, Cl. 313-403.000.
Morrell, Roger J.; Gunn, Jerome A.; and Wilson, Richard J., to United States of America, Interior. Borehole aerostatic ground support system. 4,072,015, Cl. 61-35.000.
Morris, Fred J.; Waters, Robert L.; and Roberts, George F. Surveying of subterranean magnetic bodies from an adjacent off-vertical borehole. 4,072,200, Cl. 175-45.000.
Moss, Herbert L. Inspecting and measuring of soft contact lenses. 4,072,428, Cl. 356-244.000.
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Motoyoshi, Kenya; Kume, Masahiro; and Amano, Yoshinari, to Sumitomo Electric Industries, Ltd. Electrical contact material. 4,072,515, Cl. 75-173.00A.
Mount, Donald L. Centrifugal force controlled transmission. 4,072,066, Cl. 74-752.00F.
Mravic, Brian: *See—*
Shapiro, Stanley; Shapiro, Eugene; Mravic, Brian; and Watson, W. Gary, 4,072,513, Cl. 75-164.000.
Muehlthaler, Wolfgang: *See—*
Halbritter, Guenter; Muehlthaler, Wolfgang; Sperber, Heinrich; Diem, Hans; Dudeck, Christian; and Lehmann, Gunter, 4,072,717, Cl. 260-603.00C.
Mueller, Bruce M., to Owens-Illinois, Inc. Linerless closure. 4,072,244, Cl. 215-344.000.
Mueller, James P., to Caterpillar Tractor Co. Digital positioner for remote actuation of a control valve. 4,072,087, Cl. 91-461.000.
Muller, Erwin: *See—*
Honegger, Werner; and Muller, Erwin, 4,072,228, Cl. 198-459.000.
Muller, Werner Heinrich; Hey, Hansjorg; and Weil, Tomas, to Hoechst Aktiengesellschaft. Process for the manufacture of resorcinols. 4,072,660, Cl. 260-621.00H.
Mulligan, Vincent R., to L. K. Van Keuren Company, Inc. Assembly for supporting delicate equipment during shipping. 4,072,230, Cl. 206-334.000.
Multifluid-Energie, Societe Anonyme: *See—*
Fillios, Jean-Pierre; and Kergueno, Joseph, 4,072,141, Cl. 126-270.000.
Munson, Ramon Jon; Hurd, Claude Calvert; and Weigl, James, to Bourns, Inc. Multistage mixing valve for a medical respirator. 4,072,148, Cl. 128-142.200.
Murakado, Hiroshi; Nakata, Kazuhiro; Usui, Eiki; Tamiya, Tetsuo; Chikuda, Masahiro; Kitao, Yoshinobu; and Fujiwara, Akira, to Kobe Steel, Ltd. Alloy sheet metal for fins of heat exchanger and process for preparation thereof. 4,072,542, Cl. 148-11.50A.
Murao, Sadatomi: *See—*
Oyama, Fusao; Murao, Sadatomi; and Okada, Shizuo, 4,072,678, Cl 260-239.30A.
Murari, Bruno; and Menniti, Pietro, to SGS-ATES Componenti Elettronici S.p.A. Audio amplifier with constant current consumption. 4,072,908, Cl. 330-265.000.
Murata, Kazuo; Tanso, Shiro; and Yamao, Junzo, to Yuasa Battery Company Limited. Storage battery, separator therefor. 4,072,802, Cl. 429-147.000.
Muroi, Tadashi: *See—*
Ishida, Masahiko; Oguri, Yoshitaka; Shimizu, Norio; and Muroi, Tadashi, 4,072,667, Cl. 260-112.00R.
Murphy, John E.; and Wolf, Chester, to Lever Brothers Company. Metering apparatus. 4,072,248, Cl. 222-56.000.
Murso, Bernhard; and Riedmuller, Eberhard, to Spieth, Ernst K. Target mechanism. 4,072,313, Cl. 273-105.200.
Mutchler, Paul A., to American Air Filter Company, Inc. Flexible fluid connecting device. 4,072,329, Cl. 285-187.000.
Muto, Kiyoshi; Hisada, Toshihiko; Ohmori, Nobutsugu; Bessho, Satoshi; Mori, Naoharu; and Ishikawa, Katsuhiko, to Kajima Kensetsu Kabushiki Kaisha. Process for reinforcing reinforced concrete post. 4,071,996, Cl. 52-741.000.
Naegeli, Peter, to Givaudan Corporation. 4-(2,6,6-Trimethyl-2-cyclohexen-1-ylidene)-butan-2-ol. 4,072,719, Cl. 260-617.00A.
Nagao, Taku: *See—*
Ikezaki, Muneyoshi; Ito, Nobuo; Okazaki, Yasushi; Hoshiyama, Masao; Nagao, Taku; and Nakajima, Hiromichi, 4,072,759, Cl. 424-330.000.
Nagata, Osamu: *See—*
Inubushi, Masanobu; Yamamoto, Hajime; and Nagata, Osamu, 4,072,006, Cl. 60-39.250.
Naggar, Enever: *See—*
Radkowski, Stanley J.; Lawrence, John M.; Naggar, Enever; and Dunham, Raymond W., 4,072,473, Cl. 44-46.000.
Nagy, Joseph, to Union Special Corporation. Overedge stitch sewing machine. 4,072,116, Cl. 112-286.000.
Nahory, Robert Edward: *See—*
DeWinter, John Christian; Nahory, Robert Edward; and Pollack, Martin Alan, 4,072,544, Cl. 148-171.000.
Naito, Han-Ichiro. Structure adapted to be successively drawn and telescoped. 4,072,179, Cl. 160-197.000.
Naizer, Kenneth C.; and DuBose, Jesse K., to Texaco Inc. Method and system for detecting hydrogen in an inert gas stream. 4,072,043, Cl. 73-23.000.
Nakagawa, Kazuyuki; Uchida, Minoru; and Oka, Hiroaki, to Otsuka Pharmaceutical Co., Ltd. 3,4-Dihydrocarbostyril derivatives. 4,072,683, Cl. 260-288.00R.
Nakajima, Hiromichi: *See—*
Ikezaki, Muneyoshi; Ito, Nobuo; Okazaki, Yasushi; Hoshiyama, Masao; Nagao, Taku; and Nakajima, Hiromichi, 4,072,759, Cl. 424-330.000.
Nakamura, Youichi: *See—*
Hirame, Yasutel; and Nakamura, Youichi, 4,072,530, Cl. 106-44.000.
Nakanishi, Kaname: *See—*
Teshima, Toru; Ehara, Takuhisa; and Nakanishi, Kaname, 4,072,005, Cl. 58-42.500.
Nakanishi, Yoshitaka. Method for forming counter-sunk hole in a base material and an apparatus for carrying out the same. 4,072,039, Cl. 72-334.000.
Nakase, Takamichi: *See—*
Hattori, Tadashi; Takada, Akira; Nakase, Takamichi; and Sugi, Fumio, 4,072,137, Cl. 123-119.0DB.

Nakata, Kazuhiro: *See—*
Murakado, Hiroshi; Nakata, Kazuhiro; Usui, Eiki; Tamiya, Tetsuo; Chikuda, Masahiro; Kitao, Yoshinobu; and Fujiwara, Akira, 4,072,542, Cl. 148-11.50A.

Nakata, Tetsuya; Yamada, Nobuo; Hashimoto, Akira; Takata, Yasuto; and Bunnomori, Yukinari, to Osaka Soda Co. Ltd. Cured or uncured compositions of homopolymers and copolymers of epihalohydrins. 4,072,734, Cl. 260-873.000.

Nakazawa, Shizumasa. Pressure control valve for a sphygmomanometer. 4,072,171, Cl. 137-599.200.

Nakazyo, Kiyoshi: *See—*
Inouye, Kozo; Yokota, Yukio; and **Nakazyo, Kiyoshi, 4,072,525**, Cl. 96-55.000.

National Research Development Corporation: *See—*
Bright, Alfred William; Overton, Michael **Anthony Mersham; and** Parker, Ian Frederick, 4,072,129, Cl. **118-629.000.**
Dawson, Graham Robert; and Sansome, **Dennis Hugh, 4,072,034**, Cl. 72-56.000.
Ryder, Jack Forrester, 4,072,534, Cl. 106-98.000.

National Semiconductor Corporation: *See—*
Allen, Robert M., 4,072,581, Cl. 204-15.000.

Nauman, Harold Joseph, to Caterpillar Tractor Co. Engine cranking adapter. 4,072,063, Cl. 74-405.000.

NCR Corporation: *See—*
Gillow, George B., 4,072,869, Cl. 307-291.000.
Granzow, Robert H.; and Marvin, Richard P., 4,072,098, Cl. 101-32.000.
Towne, Gary L.; Depew, Noel F.; and Fowler, Charles A., 4,072,379, Cl. 339-17.0LM.

Nedelec, Lucien; Guillaume, Jacques; and Dumont, Claude, to Roussel Uclaf. 3-(3',4'-Disubstituted) phenyl piperidines. 4,072,685, Cl. 260-293.810.

Neef, Klaus: *See—*
Hahm, Heinz Guenter; and Neef, Klaus, 4,072,219, Cl. 188-218.0XL.

Neff, Roger Edgar: *See—*
Schiller, Arthur Maurice; Goodman, Richard Martin; and Neff, Roger Edgar, 4,072,607, Cl. 210-58.000.

Neidl, Herbert; Kaspar, Gunther; and Drossel, Rolf, to Siemens Aktiengesellschaft. Method and apparatus for the zone-wise shuffling of nuclear reactor fuel elements. 4,072,559, Cl. 176-19.0LD.

Nelson, Alden W., to Crompton & Knowles Corporation. Air cooling apparatus for vertical extruders. 4,072,185, Cl. 165-30.000.

Nelson, Yvette E. Apparatus for rocking a bed. 4,071,916, Cl. 5-62.000.

Nerge, Steven F.: *See—*
Craig, James R.; and Nerge, Steven F., 4,072,865, Cl. 250-409.000.

Neyret, Guy, to Etablissements Genoud & Cie. Valve for disposable gas lighter. 4,072,290, Cl. 251-127.000.

Nibby, Chester M., Jr.: *See—*
Barlow, George J.; and Nibby, Chester M., Jr., 4,072,853, Cl. 235-312.000.

Nice-Pak Products, Inc.: *See—*
Julius, Robert P., 4,071,955, Cl. 32-34.000.

Nichiei Bussan Co., Ltd.: *See—*
Tanaka, Toshie, 4,071,930, Cl. 24-252.00R.

Nickell, Louis G., to W. R. Grace & Co. 2,6-Dichlorobenzaldehyde tetrahydro-2-furoyl hydrazone and its use as a ripener for sugarcane. 4,072,496, Cl. 71-88.000.

Nickey, George Allen: *See—*
Braker, Frederick Williams; Heckman, Russell William; Nickey, George Allen, and Potter, Terry Clair, 4,072,553, Cl. 156-423.000.

Nidola, Antonio: *See—*
Bianchi, Giuseppe; de Nora, Vittorio; Gallone, Patrizio; and Nidola, Antonio, 4,072,585, Cl. 204-98.000.
De Nora, Oronzio; Nidola, Antonio; and Spaziante, Placido M., 4,072,586, Cl. 204-105.00M.

Niederhauser, Donald Olcott, to Du Pont de Nemours, E. I., and Company. Web forming method. 4,071,931, Cl. 28-101.000.

Niemann, Hans-Joachim; Schuster, Eberhard; and Kersting, Arno, to Kraftwerk Union Aktiengesellschaft. Method for separating isotopes from gaseous mixtures. 4,072,590, Cl. 204-157.10R.

Niemeyer, Lutz; and Ragaller, Klaus, to BBC Brown, Boveri & Company Limited. Electrical power switch with pressurized gas blasting device for lengthening the switching arc. 4,072,838, Cl. 200-148.00R.

Niemiec, Albin Joseph, to Sperry Rand Corporation. Power transmission. 4,072,451, Cl. 418-178.000.

Nifco Inc.: *See—*
Tanaka, Toshie, 4,071,930, Cl. 24-252.00R.

Nilsson, Ove, to Aktiebolaget Tudor. Production of lead powder for tube electrodes. 4,071,946, Cl. 29-623.100.

Nippert Company, The: *See—*
Nippert, Russell A., 4,071,947, Cl. 29-624.000.

Nippert, Russell A., to Nippert Company, The. Bimetal resistance welding electrode and method for making. 4,071,947, Cl. 29-624.000.

Nippon Electric Co., Ltd.: *See—*
Takayama, Yoichiro, 4,072,897, Cl. 324-158.00T.

Nippon Glass Measure Co., Ltd.: *See—*
Yamazaki, Seichi, 4,072,247, Cl. 222-47.000.

Nippon Kogaku K.K.: *See—*
Maida, Osamu, 4,072,962, Cl. 354-24.000.

Nippon Oil Company Limited: *See—*
Ito, Hiroyuki; and Imai, Hirosuke, 4,072,646, Cl. 260-29.70H.
Masunaga, Midori; Kohno, Yoshiki; and Hasegawa, Hiroshi, 4,072,620, Cl. 252-63.000.
Otsuki, Yutaka; Araki, Yoshihiko; and Aoyama, Kazuho, 4,072,536, Cl. 106-252.000.

Nippon Soken, Inc.: *See—*
Hattori, Tadashi; Takada, Akira; Nakase, Takamichi; and Sugi, Fumio, 4,072,137, Cl. 123-119.0DB.
Shimokawa, Toshiaki; and Suzuki, Kunitaka, 4,072,323, Cl. 280-745.000.

Nippon Steel Corporation: *See—*
Tanaka, Tadashi; Okamoto, Akira; Kouno, Takashi; Kramer, William E.; Hopkins, Richard H.; and Hoffman, Richard A., **4,072,657**, Cl. 260-47.0UA.
Yasue, Motoi; Tagawa, Yoshikazu; and Higashi, Mitsuo, 4,072,783, **Cl. 428-341.000.**

Nishiyama, Tadao: *See—*
Aoki, Makoto; and Nishiyama, Tadao, 4,072,482, Cl. 55-195.000.

Nisikawa, Kazunori: *See—*
Haramoto, Yutaka; Nisikawa, Kazunori; and Yamazaki, Masami, **4,072,914**, Cl. 333-14.000.

Nissan Motor Company, Limited: *See—*
Hamada, Hideo, 4,072,220, Cl. 192-.075.
Katsumata, Masaaki; and Fujiki, Norio, 4,072,945, Cl. 343-7.0VM.

Nisshin Oil Mills, Ltd., The: *See—*
Aoki, Makoto; and Nishiyama, Tadao, 4,072,482, Cl. 55-195.000.

Nitto Boseki Co., Ltd.: *See—*
Araki, Kunio; Sasaki, Takashi; Kasahara, Yuko; Yamashita, Yoshisada; Yotumoto, Keiichi; Sunaga, Hiromi; Tabei, Kiyoshi; Goto, Kazuo; Tajiri, Kunio; and Kittaka, Hirokama, 4,072,792, Cl. 428-246.000.

Noguchi, Masaaki; Tanaka, Yukiyasu; Sekiya, Setsuro; and Motosugi, Katsuhiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Apparatus for supplying rich air/fuel mixture in an internal combustion engine. 4,072,134, Cl. 123-75.00B.

Noguchi, Masaaki; Tanaka, Yukiyasu; Sekiya, Setsuro; and Motosugi, Katsuhiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Apparatus for supplying a rich air/fuel mixture in an internal combustion engine. 4,072,135, Cl. 123-75.00B.

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Nolet, Jean-Yves. Machine for bag closing and sealing. 4,071,999, Cl. 53-373.000.

Nomura, Kenji; Yoshioka, Kengo; and Goto, Toshihiro, to Toyoda-Koki Kabushiki-Kaisha. Article transfer apparatus. 4,072,236, Cl. 214-1.0BB.

Nomura, Motoi; Shirai, Yasuhiro; Yoshinaga, Yoshiaki; and Yamaizumi, Kouji, to NTN Toyo Bearing Co. Ltd. Pin type transfer apparatus for apertured-workpieces. 4,072,227, Cl. 198-370.000.

Nomura, Noboru; Kanai, Kenji; Kaminaka, Nobuyuki; and Nouchi, Norimoto, to Matsushita Electric Industrial Co., Ltd. Multi-element magnetic head. 4,072,993, Cl. 360-121.000.

Noonan, Charles M., to Westinghouse Electric Corporation. Thin film electrostatic epoxy powder coating process and the resulting article. 4,072,795, Cl. 428-379.000.

Nordlund, Karl Signar; and Berglund, Kjell. Driving assembly. 4,072,086, Cl. 91-418.000.

Nordqvist, Erik Gustaf Percy: *See—*
Ekenstam, Bo Thuresson Af; and Nordqvist, Erik Gustaf Percy, 4,072,249, Cl. 222-95.000.

Norland Corporation: *See—*
Rose, Frederick A., 4,072,851, Cl. 364-487.000.

Norrbottens Jarnverk AB: *See—*
Santen, Sven; and Grip, Carl Erik, 4,072,502, Cl. 75-11.000.

Nottingham, Lawrence D., to Westinghouse Electric Corporation. Biaxial compression phase lead connector. 4,072,873, Cl. 310-71.000.

Nouchi, Norimoto: *See—*
Nomura, Noboru; Kanai, Kenji; Kaminaka, Nobuyuki; and Nouchi, Norimoto, 4,072,993, Cl. 360-121.000.

Nowak, Herbert: *See—*
Schacht, Erich; Mehrhof, Werner; Simane, Zdenek; Nowak, Herbert; and Kayser, Detlev, 4,072,754, Cl. 424-308.000.

NTN Toyo Bearing Co. Ltd.: *See—*
Nomura, Motoi; Shirai, Yasuhiro, Yoshinaga, Yoshiaki; and Yamaizumi, Kouji, 4,072,227, Cl. 198-370.000.

Nusslein, Ludwig: *See—*
Arndt, Friedrich; and Nusslein, Ludwig, 4,072,497, Cl. 71-90.000.

Nychka, Henry Robert, Erbeck, Richard Elmer; Robinson, Martin Alvin; and Jones, Edward Stephen, to Allied Chemical Corporation. Hydrogenation of fluorinated esters. 4,072,726, Cl. 260-633.000.

Nylite Skate Company of Canada Ltd. *See—*
Chambers, Alan F., 4,071,935, Cl. 29-423.000.

Oberpriller, Jakob; and Hofmann, Dolf Dieter, to Linde Aktiengesellschaft. Method of cooling of articles and materials. 4,072,026, Cl. 62-63.000.

O'Brien, Thomas J.; Parsons, David A.; and Harger, Virginia Ruth, to O'Brien, Thomas J. Tent having veranda-style extension. 4,072,158, Cl. 135-1.00R.

Occidental Oil Shale, Inc.: *See—*
Bartel, William J.; and Burton, Robert S., III, 4,072,350, Cl. 299-2.000.

Oce'-Industries, Inc.: *See—*
Kratcoski, Frank L.; and Hausmann, Herbert H., 4,072,410, Cl. 353-68.000.

Oda, Kiyoshi, to Yoshida Kogyo K.K. Slider for a concealed slide fastener. 4,071,928, Cl. 24-205.10R.

O'Farrell, Charles P.; and Higgins, John J., to Exxon Research & Engineering Co. High tensile strength elastomeric adhesive cements and laminates therefrom. 4,072,648, Cl. 260-33.4PQ.

Ogawa, Yutaka: *See—*
Inoue, Takehisa; Ogawa, Yutaka; Sugita, Hiroaki; and Watanabe, Namio, 4,072,217, Cl. 188-73.600.

Ogihara, Kenzo, to Olympus Optical Co., Ltd. Attachment for loudspeaker. 4,072,829, Cl. 179-146.00R.

Oguri, Yoshitaka: *See—*
Ishida, Masahiko; Oguri, Yoshitaka; Shimizu, Norio; and Muroi, Tadashi, 4,072,667, Cl. 260-112.00R.

Ohkubo, Kazuo: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,072,743, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,072,744, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,072,757, Cl. 424-267.000.

Ohkubo, Shoichi: *See—*
Ashida, Kaneyoshi; Ohtani, Masaaki; and Ohkubo, Shoichi, 4,072,636, Cl. 260-2.5AW.

Ohmori, Nobutsugu: *See—*
Muto, Kiyoshi; Hisada, Toshihiko; Ohmori, Nobutsugu; Bessho, Satoshi; Mori, Naoharu; and Ishikawa, Katsuhiko, 4,071,996, Cl. 52-741.000.

Ohnigian, Suran; and Seitchik, Jerold A., to Sperry Rand Corporation. Fault-tolerant memory organization. 4,073,012, Cl. 365-1.000.

Ohtani, Masaaki: *See—*
Ashida, Kaneyoshi; Ohtani, Masaaki; and Ohkubo, Shoichi, 4,072,636, Cl. 260-2.5AW.

Oka, Hiroaki: *See—*
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Okada, Shizuo: *See—*
Oyama, Fusao; Murao, Sadatomi; and Okada, Shizuo, 4,072,678, Cl. 260-239.30A.

Okamoto, Akira: *See—*
Tanaka, Tadashi; Okamoto, Akira; Kouno, Takashi; Kramer, William E.; Hopkins, Richard H.; and Hoffman, Richard A., 4,072,657, Cl. 260-47.0UA.

Okamoto, Kazuo; and Uchio, Hiroshi, to Kanebo, Ltd. Novel phosphorus- and bromine-containing polymers. 4,072,658, Cl. 260-49.000.

Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, to Mitsubishi Chemical Industries Limited; and Okamoto, Shosuke. N^2-arylsulfonyl-L-argininamides and the pharmaceutically acceptable salts thereof. 4,072,743, Cl. 424-177.000.

Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, to Mitsubishi Chemical Industries Limited; and Okamoto, Shosuke. N^2-naphthalenesulfonyl-L-argininamides and the pharmaceutically acceptable salts thereof. 4,072,744, Cl. 424-177.000.

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Okazaki, Yasushi: *See—*
Ikezaki, Muneyoshi; Ito, Nobuo; Okazaki, Yasushi; Hoshiyama, Masao; Nagao, Taku; and Nakajima, Hiromichi, 4,072,759, Cl. 424-330.000.

Olin Corporation: *See—*
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Saeman, Walter C., 4,071,962, Cl. 34-135.000.
Shapiro, Stanley; Shapiro, Eugene; Mravic, Brian; and Watson, W. Gary, 4,072,513, Cl. 75-164.000.

Olofsson, Mats: *See—*
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Oltmanns, Heinrich; and Volckmann, Klaus, to Ziegelwerke Heinrich Oltmanns. Plant for the production of tubular or hose-like articles of synthetic material. 4,072,453, Cl. 425-62.000.

Olympus Optical Co., Ltd.: *See—*
Ogihara, Kenzo, 4,072,829, Cl. 179-146.00R.
Sato, Masaaki, 4,072,995, Cl. 360-137.000.
Uetake, Toshifumi; and Tojyo, Tsutomu, 4,072,408, Cl. 350-255.000.

Oman, Robert C. Telephone patching apparatus. 4,072,827, Cl. 179-42.000.

Omura, Takeshi: *See—*
Cady, Paxton; Omura, Takeshi; Rudin, Melvin; and Fleming, James H., 4,072,578, Cl. 195-127.000.

Onder, Besir K., to Upjohn Company, The. Polyamide from arylene diamine, isophthalic acid and alkylene dicarboxylic acid. 4,072,665, Cl. 260-78.00R.

O'Neil, Walter K., to Eaton Corporation. Tire pressure monitor. 4,072,927, Cl. 340-58.000.

Ontario Energy Corporation: *See—*
Kizior, Thaddeus Eugene, 4,072,609, Cl. 210-73.00R.

Ontario Research Foundation: *See—*
Smellie, Allan M.; and Brandstatter, Hans G., 4,072,510, Cl. 75-130.500.

Oosterwijk, Hendrik H. J.; Magre, Eduard P.; and Beyleveld, Wilhelmus M., to Akzona Incorporated. Novel chlorinated dicumene initiators. 4,072,811, Cl. 526-346.000.

Opalka, Chester J., Jr.: *See—*
Lesher, George Y.; and Opalka, Chester J., Jr., 4,072,746, Cl. 424-263.000.

Opie, William R.: *See—*
Rajcevic, Harold P.; Opie, William R.; and Cusanelli, Dominic C., 4,072,507, Cl. 75-74.000.

Opitz, Konrad: *See—*
Schlafer, Ludwig; and Opitz, Konrad, 4,072,463, Cl. 8-41.00B.

Orchimed S.A.: *See—*
Mieville, Andre, 4,072,705, Cl. 424-308.000.

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Osaka Soda Co. Ltd.: *See—*
Nakata, Tetsuya; Yamada, Nobuo; Hashimoto, Akira; Takata, Yasuto; and Bunnomori, Yukinari, 4,072,734, Cl. 260-873.000.

Oshima, Seiichi; and Miyamoto, Mamoru, to Mitsubishi Denki Kabushiki Kaisha. Starting control apparatus for AC load. 4,072,880, Cl. 318-227.000.

Oshima, Takeo; and Kondo, Takashi, to Glory Kogyo Kabushiki Kaisha. Sheet counting apparatus. 4,072,854, Cl. 235-92.0SB.

Otis Elevator Company: *See—*
Salmon, John Kennedy, 4,072,213, Cl. 188-1.00B.

Otis Engineering Corporation: *See—*
Raulins, George M., 4,072,190, Cl. 166-.500.

Otsuka, Katsumi, to Teibow Company Limited. Writing instrument. 4,072,430, Cl. 401-265.000.

Otsuka Pharmaceutical Co., Ltd.: *See—*
Nakagawa, Kazuyuki; Uchida, Minoru; and Oka, Hiroaki, 4,072,683, Cl. 260-288.00R.

Otsuki, Yutaka; Araki, Yoshihiko; and Aoyama, Kazuho, to Nippon Oil Company, Ltd. Water-soluble coating compositions and process for their preparation. 4,072,536, Cl. 106-252.000.

Otto Bock Orthopadische Industrie K.G.: *See—*
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Outsuka, Koremitsu; and Tanaka, Yutaka, to Mitsubishi Kasei Kogyo Kabushiki Kaisha. Anodic stripping voltammetric apparatus. 4,072,594, Cl. 204-195.00R.

Overton, Michael Anthony Mersham: *See—*
Bright, Alfred William; Overton, Michael Anthony Mersham; and Parker, Ian Frederick, 4,072,129, Cl. 118-629.000.

Ovutime, Inc.: *See—*
Kopito, Louis, 4,072,045, Cl. 73-54.000.

Owens-Corning Fiberglas Corporation: *See—*
Hayden, David E.; and Foucht, Millard E., 4,072,623, Cl. 252-182.000.

Owens-Illinois, Inc.: *See—*
Amberg, Stephen; and Amberg, Ralph G., 4,072,549, Cl. 156-86.000.
Braker, Frederick Williams; Heckman, Russell William; Nickey, George Allen; and Potter, Terry Clair, 4,072,553, Cl. 156-423.000.
Kramer, Heinz; Peretti, Norbert; and Waschneck, Helmut, 4,072,491, Cl. 65-72.000.
Mueller, Bruce M., 4,072,244, Cl. 215-344.000.

Oyama, Fusao; Murao, Sadatomi; and Okada, Shizuo, to Sumitomo Chemical Company, Limited. Process for producing caprolactam. 4,072,678, Cl. 260-239.30A.

Ozeki, Banri, to Tokina Optical Co., Ltd. Prism system for use in tricolor separation. 4,072,405, Cl. 350-173.000.

P.C. Cox (Mastic Appliances) Limited: *See—*
Cox, John Patrick Anthony, 4,072,254, Cl. 222-391.000.

P. Leiner & Sons Limited: *See—*
Croome, Ronald John; and Thomas, Donald Beuford, 4,072,624, Cl. 252-301.350.

Padgett, Charles L.: *See—*
Drews, William A.; Padgett, Charles L.; and Pinna, Ray Anthony, 4,072,948, Cl. 343-18.00C.

Pako Corporation: *See—*
Caflisch, Jerry A., 4,072,061, Cl. 74-67.000.

Palara, Sergio, to SGS-ATES Componenti Elettronici S.p.A. Integrated power amplifier. 4,072,979, Cl. 357-36.000.

Pandula, Jan: *See—*
Kostura, Michal; Pandula, Jan; Harmansky, Absolon; Smiga, Slavomir; and Kepic, Stefan, 4,072,181, Cl. 164-154.000.

Pantzar, Glenn Goran Egon, to Sandvik Aktiebolaget. Chain saw guide bar. 4,071,953, Cl. 30-384.000.

Paradowski, Henri: *See—*
Becdelievre, Charles; Kaiser, Victor; and Paradowski, Henri, 4,072,485, Cl. 62-23.000.

Parekh, Manher: *See—*
Vogt, Herwart Curt; Parekh, Manher; Cenker, Moses; and Patton, John Thomas, Jr., 4,072,631, Cl. 252-431.00R.

Parker, Dane K., to Goodyear Tire & Rubber Company, The. Process for preparing hindered alkenyl phenols. 4,072,724, Cl. 260-624.00B.

Parker, Gary D.; and Robb, E. S. Agricultural vehicle for transporting hay bales. 4,072,241, Cl. 214-392.000.

Parker, Ian Frederick: *See—*
Bright, Alfred William; Overton, Michael Anthony Mersham; and Parker, Ian Frederick, 4,072,129, Cl. 118-629.000.

Parker Manufacturing Company: *See—*
LaPointe, Gabriel M., 4,072,441, Cl. 408-204.000.

Parkin, Thomas Randall, to Control Data Corporation. Multi-processor computer system. 4,073,005, Cl. 364-200.000.

Parsons, David A.: *See—*
O'Brien, Thomas J.; Parsons, David A.; and Harger, Virginia Ruth. 4,072,158, Cl. 135-1.00R.

Paton, Boris Evgenievich: *See—*
Zorev, Nikolai Nikolaevich; Astafiev, Anatoly Alexandrovich; Loboda, Alexandr Sergeevich; Savukov, Vladimir Pavlovich; Runov, Andrei Efimovich; Belov, Vladimir Alexandrovich; Sobolev, Jury Vasilievich; Sobolev, Valentin Vasilievich; Pavlov, Nikolai Mikhailovich; Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Balandin, Jury Fedorovich; Gorynin, Igor Vasilievich; Zvezdin, Jury Ivanovich; Ivanov, Kuzma Makeevich; Ignatov, Viktor Alexandrovich; and Emelyanenko, July Georgievich, 4,072,509, Cl. 75-124.000.

Patouillet, Jean Joseph Nicolas, to Antar Petroles de l'Atlantique. Process and apparatus for performing endothermic catalytic reactions. 4,072,601, Cl. 208-134.000.

Patton, John Thomas, Jr.: *See—*
Vogt, Herwart Curt; Parekh, Manher; Cenker, Moses; and Patton, John Thomas, Jr., 4,072,631, Cl. 252-431.00R.

Paulin, Arthur. Display rack. 4,072,246, Cl. 221-307.000.

Paulucci, Jeno F.: *See—*
Zimmer, Elvis Simon; and Hassell, David Allen, 4,072,093, Cl. 99-443.00R.

Pauluis, Gerard J. C. A., to Atomic Energy of Canada Limited. Interconnection arrangement for a dual temperature isotope exchange. 4,072,469, Cl. 23-260.000.

Pauwels, Edward M., to Bendix Corporation, The. Modulator for an adaptive braking system. 4,072,365, Cl. 303-115.000.

Pavlov, Nikolai Mikhailovich: *See—*
Zorev, Nikolai Nikolaevich; Astafiev, Anatoly Alexandrovich; Loboda, Alexandr Sergeevich; Savukov, Vladimir Pavlovich; Runov, Andrei Efimovich; Belov, Vladimir Alexandrovich; Sobolev, Jury Vasilievich; Sobolev, Valentin Vasilievich; Pavlov, Nikolai Mikhailovich; Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Balandin, Jury Fedorovich; Gorynin, Igor Vasilievich; Zvezdin, Jury Ivanovich; Ivanov, Kuzma Makeevich; Ignatov, Viktor Alexandrovich; and Emelyanenko, July Georgievich, 4,072,509, Cl. 75-124.000.

Pavnica, Joseph F. Paperhanging hand tool and method. 4,072,547, Cl. 156-71.000.

Payen, Claude Andre: *See—*
Couderc, Georges; Payen, Claude Andre; Dansac, Jean; and Symaniec, Leonidas, 4,072,861, Cl. 250-233.000.

Payne, R. L.: *See—*
Westbrook, L. V.; and Payne, R. L., 4,072,890, Cl. 323-22.00R.

Pearson, James M.; Williams, David J.; and Limburg, William W., to Xerox Corporation. Photoconductive composition, and element. 4,072,519, Cl. 96-1.50R.

Pearson, Leonard Louis, to Fosroc International Limited. Soil consolidation method. 4,072,019, Cl. 61-36.00C.

Pedersen, Thor; and Kristiansen, Aksel Erik, to Elkem-Spigerverket A/S. Apparatus for plugging holes in an electric smelting furnace or the like. 4,072,250, Cl. 222-326.000.

Peka, Ivo: *See—*
Vodicka, Ludek; Peka, Ivo; and Suchy, Voktor, 4,072,508, Cl. 75-121.000.

Pelosi, Marco Antonio; and Apuzzio, Joseph J. Instrument and method for measuring urethral defects in patients with urinary stress incontinence. 4,072,144, Cl. 128-2.00S.

Pemco-Kalamazoo, Inc.: *See—*
Black, John W., 4,072,373, Cl. 308-191.000.

Pendlebury, David, to Allied Chemical Corporation. Transfer system for conveying polyester polymer. 4,072,663, Cl. 260-75.00M.

Pennwalt Corporation: *See—*
D'Angelo, Antonio Joseph; Mageli, Orville Leonard; and Sheppard, Chester Stephen, 4,072,810, Cl. 526-230.000.

Pentel, Jerry. Spark ignition device and fuel insection means for internal combustion engines. 4,072,131, Cl. 123-8.090.

Pentith, Gerald Richard Oldham, to Summit Mining Ltd. Fluid supply duct and pickup for mining machines. 4,072,355, Cl. 299-43.000.

Pepper, Roger T.; and Zack, Thomas A., to Fiber Materials, Inc. Graphite fiber/metal composites. 4,072,516, Cl. 75-229.000.

Perdahl, Orn Gunnar; and Santen, Sven Oscar, to Aktiebolaget Svenska Kullagerfabriken. Method of producing metal from metal oxides. 4,072,504, Cl. 75-40.000.

Peretti, Norbert: *See—*
Kramer, Heinz; Peretti, Norbert; and Waschneck, Helmut, 4,072,491, Cl. 65-72.000.

Perfection Enterprises, Inc.: *See—*
Wallo, William H., 4,072,386, Cl. 339-91.00R.

Perrella, Guido. Adjustment mechanism for day/night outside mirror. 4,072,065, Cl. 74-502.000.

Perris, James, to James Perris Co., Inc., The. Heating control system. 4,072,268, Cl. 236-78.00C.

Perry, Sarah H.: *See—*
Land, Edwin H.; Bachelder, Albert J.; and Perry, Sarah H., 4,072,968, Cl. 354-86.000.

Petersen, Leo D. Drop cord reel. 4,072,278, Cl. 242-96.000.

Peterson, David G.: *See—*
Heinen, Harold J.; Peterson, David G.; and Lindstrom, Roald E., 4,072,587, Cl. 204-110.000.

Peterson, Jerry R., to Geosource, Inc. Parameter compensating system for a flowmeter. 4,072,051, Cl. 73-194.00M.

Petitpierre, Jean-Claude: *See—*
Garner, Robert; Henshall, John Barry; and Petitpierre, Jean-Claude, 4,072,690, Cl. 260-326.14R.

Petterson, Stig Arvid; Lindstad, Tor; Dyvik, Froystein; and Steintveit, Georg, to Det Norske Zinkkompani A/S. Thermal treatment of leaching residue from hydrometallurgical zinc production. 4,072,503, Cl. 75-14.000.

Pfeuffer, Alfred; Rudolf, Herbert; and Balfanz, Fred, to C-R-O, Inc. Continuous casting cut-off device. 4,072,300, Cl. 266-50.000.

Pharmacia AS: *See—*
Hedegaard, Kurt, 4,072,760, Cl. 424-330.000.

Phillips, Carmen S., to International Harvester Company. Baler gate hydraulic lock. 4,072,096, Cl. 100-53.000.

Phillips, Peter J., to Gartner, Klaus; and Uyeda, Tim. Key changeable lock. 4,072,032, Cl. 70-339.000.

Phillips Petroleum Company: *See—*
Billings, William G., 4,072,718, Cl. 260-608.000.
Bjornson, Geir, 4,072,713, Cl. 260-567.60M.
Bost, Howard W., 4,072,643, Cl. 260-23.00H.
Cheng, Paul J., 4,072,468, Cl. 23-259.500.
Clampitt, Richard L., 4,072,191, Cl. 166-261.000.
Farha, Floyd, Jr.; and Box, E. O., Jr., 4,072,608, Cl. 210-63.00R.
Richards, Frank P.; and Taylor, Raymond C., 4,072,226, Cl. 198-345.000.
Uraneck, Carl A.; and Brown, James D., 4,072,807, Cl. 526-48.100.

Phillips, Robert C., to Gimix, Inc. Automatic dialer for paging system or the like. 4,072,824, Cl. 179-18.00B.

Phillips, Wayne M.: *See—*
United States of America, National Aeronautics and Space Administration; and Phillips, Wayne M., 4,072,532, Cl. 106-65.000.

Phinney, John M., to Faik Corporation, The. Marine clutch and throttle governor control system. 4,072,221, Cl. 192-.098.

Physical Systems, Inc.: *See—*
Hutter, Charles G., III, 4,072,333, Cl. 292-292.000.

Pi, Alberto: *See—*
Larson, Gerald L.; Pi, Alberto; and Uitvlugt, Martin W., 4,072,206, Cl. 180-105.00E.

Pichler, Herman P.: *See—*
Haag, Michael; and Pichler, Herman P., 4,072,917, Cl. 335-205.000.

Pierce Chemical Company: *See—*
Gindler, E. Melvin, 4,072,627, Cl. 252-408.000.

Pierson, Neil W. Small, personal, all terrain vehicle. 4,072,203, Cl. 180-9.440.

Pierson, Robert M.; and Lovell, John A., to Goodyear Tire & Rubber Company, The. Method of forming shaped articles. 4,072,738, Cl. 264-102.000.

Pinna, Ray Anthony: *See—*
Drews, William A.; Padgett, Charles L.; and Pinna, Ray Anthony, 4,072,948, Cl. 343-18.00C.

Pinto, Alwyn, to Imperial Chemical Industries Limited. Steam-hydrocarbon process. 4,072,625, Cl. 252-373.000.

Pirk, Harald, to Metzeler Kautschuk AG. Apparatus for the production of laminated bodies particularly, multilayered shoe soles. 4,072,461, Cl. 425-515.000.

Pitney-Bowes, Inc.: *See—*
Brown, Michael A.; and Mol, Hans C., 4,072,304, Cl. 270-58.000.
Storace, Anthony, 4,072,202, Cl. 177-229.000.

Pitt, Leland S.; and Large, George B., to Stauffer Chemical Company. Substituted vinyl thiophosphate activators. 4,072,745, Cl. 424-200.000.

Plaessmann, Frederick August, to Seal-Spout Corporation. Canister indexing spout-inserting machine. 4,072,117, Cl. 113-1.00H.

Pletka, Hans-Dieter; and Michel, Rudolf, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of sulfur containing organosilicon compounds. 4,072,701, Cl. 260-448.80R.

Pluss-Staufer AG: *See—*
Horn, Herwig, 4,072,426, Cl. 356-212.000.

Pneumo Corporation: *See—*
Bradley, Charles Duane, Jr., 4,072,165, Cl. 137-493.000.

Polaroid Corporation: *See—*
Gold, Nicholas, 4,072,972, Cl. 354-275.000.
Land, Edwin H.; Bachelder, Albert J.; and Perry, Sarah H., 4,072,968, Cl. 354-86.000.
Pope, William R., 4,072,964, Cl. 354-33.000.

Polizzi, Charles J.; and DeCola, Charles R. Hexagonally shaped rotating display with tetrahedral elements. 4,071,968, Cl. 40-473.000.

Pollack, Martin Alan: *See—*
DeWinter, John Christian; Nahory, Robert Edward; and Pollack, Martin Alan, 4,072,544, Cl. 148-171.000.

Pollet, Robert Joseph; Sels, Francis Jeanne; and Vandeputte, Camille Angelina, to AGFA-GEVAERT, N.V. Development of photographic silver halide material. 4,072,523, Cl. 96-22.000.

Pollet, Robert Joseph: *See—*
Sels, Jeanne Francis Jeanne; Pollet, Robert Joseph; Vandeputte, Camille Angelina; and Willems, Jozef Frans, 4,072,526, Cl. 96-66.300.

Polo, Francois. Numbering machine assembly especially adapted for use with printing machinery. 4,072,100, Cl. 101-79.000.

Polovinkin, Evgeny Petrovich: *See—*
Volman, Mikhail Yakovlevich; Grinshtein, Vladimir Yakovlevich; Zhukov, Mikhail Leonidovich; Kuchuk, Ivan Anatolievich; and Polovinkin, Evgeny Petrovich, 4,072,999, Cl. 361-333.000.

Polychrome Corporation: *See—*
Golda, Eugene; Huang, Jen-chi; Shimazu, Ken-ichi; and Chu, Simon Long, 4,072,589, Cl. 204-129.400.

Pomerantz, Allen J., to General Motors Corporation. Automotive priority message display. 4,072,924, Cl. 340-52.00F.

Pommerening, Rudiger. Roller skate having ankle bracing support. 4,072,317, Cl. 280-11.230.

Pont-A-Mousson S.A.: *See—*
Bellehache, Pierre; and Le Troadec, Yves, 4,072,162, Cl. 137-71.000.

Pontiac Furniture Industries, Inc.: *See—*
Johnson, Carl B.; and James, Henry, 4,072,342, Cl. 297-84.000.

Pope, William R., to Polaroid Corporation. Scene light responsive variable quench time delay for quench strobe. 4,072,964, Cl. 354-33.000.

Potter, Terry Clair: *See—*
Braker, Frederick Williams; Heckman, Russell William; Nickey, George Allen; and Potter, Terry Clair, 4,072,553, Cl. 156-423.000.

Pouli, Dirk: *See—*
Cipris, Divna; and Pouli, Dirk, 4,072,584, Cl. 204-73.00R.

Powell, Leon A. Coupling element for trailer hitches. 4,072,320, Cl. 280-415.00A.

Powers, Thomas R., to TRW Inc. Insert type drill and insert therefor. 4,072,438, Cl. 408-59.000.

PPG Industries, Inc.: *See—*
Castine, William A., Jr., 4,072,492, Cl. 65-107.000.
Franz, Helmut, 4,072,772, Cl. 427-164.000.
Imler, Vaughn R., 4,072,493, Cl. 65-107.000.
Sickles, James E.; and Tepper, Richard M., 4,073,002, Cl. 361-227.000.
Welton, Sanford M., 4,072,259, Cl. 225-2.000.

Pradal, Bortolo Mario, to RCA Corporation. Network for temperature compensation of an AT cut quartz crystal oscillator. 4,072,912, Cl. 331-116.00R.

Price, Raymond R., to Rochester Silo, Inc. Automatic silo door construction. 4,071,977, Cl. 49-70.000.

Procter & Gamble Company, The: *See—*
Rose, Terence James, 4,072,621, Cl. 252-89.00R.

Provencher, Joseph H., to United States of America, Navy. Multifrequency array using common phasors. 4,072,956, Cl. 343-844.000.

Psaltis, Demetri: *See—*
Casasent, David Paul; and Psaltis, Demetri, 4,073,010, Cl. 364-822.000.

Pun, Kwok-Wah, to Fung, Cheung King. Fire heat detector and/or burglar alarm. 4,072,933, Cl. 340-229.000.

Purvis, Joseph R.: *See—*
Chuss, John T.; Krechel, Henry H.; and Purvis, Joseph R., 4,071,944, Cl. 29-574.000.

Quast, Eberhard: *See—*
Scheid, Karl; Schweibfurt, Werner; and Quast, Eberhard, 4,072,305, Cl. 271-3.000.

Quinby, Thomas C., to United States of America, Energy. Method of producing homogeneous mixed metal oxides and metal-metal oxide mixtures. 4,072,501, Cl. 75-.5BC.

R. E. Dupont Research and Investment Services Limited: *See—*
Walker, Alan John, 4,072,446, Cl. 417-420.000.

Radkowski, Stanley J.; Lawrence, John M.; Naggar, Enever; and Dunham, Raymond W., to Diamond International Corporation. Self-extinguishing match and method of manufacture. 4,072,473, Cl. 44-46.000.

Ragaller, Klaus: *See—*
Niemeyer, Lutz; and Ragaller, Klaus, 4,072,838, Cl. 200-148.00R.

Ragulina, Raisa Ivanovna: *See—*
Brusako, Jury Ivanovich; Rzhavin, Sergei Alexandrovich; Kiselev, Vasily Pavlovich; Tarasov, Mikhail Sergeevich; Rapoport, Vladimir Mendeleevich; Timofeev, Vladimir Vasilievich; Ragulina, Raisa Ivanovna; Alivoivodich, Miro Khristoforovich; Kucherenko, Anatoly Gavrilovich; Varjushenkov, Anatoly Mikhailovich; Isaeva, Elena Pavlovna; Berezhnoi, Ivan Arkhipovich; Rumyantsev, Vasily Petrovich; Shpak, Grigory Safronovich; Guz, Dmitry Semenovich; Ilinkov, Dmitry Vladimirovich; Volpin, Pavel Ilich; Avdeev, Mikhail Pavlovich; Artemenko, Stanislav Arsentievich; and Khrennikova, Ljudmila Pavlovna, 4,072,512, Cl. 75-148.000.

Rajcevic, Harold P.; Opie, William R.; and Cusanelli, Dominic C., to Amax Inc. Production of blister copper in a rotary furnace from calcined copper-iron concentrates. 4,072,507, Cl. 75-74.000.

Ramos, Joseph: *See—*
Cole, Robert Clay; Koch, Ronney R.; and Ramos, Joseph, 4,072,194, Cl. 166-295.000.

Rampel, Hans; Hess, Peter; and Becker, Herbert, to Metallwerk Max Brose & Co. Window arrangement with sliding pane. 4,071,978, Cl. 49-348.000.

Randall-Ford, Mattias J.: *See—*
Servin, Arturo; and Servin, Jose, 4,072,042, Cl. 72-457.000.

Randall, Robert E., to Rowland, Incorporated. Sheet material with multicolor striated pattern. 4,072,791, Cl. 428-221.000.

Rank Xerox Ltd.: *See—*
Fujizuka, Kaoru, 4,072,418, Cl. 355-75.000.
Motomura, Koichi, 4,072,417, Cl. 355-67.000.

Ransomes Sims & Jefferies Limited: *See—*
Aldred, Edward John, 4,072,001, Cl. 56-7.000.

Rapoport, Vladimir Mendeleevich: *See—*
Brusako, Jury Ivanovich; Rzhavin, Sergei Alexandrovich; Kiselev, Vasily Pavlovich; Tarasov, Mikhail Sergeevich; Rapoport, Vladimir Mendeleevich; Timofeev, Vladimir Vasilievich; Ragulina, Raisa Ivanovna; Alivoivodich, Miro Khristoforovich; Kucherenko, Anatoly Gavrilovich; Varjushenkov, Anatoly Mikhailovich; Isaeva, Elena Pavlovna; Berezhnoi, Ivan Arkhipovich; Rumyantsev, Vasily Petrovich; Shpak, Grigory Safronovich; Guz, Dmitry Semenovich; Ilinkov, Dmitry Vladimirovich; Volpin, Pavel Ilich; Avdeev, Mikhail Pavlovich; Artemenko, Stanislav Arsentievich; and Khrennikova, Ljudmila Pavlovna, 4,072,512, Cl. 75-148.000.

Rasile, John: *See—*
Gedney, Ronald Walker; and Rasile, John, 4,072,816, Cl. 174-52.0FP.

Raue, Roderich: *See—*
Walther, Herbert; Hartig, Wolfgang; Friedrich, Adolf; and Raue, Roderich, 4,072,911, Cl. 331-94.50L.

Raulins, George M., to Otis Engineering Corporation. Motion compensator. 4,072,190, Cl. 166-.500.

Rausch, Richard E., to UOP Inc. Dehydrocyclization with an acidic multimetallic catalytic composite. 4,072,731, Cl. 260-673.500.

Ravey, Mani; Shorr, Leonard Marshall; and Waterman, Jacques A., deceased (by Frankel, Jacob, administrator), to IMI (TAMI) Institut for Research and Development. Novel vinyl chloride polymers and process for their production. 4,072,806, Cl. 526-89.000.

Ray, Carl L. CB Radio accessory unit. 4,072,900, Cl. 325-67.000.

Raymond Lee Organization, Inc., The: *See—*
Jury, Daniel E., 4,071,921, Cl. 15-227.000.
Richardson, Victor M., 4,072,091, Cl. 99-323.500.

Raynaud, Guy M.: *See—*
Fauran, Claude P.; Turin, Michel J.; Imbert, Thierry F.; Raynaud, Guy M.; and Dorme, Nicole A. M., 4,072,682, Cl. 260-268.0BC.

Raytheon Company: *See—*
Chambers, Derek, 4,073,003, Cl. 363-20.000.
Chambers, Derek; and Harley, A. Leonard, 4,073,004, Cl 363-79.000.
Lind, Earl R., 4,072,892, Cl. 324-30.00B.

RCA Corporation: *See—*
Aschwanden, Felix, 4,072,983, Cl. 358-19.000.
Dingwall, Andrew Gordon Francis; and Rosenthal, Bruce David, 4,072,910, Cl. 331-57.000.
Ipri, Alfred Charles, 4,072,974, Cl 357-23.000
Johnson, Henry Charles, 4,072,947, Cl. 343-14.000.
Kaganowicz, Grzegorz; and Robinson, John Walter, 4,072,985, Cl. 358-128.000.
Keelty, James Malcolm, 4,072,905, Cl. 329-122.000.
Miller, Jeffrey Ellis, 4,072,943, Cl. 343-6.5LC.
Morrell, Albert Maxwell, 4,072,876, Cl. 313-403.000.
Pradal, Bortolo Mario, 4,072,912, Cl. 331-116.00R.
Treadwell, Richard Julian, 4,072,884, Cl. 318-314.000.

Read, Reginald A., Jr., to Regdon Corporation. Bistable electromagnetic actuator. 4,072,918, Cl. 335-236.000.

Rebold, Jerome I.: *See—*
Meshulam, Avram; and Rebold, Jerome I., 4,071,952, Cl. 30-151.000.

Rebours, Albert: *See—*
Carre, Christian; Guibet, Jean-Pierre; Rebours, Albert; and Rigal, Andre, 4,072,484, Cl. 55-379.000.

Recognition Equipment Incorporated: *See—*
McWaters, Lynn D., 4,072,859, Cl. 250-214.00R.

Rector, Michael H., to Rector & Wolfe Incorporated. Protective gloves. 4,071,913, Cl. 2-20.000.

Rector & Wolfe Incorporated: *See—*
Rector, Michael H., 4,071,913, Cl. 2-20.000.

Reed, David Alan, to Lever Brothers Company. Dishwashing compositions. 4,072,632, Cl. 252-541.000.

Reed, William R.: *See—*
Barrall, Jeffery L.; and Reed, William R., 4,072,533, Cl. 106-84.000.

Reeves, H. Neal: *See—*
Taner, M. Turhan; Sheriff, Robert E.; and Reeves, H. Neal, 4,072,922, Cl. 340-15.5CP.

Regdon Corporation: *See—*
Read, Reginald A., Jr., 4,072,918, Cl. 335-236.000.

Regehr, Ulrich; and Bulang, Siegfried. Mist remover. 4,072,478, Cl. 55-440.000.

Rehder, Robert Henry: *See—*
Boothman, David Richard; Rehder, Robert Henry; and Elgar, Everett Charles, 4,072,997, Cl. 361-103.000.

Reinhardt, Helmut; Trebinger, Karl; and Kallrath, Gottfried, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for hydrophobization of finely divided silica and silicates using prepolycondensed organosilane. 4,072,796, Cl. 428-405.000.

Reinhoudt, David N.; and Gray, Robin Th., to Shell Oil Company. Macrocyclic polyethers. 4,072,693, Cl. 260-338.000.

Reiniger, Haigh McDiarmid, to Southeast SBIC, Inc. Process for dry recovery of materials from solid refuse. 4,072,273, Cl. 241-24.000.

Reismuller, Anton, to Remesta GmbH. Method and apparatus for monitoring intake manifold vacuum. 4,072,047, Cl. 73-115.000.

Remesta GmbH: *See—*
Reismuller, Anton, 4,072,047, Cl. 73-115.000.

Reschke, Kurt W. Safety outlet. 4,072,382, Cl. 339-40.000.

Reuter, Herbert: *See—*
Kuhling, Dieter; Huppertz, Josef; Krings, Peter; and Reuter, Herbert, 4,072,622, Cl. 252-179.000.

Revertex (South Africa) (Proprietary) Limited: *See—*
Bishop, Richard T., 4,072,020, Cl. 61-36.00C.

Revue Thommen AG: *See—*
Budmiger, Hermann, 4,071,912, Cl. 2-8.000.

Reymann, Wolfgang: *See—*
Appel, Adolf; and Reymann, Wolfgang, 4,072,456, Cl. 425-183.000.

Reynolds, John Harvey: *See—*
Meulenberg, Andrew, Jr.; and Reynolds, John Harvey, 4,072,541, Cl. 136-89.0SJ.

Reynolds Metals Company: *See—*
Bullough, Vaughn L.; and Daley, Luther O., 4,072,599, Cl. 204-294.000.

Rhodes, Ignace. Processes of cooling foods and apparatus therefor. 4,072,762, Cl. 426-510.000.

Rhone-Progil: *See—*
Costes, Jean-Raymond; Strini, Jean-Claude; and Hardouin, Serge, 4,072,728, Cl. 260-660.000.

Richards, Frank P.; and Taylor, Raymond C., to Phillips Petroleum Company. Conveyor apparatus for use with a container manufacturing apparatus. 4,072,226, Cl. 198-345.000.

Richardson, Victor M., to Raymond Lee Organization, Inc., The, a part interest. Portable electric heating device for popping corn. 4,072,091, Cl. 99-323.500.

Ricks, Earl C., to United States of America, Army. Laminated wall tubing. 4,072,787, Cl. 428-594.000.

Ridha, Raouf Abdul, to Firestone Tire & Rubber Company, The. Compression molded cut-fiber reinforced plastic wheels. 4,072,358, Cl. 301-63.0PW.

Riedmuller, Eberhard: *See—*
Murso, Bernhard; and Riedmuller, Eberhard, 4,072,313, Cl. 273-105.200.

Riegler, Ernst; and Schmidt, Manfred, to Vereinigte Osterreichische Eisen- und Stahlwerke Alpine Montan Aktiengesellschaft. Tiltable metallurgical vessel arrangement. 4,072,302, Cl. 266-245.000.

Rietberg, Johan: *See—*
van der Linde, Robert; Meijerink, Gerardus Franciscus; and Rietberg, Johan, 4,072,662, Cl. 260-75.00R.

Rigal, Andre: *See—*
Carre, Christian; Guibet, Jean-Pierre; Rebours, Albert; and Rigal, Andre, 4,072,484, Cl. 55-379.000.

Ritz, Jurgen; Zimmermann, Rolf; and Fischer, Hannes, to Hoechst Aktiengesellschaft. Alkyd resins. 4,072,642, Cl. 260-22.0CB.

Rixson-Firemark, Inc.: *See—*
Haag, Michael; and Pichler, Herman P., 4,072,917, Cl. 335-205.000.

Robb, E. S.: *See—*
Parker, Gary D.; and Robb, E. S., 4,072,241, Cl. 214-392.000.

Robert Bosch GmbH: *See—*
Heiser, Joachim; Hoheisel, Rainer; Flaschar, Heinz; Gand, Heinz; Kleinschmidt, Heinz; Braunlinger, Konrad; Sopha, Klaus; Schempp, Roland; and Sanzenbacher, Hermann, 4,072,169, Cl. 137-596.130.
Lockbrunner, Eduard; and Schnepf, Dietmar, 4,072,378, Cl. 339-17.00C.
Wanner, Karl, 4,072,199, Cl. 173-131.000.

Roberts, Darrel V. Foldable backstop and like structure. 4,072,295, Cl. 256-26.000.

Roberts, David J.; and Mauri, Jacinto Moragues, to Antonio Gallardo, S.A. Derivatives of 1,2-diphenyl-3,5-dioxo-4-n-butyl-pyrazolidine and process for making same. 4,072,747, Cl. 424-270.000.

Roberts, George F.: *See—*
Morris, Fred J.; Waters, Robert L.; and Roberts, George F., 4,072,200, Cl. 175-45.000.

Robin, Michel: *See—*
Mahieu, Jean-Rene; and Robin, Michel, 4,072,901, Cl. 325-445.000.

Robinson, John Walter: *See—*
Kaganowicz, Grzegorz; and Robinson, John Walter, 4,072,985, Cl. 358-128.000.

Robinson, Martin A.: *See—*
Berenbaum, Morris B.; Evans, Francis E.; Eibeck, Richard E.; and Robinson, Martin A., 4,072,027, Cl. 62-112.000.

Robinson, Martin Alvin: *See—*
Nychka, Henry Robert; Eibeck, Richard Elmer; Robinson, Martin Alvin; and Jones, Edward Stephen, 4,072,726, Cl. 260-633.000.

Roche, Stanley E.: *See—*
Waight, William J.; and Roche, Stanley E., 4,072,431, Cl. 403-158.000.

Rochester Silo, Inc.: *See—*
Price, Raymond R., 4,071,977, Cl. 49-70.000.

Rochlitz, Jurgen; and Schon, Gunter, to Hoechst Aktiengesellschaft. Electrophotographic dual layer recording material. 4,072,520, Cl. 96-1.50R.

Rockwell International Corporation: *See—*
Schoeneweis, E. Frederick; and Stephens, Leonard J., 4,072,161, Cl. 137-68.00R.

Rockwell-Rimoldi S.p.A.: *See—*
Marforio, Nerino, 4,072,115, Cl. 112-205.000.

Rodgers, Gregory D.: *See—*
Aldridge, Clifton; Gibson, Sandra F.; and Rodgers, Gregory D., 4,072,573, Cl. 195-100.000.
Gibson, Sandra F.; and Rodgers, Gregory D., 4,072,571, Cl. 195-100.000.
Lanham, James W.; Rodgers, Gregory D.; and Meyer, Michael C., 4,072,572, Cl. 195-100.000.

Rogachev, Viktor Igorevich; Sukhorukov, Vasily Vasilievich; and Shkatov, Petr Nikolaevich. Eddy current converter for non-destructive testing of electrically conducting coating in holes of printed circuit boards. 4,072,895, Cl. 324-238.000.

Rogan, John B., to Standard Oil Company (Indiana). Catalyst and process for the polymerization of alpha-olefins. 4,072,809, Cl. 526-136.000.

Rohe, Lothar; Schramm, Jurgen; Klauke, Erich; Eue, Ludwig; and Schmidt, Robert Rudolf, to Bayer Aktiengesellschaft. Halogenated 4-trifluoromethyl-diphenyl-ether compounds and herbicidal compositions. 4,072,500, Cl. 71-98.000.

Rohlig, Rainer, to Sintermetallwerk Krebsoge GmbH. Filter cartridge with folded filter sheath. 4,071,937, Cl. 29-420.000.

Rohlig, Rainer, to Sintermetallwerk Krebsoge GmbH. Filter cartridge. 4,072,616, Cl. 210-493.00R.

Rohm and Haas Company: *See—*
Kuhn, Robert R.; and Machleder, Warren H., 4,072,474, Cl. 44-58.000.

Romagnoli, Andrea. Device for forming orderly arranged groups of packages from a continuous web of packages. 4,072,074, Cl. 83-85.000.

Romanowski, Chester J., to Foster Wheeler Energy Corporation. Pulverizer with caster roller assembly. 4,072,276, Cl. 241-117.000.

Rose, Frederick A., to Norland Corporation. Waveform measuring instrument with resident programmed processor for controlled waveform display and waveform data reduction and calculation. 4,072,851, Cl. 364-487.000.

Rose, Terence James, to Procter & Gamble Company, The. Detergent composition. 4,072,621, Cl. 252-89.00R.

Rosen, Beverly; and Tepper, Sidney A., to Lasco Toys International Inc. Sound-producing mirror toy. 4,072,314, Cl. 273-161.000.

Rosenbaum, Georges: *See—*
Bouillon, Claude; and Rosenbaum, Georges, 4,072,742, Cl. 424-47.000.

Rosenberg, William E., to Columbia Chemical Corporation. Aqueous acid plating bath and additives for producing bright electrodeposits of tin. 4,072,582, Cl. 204-54.00R.

Rosenthal, Bruce David: *See—*
Dingwall, Andrew Gordon Francis; and Rosenthal, Bruce David, 4,072,910, Cl. 331-57.000.

Ross, Cecil Jack; and Thompson, John Fred, to W. R. Weaver. Apparatus fur securin a spherical body to a supporting member. 4,071,949, Cl. 29-818.000.

Ross, Cecil Jack, to W. R. Weaver. Focussing objective mechanism for telescopic rifle sights. 4,072,396, Cl. 350-46.000.

Ross, Thomas H. Mirror attachment for shower head. 4,072,397, Cl. 350-61.000.

Roth, Ronald W.: *See—*
Voss, Hubert E.; and Roth, Ronald W., 4,072,271, Cl. 239-541.000.

Rothbart, Herbert L.: *See—*
Luddy, Francis E.; Hampson, James W.; Herb, Samuel F.; and Rothbart, Herbert L., 4,072,766, Cl. 426-607.000.

Rothlisberger, Melvin Albert. High ground clearance passenger vehicle handle apparatus. 4,072,339, Cl. 296-71.000.

Roundy, Carlos B. Pyroelectric infrared detection system. 4,072,863, Cl. 250-332.000.

Roussel UCLAF: *See—*
Buendia, Jean; Vivat, Michel; and Schalbar, Jeanine, 4,072,755, Cl. 424-312.000.
Nedelec, Lucien; Guillaume, Jacques; and Dumont, Claude, 4,072,685, Cl. 260-293.810.

Rouviere, Roger Francois: *See—*
Tiraspolsky, Wladimir; and Rouviere, Roger Francois, 4,072,166, Cl. 137-496.000.

Rowland, Incorporated: *See—*
Randall, Robert E., 4,072,791, Cl. 428-221.000.

Rowland, Stanley P.: *See—*
Cirino, Vidabelle O.; and Rowland, Stanley P., 4,072,784, Cl. 428-507.000.

Roy L. Wines & Son, Inc.: *See—*
Wines, Roy Layton, Jr.; and Wines, Roy Layton, III, 4,072,157, Cl. 134-58.00R.

Roye, Henry L. Radial mining method. 4,072,351, Cl. 299-11.000.

Rubner, Roland: *See—*
Kleeberg, Wolfgang; Rubner, Roland; and Bartel, Wieland, 4,072,524, Cl. 96-35.100.

Rucker Company, The: *See—*
Balston, John C., 4,072,122, Cl. 114-230.000.

Rudin, Melvin: *See—*
Cady, Paxton; Omura, Takeshi; Rudin, Melvin; and Fleming, James H., 4,072,578, Cl. 195-127.000.

Rudolf, Herbert: *See—*
Pfeuffer, Alfred; Rudolf, Herbert; and Balfanz, Fred, 4,072,300, Cl. 266-50.000.

Rudolph, Rene, to BBC Brown, Boveri & Company Limited. Method and arrangement for arc quenching in arresters. 4,072,996, Cl. 361-134.000.

Ruhnau, Gerhard: *See—*
Gudat, Wolfgang; and Ruhnau, Gerhard, 4,072,364, Cl. 303-95.000.

Ruhrchemie AG: *See—*
Feichtinger, Hans; Lutze, Siegfried; Birnkraut, Hans-Walter; and Kluy, Werner, 4,072,659, Cl. 260-57.00A.

Rumyantsev, Vasily Petrovich: *See—*
Brusako, Jury Ivanovich; Rzhavin, Sergei Alexandrovich; Kiselev, Vasily Pavlovich; Tarasov, Mikhail Sergeevich; Rapoport, Vladimir Mendeleevich; Timofeev, Vladimir Vasilievich; Ragulina, Raisa Ivanovna; Alivoivodich, Miro Khristoforovich; Kucherenko, Anatoly Gavrilovich; Varjushenkov, Anatoly Mikhailovich; Isaeva, Elena Pavlovna; Berezhnoi, Ivan Arkhipovich; Rumyantsev, Vasily Petrovich; Shpak, Grigory Safronovich; Guz, Dmitry Semenovich; Ilinkov, Dmitry Vladimirovich; Volpin, Pavel Ilich; Avdeev, Mikhail Pavlovich; Artemenko, Stanislav Arsentievich; and Khrennikova, Ljudmila Pavlovna, 4,072,512, Cl. 75-148.000.

Runov, Andrei Efimovich: *See—*
Zorev, Nikolai Nikolaevich; Astafiev, Anatoly Alexandrovich; Loboda, Alexandr Sergeevich; Savukov, Vladimir Pavlovich; Runov, Andrei Efimovich; Belov, Vladimir Alexandrovich; Sobolev, Jury Vasilievich; Sobolev, Valentin Vasilievich; Pavlov, Nikolai Mikhailovich; Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Balandin, Jury Fedorovich; Gorynin, Igor Vasilievich; Zvezdin, Jury Ivanovich; Ivanov, Kuzma Makeevich; Ignatov, Viktor Alexandrovich; and Emelyanenko, July Georgievich, 4,072,509, Cl. 75-124.000.

Ruppert, Juergen: *See—*
Sauer, Gerhard; Hauser, Helmut; Haffer, Gregor; Ruppert, Juergen; Eder, Ulrich; and Wiechert, Rudolf, 4,072,716, Cl. 260-586.00F.

Russell, Anthony William: *See—*
Russell, Michael King; and Russell, Anthony William, 4,071,959, Cl. 33-312.000.

Russell, Michael King; and Russell, Anthony William. Gyro-stabilized single-axis platform. 4,071,959, Cl. 33-312.000.

Ruzicka, Leo J. Vacuum spoiler for pickup. 4,072,336, Cl. 296-1.00S.

Ryan, Robert Allan: *See—*
Manning, Donald Franklin; and Ryan, Robert Allan, 4,072,225, Cl. 197-133.00R.

Rydborn, Sten-Ake Olaus. Apparatus for indicating whether one or more objects are in motion. 4,072,935, Cl. 340-259.000.

Ryder, Jack Forrester, to National Research Development Corporation. Super sulphate cement reinforced with glass fibers. 4,072,534, Cl. 106-98.000.

Ryzhikov, Igor Veniaminovich: *See—*
Karatsjuba, Anatoly Prokofievich; Kmita, Tatyana Georgievna; Kruglov, Igor Ivanovich; Kurinny, Vladimir Ivanovich; Kurnosov, Anatoly Ivanovich; Ryzhikov, Igor Veniaminovich; and Judin, Vladimir Vasilievich, 4,071,945, Cl. 29-578.000.

Rzhavin, Sergei Alexandrovich: *See—*
Brusako, Jury Ivanovich; Rzhavin, Sergei Alexandrovich; Kiselev, Vasily Pavlovich; Tarasov, Mikhail Sergeevich; Rapoport, Vladimir Mendeleevich; Timofeev, Vladimir Vasilievich; Ragulina, Raisa Ivanovna; Alivoivodich, Miro Khristoforovich; Kucherenko, Anatoly Gavrilovich; Varjushenkov, Anatoly Mikhailovich; Isaeva, Elena Pavlovna; Berezhnoi, Ivan Arkhipovich; Rumyantsev, Vasily Petrovich; Shpak, Grigory Safronovich; Guz, Dmitry Semenovich; Ilinkov, Dmitry Vladimirovich; Volpin, Pavel Ilich; Avdeev, Mikhail Pavlovich; Artemenko, Stanislav Arsentievich; and Khrennikova, Ljudmila Pavlovna, 4,072,512, Cl. 75-148.000.

S & C Electric Company: *See—*
Krejsa, Richard E., 4,073,000, Cl. 361-344.000.

Sacchetti, Peter John, to AMF Incorporated. Low inductance precision resistor deposited on an adhesive backing and wound on a bobbin. 4,072,921, Cl. 338-61.000.

Sadler, Boyd. Boat jacks. 4,072,293, Cl. 254-89.00R.

Saeman, Walter C., to Olin Corporation. Rotary dryers. 4,071,962, Cl. 34-135.000.

Saggers, David Thomas: *See—*
Gates, Peter Stuart; Gillon, John; and Saggers, David Thomas, 4,072,495, Cl. 71-76.000.

Sagner, Max; and Souquet, Jacques, to Bertin & Cie. Pressure-relieving device for steam generators and the like. 4,072,170, Cl. 137-599.000.

Saito, Humitoshi: *See—*
Tsujihara, Toshio; Saito, Humitoshi; and Kitamori, Teruaki, 4,072,315, Cl. 274-1.00E.

Sakabe, Nobuyuki: *See—*
Sekiya, Mamoru; and Sakabe, Nobuyuki, 4,072,907, Cl. 330-261.000.

Saletta, Gary F.: *See—*
Engel, Joseph C.; and Saletta, Gary F., 4,072,878, Cl. 315-205.000.

Salk Institute for Biological Studies, The: *See—*
Amoss, Max S.; Monahan, Michael W.; and Vale, Wylie W., Jr., 4,072,668, Cl. 260-112.5LH.

Salmon, John Kennedy, to Otis Elevator Company. Suspended cable apparatus. 4,072,213, Cl. 188-1.00B.

Saltzman, William H., to Intellectual Property Development Corporation. 3α,7α-Dihydroxy-cholanic acid derivatives. 4,072,695, Cl. 260-397.100.

Sanday, Santiago C., to Westinghouse Electric Corporation. Gas turbine combustor employing plural catalytic stages. 4,072,007, Cl. 60-39.69A.

Sanders Associates, Inc.: *See—*
Bianco, Joseph F.; Senio, Nicholas; Hawes, Russell B.; and Strang, Donald B., 4,072,944, Cl. 343-7.0PF.

Sanderson, Allan, to Welding Institute, The. Electron beam welding generators. 4,072,356, Cl. 219-121.0EB.

Sandoz Ltd.: *See—*
Bohler, Hans; and Griesser, Rolf, 4,072,700, Cl. 260-438.100.
Ebnother, Anton; Bastian, Jean-Michel; Gadient, Fulvio; and Stoll, Andre, 4,072,756, Cl. 424-267.000.
Henzi, Beat, 4,072,672, Cl. 260-205.000.

Sandoz, Oscar A.: *See—*
Hamid, Michael A.; and Sandoz, Oscar A., 4,072,941, Cl. 343-5.0NA.

Sandvik Aktiebolaget: *See—*
Pantzar, Glenn Goran Egon, 4,071,953, Cl. 30-384.000.

Sanematsu, Hisato: *See—*
Chibata, Ichiro; Yamada, Shigeki; Yamamoto, Masao; and Sanematsu, Hisato, 4,072,691, Cl. 260-326.14T.

Sangamo Weston, Inc.: *See—*
Wilder, Joseph, 4,072,928, Cl. 340-146.30H.

Sankovich, Melvin F., to Babcock & Wilcox Company, The. Device to accept axial forces occurring on fuel assemblies during the operation of nuclear reactors. 4,072,562, Cl. 176-50.000

Sano, Konosuke: *See—*
Togo, Kazushi; Tamura, Fumihide; Yasuda, Naohiko; Ichikawa, Takehiko; Sano, Konosuke; Matsuda, Keizo; and Mitsugi, Koji, 4,072,687, Cl. 260-306.70T.

Sansome, Dennis Hugh: *See—*
Dawson, Graham Robert; and Sansome, Dennis Hugh, 4,072,034, Cl. 72-56.000.

Santen, Sven; and Grip, Carl Erik, to SKF Industrial Trading and Development Co. B.V.; and Norrbottens Jarnverk AB. Method apparatus for increasing blast gas temperature in a shaft furnace. 4,072,502, Cl. 75-11.000.

Santen, Sven Oscar: *See—*
Perdahl, Orn Gunnar; and Santen, Sven Oscar, 4,072,504, Cl. 75-40.000.

Sanzenbacher, Hermann: *See—*
Heiser, Joachim; Hoheisel, Rainer; Flaschar, Heinz; Gand, Heinz; Kleinschmidt, Heinz; Braunlinger, Konrad; Sopha, Klaus; Schempp, Roland; and Sanzenbacher, Hermann, 4,072,169, Cl. 137-596.130.

Sarda, Jean-Paul; and Le Tirant, Pierre, to Institut Francais du Petrole; and Societe Europeene de Produits Refractaires. Propping agent and method of propping open fractures in the walls of a bored well 4,072,193, Cl. 166-280.000.

Sasaki, Takashi: *See—*
Araki, Kunio; Sasaki, Takashi; Kasahara, Yuko; Yamashita, Yoshisada; Yotumoto, Keiichi; Sunaga, Hiromi; Tabei, Kiyoshi; Goto, Kazuo; Tajiri, Kunio; and Kittaka, Hirokama, 4,072,792, Cl. 428-246.000.

Sato, Manabu; and Matumoto, Shigeru, to Victor Company of Japan, Ltd. Cassette loading device in a cassette tape recorder 4,072,988, Cl. 360-96.000.

Sato, Masaaki, to Olympus Optical Co., Ltd. Tape viewing system for micro-cassette tape recorder. 4,072,995, Cl. 360-137.000.

Sato, Yukio; Itoh, Takeshi; and Izawa, Hiromi, to Star Seimitsu Kabushiki Kaisha. Mechanical-hydraulic radial feed system for a lathe 4,072,071, Cl. 82-2.00R.

Sauer, Gerhard; Hauser, Helmut; Haffer, Gregor; Ruppert, Juergen; Eder, Ulrich; and Wiechert, Rudolf, to Schering Aktiengesellschaft. Bicycloalkane derivatives. 4,072,716, Cl. 260-586.00F.

Savukov, Vladimir Pavlovich: *See—*
Zorev, Nikolai Nikolaevich; Astafiev, Anatoly Alexandrovich; Loboda, Alexandr Sergeevich; Savukov, Vladimir Pavlovich; Runov, Andrei Efimovich; Belov, Vladimir Alexandrovich; Sobolev, Jury Vasilievich; Sobolev, Valentin Vasilievich; Pavlov, Nikolai Mikhailovich; Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Balandin, Jury Fedorovich; Gorynin, Igor Vasilievich; Zvezdin, Jury Ivanovich; Ivanov, Kuzma Makeevich; Ignatov, Viktor Alexandrovich; and Emelyanenko, July Georgievich, 4,072,509, Cl. 75-124.000.

Sawa, Yoshihiko: *See—*
Seki, Kiyoshi; Tomioka, Ichiro; and Sawa, Yoshihiko, 4,072,016, Cl. 61-35.000.

Saxe, Frederick E.; and Einbinder, Seymour K., to United States of America, Army. Missile control means. 4,072,107, Cl. 102-4.000.

Sayegh, Georges, to Sciaky Bros., Inc. Apparatus for electron beam machining in vacuum. 4,072,844, Cl. 219-121.0EB

Scarsella, Edward Louis; and Spotholz, Clifford Henry, to General Foods Corporation. Method of making an extractable coffee substitute. 4,072,765, Cl. 426-596.000.

Schacht, Erich; Mehrhof, Werner; Simane, Zdenek; Nowak, Herbert, and Kayser, Detlev, to Merck Patent Gesellschaft mit beschrankter Haftung. Hydratropic acid derivatives and process for the production thereof. 4,072,754, Cl. 424-308.000.

Schaffer, Robert H., to Harris-Intertype Corporation. Printing unit drive system. 4,072,104, Cl. 101-248.000.

Schalbar, Jeanine: *See—*
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Schatz, Friedrich: *See—*
Ziemek, Gerhard; and Schatz, Friedrich, 4,072,035, Cl. 72-209.000.

Schaupp, Kurt: *See—*
Hinsche, Friedrich; and Schaupp, Kurt, 4,072,786, Cl. 428-537.000.

Schei, Asle, to ASEA Aktiebolag. Over-voltage protection device. 4,072,998, Cl. 361-117.000.

Scheid, Karl; Schweibfurt, Werner; and Quast, Eberhard, to Meteor-Siegen Apparatebau Paul Schmeck GmbH. Photocopying machine having a repeat mechanism. 4,072,305, Cl. 271-3.000.

Schempp, Roland: *See—*
Heiser, Joachim; Hoheisel, Rainer; Flaschar, Heinz; Gand, Heinz; Kleinschmidt, Heinz; Braunlinger, Konrad; Sopha, Klaus; Schempp, Roland; and Sanzenbacher, Hermann, 4,072,169, Cl. 137-596.130.

Schering Aktiengesellschaft: *See—*
Arndt, Friedrich; and Nusslein, Ludwig, 4,072,497, Cl. 71-90.000.
Sauer, Gerhard; Hauser, Helmut; Haffer, Gregor; Ruppert, Juergen; Eder, Ulrich; and Wiechert, Rudolf, 4,072,716, Cl. 260-586.00F.

Schicketanz, Dieter: *See—*
Larsen, Herbert; Zeidler, Guenter; and Schicketanz, Dieter, 4,072,398, Cl. 350-96.230.

Schiel, Christian, to J. M. Voith GmbH. Method and apparatus for shrinking a travelling web of fibrous material. 4,072,557, Cl. 162-111.000.

Schiller, Arthur Maurice; Goodman, Richard Martin; and Neff, Roger

Edgar, to American Cyanamid Company. Preparation of anionic polymers for use as scale inhibitors and anti-precipitants. 4,072,607, Cl. 210-58.000.

Schlafer, Ludwig; and Opitz, Konrad, to Hoechst Aktiengesellschaft. Liquid preparations of reactive dyestuffs. 4,072,463, Cl. 8-41.00B.

Schlieckmann, Alfred, to Upjohn Company, The. Mould carrier. 4,072,458, Cl. 425-451.600.

Schlosberg, Richard H.; Wright, Franklin J.; and Hartgerink, Ronald L., to Exxon Research & Engineering Co. Method for improving gasification process rates and yields by means of electrophilic aromatic substitution pretreatment of coal. 4,072,475, Cl. 48-210.000.

Schluderberg, Donald C.: *See—*
McDonald, Bertrand N.; and Schluderberg, Donald C., 4,072,563, Cl. 176-65.000.

Schmidt, Manfred: *See—*
Riegler, Ernst; and Schmidt, Manfred, 4,072,302, Cl. 266-245.000.

Schmidt, Otto, to Siemens Aktiengesellschaft. Device for crucible-free floating-zone melting of a crystalline rod and method of operating the same. 4,072,556, Cl. 156-620.000.

Schmidt, Robert Rudolf: *See—*
Rohe, Lothar; Schramm, Jurgen; Klauke, Erich; Eue, Ludwig; and Schmidt, Robert Rudolf, 4,072,500, Cl. 71-98.000.

Schneider, Alan Arthur, to Catalyst Research Corporation. Lithium halide cell. 4,072,803, Cl. 429-181.000.

Schneider, Ronald A., to Chevron Research Company. Polyvinyl chloride plastic compositions. 4,072,647, Cl. 260-31.80R.

Schnepf, Dietmar: *See—*
Lockbrunner, Eduard; and Schnepf, Dietmar, 4,072,378, Cl. 339-17.00C.

Schoeneweis, E. Frederick; and Stephens, Leonard J., to Rockwell International Corporation. Sealing member for valve stems. 4,072,161, Cl. 137-68.00R.

Schoenthaler, David, to Western Electric Co., Inc. Method and apparatus for forming a uniform solder wave. 4,072,777, Cl. 427-433.000.

Scholeman-Siemag Aktiengesellschaft: *See—*
Aveneau, Andre Auguste, 4,072,826, Cl. 179-15.0AF.

Schon, Gunter: *See—*
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Schramm, Jurgen: *See—*
Rohe, Lothar; Schramm, Jurgen; Klauke, Erich; Eue, Ludwig; and Schmidt, Robert Rudolf, 4,072,500, Cl. 71-98.000.

Schroder, Ernst, to Licentia Patent-Verwaltungs G.m.b.H. Variable gain amplifier with adjustable upper frequency limit. 4,072,906, Cl. 330-86.000.

Schrotz, Kurt: *See—*
Becker, Werner; and Schrotz, Kurt, 4,072,105, Cl. 101-288.000.

Schueler, Ralf. Seating furniture. 4,072,346, Cl. 297-217.000.

Schuenemann, Claus: *See—*
Bechtle, Bastian; Schuenemann, Claus; Skudelny, Gisbert; Spruth, Wilhelm; Weis, Helmut; and Zimmermann, Volker, 4,072,888, Cl. 318-685.000.

Schultheiss, Adrian, to Armco Steel Corporation. Seam crimping apparatus. 4,072,118, Cl. 113-57.000.

Schulz, Klaus-Dieter: *See—*
Hausen, Peter; and Schulz, Klaus-Dieter, 4,072,505, Cl. 75-61.000.

Schuman, Mark. Thermally driven piston apparatus. 4,072,010, Cl. 60-520.000.

Schurmann, Werner: *See—*
Bartels, Hermann; Schurmann, Werner; and Sigg, Max, 4,072,275, Cl. 241-79.000.

Schurter AG: *See—*
Wallner, Peter, 4,072,385, Cl. 339-88.00R.

Schuster, Eberhard: *See—*
Niemann, Hans-Joachim; Schuster, Eberhard; and Kersting, Arno, 4,072,590, Cl. 204-157.10R.

Schwartz, Albert B., to Mobil Oil Corporation. Catalytic cracking process. 4,072,600, Cl. 208-120.000.

Schweibfurt, Werner: *See—*
Scheid, Karl; Schweibfurt, Werner; and Quast, Eberhard, 4,072,305, Cl. 271-3.000.

Sciaky Bros., Inc.: *See—*
Sayegh, Georges, 4,072,844, Cl. 219-121.0EB.

Scientific-Atlanta, Inc.: *See—*
Davis, Glenn A., 4,072,931, Cl. 340-171.00R.

SCM Corporation: *See—*
Close, Ralph E.; and Oroshnik, William, 4,072,725, Cl. 260-632.00R.
Ting, Vincent Wen-Hwa, 4,072,770, Cl. 427-54.000.

Scott, Gerald R.: *See—*
Smith, Garland Y.; Scott, Gerald R.; Blazek, George A.; and Kowalski, John L., 4,072,437, Cl. 407-118.000.

Scouten, Charles G.; and Hamilton, Willard C., to Xerox Corporation. Amides of ω — and cis alkenoic acids in imaging process and element. 4,072,521, Cl. 96-1.50R.

Seal-Spout Corporation: *See—*
Plaessmann, Frederick August, 4,072,117, Cl. 113-1.00H.

Seegmiller, Wan; Young, Bruce O.; and Story, Joe A., to Energy Absorption Systems, Inc. Energy absorbing bumper. 4,072,334, Cl. 293-71.00R.

Segreto, Salvador J. Drill pipe stabbing protector. 4,072,369, Cl. 308-4.00A.

Seibel, Arthur H. Litter disposal device for automobiles. 4,072,097, Cl. 100-100.000.

Seidelberger, Emmerich, to Kraftwerk Union Aktiengesellschaft. Pressurized-water reactor pressure vessel emergency core coolant connection arrangement. 4,072,560, Cl. 176-38.000.

Seiscom Delta Inc.: *See—*
Taner, M. Turhan; Sheriff, Robert E.; and Reeves, H. Neal, 4,072,922, Cl. 340-15.5CP.

Seitchik, Jerold A.: *See—*
Ohnigian, Suran; and Seitchik, Jerold A., 4,073,012, Cl. 365-1.000.

Seki, Kiyoshi; Tomioka, Ichiro; and Sawa, Yoshihiko. Method of reconstructing and reclamation of river channels. 4,072,016, Cl. 61-35.000.

Sekine, Hisashi; Yamamoto, Akira; and Hayashi, Shizuo, to Kao Soap Co., Ltd. Method for deodorizing liquid lanolin. 4,072,697, Cl. 260-397.250.

Sekiya, Mamoru; and Sakabe, Nobuyuki, to Shin-Shirasuna Electric Corporation. Amplifier circuit. 4,072,907, Cl. 330-261.000.

Sekiya, Setsuro: *See—*
Noguchi, Masaaki; Tanaka, Yukiyasu; Sekiya, Setsuro; and Motosugi, Katsuhiko, 4,072,134, Cl. 123-75.00B.
Noguchi, Masaaki; Tanaka, Yukiyasu; Sekiya, Setsuro; and Motosugi, Katsuhiko, 4,072,135, Cl. 123-75.00B.
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Sellstedt, John H., to American Home Products Corporation. Process for preparation of 6-aminopenicillanic acid derivatives. 4,072,676, Cl. 260-239.100.

Sels, Francis Jeanne: *See—*
Pollet, Robert Joseph; Sels, Francis Jeanne; and Vandeputte, Camille Angelina, 4,072,523, Cl. 96-22.000.

Sels, Jeanne Francis Jeanne; Pollet, Robert Joseph; Vandeputte, Camille Angelina; and Willems, Jozef Frans, to AGFA-GEVAERT, N.V. Development of photographic silver halide material. 4,072,526, Cl. 96-66.300.

Senftle, Frank E.: *See—*
Sisler, Frederick D.; and Senftle, Frank E., 4,072,798, Cl. 429-2.000.

Senio, Nicholas: *See—*
Bianco, Joseph F.; Senio, Nicholas; Hawes, Russell B.; and Strang, Donald B., 4,072,944, Cl. 343-7.0PF.

Senzaki, Takaya: *See—*
Yashima, Michio; Senzaki, Takaya; and Kurihara, Norimitsu, 4,072,925, Cl. 340-52.00F.

Sera, Hidefumi: *See—*
Yamaguchi, Teruo; and Sera, Hidefumi, 4,072,639, Cl. 260-6.000.

Servin, Arturo; and Servin, Jose, to Camp, Roger D.; and Randall-Ford, Mattias J., part interest to each. Automatic metal puller. 4,072,042, Cl. 72-457.000.

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Servin, Arturo; and Servin, Jose, 4,072,042, Cl. 72-457.000.

Seydelmann, Ludwig. Cutter blade for food processing. 4,072,277, Cl. 241-292.100.

Seyle, Robert Alan, to Bate & Ramey, Inc. Pile straightener. 4,072,040, Cl. 72-406.000.

SGL Industries, Inc.: *See—*
Instone, John C., 4,072,401, Cl. 339-125.00R.

SGS-ATES Componenti Elettronici S.p.A.: *See—*
Murari, Bruno; and Menniti, Pietro, 4,072,908, Cl. 330-265.000.
Palara, Sergio, 4,072,979, Cl. 357-36.000.

Shaffran, Clifford John: *See—*
Anderson, Warren Malcolm; and Shaffran, Clifford John, 4,072,121, Cl. 114-90.000.

Shallenberger, Larry R.; and Southard, James S., to C.G. Conn, Ltd. System for automatically producing tone patterns. 4,072,078, Cl. 84-1.030.

Shannon, Suel Grant, to AMP Incorporated. Socket assemblies. 4,072,376, Cl. 339-17.00C.

Shapiro, Eugene: *See—*
Shapiro, Stanley; Shapiro, Eugene; Mravic, Brian; and Watson, W. Gary, 4,072,513, Cl. 75-164.000.

Shapiro, Stanley; Shapiro, Eugene; Mravic, Brian; and Watson, W. Gary, to Olin Corporation. Copper base alloys with high strength and high electrical conductivity. 4,072,513, Cl. 75-164.000.

Sharp, Paul H., to CBS Inc. Apparatus and method for modifying a musical tone to produce celeste and other effects. 4,072,079, Cl. 84-1.240.

Shaw, Wilfrid G.: *See—*
White, James F.; Shaw, Wilfrid G.; and Applequist, Michael D., 4,072,708, Cl. 260-530.00N.

Shell Oil Company: *See—*
Janssen, Frank J., 4,072,629, Cl. 252-416.000.
Reinhoudt, David N.; and Gray, Robin Th., 4,072,693, Cl. 260-338.000.

Shenton, Francis L.: *See—*
Hylton, Thomas A.; and Shenton, Francis L., 4,072,698, Cl. 260-465.00E.

Sheppard, Chester Stephen: *See—*
D'Angelo, Antonio Joseph; Mageli, Orville Leonard; and Sheppard, Chester Stephen, 4,072,810, Cl. 526-230.000.

Sheriff, Robert E.: *See—*
Taner, M. Turhan; Sheriff, Robert E.; and Reeves, H. Neal, 4,072,922, Cl. 340-15.5CP.

Sherwood Refractories, Inc.: *See—*
Loxley, Ted A.; Barber, Walter G.; Combs, Walter W.; and Webb, John M., 4,072,489, Cl. 65-18.000.

Sheth, Rajesh N., to Borg-Warner Corporation. Rotary compressor vane with built-in spring. 4,072,452, Cl. 418-266.000.

Shimada, Takashi: *See—*
Shimahara, Yoichi; and Shimada, Takashi, 4,072,926, Cl. 340-58.000.

Shimahara, Yoichi; and Shimada, Takashi, to Toyo Rubber Industry

Co., Ltd., The. Tire pressure warning apparatus. 4,072,926, Cl. 340-58.000.

Shimazu, Ken-ichi: *See—*
Golda, Eugene; Huang, Jen-chi; Shimazu, Ken-ichi; and Chu, Simon Long, 4,072,589, Cl. 204-129.400.

Shimizu, Norio: *See—*
Ishida, Masahiko; Oguri, Yoshitaka; Shimizu, Norio; and Muroi, Tadashi, 4,072,667, Cl. 260-112.00R.

Shimizu, Soichiro, to Tokyo Fabric Kogyo Kabushiki Kaisha. Apparatus for protecting bridge pillars. 4,072,022, Cl. 61-48.000.

Shimokawa, Toshiaki; and Suzuki, Kunitaka, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Passive seat belt device. 4,072,323, Cl. 280-745.000.

Shimp, Richard L., to Comsonics, Inc. RF leak detector. 4,072,899, Cl 325-67.000.

Shin-Shirasuna Electric Corporation: *See—*
Sekiya, Mamoru; and Sakabe, Nobuyuki, 4,072,907, Cl. 330-261.000.

Shintani, Akira: *See—*
Suda, Kyo; Takami, Katsumi; Shintani, Akira; and Hase, Shinobu, 4,072,767, Cl. 427-8.000.

Shipman, Gene Herbert, to Minnesota Mining and Manufacturing Company. Thin-walled ovenable parts. 4,072,661, Cl. 260-75.00R.

Shirahata, Ryuji; Suzuki, Masaaki; and Kitamoto, Tatsuji, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,072,781, Cl. 428-336.000.

Shirai, Yasuhiro: *See—*
Nomura, Motoi; Shirai, Yasuhiro; Yoshinaga, Yoshiaki; and Yamaizumi, Kouji, 4,072,227, Cl. 198-370.000.

Shiraki, Hisashi. Treating soil. 4,072,017, Cl. 61-35.000.

Shkatov, Petr Nikolaevich: *See—*
Rogachev, Viktor Igorevich; Sukhorukov, Vasily Vasilievich; and Shkatov, Petr Nikolaevich, 4,072,895, Cl. 324-238.000.

Shmikk, Dmitry Viktorovich: *See—*
Mamyrin, Boris Alexandrovich; Karataev, Valery Ivanovich; and Shmikk, Dmitry Viktorovich, 4,072,862, Cl. 250-286.000.

Shorr, Leonard Marshall: *See—*
Ravey, Mani; Shorr, Leonard Marshall; and Waterman, Jacques A., deceased, 4,072,806, Cl. 526-89.000.

Short, Rolland W. P.; and Verbanac, Frank, to A. E. Staley Manufacturing Company. Precompacted-starch binder-disintegrant-filler material for direct compression tablets and dry dosage capsules. 4,072,535, Cl. 106-210.000.

Shpak, Grigory Safronovich: *See—*
Brusako, Jury Ivanovich; Rzhavin, Sergei Alexandrovich; Kiselev, Vasily Pavlovich; Tarasov, Mikhail Sergeevich; Rapoport, Vladimir Mendeleevich; Timofeev, Vladimir Vasilievich; Ragulina, Raisa Ivanovna; Alivoivodich, Miro Khristoforovich; Kucherenko, Anatoly Gavrilovich; Varjushenkov, Anatoly Mikhailovich; Isaeva, Elena Pavlovna; Berezhnoi, Ivan Arkhipovich; Rumyantsev, Vasily Petrovich; Shpak, Grigory Safronovich; Guz, Dmitry Semenovich; Ilinkov, Dmitry Vladimirovich; Volpin, Pavel Ilich; Avdeev, Mikhail Pavlovich; Artemenko, Stanislav Arsentievich; and Khrennikova, Ljudmila Pavlovna, 4,072,512, Cl. 75-148.000.

Shriver, Joe E.: *See—*
Heller, Larry E.; Shriver, Joe E.; and Lindblom, Curtis H., 4,072,002, Cl. 56-53.000.

Sickles, James E.; and Tepper, Richard M., to PPG Industries, Inc. Self-adjusting power supply for induction charging. 4,073,002, Cl. 361-227.000.

Siemens Aktiengesellschaft: *See—*
Diepers, Heinrich, 4,072,588, Cl. 204-129.430.
Elmqvist, Rune, 4,072,959, Cl. 346-140.00R.
Gunther, Gerd-Joachim, 4,072,820, Cl. 178-23.00R.
Kirschner, Fritz, 4,072,980, Cl. 357-38.000.
Kleeberg, Wolfgang; Rubner, Roland; and Bartel, Wieland, 4,072,524, Cl. 96-35.100.
Kleeberg, Wolfgang; Hacker, Heinz; and Hauschildt, Klaus-Robert, 4,072,804, Cl. 526-11.200.
Kuenzle, Paul; and Baumgartl, Ulrich, 4,072,832, Cl. 200-48.00R.
Larsen, Herbert; Zeidler, Guenter; and Schicketanz, Dieter, 4,072,398, Cl. 350-96.230.
Ludwig, Martin; and Eickenscheidt, Wennemar, 4,072,819, Cl. 178-17.500.
Neidl, Herbert; Kaspar, Gunther; and Drossel, Rolf, 4,072,559, Cl. 176-19.0LD.
Schmidt, Otto, 4,072,556, Cl. 156-620.000.
Stein, Karl-Ulrich, 4,072,982, Cl. 357-49.000.

Siems, Lee E.; and Morgan, Paul M., to Western Geophysical Co. of America. Multichannel seismic telemeter system and array former. 4,072,923, Cl. 340-15.5TS.

Sigg, Max: *See—*
Bartels, Hermann; Schurmann, Werner; and Sigg, Max, 4,072,275, Cl. 241-79.000.

Silva, Jose R. Brain wave signal sensor headband assembly. 4,072,145, Cl. 128-2.10E.

Silveco Products, Inc.: *See—*
Silverman, Abe, 4,071,914, Cl. 3-36.000.

Silverman, Abe, to Silveco Products, Inc. Mastectomy pad. 4 071,914, Cl. 3-36.000.

Simane, Zdenek: *See—*
Schacht, Erich; Mehrhof, Werner; Simane, Zdenek; Nowak, Herbert; and Kayser, Detlev, 4,072,754, Cl. 424-308.000.

Simon, David Julian; and Costello, Edward Charles, to Singer Company, The. Digital to analog resolver converter. 4,072,940, Cl. 340-347.0SY.

Simpson, Fred E.: *See—*
Lawrence, Dean M.; and Simpson, Fred E., 4,072,338, Cl. 296-28.00C.

Singer Company, The: *See—*
Simon, David Julian; and Costello, Edward Charles, 4,072,940, Cl. 340-347.0SY.

Sinha, Rabindra Kumar; Wagner, Norman J.; and Joyce, Ronald S., to Calgon Corporation. Impregnated activated carbon for improved removal of malodorous compounds. 4,072,479, Cl. 55-73.000.

Sintermetallwerk Krebsoge GmbH: *See—*
Rohlig, Rainer, 4,071,937, Cl. 29-420.000.
Rohlig, Rainer, 4,072,616, Cl. 210-493.00R.

Sirover, Michael A.: *See—*
Loeb, Lawrence A.; and Sirover, Michael A., 4,072,574, Cl. 195-103.50R.

Sisler, Frederick D.; and Senftle, Frank E., to United States of America, Interior. Bioelectric neutralization of acid waters. 4,072,798, Cl. 429-2.000.

Sitton, Robert L.: *See—*
Miller, Walter E., Jr.; Sitton, Robert L.; and Blackmon, Anthony D., 4,072,281, Cl. 244-3.160.

SKF Industrial Trading and Development Co. B.V.: *See—*
Santen, Sven; and Grip, Carl Erik, 4,072,502, Cl. 75-11.000.

Sklaroff, Morton: *See—*
Hogan, James A.; and Sklaroff, Morton, 4,072,852, Cl. 235-303.100.

Skudelny, Gisbert: *See—*
Bechtle, Bastian; Schuenemann, Claus; Skudelny, Gisbert; Spruth, Wilhelm; Weis, Helmut; and Zimmermann, Volker, 4,072,888, Cl. 318-685.000.

Slam, Thomas James: *See—*
Sturm, Budd Harvey; and Slam, Thomas James, 4,072,721, Cl. 260-621.00A.

Sliney, Joseph Leo: *See—*
Godrick, Joseph A.; and Sliney, Joseph Leo, 4,072,262, Cl. 228-265.000.

Sloan, Paul H., Jr., to Stant Manufacturing Company, Inc. Filler neck cap with O-ring seal. 4,072,245, Cl. 220-295.000.

Smellie, Allan M.; and Brandstatter, Hans G., to Ontario Research Foundation. Production of ferrochrome alloy. 4,072,510, Cl. 75-130.500.

Smiga, Slavomir: *See—*
Kostura, Michal; Pandula, Jan; Harmansky, Absolon; Smiga, Slavomir; and Kepic, Stefan, 4,072,181, Cl. 164-154.000.

Smith, David W., to Townsend Engineering Company. Hand-held meat skinning device. 4,071,923, Cl. 17-21.000.

Smith, Garland Y.; Scott, Gerald R.; Blazek, George A.; and Kowalski, John L., to Garland Smith Engineering Co., Inc. Removable cutter tooth. 4,072,437, Cl. 407-118.000.

Smith, John Lionel, to Imperial-Eastman (UK) Limited. Crimping apparatus. 4,071,936, Cl. 29-237.000.

Smith Kline & French Laboratories Limited: *See—*
Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 4,072,748, Cl. 424-270.000.

Smitherman, Stephen N.; and Dougherty, Lemuel A., to Big Elk Wood Corporation. Method for bundling firewood. 4,072,094, Cl 100-3.000.

SmithKline Corporation: *See—*
Gleason, John Gerald; Holden, Kenneth George; and Huffman, William Francis, 4,072,674, Cl. 260-239.00A.

Snamprogetti, S.p.A.: *See—*
Beranger, Alessandro; Balducci, Agostino; and Gordini, Silvano, 4,072,739, Cl. 423-8.000.
Sodini, Giancarlo; and Canella, Marco, 4,072,671, Cl. 260-123.500.

Snap-on Tools Corporation: *See—*
Boone, Jack L., 4,072,375, Cl. 312-338.000.

Snyder, Estel Ray: *See—*
Stewart, Sherman A.; and Snyder, Estel Ray, 4,071,993, Cl. 52-309.500.

Snyder, Paul W., Jr.: *See—*
Morgan, Charles R., Jr.; and Snyder, Paul W., Jr., 4,072,471, Cl. 23-288.0FB.

Snyder, Richard V., to Harvard Industries, Inc. Feed forward passive coupling system and method. 4,072,913, Cl. 333-6.000.

Sobolev, Jury Vasilievich: *See—*
Zorev, Nikolai Nikolaevich; Astafiev, Anatoly Alexandrovich; Loboda, Alexandr Sergeevich; Savukov, Vladimir Pavlovich; Runov, Andrei Efimovich; Belov, Vladimir Alexandrovich; Sobolev, Jury Vasilievich; Sobolev, Valentin Vasilievich; Pavlov, Nikolai Mikhailovich; Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Balandin, Jury Fedorovich; Gorynin, Igor Vasilievich; Zvezdin, Jury Ivanovich; Ivanov, Kuzma Makeevich; Ignatov, Viktor Alexandrovich; and Emelyanenko, July Georgievich, 4,072,509, Cl. 75-124.000.

Sobolev, Valentin Vasilievich: *See—*
Zorev, Nikolai Nikolaevich; Astafiev, Anatoly Alexandrovich; Loboda, Alexandr Sergeevich; Savukov, Vladimir Pavlovich; Runov, Andrei Efimovich; Belov, Vladimir Alexandrovich; Sobolev, Jury Vasilievich; Sobolev, Valentin Vasilievich; Pavlov, Nikolai Mikhailovich; Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Balandin, Jury Fedorovich; Gorynin, Igor Vasilievich; Zvezdin, Jury Ivanovich; Ivanov, Kuzma Makeevich; Ignatov, Viktor Alexandrovich; and Emelyanenko, July Georgievich, 4,072,509, Cl. 75-124.000.

Sochor, Jerzy R., to Spectra-Strip Corporation. Multiple conductor connector unit and cable assembly. 4,072,387, Cl. 339-91.00R.

Societa Italiana Vetro Siv S.p.A.: *See—*
Comastri, Mauro; and Ciarniello, Giorgio, 4,072,953, Cl. 343-713.000.
Comastri, Mauro; and Ciarniello, Giorgio, 4,072,954, Cl. 343-713.000.
Comastri, Mauro; and Ciarniello, Giorgio, 4,072,955, Cl. 343-713.000.

S.A. Texaco Belgium N.V.: *See—*
Hermans, Johny C., 4,072,633, Cl. 260-2.00N.

Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
Horisberger, Marc; and Olofsson, Mats, 4,072,666, Cl. 260-112.00R.
Margolis, Geoffrey; and Liu, Richard Tien-Szu, 4,072,761, Cl. 426-387.000.

Societe Europeene de Produits Refractaires: *See—*
Sarda, Jean-Paul; and Le Tirant, Pierre, 4,072,193, Cl. 166-280.000.

Societe Industrielle Bertrand Faure Brieres-les-Scelles: *See—*
Boisset, Bernard, 4,072,347, Cl. 297-385.000.

Societe Industrielle d'Etudes et de Realisations Scientifiques S.I.E.R.S.: *See—*
Banon, Gabriel J. C., 4,072,292, Cl. 251-331.000.

Societe Lignes Telegraphiques et Telephoniques: *See—*
Mahieu, Jean-Rene; and Robin, Michel, 4,072,901, Cl. 325-445.000.

Sodini, Giancarlo; and Canella, Marco, to Snamprogetti, S.p.A. Method for extracting phenols and oligosaccharides from vegetable tissues. 4,072,671, Cl. 260-123.500.

Solaron Corporation: *See—*
Lof, George, 4,072,142, Cl. 126-270.000.

Solvay & Cie: *See—*
Boulet, Jean-Claude; Walraevens, Rene; Bonnety, Gerard; Lolivier, Jacques; and Trouillet, Paul, 4,072,638, Cl. 260-2.5AP.

Sony Corporation: *See—*
Ishitani, Akiyasu, 4,072,975, Cl. 357-23.000.

Sopha, Klaus. *See—*
Heiser, Joachim; Hoheisel, Rainer; Flaschar, Heinz; Gand, Heinz; Kleinschmidt, Heinz; Braunlinger, Konrad; Sopha, Klaus; Schempp, Roland; and Sanzenbacher, Hermann, 4,072,169, Cl. 137-596.130.

Sosa, Jose M., to Instituto Venezolano de Investigaciones Cientificas. Copolymerization of vinyl monomers with cellulose and starch in copper ammonium solutions. 4,072,640, Cl. 260-17.4GC.

Soupal, Thomas R., to Midland-Ross Corporation. Combined hydraulic and vacuum booster. 4,072,085, Cl. 91-413.000.

Souquet, Jacques: *See—*
Sagner, Max; and Souquet, Jacques, 4,072,170, Cl. 137-599.000.

Southard, James S.: *See—*
Shallenberger, Larry R.; and Southard, James S., 4,072,078, Cl. 84-1.030.

Southeast SBIC, Inc.: *See—*
Reiniger, Haigh McDiarmid, 4,072,273, Cl. 241-24.000.

Spalla, Thomas W. Umpire's counter. 4,072,125, Cl. 116-120.000.

Spaziante, Placido M.: *See—*
De Nora, Oronzio; Nidola, Antonio; and Spaziante, Placido M., 4,072,586, Cl. 204-105.00M.

Specht, Thomas F.; Trodler, Juergen W.; and Vanecek, Pavel, to Union Special Corporation. Spindle brake mechanism for milling machines. 4,072,218, Cl. 188-75.000.

Spectra-Flux, Inc.: *See—*
Wasson, Ken G., 4,072,370, Cl. 308-10.000.

Spectra-Strip Corporation: *See—*
Sochor, Jerzy R., 4,072,387, Cl. 339-91.00R.

Spedale, Joseph J., to Chicago Switch, Inc. Slide switch type assembly having two part housing. 4,072,839, Cl. 200-295.000.

Sperber, Heinrich: *See—*
Halbritter, Guenter; Muehlthaler, Wolfgang; Sperber, Heinrich; Diem, Hans; Dudeck, Christian; and Lehmann, Gunter, 4,072,717, Cl. 260-603.00C.

Sperry Rand Corporation: *See—*
Campbell, Willis R.; and Waldrop, Thomas W., 4,072,095, Cl. 100-5.000.
Colby, Richard A., 4,072,237, Cl. 214-6.00B.
Heller, Larry E.; Shriver, Joe E.; and Lindblom, Curtis H., 4,072,002, Cl. 56-53.000
Niemiec, Albin Joseph, 4,072,451, Cl. 418-178.000.
Ohnigian, Suran; and Seitchik, Jerold A., 4,073,012, Cl. 365-1.000.

Spevack, Jerome S., to Deuterium Corporation. Process feed and effluent treatment systems. 4,072,740, Cl. 423-563.000.

Spieth, Ernst K.: *See—*
Murso, Bernhard; and Riedmuller, Eberhard, 4,072,313, Cl. 273-105.200.

Spirig, Ernst. Method of and apparatus for detecting damage to a frangible object. 4,072,936, Cl. 340-274.00R.

Spohr, Reinhard: *See—*
Buschmann, Gerhard; and Spohr, Reinhard, 4,072,887, Cl. 318-675.000.

Spork, Helmut; Strasser, Rudolf; and Waas, Johann, to Wacker-Chemie GmbH. Process for recovering water-miscible solvents. 4,072,580, Cl. 203-47.000.

Spotholz, Clifford Henry: *See—*
Scarsella, Edward Louis; and Spotholz, Clifford Henry, 4,072,765, Cl. 426-596.000.

Springmann, Helmut, to Linde Aktiengesellschaft. Air-rectification process and apparatus. 4,072,023, Cl. 62-13.000.

Spruth, Wilhelm: *See—*
Bechtle, Bastian; Schuenemann, Claus; Skudelny, Gisbert; Spruth, Wilhelm; Weis, Helmut; and Zimmermann, Volker, 4,072,888, Cl. 318-685.000.

Stabilus GmbH: *See—*
Wirges, Winfried; and Freitag, Herbert, 4,072,288, Cl. 248-404.000.

Staebler, Paul J., to Caterpillar Tractor Co. Combined seal biasing spring and check valve for rotary mechanisms. 4,072,449, Cl. 418-87.000.

Staehlin, John H.: *See—*
Lloyd, Wayne B.; and Staehlin, John H., 4,072,064, Cl. 74-409.000.

Stainless Equipment Company: *See—*
Molitor, Victor D., 4,071,935, Cl. 29-157.30R.

Stalter, Joseph F., Jr., to Goodyear Tire & Rubber Company, The. Method and apparatus for building a closed torus tire. 4,072,550, Cl. 156-123.00R.

Standaart, Adrian W., deceased; and by Standaart, Josephine Benson, administratrix. Method of making electron guns for cathode ray tubes and the like. 4,071,932, Cl. 29-25.140.

Standaart, Josephine Benson, administratrix: *See—*
Standaart, Adrian W., deceased; and Standaart, Josephine Benson, administratrix, 4,071,932, Cl. 29-25.140.

Standard Oil Company, The: *See—*
White, James F.; Shaw, Wilfrid G.; and Applequist, Michael D., 4,072,708, Cl. 260-530.00N.

Standard Oil Company (Indiana): *See—*
Rogan, John B., 4,072,809, Cl. 526-136.000.

Stange, Klaus K., to Xerox Corporation. Apparatus for neutralizing and registering an electrostatically charged sheet. 4,073,001, Cl. 361-214.000.

Stanley Electric Co., Ltd.: *See—*
Teshima, Toru; Ehara, Takuhisa; and Nakanishi, Kaname, 4,072,005, Cl. 58-42.500.

Stant Manufacturing Company, Inc.: *See—*
Sloan, Paul H., Jr., 4,072,245, Cl. 220-295.000.

Star Seimitsu Kabushiki Kaisha: *See—*
Sato, Yukio; Itoh, Takeshi; and Izawa, Hiromi, 4,072,071, Cl. 82-2.00R.

Stauffer Chemical Company: *See—*
Chess, William B., 4,072,764, Cl. 426-558.000.
Pitt, Leland S.; and Large, George B., 4,072,745, Cl. 424-200.000.
Teach, Eugene G., 4,072,688, Cl. 260-306.70R.

Steiger Tractor Inc.: *See—*
Irwin, Gordon A., 4,072,487, Cl. 62-244.000.

Stein, Karl-Ulrich, to Siemens Aktiengesellschaft. Semiconductor component with dielectric carrier and its manufacture. 4,072,982, Cl. 357-49.000.

Steintveit, Georg: *See—*
Petterson, Stig Arvid; Lindstad, Tor; Dyvik, Froystein; and Steintveit, Georg, 4,072,503, Cl. 75-14.000.

Stember, Daniel L.: *See—*
Sweet, Robert P.; and Stember, Daniel L., 4,071,926, Cl. 24-136.00R.

Stephens, Leonard J.: *See—*
Schoeneweis, E. Frederick; and Stephens, Leonard J., 4,072,161, Cl. 137-68.00R.

Sterling Drug Inc.: *See—*
Daum, Sol Jacob, 4,072,692, Cl. 260-327.00M.
Lesher, George Y.; and Opalka, Chester J., Jr., 4,072,746, Cl. 424-263.000.

Stevens, Albert: *See—*
McMullan, James P.; and Stevens, Albert, 4,072,424, Cl. 356-208.000.

Stevens, Jack H.: *See—*
Lucero, Andres R.; Gilbert, Roy E.; and Stevens, Jack H., 4,072,930, Cl. 340-152.00T.

Stevens, Violete L.: *See—*
Hoornstra, Clayton W.; and Stevens, Violete L., 4,072,529, Cl. 96-115.00R.

Stewart, Sherman A.; and Snyder, Estel Ray, to Grefco, Inc. Construction material in sheet form and method of joining sheets edge-to-edge. 4,071,993, Cl. 52-309.500.

Stewart-Warner Corporation: *See—*
Brouwer, Frans, 4,072,301, Cl. 266-60.000.

Steyns, Emile B.; and Miller, Jerry H., to AFA Corporation, The. Hand operated sprayer with automatic container vent. 4,072,252, Cl. 222-341.000.

Stine, Laurence O.; and Ward, Dennis J., to UOP Inc. Simulated moving bed reaction process. 4,072,729, Cl. 260-671.00R.

Stoka, Roberto: *See—*
Burgdorf, Jochen; Eikenberg, Dieter; Stoka, Roberto; and Marianu, Vlod, 4,072,215, Cl. 188-72.400.

Stoll, Andre: *See—*
Ebnother, Anton; Bastian, Jean-Michel; Gadient, Fulvio; and Stoll, Andre, 4,072,756, Cl. 424-267.000.

Stone, Samuel M., to GTE Laboratories Incorporated. Laser beam intensity regulator. 4,072,858, Cl. 250-205.000.

Storace, Anthony, to Pitney-Bowes, Inc. Elastic-type clamp for a twin leaf spring scale. 4,072,202, Cl. 177-229.000.

Story, Joe A.: *See—*
Seegmiller, Wan; Young, Bruce O.; and Story, Joe A., 4,072,334, Cl. 293-71.00R.

Strait, Delbert W.: *See—*
Tift, Arlan William; and Strait, Delbert W., 4,072,335, Cl. 294-93.000.

Strang, Donald B.: *See—*
Bianco, Joseph F.; Senio, Nicholas; Hawes, Russell B.; and Strang, Donald B., 4,072,944, Cl. 343-7.0PF.

Strasser, Rudolf: *See—*
Spork, Helmut; Strasser, Rudolf; and Waas, Johann, 4,072,580, Cl 203-47.000.

Strini, Jean-Claude: *See—*
Costes, Jean-Raymond; Strini, Jean-Claude; and Hardouin, Serge, 4,072,728, Cl. 260-660.000.

Strizki, Richard A., to Transpo-Safety, Inc. Hinge plate for roadside post safety breakaway system for sign panels and the like. 4,071,970, Cl. 40-607.000.

Struers K/S: *See—*
Damgaard, Lavritz Gudmund, 4,072,598, Cl. 204-274.000.

Sturm, Budd Harvey; and Slam, Thomas James, to Goodyear Tire & Rubber Company, The. Purification of hydroquinone. 4,072,721, Cl. 260-621.00A.

Suchy, Voktor: *See—*
Vodicka, Ludek; Peka, Ivo; and Suchy, Voktor, 4,072,508, Cl. 75-121.000.

Sud-Chemie AG: *See—*
Fahn, Rudolf; Brenner, Bernd; and Buckl, Hans, 4,072,538, Cl. 127-37.000.

Suda, Kyo; Takami, Katsumi; Shintani, Akira; and Hase, Shinobu, to Hitachi, Ltd. Method for controlling chemical vapor deposition. 4,072,767, Cl. 427-8.000.

Suda, Masashi; and Kubo, Shunichi, to Canon Kabushiki Kaisha. Image transfer device. 4,072,412, Cl. 355-3.0TR.

Sugi, Fumio: *See—*
Hattori, Tadashi; Takada, Akira; Nakase, Takamichi; and Sugi, Fumio, 4,072,137, Cl. 123-119.0DB.

Sugita, Hiroaki: *See—*
Inoue, Takehisa; Ogawa, Yutaka; Sugita, Hiroaki; and Watanabe, Namio, 4,072,217, Cl. 188-73.600.

Sugiyama, Akira; Yamamoto, Yoshikazu; and Yamada, Shiro, to Brother Kogyo Kabushiki Kaisha. Contour tracing sewing machine. 4,072,114, Cl. 112-121.120.

Sukhorukov, Vasily Vasilievich: *See—*
Rogachev, Viktor Igorevich; Sukhorukov, Vasily Vasilievich; and Shkatov, Petr Nikolaevich, 4,072,895, Cl. 324-238.000.

Sumitomo Chemical Company, Limited: *See—*
Oyama, Fusao; Murao, Sadatomi; and Okada, Shizuo, 4,072,678, Cl. 260-239.30A.

Sumitomo Durez Company, Ltd.: *See—*
Funabiki, Kyohei; and Tokunaga, Tetsuya, 4,072,531, Cl. 106-56.000.

Sumitomo Electric Industries, Ltd.: *See—*
Motoyoshi, Kenya; Kume, Masahiro; and Amano, Yoshinari, 4,072,515, Cl. 75-173.00A.

Summit Mining Ltd.: *See—*
Pentith, Gerald Richard Oldham, 4,072,355, Cl. 299-43.000.

Sumption, Richard F.; and Wallace, Charles H., to International Telephone & Telegraph Corporation. Method and apparatus for measuring carcasses. 4,071,957, Cl. 33-174.00L.

Sunaga, Hiromi: *See—*
Araki, Kunio; Sasaki, Takashi; Kasahara, Yuko; Yamashita, Yoshisada; Yotumoto, Keiichi; Sunaga, Hiromi; Tabei, Kiyoshi; Goto, Kazuo; Tajiri, Kunio; and Kittaka, Hirokama, 4,072,792, Cl. 428-246.000.

Suntech, Inc.: *See—*
Wentzheimer, William W., 4,072,603, Cl. 208-264.000.

Superfos Emgallage A/S: *See—*
Bock, Erik, 4,071,939, Cl. 29-434.000.

Surgical Appliance Industries, Inc.: *See—*
Applegate, Leslie T., 4,072,308, Cl. 272-117.000.

Suzuki, Kunitaka: *See—*
Shimokawa, Toshiaki; and Suzuki, Kunitaka, 4,072,323, Cl. 280-745.000.

Suzuki, Masaaki: *See—*
Shirahata, Ryuji; Suzuki, Masaaki; and Kitamoto, Tatsuji, 4,072,781, Cl. 428-336.000.

Suzuki, Masahiro. Magnesium composites and mixtures for hydrogen generation and method for manufacture thereof. 4,072,514, Cl. 75-168.00R.

Suzuki, Shigehiko: *See—*
Terazono, Narihiro; Kamaike, Hiroshi; and Suzuki, Shigehiko, 4,072,212, Cl. 187-29.00R.

Swanson, Eric R. LF/MF navigation system. 4,072,950, Cl. 343-105.00R.

Swartz, William H. Post hysterectomy fluid drainage tube. 4,072,153, Cl. 128-350.00R.

Sweet, LaVern E. Method for assemblying improved truss joist. 4,071,941, Cl. 29-468.000.

Sweet, Robert P.; and Stember, Daniel L., to D. B. Enterprises, Inc. Safety device for ladder climbers. 4,071,926, Cl. 24-136.00R.

Swenson, Richard F.; Eimen, Shawn H.; and Gryga, John J., Jr., to Milsco Manufacturing Company. Seat supporting assembly of the resiliently loaded type. 4,072,287, Cl. 248-399.000.

Swift, Harold E.: *See—*
Lakshmanan, Pallavoor R.; Swift, Harold E.; and Wu, Ching Yong, 4,072,808, Cl. 526-76.000.

Symaniec, Leonidas: *See—*
Couderc, Georges; Payen, Claude Andre; Dansac, Jean; and Symaniec, Leonidas, 4,072,861, Cl. 250-233.000.

Symons, Philip C.; and Amato, Carmelo J., to Energy Development Associates. Rechargeable electrical energy storage device. 4,072,540, Cl. 429-70.000.

Syntex (U.S.A.) Inc.: *See—*
Beard, Colin C.; Edwards, John A.; and Fried, John H., 4,072,696, Cl. 260-397.600.

Syrjanen, Ahti, to Yhtyneet Paperitehtaat Osakeyhtio Jylhavaara Procedure and apparatus for preparing hot groundwood. 4,072,274, Cl. 241-28.000.

Szabo, Ferdinand W. Spring clamp for paper logs. 4,072,303, Cl. 269-131.000.

Szabo, Joseph F.: *See—*
Leeson, Jeffrey S.; and Szabo, Joseph F., 4,072,799, Cl. 429-82.000.

Szabo, Robert L., to General Dynamics Corporation. Apparatus and method for weld bonding. 4,072,843, Cl. 219-91.210.

T & H Mfg. Co., Inc.: *See—*
Carlson, Elmer Carl, 4,072,195, Cl. 172-15.000.

Tabei, Kiyoshi: *See—*
Araki, Kunio; Sasaki, Takashi; Kasahara, Yuko; Yamashita, Yoshisada; Yotumoto, Keiichi; Sunaga, Hiromi; Tabei, Kiyoshi; Goto, Kazuo; Tajiri, Kunio; and Kittaka, Hirokama, 4,072,792, Cl. 428-246.000.

Tagawa, Yoshikazu: *See—*
Yasue, Motoi; Tagawa, Yoshikazu; and Higashi, Mitsuo, 4,072,783, Cl. 428-341.000.

Tajiri, Kunio: *See—*
Araki, Kunio; Sasaki, Takashi; Kasahara, Yuko; Yamashita, Yoshisada; Yotumoto, Keiichi; Sunaga, Hiromi; Tabei, Kiyoshi; Goto, Kazuo; Tajiri, Kunio; and Kittaka, Hirokama, 4,072,792, Cl. 428-246.000.

Takada, Akira: *See—*
Hattori, Tadashi; Takada, Akira; Nakase, Takamichi; and Sugi, Fumio, 4,072,137, Cl. 123-119.0DB.

Takamatsu, Akira: *See—*
Umezawa, Hamao; Takeuchi, Tomio; Takamatsu, Akira; and Mori, Shunro, 4,072,753, Cl. 424-308.000.

Takami, Katsumi: *See—*
Suda, Kyo; Takami, Katsumi; Shintani, Akira; and Hase, Shinobu, 4,072,767, Cl. 427-8.000.

Takamitsu, Nagaaki: *See—*
Umemura, Sumio; Takamitsu, Nagaaki; Hamamoto, Toshikazu; and Kuroda, Nobuyuki, 4,072,722, Cl. 260-621.00G.

Takashima, Hideo, to Canon Kabushiki Kaisha; and Canon Denshi Kabushiki Kaisha. Read-after-write head. 4,072,994, Cl. 360-124.000.

Takata, Yasuto: *See—*
Nakata, Tetsuya; Yamada, Nobuo; Hashimoto, Akira; Takata, Yasuto; and Bunnomori, Yukinari, 4,072,734, Cl. 260-873.000.

Takayama, Yoichiro, to Nippon Electric Co., Ltd. Equivalent load-pull characterization of microwave transistors. 4,072,897, Cl. 324-158.00T.

Takeda, Mitsuo: *See—*
Tanaka, Nobuyoshi; Takeda, Mitsuo; and Matsumoto, Kazuya, 4,072,422, Cl. 356-108.000.

Takeuchi, Masaru: *See—*
Iizuka, Chiyokichi; and Takeuchi, Masaru, 4,071,973, Cl. 47-1.100.

Takeuchi, Tomio: *See—*
Umezawa, Hamao; Takeuchi, Tomio; Takamatsu, Akira; and Mori, Shunro, 4,072,753, Cl. 424-308.000.

Takigawa, Tomoshi: *See—*
Hirata, Noritsugu; Takigawa, Tomoshi; and Ishikawa, Kazuo, 4,072,409, Cl. 352-174.000.

Tamai, Mitsuru: *See—*
Yasuhara, Takeshi; Tamai, Mitsuru; and Yuhara, Tadanori, 4,072,057, Cl. 73-718.000.

Tamao, Yoshikuni: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,072,743, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,072,757, Cl. 424-267.000.

Tamao, Yoshikuno: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,072,744, Cl. 424-177.000.

Tamiya, Tetsuo: *See—*
Murakado, Hiroshi; Nakata, Kazuhiro; Usui, Eiki; Tamiya, Tetsuo; Chikuda, Masahiro; Kitao, Yoshinobu; and Fujiwara, Akira, 4,072,542, Cl. 148-11.50A.

Tamura, Fumihide: *See—*
Togo, Kazushi; Tamura, Fumihide; Yasuda, Naohiko; Ichikawa, Takehiko; Sano, Konosuke; Matsuda, Keizo; and Mitsugi, Koji, 4,072,687, Cl. 260-306.70T.

Tanabe Seiyaku Co., Ltd.: *See—*
Chibata, Ichiro, Yamada, Shigeki; Yamamoto, Masao; and Sanematsu, Hisato, 4,072,691, Cl. 260-326.14T.
Ikezaki, Muneyoshi; Ito, Nobuo; Okazaki, Yasushi; Hoshiyama, Masao; Nagao, Taku; and Nakajima, Hiromichi, 4,072,759, Cl. 424-330.000.

Tanaka, Kazunobu; Kusumoto, Masahiko; and Watanabe, Shoji, to Daicel Ltd. Method of promoting the growth of plants. 4,071,975, Cl. 47-9.000.

Tanaka, Kojiro; and Yagi, Kenjiro, to Kabushiki Kaisha Daini Seikosha. Switching construction for a handy electronic device. 4,072,004, Cl. 58-23.00R.

Tanaka, Nobuyoshi; Takeda, Mitsuo; and Matsumoto, Kazuya, to Canon Kabushiki Kaisha. Apparatus for interferometrically measuring the physical properties of test object. 4,072,422, Cl. 356-108.000.

Tanaka, Tadashi; Okamoto, Akira; Kouno, Takashi; Kramer, William

E.; Hopkins, Richard H.; and Hoffman, Richard A., to Nippon Steel Corporation; and Westinghouse Electric Corporation. Resin composite for paint curable by high energy ionizing radiation. 4,072,657, Cl. 260-47.0UA.

Tanaka, Toshie, to Nifco Inc.; and Nichiei Bussan Co., Ltd. Pinching clip. 4,071,930, Cl. 24-252.00R.

Tanaka, Yukiyasu: *See*—
Noguchi, Masaaki; Tanaka, Yukiyasu; Sekiya, Setsuro; and Motosugi, Katsuhiko, 4,072,134, Cl. 123-75.00B.
Noguchi, Masaaki; Tanaka, Yukiyasu; Sekiya, Setsuro; and Motosugi, Katsuhiko, 4,072,135, Cl. 123-75.00B.
Noguchi, Masaaki; Tanaka, Yukiyasu; Sekiya, Setsuro; and Motosugi, Katsuhiko, 4,072,136, Cl. 123-75.00B.

Tanaka, Yutaka: *See*—
Outsuka, Koremitsu; and Tanaka, Yutaka, 4,072,594, Cl. 204-195.00R.

Taner, M. Turhan; Sheriff, Robert E.; and Reeves, H. Neal, to Seiscom Delta Inc. Method for seismic exploration for enhanced results in simulated cylindrical or plane waves. 4,072,922, Cl. 340-15.5CP.

Tanso, Shiro: *See*—
Murata, Kazuo; Tanso, Shiro; and Yamao, Junzo, 4,072,802, Cl. 429-147.000.

Tarasov, Mikhail Sergeevich: *See*—
Brusako, Jury Ivanovich; Rzhavin, Sergei Alexandrovich; Kiselev, Vasily Pavlovich; Tarasov, Mikhail Sergeevich; Rapoport, Vladimir Mendeleevich; Timofeev, Vladimir Vasilievich; Ragulina, Raisa Ivanovna; Alivoivodich, Miro Khristoforovich; Kucherenko, Anatoly Gavrilovich; Varjushenkov, Anatoly Mikhailovich; Isaeva, Elena Pavlovna; Berezhnoi, Ivan Arkhipovich; Rumyantsev, Vasily Petrovich; Shpak, Grigory Safronovich; Guz, Dmitry Semenovich; Ilinkov, Dmitry Vladimirovich; Volpin, Pavel Ilich; Avdeev, Mikhail Pavlovich; Artemenko, Stanislav Arsentievich; and Khrennikova, Ljudmila Pavlovna, 4,072,512, Cl. 75-148.000.

Tarzia, Giorgio, to Gruppo Lepetit S.p.A. Monoamino 2,4,5-trisubstituted oxazoles. 4,072,689, Cl. 260-307.00R.

Taylor, John S.; and Grantham, William G., to FMC Corporation. Dimensionally stable, nitrocellulose coated cellophane. 4,072,785, Cl. 428-536.000.

Taylor, Raymond C.: *See*—
Richards, Frank P.; and Taylor, Raymond C., 4,072,226, Cl. 198-345.000.

Teach, Eugene G., to Stauffer Chemical Company. Haloacyl and thiohaloacyl aryl-substituted oxazolidines and thiazolidines-herbicidal antidotes. 4,072,688, Cl. 260-306.70R.

Technicon Instruments Corporation: *See*—
Coyne, Lawrence J.; George, Wilberdan V.; and Groner, Warren, 4,072,421, Cl. 356-39.000.

Teibow Company Limited: *See*—
Otsuka, Katsumi, 4,072,430, Cl. 401-265.000.

Teich, Wolfgang: *See*—
Korrenn, Heinz; Teich, Wolfgang; and Heimrich, Helmut, 4,072,372, Cl. 308-72.000.

Teijin Seiki Company Limited: *See*—
Mino, Kazuhiko, 4,072,003, Cl. 57-58.520.

Tekken Construction Co. Ltd.: *See*—
Yamazaki, Hironobu, 4,072,021, Cl. 61-42.000.

Teledyne Industries, Inc.: *See*—
Megy, Joseph Allen, 4,072,506, Cl. 75-63.000.

Telesio, George O. Scoring tool for frankfurters. 4,071,950, Cl. 30-124.000.

Tension Envelope Corporation: *See*—
Kranz, Richard, 4,072,264, Cl. 229-72.000.

Tepper, Richard M.: *See*—
Sickles, James E.; and Tepper, Richard M., 4,073,002, Cl. 361-227.000.

Tepper, Sidney A.: *See*—
Rosen, Beverly; and Tepper, Sidney A., 4,072,314, Cl. 273-161.000.

Terajima, Kazuki: *See*—
Tomita, Shigeru; Matsuda, Yoshindo; Terajima, Kazuki; and Abe, Keiji, 4,072,794, Cl. 428-378.000.

Terazono, Narihiro; Kamaike, Hiroshi; and Suzuki, Shigehiko, to Mitsubishi Denki Kabushiki Kaisha. Elevator speed control system. 4,072,212, Cl. 187-29.00R.

Terman, Lewis Madison: *See*—
Heller, Lawrence Griffith; and Terman, Lewis Madison, 4,072,939, Cl. 340-347.0AD.

Ter-Minassian, Leon, to Agence Nationale de Valorisation de la Recherche (ANVAR). Isothermal calorimetry process and calorimeter for carrying out the process. 4,072,050, Cl. 73-190.00R.

Terrell Machine Company, The: *See*—
Ferguson, Richard; and Troutman, Kenneth W., 4,072,240, Cl. 214-313.000.

Terzian, Rouben T.; and Brand, Derek A., to Marvin Glass & Associates. Paint roller. 4,072,429, Cl. 401-146.000.

Teshima, Toru; Ehara, Takuhisa; and Nakanishi, Kaname, to Stanley Electric Co., Ltd. Clock device. 4,072,005, Cl. 58-42.500.

Texaco Inc.: *See*—
Kudchadker, Mohan V.; and Weiss, Walter J., 4,072,192, Cl. 166-273.000.
Naizer, Kenneth C.; and DuBose, Jesse K., 4,072,043, Cl. 73-23.000.

Texas Instruments Incorporated: *See*—
Bate, Robert T.; and Caywood, John Millard, 4,072,977, Cl. 357-24.000.
Black, Christopher T.; and Lear, Anthony, 4,072,981, Cl. 357-46.000.
Buss, Dennis Darcy; Emmons, Stephen P.; and Barton, James Brockman, 4,072,978, Cl. 357-24.000.
Kitagawa, Norihisa; and White, Lionel Stuart, Jr., 4,072,932, Cl. 365-233.000.
Tubbs, Graham S., 4,073,006, Cl. 364-200.000.

Textron Inc.: *See*—
Waight, William J.; and Roche, Stanley E., 4,072,431, Cl. 403-158.000.

Tezuka, Tohru: *See*—
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,072,743, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,072,744, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,072,757, Cl. 424-267.000.

Thelander, Paul F., to Automated Medical Systems, Inc. Method of obtaining a precipitate of metallic ions from solutions containing low concentrations of metal salts. 4,072,605, Cl. 210-50.000.

Thermon Manufacturing Company: *See*—
Johnson, Ben C.; Thornton, J. Scott; Glowe, Donald E.; Cassidy, Patrick E.; and Anderson, Robert E., 4,072,848, Cl. 219-528.000.

Thibault, Jean-Jacques, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Regeneration-type cryopump. 4,072,025, Cl. 62-55.500.

Thielen, James E., to Minnesota Mining and Manufacturing Company. Griddle cleaning pad holder. 4,071,983, Cl. 51-393.000.

Thomas, Donald Beuford: *See*—
Croome, Ronald John; and Thomas, Donald Beuford, 4,072,624, Cl. 252-301.350.

Thome, Paul, to Mecazo. Rotative welding gun. 4,072,828, Cl. 219-137.310.

Thompson, John Fred: *See*—
Ross, Cecil Jack; and Thompson, John Fred, 4,071,949, Cl. 29-818.000.

Thompson, John Stewart: *See*—
Gitlin, Richard Dennis; and Thompson, John Stewart, 4,072,830, Cl. 179-170.200.

Thomson-CSF: *See*—
Couderc, Georges; Payen, Claude Andre; Dansac, Jean; and Symaniec, Leonidas, 4,072,861, Cl. 250-233.000.

Thomson-CSF Laboratories, Inc.: *See*—
Kaiser, Arthur, 4,072,984, Cl. 358-31.000.

Thornton, J. Scott: *See*—
Johnson, Ben C.; Thornton, J. Scott; Glowe, Donald E.; Cassidy, Patrick E.; and Anderson, Robert E., 4,072,848, Cl. 219-528.000.

Thurston, Harold H. Shiftable anchor assembly. 4,072,113, Cl. 105-484.000.

Tift, Arlan William; and Strait, Delbert W. Lifting device. 4,072,335, Cl. 294-93.000.

Timofeev, Vladimir Vasilievich: *See*—
Brusako, Jury Ivanovich; Rzhavin, Sergei Alexandrovich; Kiselev, Vasily Pavlovich; Tarasov, Mikhail Sergeevich; Rapoport, Vladimir Mendeleevich; Timofeev, Vladimir Vasilievich; Ragulina, Raisa Ivanovna; Alivoivodich, Miro Khristoforovich; Kucherenko, Anatoly Gavrilovich; Varjushenkov, Anatoly Mikhailovich; Isaeva, Elena Pavlovna; Berezhnoi, Ivan Arkhipovich; Rumyantsev, Vasily Petrovich; Shpak, Grigory Safronovich; Guz, Dmitry Semenovich; Ilinkov, Dmitry Vladimirovich; Volpin, Pavel Ilich; Avdeev, Mikhail Pavlovich; Artemenko, Stanislav Arsentievich; and Khrennikova, Ljudmila Pavlovna, 4,072,512, Cl. 75-148.000.

Timsons Limited: *See*—
Miles, Geoffrey Robert Henry, 4,072,076, Cl. 83-300.000.

Ting, Vincent Wen-Hwa, to SCM Corporation. U.V. curable poly(ester-urethane) polyacrylate polymers and wet look coatings therefrom. 4,072,770, Cl. 427-54.000.

Tinker, Harold Burnham, to Monsanto Company. Production of lactic acid. 4,072,709, Cl. 260-535.00R.

Tiraspolsky, Wladimir; and Rouviere, Roger Francois. Valve apparatus for deep drilling. 4,072,166, Cl. 137-496.000.

Tischlinger, Edward A. Nose cap and diaphragm assembly for injector. 4,072,149, Cl. 128-218.0NV.

Tither, Geoffrey: *See*—
Coldren, Arthur P.; Tither, Geoffrey; and Doane, Douglas V., 4,072,543, Cl. 148-12.00F.

Togo, Kazushi; Tamura, Fumihide; Yasuda, Naohiko; Ichikawa, Takehiko; Sano, Konosuke; Matsuda, Keizo; and Mitsugi, Koji, to Ajinomoto Co., Inc. Process for producing 2-amino-(2)-thiazoline-4-carboxylic acid. 4,072,687, Cl. 260-306.70T.

Tohyama, Yoshikuni: *See*—
Kitajima, Tadayuki; and Tohyama, Yoshikuni, 4,072,211, Cl. 185-40.00R.

Tojyo, Tsutomu: *See*—
Uetake, Toshifumi; and Tojyo, Tsutomu, 4,072,408, Cl. 350-255.000.

Tokico Ltd.: *See*—
Haraikawa, Tetsuo; and Karasudani, Yasuo, 4,072,214, Cl. 188-72.400.
Haraikawa, Tetsuo, 4,072,216, Cl. 188-73.300.

Tokina Optical Co., Ltd.: *See*—
Ozeki, Banri, 4,072,405, Cl. 350-173.000.

Tokunaga, Tetsuya: *See*—
Funabiki, Kyohei; and Tokunaga, Tetsuya, 4,072,531, Cl. 106-56.000.

Tokyo Denryoku Kabushiki Kaisha: *See*—
Andow, Fumio; Matsushima, Tetsuo; and Iwasaki, Minoru, 4,073,008, Cl. 364-602.000.
Andow, Fumio; Matsushima, Tetsuo; and Iwasaki, Minoru, 4,073,009, Cl. 364-602.000.

Tokyo Fabric Kogyo Kabushiki Kaisha: *See*—
Shimizu, Soichiro, 4,072,022, Cl. 61-48.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Andow, Fumio; Matsushima, Tetsuo; and Iwasaki, Minoru, 4,073,008, Cl. 364-602.000.
Andow, Fumio; Matsushima, Tetsuo; and Iwasaki, Minoru, 4,073,009, Cl. 364-602.000.

Tomioka, Ichiro: *See*—
Seki, Kiyoshi; Tomioka, Ichiro; and Sawa, Yoshihiko, 4,072,016, Cl. 61-35.000.

Tomita, Shigeru; Matsuda, Yoshindo; Terajima, Kazuki; and Abe, Keiji, to Agency of Industrial Science and Technology of Japan. Oil adsorbent and a method of producing same. 4,072,794, Cl. 428-378.000.

Tomoyuki, Nogami, to Toyota Jidosha Kogyo Kabushiki Kaisha. Inertia-controlled valve for vehicle braking systems. 4,072,363, Cl. 303-24.00C.

Tonhauser, Harry L. Collapsible display elements. 4,071,969, Cl. 40-610.000.

Tonomura, Shinji: *See*—
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,072,743, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,072,744, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,072,757, Cl. 424-267.000.

Topolyansky, Jury Arnoldovich: *See*—
Kovanov, Pavel Vasilievich; Torochkov, Ivan Mikhailovich; Zonenko, Ivan Timofeevich; Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Tsimbler, Jury Abramovich; Kantor, Ilya Solomonovich; Topolyansky, Jury Arnoldovich; and Lurie, Mikhail Vladimirovich, 4,072,109, Cl. 104-138.00R.

Tornas, Olle. Device for increasing and standardizing the scatter of shotguns, particularly for skeet shooting. 4,071,971, Cl. 42-79.000.

Torney, Harry Lester: *See*—
Weiss, Stefan Adam; Torney, Harry Lester; and Caldwell, William Joseph, 4,072,565, Cl. 195-1.100.

Torochkov, Ivan Mikhailovich: *See*—
Kovanov, Pavel Vasilievich; Torochkov, Ivan Mikhailovich; Zonenko, Ivan Timofeevich; Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Tsimbler, Jury Abramovich; Kantor, Ilya Solomonovich; Topolyansky, Jury Arnoldovich; and Lurie, Mikhail Vladimirovich, 4,072,109, Cl. 104-138.00R.

Toulios, Peter P.: *See*—
Knox, Robert M.; and Toulios, Peter P., 4,072,902, Cl. 325-446.000.

Towne, Gary L.; Depew, Noel F.; and Fowler, Charles A., to NCR Corporation. Electric power distributing apparatus. 4,072,379, Cl. 339-17.0LM.

Townsend Engineering Company: *See*—
Smith, David W., 4,071,923, Cl. 17-21.000.

Toyo Kogyo Co., Ltd.: *See*—
Kubo, Yoshiki, 4,071,980, Cl. 51-165.870.

Toyo Rubber Industry Co., Ltd., The: *See*—
Shimahara, Yoichi; and Shimada, Takashi, 4,072,926, Cl. 340-58.000.

Toyobo Co., Ltd.: *See*—
Konomi, Tuyoshi; Endo, Seiji; Yamaguchi, Masayasu; and Katsuo, Kenichi, 4,072,664, Cl. 260-78.00R.

Toyoda-Koki Kabushiki-Kaisha: *See*—
Nomura, Kenji; Yoshioka, Kengo; and Goto, Toshihiro, 4,072,236, Cl. 214-1.0BB.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Hattori, Tadashi; Takada, Akira; Nakase, Takamichi; and Sugi, Fumio, 4,072,137, Cl. 123-119.0DB.
Kawakami, Susumu, 4,072,012, Cl. 60-562.000.
Noguchi, Masaaki; Tanaka, Yukiyasu; Sekiya, Setsuro; and Motosugi, Katsuhiko, 4,072,134, Cl. 123-75.00B.
Noguchi, Masaaki; Tanaka, Yukiyasu; Sekiya, Setsuro; and Motosugi, Katsuhiko, 4,072,135, Cl. 123-75.00B.
Noguchi, Masaaki; Tanaka, Yukiyasu; Sekiya, Setsuro; and Motosugi, Katsuhiko, 4,072,136, Cl. 123-75.00B.
Shimokawa, Toshiaki; and Suzuki, Kunitaka, 4,072,323, Cl. 280-745.000.
Tomoyuki, Nogami, 4,072,363, Cl. 303-24.00C.

Traber, Fritz. Demountable frame and panel. 4,071,990, Cl. 52-155.000.

Transpo-Safety, Inc.: *See*—
Strizki, Richard A., 4,071,970, Cl. 40-607.000.

Treadwell, Richard Julian, to RCA Corporation. Brushless phase locked servo drive. 4,072,884, Cl. 318-314.000.

Trebinger, Karl: *See*—
Reinhardt, Helmut; Trebinger, Karl; and Kallrath, Gottfried, 4,072,796, Cl. 428-405.000.

Tripp, Ralph N., Jr. Thermal retaining garden water blanket. 4,071,974, Cl. 47-2.000.

Trodler, Juergen W.: *See*—
Specht, Thomas F.; Trodler, Juergen W.; and Vanecek, Pavel, 4,072,218, Cl. 188-75.000.

Trouillet, Paul: *See*—
Boulet, Jean-Claude; Walraevens, Rene; Bonnety, Gerard; Lolivier, Jacques; and Trouillet, Paul, 4,072,638, Cl. 260-2.5AP.

Troutman, Kenneth W.: *See*—
Ferguson, Richard; and Troutman, Kenneth W., 4,072,240, Cl. 214-313.000.

True, Howard D. F., Jr., to General Electric Company. Side fastener clip for a plate-like member. 4,072,374, Cl. 312-214.000.

TRW Inc.: *See*—
Carlson, Robert E., 4,072,450, Cl. 418-133.000.
Powers, Thomas R., 4,072,438, Cl. 408-59.000.

Tsimbler, Jury Abramovich: *See*—
Kovanov, Pavel Vasilievich; Torochkov, Ivan Mikhailovich; Zonenko, Ivan Timofeevich; Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Tsimbler, Jury Abramovich; Kantor, Ilya Solomonovich; Topolyansky, Jury Arnoldovich; and Lurie, Mikhail Vladimirovich, 4,072,109, Cl. 104-138.00R.

Tsuchiya, Hiroyoshi: *See*—
Hayami, Heijiro; Tsuchiya, Hiroyoshi; Yoshida, Kunio; Tsuda, Yukifumi; and Kanno, Yoshimitsu, 4,072,958, Cl. 346-140.00R.

Tsuda, Yukifumi: *See*—
Hayami, Heijiro; Tsuchiya, Hiroyoshi; Yoshida, Kunio; Tsuda, Yukifumi; and Kanno, Yoshimitsu, 4,072,958, Cl. 346-140.00R.

Tsujihara, Toshio; Saito, Humitoshi; and Kitamori, Teruaki, to Matsushita Electric Industrial Co., Ltd. Turntable direct-drive system. 4,072,315, Cl. 274-1.00E.

Tsushima, Sakae: *See*—
Watanabe, Itaru; Yamakoshi, Yasumichi; Miyauchi, Hirotsugu; Tsushima, Sakae; and Fukumoto, Mitsunobu, 4,072,793, Cl. 428-255.000.

Tsuto, Keiichi; Majima, Kanji; and Hirasaka, Toshio, to Kao Soap Co., Ltd. Gas feeder for sulfonation apparatus. 4,072,470, Cl. 23-284.000.

Tubbs, Graham S., to Texas Instruments Incorporated. Digital processor system with simultaneous branch and OP code function. 4,073,006, Cl. 364-200.000.

Tubbs, Myron W.: *See*—
Decker, John W.; and Tubbs, Myron W., 4,072,316, Cl. 277-235.00B.

Turin, Michel J.: *See*—
Fauran, Claude P.; Turin, Michel J.; Imbert, Thierry F.; Raynaud, Guy M.; and Dorme, Nicole A. M., 4,072,682, Cl. 260-268.0BC.

Turner, Garland Linwood: *See*—
Cooksey, James Judson; and Turner, Garland Linwood, 4,072,457, Cl. 425-192.00S.

UBE Industries, Ltd.: *See*—
Umemura, Sumio; Takamitsu, Nagaaki; Hamamoto, Toshikazu; and Kuroda, Nobuyuki, 4,072,722, Cl. 260-621.00G.

Uchida, Minoru: *See*—
Nakagawa, Kazuyuki; Uchida, Minoru; and Oka, Hiroaki, 4,072,683, Cl. 260-288.00R.

Uchio, Hiroshi: *See*—
Okamoto, Kazuo; and Uchio, Hiroshi, 4,072,658, Cl. 260-49.000.

Uetake, Toshifumi; and Tojyo, Tsutomu, to Olympus Optical Co., Ltd. Lens mount for a microscope objective. 4,072,408, Cl. 350-255.000.

Ugo, John Walter, to Uniroyal, Inc. Sensor shoe for tire grinding machine. 4,071,979, Cl. 51-106.00R.

Uitvlugt, Martin W.: *See*—
Larson, Gerald L.; Pi, Alberto; and Uitvlugt, Martin W., 4,072,206, Cl. 180-105.00E.

Ullmann, Werner; and Buhler, Ernst, to A.G. fur industrielle Elektronik. Electro-erosion machine tool and a pulse generator for use in such a machine tool. 4,072,842, Cl. 219-69.00C.

Umemura, Sumio; Takamitsu, Nagaaki; Hamamoto, Toshikazu; and Kuroda, Nobuyuki, to UBE Industries, Ltd. Process for preparing dihydric phenol derivatives. 4,072,722, Cl. 260-621.00G.

Umezawa, Hamao; Takeuchi, Tomio; Takamatsu, Akira; and Mori, Shunro, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Pharmaceutical method for the therapy of immune diseases. 4,072,753, Cl. 424-308.000.

Unimax Switch Limited: *See*—
Corfield, John Courtney, 4,072,841, Cl. 200-332.000.

Union Carbide Corporation: *See*—
D'Silva, Themistocles D. J., 4,072,750, Cl. 424-276.000.
D'Silva, Themistocles Damasceno Joaquim, 4,072,751, Cl. 424-298.000.

Union Special Corporation: *See*—
Nagy, Joseph, 4,072,116, Cl. 112-286.000.
Specht, Thomas F.; Trodler, Juergen W.; and Vanecek, Pavel, 4,072,218, Cl. 188-75.000.

Uniroyal, Inc.: *See*—
Ugo, John Walter, 4,071,979, Cl. 51-106.00R.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Fulker, John Leslie; Hall, David John; and Lock, Robert Christopher, 4,072,282, Cl. 244-35.00R.

United States of America
Agriculture: *See*—
Betschart, Antoinette A., 4,072,669, Cl. 260-123.500.
Cirino, Vidabelle O.; and Rowland, Stanley P., 4,072,784, Cl. 428-507.000.
Folk, Craig L., 4,071,925, Cl. 19-296.000.

Luddy, Francis E.; Hampson, James W.; Herb, Samuel F.; and Rothbart, Herbert L., 4,072,766, Cl. 426-607.000.

Army: *See—*
Demko, Paul S., 4,072,952, Cl. 343-700.0MS.
Drews, William A.; Padgett, Charles L.; and Pinna, Ray Anthony, 4,072,948, Cl. 343-18.00C.
Guttman, Thomas, 4,072,425, Cl. 356-209.000.
Huskins, Chester W., 4,072,702, Cl. 260-453.0AB.
Lewis, William; Weldon, Peter J.; Hagedorn, Henry, Jr.; Hayes, Thomas E.; and Israels, Sylvan H., 4,072,108, Cl. 102-70.20R.
Miller, Miles C., 4,072,049, Cl. 73-147.000.
Miller, Walter E., Jr.; Sitton, Robert L.; and Blackmon, Anthony D., 4,072,281, Cl. 244-3.160.
Ricks, Earl C., 4,072,787, Cl. 428-594.000.
Saxe, Frederick E.; and Einbinder, Seymour K., 4,072,107, Cl. 102-4.000.
Youngren, Fred R., 4,072,774, Cl. 427-294.000.

Energy: *See—*
Fraas, Arthur P., 4,072,183, Cl. 165-11.000.
Knight, Charles E., Jr.; Kovach, Louis; and Hurst, Jonn S., 4,072,084, Cl. 90-11.00A.
Quinby, Thomas C., 4,072,501, Cl. 75-.5BC.

Interior: *See—*
Heinen, Harold J.; Peterson, David G.; and Lindstrom, Roald E., 4,072,587, Cl. 204-110.000.
Morrell, Roger J.; Gunn, Jerome A.; and Wilson, Richard J., 4,072,015, Cl. 61-35.000.
Sisler, Frederick D.; and Senftle, Frank E., 4,072,798, Cl. 429-2.000

National Aeronautics and Space Administration; administrator; with respect to an invention of:
Phillips, Wayne M. High temperature resistant cermet and ceramic compositions. 4,072,532, Cl. 106-65.000.

Navy: *See—*
Alig, Craig S., 4,072,613, Cl. 210-198.00R.
Casasent, David Paul; and Psaltis, Demetri, 4,073,010, Cl. 364-822.000
Casner, Paul G.; and McDevitt, Edward J., 4,072,904, Cl. 328-39.000.
Finn, Arthur Francis, 4,072,070, Cl. 81-71.000.
Kalot, Cyril M., 4,072,951, Cl. 343-700.0MS.
Mohon, Windell N., 4,072,395, Cl. 350-33.000.
Provencher, Joseph H., 4,072,956, Cl. 343-844.000.
Van Brunt, LeRoy B., 4,072,949, Cl. 343-18.00E.

U.S. Philips Corporation: *See—*
Kok, Cornelis Hendrik, 4,072,991, Cl. 360-92.000.
Mitchell, Richard F., 4,072,915, Cl. 333-72.000.

University of California, The Regents of the: *See—*
Hanson, Donald N.; and Wilke, Charles R., 4,072,477, Cl. 55-10.000.

University of Missouri, The Curators of the: *See—*
Clark, George B.; and Lehnhoff, Terry F., 4,072,353, Cl. 299-22.000.

University of Sussex, The: *See—*
Jayawant, Bhalchandra Vinayak, 4,072,110, Cl. 104-148.0MS.

UOP Inc.: *See—*
Carson, Don B., 4,072,579, Cl. 203-11.000.
Douglas, Walter M., 4,072,630, Cl. 252-430.000.
Hayes, John C., 4,072,602, Cl. 208-138.000.
Rausch, Richard E., 4,072,731, Cl. 260-673.500.
Stine, Laurence O.; and Ward, Dennis J., 4,072,729, Cl. 260-671.00R.
Ward, Dennis J., 4,072,604, Cl. 208-341.000.
Winter, George R., III, 4,072,730, Cl. 260-671.00R.

Upjohn Company, The: *See—*
Hylton, Thomas A.; and Shenton, Francis L., 4,072,698, Cl. 260-465.00E.
Moon, Malcolm W.; and Kornis, Gabriel, 4,072,498, Cl. 71-92.000.
Onder, Besir K., 4,072,665, Cl. 260-78.00R.
Schlieckmann, Alfred, 4,072,458, Cl. 425-451.600.

Uraneck, Carl A.; and Brown, James D., to Phillips Petroleum Company. Molecular weight reduction of unsaturated polymers. 4,072,807, Cl. 526-48.100.

Urano, Toshihiro: *See—*
Kokaji, Norio; and Urano, Toshihiro, 4,072,957, Cl. 346-74.100.

Urbani, Larry E. Wax container material. 4,071,943, Cl. 29-525.000.

Usui, Eiki: *See—*
Murakado, Hiroshi; Nakata, Kazuhiro; Usui, Eiki; Tamiya, Tetsuo; Chikuda, Masahiro; Kitao, Yoshinobu; and Fujiwara, Akira, 4,072,542, Cl. 148-11.50A.

Utility Products Co.: *See—*
Van de Loo, Harley J.; and Ziegler, Hans J., 4,072,377, Cl. 339-17.00F.

Uyeda, Tim: *See—*
Phillips, Peter J., 4,072,032, Cl. 70-339.000.

Vale, Wylie W., Jr.: *See—*
Amoss, Max S.; Monahan, Michael W.; and Vale, Wylie W., Jr., 4,072,668, Cl. 260-112.5LH.

Van Anrooy, John A., to Lambert Brake Corporation. Trailer brake system. 4,072,362, Cl. 303-7.000.

Van Brunt, LeRoy B., to United States of America, Navy. Range gate walk-off of compressive radar. 4,072,949, Cl. 343-18.00E.

Van de Loo, Harley J.; and Ziegler, Hans J., to Utility Products Co. Terminal block. 4,072,377, Cl. 339-17.00F.

Vandeputte, Camille Angelina: *See—*
Pollet, Robert Joseph; Sels, Francis Jeanne; and Vandeputte, Camille Angelina, 4,072,523, Cl. 96-22.000.
Sels, Jeanne Francis Jeanne; Pollet, Robert Joseph; Vandeputte, Camille Angelina; and Willems, Jozef Frans, 4,072,526, Cl. 96-66.300.

van der Lely, Cornelis. Cultivators. 4,072,196, Cl. 172-49.000.

van der Linde, Robert; Meijerink, Gerardus Franciscus; and Rietberg, Johan, to Internationale Octrooi Maatschappij "Octropa" B.V. Polyesters. 4,072,662, Cl. 260-75.00R.

Vandersons Corporation: *See—*
Fletcher, C. Hugh; Bogdan, Raymond G.; Wright, Robert W.; and Cheuvront, Robert M., 4,072,103, Cl. 101-151.000.

Vanderspurt, Thomas H., to Celanese Corporation. Silver-cadmium-zinc alloy catalyst for hydrogenation of acrolein to allyl alcohol. 4,072,727, Cl. 260-638.00B.

Vandervell Products Limited: *See—*
Hill, Joseph Henry; and Green, David Frederick, 4,072,371, Cl. 308-56.000.

Vanecek, Pavel: *See—*
Specht, Thomas F.; Trodler, Juergen W.; and Vanecek, Pavel, 4,072,218, Cl. 188-75.000.

Varadyne Industries, Inc.: *See—*
Zillman, Jack H., 4,072,780, Cl. 428-325.000.

Varian Associates, Inc.: *See—*
Christen, Urs; and Guidinger, Dewayne C., 4,072,846, Cl. 219-497.000.
Lee, Arnold St. Jacques, 4,072,056, Cl. 73-706.000.

Varjushenkov, Anatoly Mikhailovich: *See—*
Brusako, Jury Ivanovich; Rzhavin, Sergei Alexandrovich; Kiselev, Vasily Pavlovich; Tarasov, Mikhail Sergeevich; Rapoport, Vladimir Mendeleevich; Timofeev, Vladimir Vasilievich; Ragulina, Raisa Ivanovna; Alivoivodich, Miro Khristoforovich; Kucherenko, Anatoly Gavrilovich; Varjushenkov, Anatoly Mikhailovich; Isaeva, Elena Pavlovna; Berezhnoi, Ivan Arkhipovich; Rumyantsev, Vasily Petrovich; Shpak, Grigory Safronovich; Guz, Dmitry Semenovich; Ilinkov, Dmitry Vladimirovich; Volpin, Pavel Ilich; Avdeev, Mikhail Pavlovich; Artemenko, Stanislav Arsentievich; and Khrennikova, Ljudmila Pavlovna, 4,072,512, Cl. 75-148.000.

Vaudaux, Francis, to Garcia Corporation, The. Lost motion anchor for a self-restoring ski binding. 4,072,321, Cl. 280-637.000.

Vaughan, Warren R., to Allis-Chalmers Corporation. Self-unloading ship with two tunnel belts and a central reclaimer. 4,072,238, Cl. 214-15.00E.

Vellins, Cyril Eric; and Dixon, Leonard Fox, to L. B. Holliday & Company Limited. Transfer printing. 4,072,462, Cl. 8-2.50A.

Velo-Bind, Inc.: *See—*
Groswith, Charles T., III; and Woodley, Ralph M., 4,072,326, Cl. 281-29.000.

Velsicol Chemical Corporation: *See—*
Anderson, Arnold L., 4,072,652, Cl. 260-45.75B.

Verbanac, Frank: *See—*
Short, Rolland W. P.; and Verbanac, Frank, 4,072,535, Cl. 106-210.000.

Vereinigte Osterreichische Eisen- und Stahlwerke Alpine Montan Aktiengesellschaft: *See—*
Riegler, Ernst; and Schmidt, Manfred, 4,072,302, Cl. 266-245.000.

Veyhl-Produktion KG: *See—*
Veyhl, Wolf, 4,072,433, Cl. 403-172.000.

Veyhl, Wolf, to Veyhl-Produktion KG. Three-tube corner joint. 4,072,433, Cl. 403-172.000.

Victor Company of Japan, Ltd.: *See—*
Haramoto, Yutaka; Nisikawa, Kazunori; and Yamazaki, Masami, 4,072,914, Cl. 333-14.000.
Sato, Manabu; and Matumoto, Shigeru, 4,072,988, Cl. 360-96.000.

Victor Comptometer Corporation: *See—*
Marsman, John W.; and Heaton, G. Norman, 4,072,232, Cl. 206-602.000.

Vielhaber, Edward T.: *See—*
Creekmore, Mark D.; Vielhaber, Edward T.; and Carter, Russell P., Jr., 4,072,790, Cl. 428-220.000.

Vihorlat, narodny podnik: *See—*
Kostura, Michal; Pandula, Jan; Harmansky, Absolon; Smiga, Slavomir; and Kepic, Stefan, 4,072,181, Cl. 164-154.000.

Vivat, Michel: *See—*
Buendia, Jean; Vivat, Michel; and Schalbar, Jeanine, 4,072,755, Cl. 424-312.000.

Vodicka, Ludek; Peka, Ivo; and Suchy, Voktor, to Vysoka skola chemicko-technologicka. Method for recovering palladium from spent palladium catalysts. 4,072,508, Cl. 75-121.000.

Voges, Dieter; Baer, Karl; Boudier, Juergen; Winderl, Siegfried; and Hoffmann, Herwig, to BASF Aktiengesellschaft. Hydrogenation of acetylene alcohols. 4,072,714, Cl. 260-584.00R.

Vogiatzis, Constantinos. Footwear fastening system. 4,071,964, Cl. 36-50.000.

Vogt, Herwart Curt; Parekh, Manher; Cenker, Moses; and Patton, John Thomas, Jr., to BASF Wyandotte Corporation. Vanadyl alcoholate, organic titanate, polyhydric alcohol compositions as esterification/-transesterification catalysts. 4,072,631, Cl. 252-431.00R.

Volckmann, Klaus: *See—*
Oltmanns, Heinrich; and Volckmann, Klaus, 4,072,453, Cl. 425-62.000.

Volman, Mikhail Yakovlevich; Grinshtein, Vladimir Yakovlevich; Zhukov, Mikhail Leonidovich; Kuchuk, Ivan Anatolievich; and

Polovinkin, Evgeny Petrovich. Outdoor high-voltage switchgear assembly. 4,072,999, Cl. 361-333.000.

Volpin, Pavel Ilich: *See—*
Brusako, Jury Ivanovich; Rzhavin, Sergei Alexandrovich; Kiselev, Vasily Pavlovich; Tarasov, Mikhail Sergeevich; Rapoport, Vladimir Mendeleevich; Timofeev, Vladimir Vasilievich; Ragulina, Raisa Ivanovna; Alivoivodich, Miro Khristoforovich; Kucherenko, Anatoly Gavrilovich; Varjushenkov, Anatoly Mikhailovich; Isaeva, Elena Pavlovna; Berezhnoi, Ivan Arkhipovich; Rumyantsev, Vasily Petrovich; Shpak, Grigory Safronovich; Guz, Dmitry Semenovich; Ilinkov, Dmitry Vladimirovich; Volpin, Pavel Ilich; Avdeev, Mikhail Pavlovich, Artemenko, Stanislav Arsentievich; and Khrennikova, Ljudmila Pavlovna, 4,072,512, Cl. 75-148.000.

von Gutfeld, Robert Jacob, to International Business Machines Corporation. Multilayered slant-angle thin film energy detector. 4,072,864, Cl. 250-338.000.

Voss, Hubert E.; and Roth, Ronald W., to Irrigation Engineering & Specialties. Self-cleaning ball valve. 4,072,271, Cl. 239-541.000.

Vysoka skola chemicko-technologicka: *See—*
Vodicka, Ludek; Peka, Ivo; and Suchy, Voktor, 4,072,508, Cl. 75-121.000.

Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi: *See—*
Buran, Vojtech; and Horn, Vladimir, 4,072,175, Cl. 139-455.000.

W. C. Heraeus GmbH: *See—*
Eligehausen, Hans, 4,072,856, Cl. 362-2.000.

W. H. Booth & Co. Limited: *See—*
Hoult, Frederick Herbert, 4,072,180, Cl. 164-130.000.

W. P. Hickman Company, Inc.: *See—*
Hickman, John B., 4,071,987, Cl. 52-94.000.

W. R. Grace & Co.: *See—*
Nickell, Louis G., 4,072,496, Cl. 71-88.000.

W. R. Weaver: *See—*
Ross, Cecil Jack; and Thompson, John Fred, 4,071,949, Cl. 29-818.000.
Ross, Cecil Jack, 4,072,396, Cl. 350-46.000.

Waas, Johann: *See—*
Spork, Helmut; Strasser, Rudolf; and Waas, Johann, 4,072,580, Cl. 203-47.000.

WABCO Westinghouse GmbH: *See—*
Gudat, Wolfgang; and Ruhnau, Gerhard, 4,072,364, Cl. 303-95.000.

Wacker-Chemie GmbH: *See—*
Louis, Eckhart; Dorsch, Norman; and Wohlfarth, Ernst, 4,072,655, Cl. 260-46.50G.
Spork, Helmut; Strasser, Rudolf; and Waas, Johann, 4,072,580, Cl. 203-47.000.

Wadleigh, Edward R. Turn-off interlock for tape and film machines. 4,072,879, Cl. 318-57.000.

Wagner, David Prugh: *See—*
Curtis, Gary Martin; and Wagner, David Prugh, 4,072,081, Cl. 85-62.000.

Wagner, Norman J., to Calgon Corporation. Dual impregnated activated carbon for improved removal of malodorous sulfur compounds. 4,072,480, Cl. 55-73.000.

Wagner, Norman J.: *See—*
Sinha, Rabindra Kumar; Wagner, Norman J.; and Joyce, Ronald S., 4,072,479, Cl. 55-73.000.

Wagner, Theodor, to C.C. Egelhaaf, Firma. Arrangement for producing selvage in woven fabrics. 4,072,174, Cl. 139-54.000.

Waight, William J.; and Roche, Stanley E., to Textron Inc. Antirotation clip. 4,072,431, Cl. 403-158.000.

Wainco Products Limited: *See—*
Dove, Michael David, 4,072,260, Cl. 226-173.000.

Waite, John Stuart, to GKN Floform Limited. Method of making semi-conductor mounts. 4,072,817, Cl. 174-52.00H.

Waldron, Clifford R.; Yonkers, Karl W.; Goebeler, Robert; Frear, David L.; and Bright, Edward J., to Bendix Corporation, The. Electrical contact assembly. 4,072,394, Cl. 339-276.00T.

Waldrop, Thomas W.: *See—*
Campbell, Willis R.; and Waldrop, Thomas W., 4,072,095, Cl. 100-5.000.

Walker, Alan John, to R. E. Dupont Research and Investment Services Limited. Electromagnetically driven pumps. 4,072,446, Cl. 417-420.000.

Walker, Ian Clive, to Micro Consultants Limited. Digital storage systems. 4,072,987, Cl. 360-48.000.

Wallace, Charles H.: *See—*
Sumption, Richard F.; and Wallace, Charles H., 4,071,957, Cl. 33-174.00L.

Wallner, Peter, to Schurter AG. Bayonet connection between two electrically conductive components. 4,072,385, Cl. 339-88.00R.

Wallo, William H., to Perfection Enterprises, Inc. Solid shell phonoconnectors. 4,072,386, Cl. 339-91.00R.

Walraevens, Rene: *See—*
Boulet, Jean-Claude; Walraevens, Rene; Bonnety, Gerard; Lolivier, Jacques; and Trouillet, Paul, 4,072,638, Cl. 260-2.5AP.

Walters, Thomas, Jr., to Ecolaire Incorporated. Rotary feeder. 4,072,253, Cl. 222-368.000.

Walther, Herbert; Hartig, Wolfgang; Friedrich, Adolf; and Raue, Roderich, to Bayer Aktiengesellschaft. Dyestuff laser. 4,072,911, Cl. 331-94.50L.

Waly, Adnan, to Izon Corporation. Optical scanning system for reading micro-image records. 4,072,416, Cl. 355-46.000.

Wanner, Karl, to Robert Bosch GmbH. Motor-driven portable hammer. 4,072,199, Cl. 173-131.000.

Ward, Dennis J., to UOP Inc. Process to separate hydrocarbons from gas streams. 4,072,604, Cl. 208-341.000.

Ward, Dennis J.: *See—*
Stine, Laurence O.; and Ward, Dennis J., 4,072,729, Cl. 260-671.00R.

Warren Insulated Bloc, Inc.: *See—*
Warren, Millard R., 4,071,989, Cl. 52-145.000.

Warren, Millard R., to Warren Insulated Bloc, Inc. Sound insulative masonry block. 4,071,989, Cl. 52-145.000.

Waschneck, Helmut: *See—*
Kramer, Heinz; Peretti, Norbert; and Waschneck, Helmut, 4,072,491, Cl. 65-72.000.

Wasson, Ken G., to Spectra-Flux, Inc. Radial magnetic bearing. 4,072,370, Cl. 308-10.000.

Watanabe, Itaru; Yamakoshi, Yasumichi; Miyauchi, Hirotsugu; Tsushima, Sakae; and Fukumoto, Mitsunobu, to Asahi Kasei Kogyo Kabushiki Kaisha. Reinforced ion-exchange membrane. 4,072,793, Cl. 428-255.000.

Watanabe, Namio: *See—*
Inoue, Takehisa; Ogawa, Yutaka; Sugita, Hiroaki; and Watanabe, Namio, 4,072,217, Cl. 188-73.600.

Watanabe, Shoji: *See—*
Tanaka, Kazunobu; Kusumoto, Masahiko; and Watanabe, Shoji, 4,071,975, Cl. 47-9.000.

Waterman, Jacques A., deceased: *See—*
Ravey, Mani; Shorr, Leonard Marshall; and Waterman, Jacques A., deceased, 4,072,806, Cl. 526-89.000.

Waters, Robert L.: *See—*
Morris, Fred J.; Waters, Robert L.; and Roberts, George F., 4,072,200, Cl. 175-45.000.

Watson, Charles J., to Bell & Howell Company. Frame count cuer for photographic film printers. 4,072,419, Cl. 355-83.000.

Watson, W. Gary: *See—*
Shapiro, Stanley; Shapiro, Eugene; Mravic, Brian; and Watson, W. Gary, 4,072,513, Cl. 75-164.000.

Webb, John M.: *See—*
Loxley, Ted A.; Barber, Walter G.; Combs, Walter W.; and Webb, John M., 4,072,489, Cl. 65-18.000.

Webley, Reginald Sidney, to EMI Limited. X-ray tube. 4,072,875, Cl. 313-60.000.

Weemes, Doyle A.: *See—*
McConnell, Richard L.; Weemes, Doyle A.; and Joyner, Frederick B., 4,072,812, Cl. 526-348.200.
McConnell, Richard L.; Weemes, Doyle A.; and Joyner, Frederick B., 4,072,813, Cl. 526-348.200.

Wehrli, Pius Anton, to Hoffmann-La Roche Inc. Preparation of 2,3,6-tri-lower alkyl phenols. 4,072,723, Cl. 260-621.00H.

Weigl, James: *See—*
Munson, Ramon Jon; Hurd, Claude Calvert; and Weigl, James, 4,072,148, Cl. 128-142.200.

Weil, Tomas: *See—*
Muller, Werner Heinrich; Hey, Hansjorg; and Weil, Tomas, 4,072,660, Cl. 260-621.00H.

Weiland, Richard Herschel, to Boeing Company, The. Aerial refueling boom articulation. 4,072,283, Cl. 244-135.00A.

Weis, Helmut: *See—*
Bechtle, Bastian; Schuenemann, Claus; Skudelny, Gisbert; Spruth, Wilhelm; Weis, Helmut; and Zimmermann, Volker, 4,072,888, Cl. 318-685.000.

Weiss, Stefan Adam; Torney, Harry Lester; and Caldwell, William Joseph, to Dow Chemical Company, The. Production of viruses in tissue culture without use of serum. 4,072,565, Cl. 195-1.100.

Weiss, Walter J.: *See—*
Kudchadker, Mohan V.; and Weiss, Walter J., 4,072,192, Cl. 166-273.000.

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Sanderson, Allan, 4,072,356, Cl. 219-121.0EB.

Weldon, Peter J.: *See—*
Lewis, William; Weldon, Peter J.; Hagedorn, Henry, Jr.; Hayes, Thomas E.; and Israels, Sylvan H., 4,072,108, Cl. 102-70.20R.

Welton, Sanford M., to PPG Industries, Inc. Method and apparatus for opening scores in a glass sheet. 4,072,259, Cl. 225-2.000.

Wentzheimer, William W., to Suntech, Inc. Process to make technical white oils. 4,072,603, Cl. 208-264.000.

Werner & Pfleiderer: *See—*
Lambertus, Friedrich, 4,072,459, Cl. 425-464.000.

West Electric Co., Ltd.: *See—*
Iwata, Hiroshi; and Ishikawa, Katsuji, 4,072,963, Cl. 354-31.000.

Westbrook, L. V.; and Payne, R. L., to Honeywell Inc. Voltage regulator. 4,072,890, Cl. 323-22.00R.

Western Electric Co., Inc.: *See—*
Chuss, John T.; Krechel, Henry H.; and Purvis, Joseph R., 4,071,944, Cl. 29-574.000.
Fuchs, Francis Joseph, Jr., 4,072,037, Cl. 72-261.000.
Schoenthaler, David, 4,072,777, Cl. 427-433.000.

Western Geophysical Co. of America: *See—*
Siems, Lee E.; and Morgan, Paul M., 4,072,923, Cl. 340-15.5TS.

Westinghouse Electric Corporation: *See—*
Benbow, Eugene C., 4,072,267, Cl. 235-112.000.
Buchanan, James E., 4,072,938, Cl. 340-347.0AD.
Coviello, John W., 4,072,818, Cl. 358-284.000.
Emark, Lawrence W., Jr., 4,072,885, Cl. 318-600.000.
Engel, Joseph C.; and Saletta, Gary F., 4,072,878, Cl. 315-205.000.
Kramer, William E.; Hopkins, Richard H.; and Hoffman, Richard A., 4,072,782, Cl. 428-409.000.
Lloyd, Wayne B.; and Staehlin, John H., 4,072,064, Cl. 74-409.000

Moeglich, Karl, 4,072,596, Cl. 204-241.000.
Noonan, Charles M., 4,072,795, Cl. 428-379.000.
Nottingham, Lawrence D., 4,072,873, Cl. 310-71.000.
Sanday, Santiago C., 4,072,007, Cl. 60-39.69A.
Tanaka, Tadashi; Okamoto, Akira; Kouno, Takashi; Kramer, William E.; Hopkins, Richard H.; and Hoffman, Richard A., 4,072,657, Cl. 260-47.0UA.
Wilson, Charles R., 4,072,871, Cl. 310-333.000.

Westport International: *See—*
Hellman, Robert R.; and French, Douglas M., 4,072,898, Cl. 325-37.000.

Westvaco Corporation: *See—*
Kurrle, Frederick L., 4,072,537, Cl. 106-288.00B.

WGW Westdeutsche Getriebe- und Kupplungswerke GmbH: *See—*
Benthake, Heinrich, 4,072,067, Cl. 74-789.000.

White, Donald A.: *See—*
Hallcher, Richard C.; Baizer, Manuel M.; and White, Donald A., 4,072,583, Cl. 204-59.00R.

White, James F.; Shaw, Wilfrid G.; and Applequist, Michael D., to Standard Oil Company, The. Process for the preparation of unsaturated acids from unsaturated aldehydes. 4,072,708, Cl. 260-530.00N.

White, Lionel Stuart, Jr.: *See—*
Kitagawa, Norihisa; and White, Lionel Stuart, Jr., 4,072,932, Cl. 365-233.000.

Whitehead, Robert C., Jr., to Honeywell Inc. Differential pressure transmitter with pressure sensor protection. 4,072,058, Cl. 73-720.000.

Whitehurst, Darrell Duayne: *See—*
Haag, Werner O.; and Whitehurst, Darrell Duayne, 4,072,720, Cl. 260-618.00H.

Wiart, Albert Charles; and de la Jonquiere, Pierre Jacques, to Jeumont-Schneider. Frequency current converter for energizing an AC machine. 4,072,882, Cl. 318-227.000.

Wicks, Anthony John; and Wilson, Eric Terence, to Wicks & Wilson Limited. Microfilm card duplication. 4,072,420, Cl. 355-100.000.

Wicks & Wilson Limited: *See—*
Wicks, Anthony John; and Wilson, Eric Terence, 4,072,420, Cl. 355-100.000.

Wickwire, Chester F. Arch and building construction. 4,071,985, Cl. 52-86.000.

Wickwire, Chester F. Building structure. 4,071,986, Cl. 52-86.000.

Widmer, Erich: *See—*
Boguth, Walter; Leuenberger, Hans Georg Wilhelm; Mayer, Hans Johann; Widmer, Erich; and Zell, Reinhard, 4,072,715, Cl. 260-586.00R.

Wiebe, Donald, to A. Stucki Company. Resiliently biasing truck pedestal bearing retention assembly. 4,072,112, Cl. 105-221.00K.

Wiechert, Rudolf: *See—*
Sauer, Gerhard; Hauser, Helmut; Haffer, Gregor; Ruppert, Juergen; Eder, Ulrich; and Wiechert, Rudolf, 4,072,716, Cl. 260-586.00F.

Wiesler, Mordechai. Digital weighing machine. 4,072,201, Cl. 177-210.00R.

Wilder, Joseph, to Sangamo Weston, Inc. Industrial system for inspecting and identifying workpieces. 4,072,928, Cl. 340-146.30H.

Wilhelm, Daniel C.: *See—*
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Wilke, Charles R.: *See—*
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Wilkinson, Ralph A.: *See—*
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Willems, Jozef Frans: *See—*
Sels, Jeanne Francis Jeanne; Pollet, Robert Joseph; Vandeputte, Camille Angelina; and Willems, Jozef Frans, 4,072,526, Cl. 96-66.300.

William Machinery Limited: *See—*
Holmes, John, 4,072,354, Cl. 299-37.000.

Williams, Barney V. Vertical rising boat lift. 4,072,119, Cl. 114-45.000.

Williams, David J.: *See—*
Pearson, James M.; Williams, David J.; and Limburg, William W., 4,072,519, Cl. 96-1.50R.

Williams, Dennis A.; and Carswell, Robert, to Dow Chemical Company, The. Ester lubricants containing polyoxyalkylene phenothiazines. 4,072,619, Cl. 252-47.500.

Williams, Joseph James: *See—*
Dabal, Dennis Joseph; and Williams, Joseph James, 4,072,551, Cl. 156-378.000.

Williams, Wilmore, to Beatrice Foods Co. Preparation of a tuberculosis test medium by reconstituting a storage stabilized dry powdered Lowenstein-Jensen medium. 4,072,570, Cl. 195-100.000.

Wilson, Charles R., to Westinghouse Electric Corporation. Electro-acoustic transducer. 4,072,871, Cl. 310-333.000.

Wilson, Edward A.; and Fredenberg, James D., to Honeywell Information Systems Inc. Fluid cooling systems for electronic systems. 4,072,188, Cl. 165-80.000.

Wilson, Eric Terence: *See—*
Wicks, Anthony John; and Wilson, Eric Terence, 4,072,420, Cl. 355-100.000.

Wilson, James Ellsworth: *See—*
Conant, Louis A.; Bolton, Wilbur Monroe; and Wilson, James Ellsworth, 4,072,243, Cl. 215-12.00R.

Wilson, Jerry Lee. Multi-purpose exercise device. 4,072,309, Cl. 272-136.000.

Wilson, Richard J.: *See—*
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Winderl, Siegfried: *See—*
Voges, Dieter; Baer, Karl; Boudier, Juergen; Winderl, Siegfried; and Hoffmann, Herwig, 4,072,714, Cl. 260-584.00R.

Winer, Richard, to Hercules Incorporated. Use of graphite fibers to augment propellant burning rate. 4,072,546, Cl. 149-19.800.

Wines, Roy Layton, Jr.; and Wines, Roy Layton, III, to Roy L. Wines & Son, Inc. Portable nursing device. 4,072,157, Cl. 134-58.00R.

Wines, Roy Layton, III: *See—*
Wines, Roy Layton, Jr.; and Wines, Roy Layton, III, 4,072,157, Cl. 134-58.00R.

Winkler, Alfred, to AGFA-Gevaert Aktiengesellschaft. Still camera. 4,072,970, Cl. 354-187.000.

Winter, George R., III, to UOP Inc. Process for alkylating aromatic hydrocarbons. 4,072,730, Cl. 260-671.00R.

Wirges, Winfried; and Freitag, Herbert, to Stabilus GmbH. Chair with pneumatically adjustable seat height and back support inclination. 4,072,288, Cl. 248-404.000.

Wit-Son Carbide Tool, Inc.: *See—*
Kulson, Walter A., 4,072,476, Cl. 51-215.00H.

Witmer, Kurt; and Cachin, Roland, to Dr. K. Witmer Elektronik AG. Electronically stabilized feeder device for the supply of DC current. 4,072,889, Cl. 323-9.000.

Wittenmyer, James D. Dual standpipe arrangement supplementing a water supply system. 4,072,168, Cl. 137-567.000.

Wohlfarth, Ernst: *See—*
Louis, Eckhart; Dorsch, Norman; and Wohlfarth, Ernst, 4,072,655, Cl. 260-46.50G.

Wolf, Bobby G. Implement, especially for lawn work. 4,072,436, Cl. 404-122.000.

Wolf, Chester: *See—*
Murphy, John E.; and Wolf, Chester, 4,072,248, Cl. 222-56.000.

Wolf, William D., to Monsanto Company. Method for production of hollow articles from injection molded preforms using insulated runner system. 4,072,737, Cl. 264-97.000.

Wolfe, George Edwin: *See—*
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Woltmann, Ivan Elmer: *See—*
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Wood, Gillies: *See—*
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Woodstream Corporation: *See—*
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Wright, Franklin J.: *See—*
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Wright, Leon W.: *See—*
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Wright, Robert W.: *See—*
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Wright, Theodore D., to K & F Manufacturing Co., Inc. Magnetic holding device. 4,072,920, Cl. 335-285.000.

Wu, Ching Yong: *See—*
Lakshmanan, Pallavoor R.; Swift, Harold E.; and Wu, Ching Yong, 4,072,808, Cl. 526-76.000.

Wu, Yao Hua; and Lobeck, Walter G., Jr., to Mead Johnson & Company. N-phenyl amidines. 4,072,675, Cl. 260-239.0BE.

Wylain, Inc.: *See—*
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Xerox Corporation: *See—*
Amess, Colin Lawrence, 4,072,413, Cl. 355-3.0CH.
Goffe, William L.; and Mammino, Joseph, 4,072,517, Cl. 96-1.0PS.
Hanson, William J., 4,072,414, Cl. 355-4.000.
Knieser, James J., 4,072,307, Cl. 271-174.000.
Leder, Lewis B., 4,072,518, Cl. 96-1.50R.
Miyatuka, Hajime, 4,072,522, Cl. 96-1.800.
Pearson, James M.; Williams, David J.; and Limburg, William W., 4,072,519, Cl. 96-1.50R.
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Xonics, Inc.: *See—*
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Yagi, Kenjiro: *See—*
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Yamada, Nobuo: *See—*
Nakata, Tetsuya; Yamada, Nobuo; Hashimoto, Akira; Takata, Yasuto; and Bunnomori, Yukinari, 4,072,734, Cl. 260-873.000.

Yamada, Seiji, to Minolta Camera Kabushiki Kaisha. Light measuring circuit for automatic exposure control. 4,072,961, Cl. 354-24.000.

Yamada, Shigeki: *See—*
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Yamada, Shiro: *See—*
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Yamada, Yoshihito. Two-way stethoscope for direct and amplified sound. 4,072,822, Cl. 179-1.50T.

Yamaguchi, Masayasu: *See—*
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Yamaguchi, Teruo; and Sera, Hidefumi, to Fuji Photo Film Co., Ltd. Undercoating composition for polyesters containing epoxy compounds. 4,072,639, Cl. 260-6.000.

Yamaizumi, Kouji: *See—*
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Yamakoshi, Yasumichi: *See—*
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Yamashita, Koichi: *See—*
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Yamazaki, Hironobu, to Tekken Construction Co. Ltd. Method of driving and forming a tunnel with hydraulic boring machine. 4,072,021, Cl. 61-42.000.

Yamazaki, Masami: *See—*
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Yamazaki, Seichi, to Nippon Glass Measure Co., Ltd. Liquid dispensing device. 4,072,247, Cl. 222-47.000.

Yancey, Charles B.: *See—*
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Yashima, Michio; Senzaki, Takaya; and Kurihara, Norimitsu, to Honda Giken Kogyo Kabushiki Kaisha. Warning system for vehicles. 4,072,925, Cl. 340-52.00F.

Yasuda, Naohiko: *See—*
Togo, Kazushi; Tamura, Fumihide; Yasuda, Naohiko; Ichikawa, Takehiko; Sano, Konosuke; Matsuda, Keizo; and Mitsugi, Koji, 4,072,687, Cl. 260-306.70T.

Yasue, Motoi; Tagawa, Yoshikazu; and Higashi, Mitsuo, to Nippon Steel Corporation. Method for surface treatment of steel sheet and steel sheets obtained therefrom. 4,072,783, Cl. 428-341.000.

Yasuhara, Takeshi; Tamai, Mitsuru; and Yuhara, Tadanori, to Fuji Electric Co., Ltd. Differential pressure cell with diaphragm tension and overpressure protection. 4,072,057, Cl. 73-718.000.

Yen, Chung Hwai: *See—*
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Yhtyneet Paperitehtaat Osakeyhtio Jylhavaara: *See—*
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Yokobayashi, Koji; Ikeda, Tadashi; and Misaki, Akira, to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo. Compound water-insoluble glucan and process for the production thereof. 4,072,567, Cl. 195-63.000.

Yokota, Yukio: *See—*
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Yoshida, Kunio: *See—*
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Yoshinaga, Yoshiaki: *See—*
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Yoshioka, Kengo: *See—*
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Yotumoto, Keiichi: *See—*
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Young, Bruce O.: *See—*
Seegmiller, Wan; Young, Bruce O.; and Story, Joe A., 4,072,334, Cl. 293-71.00R.

Young, D. Craig, to Caterpillar Tractor Co. Slip joint between a gas turbine engine and a heat exchanger. 4,072,327, Cl. 285-137.00R.

Young, Daniel L. Game ball holder. 4,072,256, Cl. 224-5.00D.

Youngren, Fred R., to United States of America, Army. Sealing method for porous material. 4,072,774, Cl. 427-294.000.

Yuasa Battery Company Limited: *See—*
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Yuhara, Tadanori: *See—*
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Zack, Thomas A.: *See—*
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Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See—*
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Zeisky, Andre. Apparatus for holding, reading and handling books. 4,072,407, Cl. 350-241.000.

Zell, Reinhard: *See—*
Boguth, Walter; Leuenberger, Hans Georg Wilhelm; Mayer, Hans Johann; Widmer, Erich; and Zell, Reinhard, 4,072,715, Cl. 260-586.00R.

Zenith Radio Corporation: *See—*
Citta, Richard W., 4,072,909, Cl. 331-12.000.

Zentrum fur Elektronemikroskopie: *See—*
Horn, Herwig, 4,072,426, Cl. 356-212.000.

Zenz, Frederick A., to Ducon Company, Inc., The. Apparatus and method for generating steam. 4,072,130, Cl. 122-4.00D.

Zero Corporation: *See—*
Freehauf, Eugene G., 4,072,380, Cl. 339-17.0CF.

Zerouki, Aime: *See—*
Chaix, Jean Edmond; Fajeau, Maurice; Le Borgne, Edmond; and Zerouki, Aime, 4,072,189, Cl. 165-142.000.

Zhukov, Mikhail Leonidovich: *See—*
Volman, Mikhail Yakovlevich; Grinshtein, Vladimir Yakovlevich; Zhukov, Mikhail Leonidovich; Kuchuk, Ivan Anatolievich; and Polovinkin, Evgeny Petrovich, 4,072,999, Cl. 361-333.000.

Ziegelwerke Heinrich Oltmanns: *See—*
Oltmanns, Heinrich; and Volckmann, Klaus, 4,072,453, Cl. 425-62.000.

Ziegler, Hans J.: *See—*
Van de Loo, Harley J.; and Ziegler, Hans J., 4,072,377, Cl. 339-17.00F.

Ziemek, Gerhard; and Schatz, Friedrich, to Kabel-und Metallwerke. Strengthening of a welding seam. 4,072,035, Cl. 72-209.000.

Zillman, Jack H., to Varadyne Industries, Inc. Process for making electrical components having dielectric layers comprising particles of a lead oxide-germanium dioxide-silicon dioxide glass and a resin binder therefore. 4,072,780, Cl. 428-325.000.

Zimmer, Elvis Simon; and Hassell, David Allen, to Paulucci, Jeno F. Rotary food oven. 4,072,093, Cl. 99-443.00R.

Zimmermann, Rolf: *See—*
Ritz, Jurgen; Zimmermann, Rolf; and Fischer, Hannes, 4,072,642, Cl. 260-22.0CB.

Zimmermann, Volker: *See—*
Bechtle, Bastian; Schuenemann, Claus; Skudelny, Gisbert; Spruth, Wilhelm; Weis, Helmut; and Zimmermann, Volker, 4,072,888, Cl. 318-685.000.

Zoell, Bob: *See—*
Lloyd, Peter; and Zoell, Bob, 4,072,229, Cl. 206-309.000.

Zolman, Junior O.; and Griewahn, Carl O., to Brazeway, Inc. CFT Box fin. 4,071,934, Cl. 29-157.30A.

Zonenko, Ivan Timofeevich: *See—*
Kovanov, Pavel Vasilievich; Torochkov, Ivan Mikhailovich; Zonenko, Ivan Timofeevich; Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Tsimbler, Jury Abramovich; Kantor, Ilya Solomonovich; Topolyansky, Jury Arnoldovich; and Lurie, Mikhail Vladimirovich, 4,072,109, Cl. 104-138.00R.

Zorev, Nikolai Nikolaevich; Astafiev, Anatoly Alexandrovich; Loboda, Alexandr Sergeevich; Savukov, Vladimir Pavlovich; Runov, Andrei Efimovich; Belov, Vladimir Alexandrovich; Sobolev, Jury Vasilievich; Sobolev, Valentin Vasilievich; Pavlov, Nikolai Mikhailovich; Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Balandin, Jury Fedorovich; Gorynin, Igor Vasilievich; Zvezdin, Jury Ivanovich; Ivanov, Kuzma Makeevich; Ignatov, Viktor Alexandrovich; and Emelyanenko, July Georgievich. Steel for nuclear applications. 4,072,509, Cl. 75-124.000.

Zvezdin, Jury Ivanovich: *See—*
Zorev, Nikolai Nikolaevich; Astafiev, Anatoly Alexandrovich; Loboda, Alexandr Sergeevich; Savukov, Vladimir Pavlovich; Runov, Andrei Efimovich; Belov, Vladimir Alexandrovich; Sobolev, Jury Vasilievich; Sobolev, Valentin Vasilievich; Pavlov, Nikolai Mikhailovich; Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Balandin, Jury Fedorovich; Gorynin, Igor Vasilievich; Zvezdin, Jury Ivanovich; Ivanov, Kuzma Makeevich; Ignatov, Viktor Alexandrovich; and Emelyanenko, July Georgievich, 4,072,509, Cl. 75-124.000.

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DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 24,017	3,914,140	Oct. 21, 1975	B 287,275	3,925,141	Dec. 9, 1975
B 24,018	3,914,206	Oct. 21, 1975	B 287,373	3,918,568	Nov. 11, 1975
B 64,868	3,914,141	Oct. 21, 1975	B 288,018	3,925,239	Dec. 9, 1975
B 78,331	3,914,142	Oct. 21, 1975	B 288,627	3,916,179	Oct. 28, 1975
B 112,422	3,913,484	Oct. 21, 1975	B 288,638	3,925,132	Dec. 9, 1975
B 150,560	3,913,654	Oct. 21, 1975	B 289,175	3,924,309	Dec. 9, 1975
B 176,995	3,915,773	Oct. 28, 1975	B 289,471	3,917,184	Nov. 4, 1975
B 178,475	3,944,602	Mar. 16, 1976	B 289,523	3,921,166	Nov. 18, 1975
B 189,772	3,925,367	Dec. 9, 1975	B 289,883	3,925,063	Dec. 9, 1975
B 189,773	3,925,405	Dec. 9, 1975	B 290,328	3,924,838	Dec. 9, 1975
B 190,679	3,925,346	Dec. 9, 1975	B 291,104	3,925,007	Dec. 9, 1975
B 198,810	3,916,043	Oct. 28, 1975	B 291,694	3,925,339	Dec. 9, 1975
B 204,161	3,924,605	Dec. 9, 1975	B 292,054	3,915,877	Oct. 28, 1975
B 207,272	3,914,123	Oct. 21, 1975	B 292,126	3,914,465	Oct. 21, 1975
B 211,786	3,914,300	Oct. 21, 1975	B 292,140	3,914,340	Oct. 21, 1975
B 213,211	3,925,269	Dec. 9, 1975	B 292,300	3,927,167	Dec. 16, 1975
B 220,683	3,914,471	Oct. 21, 1975	B 292,563	3,923,653	Dec. 2, 1975
B 222,188	3,914,739	Oct. 21, 1975	B 293,378	3,923,725	Dec. 2, 1975
B 223,621	3,925,526	Dec. 9, 1975	B 293,437	3,913,414	Oct. 21, 1975
B 224,323	3,925,476	Dec. 9, 1975	B 294,103	3,924,396	Dec. 9, 1975
B 233,383	3,925,424	Dec. 9, 1975	B 294,579	3,916,737	Nov. 4, 1975
B 233,741	3,925,326	Dec. 9, 1975	B 294,673	3,916,023	Oct. 28, 1975
B 235,011	3,925,086	Dec. 9, 1975	B 295,481	3,921,593	Nov. 25, 1975
B 235,925	3,924,949	Dec. 9, 1975	B 295,674	3,916,107	Oct. 28, 1975
B 236,609	3,925,187	Dec. 9, 1975	B 295,860	3,923,880	Dec. 2, 1975
B 237,953	3,924,051	Dec. 2, 1975	B 299,267	3,917,106	Nov. 4, 1975
B 239,289	3,922,711	Nov. 25, 1975	B 300,353	3,921,734	Nov. 25, 1975
B 241,433	3,923,711	Dec. 2, 1975	B 302,271	3,929,130	Dec. 30, 1975
B 245,194	3,919,179	Nov. 11, 1975	B 302,692	3,924,598	Dec. 9, 1975
B 248,916	3,920,862	Nov. 18, 1975	B 302,836	3,923,573	Dec. 2, 1975
B 251,109	3,914,148	Oct. 21, 1975	B 302,998	3,928,233	Dec. 23, 1975
B 251,635	3,914,149	Oct. 21, 1975	B 303,011	3,930,188	Dec. 30, 1975
B 252,947	3,923,803	Dec. 2, 1975	B 303,702	3,914,131	Oct. 21, 1975
B 254,211	3,917,677	Nov. 4, 1975	B 304,687	3,924,783	Dec. 9, 1975
B 254,708	3,923,878	Dec. 2, 1975	B 305,417	3,915,882	Oct. 28, 1975
B 255,756	3,923,781	Dec. 2, 1975	B 305,868	3,921,463	Nov. 25, 1975
B 256,334	3,924,988	Dec. 9, 1975	B 305,881	3,923,478	Dec. 2, 1975
B 256,936	3,925,513	Dec. 9, 1975	B 306,655	3,924,642	Dec. 9,1975
B 258,687	3,914,221	Oct. 21, 1975	B 306,829	3,925,411	Dec. 9, 1975
B 259,236	3,924,874	Dec. 9, 1975	B 306,938	3,916,050	Oct. 28, 1975
B 259,274	3,928,688	Dec. 23, 1975	B 307,677	3,915,276	Oct. 28, 1975
B 260,455	3,925,634	Dec. 9, 1975	B 308,661	3,924,349	Dec. 9, 1975
B 260,945	3,925,250	Dec. 9, 1975	B 308,892	3,919,624	Nov. 11, 1975
B 261,378	3,913,468	Oct. 21, 1975	B 309,207	3,914,743	Oct. 21, 1975
B 261,828	3,925,551	Dec. 9, 1975	B 309,499	3,922,002	Nov. 25, 1975
B 262,241	3,925,528	Dec. 9, 1975	B 309,681	3,927,374	Dec. 16, 1975
B 262,287	3,921,209	Nov. 18, 1975	B 309,755	3,919,468	Nov. 11, 1975
B 262,378	3,914,410	Oct. 21, 1975	B 309,756	3,914,136	Oct. 21, 1975
B 262,599	3,925,323	Dec. 9, 1975	B 309,860	3,922,485	Nov. 25, 1975
B 264,257	3,928,665	Dec. 23, 1975	B 310,149	3,924,705	Dec. 9, 1975
B 264,833	3,923,566	Dec. 2, 1975	B 310,271	3,923,689	Dec. 2, 1975
B 265,369	3,925,245	Dec. 9, 1975	B 310,740	3,985,686	Oct. 12, 1976
B 265,727	3,914,479	Oct. 21, 1975	B 311,313	3,925,142	Dec. 9, 1975
B 265,862	3,915,915	Oct. 28, 1975	B 311,317	3,918,975	Nov. 11, 1975
B 266,195	3,923,599	Dec. 2, 1975	B 311,413	3,925,515	Dec. 9, 1975
B 269,673	3,914,377	Oct. 21, 1975	B 311,910	3,924,357	Dec. 9, 1975
B 270,089	3,923,875	Dec. 2, 1975	B 311,977	3,925,233	Dec. 9,1975
B 271,104	3,925,400	Dec. 9, 1975	B 312,139	3,925,530	Dec. 9, 1975
B 274,945	3,924,992	Dec. 9, 1975	B 312,477	3,923,714	Dec. 2, 1975
B 275,426	3,925,168	Dec. 9, 1975	B 313,029	4,072,769	Jan. 28, 1975
B 276,271	3,916,028	Oct. 28, 1975	B 313,098	3,925,045	Dec. 9, 1975
B 276,560	3,916,030	Oct. 28, 1975	B 313,531	3,925,548	Dec. 9, 1975
B 276,993	3,948,823	Apr. 6, 1976	B 313,594	3,924,626	Dec. 9, 1975
B 277,449	3,924,048	Dec. 2, 1975	B 313,900	3,915,932	Oct. 28, 1975
B 278,491	3,921,170	Nov. 18, 1975	B 314,049	3,920,588	Nov. 18, 1975
B 278,991	3,914,469	Oct. 21, 1975	B 314,255	3,923,764	Dec. 2, 1975
B 279,583	3,923,749	Dec. 2, 1975	B 314,271	3,921,845	Nov. 25, 1975
B 280,015	3,925,378	Dec. 9, 1975	B 314,489	3,925,016	Dec. 9, 1975
B 280,395	3,919,604	Nov. 11, 1975	B 314,800	3,930,087	Dec. 30, 1975
B 281,341	3,920,643	Nov. 18, 1975	B 314,977	3,923,459	Dec. 2, 1975
B 281,943	3,924,013	Dec. 2, 1975	B 315,363	3,920,673	Nov. 18, 1975
B 282,081	3,913,483	Oct. 21, 1975	B 315,397	3,923,963	Dec. 2, 1975
B 282,252	3,924,997	Dec. 9, 1975	B 315,731	3,914,108	Oct. 21, 1975
B 282,390	3,924,576	Dec. 9,1975	B 316,014	3,920,861	Nov. 18, 1975
B 282,819	3,982,932	Sep. 28, 1976	B 316,239	3,913,546	Oct. 21, 1975
B 283,124	3,923,512	Dec. 2, 1975	B 316,422	4,016,206	Apr. 19, 1977
B 283,300	3,925,011	Dec. 9, 1975	B 316,917	3,925,494	Dec. 9, 1975
B 284,297	3,913,722	Oct. 21, 1975	B 317,080	3,925,324	Dec. 9, 1975
B 284,427	3,952,812	Apr. 27, 1976	B 317,347	3,923,552	Dec. 2, 1975
B 285,200	3,923,680	Dec. 2, 1975	B 317,624	3,925,167	Dec. 9, 1975
B 285,796	3,914,303	Oct. 21, 1975	B 318,122	4,026,905	May 31, 1977
B 286,499	3,914,129	Oct. 21, 1975	B 318,195	3,915,699	Oct. 28, 1975
B 286,614	3,924,696	Dec. 9, 1975	B 318,618	3,915,365	Oct. 28, 1975
B 286,913	3,928,696	Dec. 23, 1975	B 318,640	3,925,186	Dec. 9, 1975
B 287,164	3,914,139	Oct. 21, 1975	B 318,745	3,916,571	Nov. 4, 1975
B 287,270	3,924,825	Dec. 9, 1975	B 319,226	3,925,082	Dec. 9, 1975

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B 319,339	3,916,056	Oct. 28, 1975
B 319,402	3,919,568	Nov. 11, 1975
B 319,414	3,928,666	Dec. 23, 1975
B 320,261	3,924,033	Dec. 2, 1975
B 320,452	3,925,083	Dec. 9, 1975
B 320,603	3,915,571	Oct. 28, 1975
B 321,018	3,921,623	Nov. 25, 1975
B 321,101	3,917,163	Nov. 4, 1975
B 321,938	3,923,889	Dec. 2, 1975
B 322,182	3,925,390	Dec. 9, 1975
B 322,239	3,920,973	Nov. 18, 1975
B 322,564	3,914,373	Oct. 21, 1975
B 322,621	3,920,863	Nov. 18,1975
B 322,777	3,924,382	Dec. 9, 1975
B 323,127	3,923,967	Dec. 2, 1975
B 323,191	3,914,566	Oct. 21, 1975
B 323,203	3,916,165	Oct. 28, 1975
B 323,568	3,920,536	Nov. 18, 1975
B 323,666	3,924,568	Dec. 9, 1975
B 324,495	3,928,664	Dec. 23, 1975
B 324,503	3,928,524	Dec. 23, 1975
B 324,505	3,925,294	Dec. 9, 1975
B 324,739	3,924,990	Dec. 9, 1975
B 324,879	3,923,538	Dec. 2, 1975
B 325,102	3,924,355	Dec. 9, 1975
B 325,261	3,921,304	Nov. 25,1975
B 326,514	3,925,080	Dec. 9, 1975
B 327,109	3,925,350	Dec. 9, 1975
B 327,363	3,923,504	Dec. 2, 1975
B 327,612	3,925,620	Dec. 9, 1975
B 327,674	3,918,540	Nov. 11, 1975
B 327,899	3,925,674	Dec. 9, 1975
B 328,164	3,914,703	Oct. 21, 1975
B 328,200	3,916,031	Oct. 28, 1975
B 328,205	3,914,106	Oct. 21, 1975
B 328,210	3,914,275	Oct. 21, 1975
B 328,391	4,039,888	Aug. 2, 1977
B 328,870	3,916,486	Nov. 4, 1975
B 329,115	3,924,727	Dec. 9, 1975
B 329,476	3,920,562	Nov. 18, 1975
B 329,612	3,925,128	Dec. 9, 1975
B 329,787	3,920,688	Nov. 18, 1975
B 329,816	3,923,947	Dec. 2, 1975
B 330,536	3,925,452	Dec. 9, 1975
B 330,828	3,913,589	Oct. 21, 1975
B 331,417	3,914,157	Oct. 21, 1975
B 331,557	3,916,577	Nov. 4, 1975
B 331,895	3,916,403	Oct. 28, 1975
B 332,527	3,924,017	Dec. 2, 1975
B 332,811	3,924,359	Dec. 9, 1975
B 333,876	3,921,208	Nov. 18, 1975
B 333,928	3,927,172	Dec. 16, 1975
B 334,251	3,924,719	Dec. 9, 1975
B 334,868	3,919,469	Nov. 11, 1975
B 334,985	3,923,912	Dec. 2, 1975
B 335,670	3,928,686	Dec. 23, 1975
B 335,741	3,925,615	Dec. 9, 1975
B 335,773	3,920,953	Nov. 18, 1975
B 336,129	3,923,606	Dec. 2, 1975
B 336,243	3,925,422	Dec. 9, 1975
B 336,345	3,925,179	Dec. 9, 1975
B 336,652	3,914,211	Oct. 21, 1975
B 336,902	3,918,897	Nov. 11, 1975
B 336,946	3,919,425	Nov. 11, 1975
B 336,978	3,923,968	Dec. 2, 1975
B 337,235	3,919,386	Nov. 11, 1975
B 337,409	3,925,258	Dec. 9, 1975
B 337,442	3,913,658	Oct. 21, 1975
B 337,703	3,914,690	Oct. 21, 1975
B 337,787	3,923,506	Dec. 2, 1975
B 339,059	3,924,822	Dec. 9, 1975
B 339,218	3,925,121	Dec. 9, 1975
B 339,699	3,933,527	Jan. 20, 1976
B 339,838	3,930,221	Dec. 30, 1975
B 340,212	3,922,645	Nov. 25, 1975
B 340,833	3,925,208	Dec. 9, 1975
B 341,579	3,913,363	Oct. 21, 1975
B 342,084	3,928,694	Dec. 23, 1975
B 342,423	3,925,334	Dec. 9, 1975
B 342,763	4,051,920	Oct. 4, 1977
B 342,886	3,923,507	Dec. 2, 1975
B 343,136	3,919,453	Nov. 11, 1975
B 343,240	3,925,693	Dec. 9, 1975
B 343,506	3,916,021	Oct. 28, 1975
B 343,577	3,921,165	Nov. 18, 1975
B 344,203	3,928,719	Dec. 23, 1975
B 344,479	3,924,042	Dec. 2, 1975
B 345,060	3,916,018	Oct. 28, 1975
B 345,384	3,916,146	Oct. 28, 1975
B 345,390	3,940,343	Feb. 24, 1976
B 345,422	3,914,392	Oct. 21, 1975
B 345,527	3,927,365	Dec. 16, 1975
B 345,567	3,913,985	Oct. 21, 1975
B 346,044	3,988,405	Oct. 26, 1976
B 346,145	3,913,293	Oct. 21, 1975
B 346,210	3,916,142	Oct. 28, 1975
B 346,350	3,915,824	Oct. 28, 1975
B 346,487	3,927,406	Dec. 16, 1975
B 346,585	3,913,820	Oct. 21, 1975
B 346,613	3,923,545	Dec. 2, 1975
B 346,901	3,915,583	Oct. 28, 1975
B 348,083	3,923,774	Dec. 2, 1975
B 348,383	3,923,452	Dec. 2, 1975
B 348,495	3,914,654	Oct. 21, 1975
B 348,558	3,914,109	Oct. 21, 1975
B 349,141	3,915,363	Oct. 28, 1975
B 349,177	3,914,033	Oct. 21, 1975
B 349,231	3,915,831	Oct. 28, 1975
B 349,321	3,916,103	Oct. 28, 1975
B 349,948	3,914,557	Oct. 21, 1975
B 350,025	3,927,415	Dec. 16, 1975
B 350,143	3,924,419	Dec. 9, 1975
B 350,219	3,917,802	Nov. 4, 1975
B 350,245	3,914,331	Oct. 21, 1975
B 350,523	3,924,726	Dec. 9, 1975
B 350,589	3,927,419	Dec. 16, 1975
B 350,708	3,923,871	Dec. 2, 1975
B 350,843	3,915,461	Oct. 28, 1975
B 351,055	3,914,074	Oct. 21, 1975
B 351,218	3,914,186	Oct. 21, 1975
B 351,222	3,921,179	Nov. 18, 1975
B 351,348	3,923,563	Dec. 2, 1975
B 351,421	3,914,733	Oct. 21, 1975
B 351,493	3,914,758	Oct. 21, 1975
B 351,535	3,915,239	Oct. 28, 1975
B 351,665	3,919,701	Nov. 11, 1975
B 351,672	3,914,000	Oct. 21, 1975
B 351,735	3,913,385	Oct. 21, 1975
B 351,863	3,914,700	Oct. 21, 1975
B 351,883	3,924,657	Dec. 9, 1975
B 351,926	3,914,133	Oct. 21, 1975
B 351,939	3,913,480	Oct. 21, 1975
B 352,445	3,928,746	Dec. 23, 1975
B 352,934	3,913,692	Oct. 21, 1975
B 352,950	3,922,590	Nov. 25, 1975
B 352,965	3,921,926	Nov. 25, 1975
B 353,317	3,916,446	Nov. 4, 1975
B 353,387	3,924,404	Dec. 9, 1975
B 353,546	3,913,273	Oct. 21, 1975
B 354,008	3,925,081	Dec. 9, 1975
B 354,098	3,925,547	Dec. 9, 1975
B 354,145	3,927,279	Dec. 16, 1975
B 354,296	3,914,580	Oct. 21, 1975
B 354,510	3,928,658	Dec. 23, 1975
B 354,889	3,913,204	Oct. 21, 1975
B 354,979	3,914,251	Oct. 21, 1975
B 355,095	3,925,656	Dec. 9, 1975
B 355,269	3,914,561	Oct. 21, 1975
B 355,510	3,913,704	Oct. 21, 1975
B 355,595	3,925,649	Dec. 9, 1975
B 355,876	3,925,685	Dec. 9, 1975
B 356,032	3,928,636	Dec. 23, 1975
B 356,253	3,925,025	Dec. 9, 1975
B 356,602	3,927,393	Dec. 16, 1975
B 356,724	3,924,586	Dec. 9, 1975
B 357,039	3,924,406	Dec. 9, 1975
B 357,057	3,913,738	Oct. 21, 1975
B 357,131	3,924,453	Dec. 9, 1975
B 357,402	3,914,180	Oct. 21, 1975
B 357,682	3,924,973	Dec. 9, 1975
B 357,803	3,919,470	Nov. 11, 1975
B 358,174	3,924,958	Dec. 9, 1975
B 358,244	3,913,411	Oct. 21, 1975
B 358,311	3,923,561	Dec. 2, 1975
B 358,939	3,924,713	Dec. 9, 1975
B 359,174	3,914,117	Oct. 21, 1975
B 359,187	3,924,525	Dec. 9, 1975
B 359,540	3,915,235	Oct. 28, 1975
B 359,740	3,936,212	Feb. 3, 1976
B 359,791	3,929,430	Dec. 30, 1975
B 359,825	3,921,344	Nov. 25, 1975
B 359,946	3,914,132	Oct. 21, 1975

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B 359,947	3,914,653	Oct. 21, 1975
B 360,208	3,923,750	Dec. 2, 1975
B 360,296	3,916,720	Nov. 4, 1975
B 360,719	3,915,715	Oct. 28, 1975
B 360,910	3,925,696	Dec. 9, 1975
B 361,265	3,923,569	Dec. 2, 1975
B 361,347	3,914,642	Oct. 21, 1975
B 361,443	3,927,405	Dec. 16, 1975
B 361,569	3,914,554	Oct. 21, 1975
B 361,604	3,922,702	Nov. 25, 1975
B 361,734	3,915,764	Oct. 28, 1975
B 361,743	4,035,255	July 12, 1977
B 361,744	4,035,254	July 12, 1977
B 362,589	3,914,012	Oct. 21, 1975
B 363,205	3,923,744	Dec. 2, 1975
B 363,337	3,928,639	Dec. 23, 1975
B 363,457	3,922,595	Nov. 25, 1975
B 363,674	3,929,716	Dec. 30, 1975
B 363,892	3,913,395	Oct. 21, 1975
B 363,962	3,921,826	Nov. 25, 1975
B 364,022	3,913,499	Oct. 21, 1975
B 364,163	3,916,092	Oct. 28, 1975
B 364,241	3,916,668	Nov. 4, 1975
B 364,334	3,924,670	Dec. 9, 1975
B 364,528	3,919,510	Nov. 11, 1975
B 364,786	3,921,673	Nov. 25, 1975
B 364,910	3,925,335	Dec. 9, 1975
B 365,371	3,988,181	Oct. 26, 1976
B 365,490	3,918,527	Nov. 11, 1975
B 365,834	3,914,702	Oct. 21, 1975
B 365,841	3,925,628	Dec. 9, 1975
B 365,855	3,917,258	Nov. 4, 1975
B 366,287	3,924,946	Dec. 9, 1975
B 366,402	3,928,053	Dec. 23, 1975
B 366,589	3,914,719	Oct. 21, 1975
B 367,021	3,914,752	Oct. 21, 1975
B 367,040	3,924,775	Dec. 9, 1975
B 367,661	3,914,158	Oct. 21, 1975
B 367,739	3,923,648	Dec. 2, 1975
B 367,812	3,924,789	Dec. 9, 1975
B 368,081	3,924,691	Dec. 9, 1975
B 368,387	3,924,923	Dec. 9, 1975
B 368,392	3,913,812	Oct. 21, 1975
B 368,397	3,914,677	Oct. 21, 1975
B 368,862	3,925,549	Dec. 9, 1975
B 369,563	3,924,449	Dec. 9, 1975
B 369,607	3,923,786	Dec. 2, 1975
B 369,997	3,913,533	Oct. 21, 1975
B 370,453	3,964,101	Jun. 15, 1976
B 370,706	3,925,242	Dec. 9, 1975
B 371,073	3,930,135	Dec. 30, 1975
B 371,085	3,923,783	Dec. 2, 1975
B 371,787	3,921,217	Nov. 18, 1975
B 371,805	3,914,433	Oct. 21, 1975
B 371,836	3,923,541	Dec. 2, 1975
B 372,823	3,924,660	Dec. 9, 1975
B 373,051	3,914,162	Oct. 21, 1975
B 373,297	3,924,436	Dec. 9, 1975
B 373,326	3,920,433	Nov. 18, 1975
B 373,428	3,915,511	Oct. 28, 1975
B 375,220	3,920,417	Nov. 18, 1975
B 375,652	3,921,303	Nov. 25, 1975
B 376,504	3,914,570	Oct. 21, 1975
B 376,654	3,922,513	Nov. 25, 1975
B 376,742	3,924,392	Dec. 9, 1975
B 376,799	3,913,955	Oct. 21, 1975
B 377,172	3,918,255	Nov. 11, 1975
B 377,683	3,924,433	Dec. 9, 1975
B 377,833	3,913,884	Oct. 21, 1975
B 377,869	3,917,002	Nov. 4, 1975
B 378,621	3,923,840	Dec. 2, 1975
B 379,038	3,923,994	Dec. 2, 1975
B 379,172	3,914,379	Oct. 21, 1975
B 379,282	3,913,462	Oct. 21, 1975
B 379,955	3,913,157	Oct. 21, 1975
B 380,014	3,921,915	Nov. 25, 1975
B 380,141	3,925,161	Dec. 9, 1975
B 380,310	3,921,048	Nov. 18, 1975
B 380,312	3,913,953	Oct. 21, 1975
B 380,338	3,924,873	Dec. 9, 1975
B 380,446	3,923,836	Dec. 2, 1975
B 380,900	3,913,307	Oct. 21, 1975
B 380,926	3,925,095	Dec. 9, 1975
B 381,074	3,919,583	Nov. 11, 1975
B 381,632	3,914,732	Oct. 21, 1975
B 381,847	3,921,152	Nov. 18, 1975
B 382,018	3,929,742	Dec. 30, 1975
B 382,021	3,913,212	Oct. 21, 1975
B 382,261	3,914,991	Oct. 28, 1975
B 382,290	3,924,717	Dec. 9, 1975
B 382,783	3,919,527	Nov. 11, 1975
B 382,798	3,924,435	Dec. 9, 1975
B 382,840	3,922,007	Nov. 25, 1975
B 383,465	3,927,412	Dec. 16, 1975
B 383,581	3,925,318	Dec. 9, 1975
B 383,852	3,914,246	Oct. 21, 1975
B 384,499	3,925,135	Dec. 9, 1975
B 384,658	3,913,452	Oct. 21, 1975
B 384,773	3,915,416	Oct. 28, 1975
B 385,210	3,913,406	Oct. 21, 1975
B 386,403	3,924,895	Dec. 9, 1975
B 386,592	3,925,305	Dec. 9, 1975
B 387,039	3,924,510	Dec. 9, 1975
B 387,331	3,913,701	Oct. 21, 1975
B 387,363	3,927,378	Dec. 16, 1975
B 387,687	3,918,151	Nov. 11, 1975
B 387,761	3,914,245	Oct. 21, 1975
B 387,790	3,925,380	Dec. 9, 1975
B 387,818	3,918,935	Nov. 11, 1975
B 388,580	3,923,712	Dec. 2, 1975
B 389,070	3,914,171	Oct. 21, 1975
B 389,295	3,914,631	Oct. 21, 1975
B 389,327	3,924,504	Dec. 9, 1975
B 389,639	3,914,626	Oct. 21, 1975
B 389,726	3,921,010	Nov. 18, 1975
B 389,807	3,922,623	Nov. 25, 1975
B 389,932	3,913,268	Oct. 21, 1975
B 389,933	3,913,267	Oct. 21, 1975
B 390,679	3,913,668	Oct. 21, 1975
B 390,732	3,913,878	Oct. 21, 1975
B 390,738	4,035,343	July 12, 1977
B 391,184	3,914,214	Oct. 21, 1975
B 391,210	3,914,220	Oct. 21, 1975
B 391,437	3,915,416	Oct. 28, 1975
B 391,509	3,925,175	Dec. 9, 1975
B 391,675	3,916,017	Oct. 28, 1975
B 392,154	3,923,809	Dec. 2, 1975
B 392,242	3,926,636	Dec. 16, 1975
B 392,696	3,916,175	Oct. 28, 1975
B 392,732	3,914,903	Oct. 21, 1975
B 392,753	3,916,341	Oct. 28, 1975
B 392,894	3,914,763	Oct. 21, 1975
B 393,163	3,914,535	Oct. 21, 1975
B 393,347	3,985,800	Oct. 12, 1976
B 393,970	3,914,638	Oct. 21, 1975
B 394,088	3,914,740	Oct. 21, 1975
B 394,188	3,924,591	Dec. 9, 1975
B 394,300	3,914,159	Oct. 21, 1975
B 394,712	3,916,306	Oct. 28, 1975
B 395,478	3,922,577	Nov. 25, 1975
B 395,496	3,919,435	Nov. 11, 1975
B 395,671	3,920,418	Nov. 18, 1975
B 395,889	3,913,190	Oct. 21, 1975
B 396,025	3,913,869	Oct. 21, 1975
B 396,551	3,921,929	Nov. 25, 1975
B 397,027	3,923,736	Dec. 2, 1975
B 397,527	3,913,488	Oct. 21, 1975
B 397,990	3,914,848	Oct. 28, 1975
B 398,262	3,913,481	Oct. 21, 1975
B 398,551	3,924,924	Dec. 9, 1975
B 398,597	3,913,743	Oct. 21, 1975
B 398,625	3,920,996	Nov. 18, 1975
B 399,292	3,914,810	Oct. 28, 1975
B 399,304	3,919,567	Nov. 11, 1975
B 399,349	3,925,694	Dec. 9, 1975
B 399,766	3,915,667	Oct. 28, 1975
B 400,080	3,925,163	Dec. 9, 1975
B 400,293	3,923,719	Dec. 2, 1975
B 400,310	3,915,507	Oct. 28, 1975
B 401,133	3,924,443	Dec. 9, 1975
B 401,992	3,924,898	Dec. 9, 1975
B 402,065	3,925,413	Dec. 9, 1975
B 402,555	3,914,688	Oct. 21, 1975
B 403,140	3,913,486	Oct. 21, 1975
B 403,355	3,913,352	Oct. 21, 1975
B 403,990	3,914,684	Oct. 21, 1975
B 403,996	3,916,016	Oct. 28, 1975
B 404,290	3,924,918	Dec. 9, 1975
B 404,437	3,915,200	Oct. 28, 1975
B 405,136	3,915,565	Oct. 28, 1975
B 405,137	3,915,566	Oct. 28, 1975
B 405,160	3,924,821	Dec. 9, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 405,248	3,926,294	Dec. 16, 1975
B 405,305	3,922,111	Nov. 25, 1975
B 405,360	3,913,403	Oct. 21, 1975
B 405,495	3,924,577	Dec. 9, 1975
B 405,938	3,920,109	Nov. 18, 1975
B 406,065	3,914,199	Oct. 21, 1975
B 406,357	3,924,529	Dec. 9, 1975
B 406,800	3,952,708	Apr. 27, 1976
B 407,357	3,924,614	Dec. 9, 1975
B 407,728	3,925,240	Dec. 9, 1975
B 407,736	3,924,463	Dec. 9, 1975
B 408,380	3,984,172	Oct. 5, 1976
B 408,487	3,924,046	Dec. 2, 1975
B 408,749	3,914,116	Oct. 21, 1975
B 409,026	3,925,497	Dec. 9, 1975
B 409,220	3,915,648	Oct. 28, 1975
B 409,251	3,922,620	Nov. 25, 1975
B 409,657	3,927,362	Dec. 16, 1975
B 409,816	3,921,317	Nov. 25, 1975
B 410,062	3,923,855	Dec. 2, 1975
B 410,168	3,914,717	Oct. 21, 1975
B 411,145	3,914,168	Oct. 21, 1975
B 411,356	3,919,649	Nov. 11, 1975
B 411,483	3,925,196	Dec. 9, 1975
B 411,633	3,914,741	Oct. 21, 1975
B 412,516	3,927,417	Dec. 16, 1975
B 412,619	3,925,292	Dec. 9, 1975
B 412,867	3,924,587	Dec. 9, 1975
B 413,006	3,914,850	Oct. 28, 1975
B 413,546	3,924,314	Dec. 9, 1975
B 414,129	3,925,484	Dec. 9, 1975
B 414,288	3,925,537	Dec. 9, 1975
B 415,113	3,915,717	Oct. 28, 1975
B 415,124	3,915,944	Oct. 28, 1975
B 415,845	3,925,076	Dec. 9, 1975
B 415,847	3,914,208	Oct. 21, 1975
B 415,957	3,925,635	Dec. 9, 1975
B 415,977	3,927,359	Dec. 16, 1975
B 416,598	3,923,473	Dec. 2, 1975
B 416,710	3,923,746	Dec. 2, 1975
B 416,832	3,924,975	Dec. 9, 1975
B 416,933	3,924,968	Dec. 9, 1975
B 417,299	3,918,235	Nov. 11, 1975
B 418,121	3,925,023	Dec. 9, 1975
B 418,153	3,925,251	Dec. 9, 1975
B 418,302	3,913,252	Oct. 21, 1975
B 419,327	3,921,197	Nov. 18, 1975
B 419,481	3,924,970	Dec. 9, 1975
B 420,016	3,914,572	Oct. 21, 1975
B 420,148	3,927,414	Dec. 16, 1975
B 420,514	3,923,929	Dec. 2, 1975
B 420,568	3,925,069	Dec. 9, 1975
B 421,026	3,914,785	Oct. 21, 1975
B 421,362	3,924,817	Dec. 9, 1975
B 421,383	3,925,047	Dec. 9, 1975
B 421,797	3,914,023	Oct. 21, 1975
B 422,399	3,928,656	Dec. 23, 1975
B 422,467	3,924,804	Dec. 9, 1975
B 422,949	3,921,873	Nov. 25, 1975
B 424,415	3,919,458	Nov. 11, 1975
B 424,462	3,920,522	Nov. 18, 1975
B 424,572	3,924,979	Dec. 9, 1975
B 424,748	3,924,395	Dec. 9, 1975
B 425,035	3,914,025	Oct. 21, 1975
B 425,345	3,922,015	Nov. 25, 1975
B 425,470	3,923,796	Dec. 2, 1975
B 425,539	3,916,742	Nov. 4, 1975
B 425,541	3,914,051	Oct. 21, 1975
B 425,572	3,923,822	Dec. 2, 1975
B 425,770	3,989,817	Nov. 2, 1976
B 427,631	3,921,433	Nov. 25, 1975
B 428,177	3,914,624	Oct. 21, 1975
B 428,795	3,921,056	Nov. 18, 1975
B 429,442	3,923,485	Dec. 2, 1975
B 430,106	3,918,941	Nov. 11, 1975
B 430,140	3,922,084	Nov. 25, 1975
B 430,149	4,037,175	July 19, 1977
B 430,385	4,001,104	Jan. 4, 1977
B 430,798	3,918,204	Nov. 11, 1975
B 430,944	3,922,096	Nov. 25, 1975
B 432,373	3,919,670	Nov. 11, 1975
B 433,587	3,914,567	Oct. 21, 1975
B 435,343	3,919,244	Nov. 11, 1975
B 435,844	3,925,170	Dec. 9, 1975
B 437,172	3,913,251	Oct. 21, 1975
B 437,173	3,924,627	Dec. 9, 1975
B 437,195	3,914,618	Oct. 21, 1975
B 437,450	3,922,479	Nov. 25, 1975
B 438,053	3,916,013	Oct. 28, 1975
B 438,706	3,925,050	Dec. 9, 1975
B 439,168	3,919,676	Nov. 11, 1975
B 439,669	3,921,499	Nov. 25, 1975
B 440,898	3,921,789	Nov. 25, 1975
B 441,024	3,913,629	Oct. 21, 1975
B 441,416	3,913,851	Oct. 21, 1975
B 442,280	3,914,054	Oct. 21, 1975
B 442,859	3,918,570	Nov. 11, 1975
B 442,919	3,925,483	Dec. 9, 1975
B 444,614	3,927,996	Dec. 23, 1975
B 445,471	3,914,711	Oct. 21, 1975
B 445,740	3,923,612	Dec. 2, 1975
B 447,417	4,024,727	May 24, 1977
B 448,571	3,924,760	Dec. 9, 1975
B 449,647	3,916,797	Nov. 4, 1975
B 450,499	3,920,526	Nov. 18, 1975
B 450,546	3,924,417	Dec. 9, 1975
B 450,927	3,913,844	Oct. 21, 1975
B 455,520	3,922,543	Nov. 25, 1975
B 455,775	3,914,356	Oct. 21, 1975
B 456,346	3,914,531	Oct. 21, 1975
B 459,425	3,928,773	Dec. 23, 1975
B 461,872	3,919,586	Nov. 11, 1975
B 467,684	3,915,119	Oct. 28, 1975
B 468,198	3,925,340	Dec. 9, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 48,560	4,002,772	Mar. 30, 1976	Jan. 11, 1977
B 54,859	4,000,101	Feb. 17, 1976	Dec. 28, 1976
B 59,512	3,999,216	Mar. 16, 1976	Dec. 21, 1976
B 66,272	4,014,978	Feb. 24, 1976	Mar. 29, 1977
B 71,613	4,008,393	Mar. 16, 1976	Feb. 15, 1977
B 73,017	4,001,879	Mar. 9, 1976	Jan. 4, 1977
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976
B 97,259	3,999,614	Mar. 9, 1976	Dec. 28, 1976
B 105,006	4,007,074	Mar. 23, 1976	Feb. 8, 1977
B 111,130	4,001,380	Mar. 16, 1976	Jan. 4, 1977
B 141,968	4,013,442	Mar. 30, 1976	Mar. 22, 1977
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976
B 159,570	4,036,870	Mar. 23, 1976	July 19, 1977
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976
B 160,099	3,987,221	Jan. 13, 1976	Oct. 19, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976
B 167,470	4,001,101	Mar. 2, 1976	Jan. 4, 1977
B 181,208	4,001,391	Mar. 9, 1976	Jan. 4, 1977
B 200,759	3,986,872	Feb. 3, 1976	Oct. 19, 1976
B 208,916	3,987,106	Jan. 13, 1976	Oct. 19, 1976
B 214,925	3,997,648	Mar. 9, 1976	Dec. 14, 1976
B 231,416	4,000,054	Mar. 30, 1976	Dec. 28, 1976
B 236,266	4,013,624	Mar. 23, 1976	Mar. 22, 1977
B 236,342	4,001,182	Feb. 10, 1976	Jan. 4, 1977
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976
B 257,143	4,000,111	Mar. 16, 1976	Dec. 28, 1976
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976
B 270,351	3,997,893	Mar. 30, 1976	Dec. 14, 1976
B 271,743	4,001,195	Mar. 16, 1976	Jan. 4, 1977
B 276,026	3,992,405	Feb. 3, 1976	Nov. 16, 1976
B 279,415	4,000,697	Mar. 16, 1976	Jan. 4, 1977
B 279,969	3,986,073	Jan. 13, 1976	Oct. 12, 1976
B 281,162	4,009,481	Mar. 23, 1976	Feb. 22, 1977
B 283,941	3,995,313	Feb. 3, 1976	Nov. 30, 1976
B 288,757	4,001,072	Mar. 30, 1976	Jan. 4, 1977
B 301,143	3,991,107	Jan. 27, 1976	Nov. 9, 1976
B 302,160	3,985,774	Feb. 3, 1976	Oct. 12, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct. 12, 1976
B 307,698	3,993,763	Feb. 3, 1976	Nov. 23, 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976
B 311,450	3,988,976	Mar. 9, 1976	Nov. 2, 1976
B 311,779	4,013,481	Feb. 10, 1976	Mar. 22, 1977
B 313,280	4,003,591	Apr. 6, 1976	Jan. 18, 1977
B 326,211	3,988,272	Mar. 23, 1976	Oct. 26, 1976
B 328,065	4,014,752	Mar. 30, 1976	Mar. 29, 1977
B 328,077	4,014,860	Apr. 13, 1976	Mar. 29, 1977
B 328,116	4,000,774	Mar. 9, 1976	Jan. 4, 1977
B 330,719	4,001,121	Mar. 16, 1976	Jan. 4, 1977
B 330,736	3,996,299	Feb. 3, 1976	Dec. 7, 1976
B 332,442	4,001,231	Mar. 30, 1976	Jan. 4, 1977
B 333,110	3,989,867	Mar. 16, 1976	Nov. 2, 1976
B 333,247	4,001,201	Mar. 16, 1976	Jan. 4, 1977
B 333,838	4,006,263	Mar. 23, 1976	Feb. 1, 1977
B 335,783	4,013,744	Mar. 30, 1976	Mar. 22, 1977
B 336,754	3,989,805	Mar. 16, 1976	Nov. 2, 1976
B 337,023	4,013,188	Mar. 30, 1976	Mar. 22, 1977
B 337,823	4,002,746	Mar. 23, 1976	Jan. 11, 1977
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976
B 339,446	4,001,067	Feb. 24, 1976	Jan. 4, 1977
B 340,170	4,000,444	Mar. 30, 1976	Dec. 28, 1976
B 344,669	4,013,655	Mar. 16, 1976	Mar. 22, 1977
B 347,661	3,999,218	Mar. 16, 1976	Dec. 21, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976
B 349,370	3,989,684	Jan. 27, 1976	Nov. 2, 1976
B 351,455	4,001,309	Feb. 24, 1976	Jan. 4, 1977
B 354,222	4,012,305	Mar. 23, 1976	Mar. 15, 1977
B 354,959	3,995,996	Feb. 17, 1976	Dec. 7, 1976
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976
B 356,470	4,014,789	Mar. 23, 1976	Mar. 29, 1977
B 357,526	4,001,319	Mar. 23, 1976	Jan. 4, 1977
B 358,260	3,989,661	Mar. 30, 1976	Nov. 2, 1976
B 358,427	3,989,896	Feb. 3, 1976	Nov. 2, 1976
B 359,768	4,013,684	Mar. 30, 1976	Mar. 22, 1977
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976
B 361,954	4,014,753	Apr. 6, 1976	Mar. 29, 1977
B 363,565	4,004,821	Mar. 30, 1976	Jan. 25, 1977
B 364,797	3,996,131	Feb. 17, 1976	Dec. 7, 1976
B 367,092	4,014,920	Apr. 13, 1976	Mar. 29, 1977
B 367,305	3,998,640	Mar. 2, 1976	Dec. 21, 1976
B 367,621	3,989,589	Feb. 3, 1976	Nov. 2, 1976
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976
B 369,373	4,013,683	Mar. 23, 1976	Mar. 22, 1977
B 369,379	4,013,754	Mar. 30, 1976	Mar. 22, 1977
B 370,309	3,989,640	Jan. 20, 1976	Nov. 2, 1976
B 371,095	4,005,074	Mar. 23, 1976	Jan. 25, 1977
B 371,635	4,010,290	Mar. 23, 1976	Mar. 1, 1977
B 371,912	3,995,738	Mar. 2, 1976	Dec. 7, 1976
B 372,016	3,989,685	Mar. 9, 1976	Nov. 2, 1976
B 372,232	4,000,967	Mar. 16, 1976	Jan. 4, 1977
B 372,722	3,998,925	Mar. 9, 1976	Dec. 21, 1976
B 373,344	4,053,067	Feb. 3, 1976	Oct. 11, 1977
B 373,354	3,989,870	Jan. 27, 1976	Nov. 2, 1976
B 374,553	4,008,394	Mar. 30, 1976	Feb. 15, 1977
B 374,588	3,985,899	Jan. 27, 1976	Oct. 12, 1976
B 376,749	4,014,856	Mar. 30, 1976	Mar. 29, 1977
B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976
B 378,760	4,001,477	Mar. 9, 1976	Jan. 4, 1977
B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976
B 380,137	4,014,802	Mar. 23, 1976	Mar. 29, 1977
B 381,006	4,009,447	Apr. 6, 1976	Feb. 22, 1977
B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976
B 381,985	3,990,775	Feb. 3, 1976	Nov. 9, 1976
B 382,120	4,013,639	Mar. 23, 1976	Mar. 22, 1977
B 383,697	4,008,211	Feb. 17, 1976	Feb. 15, 1977
B 384,225	3,998,523	Mar. 16, 1976	Dec. 21, 1976
B 384,330	3,985,613	Jan. 27, 1976	Oct. 12, 1976
B 384,654	3,992,681	Feb. 24, 1976	Nov. 16, 1976
B 385,024	3,994,911	Feb. 10, 1976	Nov. 30, 1976
B 385,483	3,993,684	Feb. 17, 1976	Nov. 23, 1976
B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976
B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976
B 386,673	3,993,717	Feb. 3, 1976	Nov. 23, 1976
B 386,828	3,992,440	Feb. 3, 1976	Nov. 16, 1976
B 387,337	D 243,157	Mar. 16, 1976	Jan. 25, 1977
B 388,675	4,012,459	Mar. 30, 1976	Mar. 15, 1977
B 389,155	4,000,970	Mar. 30, 1976	Jan. 4, 1977
B 389,304	3,986,829	Jan. 27, 1976	Oct. 19, 1976
B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976
B 390,408	3,992,426	Feb. 3, 1976	Nov. 16, 1976
B 390,979	4,003,850	Mar. 23, 1976	Jan. 18, 1977
B 391,473	3,988,370	Mar. 2, 1976	Oct. 26, 1976
B 391,797	3,988,046	Mar. 9, 1976	Oct. 26, 1976
B 391,828	4,014,933	Apr. 6, 1976	Mar. 29, 1977
B 391,844	3,999,165	Mar. 16, 1976	Dec. 21, 1976
B 392,798	3,996,249	Mar. 30, 1976	Dec. 7, 1976
B 394,248	3,989,764	Jan. 27, 1976	Nov. 2, 1976
B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 394,742	4,009,285	Apr. 13, 1976	Feb. 22, 1977
B 395,554	3,998,156	Mar. 9, 1976	Dec. 21, 1976
B 395,975	4,001,085	Mar. 2, 1976	Jan. 4, 1977
B 396,164	3,989,590	Feb. 3, 1976	Nov. 2, 1976
B 396,377	D 243,148	Apr. 6, 1976	Jan. 25, 1977
B 397,674	3,998,438	Mar. 16, 1976	Dec. 21, 1976
B 398,084	3,996,239	Feb. 3, 1976	Dec. 7, 1976
B 398,220	3,990,834	Feb. 3, 1976	Nov. 9, 1976
B 398,488	3,987,991	Feb. 24, 1976	Oct. 26, 1976
B 399,098	3,997,665	Feb. 24, 1976	Dec. 14, 1976
B 399,632	4,001,046	Mar. 9, 1976	Jan. 4, 1977
B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 400,871	3,988,893	Feb. 17, 1976	Nov. 2, 1976
B 401,042	D 242,197	Mar. 16, 1976	Nov. 9, 1976
B 401,221	4,014,791	Apr. 6, 1976	Mar. 29, 1977
B 402,162	3,994,902	Mar. 2, 1976	Nov. 30, 1976
B 402,328	3,995,545	Apr. 6, 1976	Dec. 7, 1976
B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 402,657	4,013,665	Apr. 6, 1976	Mar. 22, 1977
B 402,929	3,991,251	Feb. 3, 1976	Nov. 9, 1976
B 403,076	4,014,917	Apr. 20, 1976	Mar. 29, 1977
B 403,243	3,996,232	Mar. 30, 1976	Dec. 7, 1976
B 403,326	4,001,212	Mar. 23, 1976	Jan. 4, 1977
B 403,477	3,995,315	Feb. 3, 1976	Nov. 30, 1976
B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 403,766	3,994,834	Feb. 10, 1976	Nov. 30, 1976
B 403,883	4,001,481	Mar. 23, 1976	Jan. 4, 1977
B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 406,546	D 242,966	Mar. 16, 1976	Jan. 11, 1977
B 407,205	4,000,966	Mar. 16, 1976	Jan. 4, 1977
B 407,737	3,992,546	Feb. 3, 1976	Nov. 16, 1976
B 407,812	4,010,006	Mar. 23, 1976	Mar. 1, 1977
B 408,123	4,014,887	Apr. 13, 1976	Mar. 29, 1977
B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976
B 410,074	4,001,303	Feb. 24, 1976	Jan. 4, 1977
B 410,694	3,995,530	Mar. 23, 1976	Dec. 7, 1976
B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976
B 411,624	4,001,205	Mar. 16, 1976	Jan. 4, 1977
B 411,765	3,993,428	Feb. 24, 1976	Nov. 23, 1976
B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 412,124	4,007,000	Mar. 23, 1976	Feb. 8, 1977
B 413,379	4,001,325	Mar. 9, 1976	Jan. 4, 1977
B 414,028	3,993,738	Feb. 17, 1976	Nov. 23, 1976
B 414,266	3,993,614	Feb. 10, 1976	Nov. 23, 1976
B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976
B 414,971	D 242,208	Feb. 10, 1976	Nov. 9, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 415,021	3,994,173	Mar. 2, 1976	Nov. 30, 1976
B 415,122	3,997,503	Feb. 10, 1976	Dec. 14, 1976
B 415,590	4,009,317	Mar. 23, 1976	Feb. 22, 1977
B 416,257	4,001,335	Mar. 16, 1976	Jan. 4, 1977
B 416,589	3,990,363	Jan. 27, 1976	Nov. 9, 1976
B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976
B 417,164	4,001,360	Mar. 2, 1976	Jan. 4, 1977
B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976
B 417,498	4,013,471	Mar. 23, 1976	Mar. 22, 1977
B 418,489	3,989,592	Jan. 13, 1976	Nov. 2, 1976
B 419,173	3,999,728	Mar. 9, 1976	Dec. 28, 1976
B 419,582	3,989,681	Mar. 2, 1976	Nov. 2, 1976
B 420,176	4,001,017	Mar. 16, 1976	Jan. 4, 1977
B 420,321	3,990,645	Mar. 30, 1976	Nov. 9, 1976
B 420,472	3,993,934	Feb. 24, 1976	Nov. 23, 1976
B 421,373	4,001,326	Mar. 23, 1976	Jan. 4, 1977
B 421,608	4,013,806	Mar. 23, 1976	Mar. 22, 1977
B 421,975	3,994,693	Mar. 2, 1976	Nov. 30, 1976
B 422,063	3,994,835	Feb. 3, 1976	Nov. 30, 1976
B 422,156	4,010,401	Mar. 23, 1976	Mar. 1, 1977
B 423,365	3,996,186	Feb. 17, 1976	Dec. 7, 1976
B 423,404	3,990,958	Mar. 2, 1976	Nov. 9, 1976
B 423,441	3,997,137	Feb. 17, 1976	Dec. 14, 1976
B 423,867	3,990,844	Feb. 3, 1976	Nov. 9, 1976
B 423,883	3,986,871	Jan. 27, 1976	Oct. 19, 1976
B 424,354	D 242,416	Feb. 10, 1976	Nov. 23, 1976
B 424,410	4,021,196	Mar. 30, 1976	May 3, 1977
B 424,989	3,990,569	Feb. 3, 1976	Nov. 9, 1976
B 425,193	4,002,107	Mar. 23, 1976	Jan. 11, 1977
B 425,285	4,014,676	Apr. 13, 1976	Mar. 29, 1977
B 425,462	3,998,396	Mar. 9, 1976	Dec. 21, 1976
B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976
B 426,157	4,013,714	Mar. 23, 1976	Mar. 22, 1977
B 426,227	3,999,028	Mar. 2, 1976	Dec. 21, 1976
B 426,266	3,998,839	Mar. 2, 1976	Dec. 21, 1976
B 426,274	4,014,949	Jan. 20, 1976	Mar. 29, 1977
B 426,424	3,993,742	Feb. 3, 1976	Nov. 23, 1976
B 426,639	3,992,539	Feb. 3, 1976	Nov. 16, 1976
B 426,819	3,995,868	Feb. 17, 1976	Dec. 7, 1976
B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976
B 427,946	4,006,161	Mar. 23, 1976	Feb. 1, 1977
B 428,103	4,000,211	Feb. 10, 1976	Dec. 28, 1976
B 428,271	3,987,415	Mar. 23, 1976	Oct. 19, 1976
B 428,408	3,995,252	Mar. 2, 1976	Nov. 30, 1976
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976
B 429,018	3,990,061	Feb. 10, 1976	Nov. 2, 1976
B 429,027	4,001,260	Mar. 23, 1976	Jan. 4, 1977
B 429,157	3,990,628	Jan. 27, 1976	Nov. 9, 1976
B 429,434	3,989,223	Feb. 17, 1976	Nov. 2, 1976
B 430,157	3,992,465	Feb. 17, 1976	Nov. 16, 1976
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976
B 430,213	4,013,514	Mar. 30, 1976	Mar. 22, 1977
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976
B 430,287	D 242,489	Feb. 10, 1976	Nov. 23, 1976
B 430,326	4,003,581	Mar. 23, 1976	Jan. 18, 1977
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976
B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976
B 431,713	4,000,167	Feb. 10, 1976	Dec. 28, 1976
B 431,785	3,999,950	Feb. 24, 1976	Dec. 28, 1976
B 431,797	4,007,290	Mar. 30, 1976	Feb. 8, 1977
B 432,049	3,995,123	Mar. 23, 1976	Nov. 30, 1976
B 432,140	3,999,163	Mar. 23, 1976	Dec. 21, 1976
B 432,265	4,013,480	Mar. 23, 1976	Mar. 22, 1977
B 432,594	4,003,404	Mar. 30, 1976	Jan. 18, 1977
B 432,969	3,997,017	Mar. 2, 1976	Dec. 14, 1976
B 432,991	3,991,669	Mar. 2, 1976	Nov. 16, 1976
B 433,094	3,987,768	Jan. 27, 1976	Oct. 26, 1976
B 433,707	4,013,594	Mar. 23, 1976	Mar. 22, 1977
B 433,892	4,016,061	Apr. 6, 1976	Apr. 5, 1977
B 433,930	4,012,324	Mar. 23, 1976	Mar. 15, 1977
B 434,206	3,994,610	Feb. 3, 1976	Nov. 30, 1976
B 434,441	D 242,849	Mar. 16, 1976	Dec. 28, 1976
B 435,481	4,000,892	Mar. 9, 1976	Jan. 4, 1977
B 435,570	4,000,908	Mar. 16, 1976	Jan. 4, 1977
B 435,617	4,001,234	Mar. 16, 1976	Jan. 4, 1977
B 436,724	3,991,856	Feb. 24, 1976	Nov. 16, 1976
B 437,209	4,001,193	Feb. 3, 1976	Jan. 4, 1977
B 437,559	3,993,287	Feb. 3, 1976	Nov. 23, 1976
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976
B 437,894	4,001,015	Mar. 2, 1976	Jan. 4, 1977
B 437,986	4,011,399	Apr. 20, 1976	Mar. 8, 1977
B 438,048	4,001,394	Mar. 23, 1976	Jan. 4, 1977
B 438,484	3,992,451	Feb. 17, 1976	Nov. 16, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976
B 439,778	4,001,455	Feb. 3, 1976	Jan. 4, 1977
B 440,548	4,001,271	Mar. 16, 1976	Jan. 4, 1977
B 440,632	4,014,955	Apr. 13, 1976	Mar. 29, 1977
B 440,633	4,000,116	Feb. 10, 1976	Dec. 28, 1976
B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976
B 441,543	4,014,755	Mar. 23, 1976	Mar. 29, 1977
B 441,605	4,026,862	Feb. 3, 1976	May 31, 1977
B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976
B 441,789	4,001,449	Mar. 30, 1976	Jan. 4, 1977
B 442,163	D 242,192	Mar. 16, 1976	Nov. 9, 1976
B 442,295	4,000,477	Mar. 16, 1976	Dec. 28, 1976
B 442,431	4,011,260	Mar. 23, 1976	Mar. 8, 1977
B 442,810	3,997,533	Feb. 24, 1976	Dec. 14, 1976
B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976
B 442,953	4,002,657	Mar. 23, 1976	Jan. 11, 1977
B 442,970	3,989,890	Feb. 3, 1976	Nov. 2, 1976
B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976
B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976
B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976
B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976
B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976
B 444,078	4,014,854	Mar. 23, 1976	Mar. 29, 1977
B 444,294	4,013,634	Mar. 30, 1976	Mar. 22, 1977
B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976
B 445,166	4,001,252	Mar. 2, 1976	Jan. 4, 1977
B 445,459	3,988,889	Feb. 3, 1976	Nov. 2, 1976
B 445,493	3,994,903	Mar. 2, 1976	Nov. 30, 1976
B 445,690	3,999,584	Feb. 3, 1976	Dec. 28, 1976
B 446,107	4,001,276	Mar. 9, 1976	Jan. 4, 1977
B 446,956	4,014,765	Apr. 13, 1976	Mar. 29, 1977
B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976
B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976
B 449,892	3,997,919	Mar. 23, 1976	Dec. 14, 1976
B 449,988	4,014,794	Mar. 30, 1976	Mar. 29, 1977
B 449,989	4,061,572	Mar. 30, 1976	Dec. 6, 1977
B 450,196	3,997,701	Feb. 10, 1976	Dec. 14, 1976
B 450,413	4,007,463	Mar. 23, 1976	Feb. 8, 1977
B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976
B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976
B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976
B 450,870	3,998,951	Mar. 16, 1976	Dec. 21, 1976
B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976
B 451,248	3,997,758	Mar. 2, 1976	Dec. 14, 1976
B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976
B 451,396	4,000,450	Apr. 13, 1976	Dec. 28, 1976
B 451,438	Re. 29,066	Mar. 2, 1976	Dec. 7, 1976
B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976
B 452,034	4,002,367	Mar. 23, 1976	Jan. 11, 1977
B 452,138	4,004,278	Mar. 23, 1976	Jan. 18, 1977
B 452,293	4,014,726	Mar. 30, 1976	Mar. 29, 1977
B 452,501	4,001,111	Mar. 16, 1976	Jan. 4, 1977
B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976
B 452,879	4,001,089	Mar. 16, 1976	Jan. 4, 1977
B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976
B 452,915	4,013,933	Mar. 30, 1976	Mar. 22, 1977
B 452,938	3,994,719	Feb. 17, 1976	Nov. 30, 1976
B 452,944	4,009,773	Mar. 30, 1976	Mar. 1, 1977
B 453,031	3,998,678	Mar. 16, 1976	Dec. 21, 1976
B 453,067	4,005,394	Mar. 23, 1976	Jan. 25, 1977
B 453,238	3,997,063	Mar. 2, 1976	Dec. 14, 1976
B 453,432	4,000,514	Mar. 16, 1976	Dec. 28, 1976
B 453,533	3,997,744	Feb. 17, 1976	Dec. 14, 1976
B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 453,759	3,989,790	Jan. 27, 1976	Nov. 2, 1976
B 453,960	4,014,701	Apr. 13, 1976	Mar. 29, 1977
B 454,283	3,995,153	Feb. 3, 1976	Nov. 30, 1976
B 454,833	4,008,733	Mar. 30, 1976	Feb. 22, 1977
B 455,425	3,990,060	Feb. 3, 1976	Nov. 2, 1976
B 455,481	3,991,092	Feb. 24, 1976	Nov. 9, 1976
B 455,486	4,001,353	Mar. 16, 1976	Jan. 4, 1977
B 455,686	4,001,156	Mar. 2, 1976	Jan. 4, 1977
B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 455,806	3,998,919	Mar. 23, 1976	Dec. 21, 1976
B 456,069	3,998,991	Mar. 9, 1976	Dec. 21, 1976
B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 456,153	3,997,992	Mar. 9, 1976	Dec. 21, 1976
B 456,384	4,014,859	Apr. 6, 1976	Mar. 29, 1977
B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 456,869	4,001,277	Mar. 9, 1976	Jan. 4, 1977
B 456,900	3,996,262	Feb. 3, 1976	Dec. 7, 1976
B 456,905	4,013,431	Mar. 23, 1976	Mar. 22, 1977
B 457,547	3,996,397	Feb. 17, 1976	Dec. 7, 1976
B 457,850	3,993,586	Feb. 10, 1976	Nov. 23, 1976
B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976
B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976
B 457,931	4,001,229	Mar. 16, 1976	Jan. 4, 1977
B 458,500	3,997,805	Feb. 24, 1976	Dec. 14, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976
B 458,964	3,996,615	Mar. 2, 1976	Dec. 7, 1976
B 459,190	4,010,786	Mar. 30, 1976	Mar. 8, 1977
B 459,381	4,000,017	Mar. 9, 1976	Dec. 28, 1976
B 459,408	4,018,890	Mar. 23, 1976	Apr. 19, 1977
B 459,597	3,996,711	Feb. 17, 1976	Dec. 14, 1976
B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976
B 459,821	4,005,954	Mar. 30, 1976	Feb. 1, 1977
B 460,388	3,989,448	Jan. 27, 1976	Nov. 2, 1976
B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976
B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976
B 461,184	3,992,482	Feb. 17, 1976	Nov. 16, 1976
B 461,250	4,000,768	Mar. 16, 1976	Jan. 4, 1977
B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976
B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976
B 461,685	4,013,661	Mar. 30, 1976	Mar. 22, 1977
B 461,752	4,016,541	Apr. 20, 1976	Apr. 5, 1977
B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976
B 462,030	4,009,342	Mar. 23, 1976	Feb. 22, 1977
B 462,386	3,988,188	Jan. 13, 1976	Oct. 26, 1976
B 462,424	3,989,602	Feb. 24, 1976	Nov. 2, 1976
B 462,828	3,998,395	Mar. 9, 1976	Dec. 21, 1976
B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976
B 463,322	3,989,982	Jan. 20, 1976	Nov. 2, 1976
B 463,388	3,992,605	Feb. 10, 1976	Nov. 16, 1976
B 463,473	4,002,068	Mar. 23, 1976	Jan. 11, 1977
B 463,591	4,015,051	Mar. 30, 1976	Mar. 29, 1977
B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976
B 464,027	3,999,390	Mar. 16, 1976	Dec. 28, 1976
B 464,290	3,990,307	Feb. 3, 1976	Nov. 9, 1976
B 464,491	4,015,612	Mar. 30, 1976	Apr. 5, 1977
B 464,587	3,991,091	Feb. 3, 1976	Nov. 9, 1976
B 464,593	3,997,659	Mar. 9, 1976	Dec. 14, 1976
B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976
B 465,202	3,989,757	Feb. 24, 1976	Nov. 2, 1976
B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976
B 465,688	3,989,770	Jan. 27, 1976	Nov. 2, 1976
B 465,955	3,997,502	Feb. 3, 1976	Dec. 14, 1976
B 466,304	4,007,095	Mar. 23, 1976	Feb. 8, 1977
B 466,318	3,999,115	Mar. 9, 1976	Dec. 21, 1976
B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976
B 466,419	4,011,087	Mar. 23, 1976	Mar. 8, 1977
B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976
B 466,906	3,993,037	Mar. 16, 1976	Nov. 23, 1976
B 466,929	3,991,195	Jan. 27, 1976	Nov. 9, 1976
B 467,250	3,997,428	Feb. 3, 1976	Dec. 14, 1976
B 467,328	3,997,599	Mar. 9, 1976	Dec. 14, 1976
B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976
B 467,486	3,991,725	Mar. 16, 1976	Nov. 16, 1976
B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976
B 468,052	3,988,335	Feb. 10, 1976	Oct. 26, 1976
B 468,100	3,995,107	Mar. 9, 1976	Nov. 30, 1976
B 468,330	4,001,475	Mar. 16, 1976	Jan. 4, 1977
B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976
B 468,421	4,014,739	Mar. 30, 1976	Mar. 29, 1977
B 468,603	4,003,839	Mar. 23, 1976	Jan. 18, 1977
B 469,036	4,005,926	Mar. 16, 1976	Feb. 1, 1977
B 469,228	4,052,954	Feb. 17, 1976	Oct. 11, 1977
B 469,468	4,000,220	Mar. 16, 1976	Dec. 28, 1976
B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976
B 470,170	3,986,410	Jan. 13, 1976	Oct. 19, 1976
B 470,305	4,014,043	Apr. 6, 1976	Mar. 22, 1977
B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976
B 470,576	3,997,507	Feb. 24, 1976	Dec. 14, 1976
B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976
B 470,798	3,987,480	Jan. 20, 1976	Oct. 19, 1976
B 470,853	4,002,101	Mar. 23, 1976	Jan. 11, 1977
B 470,899	3,996,441	Mar. 2, 1976	Dec. 7, 1976
B 470,900	4,001,213	Mar. 2, 1976	Jan. 4, 1977
B 470,945	4,014,848	Apr. 13, 1976	Mar. 29, 1977
B 471,116	4,001,318	Feb. 17, 1976	Jan. 4, 1977
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976
B 471,405	3,993,576	Feb. 10, 1976	Nov. 23, 1976
B 471,494	3,993,660	Mar. 16, 1976	Nov. 23, 1976
B 471,579	3,985,689	Jan. 13, 1976	Oct. 12, 1976
B 471,617	3,994,871	Feb. 10, 1976	Nov. 30, 1976
B 471,681	4,012,844	Apr. 13, 1976	Mar. 22, 1977
B 471,735	3,989,408	Feb. 3, 1976	Nov. 2, 1976
B 471,836	4,000,150	Feb. 24, 1976	Dec. 28, 1976
B 472,241	3,992,453	Feb. 17, 1976	Nov. 16, 1976
B 472,256	3,985,789	Jan. 13, 1976	Oct. 12, 1976
B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976
B 472,591	4,013,029	Apr. 6, 1976	Mar. 22, 1977
B 472,760	4,001,330	Apr. 13, 1976	Jan. 4, 1977
B 473,039	3,985,747	Feb. 10, 1976	Oct. 12, 1976
B 473,040	3,985,738	Feb. 10, 1976	Oct. 12, 1976
B 473,813	3,989,071	Mar. 9, 1976	Nov. 2, 1976
B 473,972	3,984,043	Jan. 13, 1976	Oct. 5, 1976
B 474,573	3,988,375	Jan. 20, 1976	Oct. 26, 1976
B 474,747	3,997,704	Feb. 24, 1976	Dec. 14, 1976
B 475,236	3,989,990	Feb. 3, 1976	Nov. 2, 1976
B 475,385	4,001,071	Mar. 9, 1976	Jan. 4, 1977
B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976
B 475,801	4,056,759	Mar. 30, 1976	Nov. 1, 1977
B 476,267	4,005,068	Apr. 6, 1976	Jan. 25, 1977
B 476,372	3,985,771	Feb. 24, 1976	Oct. 12, 1976
B 476,542	4,013,549	Mar. 30, 1976	Mar. 22, 1977
B 476,568	3,999,456	Mar. 16, 1976	Dec. 28, 1976
B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976
B 476,681	3,986,181	Jan. 13, 1976	Oct. 12, 1976
B 476,776	3,998,715	Mar. 23, 1976	Dec. 21, 1976
B 476,967	3,995,206	Mar. 9, 1976	Nov. 30, 1976
B 477,252	3,985,759	Jan. 13, 1976	Oct. 12, 1976
B 477,481	3,991,076	Feb. 3, 1976	Nov. 9, 1976
B 477,584	D 242,855	Apr. 6, 1976	Dec. 28, 1976
B 477,597	3,993,912	Feb. 17, 1976	Nov. 23, 1976
B 477,892	4,010,355	Mar. 30, 1976	Mar. 1, 1977
B 478,234	4,010,421	Mar. 30, 1976	Mar. 1, 1977
B 478,739	3,992,253	Feb. 17, 1976	Nov. 16, 1976
B 478,759	4,055,681	Mar. 16, 1976	Oct. 25, 1977
B 479,175	3,985,700	Feb. 17, 1976	Oct. 12, 1976
B 479,242	3,983,074	Feb. 17, 1976	Sep. 28, 1976
B 479,502	3,999,030	Mar. 16, 1976	Dec. 21, 1976
B 479,681	D 242,672	Mar. 16, 1976	Dec. 14, 1976
B 479,969	4,001,132	Mar. 9, 1976	Jan. 4, 1977
B 480,114	4,001,327	Mar. 2, 1976	Jan. 4, 1977
B 480,251	4,008,700	Mar. 23, 1976	Feb. 22, 1977
B 480,287	4,006,029	Mar. 30, 1976	Feb. 1, 1977
B 480,292	3,994,011	Mar. 16, 1976	Nov. 23, 1976
B 480,350	3,994,164	Feb. 10, 1976	Nov. 30, 1976
B 480,384	3,999,737	Mar. 23, 1976	Dec. 28, 1976
B 480,452	3,994,923	Feb. 10, 1976	Nov. 30, 1976
B 480,473	3,995,608	Mar. 2, 1976	Dec. 7, 1976
B 480,604	3,985,251	Jan. 13, 1976	Oct. 12, 1976
B 480,625	3,996,227	Feb. 24, 1976	Dec. 7, 1976
B 480,662	3,988,382	Mar. 2, 1976	Oct. 26, 1976
B 480,740	3,996,431	Mar. 2, 1976	Dec. 7, 1976
B 480,749	3,999,207	Mar. 9, 1976	Dec. 21, 1976
B 480,987	4,001,459	Mar. 30, 1976	Jan. 4, 1977
B 481,048	3,998,542	Mar. 16, 1976	Dec. 21, 1976
B 481,190	4,013,468	Mar. 30, 1976	Mar. 22, 1977
B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976
B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976
B 481,778	4,001,385	Mar. 30, 1976	Jan. 4, 1977
B 481,930	3,992,717	Feb. 24, 1976	Nov. 16, 1976
B 481,989	4,008,337	Mar. 23, 1976	Feb. 15, 1977
B 482,058	4,001,398	Mar. 2, 1976	Jan. 4, 1977
B 482,660	3,995,026	Feb. 10, 1976	Nov. 30, 1976
B 482,709	3,985,733	Feb. 24, 1976	Oct. 12, 1976
B 482,907	3,984,811	Jan. 20, 1976	Oct. 5, 1976
B 483,247	4,001,889	Apr. 13, 1976	Jan. 4, 1977
B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976
B 483,268	3,995,215	Mar. 9, 1976	Nov. 30, 1976
B 483,606	3,986,990	Jan. 27, 1976	Oct. 19, 1976
B 483,615	3,988,637	Jan. 27, 1976	Oct. 26, 1976
B 483,746	4,014,923	Mar. 23, 1976	Mar. 29, 1977
B 483,762	3,993,608	Feb. 10, 1976	Nov. 23, 1976
B 483,865	3,985,693	Jan. 13, 1976	Oct. 12, 1976
B 484,029	3,983,558	Feb. 10, 1976	Sep. 28, 1976
B 484,067	3,992,374	Feb. 17, 1976	Nov. 16, 1976
B 484,068	3,994,937	Mar. 2, 1976	Nov. 30, 1976
B 484,121	3,997,770	Mar. 16, 1976	Dec. 14, 1976
B 484,269	4,000,159	Feb. 10, 1976	Dec. 28, 1976
B 484,332	3,986,540	Mar. 2, 1976	Oct. 19, 1976
B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976
B 484,419	4,001,292	Mar. 9, 1976	Jan. 4, 1977
B 484,437	4,013,740	Mar. 30, 1976	Mar. 22, 1977
B 484,482	3,994,017	Mar. 23, 1976	Nov. 23, 1976
B 484,769	3,999,498	Mar. 16, 1976	Dec. 28, 1976
B 485,051	3,992,418	Feb. 17, 1976	Nov. 16, 1976
B 485,060	3,983,067	Feb. 17, 1976	Sep. 28, 1976
B 485,169	3,989,791	Mar. 16, 1976	Nov. 2, 1976
B 485,188	4,001,170	Mar. 16, 1976	Jan. 4, 1977
B 485,401	3,985,859	Jan. 27, 1976	Oct. 12, 1976
B 485,575	3,996,565	Feb. 24, 1976	Dec. 7, 1976
B 485,926	4,006,357	Mar. 23, 1976	Feb. 1, 1977
B 485,972	4,017,472	Mar. 23, 1976	Apr. 12, 1977
B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976
B 486,614	3,995,835	Feb. 17, 1976	Dec. 7, 1976
B 486,678	4,001,273	Mar. 2, 1976	Jan. 4, 1977
B 486,828	3,989,651	Mar. 2, 1976	Nov. 2, 1976
B 487,062	D 241,256	Feb. 10, 1976	Nov. 9, 1976
B 487,078	4,012,895	Mar. 30, 1976	Mar. 22, 1977
B 487,133	3,989,826	Jan. 27, 1976	Nov. 2, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 487,260	3,990,610	Jan. 27, 1976	Nov. 9, 1976
B 487,411	3,983,579	Feb. 24, 1976	Sep. 28, 1976
B 487,423	3,998,810	Mar. 2, 1976	Dec. 21, 1976
B 487,427	3,995,788	Mar. 2, 1976	Dec. 7, 1976
B 487,467	4,014,847	Apr. 13, 1976	Mar. 29, 1977
B 487,529	4,022,750	Mar. 30, 1976	May 10, 1977
B 488,111	3,985,765	Jan. 13, 1976	Oct. 12, 1976
B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976
B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976
B 488,756	3,991,810	Mar. 16, 1976	Nov. 16, 1976
B 488,836	4,013,121	Mar. 30, 1976	Mar. 22, 1977
B 489,290	3,998,081	Feb. 17, 1976	Dec. 21, 1976
B 489,328	3,990,088	Jan. 20, 1976	Nov. 2, 1976
B 489,331	3,996,175	Feb. 17, 1976	Dec. 7, 1976
B 489,485	D 243,266	Apr. 13, 1976	Feb. 1, 1977
B 489,550	4,000,710	Mar. 16, 1976	Jan. 4, 1977
B 489,685	3,984,085	Feb. 24, 1976	Oct. 5, 1976
B 490,067	3,986,600	Jan. 27, 1976	Oct. 19, 1976
B 490,547	3,999,439	Feb. 24, 1976	Dec. 28, 1976
B 490,551	D 243,168	Apr. 6, 1976	Jan. 25, 1977
B 490,589	3,990,680	Feb. 3, 1976	Nov. 9, 1976
B 490,623	3,996,964	Mar. 2, 1976	Dec. 14, 1976
B 490,647	3,985,196	Feb. 24, 1976	Oct. 12, 1976
B 490,806	3,989,486	Feb. 3, 1976	Nov. 2, 1976
B 490,812	3,998,842	Mar. 30, 1976	Dec. 21, 1976
B 490,946	3,993,652	Feb. 17, 1976	Nov. 23, 1976
B 490,995	3,995,031	Feb. 3, 1976	Nov. 30, 1976
B 491,032	3,981,892	Feb. 10, 1976	Sep. 21, 1976
B 491,052	3,985,790	Mar. 2, 1976	Oct. 12, 1976
B 491,111	3,997,916	Feb. 17, 1976	Dec. 14, 1976
B 491,455	3,991,167	Feb. 3, 1976	Nov. 9, 1976
B 491,501	3,984,914	Jan. 13, 1976	Oct. 12, 1976
B 491,618	4,007,950	Mar. 16, 1976	Feb. 15, 1977
B 491,650	3,999,044	Mar. 9, 1976	Dec. 21, 1976
B 491,673	3,994,770	Feb. 17, 1976	Nov. 30, 1976
B 491,711	4,053,467	Mar. 23, 1976	Oct. 11, 1977
B 491,776	3,986,298	Mar. 16, 1976	Oct. 19, 1976
B 491,883	3,984,412	Feb. 3, 1976	Oct. 5, 1976
B 491,906	D 242,223	Feb. 10, 1976	Nov. 9, 1976
B 492,039	3,997,541	Feb. 24, 1976	Dec. 14, 1976
B 492,093	4,003,658	Mar. 23, 1976	Jan. 18, 1977
B 492,120	3,995,692	Feb. 24, 1976	Dec. 7, 1976
B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976
B 492,373	4,010,908	Mar. 30, 1976	Mar. 8, 1977
B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976
B 492,716	3,998,739	Mar. 2, 1976	Dec. 21, 1976
B 492,774	4,001,843	Mar. 9, 1976	Jan. 4, 1977
B 492,902	3,993,859	Feb. 24, 1976	Nov. 23, 1976
B 492,946	3,991,303	Jan. 27, 1976	Nov. 9, 1976
B 493,254	D 243,267	Apr. 13, 1976	Feb. 1, 1977
B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976
B 493,463	4,013,510	Mar. 23, 1976	Mar. 22, 1977
B 493,474	4,013,565	Mar. 23, 1976	Mar. 22, 1977
B 493,501	3,988,061	Feb. 3, 1976	Oct. 26, 1976
B 493,686	4,008,338	Mar. 23, 1976	Feb. 15, 1977
B 493,955	3,989,830	Mar. 9, 1976	Nov. 2, 1976
B 493,981	3,990,165	Mar. 9, 1976	Nov. 9, 1976
B 494,138	4,034,002	Mar. 23, 1976	July 5, 1977
B 494,234	3,983,808	Feb. 10, 1976	Oct. 5, 1976
B 494,339	4,001,255	Mar. 16, 1976	Jan. 4, 1977
B 494,383	3,991,289	Feb. 3, 1976	Nov. 9, 1976
B 494,439	4,057,521	Apr. 13, 1976	Nov. 8, 1977
B 494,440	4,056,502	Feb. 17, 1976	Nov. 1, 1977
B 494,669	3,991,104	Feb. 3, 1976	Nov. 9, 1976
B 494,691	3,987,457	Mar. 16, 1976	Oct. 19, 1976
B 494,806	3,989,210	Feb. 3, 1976	Nov. 2, 1976
B 494,944	3,992,469	Feb. 17, 1976	Nov. 16, 1976
B 495,124	4,060,968	Mar. 9, 1976	Dec. 6, 1977
B 495,185	3,999,166	Mar. 9, 1976	Dec. 21, 1976
B 495,331	4,000,456	Mar. 16, 1976	Dec. 28, 1976
B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976
B 495,408	4,000,222	Feb. 3, 1976	Dec. 28, 1976
B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976
B 495,550	3,993,666	Feb. 3, 1976	Nov. 23, 1976
B 495,554	3,993,665	Feb. 3, 1976	Nov. 23, 1976
B 495,759	3,989,998	Feb. 3, 1976	Nov. 2, 1976
B 495,781	4,013,699	Mar. 23, 1976	Mar. 22, 1977
B 495,903	3,995,997	Feb. 17, 1976	Dec. 7, 1976
B 496,430	3,991,140	Feb. 10, 1976	Nov. 9, 1976
B 496,431	3,985,894	Jan. 13, 1976	Oct. 12, 1976
B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976
B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976
B 496,502	3,987,444	Jan. 20, 1976	Oct. 19, 1976
B 496,792	3,999,959	Feb. 17, 1976	Dec. 28, 1976
B 496,964	3,999,219	Apr. 20, 1976	Dec. 21, 1976
B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976
B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976
B 497,194	3,988,267	Feb. 3, 1976	Oct. 26, 1976
B 497,292	3,994,052	Feb. 3, 1976	Nov. 30, 1976
B 497,293	4,011,412	Mar. 30, 1976	Mar. 8, 1977
B 497,473	3,990,839	Feb. 3, 1976	Nov. 9, 1976
B 497,571	4,009,997	Mar. 23, 1976	Mar. 1, 1977
B 497,584	3,988,184	Feb. 24, 1976	Oct. 26, 1976
B 497,702	3,996,589	Mar. 2, 1976	Dec. 7, 1976
B 497,780	3,997,500	Feb. 24, 1976	Dec. 14, 1976
B 497,853	3,987,934	Feb. 17, 1976	Oct. 26, 1976
B 497,896	D 243,091	Apr. 6, 1976	Jan. 18, 1977
B 497,960	3,991,325	Jan. 20, 1976	Nov. 9, 1976
B 498,208	4,001,480	Apr. 13, 1976	Jan. 4, 1977
B 498,288	4,013,657	Mar. 23, 1976	Mar. 22, 1977
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 498,205	3,989,611	Feb. 10, 1976	Nov. 2, 1976
B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 498,820	3,996,670	Mar. 9, 1976	Dec. 14, 1976
B 498,951	3,996,907	Mar. 2, 1976	Dec. 14, 1976
B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976
B 499,209	3,995,907	Feb. 24, 1976	Dec. 7, 1976
B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976
B 499,324	4,001,375	Mar. 16, 1976	Jan. 4, 1977
B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976
B 499,370	4,013,544	Mar. 30, 1976	Mar. 22, 1977
B 499,718	3,990,058	Jan. 27, 1976	Nov. 2, 1976
B 499,786	4,000,663	Mar. 16, 1976	Jan. 4, 1977
B 500,171	3,997,262	Mar. 30, 1976	Dec. 14, 1976
B 500,176	3,995,316	Feb. 3, 1976	Nov. 30, 1976
B 500,408	D 242,721	Mar. 16, 1976	Dec. 14, 1976
B 500,945	3,996,817	Feb. 24, 1976	Dec. 14, 1976
B 500,959	4,014,853	Apr. 13, 1976	Mar. 29, 1977
B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976
B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976
B 501,128	4,072,723	Feb. 24, 1976	Feb. 7, 1978
B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976
B 501,253	3,994,015	Feb. 3, 1976	Nov. 23, 1976
B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976
B 501,379	4,013,696	Mar. 30, 1976	Mar. 22, 1977
B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976
B 501,482	4,012,650	Jan. 13, 1976	Mar. 15, 1977
B 501,503	4,001,640	Mar. 2, 1976	Jan. 4, 1977
B 501,540	3,985,694	Jan. 13, 1976	Oct. 12, 1976
B 501,975	3,998,466	Mar. 2, 1976	Dec. 21, 1976
B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976
B 502,151	3,998,614	Mar. 23, 1976	Dec. 21, 1976
B 502,161	4,000,500	Mar. 2, 1976	Dec. 28, 1976
B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976
B 502,381	D 242,231	Mar. 16, 1976	Nov. 9, 1976
B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976
B 502,571	D 242,433	Apr. 6, 1976	Nov. 23, 1976
B 502,589	3,989,652	Jan. 27, 1976	Nov. 2, 1976
B 502,652	3,989,186	Feb. 24, 1976	Nov. 2, 1976
B 502,667	3,991,431	Feb. 24, 1976	Nov. 16, 1976
B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976
B 502,993	3,992,489	Feb. 17, 1976	Nov. 16, 1976
B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976
B 503,345	4,001,235	Feb. 24, 1976	Jan. 4, 1977
B 503,371	4,009,401	Mar. 30, 1976	Feb. 22, 1977
B 503,436	3,988,819	Feb. 24, 1976	Nov. 2, 1976
B 503,456	4,007,702	Mar. 23, 1976	Feb. 15, 1977
B 503,521	3,999,646	Mar. 16, 1976	Dec. 28, 1976
B 503,579	3,989,680	Feb. 10, 1976	Nov. 2, 1976
B 503,618	3,997,782	Mar. 9, 1976	Dec. 14, 1976
B 503,742	3,989,756	Feb. 17, 1976	Nov. 2, 1976
B 503,776	4,016,000	Mar. 23, 1976	Apr. 5, 1977
B 503,780	3,990,055	Mar. 16, 1976	Nov. 2, 1976
B 503,817	3,988,307	Jan. 13, 1976	Oct. 26, 1976
B 504,056	3,993,923	Feb. 24, 1976	Nov. 23, 1976
B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976
B 504,156	3,999,048	Mar. 23, 1976	Dec. 21, 1976
B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976
B 504,404	3,996,499	Feb. 24, 1976	Dec. 7, 1976
B 504,405	4,007,401	Apr. 13, 1976	Feb. 8, 1977
B 504,439	3,999,398	Mar. 16, 1976	Dec. 28, 1976
B 504,503	3,999,210	Mar. 9, 1976	Dec. 21, 1976
B 504,582	4,005,138	Mar. 30, 1976	Jan. 25, 1977
B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976
B 504,877	3,997,564	Feb. 24, 1976	Dec. 14, 1976
B 504,899	3,991,273	Mar. 9, 1976	Nov. 9, 1976
B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976
B 505,221	4,013,627	Mar. 30, 1976	Mar. 22, 1977
B 505,582	4,001,659	Mar. 23, 1976	Jan. 4, 1977
B 505,689	3,987,631	Mar. 2, 1976	Oct. 26, 1976
B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976
B 506,144	3,991,147	Feb. 10, 1976	Nov. 9, 1976
B 506,148	3,988,319	Feb. 3, 1976	Oct. 26, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 506,167	3,990,652	Feb. 10, 1976	Nov. 9, 1976
B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976
B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976
B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976
B 506,624	3,999,695	Mar. 9, 1976	Dec. 28, 1976
B 506,648	3,994,857	Feb. 3, 1976	Nov. 30, 1976
B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976
B 506,760	4,012,835	Apr. 13, 1976	Mar. 22, 1977
B 506,839	4,005,389	Mar. 23, 1976	Jan. 25, 1977
B 506,840	4,002,928	Mar. 23, 1976	Jan. 11, 1977
B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976
B 506,926	3,993,232	Feb. 17, 1976	Nov. 23, 1976
B 507,087	3,991,389	Feb. 17, 1976	Nov. 9, 1976
B 507,131	4,000,499	Mar. 2, 1976	Dec. 28, 1976
B 507,166	4,014,738	Apr. 13, 1976	Mar. 29, 1977
B 507,396	3,995,167	Feb. 10, 1976	Nov. 30, 1976
B 507,476	3,994,680	Feb. 10, 1976	Nov. 30, 1976
B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976
B 508,118	3,992,283	Feb. 17, 1976	Nov. 16, 1976
B 508,119	3,992,285	Feb. 17, 1976	Nov. 16, 1976
B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976
B 508,639	4,004,194	Mar. 23, 1976	Jan. 18, 1977
B 508,817	3,989,891	Feb. 3, 1976	Nov. 2, 1976
B 508,878	3,994,117	Feb. 3, 1976	Nov. 30, 1976
B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976
B 508,961	3,987,477	Feb. 3, 1976	Oct. 19, 1976
B 509,043	3,996,767	Feb. 24, 1976	Dec. 14, 1976
B 509,165	3,999,155	Mar. 2, 1976	Dec. 21, 1976
B 509,185	3,989,996	Feb. 3, 1976	Nov. 2, 1976
B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976
B 509,474	3,997,260	Feb. 17, 1976	Dec. 14, 1976
B 509,586	4,006,645	Feb. 3, 1976	Feb. 8, 1977
B 509,606	3,989,986	Feb. 3, 1976	Nov. 2, 1976
B 509,772	3,999,004	Mar. 16, 1976	Dec. 21, 1976
B 509,819	4,014,712	Apr. 13, 1976	Mar. 29, 1977
B 510,026	4,016,763	Apr. 13, 1976	Apr. 12, 1977
B 510,184	D 242,784	Apr. 6, 1976	Dec. 21, 1976
B 510,278	4,008,972	Mar. 30, 1976	Feb. 22, 1977
B 510,281	3,993,215	Mar. 9, 1976	Nov. 23, 1976
B 510,346	D 242,207	Feb. 10, 1976	Nov. 9, 1976
B 510,458	4,000,221	Feb. 10, 1976	Dec. 28, 1976
B 510,521	3,990,656	Mar. 2, 1976	Nov. 9, 1976
B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976
B 510,677	3,989,541	Feb. 24, 1976	Nov. 2, 1976
B 510,682	4,000,978	Mar. 30, 1976	Jan. 4, 1977
B 510,836	4,013,795	Mar. 23, 1976	Mar. 22, 1977
B 510,850	3,989,841	Feb. 3, 1976	Nov. 2, 1976
B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976
B 511,907	3,999,622	Mar. 30, 1976	Dec. 28, 1976
B 510,998	3,992,336	Feb. 10, 1976	Nov. 16, 1976
B 511,002	3,998,717	Mar. 2, 1976	Dec. 21, 1976
B 511,099	3,990,162	Feb. 3, 1976	Nov. 9, 1976
B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976
B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976
B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976
B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976
B 511,665	4,001,037	Mar. 2, 1976	Jan. 4, 1977
B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976
B 511,886	3,989,991	Feb. 3, 1976	Nov. 2, 1976
B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976
B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976
B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976
B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976
B 512,779	4,014,897	Apr. 13, 1976	Mar. 29, 1977
B 512,818	3,997,363	Apr. 6, 1976	Dec. 14, 1976
B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976
B 512,964	3,995,279	Feb. 10, 1976	Nov. 30, 1976
B 513,014	3,991,113	Feb. 10, 1976	Nov. 9, 1976
B 513,027	3,995,143	Feb. 17, 1976	Nov. 30, 1976
B 513,134	4,006,764	Mar. 23, 1976	Feb. 8, 1977
B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976
B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976
B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976
B 513,756	3,993,869	Feb. 3, 1976	Nov. 23, 1976
B 513,781	4,001,324	Feb. 24, 1976	Jan. 4, 1977
B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976
B 513,791	4,008,608	Mar. 30, 1976	Feb. 22, 1977
B 514,259	4,013,649	Mar. 23, 1976	Mar. 22, 1977
B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976
B 514,839	4,033,816	Mar. 2, 1976	July 5, 1977
B 515,135	3,990,085	Feb. 17, 1976	Nov. 2, 1976
B 515,303	3,987,939	Jan. 20, 1976	Oct. 26, 1976
B 515,368	4,014,733	Apr. 6, 1976	Mar. 29, 1977
B 515,452	3,995,243	Feb. 10, 1976	Nov. 30, 1976
B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976
B 515,642	4,001,258	Feb. 24, 1976	Jan. 4, 1977
B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976
B 516,002	3,988,638	Jan. 13, 1976	Oct. 26, 1976
B 516,032	3,986,634	Jan. 27, 1976	Oct. 19, 1976
B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976
B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976
B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976
B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976
B 516,537	3,996,784	Feb. 17, 1976	Dec. 14, 1976
B 516,564	3,993,931	Feb. 17, 1976	Nov. 23, 1976
B 516,609	3,994,486	Feb. 24, 1976	Nov. 30, 1976
B 516,625	4,013,542	Mar. 30, 1976	Mar. 22, 1977
B 516,804	3,991,209	Mar. 23, 1976	Nov. 9, 1976
B 516,825	3,988,885	Feb. 3, 1976	Nov. 2, 1976
B 517,273	D 242,798	Mar. 16, 1976	Dec. 21, 1976
B 517,504	3,999,855	Mar. 9, 1976	Dec. 28, 1976
B 517,668	4,013,423	Apr. 6, 1976	Mar. 22, 1977
B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976
B 517,858	4,000,999	Feb. 17, 1976	Jan. 4, 1977
B 517,956	D 243,088	Apr. 6, 1976	Jan. 18, 1977
B 517,957	D 243,089	Apr. 6, 1976	Jan. 18, 1977
B 518,076	4,014,914	Mar. 30, 1976	Mar. 29, 1977
B 518,226	3,993,509	Feb. 10, 1976	Nov. 23, 1976
B 518,326	4,008,282	Mar. 23, 1976	Feb. 15, 1977
B 518,656	3,989,732	Feb. 17, 1976	Nov. 2, 1976
B 518,859	3,989,971	Feb. 3, 1976	Nov. 2, 1976
B 518,999	3,990,323	Feb. 3, 1976	Nov. 9, 1976
B 519,095	3,993,621	Feb. 24, 1976	Nov. 23, 1976
B 519,355	4,014,829	Apr. 13, 1976	Mar. 29, 1977
B 519,377	3,987,223	Jan. 27, 1976	Oct. 19, 1976
B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976
B 519,485	3,991,134	Feb. 10, 1976	Nov. 9, 1976
B 519,486	3,992,481	Feb. 17, 1976	Nov. 16, 1976
B 519,487	3,992,337	Feb. 17, 1976	Nov. 16, 1976
B 519,599	3,995,350	Feb. 17, 1976	Dec. 7, 1976
B 519,623	4,012,049	Apr. 6, 1976	Mar. 15, 1977
B 519,680	4,014,660	Mar. 30, 1976	Mar. 29, 1977
B 519,932	3,988,618	Feb. 3, 1976	Oct. 26, 1976
B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976
B 520,063	3,989,934	Mar. 2, 1976	Nov. 2, 1976
B 520,075	3,989,935	Feb. 24, 1976	Nov. 2, 1976
B 520,076	3,989,936	Mar. 2, 1976	Nov. 2, 1976
B 520,082	3,989,937	Mar. 23, 1976	Nov. 2, 1976
B 520,115	4,003,072	Mar. 23, 1976	Jan. 11, 1977
B 520,227	4,002,823	Mar. 30, 1976	Jan. 11, 1977
B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976
B 520,277	3,995,635	Feb. 17, 1976	Dec. 7, 1976
B 520,341	3,992,028	Mar. 16, 1976	Nov. 16, 1976
B 520,384	3,986,592	Jan. 27, 1976	Oct. 19, 1976
B 520,514	3,988,308	Mar. 9, 1976	Oct. 26, 1976
B 520,534	3,997,119	Feb. 17, 1976	Dec. 14, 1976
B 520,543	3,986,768	Jan. 27, 1976	Oct. 19, 1976
B 520,546	4,001,133	Mar. 2, 1976	Jan. 4, 1977
B 520,613	3,991,341	Mar. 16, 1976	Nov. 9, 1976
B 520,658	3,998,778	Mar. 9, 1976	Dec. 21, 1976
B 520,878	4,014,849	Apr. 6, 1976	Mar. 29, 1977
B 520,884	4,000,433	Mar. 16, 1976	Dec. 28, 1976
B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976
B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976
B 520,952	4,000,876	Mar. 16, 1976	Jan. 4, 1977
B 520,995	4,009,996	Mar. 23, 1976	Mar. 1, 1977
B 521,025	3,998,838	Mar. 23, 1976	Dec. 21, 1976
B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976
B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976
B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976
B 521,125	3,994,865	Feb. 10, 1976	Nov. 30, 1976
B 521,126	3,997,510	Feb. 10, 1976	Dec. 14, 1976
B 521,127	3,996,201	Feb. 17, 1976	Dec. 7, 1976
B 521,128	3,997,511	Feb. 10, 1976	Dec. 14, 1976
B 521,324	3,983,143	Jan. 27, 1976	Sep. 28, 1976
B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976
B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976
B 521,612	4,000,251	Mar. 9, 1976	Dec. 28, 1976
B 521,620	3,983,749	Jan. 27, 1976	Oct. 5, 1976
B 521,643	3,997,567	Mar. 2, 1976	Dec. 14, 1976
B 521,711	3,989,835	Feb. 10, 1976	Nov. 2, 1976
B 521,793	3,996,981	Feb. 24, 1976	Dec. 14, 1976
B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976
B 521,985	4,012,404	Mar. 23, 1976	Mar. 15, 1977
B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976
B 522,009	3,995,444	Feb. 17, 1976	Dec. 7, 1976
B 522,038	3,993,119	Feb. 3, 1976	Nov. 23, 1976
B 522,227	3,992,904	Mar. 30, 1976	Nov. 23, 1976
B 522,309	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 522,354	3,984,959	Jan. 20, 1976	Oct. 12, 1976
B 522,446	4,001,194	Mar. 30, 1976	Jan. 4, 1977
B 522,537	3,999,587	Mar. 30, 1976	Dec. 28, 1976
B 522,567	3,996,238	Feb. 17, 1976	Dec. 7, 1976
B 522,568	D 242,785	Apr. 6, 1976	Dec. 21, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976
B 522,629	4,001,155	Mar. 16, 1976	Jan. 4, 1977
B 523,226	4,006,367	Mar. 23, 1976	Feb. 1, 1977
B 523,696	3,986,071	Jan. 13, 1976	Oct. 12, 1976
B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976
B 523,952	3,988,707	Mar. 23, 1976	Oct. 26, 1976
B 524,026	3,992,206	Feb. 10, 1976	Nov. 16, 1976
B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976
B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976
B 524,806	4,000,065	Mar. 2, 1976	Dec. 28, 1976
B 524,849	4,014,938	Mar. 23, 1976	Mar. 29, 1977
B 525,133	3,996,481	Mar. 23, 1976	Dec. 7, 1976
B 525,204	4,001,109	Mar. 16, 1976	Jan. 4, 1977
B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976
B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976
B 526,106	3,990,073	Jan. 27, 1976	Nov. 2, 1976
B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976
B 526,279	4,013,138	Apr. 13, 1976	Mar. 22, 1977
B 526,289	3,992,641	Feb. 24, 1976	Nov. 16, 1976
B 526,388	3,992,017	Feb. 3, 1976	Nov. 16, 1976
B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976
B 526,447	4,000,052	Feb. 24, 1976	Dec. 28, 1976
B 526,510	3,989,708	Jan. 20, 1976	Nov. 2, 1976
B 526,654	4,011,534	Mar. 23, 1976	Mar. 8, 1977
B 526,942	4,013,700	Mar. 30, 1976	Mar. 22, 1977
B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976
B 527,040	4,013,515	Mar. 23, 1976	Mar. 22, 1977
B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976
B 527,171	3,998,248	Mar. 9, 1976	Dec. 21, 1976
B 527,187	3,995,202	Feb. 17, 1976	Nov. 30, 1976
B 527,333	3,999,732	Mar. 23, 1976	Dec. 28, 1976
B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976
B 527,693	3,995,233	Feb. 3, 1976	Nov. 30, 1976
B 527,788	D 242,337	Feb. 10, 1976	Nov. 16, 1976
B 527,972	4,000,016	Mar. 9, 1976	Dec. 28, 1976
B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976
B 528,297	4,001,138	Mar. 16, 1976	Jan. 4, 1977
B 528,303	3,991,023	Feb. 10, 1976	Nov. 9, 1976
B 528,401	3,991,619	Feb. 3, 1976	Nov. 16, 1976
B 528,756	3,990,476	Feb. 3, 1976	Nov. 9, 1976
B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976
B 528,962	3,989,666	Feb. 24, 1976	Nov. 2, 1976
B 528,966	3,989,667	Feb. 24, 1976	Nov. 2, 1976
B 529,156	3,989,158	Jan. 13, 1976	Nov. 2, 1976
B 529,194	4,000,776	Mar. 23, 1976	Jan. 4, 1977
B 529,214	4,013,004	Apr. 20, 1976	Mar. 22, 1977
B 529,659	3,996,875	Feb. 24, 1976	Dec. 14, 1976
B 529,836	3,994,345	Feb. 3, 1976	Nov. 30, 1976
B 529,925	4,014,003	Mar. 30, 1976	Mar. 22, 1977
B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976
B 530,174	3,993,635	Feb. 24, 1976	Nov. 23, 1976
B 530,255	3,996,103	Mar. 2, 1976	Dec. 7, 1976
B 530,263	4,009,736	Mar. 30, 1976	Mar. 1, 1977
B 530,285	4,013,903	Apr. 6, 1976	Mar. 22, 1977
B 530,303	4,006,029	Mar. 23, 1976	Feb. 1, 1977
B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976
B 530,437	4,014,857	Apr. 13, 1976	Mar. 29, 1977
B 530,569	3,999,865	Mar. 16, 1976	Dec. 28, 1976
B 530,580	4,001,151	Mar. 2, 1976	Jan. 4, 1977
B 530,605	3,989,064	Feb. 3, 1976	Nov. 2, 1976
B 530,709	4,012,944	Apr. 6, 1976	Mar. 22, 1977
B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976
B 530,873	4,001,016	Feb. 17, 1976	Jan. 4, 1977
B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976
B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976
B 531,267	3,997,040	Feb. 24, 1976	Dec. 14, 1976
B 531,425	3,992,595	Feb. 3, 1976	Nov. 16, 1976
B 531,566	3,997,820	Mar. 16, 1976	Dec. 14, 1976
B 531,686	3,990,017	Mar. 23, 1976	Nov. 2, 1976
B 531,753	3,988,843	Mar. 2, 1976	Nov. 2, 1976
B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976
B 532,005	3,992,397	Feb. 24, 1976	Nov. 16, 1976
B 532,140	4,001,299	Mar. 2, 1976	Jan. 4, 1977
B 532,319	3,990,292	Feb. 3, 1976	Nov. 9, 1976
B 532,326	3,993,959	Mar. 23, 1976	Nov. 23, 1976
B 532,424	D 242,292	Feb. 10, 1976	Nov. 9, 1976
B 532,476	3,992,756	Feb. 3, 1976	Nov. 23, 1976
B 532,477	4,014,895	Apr. 13, 1976	Mar. 29, 1977
B 532,679	4,010,706	Apr. 6, 1976	Mar. 8, 1977
B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976
B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976
B 532,976	4,000,837	Mar. 23, 1976	Jan. 4, 1977
B 533,056	3,983,969	Jan. 13, 1976	Oct. 5, 1976
B 533,259	3,999,556	Feb. 24, 1976	Dec. 28, 1976
B 533,454	3,996,566	Mar. 2, 1976	Dec. 7, 1976
B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976
B 533,652	4,000,196	Mar. 23, 1976	Dec. 28, 1976
B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976
B 533,968	3,986,576	Jan. 27, 1976	Oct. 19, 1976
B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976
B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976
B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976
B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976
B 534,334	D 242,722	Mar. 16, 1976	Dec. 14, 1976
B 534,443	3,989,970	Jan. 27, 1976	Nov. 2, 1976
B 534,574	3,995,624	Feb. 24, 1976	Dec. 7, 1976
B 534,591	3,991,141	Feb. 17, 1976	Nov. 9, 1976
B 534,680	4,014,904	Apr. 20, 1976	Mar. 29, 1977
B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976
B 534,915	4,012,668	Mar. 23, 1976	Mar. 15, 1977
B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976
B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976
B 535,209	4,001,873	Mar. 16, 1976	Jan. 4, 1977
B 535,256	3,999,150	Mar. 23, 1976	Dec. 21, 1976
B 535,268	3,999,045	Mar. 30, 1976	Dec. 21, 1976
B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976
B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976
B 535,411	3,990,543	Feb. 24, 1976	Nov. 9, 1976
B 535,437	3,997,555	Feb. 24, 1976	Dec. 14, 1976
B 535,448	3,997,123	Mar. 16, 1976	Dec. 14, 1976
B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976
B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976
B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976
B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976
B 536,082	3,997,783	Mar. 16, 1976	Dec. 14, 1976
B 536,322	4,001,272	Mar. 23, 1976	Jan. 4, 1977
B 536,403	3,998,341	Mar. 23, 1976	Dec. 21, 1976
B 536,511	3,995,989	Mar. 9, 1976	Dec. 7, 1976
B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976
B 536,923	4,007,828	Mar. 30, 1976	Feb. 15, 1977
B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976
B 537,058	4,000,969	Mar. 23, 1976	Jan. 4, 1977
B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976
B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976
B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976
B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976
B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976
B 537,990	4,057,651	Jan. 13, 1976	Nov. 8, 1977
B 538,472	3,992,884	Feb. 3, 1976	Nov. 23, 1976
B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976
B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 538,753	3,993,642	Feb. 10, 1976	Nov. 23, 1976
B 539,374	3,996,229	Mar. 9, 1976	Dec. 7, 1976
B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976
B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976
B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976
B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976
B 540,703	4,013,206	Apr. 13, 1976	Mar. 22, 1977
B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976
B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976
B 540,888	4,005,528	Mar. 30, 1976	Feb. 1, 1977
B 541,015	3,993,208	Jan. 27, 1976	Nov. 23, 1976
B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976
B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976
B 541,464	3,995,424	Feb. 17, 1976	Dec. 7, 1976
B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976
B 541,501	4,005,826	Apr. 13, 1976	Feb. 1, 1977
B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976
B 541,710	3,994,472	Feb. 24, 1976	Nov. 30, 1976
B 542,135	3,986,939	Feb. 10, 1976	Oct. 19, 1976
B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976
B 542,226	3,993,748	Feb. 24, 1976	Nov. 23, 1976
B 542,258	4,013,536	Mar. 23, 1976	Mar. 22, 1977
B 543,078	3,995,687	Feb. 17, 1976	Dec. 7, 1976
B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976
B 544,034	3,997,175	Feb. 17, 1976	Dec. 14, 1976
B 544,476	3,993,585	Feb. 24, 1976	Nov. 23, 1976
B 544,899	3,994,962	Feb. 17, 1976	Nov. 30, 1976
B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976
B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976
B 545,265	D 243,090	Apr. 13, 1976	Jan. 18, 1977
B 545,299	4,001,259	Feb. 24, 1976	Jan. 4, 1977
B 545,344	4,012,746	Mar. 30, 1976	Mar. 15, 1977
B 545,464	3,992,387	Feb. 10, 1976	Nov. 16, 1976
B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976
B 545,777	4,004,906	Jan. 27, 1976	Jan. 25, 1977
B 545,856	4,006,939	Mar. 30, 1976	Feb. 8, 1977
B 545,935	3,990,337	Jan. 27, 1976	Nov. 9, 1976
B 545,945	3,995,260	Jan. 27, 1976	Nov. 30, 1976
B 546,097	3,999,309	Mar. 23, 1976	Dec. 28, 1976
B 546,295	3,987,070	Jan. 20, 1976	Oct. 19, 1976
B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976
B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 546,665	3,990,062	Jan. 20, 1976	Nov. 2, 1976
B 546,677	4,015,654	Apr. 6, 1976	Apr. 5, 1977
B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976
B 546,922	3,987,742	Mar. 16, 1976	Oct. 26, 1976
B 547,016	3,999,741	Mar. 23, 1976	Dec. 28, 1976
B 547,208	4,001,218	Feb. 24, 1976	Jan. 4, 1977
B 547,547	3,997,670	Feb. 24, 1976	Dec. 14, 1976
B 547,994	3,990,081	Jan. 20, 1976	Nov. 2, 1976
B 548,028	3,991,517	Feb. 3, 1976	Nov. 16, 1976
B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976
B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976
B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976
B 548,462	D 242,283	Feb. 10, 1976	Nov. 9, 1976
B 548,688	3,995,984	Mar. 9, 1976	Dec. 7, 1976
B 548,719	3,990,553	Feb. 17, 1976	Nov. 9, 1976
B 548,978	3,998,139	Mar. 9, 1976	Dec. 21, 1976
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976
B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976
B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976
B 549,964	3,995,899	Feb. 24, 1976	Dec. 7, 1976
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976
B 550,744	3,993,550	Feb. 17, 1976	Nov. 23, 1976
B 550,810	4,000,910	Mar. 23, 1976	Jan. 4, 1977
B 551,133	3,996,740	Mar. 2, 1976	Dec. 14, 1976
B 551,463	3,996,254	Feb. 17, 1976	Dec. 7, 1976
B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976
B 551,809	3,996,743	Feb. 24, 1976	Dec. 14, 1976
B 551,952	Re. 29,059	Mar. 2, 1976	Dec. 7, 1976
B 552,006	3,992,129	Feb. 3, 1976	Nov. 16, 1976
B 552,489	3,994,864	Feb. 10, 1976	Nov. 30, 1976
B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976
B 552,508	4,001,250	Mar. 16, 1976	Jan. 4, 1977
B 552,629	3,994,773	Mar. 23, 1976	Nov. 30, 1976
B 552,709	4,001,467	Mar. 23, 1976	Jan. 4, 1977
B 552,932	3,989,292	Feb. 3, 1976	Nov. 2, 1976
B 553,421	4,001,146	Mar. 23, 1976	Jan. 4, 1977
B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976
B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976
B 553,629	3,999,242	Feb. 24, 1976	Dec. 28, 1976
B 554,039	3,999,944	Feb. 24, 1976	Dec. 28, 1976
B 554,164	4,001,465	Mar. 9, 1976	Jan. 4, 1977
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976
B 554,291	4,001,209	Mar. 9, 1976	Jan. 4, 1977
B 554,380	4,001,147	Mar. 9, 1976	Jan. 4, 1977
B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976
B 554,655	4,015,048	Feb. 24, 1976	Mar. 29, 1977
B 554,848	4,001,265	Feb. 24, 1976	Jan. 4, 1977
B 554,939	3,994,013	Feb. 10, 1976	Nov. 23, 1976
B 555,146	4,007,636	Apr. 20, 1976	Feb. 15, 1977
B 555,437	3,991,152	Feb. 3, 1976	Nov. 9, 1976
B 555,456	3,993,423	Mar. 30, 1976	Nov. 23, 1976
B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976
B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976
B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976
B 556,897	3,992,972	Feb. 3, 1976	Nov. 23, 1976
B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 557,274	4,016,375	Mar. 23, 1976	Apr. 5, 1977
B 557,299	3,990,357	Feb. 3, 1976	Nov. 9, 1976
B 557,621	3,990,800	Feb. 3, 1976	Nov. 9, 1976
B 557,721	4,013,435	Mar. 23, 1976	Mar. 22, 1977
B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976
B 558,220	3,990,009	Jan. 27, 1976	Nov. 2, 1976
B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976
B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976
B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976
B 558,819	3,990,160	Feb. 3, 1976	Nov. 9, 1976
B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976
B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976
B 559,142	4,001,124	Mar. 2, 1976	Jan. 4, 1977
B 559,394	4,016,094	Apr. 20, 1976	Apr. 5, 1977
B 559,441	4,013,609	Mar. 23, 1976	Mar. 22, 1977
B 559,631	4,011,406	Mar. 23, 1976	Mar. 8, 1977
B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976
B 559,700	4,001,189	Mar. 23, 1976	Jan. 4, 1977
B 559,701	4,001,190	Mar. 23, 1976	Jan. 4, 1977
B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976
B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976
B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976
B 560,488	3,989,940	Mar. 16, 1976	Nov. 2, 1976
B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976
B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976
B 561,062	D 242,248	Feb. 10, 1976	Nov. 9, 1976
B 561,165	4,013,002	Mar. 30, 1976	Mar. 22, 1977
B 561,166	4,011,809	Mar. 30, 1976	Mar. 15, 1977
B 561,365	4,005,078	Apr. 13, 1976	Jan. 25, 1977
B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976
B 561,405	4,003,770	Mar. 30, 1976	Jan. 18, 1977
B 561,712	3,992,126	Feb. 17, 1976	Nov. 16, 1976
B 561,732	3,991,460	Feb. 3, 1976	Nov. 16, 1976
B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976
B 561,770	4,000,366	Mar. 16, 1976	Dec. 28, 1976
B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976
B 562,413	4,000,930	Mar. 16, 1976	Jan. 4, 1977
B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976
B 562,519	4,013,125	Mar. 30, 1976	Mar. 22, 1977
B 562,601	3,998,360	Mar. 16, 1976	Dec. 21, 1976
B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976
B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976
B 563,070	3,996,230	Mar. 9, 1976	Dec. 7, 1976
B 563,165	4,000,977	Mar. 9, 1976	Jan. 4, 1977
B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 563,301	3,995,589	Feb. 17, 1976	Dec. 7, 1976
B 563,412	3,992,127	Feb. 24, 1976	Nov. 16, 1976
B 563,419	3,999,051	Mar. 23, 1976	Dec. 21, 1976
B 563,722	3,990,925	Jan. 13, 1976	Nov. 9, 1976
B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976
B 563,932	4,000,638	Mar. 23, 1976	Jan. 4, 1977
B 564,252	4,001,293	Mar. 2, 1976	Jan. 4, 1977
B 564,255	4,015,996	Mar. 30, 1976	Apr. 5, 1977
B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 564,902	4,001,351	Mar. 23, 1976	Jan. 4, 1977
B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 565,275	3,990,299	Apr. 6, 1976	Nov. 9, 1976
B 565,717	3,999,138	Apr. 13, 1976	Dec. 21, 1976
B 565,754	4,011,626	Mar. 30, 1976	Mar. 15, 1977
B 566,464	3,996,367	Feb. 3, 1976	Dec. 7, 1976
B 566,556	3,998,511	Mar. 23, 1976	Dec. 21, 1976
B 566,572	3,988,590	Mar. 16, 1976	Oct. 26, 1976
B 566,585	4,001,083	Mar. 2, 1976	Jan. 4, 1977
B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 567,076	4,011,187	Mar. 23, 1976	Mar. 8, 1977
B 567,158	3,988,073	Mar. 23, 1976	Oct. 26, 1976
B 567,207	3,991,689	Apr. 13, 1976	Nov. 16, 1976
B 567,435	3,995,724	Feb. 3, 1976	Dec. 7, 1976
B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 567,892	4,000,855	Mar. 16, 1976	Jan. 4, 1977
B 568,226	3,992,698	Feb. 24, 1976	Nov. 16, 1976
B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 569,125	3,986,980	Feb. 24, 1976	Oct. 19, 1976
B 569,293	4,004,149	Mar. 30, 1976	Jan. 18, 1977
B 569,501	3,999,250	Mar. 9, 1976	Dec. 28, 1976
B 569,519	3,993,133	Feb. 3, 1976	Nov. 23, 1976
B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 569,859	3,994,160	Mar. 9, 1976	Nov. 30, 1976
B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976
B 570,615	3,998,570	Mar. 23, 1976	Dec. 21, 1976
B 570,862	3,991,639	Feb. 24, 1976	Nov. 16, 1976
B 570,925	4,040,802	Mar. 23, 1976	Aug. 9, 1977
B 571,219	3,991,388	Feb. 24, 1976	Nov. 9, 1976
B 571,638	4,001,244	Mar. 9, 1976	Jan. 4, 1977
B 571,659	3,995,186	Apr. 13, 1976	Nov. 30, 1976
B 572,642	3,990,715	Feb. 10, 1976	Nov. 9, 1976
B 572,726	4,015,020	Feb. 24, 1976	Mar. 29, 1977
B 573,033	3,995,224	Mar. 23, 1976	Nov. 30, 1976
B 573,114	4,014,843	Apr. 6, 1976	Mar. 29, 1977
B 573,991	4,013,704	Mar. 30, 1976	Mar. 22, 1977
B 573,994	4,000,641	Mar. 23, 1976	Jan. 4, 1977
B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 574,616	4,000,424	Mar. 2, 1976	Dec. 28, 1976
B 574,996	3,989,718	Feb. 17, 1976	Nov. 2, 1976
B 575,583	4,000,928	Mar. 16, 1976	Jan. 4, 1977
B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 575,761	4,013,123	Apr. 13, 1976	Mar. 22, 1977
B 575,776	4,013,124	Apr. 20, 1976	Mar. 22, 1977
B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976
B 576,385	4,009,498	Mar. 30, 1976	Mar. 1, 1977
B 576,859	3,991,526	Feb. 24, 1976	Nov. 16, 1976
B 576,903	3,995,032	Feb. 3, 1976	Nov. 30, 1976
B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976
B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 1976
B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976
B 579,153	4,013,745	Mar. 30, 1976	Mar. 22, 1977
B 579,806	3,995,318	Feb. 3, 1976	Nov. 30, 1976
B 580,379	4,000,796	Apr. 6, 1976	Jan. 4, 1977
B 580,826	3,988,391	Feb. 17, 1976	Oct. 26, 1976
B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976
B 581,564	4,036,653	Mar. 23, 1976	July 19, 1977
B 581,843	4,000,562	Mar. 16, 1976	Jan. 4, 1977
B 583,051	3,990,714	Feb. 3, 1976	Nov. 9, 1976
B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976
B 583,712	3,995,064	Feb. 10, 1976	Nov. 30, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976	B 590,502	4,001,171	Mar. 23, 1976	Jan. 4, 1977
B 584,997	4,000,030	Mar. 9, 1976	Dec. 28, 1976	B 591,141	4,013,631	Mar. 23, 1976	Mar. 22, 1977
B 585,247	3,989,914	Feb. 3, 1976	Nov. 2, 1976	B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976
B 585,731	3,993,603	Feb. 3, 1976	Nov. 23, 1976	B 592,146	4,001,084	Mar. 2, 1976	Jan. 4, 1977
B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976	B 592,658	4,001,164	Mar. 23, 1976	Jan. 4, 1977
B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976	B 593,781	4,015,953	Mar. 16, 1976	Apr. 5, 1977
B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976	B 594,871	3,999,245	Mar. 16, 1976	Dec. 28, 1976
B 586,663	3,992,080	Feb. 3, 1976	Nov. 16, 1976	B 596,692	3,992,349	Feb. 17, 1976	Nov. 16, 1976
B 587,118	Re. 29,067	Mar. 2, 1976	Dec. 7, 1976	B 597,410	4,000,925	Mar. 30, 1976	Jan. 4, 1977
B 587,786	3,991,204	Feb. 17, 1976	Nov. 9, 1976	B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 587,936	3,999,052	Mar. 23, 1976	Dec. 21, 1976	B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 589,179	4,001,102	Mar. 23, 1976	Jan. 4, 1977	B 750,679	4,007,049	Mar. 23, 1976	Feb. 8, 1977
B 589,687	3,995,349	Mar. 23, 1976	Dec. 7, 1976	B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976
B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976	B 845,044	4,001,338	Mar. 30, 1976	Jan. 4, 1977
B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976	B 848,336	3,993,752	Mar. 30, 1976	Nov. 23, 1976
B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976				

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 7TH DAY OF FEBRUARY, 1978

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Boyette, Gerald B.: *See—*
Sweetana, Andrew S., Jr.; Brown, Frederick J.; and Boyette, Gerald B., T967,008, Cl. 323-61.000.

Breault, Homer: *See—*
Witt, Alvin E.; and Breault, Homer, T967,003, Cl. 428-113.000.

Brown, Frederick J.: *See—*
Sweetana, Andrew S., Jr.; Brown, Frederick J.; and Boyette, Gerald B., T967,008, Cl. 323-61.000.

Brown, Robert S.; and Koch, Joseph B., to Carpenter Technology Corporation. Austenitic Ni—Fe base weld material. T967,001, 2-7-78, Cl. 75-122.000.

Carpenter Technology Corporation: *See—*
Brown, Robert S.; and Koch, Joseph B., T967,001, Cl. 75-122.000.

Caterpillar Tractor Co.: *See—*
Gale, Preston L., T967,009, Cl. 427-53.000.

Davis, Burns: *See—*
Fagerburg, David R.; Davis, Burns; and Wooten, Willis C., T967,007, Cl. 260-860.000.

Fagerburg, David R.; Davis, Burns; and Wooten, Willis C. Compositions of polyesters having fine particles of poly (1,4-cyclohexylenedimethylene terephthalate) dispersed therein. T967,007, 2-7-78, Cl. 260-860.000.

Firestone Tire & Rubber Company, The: *See—*
Smith, Robert Clarence, T967,004, Cl. 526-173.000.

Gale, Preston L., to Caterpillar Tractor Co. Method of applying a wear-resistant composite coating to an article. T967,009, 2-7-78, Cl. 427-53.000.

Hoffman, Edwin Clarence. Thermal conservation assembly for roller fuser. T967,006, 2-7-78, Cl. 219-216.000.

Koch, Joseph B.: *See—*
Brown, Robert S.; and Koch, Joseph B., T967,001, Cl. 75-122.000.

Mihara, Yuji; Sakai, Takeo; Ohmatsu, Hideki; and Sato, Akira. Spectrally sensitized silver halide photographic emulsions. T967,002, 2-7-78, Cl. 96-64.000.

Ohmatsu, Hideki: *See—*
Mihara, Yuji; Sakai, Takeo; Ohmatsu, Hideki; and Sato, Akira, T967,002, Cl. 96-64.000.

Rowland, Stanley P.: *See—*
Wade, Clinton P.; and Rowland, Stanley P., T967,005, Cl. 544-220.000.

Sakai, Takeo: *See—*
Mihara, Yuji; Sakai, Takeo; Ohmatsu, Hideki; and Sato, Akira, T967,002, Cl. 96-64.000.

Sato, Akira: *See—*
Mihara, Yuji; Sakai, Takeo; Ohmatsu, Hideki; and Sato, Akira, T967,002, Cl. 96-64.000.

Smith, Robert Clarence, to Firestone Tire & Rubber Company, The. Transparent impact polystyrene plastics of di-block copolymers. T967,004, 2-7-78, Cl. 526-173.000.

Stryjewski, Walter Anthony. Fuser roller. T967,010, 2-7-78, Cl. 432-60.000.

Sweetana, Andrew S., Jr.; Brown, Frederick J.; and Boyette, Gerald B., to Westinghouse Electric Corporation. Capacitive voltage transformer with improved ferroresonance protection device. T967,008, 2-7-78, Cl. 323-61.000.

Agriculture: *See—*
Wade, Clinton P.; and Rowland, Stanley P., T967,005, Cl. 544-220.000.

Wade, Clinton P.; and Rowland, Stanley P., to United States of America, Agriculture. Cellulose reagents incorporating T-amino groups. T967,005, 2-7-78, Cl. 544-220.000.

Westinghouse Electric Corporation: *See—*
Sweetana, Andrew S., Jr.; Brown, Frederick J.; and Boyette, Gerald B., T967,008, Cl. 323-61.000.

Witt, Alvin E.; and Breault, Homer. Flooring of wood-plastic composite. T967,003, 2-7-78, Cl. 428-113.000.

Wooten, Willis C.: *See—*
Fagerburg, David R.; Davis, Burns; and Wooten, Willis C., T967,007, Cl. 260-860.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 7TH DAY OF FEBRUARY, 1978

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bell Telephone Laboratories, Incorporated: *See—*
Chen, Yu-Ssu; Geusic, Joseph Edward; Nelson, Terence John; and Shapiro, Herbert Meyer, Re. 29,535, Cl. 365-11.000.

Chen, Yu-Ssu; Geusic, Joseph Edward; Nelson, Terence John; and Shapiro, Herbert Meyer, to Bell Telephone Laboratories, Incorporated. Single wall domain nucleator. Re. 29,535, Cl. 365-11.000.

Du Pont de Nemours, E. I., and Company: *See—*
Resnick, Paul Raphael, Re. 29,534, Cl. 260-543.00F.

Geusic, Joseph Edward: *See—*
Chen, Yu-Ssu; Geusic, Joseph Edward; Nelson, Terence John; and Shapiro, Herbert Meyer, Re. 29,535, Cl. 365-11.000.

Guerci, Carlo: *See—*
Pagella, Elio; and Guerci, Carlo, Re. 29,531, Cl. 51-165.800.

Hardinge Brothers, Inc.: *See—*
Parsons, Hubert J., Re. 29,533, Cl. 279-1.00L.

Ing. C. Olivetti & C., S.p.A.: *See—*
Pagella, Elio; and Guerci, Carlo, Re. 29,531, Cl. 51-165.800.

Nelson, Terence John: *See—*
Chen, Yu-Ssu; Geusic, Joseph Edward; Nelson, Terence John; and Shapiro, Herbert Meyer, Re. 29,535, Cl. 365-11.000.

Pagella, Elio; and Guerci, Carlo, to Ing. C. Olivetti & C., S.p.A. Grinding machine. Re. 29,531, Cl. 51-165.800.

Parsons, Hubert J., to Hardinge Brothers, Inc. Self-centering jaw chuck. Re. 29,533, Cl. 279-1.00L.

Resnick, Paul Raphael, to Du Pont de Nemours, E. I., and Company. Purification of perfluorosulfonyl fluoride perfluorovinyl ethers by thermal decomposition of unstable isomers. Re. 29,534, Cl. 260-543.00F.

Shapiro, Herbert Meyer: *See—*
Chen, Yu-Ssu; Geusic, Joseph Edward; Nelson, Terence John; and Shapiro, Herbert Meyer, Re. 29,535, Cl. 365-11.000.

Zwick, William H. Vault. Re. 29,532, Cl. 52-140.000.

LIST OF PLANT PATENTEES

Duffett, William E.: *See—*
Jessel, Walter H., Jr.; and Duffett, William E., 4,206, Cl. 75.000.
Holtkamp, Reinhold. African violet plant. 4,208, 2-7-78, Cl. 69.000.
Jessel, Walter H., Jr.; and Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant. 4,206, 2-7-78, Cl. 75.000.
Mikkelsen, James C., to Mikkelsens, Inc. Kalanchoe plant. 4,207, 2-7-78, Cl. 68.000.
Mikkelsen, James C., to Mikkelsens, Inc. Kalanchoe plant. 4,209, 2-7-78, Cl. 68.000.
Mikkelsen, James C., to Mikkelsens, Inc. Begonia plant. 4,210, 2-7-78, Cl. 68.000.
Mikkelsen, James C., to Mikkelsens, Inc. Begonia plant. 4,211, 2-7-78, Cl. 68.000.
Mikkelsens, Inc.: *See—*
Mikkelsen, James C., 4,207, Cl. 68.000.
Mikkelsen, James C., 4,209, Cl. 68.000.
Mikkelsen, James C., 4,210, Cl. 68.000.
Mikkelsen, James C., 4,211, Cl. 68.000.
Woodriff, Leslie, 4,212, Cl. 68.000.
Woodriff, Leslie, to Mikkelsens, Inc. Begonia plant. 4,212, 2-7-78, Cl. 68.000.
Yoder Brothers, Inc.: *See—*
Jessel, Walter H., Jr.; and Duffett, William E., 4,206, Cl. 75.000.

LIST OF DESIGN PATENTEES

Acme Highway Products Corporation: *See—*
Puccio, Guy S., 247,185, Cl. D25-75.000.
American Can Company: *See—*
LaCroce, Leonard Thomas; and Radtke, Charles Stephan, 247,160, Cl. D9-218.000.
Arvey Corporation: *See—*
Gordon, William Donald, Sr., 247,191, Cl. D34-15.0LL.
Bailey, G. R. Boot jack. 247,141, 2-7-78, Cl. D2-378.200.
Bell & Howell Company: *See—*
Kubnick, Norman R.; and Erber, Dennis J., 247,178, Cl. D16-14.000.
Persha, Thomas J., 247,179, Cl. D16-28.000.
Berkenhoff, Hans Peter, to Lightcraft of California. Track lighting system fixture conector. 247,171, 2-7-78, Cl. D13-24.000.
Bohan, Richard A. Fishing lure. 247,180, 2-7-78, Cl. D22-27.000.
Briggs & Stratton Corporation: *See—*
Stevens, Clifford Brooks, 247,177, Cl. D15-1.000.
Caburian, Eugenio D.: *See—*
Evangelista, Bisked U.; and Caburian, Eugenio D., 247,158, Cl. D9-59.000.
Callaghan, Barbara J. Spinning toy. 247,188, 2-7-78, Cl. D34-5.0CT.
Carter, Kathleen T. Infant carrier. 247,199, 2-7-78, Cl. D87-1.00A.
Charpentier, Michel, to Ciegeco S.A. Tennis racket. 247,189, 2-7-78, Cl. D34-5.0ST.
Ciegeco S.A.: *See—*
Charpentier, Michel, 247,189, Cl. D34-5.0ST.
Clement, Joseph J., to Mead Corporation, The. Shelf support post. 247,184, 2-7-78, Cl. D25-75.000.
Cosentino, James A., to Executive, A Motor Hotel of Buffalo, Inc., The. Discotheque building. 247,183, 2-7-78, Cl. D25-11.000.
Curtis, Gerald J. Cloth wringer. 247,154, 2-7-78, Cl. D7-161.000.
Dicks, Dennis D.; and Fejer, T. William. Racket rack. 247,147, 2-7-78, Cl. D6-125.000.
Dicks, Dennis D.; and Fejer, T. William. Racket rack. 247,148, 2-7-78, Cl. D6-125.000.
Donaldson Company, Inc.: *See—*
Fernandez, Mario F.; and Rubin, Bruce J., 247,161, Cl. D10-46.000.
Duester, Everett L., to John Thomas Batts, Inc. Garment hanger body. 247,150, 2-7-78, Cl. D6-257.000.
E-Systems, Inc.: *See—*
Peter, Harley D.; Miller, Richard D.; Williams, David D.; and Gore, Fred M., 247,173, Cl. D14-43.000.
Ebert, Karl. Coupling. 247,182, 2-7-78, Cl. D23-44.000.
Eltra Corporation: *See—*
Sorge, Leonard Ralph, 247,139, Cl. D2-320.000.
Sorge, Leonard Ralph, 247,140, Cl. D2-320.000.
Erber, Dennis J.: *See—*
Kubnick, Norman R.; and Erber, Dennis J., 247,178, Cl. D16-14.000.
Evangelista, Bisked U.; and Caburian, Eugenio D. Bottle. 247,158, 2-7-78, Cl. D9-59.000.
Executive, A Motor Hotel of Buffalo, Inc., The: *See—*
Cosentino, James A., 247,183, Cl. D25-11.000.
Fabrik, Inc.: *See—*
McBride, James W., 247,151, Cl. D7-54.000.
Fejer, T. William: *See—*
Dicks, Dennis D.; and Fejer, T. William, 247,147, Cl. D6-125.000.
Dicks, Dennis D.; and Fejer, T. William, 247,148, Cl. D6-125.000.
Fernandez, Mario F.; and Rubin, Bruce J., to Donaldson Company, Inc. Sound level meter. 247,161, 2-7-78, Cl. D10-46.000.
Florists' Transworld Delivery Association: *See—*
Harshman, Arthur L.; and Messmer, James I., 247,166, Cl. D11-146.000.
Harshman, Arthur L.; and Messmer, James I., 247,167, Cl. D11-151.000.
Gardner, Derek, to Tyrrell Racing Organisation Limited. Model racing car. 247,192, 2-7-78, Cl. D34-15.0AJ.
Girson, LeRoy S.; and Goldberg, Jack. Television projection unit. 247,176, 2-7-78, Cl. D14-79.000.
Goldberg, Jack: *See—*
Girson, LeRoy S.; and Goldberg, Jack, 247,176, Cl. D14-79.000.
Gordon, William Donald, Sr., to Arvey Corporation. Toy stable and corral. 247,191, 2-7-78, Cl. D34-15.0LL.
Gore, Fred M.: *See—*
Peter, Harley D.; Miller, Richard D.; Williams, David D.; and Gore, Fred M., 247,173, Cl. D14-43.000.
GTE Automatic Electric Laboratories Incorporated: *See—*
Janda, George M., 247,174, Cl. D14-57.000.
Harshman, Arthur L.; and Messmer, James I., to Florists' Transworld Delivery Association. Bud vase. 247,166, 2-7-78, Cl. D11-146.000.
Harshman, Arthur L.; and Messmer, James I., to Florists' Transworld Delivery Association. Vase. 247,167, 2-7-78, Cl. D11-151.000.
Hart, James W., to Verti-Garden, Inc. Planter and support therefor. 247,165, 2-7-78, Cl. D11-144.000.
Hartinger, George J. Birdbath basin. 247,187, 2-7-78, Cl. D30-18.000.
Hayes, William H. Hand held cable cutter. 247,155, 2-7-78, Cl. D8-57.000.
Heber, Larry P. Adjustable handlebars for bicycle. 247,170, 2-7-78, Cl. D12-178.000.
Hero, Franz; and Odermatt, Karl, to Interlubke Gebr. Lubke K G. Combined bed, shelf and cabinet unit. 247,145, 2-7-78, Cl. D6-50.000.
Hoggard, Anthony J., to Tomar Corporation. Arrowhead extractor. 247,181, 2-7-78, Cl. D22-99.000.
Interlubke Gebr. Lubke K G: *See—*
Hero, Franz; and Odermatt, Karl, 247,145, Cl. D6-50.000.
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Julius, Robert P., to Nice-Pak Products, Inc. Combined spoon and fork. 247,153, 2-7-78, Cl. D7-148.000.
Krome, Morris L. Sport shoe. 247,137, 2-7-78, Cl. D2-310.000.
Krome, Morris L. Sport shoe. 247,138, 2-7-78, Cl. D2-310.000.
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Mizoguchi, Tetsuro, to Sanyei Corporation. Shoe. 247,136, 2-7-78, Cl. D2-309.000.
Nathan, Walter, to RTC Industries, Inc. Rack for displaying and storing packaged merchandise. 247,144, 2-7-78, Cl. D6-85.000.
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Oliney, Gloria. Transistorized radio. 247,175, 2-7-78, Cl. D14-69.000.
Parent, Eric Paul. Ribbon splitting tool. 247,142, 2-7-78, Cl. D3-19.00R.
Persha, Thomas J., to Bell & Howell Company. Microfilm reader/-printer. 247,179, 2-7-78, Cl. D16-28.000.
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Ripple, Warren. Speaker enclosure. 247,172, 2-7-78, Cl. D14-33.000.
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Rizla Limited: *See—*
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Sakai, Satoshi; Shimizu, Norio; and Nomura, Junji, to Matsushita Electric Works, Ltd. Outer blade for electric shaver. 247,186, 2-7-78, Cl. D28-49.000.
Sanyei Corporation: *See—*
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Sharp Kabushiki Kaisha: *See—*
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Sorge, Leonard Ralph, to Eltra Corporation. Shoe sole. 247,140, 2-7-78, Cl. D2-320.000.
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NOTE.—First number, class; second number, subclass; third number, patent number

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	4,072,787	4,072,481	10 : Re.29,534	4,072,437	4,072,369	4,072,384
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	4,072,397	4,072,645	4,072,785	4,072,570	4,072,146	4,072,498
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5 :	4,071,998	4,072,669	4,071,984	4,072,604	4,072,541	4,072,540
	4,072,438	4,072,688	4,072,147	4,072,627	4,072,613	4,072,543
	4,072,612	4,072,694	4,072,150	4,072,630	4,072,798	4,072,631
6 :	4,071,913	4,072,696	4,072,312	4,072,641	4,072,803	4,072,698
	4,071,941	4,072,780	4,072,386	4,072,652	4,072,818	4,072,704
	4,071,950	4,072,827	4,072,395	4,072,686	4,072,871	4,072,732
	4,071,968	4,072,835	4,072,410	4,072,729	4,072,904	4,072,733
	4,071,988	4,072,843	4,072,548	4,072,730	4,072,916	4,072,924
	4,071,993	4,072,846	4,072,725	4,072,731	4,072,938	4,072,927
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	4,072,122	4,073,011	4,072,031	18 : Re.29,532	4,072,774	4,072,434
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	4,072,148	4,072,094	4,072,062	4,072,011	4,072,858	4,072,605
	4,072,153	4,072,101	4,072,063	4,072,014	4,072,944	4,072,661
	4,072,173	4,072,142	4,072,081	4,072,078	4,072,964	4,072,825
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	4,072,229	4,071,997	4,072,127	4,072,615	4,073,004	4,072,989
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	4,072,289	4,072,273	4,072,319	4,072,375	4,072,085	4,072,066
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	4,072,335	4,072,607	4,072,338	4,072,226	4,072,206	4,072,499
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	4,072,387	4,072,791	4,072,383	4,072,286	4,072,316	4,072,573
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	4,072,583	4,072,840	4,072,726	4,072,724	4,072,606	4,072,735
	4,072,644	4,072,849	4,072,740	4,072,738	4,072,626	4,072,784
	4,072,653	4,072,884	4,072,746	4,072,761	4,072,676	4,072,808
	4,072,706	4,072,910	4,072,749	4,072,763	4,072,766	4,072,848
	4,072,891	4,072,913	4,072,762	4,072,770	4,072,771	4,072,859
31 :	4,072,052	4,072,928	4,072,764	4,072,779	4,072,772	4,072,894
32 :	4,072,113	4,072,937	4,072,765	4,072,790	4,072,777	4,072,922
	4,072,256	4,072,940	4,072,810	4,072,799	4,072,782	4,072,923
	4,072,339	4,072,947	4,072,816	4,072,886	4,072,795	4,072,932
	4,072,587	4,072,952	4,072,831	40 : 4,072,119	4,072,837	4,072,943
	4,072,930	4,072,974	4,072,850	4,072,191	4,072,852	4,072,977
33 :	4,072,921	4,072,985	4,072,864	4,072,194	4,072,857	4,072,978
34 :	Re.29,535	35 : 4,072,077	4,072,874	4,072,291	4,072,873	4,073,001
	4,071,952	4,072,177	4,072,939	4,072,351	4,072,876	4,073,006
	4,071,970	36 : 4,071,919	4,072,942	4,072,468	4,072,878	49 : 4,072,295
	4,071,974	4,071,927	37 : 4,071,932	4,072,608	4,072,885	4,072,472
	4,072,027	4,071,955	4,071,987	4,072,643	4,072,912	4,072,611
	4,072,037	4,071,976	4,072,072	4,072,713	4,072,929	4,072,863
	4,072,090	4,071,982	4,072,138	4,072,718	4,073,002	50 : 4,072,082
	4,072,107	4,071,985	4,072,155	4,072,807	4,073,010	51 : 4,071,957
	4,072,117	4,071,986	4,072,240	41 : 4,072,143	4,073,012	4,072,070
	4,072,131	4,072,033	4,072,251	4,072,205	44 : 4,072,552	4,072,285
	4,072,144	4,072,048	4,072,267	4,072,506	4,072,892	4,072,337
	4,072,213	4,072,091	4,072,407	4,072,614	45 : 4,072,265	4,072,457
	4,072,248	4,072,130	4,072,775	42 : 4,071,944	47 : 4,071,962	4,072,545
	4,072,268	4,072,157	38 : 4,072,487	4,072,002	4,071,989	4,072,562
	4,072,276	4,072,184	39 : 4,071,933	4,072,007	4,072,084	4,072,563
	4,072,314	4,072,198	4,071,947	4,072,051	4,072,096	4,072,564
	4,072,401	4,072,202	4,071,991	4,072,058	4,072,183	4,072,617
	4,072,427	4,072,225	4,072,000	4,072,095	4,072,501	4,072,650
	4,072,428	4,072,230	4,072,008	4,072,112	4,072,595	4,072,663
	4,072,447	4,072,243	4,072,055	4,072,125	4,072,812	4,072,868
	4,072,448	4,072,255	4,072,098	4,072,161	4,072,813	4,072,899
	4,072,466	4,072,296	4,072,118	4,072,163	48 : 4,071,916	4,072,903
	4,072,471	4,072,307	4,072,168	4,072,176	4,071,949	4,072,949
	4,072,475	4,072,344	4,072,244	4,072,209	4,071,956	53 : 4,072,283
	4,072,507	4,072,393	4,072,257	4,072,253	4,072,040	54 : 4,072,750
	4,072,521	4,072,394	4,072,299	4,072,259	4,072,043	4,072,751
	4,072,527	4,072,399	4,072,303	4,072,376	4,072,123	55 : 4,071,917
	4,072,528	4,072,400	4,072,308	4,072,389	4,072,126	4,071,922
	4,072,544	4,072,411	4,072,310	4,072,392	4,072,145	4,072,028
	4,072,551	4,072,414	4,072,358	4,072,425	4,072,151	4,072,044
	4,072,584	4,072,421	4,072,360	4,072,435	4,072,190	4,072,099
	4,072,618	4,072,486	4,072,489	4,072,474	4,072,192	4,072,140
	4,072,634	4,072,517	4,072,490	4,072,479	4,072,195	4,072,152
	4,072,648	4,072,518	4,072,549	4,072,480	4,072,200	4,072,221
	4,072,674	4,072,519	4,072,550	4,072,492	4,072,258	4,072,242
	4,072,699	4,072,566	4,072,553	4,072,493	4,072,309	4,072,272
	4,072,707	4,072,568	4,072,582	4,072,533	4,072,336	4,072,287
	4,072,711	4,072,577	4,072,623	4,072,539	4,072,381	4,072,357
	4,072,720	4,072,589	4,072,651	4,072,574	4,072,396	4,072,377
	4,072,723	4,072,596	4,072,654	4,072,592	4,072,445	4,072,388
	4,072,727	4,072,635	4,072,673	4,072,600	4,072,619	4,072,801
	4,072,768	4,072,692	4,072,708	4,072,603	4,072,629	4,072,851
	4,072,830	4,072,695	4,072,721			

DESIGN PATENTS

1 :	247,152	247,199	247,148	247,167	247,161	41 : 247,169
	247,155	247,200	247,174	247,168	247,187	48 : 247,141
4 :	247,156	8 : 247,159	247,178	24 : 247,137	29 : 247,164	247,154
	247,157	9 : 247,139	247,191	247,138	34 : 247,136	247,165
6 :	247,143	247,140	247,195	247,176	247,160	247,173
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	247,175	247,184	247,197	247,150	247,162	53 : 247,151
	247,180	17 : 247,142	18 : 247,163	247,181	247,183	55 : 247,177
	247,188	247,144	247,166	27 : 247,149	247,185	247,179
	247,194	247,147				

PLANT PATENTS

6 :	4,212	39 : 4,206	4,207	4,209	4,210	4,211

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

17 :	T967,009	22 :	T967,005	39 :	T967,010	42 :	T967,001	T967,003	47 : T967,007
18 :	T967,008	36 :	T967,006		T967,004				

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PATENT AND TRADEMARK OFFICE NOTICES

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,212,062, Re. S.N. 846,356, Filed Oct. 28, 1977, Cl. 235/61.7 B, CHECK AUTHORIZATION SYSTEM, Robert N. Goldman, et al., Owner of Record: *Telecredit, Inc., Wilmington, Del.*, Attorney or Agent: Edward J. Brenner, et al., Ex. Gp.: 235

3,212,062, Re. S.N. 846,357, Filed Oct. 28, 1977, Cl. 235/61.7 B, CHECK AUTHORIZATION SYSTEM, Robert N. Goldman, Owner of Record: *Telecredit, Inc., Wilmington, Del.*, Attorney or Agent: Edward J. Brenner, et al., Ex. Gp.: 235

3,459,961, Re. S.N. 856,547, Filed Dec. 1, 1977, Cl. 307/116, MOVEMENT RESPONSIVE LIGHT CONTROL MEANS, Richard J. Ravas, Owner of Record: *Westinghouse Electric Corporation, Pittsburgh, Pa.*, Attorney or Agent: C. L. McHale, et al., Ex. Gp.: 217

3,572,117, Re. S.N. 852,581, Filed Nov. 17, 1977, Cl. 73/194 B, BLUFF BODY FLOWMETER, Allan E. Rodely, Owner of Record: *Neptune Eastech, Inc., Atlanta, Ga.*, Attorney or Agent: Frederick W. Padden, Ex. Gp.: 244

3,645,706, Re. S.N. 859,243, Filed Dec. 9, 1977, Cl. 51/295, RESINOLD GRINDING WHEELS CONTAINING NICKEL-COATED CUBIC BORON NITRIDE PARTICLES, Harold Paul Bovenkerk, et al., Owner of Record: *General Electric Co., New York, N.Y.*, Attorney or Agent: Donald J. Voss, et al., Ex. Gp.: 147

3,825,083, Re. S.N. 854,467, Filed Nov. 23, 1977, Cl. 175/394, DRILL BIT AND STABILIZER COMBINATION, Frank O'Dell Flarity, et al., Owner of Record: *Christensen Diamond Products Company, Salt Lake City, Utah*, Attorney or Agent: Bernard Kriegel, et al., Ex. Gp.: 354

3,887,964, Re. S.N. 851,620, Filed Nov. 14, 1977, Cl. 17/32, FOOD PATTY MOLDING MACHINE, Louis R. Richards, Owner of Record: *Formax, Inc., Mokena, Ill.*, Attorney or Agent: James B. Kinzer, et al., Ex. Gp.: 333

3,926,021, Re. S.N. 860,424, Filed Dec. 14, 1977, Cl. 70/278, ELECTRONIC COMBINATION LOCK AND SYSTEM, Leonard J. Genest, et al., Owner of Record: *Monitron Industries, Inc., Santa Ana, Calif.*, Attorney or Agent: M. John Carson, Ex. Gp.: 355

3,926,821, Re. S.N. 860,361, Filed Dec. 14, 1977, Cl. 252/467, PHOSPHORUS, NITROGEN AND SULFO-CONTAINING ADDITIVES, William Monroe Lesuer, Owner of Record: *The Lubrizol Corporation, Wickliffe, Ohio*, Attorney or Agent: James W. Adams, Jr., et al., Ex. Gp.: 116

3,933,758, Re. S.N. 847,936, Filed Nov. 2, 1977, Cl. 260/77.5 CH, IMINOIMIDAZOLIDINEDIONE AND PARABANIC ACID POLYMERS CONTAINING IMIDE GROUPS, Tad L. Patton, Owner of Record: *Exxon Research and Engineering Company, Linden, N.J.*, Attorney or Agent: Donald C. Caulfield, et al., Ex. Gp.: 141

3,938,112, Re. S.N. 855,816, Filed Nov. 30, 1977, Cl. 340/195, TUBULAR WHEEL SPEED SENSOR, Thomas A. Gee, Owner of Record: *Eaton Corporation, Cleveland, Ohio*, Attorney or Agent: Raywood H. Blanchard, et al., Ex. Gp.: 234

3,954,142, Re. S.N. 857,734, Filed Dec. 5, 1977, Cl. 166/307, ZONAL FRACTURE TREATMENT OF WELL FORMATIONS, Gene C. Broaddus, et al., Owner of Record: *Halliburton Company, Duncan, Okla.*, Attorney or Agent: John H. Tregoning, et al., Ex. Gp.: 354

3,958,476, Re. S.N. 860,398, Filed Dec. 14, 1977, Cl. 83/143, PUNCHING DEVICE WITH PUNCH RETAINER, Kenneth J. Bartha, Owner of Record: *Houdaill Industries, Inc., Buffalo, N.Y.*, Attorney or Agent: Benjamin H. Sherman, Ex. Gp.: 324

3,982,099, Re. S.N. 854,057, Filed Nov. 23, 1977, Cl. 219/544, BILATERAL HEATER UNIT AND METHOD OF CONSTRUCTION, John W. Churchill, Owner of Record: *Inventor*, Attorney or Agent: Paul M. Craig, Jr., et al., Ex. Gp.: 213

3,984,300, Re. S.N. 854,115, Filed Nov. 23, 1977, Cl. 204/192, SEMICONDUCTOR PATTERN DELINEATION BY SPUTTER ETCHING PROCESS, Otte Van Ommeren, Owner of Record: *U.S. Philips Corporation, New York, N.Y.*, Attorney or Agent: Frank R. Trifari, Ex. Gp.: 114

3,995,185, Re. S.N. 855,594, Filed Nov. 28, 1977, Cl. 313/217, DISPLAY PANEL, Donald E. Miller, Owner of Record: *Burroughs Corporation, Detroit, Mich.*, Attorney or Agent: Robert A. Green, Ex. Gp.: 252

4,012,804, Re. S.N. 854,499, Filed Nov. 23, 1977, Cl. 14/71.3, ELECTROMECHANICALLY OPERATED DOCKBOARD, John C. Catlett, Owner of Record: *Kelley Company Inc., Milwaukee, Wis.*, Attorney or Agent: Elwin A. Andrus, et al., Ex. Gp.: 352

4,023,436, Re. S.N. 858,951, Filed Dec. 9, 1977, Cl. 74/551.3, ARTICULATED HANDLEBARS FOR BICYCLES AND THE LIKE, Peter W. Dodge, Owner of Record: *Inventor*, Attorney or Agent: Tab. T. Thein, Ex. Gp.: 345

4,031,787, Re. S.N. 860,399, Filed Dec. 14, 1977, Cl. 83/140, PUNCH AND STRIPPER ASSEMBLY, Percy Luther Cady, Owner of Record: *Houdaille Industries, Inc., Buffalo, N.Y.*, Attorney or Agent: Benjamin H. Sherman, et al., Ex. Gp.: 324

4,036,117, Re. S.N. 853,959, Filed Nov. 22, 1977, Cl. 93/51 R, PACKING MACHINES, Robert W. Davies, et al., Owner of Record: *Molins Limited, London, England*, Attorney or Agent: John C. Smith, Jr., Ex. Gp.: 325

PATENT NOTICES

Certificates of Correction for the Week of Feb. 14, 1978

Re. 28,957	4,029,912	4,043,200	4,051,411
Re. 29,312	4,029,975	4,043,392	4,051,464
Re. 29,408	4,031,081	4,043,407	4,051,609
Re. 29,422	4,032,083	4,043,677	4,051,671
D241,511	4,032,471	4,044,641	4,052,291
D242,267	4,032,510	4,044,656	4,052,537
D245,801	4,032,738	4,045,576	4,052,590
D245,899	4,033,066	4,045,589	4,052,720
3,855,270	4,033,285	4,045,636	4,052,722
3,869,986	4,033,533	4,046,068	4,052,895
3,912,682	4,033,685	4,046,071	4,053,076
3,929,801	4,033,762	4,046,222	4,053,098
3,963,718	4,033,927	4,046,230	4,053,220
3,974,195	4,034,483	4,046,744	4,053,242
3,979,414	4,034,708	4,046,750	4,053,247
3,984,637	4,035,223	4,047,250	4,053,304
3,989,474	4,035,237	4,047,615	4,053,316
3,997,760	4,035,385	4,047,945	4,053,388
3,998,562	4,035,386	4,047,947	4,053,390
4,001,441	4,035,395	4,048,000	4,053,425
4,003,971	4,035,983	4,048,053	4,053,472
4,006,310	4,036,456	4,048,195	4,053,514
4,008,483	4,036,650	4,048,237	4,053,602
4,009,107	4,036,995	4,048,703	4,053,835
4,009,661	4,037,537	4,049,467	4,054,690
4,015,721	4,038,320	4,049,694	4,054,731
4,017,391	4,038,331	4,049,804	4,054,744
4,017,514	4,038,496	4,049,839	4,054,772
4,017,714	4,038,815	4,049,912	4,054,799
4,020,285	4,039,208	4,049,970	4,055,226
4,021,112	4,039,436	4,050,023	4,055,377
4,021,147	4,039,566	4,050,082	4,055,752
4,021,467	4,039,675	4,050,207	4,055,854
4,021,837	4,040,530	4,050,209	4,056,018
4,021,927	4,040,976	4,050,302	4,056,153
4,022,927	4,041,073	4,050,348	4,056,738
4,024,636	4,041,094	4,050,352	4,056,763
4,026,254	4,041,178	4,050,423	4,056,865
4,027,883	4,041,260	4,050,634	4,056,953
4,028,694	4,041,572	4,050,752	4,057,212
4,029,264	4,042,073	4,050,763	4,057,596
4,029,753	4,042,380	4,050,805	4,057,893
4,029,779	4,042,625	4,050,809	4,058,175
4,029,794	4,042,692	4,050,911	
4,029,814	4,042,709	4,050,915	
4,029,865	4,042,712	4,050,922	

Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,647,747, C. A. Bialous, HIGH TEMPERATURE MOLDING FLAME RETARDANT POLYCARBONATE COMPOSITION, Interference No. 98,896, decided Oct. 11, 1977, claims 1, 2, 4, 5 and 6.

Patent No. 3,731,785, G. L. Stuart, METHOD AND APPARATUS FOR FORMING TYNE LAYERS IN AUTOMATIC BRICK STACKING SYSTEMS, Interference No. 98,724, decided Oct. 25, 1977, claims 1, 5, 6 and 7.

Patent No. 3,733,399, J. G. Becker, R. L. Mitchell and W. G. Pierson, ORAL COMPOSITIONS CONTAINING AN ENZYME, Interference No. 98,611, decided Oct. 4, 1977, claims 1, 2, 5, 6 and 12.

Patent No. 3,764,950, P. S. Wallia, METHODS FOR MAKING SEMICONDUCTOR PRESSURE TRANSDUCERS AND THE RESULTING STRUCTURES, Interference No. 99,049, decided Nov. 9, 1977, claims 1–13.

Patent No. 3,774,902, E. F. C. Schulze, SHEET SEPARATOR WITH INCREASED POCKET OPENING, Interference No. 98,850, decided July 27, 1977, claim 1.

Patent No. 3,781,184, J. J. Domicone, SAFE BI-MODAL WINDSHIELDS, Interference No. 98,949, decided Sept. 21, 1977, claim 1.

Patent No. 3,792,466, E. H. Arnold and D. L. McLaughlin, KEYBOARD ENTRY SYSTEM WITH N-KEY ROLLOVER AND N-KEY LOCKOUT PROTECTION, Interference No. 99,058, decided Oct. 25, 1977, claims 18, 19 and 20.

Patent No. 3,792,466, E. H. Arnold and D. L. McLaughlin, KEYBOARD ENTRY SYSTEM WITH N-KEY ROLLOVER AND N-KEY LOCKOUT PROTECTION, Interference No. 99,489, decided Oct. 25, 1977, claims 18 and 19.

Patent No. 3,792,466, E. H. Arnold and D. L. McLaughlin, KEYBOARD ENTRY SYSTEM WITH N-KEY ROLLOVER AND N-KEY LOCKOUT PROTECTION, Interference No. 99,490, decided Oct. 25, 1977, claims 14, 15, 16 and 17.

Patent No. 3,848,594, K. B. Buell, TAPE FASTENING SYSTEM FOR DISPOSABLE DIAPER, Interference No. 99,051, decided July 29, 1977, claims 1–16 and 19–21.

Patent No. 3,848,595, D. D. Endres, PREFOLDED DIAPER WITH IMPROVED LEG FIT, Interference No. 99,193, decided Nov. 17, 1977, claims 1, 3, 4 and 5.

Patent No. 3,851,770, C. Jenkins and J. R. Woolslayer, PIVOTED WELL DRILLING MAST AND SEPARATE TOWER, Interference No. 99,159, decided Sept. 21, 1977, claims 1 and 3–7.

Patent No. 3,885,951, W. Hofer, K. Lurssen and R. R. Schmidt, PLANT GROWTH REGULANT COMPOSITIONS CONTAINING 2-HALOETHANESULPHINIC ACID COMPOUNDS, Interference No. 99,221, decided Oct. 4, 1977, claims 1 and 9.

Patent No. 3,890,314, T. Ishimaru and Y. Kodama, PROCESS FOR PRODUCING 7 - ACYLAMINO - 3 - METHYL-3-CEPHEM-4-CARBOXYLIC ACIDS, Interference No. 99,610, decided Oct. 27, 1977, claim 10.

Patent No. 3,900,639, R. Lauterbach, METHOD FOR COATING SURFACES OF A WORKPIECE BY SPRAYING ON A COATING SUBSTANCE, Interference No. 99,514, decided Nov. 1, 1977, claims 1 and 2.

Patent No. 3,997,811, E. M. Tom and R. L. Vogelpohl, COLOR TELEVISION TUBE STRUCTURE AND METHOD OF MANUFACTURE, Interference No. 99,612, decided Nov. 4, 1977, claims 1, 3, 4, 5, 6, 7, 17, 18 and 24.

Disclaimers

3,731,199.—*Luke Alexander Toft*, Swansea, Wales. PRESSURE KILN SEAL. Patent dated Aug. 7, 1973. Disclaimer filed Nov. 1, 1977, by the assignee, *The International Nickel Company, Inc.*

Hereby enters this disclaimer to claim 1 of said patent.

3,918,254.—*Donald E. Wernberg*, Rockford, Ill. FUEL CONTROL FOR A GAS TURBINE HAVING AUXILIARY AIR BLEED. Patent dated Nov. 11, 1975. Disclaimer filed Dec. 1, 1977, by the assignee, *Woodward Governor Company.*

Hereby enters this disclaimer to claim 1 of said patent.

4,015,091.—*Tadikonda Narasimha Rao*, Morristown, N.J., and *Rouben Toumain*, Teheran, Iran. TELEPHONE RINGING GENERATORS. Patent dated Mar. 29, 1977. Disclaimer filed Nov. 21, 1977, by the assignee, *Bell Telephone Laboratories, Incorporated.*

Hereby enters this disclaimer to claims 6, 7, and 11 of said patent.

4,025,407.—*Wan-Hsuan Chang* and *Marco Wismer*, Gibsonia, Pa. METHOD FOR PREPARING HIGH SOLIDS FILMS EMPLOYING A PLURALITY OF CURING MECHANISMS. Patent dated May 24, 1977. Disclaimer filed Nov. 10, 1977, by the assignee, *PPG Industries, Inc.*

Hereby enters this disclaimer to claims 1, 2, 3, 4, 6, 7, 14, and 15 of said patent.

4,040,251.—*Arnold M. Heitmann*, Swampscott, *Walter L. Brassert* Belmont, and *Donald N. Chouinard*, Peabody, Mass. GAS TURBINE COMBUSTION CHAMBER ARRANGEMENT. Patent dated Aug. 9, 1977. Disclaimer filed July 20, 1977, by the assignee, *Northern Research and Engineering Corporation.*

The term of this patent subsequent to Aug. 2, 1994, has been disclaimed.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 14, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-9-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	2-11-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	7-14-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	1-10-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	3-7-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	9-13-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	8-2-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	2-7-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	5-20-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-3-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	5-6-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-3-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	4-4-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	1-3-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-6-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	4-22-77

Expiration of patents: The patents within the range of numbers indicated below expire during January 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,966,681 to 2,970,312, inclusive
Plant Patents... ..... Numbers 2,009 to 2,018, inclusive

REISSUES

FEBRUARY 14, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

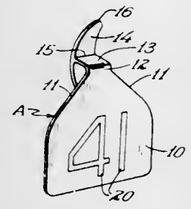
Re. 29,536
MARKING TAG

Donald David Fearing, 942 Arbor, Mahtomedi, Minn. 55115

Original No. 3,934,368, dated Jan. 27, 1976, Ser. No. 472,085, May 22, 1974. Continuation-in-part of Ser. No. 216,489, Jan. 10, 1972, abandoned. Application for reissue Feb. 14, 1977, Ser. No. 768,149

Int. Cl.[2] **G09F** *3/04*

U.S. Cl. 40—301 **4 Claims**



2. A unitary livestock identification ear tag which can be readily folded from a normal configuration to a compact configuration for insertion into an animal's ear, following which it resiliently returns to said normal configuration for effective retention into place, said tag comprising an elongated flat body portion adapted to receive identification indicia, a neck section resiliently attached at one of its edges to said body portion along a first transverse junction, said neck section extending substantially perpendicular to said body portion in said normal configuration, said neck section being thin and substantially flat in cross-section and being of a length sufficient, but not greatly exceeding, the length necessary to accommodate the thickness of an animal's ear, an elongated anchoring head substantially equal in width to said neck section resiliently attached intermediate the ends of said anchoring head to the opposite edge of said neck section along a second transverse junction substantially parallel to said first junction, said anchoring head extending lengthwise only from said second junction substantially normal to said neck section and substantially parallel to said body portion in said normal configuration, said neck section being bendable along said first and second transverse junctions to position said neck into substantially coplanar relation to said body portion and to position one end of said anchoring head substantially parallel to and substantially contacting said neck section and the other end of said anchoring head outwardly beyond said neck section with said other end of said anchoring head substantially in the plane of said neck section, whereby said anchoring head is folded into a compact configuration with said neck section for insertion through a slit in an animal's ear and returns to normal configuration after insertion into the ear.

Re. 29,537
TORQUE BALANCED ROPE

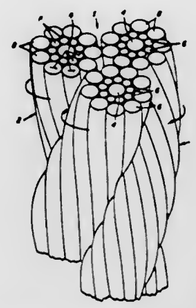
William E. Adams, Hamden, and Wilbert A. Lucht, Orange, both of Conn., assignors to United States Steel Corporation, Pittsburgh, Pa.

Original No. 3,374,619, dated Mar. 26, 1968, Ser. No. 545,726, Apr. 27, 1966. Application for reissue Aug. 24, 1976, Ser. No. 717,310

Int. Cl.[2] **D07B** *1/06;* **D02J** *13/00*

U.S. Cl. 57—148 **9 Claims**

1. A torque balanced regular lay *wire* rope comprising between three and six strands spiraled together, the angle of lay of the outer wires in each strand being at least [1½] *2* times that of the angle of lay of the strands in the rope, *said rope being*



in the stress relieved condition, the torque exerted by the rope being approximately equal to the torque exerted by the strands.

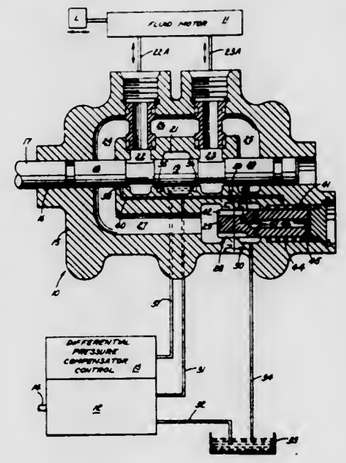
Re. 29,538
LOAD RESPONSIVE FLUID CONTROL VALVE

Tadeusz Budzich, 80 Murwood Drive, Moreland Hills, Ohio 44022

Original No. 3,744,517, dated July 10, 1973, Ser. No. 185,146, Sept. 30, 1971. Application for reissue May 9, 1975, Ser. No. 576,107

Int. Cl.[2] **F15B** *13/02, 13/08*

U.S. Cl. 137—596.2 **8 Claims**



1. A valve assembly comprising a housing having a fluid inlet chamber, [a] *at least one* fluid load chamber, a fluid outlet chamber, and a fluid exhaust means, *signal passage means between said load chamber and said outlet chamber,* first valve means for selectively interconnecting said load chamber with said inlet chamber, *said load chamber with said signal passage means, and said load chamber with said signal passage means* and said outlet chamber to meter fluid flow to and from said load chamber, and second valve means interconnecting said outlet chamber and said exhaust means, *said second valve means having means responsive to pressure in said signal passage means and pressure in said outlet chamber and* operable to maintain a constant pressure difference between said load chamber and said

outlet chamber when said load *chamber, said signal passage means* and *said* outlet chamber [s] are interconnected and said load chamber is pressurized.

11. A valve assembly comprising a housing having a fluid inlet chamber, a fluid supply chamber, first and second fluid load chambers, a fluid outlet chamber and fluid exhaust means, first valve means for selectively interconnecting said fluid load chambers with said fluid supply chamber and said fluid outlet chamber to meter fluid flow to and from said load chambers, second valve means interconnecting said outlet chamber and said exhaust means and operable to provide a passage between said outlet chamber and said exhaust means open above a preselected pressure level in the load chamber connected by said first valve means to said supply chamber and progressively reduce said passage opening upon pressure in said load chamber connected by said first valve means to said supply chamber dropping below said preselected pressure level, and third valve means interconnecting said fluid inlet chamber and said supply chamber operable to maintain a constant pressure difference between said fluid supply chamber and said fluid load chamber connected thereto.

Re. 29,539

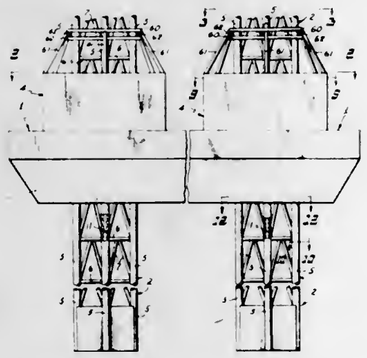
LEG SUPPORTED OFFSHORE STRUCTURE WITH JACKING APPARATUS

Herbert L. Willke, Houston, Tex., and James G. Abraham, Palos Verdes Peninsula, Calif., assignors to Armco Steel Corporation, Middletown, Ohio

Original No. 3,606,251, dated Sept. 20, 1971, Ser. No. 876,781, Nov. 14, 1969. Application for reissue Dec. 6, 1976, Ser. No. 747,802

Int. Cl.[2] B66F *7/12*

U.S. Cl. 254—89 R **15 Claims**



1. In an offshore installation of the type comprising a structure to be supported and a plurality of legs for supporting the structure, the combination of

a plurality of elongated *rigid* rack means each having two parallel opposite sides,

each of said opposite sides of said rack means having a set of rack teeth extending therealong with the two sets of rack teeth of each rack means facing away from each other,

each of said rack means being secured to one of the legs in such fashion that both sets of teeth of the rack means are located outwardly [from] *of* the leg; [and]

a plurality of jacking units [mounted on the structure to be supported and] each cooperating with a different one of said rack means, each of said jacking units comprising

rigid frame means, two pinions each mounted on said frame means for rotation about a fixed axis, each of said pinions being operatively meshed with a different one of said two sets of rack teeth of the corresponding one of said rack means, [such meshed relation to said pinions with said teeth of said rack means, and the fact that said axes are fixed rigidly on said frame means, causing any force tending to disengage either of said pinions by movement away from the corresponding set of rack teeth to be opposed by reason of engagement of the other of said pinions with its corresponding set of rack teeth,]

rotary power means, and

gearing carried by said frame means and operatively connecting said power means to drive said pinions [.]*; and*

mounting means mounting said jacking units of the structure to be supported;

the meshed relation of said pinions with said teeth of said rack means, the rigidity of said frame means, and the fact that said axes are fixed rigidly on said frame means causing any force tending to disengage either of said pinions by movement away from the corresponding set of said rack teeth to be opposed by reason of engagement of the other of said pinions with its corresponding set of rack teeth, such opposition being effective via said rigid frame means and independent of said mounting means.

Re. 29,540

PHOSPHORYLATED ALKYLPHENOL/PHENOL ESTER MIXTURES

Donald Richard Randell, and Wilfred Pickles, both of Stockport, England, assignors to Ciba-Geigy AG, Basel, Switzerland

Original No. 3,576,923, dated Apr. 27, 1971, Ser. No. 645,888, June 14, 1967. Application for reissue July 10, 1973, Ser. No. 377,907

Claims priority, application United Kingdom, June 18, 1966, 27316/66

Int. Cl.[2] C07F *9/12*

U.S. Cl. 260—966 **6 Claims**

1. A triaryl phosphate composition consisting essentially of a phosphorylated [alkylphenol/phenol] *isopropyl phenol/-phenol* ester mixture wherein the weight ratio of the [alkyl] *isopropyl* moiety to phenol moiety ranges from 0.05 to about 0.65 [and the number of carbon atoms per alkyl moiety ranges from 3 to 16] which ester is prepared by steps comprising:

(a) alkylating at a temperature of from about 15° to 250° C in the presence of a Lewis acid or a Bronsted acid as catalyst, phenol with an alkylating agent selected from the group consisting of alkyl halides in which the alkyl group is a C_1 to C_6 straight- or branched-chain alkyl or a C_6 to C_{12} cycloalkyl, C_1 to C_6 alkanols, and C_3–C_{16} olefins, with propylene to obtain an [alkylated phenol] *isopropyl phenol/phenol* reaction mixture *having 0.05 to about 0.65 by weight of isopropyl moiety per phenol moiety*, and

(b) reacting at a temperature of from about 15° to 250° C. in the presence of a Lewis acid as catalyst, said [alkylated phenol] *isopropyl phenol/phenol* reaction mixture with a phosphorylating agent selected from the group consisting of phosphorous oxychloride, phosphorous oxybromide and phosphoric acid.

PLANT PATENTS

GRANTED FEBRUARY 14, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,213

AFRICAN VIOLET PLANT

Reinhold Holtkamp, Weatherstrasse 112, 4294 Isselburg, Germany

Filed Nov. 18, 1976, Ser. No. 743,149

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet known by the cultivar name Delaware and particularly characterized as to uniqueness by the combined characteristics of upright and strong stems each of which supports 4–6 large flowers which are red in flower color and star-shaped; uniform flowering and compact growth habit, with continuous productivity of new flowers.

4,214

AFRICAN VIOLET PLANT

Reinhold Holtkamp, Weatherstrasse 112, 4294 Isselburg, Germany

Filed Mar. 3, 1977, Ser. No. 774,047

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet plant known by the cultivar name New Jersey and particularly characterized as to uniqueness by the combined characteristics of large pink flowers with frilled edges, with the flowers being non-dropping; long blooming period; upright and strong flower stems which form a bouquet above the leaves; and by the characteristic of being a saleable plant with the first flash of flowers.

4,215

GERANIUM PLANT

Frank Andrea, 390 N. Franklin St., Holbrook, Mass. 02343

Filed Mar. 11, 1977, Ser. No. 776,908

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of geranium plant, substantially as shown and described, characterized by its healthy growth; its continuous and exceptionally free blooming habits; its large and double flowered truss; its large florets with double petalage and distinctive color combination.

PATENTS

GRANTED FEBRUARY 14, 1978

ERRATA

For CLASS	See PATENT NO.
004-191	4,073,018
099-574	4,073,032
051-309 A	4,073,096
085-045	4,073,210
180-139	4,073,364
222-094	4,073,406
260-112 B	4,073,886
428-404	4,073,980
178-069.1	4,074,080
200-279	4,074,112
235-419	4,074,113
235-463	4,074,114
235-462	4,074,115
235-083	4,074,116
364-712	4,074,118
364-807	4,074,119
235-419	4,074,120
362-013	4,074,121
362-200	4,074,122
362-319	4,074,123
362-217	4,074,124
362-271	4,074,125
362-297	4,074,126
355-030	4,074,217
364-900	4,074,235
365-200	4,074,236
365-230	4,074,237
365-104	4,074,238
365-176	4,074,239
365-192	4,074,240
357-034	4,074,293

PATENTS

GRANTED FEBRUARY 14, 1978

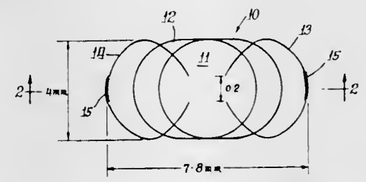
GENERAL AND MECHANICAL

4,073,014
INTRA-OCULAR LENS
Stanley Poler, 78 E. Second St., New York, N.Y. 10003
Filed May 28, 1976, Ser. No. 691,033
Int. Cl.[2] A61F *1/16, 1/24*
U.S. Cl. 3—13 **29 Claims**



9. As an article of manufacture, a single-piece weld-free mounting adapter for iris-stabilized mounting of an intra-ocular lens element, comprising a circumferentially continuous ring body which is centrally open and which is of peripheral contour generally conforming to the peripheral contour of the lens element, plural inwardly extending angularly spaced anchoring elements integral with said ring body for engagement with spaced local peripheral regions of the lens, and first and second pluralities of lens-positioning feet integral with said ring body and radially outwardly extending therefrom in angularly spaced and interlaced relation, the feet of one plurality being in axially offset relation to the feet of the other plurality.

4,073,015
ARTIFICIAL INTRAOCULAR LENS ATTACHMENT
Gholam A. Peyman, 1044 N. Oak Park Ave., and Jeffrey E. Koziol, 1213 N. Lombard St., both of Oak Park, Ill. 60300
Continuation-in-part of Ser. No. 684,248, May 7, 1976, abandoned. This application Jan. 24, 1977, Ser. No. 762,007
Int. Cl.[2] A61F *1/16, 1/24*
U.S. Cl. 3—13 **7 Claims**

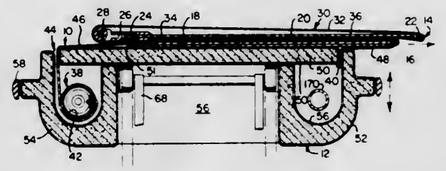


1. An artificial intraocular lens system adapted to be implanted within a living eye immediately adjacent the iris of the eye and comprising:

a plastic optical lens portion formed with a laterally extending haptical portion from said lens portion; and

attachment means including a biologically tolerable fibrous material mounted on the outer periphery of said haptical portion and adapted to contact the iris of the eye so that tissue growth of the iris into the fibrous material can occur for permanently anchoring said lens system within the eye.

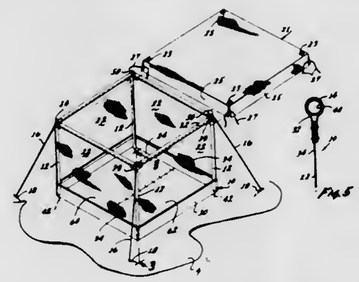
4,073,016
TRANSFER MECHANISM
Laurel A. Koll, Ruleville, Miss., assignor to Mobilizer Medical Products, Inc., Summit, N.J.
Filed June 17, 1976, Ser. No. 697,155
Int. Cl.[2] A47B *83/04*
U.S. Cl. 5—81 R **41 Claims**



1. In an object transfer mechanism having a load carrying deck with spaced front and rear edges, a translatable support having top and bottom surfaces and a front edge, the support being movable between a retracted position in which the support substantially overlies the deck and an extended position wherein the front edge of the support extends beyond the front edge of the deck, a flexible apron trained about at least the top and front edge surfaces of the support, and means for controlling movement of the apron relative to the support so that the flight portion of the apron trained along the top of the support may be selectively (a) maintained stationary relative to the deck during movement of the support relative to the deck and (b) moved with the support during translating movement thereof relative to the deck, the improvement comprising:

means for translating the support between the retracted position and a maximum extended position in which the front edge of the support is spaced beyond the front edge of the deck by a distance greater than the distance between the front and rear edges of the deck.

4,073,017
PORTABLE PLAYPEN
Amy L. Stevens, 1616 York Drive, Vista, Calif. 92083
Filed Oct. 26, 1976, Ser. No. 735,795
Int. Cl.[2] A47C *29/00*
U.S. Cl. 5—97 **8 Claims**



1. A portable playpen raised from the ground, comprising:

(a) an enclosure formed of pliable sheet material and having four side walls and a bottom wall in generally right-rectangular disposition and having an open top, at least the vertically intermediate and major portion of said side walls spaced from top and bottom margins being formed of netting so that a playpen occupant can see out through said netting,

(b) four upright posts located at the corners formed by adjacent side walls of said enclosure, the upper portion of

each post extending at least to a level near to the height of the upper edge of said enclosure,

(c) four horizontal top bars, each side wall having its upper margin secured to one of said bars which supports the same, the ends of said bars being secured to said upper portions of said posts, and

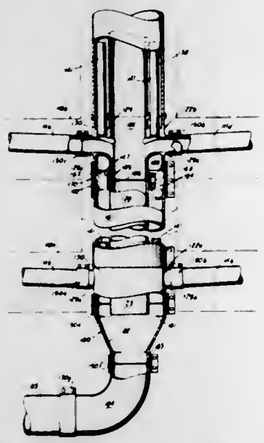
(d) a guy having one end secured to said upper portion of each post and a stake for each guy set in the ground at a location outlying said enclosure and secured to the other end of the associated guy to support the associated post against tilting inwardly of said enclosure.

4,073,018

INTERNAL BACK VENT SYSTEM

Gordon W. Arrowood, Palmetto, Ga., assignor to McKenney's, Inc., Atlanta, Ga.

Filed Mar. 31, 1975, Ser. No. 563,482
Int. Cl.[2] E03D *9/04*; F16L *41/00*
U.S. Cl. 4—191 **11 Claims**



1. A back vent drain system comprising:

a. a main upright drain for defining a drain passageway, therethrough;

(b) a main upright vent disposed adjacent to and surrounding said drain, said main vent and said main upright drain defining therebetween a vent passageway;

(c) a plurality of branch waste pipes extending through said main upright drain and communicating with said drain passageway of said drain; and

(d) a plurality of upstanding tubular back vent pipes wholly within said vent passageway and between said main upright drain and said main upright vent, the lower ends of said back vent pipes respectively being received within said vent passageway by and communicating with said branch waste between said main upright drain and said upright vent pipe, the upper ends of said back vent pipes terminating within said vent passageway.

4,073,019

LIGHTWEIGHT WATERBED ASSEMBLY

Peter Fraser, 99 Mount Auburn St., Cambridge, Mass. 02138

Filed Aug. 9, 1976, Ser. No. 712,550
Int. Cl.[2] A47C *27/08*
U.S. Cl. 5—365 **3 Claims**

1. A lightweight waterbed assembly comprising

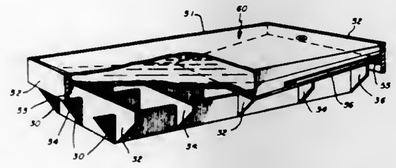
a fluid filled mattress and a substructure therefore,

said substructure including, a pair of planar sheets for engaging and supporting the bottom of said mattress,

a supporting frame comprising a lattice of interlocked members having upper edges positioned to support and engage said planar sheets in planes at an obtuse angle to one another,

a retaining frame having sides and ends defining a rectangular wall,

means supporting said retaining frame on said supporting frame with edges of said retaining frame extending above and other edges thereof extending at least partially below the outer edges of said planar sheets to define a cavity to receive said mattress with said cavity open at the top and with a non-uniformly deep bottom so that the maximum thickness of the mattress occurs in areas where maximum body support is required,



said mattress being fabricated of upper and lower water impervious sheets sealed at their peripheries, each of said water impervious sheets having a width which is greater intermediate the ends than at the ends,

said lower water impervious sheet conformed to the surfaces defined by said planar sheets and the walls of said retaining frame,

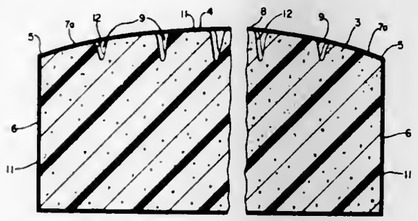
said lattice of interlocked members include two sets of flat elongated members with each elongated member having parallel longitudinal edges and a plurality of slots in one of said edges, said sets positioned normal to one another with one set above the other and with said slots of one set aligned and interlocked with the slots of the other set.

4,073,020

CONTOURED FOAM MATTRESS

Robert J. Stalter, Bowling Green, and Theodore B. Burkholder, Perrysburg, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 19, 1976, Ser. No. 678,011
Int. Cl.[2] A47C *27/04, 27/22*
U.S. Cl. 5—355 **6 Claims**



1. A molded foam mattress of essentially a rectangular shape and having a crown, said crown being divided into a decorative segment by cored-out areas, said coring being positioned to give a geometric pattern of grooves that extend continuously in lengths no more than 4 inches before the grooves terminate or change directions to give raised portions relative to the groove, each portion being capable of being compressed independent of any other portion for at least 10 percent of its compression deflection.

4,073,021

DIFFERENTIAL-PRESSURE FLOTATION CUSHION

Richard S. Carlisle, P.O. Box 307, Rye, N.Y. 10580

Filed Mar. 3, 1976, Ser. No. 663,544
Int. Cl.[2] A47C *27/08*
U.S. Cl. 5—365 **9 Claims**



1. A compartmented, fluid containing cushion for a person comprising

an inner multiple compartmented cushion containing fluid at a positive pressure sufficient to support a person; and

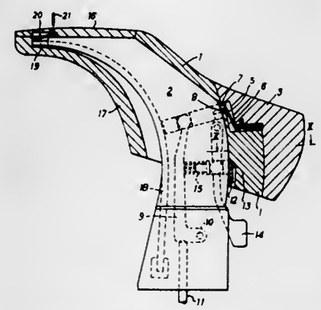
an outer fluid containing envelope enclosing said inner multiple compartmented cushion, said outer envelope containing fluid at a pressure which is selected sufficiently low to enable a portion of said outer envelope to undulate upwardly for support of a certain area of a person while another portion of said outer envelope is enabled to effectively rest upon said inner compartmented cushion for the latter's effective support of other areas of a person.

4,073,022

MANUFACTURE OF SHOES

Frank Gordon Bailey, Kettering, and George Trevor Ralphs, Bath, both of England, assignors to C. & J. Clark Ltd., England

Filed June 25, 1976, Ser. No. 699,808
Claims priority, application United Kingdom, June 25, 1975, 27010/75
Int. Cl.[2] A43D *3/00*
U.S. Cl. 12—135 A **9 Claims**



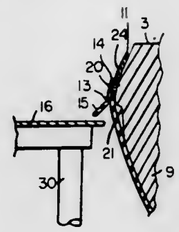
1. For use in the manufacture of shoes, the combination of a last and a last post, the last comprising a main body portion and the post having an upper end portion, one of said portions having a socket therein of a noncircular cross-section and the other portion having a spigot having a cross-sectional shape complementary to said socket and mating with the socket for locating and detachably mounting said last on said post, said last further comprising a heel part slidably mountable on said body portion for sliding a distance for removing said heel part from said body portion, a rib and a mating groove formed one on the body portion and the other on the heel part, said rib and groove when interengaged mounting said heel part on said body portion in slidable engagement therewith, said body portion and said heel part respectively having surfaces thereon which abut when said heel part is slid to an operative position, a spring latch secured on said heel part and having a free end movable to engage an abutment on said body portion when said heel part is slid to its operative position, and means for moving said free end out of engagement with said abutment for releasing said heel part for removal from said body portion.

4,073,023

METHOD OF MANUFACTURE OF FOOTWEAR

Anton Liebscher, Waynesville; Sven Oberg, Lake Junaluska; Kenneth Smathers, and Horace Auberry, both of Waynesville, all of N.C., assignors to Ro-Search, Inc., Waynesville, N.C.

Division of Ser. No. 493,965, Aug. 1, 1974, Pat. No. 4,003,145.
This application Oct. 22, 1976, Ser. No. 734,879
Int. Cl.[2] A43D *21/00*
U.S. Cl. 12—142 RS **1 Claim**



1. The method of manufacture of footwear with molded soles, comprising the steps of

securing an outward extending welt to the upper spaced substantially above the insole level,

securing string lasting means to said upper above the insole level,

string lasting said upper on the mold last of a sole molding device in its loading station,

positioning and maintaining the outward extending welt in its final position by means of a welt plate while removed from the sole molding device,

inspecting the shoe bottom and locking said welt plate in position relative to said mold last,

moving the unit of last, welt plate, and locking means into juxtaposition with the sole molding device,

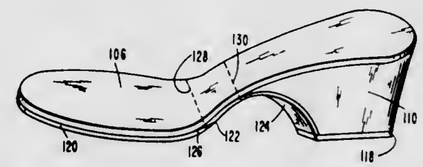
clamping the edge of the outward extending welt between said welt plate and the edge of the sole molding device, while preventing the inwardly protruding edge of said welt plate from exerting horizontal pressure upon the upper and thereby preventing damage to said upper, and molding a sole to said welt.

4,073,024

METHOD OF MAKING A SHOE

Nathan Stix, Cincinnati, Ohio, assignor to The United States Shoe Corporation, Cincinnati, Ohio

Division of Ser. No. 665,832, March 11, 1976, Pat. No. 4,048,732. This application Mar. 4, 1977, Ser. No. 774,846
Int. Cl.[2] A43D *9/00*
U.S. Cl. 12—142 J **17 Claims**



1. A method of constructing a shoe having a relatively flexible shank portion without shank reinforcement, comprising:

assembling an upper for said shoe;

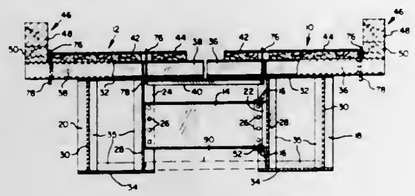
slip lasting the forepart only of said shoe, the step of slip lasting including securing the forepart portion only of an insole to the forepart of said upper;

cement lasting the shank and heel seat portions of said insole to said upper;

attaching a heel and an outsole to the bottom of said insole; and

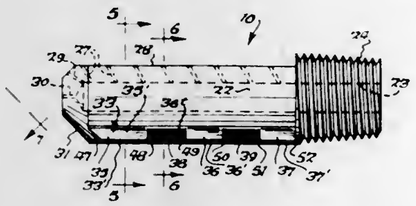
interlocking said outsole, insole and heel by means of stitching extending across the shank portion of the shoe.

4,073,025
PORTABLE BRIDGE
William T. Peckham, Eugene, Oreg., assignor to Hamilton Construction Co., Springfield, Oreg.
Filed Feb. 22, 1977, Ser. No. 770,754
Int. Cl.² E01D *15/12*
U.S. Cl. 14—2.4 **12 Claims**



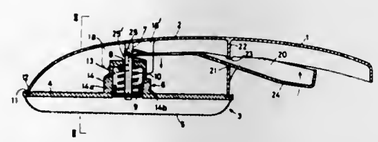
1. A portable bridge structure comprising:
two longitudinal bridge sections adapted for supporting heavy trucks and for releasable mounting in parallel spaced apart relationship in position to span an area to be covered;
each bridge section comprising at least one upright elongated support member extending longitudinally of the bridge, a plurality of cross members extending across the top of said support member so that said support member is positioned intermediate the ends of said cross members and a bridge roadway portion provided on said cross members, said two bridge sections providing two separate roadway portions spaced apart when mounted at said area;
a plurality of rectangular diaphragm members spaced longitudinally along the support members and each pivoted at one end portion to one support member of one bridge section so that the free end portion may pivot toward and be releasably secured to the other support member of the second bridge section to join the bridge sections together when said bridge sections are mounted; and
releasable connection means for releasably securing said diaphragm members to said other support member to enable the bridge sections to be separated and transported from said area to another bridge site.

4,073,026
LANCE TIP CONSTRUCTION
Robert J. Goodwin, Hendersonville, N.C., assignor to C. H. Heist Corporation, Clearwater, Fla.
Filed July 9, 1976, Ser. No. 703,790
Int. Cl.² B08B *9/02*
U.S. Cl. 15—104.1 R **18 Claims**



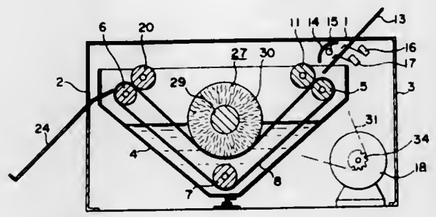
1. A tube cleaning lance tip construction for insertion into a tube comprising a body portion having a longitudinal axis and an outer surface, first bore means in said body portion for receiving high pressure fluid, second bore means in communication with said first bore means and extending through said body portion to said outer surface for causing fluid to be ejected with a net lateral force component to bias said body portion toward said tube, and a plurality of axially extending blade means with axial spaces therebetween on the opposite side of said body portion from said second bore means for engaging the inside of said tube.

4,073,027
CLEANING BRUSH
Teruya Tsuruzawa, Suita, and Muneyuki Ueda, Nishinomiya, both of Japan, assignors to Nippon Seal Co., Ltd., Osaka, Japan
Filed Dec. 28, 1976, Ser. No. 755,042
Claims priority, application Japan, Jan. 6, 1976, 51-1206
Int. Cl.² A46B *9/10*
U.S. Cl. 15—172 **5 Claims**



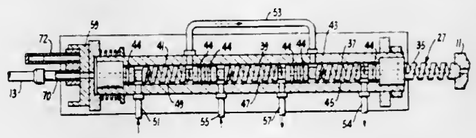
1. A cleaning brush which comprises a handle provided with a brush holder holding a brush body provided with a brush surface having numerous short bristles inclined in the same direction; a hollow boss provided on the back side of the brush body and within said brush holder and is rotatably, upwardly and downwardly movably mounted on a projection shaft extending downwardly from the brush holder into said hollow boss; a spring means arranged within said hollow boss to urge the boss with the brush body toward the brush holder so that the brush body is held on the brush holder for enabling brushing operation; the hollow boss comprising an upper portion and a lower portion which is larger in diameter than the upper portion; said lower boss portion being formed in its periphery with vertical grooves extending axially thereof in diametrically opposed relation to each other; projecting members extending downwardly from the brush holder and engageable with said grooves respectively so as to lock the boss against rotation when the projecting members are in engagement with the respective grooves; said lower boss portion being divided by said grooves into one-half circumferential sections each having a downwardly slanting top surface inclined circumferentially in the same direction; an actuating lever mounted on said holder and forked at its front end into two arms which extend above the upper boss portion; raised portions provided on the top face of the upper boss portion or on said arms; inclined surfaces provided on said arms or on the top face of the upper boss portion and cooperating with said raised portions; the arrangement being such that when the actuating lever is operated the boss together with the brush body is pressed down against the force of the spring and the projecting members are disengaged from the grooves to release the boss from locking whereupon the boss is somewhat rotated to allow the projecting members to ride on the slanting top surfaces on the lower boss portion so that when the actuating lever is released the projecting members slide down along the slanting top surfaces on the lower boss portion with a result that the boss together with the brush body is rotated to a complete 180° rotation and is moved upwardly to the position in which the boss is locked against rotation returned to the original position.

4,073,028
ETCHING PROCESSING APPARATUS
Akira Kakito, Hino; Junichi Yasui, Tama, and Yoji Koganei, Fussa, all of Japan, assignors to Iwatsu Electric Co., Ltd., Japan
Filed Aug. 2, 1976, Ser. No. 710,603
Claims priority, application Japan, Sept. 30, 1975, 50-118654
Int. Cl.² B41F *35/00*
U.S. Cl. 15—102 **5 Claims**



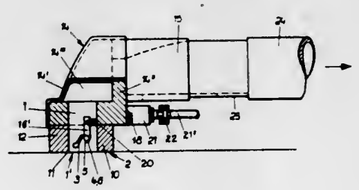
1. An etching processing apparatus for processing a lithographic master comprising:
an etching processing liquid vessel containing a bath of etching liquid;
an endless belt for conveying the lithographic master to be processed on a predetermined path through the etching processing liquid vessel and through the bath of etching liquid;
driving means for rotating the endless belt in a predetermined direction;
non-rotatable means disposed in the bath of etching liquid for frictionally rubbing a surface of the lithographic master being conveyed in the bath of etching liquid to render the surface of the lithographic master hydrophilic; and
means for maintaining adequate pressure between the non-rotatable means for frictionally rubbing a surface of the lithographic master and the endless belt.

4,073,029
PARTS CLEANER
Alphonse C. Vassallo, 1439 Wayland, San Francisco, Calif. 94134
Filed May 27, 1976, Ser. No. 690,407
Int. Cl.² B08B *7/04*
U.S. Cl. 15—302 **4 Claims**



1. A cleaner for cylindrical parts contaminated with oil or the like, said cleaner being adapted to be attached to a machine which ejects parts therefrom, comprising in combination:
a. a helix having a hollow, circular center opening through which said cylindrical parts can pass with a small clearance, said circular center opening being attached to the discharge of said machine whereby parts discharged from said machine will be pushed into said circular center opening, said helix being divided into four sections arranged in the following order;
b. a first section of said helix open to the air whereby parts passing through said circular center opening with small clearance have a substantial amount of oil scraped from said parts while going through said opening;
c. a second section of said helix, said second section being enclosed and having sealing means at each end thereof whereby only the circular center opening in said helix provides an opening at the ends of said section;
d. means for introducing an air-solvent mixture at one end of said second section and means for removing the air-solvent mixture from the opposite end of said section;
e. a third section of said helix having an enclosure thereabout with sealing means at each end thereof whereby said circular center opening provides the only opening at the ends of said enclosure and means for introducing a solvent into said third section near one end of said enclosure and for removing the solvent at the opposite end of said fourth enclosure;
f. a fourth section of said helix having an enclosure thereabout with sealing means at each end of said section wherein said central opening provides the only opening at the ends of said fourth section and means for introducing an air blast into said section near one end thereof to remove adhering solvent from said parts and for removing air and solvent from said fourth section at the opposite end of said fourth section enclosure; and
g. an exit end of said circular opening whereby parts are discharged from the circular opening.

4,073,030
SUCTION CLEANING APPARATUS WITH A BAFFLE TO DIRECT FLOW OF A CLEANING FLUID
Hartmut Albishausen, Auf den 30 Morgen, 6382 Friedrichsdorf, Germany
Filed Sept. 14, 1976, Ser. No. 723,195
Claims priority, application Austria, Sept. 15, 1975, 7052/75
Int. Cl.² A47L *7/00*
U.S. Cl. 15—322 **13 Claims**



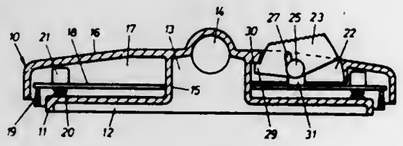
1. In an arrangement for cleaning planar and curved surfaces of textile material coverings on floors, walls, furniture and the like, of the type having a suction means and a cleaning fluid supply means, a combination comprising a portable cleaning head including a suction attachment connected to the suction means, an elongated intake opening lying in a plane and being juxtaposed with contaminated portions of a surface to be cleaned, and a suction channel extending intermediate said suction attachment and said intake opening for transmitting suction force from the suction means to the surface to be cleaned; means for injecting streams of cleaning fluid along paths into said suction channel at a predetermined acute angle of inclination relative to the plane of said intake opening, including a plurality of fluid discharge outlets in said suction channel, said outlets communicating with the cleaning fluid supply means and being spaced along a row which extends generally along the elongation of said intake opening; and means for directing a fluid curtain constituted by the respective streams towards said intake opening at a predetermined cleaning angle relative to the plane of said intake opening, including a baffle in said suction channel, said baffle being spaced from said outlets and extending generally along the row of said outlets, said baffle having a fluid-deflecting substantially planar portion which is located in the paths of the respective streams and which is inclined at said predetermined cleaning angle which is different from said predetermined angle of inclination of said streams for intercepting the respective streams and for directing the latter to flow for a distance along said substantially planar portion prior to impingement upon the surface to

be cleaned, said baffle also having an enlarged rounded portion which extends in an arcuate path from said substantially planar portion and into said suction channel in direction away from the plane of said intake opening, said enlarged rounded portion being sufficiently rounded to direct the intercepted streams to flow at least in part along said arcuate path towards said suction attachment so as to prevent fluid from undesirably dripping onto the surface to be cleaned when said cleaning head is lifted therefrom.

4,073,031
VACUUM CLEANER NOZZLE WITH RETRACTABLE BRUSH

Osten Schwartz, Varmdo, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Mar. 15, 1976, Ser. No. 666,581
Claims priority, application Sweden, Mar. 26, 1975, 7503538
Int. Cl.² A47L *9/02*
U.S. Cl. 15—373 **4 Claims**



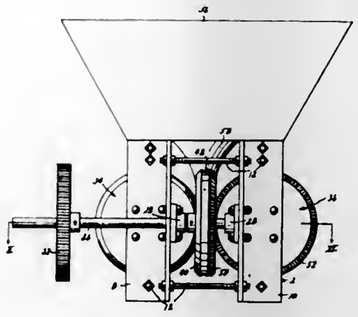
1. A vacuum cleaner nozzle having a fixed open bottom part facing the surface to be cleaned, a brush carrying plate in said nozzle which is movable relative to said fixed bottom part and is utilized for cleaning another type of work surface, yieldable means urging said movable plate away from said bottom part, an operator, means supporting said operator on said movable brush carrying plate, said operator co-acting with said movable brush carrying plate for moving the latter between a first retracted position and a second extended position, said operator being externally accessible through the top of said nozzle and being capable of pivotal movement, a ledge on said operator whereby when the latter moves said ledge co-acts with a shoulder of said nozzle, the point of abutment of said ledge on said shoulder functioning as a first pivot point of said operator thereby permitting the latter to pivot, a vertical groove in at least part of said nozzle walls, said operator being provided with a shaft which is supported in said vertical groove, said shaft being provided with at least one projection, a recess in said nozzle walls for accommodating said projection, and in the second position of said movable plate said projection is released from said recess as said projection and operator are pivoted about a second point to thereby engage said projection with an abutment surface in said vertical groove whereby said movable plate is locked in its second extended position.

4,073,032
NUT CRACKING MACHINE

Ralph V. Packwood, Box 203, Exeter, Mo. 65647

Filed Nov. 24, 1976, Ser. No. 744,522
Int. Cl.² A23N *5/00*
U.S. Cl. 99—574 **1 Claim**

1. A nut cracking machine comprising a frame, cracking means consisting of a plurality of wheels carried rotatably by said frame, the axes of said wheels forming a closed polygon lying in a horizontal plane, each of said wheels contacting the next adjacent wheels centrally of said polygon, and there being a groove of arcuate cross-sectional contour formed peripherally in each of said wheels, said grooves of all of said wheels conjointly forming a circular orifice having a vertical axis at the juncture of said wheels, there being at least four of said wheels, in which case the axes of said wheels form a square, and the groove in the periphery of each of said wheels is on 90° angular extend in cross-sectional contour, gravity means operable to feed nuts and nut fragments to be cracked downwardly between said wheels to said orifice, said nuts and fragments being of non-circular cross-sectional and having a major dimension greater than the diameter of said orifice, and power means operable to rotate all of said wheels at equal speeds in

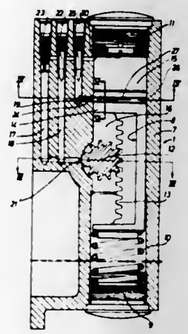


such directions that the portions of their peripheries defining said orifice at any given moment downwardly with respect to said orifice, whereby said nuts and fragments are drawn through said orifice and cracked by pressure across the major dimensions thereof.

4,073,033
DOOR CLOSING DEVICE

Sven-Olof Lexnäs, Vastra Frolunda, Sweden, assignor to Stilexo Johansson & Co. Aktiebolag, Skillingaryd, Sweden

Filed Feb. 13, 1976, Ser. No. 658,126
Claims priority, application Sweden, Feb. 14, 1975, 7501659
Int. Cl.² E05F *3/10*
U.S. Cl. 16—52 **3 Claims**

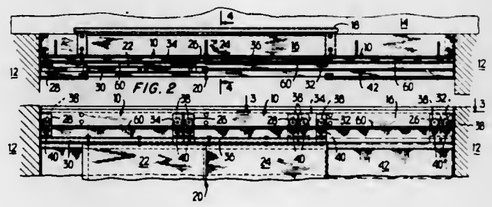


1. A door closing device comprising a fluid filled cylinder, a piston within said cylinder forming a first and second chambers and slidable in opposite directions, an arm and gear mechanism connected to the piston and adapted to be further connected to a pivotable door in order to transmit opening and closing movements of the door to the piston and vice versa, a sealing ring of metallic material positioned in a groove at one end of said piston, said sealing ring being open and expandable against the wall of said cylinder, a spring forcibly biasing the piston in one of its slidable directions, first and second by-pass channels communicating through a first port with a first chamber formed by one extreme end of said piston and through a second port with the second chamber formed by said piston, said first by-pass channel being provided with a check valve arranged to permit the free-flow of fluid in a direction caused by the piston sliding against the bias of the spring and to check the flow of fluid in the opposite direction, said second by-pass channel being provided with a throttle valve arranged to retard the flow of fluid in both directions, a third by-pass channel communicating said first port and said first chamber with a third port positioned between said first and second ports and at a distance with respect to the distance travelled by the sealing ring to permit intermittent communication of said third port with said first chamber.

4,073,034
DOOR-SUPPORTING SYSTEM FOR MULTIPANEL, SIDE-OPENING DOORS

Edward W. Martens, Memphis, Tenn., assignor to Dover Corporation, Memphis, Tenn.

Filed Sept. 13, 1976, Ser. No. 722,729
Int. Cl.² E05D *13/02*
U.S. Cl. 16—87 B **10 Claims**

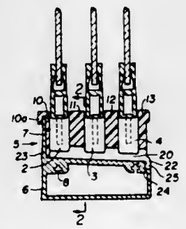


1. In a door-supporting system for a side-opening door, having a multiplicity of individual panels arranged parallel to one another, all the panels being capable of traveling in a first direction to open the door and in a second direction, opposite of the first direction, to close the door, each individual panel traveling a different distance than an adjacent panel during opening and closing of the door, the improvement comprising a single track and means for supporting each panel from said track, said supporting means including a multiplicity of pairs of spaced-apart hangers mounted from said track, each panel having a corresponding pair of said spaced-apart hangers attached thereto, one hanger of each panel being positioned for travel along said track between the hangers of an adjacent panel during opening and closing of the door, the hangers of said corresponding pair of spaced-apart hangers being spaced apart a distance at least equal to the width of the corresponding panel plus the width of the hanger of the adjacent panel positioned therebetween.

4,073,035
LOWER GUIDE MEMBER FOR ADJACENTLY SUSPENDED, SLIDEABLE PARTITIONS FOR A WET CHAMBER

Heinz Georg Baus, Ulmenweg 46, Thun, Switzerland

Filed Apr. 16, 1976, Ser. No. 677,797
Claims priority, application Germany, Apr. 17, 1975, 2516851
Int. Cl.² E05D *13/02*
U.S. Cl. 16—96 R **6 Claims**

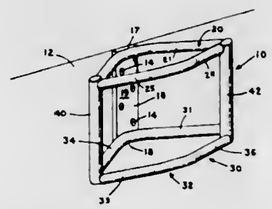


1. Lower guide member for adjacently suspended, slideable partitions for a wet chamber comprising a compensating member seatable on the edge of a wet-chamber tub and having a hollow profile, means providing an upper surface for said compensating member decreasing in elevation toward the wet chamber, and a removable elongated guide rail secured to said compensating member, said compensating member being closed at said upper surface and having a lateral longitudinal side with a wall extending along said lateral longitudinal side at said upper surface, said guide rail overlapping said wall and comprising parallel U-shaped guides, guide walls respectively bordering said guides and connected to one another, and connecting bars extending perpendicularly to said U-shaped guides, said connecting bars being disposed on said upper surface, said guide rail being formed with water outlet openings directed toward the wet chamber.

4,073,036
MULTI-WAY GRAB RAIL

Leopold Bustin, Emmans Road, Flanders, N.J. 07836

Filed Jan. 19, 1977, Ser. No. 760,363
Int. Cl.² B60N *3/02*
U.S. Cl. 16—110 R **5 Claims**

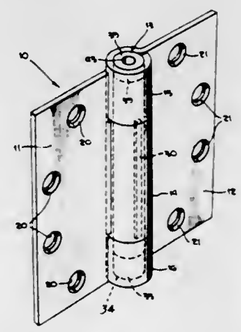


1. A multi-grab handle comprising:
a. a base plate, said base plate having an upper end, a lower end and a front surface;
b. a first grab handle element extending generally normally to said surface of said base plate, said first grab handle element being rigidly secured to said upper end of said base plate;
c. a second grab handle element extending generally normally to said surface of said base plate, said second grab handle element being rigidly secured to said lower end of said base plate; and
d. third and fourth grab handle elements, said third and fourth grab hand elements comprising spaced generally parallel bars extending between and rigidly secured to said first and second grab handle elements.

4,073,037
HINGE PINTLE RETAINING MEANS

Edward G. Curry, and Vernard W. Sanders, both of Los Angeles, Calif., assignors to Henry Soss and Company, Los Angeles, Calif.

Filed Oct. 7, 1976, Ser. No. 730,340
Int. Cl.² E05D *5/12*; E05F *1/14, 3/20*
U.S. Cl. 16—169 **7 Claims**



1. A hinge assembly comprising a pair of hinge leaves having

knuckles on the respective leaves in axial alignment, each knuckle having a chamber in axial alignment with the chamber in the other knuckle, said leaves having collapsed positions, normal extended positions, and positions in excess of said normal extended positions,

a unitary self contained pintle subassembly adapted for reception in said chambers to serve as a pivot for said hinge assembly, said pintle subassembly comprising a tubular housing having a length not less than the aggregate length of adjacent knuckles and extending throughout said aggregate length, said tubular housing providing interior space for a spring motor,

a keying rib attached to and extending axially along the exterior of said tubular housing at a location intermediate opposite ends,

a groove in each of the knuckles, the groove in one of said knuckles being open at both ends and the groove in the other knuckle being open at only one end,

said grooves being in axial alignment with each other only when the leaves of the hinge are rotated to positions in excess of said normal extended positions to enable insertion of the pintle into the chambers and the accompanying rib into the grooves of the respective knuckles,

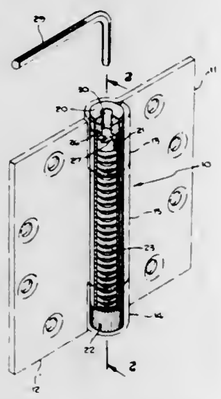
said grooves being out of alignment in all other positions of the leaves whereby to inhibit removal of the pintle.

4,073,038

PINTLE WITH ADJUSTABLE SPRING TENSION MOTOR

Edward G. Curry, and Vernard W. Sanders, both of Los Angeles, Calif., assignors to Henry Soss and Company, Los Angeles, Calif.

Filed Oct. 7, 1976, Ser. No. 730,341
Int. Cl.² E05F *1/12*
U.S. Cl. 16—189 **11 Claims**



1. A separate torsion spring motor unit, for action between pivotally mounted elements, comprising a cylindrical housing having an elongated chamber therein,

a coiled torsion spring in said chamber, a first spring keeper having an attachment to one end of the spring at an adjacent end of the chamber and having a rotatable mounting relative to said housing,

a spring tension subassembly comprising a second spring keeper having an attachment to the other end of the spring and rotatable relative to said housing,

a plug fixed to the end of the housing adjacent said second spring keeper, detent means comprising elements respectively on said plug and said second spring keeper,

means on said second spring keeper enabling rotation of said second spring keeper to vary tension in said spring, and access means past said plug to said means on said second spring keeper,

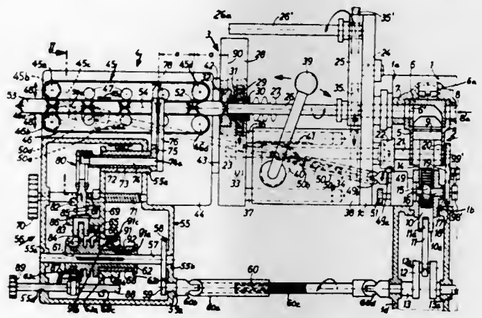
said detent means having a blocking engagement in one rotational direction whereby to maintain spring tension and being yieldable in the opposite rotational direction whereby to enable rotation to increase spring tension, said detent means being yieldable in an axial direction whereby to enable a release of detent action and effect a variable decrease in spring tension.

4,073,039

APPARATUS FOR THE PRODUCTION OF SAUSAGE

Johann Müller, Biberach; Hans Ernst Weerth, Winterstettenstadt, and Georg Staudenrausch, Biberach-Rissegg, all of Germany, assignors to Albert Handtmann, Biberach, Germany

Filed Feb. 2, 1977, Ser. No. 764,990
Claims priority, application Germany, Feb. 13, 1976, 2605745
Int. Cl.² A22C *11/00*
U.S. Cl. 17—1 F **12 Claims**



1. An apparatus for producing links of sausage of equal length and equal weight, comprising:

a housing;

dosaging pump means on said housing for displacing masses of sausage filling in a predetermined cadence;

a filling tube adapted to carry a loose length of sausage casing and connectable with said pump means for feeding the sausage filling into said casing and forming links of sausage therein;

twisting means at a downstream end of said tube for twisting said casing between the links of sausage, said twisting means operating substantially in the cadence of said pump means;

a conveyor on said support downstream of said twisting means defining a transport path for sausage links separated by twisted portions of said sausage casing said transport path having an upstream end and a downstream end;

a cutting device on said support along said transport path between the ends thereof of said conveyor for severing selected lengths from one another at the twisted portion therebetween;

mechanism for varying the distance between said cutting device and said twisting means; and

an actuator connected to said cutting device and operatively connected to one of said means for operating said device in synchronism with said one of said means for severing said portion to separate an integral number of links from the chain of sausage links produced at said twisting means for each operation of said device.

4,073,040

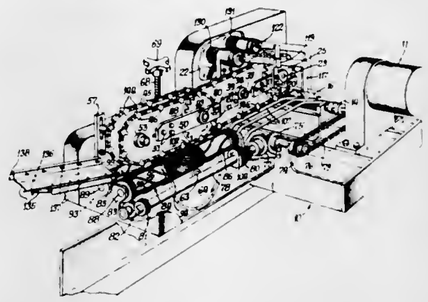
MACHINE FOR PROCESS OF POULTRY GIZZARDS

Carl J. Hill, Rte. 2, Ball Ground, Ga. 30107

Filed Aug. 13, 1975, Ser. No. 604,165
Int. Cl.² A22C *17/14*
U.S. Cl. 17—43 **21 Claims**

1. In a machine for processing a poultry gizzard having the stomach attached thereto and comprising a first device at a first station for detaching the stomach, a second device including a blade rotating on a shaft at a second station for slitting one side of the gizzard, a third device at a third station for separating the sides of the gizzard at said split to expose the interior of the gizzard, means for moving the gizzard sequentially from the first to the third station, and power means for operating said devices, the improvement comprising:

said first device comprising a first pair of rolls, each having an axis, positioned in juxtaposition with their axes parallel and approximately horizontal, said power means rotating said rolls in directions such that the tops thereof are turning toward each other;



said third device comprising a second pair of rolls, each having an axis, positioned in juxtaposition with their axes parallel and approximately horizontal, the rolls of the second pair being coaxial with the rolls of the first pair, said power means rotating the second pair of rolls in directions such that the tops thereof are turning away from each other;

said blade shaft being below said second pair of rolls with the blade extending upwardly between the second pair of rolls at least to the elevation of the tops thereof; and

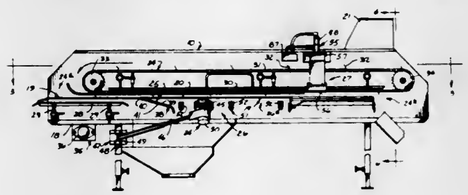
said moving means having a portion above the rolls and generally parallel to said axes and engaging the gizzard to move the gizzard parallel to the axes and hold the gizzard against the tops of said rolls.

4,073,041

CRAB BUTCHERING MACHINE

Walter L. Davis, and Henry V. Svehaug, both of Milton-Freewater, Oreg., assignors to Applied Magnetics, Inc., Goleta, Calif.

Filed Aug. 30, 1976, Ser. No. 719,075
Int. Cl.² A22C *29/04, 25/08*
U.S. Cl. 17—71 **6 Claims**



1. A crab butchering machine, comprising:

an elongated crab support means for slidably supporting a crab carcass at points thereon between its carapace and the proximal articulation of its legs with the carapace facing downwardly;

an overhead endless chain conveyor having lugs thereon for engaging and sliding successive crabs along the elongated crab support means in a prescribed path from an infeed station to a discharge station;

carapace removing means along the prescribed path for performing the carapace removal operation as the crab is slid along the path exposing the crab body including the viscera and the gills;

viscera removing means along the path and beneath the crab support means for performing the viscera removal operation as the crab is moved along the prescribed path;

a pair of rotatable gill removing brushes beneath the crab support means on opposite sides of the path and powered to rotate about axes for performing the gill removal operation;

biasing means for yieldably urging the brushes inward against the crab body with the brushes following the contours of the crab body to efficiently remove the gills without damaging the body;

leg severing means along the path for performing the leg severing operation; and

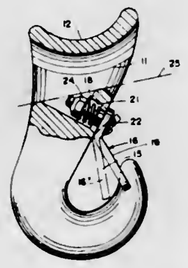
control means for varying the speed of the conveying means to increase the rate of movement of the crabs between the removal and severing operations and to decrease the rate of movement of the crabs during the removal and severing operations.

4,073,042

SAFETY HOOK

Franklin L. Miller, Portland, Oreg., assignor to Esco Corporation, Portland, Oreg.

Filed Nov. 26, 1975, Ser. No. 635,763
Int. Cl.² A44B *13/02*
U.S. Cl. 24—241 P **2 Claims**



1. A safety hook comprising a unitary body having a shank curving downwardly and forwardly into a bill with the upper end of said bill being in spaced relation to said shank to provide a throat,

said body at the upper end thereof being equipped with a passageway adapted to receive a wire rope, said passageway extending from the rear of said body forwardly therethrough, said passageway being relatively elongated and being longitudinally arcuate,

a latch member pivotally mounted on said shank and extending across said throat in a first position to releasably engage said bill to close said throat,

a bolt pivotally securing said latch member to said shank for arcuate movement of said latch member to a second position upon said bill,

said passageway having a smooth upper wall and a lower wall interrupted to provide a forwardly extending recess terminating in a bolt-receiving opening, said bolt extending through said opening into said recess, and

a spring and nut in said recess mounted on said bolt, said recess being constructed and arranged relative to said nut and bolt so as to shield the same from a wire rope in said passageway.

4,073,043

DRIVE SYSTEM FOR NAPPER MACHINE STRIPPERS

Vander B. Lowder, 320 Bypass - 29 North, Concord, N.C. 28025

Filed Mar. 9, 1977, Ser. No. 775,881
Int. Cl.² D06C *11/00*
U.S. Cl. 26—33 **4 Claims**

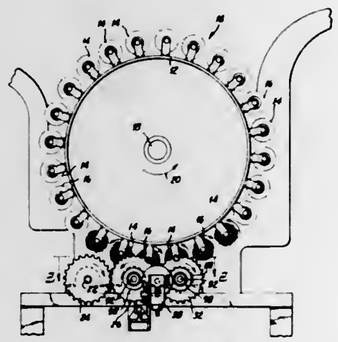
1. In a cloth napper apparatus including rotatable napper

rollers carried by a rotatable annular carrier, and at least a pair of napper stripper drive shafts interconnected by drive gearing to each other and to a drive means for the carrier, the improvement comprising:

(a) each stripper drive shaft having a stripper drive gear coaxially mounted thereon, the stripper drive gears being engaged with one another;

(b) at least one input drive gear engaged with one of the stripper drive gears, and drivingly connected to the carrier drive means in a manner enabling timed rotation of the stripper drive shafts with respect to the carrier;

(c) separate and independent overload release clutch means mounted on each stripper drive shaft;



(d) each clutch means releasably connecting each stripper drive gear to its respective drive shaft when the clutch means is engaged;

(e) each stripper drive gear being freely rotatable about the respective stripper drive shaft when the clutch means is disengaged;

(f) means for positively holding the clutch in its disengaged position when it becomes disengaged;

(g) means for resetting the clutch to its engaged position from a disengaged position; and

(h) means for preventing resetting of the clutch means to its engaged position unless the respective stripper drive shaft and stripper drive gear connected to the clutch means are in a predetermined rotational angular relationship to each other.

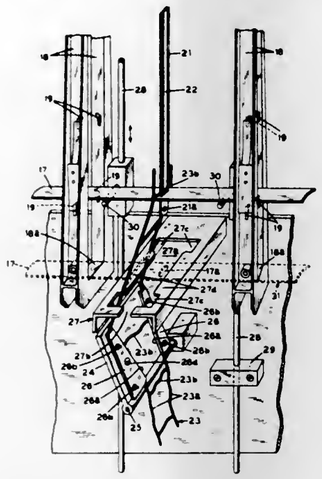
4,073,044

APPARATUS FOR ASSEMBLING LOUVRED BLINDS

Gerardus Hendrikus Edixhoven, Voorschoten, Netherlands, assignor to Hunter Douglas International N.V., Willemstad, Netherlands Antilles

Filed Aug. 4, 1976, Ser. No. 711,446
Claims priority, application Germany, Aug. 8, 1975, 2535453
Int. Cl.[2] B23P *19/04*
U.S. Cl. 29—24.5 **13 Claims**

1. The method of assembling louvred blinds having louvres with holes therein, an elevating member, and a ladder having a pair of stringers with a plurality of rungs extending between said stringers comprising positioning a needle for threading the elevating member through holes in the louvres with the longitudinal axis of said needle vertical, guiding and positioning the ladder by means of a pivoted flap in guiding relationship with the ladder, inserting louvres successively between adjacent rungs of said ladder, raising each successive louvre after its insertion in said ladder to pass said needle through a hole in the louvre, raising of a louvre effecting upward movement of the ladder during at least a portion of the raising movement of the louvre, pivoting said flap to and between a first position in which said flap positions said ladder with a rung to one side of the vertical axis of said needle and a second position in which said flap positions the next successive rung of the ladder to the other side of said axis, and effecting the pivoting of said flap



solely and directly by forces exerted on said flap by said ladder during upward movements of said ladder.

4,073,045

CONVECTOR FOR HEATING ROOMS

Peter Heinrich Erwin Margen; Harry Evert Grimstedt, and Jan Anders Bosaeus, all of Nykoping, Sweden, assignors to Aktiebolaget Atomenergi, Stockholm, Sweden

Division of Ser. No. 433,003, Jan. 14, 1974, abandoned. This application Apr. 25, 1975, Ser. No. 571,846
Int. Cl.[2] B23P *15/26*
U.S. Cl. 29—157.3 C **9 Claims**



1. Method of manufacturing a convector for heating rooms comprising forming two uprights each having an upwardly extending central axis and a plurality of guide surfaces curved in the direction extending tranversely of the central axis with the guide surfaces alternating in the upward direction of the uprights, displacing adjacent guide surfaces equal distances from and in the opposite direction from the central axis, winding a tube of cross-linked polyethylene while it is still warm from the cross-linking process serially around the alternating guide surfaces for forming a helical coil, displacing the uprights out of engagement with the helically coiled tube and removing the uprights from within the coil.

4,073,046

SHOCK ABSORBER INSTALLATION TOOL

Frederick G. Ramsden, 157 Division St., East Greenwich, R.I. 02886

Filed Oct. 28, 1975, Ser. No. 626,540
Int. Cl.[2] B25B *27/14;* **B23P** *7/00*
U.S. Cl. 29—401 R **10 Claims**

1. A tool for installing shock absorbers comprising:

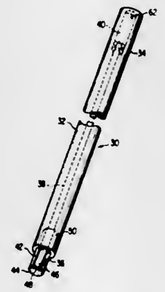
an elongated member, said elongated member having at its forward end a non-expandable bolt having disposed thereon a series of rearwardly facing projections said bolt and said rearwardly facing projections being of sufficient

size to seat in the inside opening of a shock absorber shaft such that upon retraction said rearwardly facing projections are forced into the metal confronting wall defining the inside opening in the top of a shock absorber's upper shaft, and a handle at the rearward end for guiding said upper shaft of said shock absorber into a shock absorber bearing support.

5. A tool for installing shock absorbers comprising:

(a) a hollow elongated member having at one end;

(b) an adjustable member for engaging the upper shaft of a shock absorber said adjustable member comprising a laterally expandable bolt disposed on said hollow elongated member, said bolt having at its forward end a plurality of



laterally expandable prongs, said prongs providing maximum lateral expansion at the terminal end of said expandable bolt;

(c) means for expanding said laterally expandable bolt, said means comprising a rod capable of forward and rearward actuation within said hollow elongated member wherein said forward and rearward actuation of said rod within said elongated member is provided by a screw assembly disposed in said elongated member and wherein the forward end of said rod provides bias against the internal sides of said prongs; and

(d) means at the other end of said hollow elongated member for guiding said upper shaft of said shock absorber into a shock absorber bearing support.

4,073,047

METHOD OF MAKING VIBRATION DAMPER

Byron L. Fishbaugh; Harold E. Keller, both of St. Marys, Ohio, and Lionel G. Stewart, N. Dartmouth, Mass., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 536,508, Dec. 26, 1974, Pat. No. 3,990,324, and a continuation-in-part of Ser. No. 449,159, March 7, 1974, abandoned. This application May 13, 1976, Ser. No. 685,965
Int. Cl.[2] B23P *11/02*
U.S. Cl. 29—450 **6 Claims**

1. A method of making a vibration damper for use with an oscillating body, said damper including an inner core member and an outer inertia ring member surrounding and axially spaced from said core member with a retaining band and a resilient damping elastomer disposed between said core and inertia ring members, said method comprising the steps of:

preparing the inner surface of the retaining band and the outer surface of the core;

applying a chemical adhesive system to said prepared surfaces;

placing the retaining band and the core members in a mold in concentric relative position such that an annular mold space exists between the core and the outwardly positioned band;

filling the annular mold space with damping elastomer, said mold characterized by having its end surfaces in a configuration for forming annular grooves in the finished elastomer upon vulcanization;

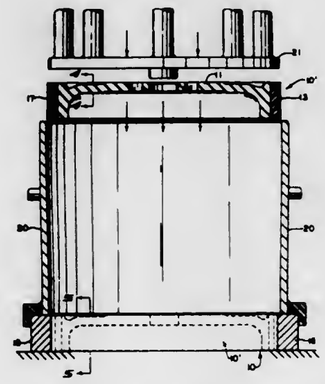
applying heat and pressure to said mold to vulcanize the elastomer and initiate a chemical bonding action between the elastomer and the confronting peripheral surfaces of the band and the core, said elastomer extending across the entire width of said band and core members to form an integrally assembled unit;

removing said assembled unit from the mold and force fitting said unit into the inertia ring such that the damping elastomer remains in a limited compressed condition.

3. A method of making a vibration damper for use with an oscillating body, said damper including an inner core member and an outer inertia ring member surrounding and axially spaced from said core member with a retaining band and a resilient damping elastomer disposed between said core and inertia ring members, said method comprising the steps of:

preparing the inner surface of the inertia ring and the outer surface of the retaining band;

applying a chemical adhesive system to said prepared surfaces;



placing the inertia ring and the retaining band in a mold in concentric relative position such that an annular mold space exists between the band and the outwardly positioned inertia ring;

filling the annular mold space with damping elastomer, said mold characterized by having its end surfaces in a configuration for forming annular grooves in the finished elastomer upon vulcanization;

applying heat and pressure to said mold to vulcanize the elastomer and initiate a chemical bonding action between the elastomer and the confronting peripheral surfaces of the inertia ring and retaining band members, said elastomer extending across the entire width of said band and inertia ring to form an integrally assembled unit;

removing said assembled unit from the mold and force fitting said unit onto the core member such that the damping elastomer remains in a limited compressed condition.

4,073,048

GASKET SEAL BETWEEN SEWER PIPE AND MANHOLE OPENING

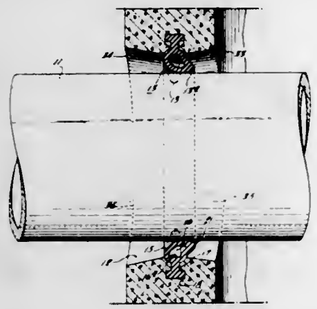
John Ditcher, Langhorne, Pa., assignor to A-Lok Corporation, Trenton, N.J.

Filed July 30, 1976, Ser. No. 710,264
Int. Cl.[2] B23P *11/02*
U.S. Cl. 29—450 **5 Claims**

1. The method of constructing a disk-like gasket for sealing the space between a pipe and an opening through which the pipe passes, which method comprises the following procedures:

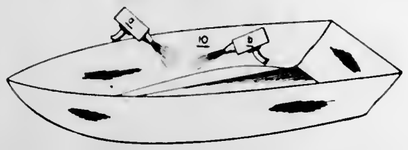
(a) Providing an extrusion of elastomeric material having, in cross section, the shape of a hollow, pear-shaped head integrated in a mid region of its lower part with a flange in the shape of an inverted "T", the height of said extrusion being greater than its width,

(b) Cutting the extrusion to a length approximating the outer circumference of the pipe,
(c) Vulcanizing the ends of the extrusion together to form a right cylinder, wherein the height of the extrusion extends in an axial direction,



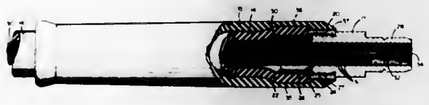
(d) Deflecting the walls of the cylinder into a disk-like form, wherein the height of the extrusion extends transversely of the axis, with its head portion inward and its flange portion outward, thus placing the inner portion of the gasket in compression and the outer portion in tension and
(e) Embedding the flange portion only in settable material.

4,073,049
METHOD OF MAKING A REINFORCED FOAM-FILLED RESIN-IMPREGNATED FIBER GLASS COVERED VACUUM FORMING MOLD PLUG
Robert E. Lint, Medford, N.J., assignor to Rohm and Haas Company, Philadelphia, Pa.
Filed Jan. 27, 1975, Ser. No. 544,525
Int. Cl.² B29D *3/02*; B32B *31/06*; B29D *27/04*
U.S. Cl. 29—458 **7 Claims**



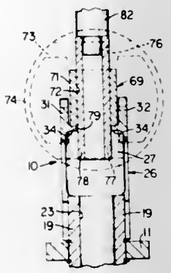
1. A method for making a mold suitable for vacuum thermoforming, compressing:
a. forming a polyester gel coat on a master pattern;
b. applying a rigidizing mixture of a thermosetting resin and glass fiber to said gel coat and curing said resin;
c. constructing and bonding on egg crate framework to the rigid layer, said egg crate framework defining spaces in the molds;
d. filling the spaces defined by the egg crate framework with a polymeric rigidizing foam;
e. forming a vacuum plenum chamber by
i. attaching a first cap board to said polymeric foam and said crate framework; and
ii. attaching spacers to said first cap board and a second cap board to said spacers, the first and second cap board being of a durable material which remains rigid under vacuum forming conditions;
f. securing to said vacuum plenum chamber a means for introducing a vacuum therein; and
g. forming air passageways through said gel coat, said rigid layer said polymeric rigidizing foam, said cap board and into said vacuum chamber, including forming some of said passageways adjacent portions of said mold corresponding to sharp angles and indentations in the molded product, thereby making said mold.

4,073,050
METHOD OF MAKING FIBEROPTIC CABLE ASSEMBLY
Jacobus Kloots, Sturbridge, Mass., assignor to Applied Fiberoptics, Inc., Southbridge, Mass.
Filed Aug. 31, 1976, Ser. No. 719,342
Int. Cl.² B23P *11/02*
U.S. Cl. 29—450 **4 Claims**



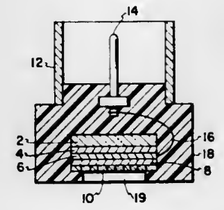
1. A method of assembling fiberoptic cables comprising:
a. cutting a length of extruded elastomer tubing;
b. fitting into one end of said tubing an insert while leaving a portion of said insert exposed;
c. placing said end into a mold and molding an end casing of elastomer around said tubing extending over and adhering to said insert;
d. installing a bundle of optical fibers in said tubing projecting at said one end;
e. securing a cylindrical end fitting into said insert;
f. cutting said fibers at said one end;
g. filling the interstices between said fibers and space between said fibers and said end fitting with cement; and,
h. polishing said fibers flush with said end fitting at said one end.

4,073,051
PISTON PIN INSTALLING AND REMOVING METHOD
James A. Okamuro, Kalamazoo, Mich., assignor to Borroughs Tool & Equipment Corporation, Kalamazoo, Mich.
Division of Ser. No. 698,671, June 22, 1976, Pat. No. 4,050,139.
This application Feb. 22, 1977, Ser. No. 770,454
Int. Cl.² B23P *19/02*
U.S. Cl. 29—427 **1 Claim**



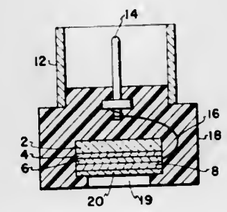
1. A method for assembling and disassembling a piston pin connection between a connecting rod and a piston head, said piston head being hollow and having spaced readily deformable walls which each have a first opening therein aligned with the other first opening, wherein said connecting rod has an end having a second opening therein adapted to receive said piston pin therein and wherein a clearance space exists between said end and said spaced walls of said piston head which have said aligned first openings therein, comprising:
supporting said connecting rod in said clearance space in a manner to engage said rod with said wall opposite said clearance space; and
moving said piston pin relative to said connecting rod and said piston head to effect said assembling and disassembling of said piston pin connection between said connecting rod and said piston head, the resistance to movement of said piston pin being absorbed by the support for said connecting rod.

4,073,052
METHOD OF MAKING A REFERENCE ELECTRODE
Eugene L. Szonntagh, Flourtown, Pa., assignor to Honeywell Inc., Minneapolis, Minn.
Division of Ser. No. 661,958, Feb. 27, 1976, Pat. No. 4,031,606, which is a division of Ser. No. 552,284, Feb. 24, 1975, abandoned.
This application Jan. 19, 1977, Ser. No. 760,542
Int. Cl.² B01J *17/00*
U.S. Cl. 29—570 **3 Claims**



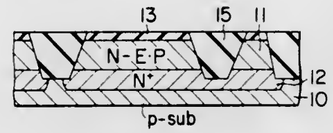
1. A method of making a reference electrode comprising the steps of depositing a metallic layer on an electrically insulating substrate, depositing a solid electrolyte layer on said metallic layer, depositing a glass layer on said electrolyte layer with a coefficient of thermal expansion mismatched with respect to a coefficient of thermal expansion of said electrolyte layer to produce cracking of said glass layer during a predetermined temperature cycle and exposing said electrode to said temperature cycle.

4,073,053
METHOD OF MAKING AN ION RESPONSIVE ELECTRODE
Eugene L. Szonntagh, Flourtown, Pa., assignor to Honeywell Inc., Minneapolis, Minn.
Division of Ser. No. 661,958, Feb. 27, 1976, Pat. No. 4,031,606, which is a division of Ser. No. 552,284, Feb. 24, 1975, abandoned.
This application Jan. 19, 1977, Ser. No. 760,584
Int. Cl.² B01J *17/00*
U.S. Cl. 29—570 **4 Claims**



1. A method for making a pH electrode comprising the steps of depositing a metallic layer of an electrically insulating substrate, depositing a solid electrolyte layer on said metallic layer, and depositing a pH glass layer by RF sputtering on said electrolyte layer, said glass layer having a coefficient of thermal expansion substantially matched with respect to a coefficient of thermal expansion of said electrolyte layer to maintain the integrity of said glass layer over a predetermined temperature range.

4,073,054
METHOD OF FABRICATING SEMICONDUCTOR DEVICE
Tadao Kaji, Tokyo, and Yoshio Homma, Hachioji, both of Japan, assignors to Hitachi, Ltd., Japan
Filed Aug. 13, 1976, Ser. No. 714,197
Claims priority, application Japan, Aug. 25, 1975, 50-102181
Int. Cl.² B01J *17/00*
U.S. Cl. 29—580 **1 Claim**

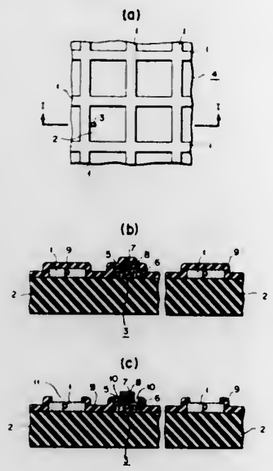


1. A method of fabricating a bipolar type semiconductor integrated circuit device, comprising the steps of:
(a) selectively forming an embedded N^+-type layer in one major surface of a substrate of P-type silicon;
(b) growing an N-type epitaxial layer all over the surface of said embedded N^+-type layer and said P-type silicon substrate;
(c) selectively etching said N-type epitaxial layer through a mask of suitable material to provide a groove which extends into said N^+-type layer;
(d) depositing an SiO_2 layer by chemical vapor deposition to cover said N-type epitaxial layer and to fill said groove;
(e) coating said CVD-SiO_2 layer with a layer of PIQ resin;
(f) applying rf sputtering from the side of the surface of said PIQ resin layer to remove by etching said PIQ resin layer and said CVD-SiO_2 layer to leave in said groove a portion of said CVD-SiO_2 layer having a flat surface extending flush with the surface of said mask thereby providing an isolation region;
(g) forming a P-type base region in said N-type epitaxial layer by diffusion;
(h) forming an N^+-type emitter region in said P-type base region by diffusion;
(i) forming an N^+-type collector contact region in the portion of said N-type epitaxial layer external to and spaced apart by said isolation region from the portion of said N-type epitaxial layer in which said P-type base region and said N^+-type emitter region are formed;
(j) depositing electrodes in contact with said N^+-type emitter region, said P-type base region and said N^+-type collector contact region respectively; and
(k) sealing the resultant device with a suitable resin.

4,073,055
METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICES
Minoru Kimura, Kawasaki; Hiroyuki Tango, and Yukio Ohmori, both of Yokohama, all of Japan, assignors to The President of the Agency of Industrial Science and Technology, Tokyo, Japan
Filed Feb. 22, 1977, Ser. No. 770,605
Claims priority, application Japan, Feb. 23, 1976, 51-17911
Int. Cl.² H01L *21/302*
U.S. Cl. 29—583 **10 Claims**

1. A method for manufacturing semiconductor devices, comprising the steps of
a. selectively forming first and second semiconductor regions on an insulating substrate, said first semiconductor region constituting a semiconductor element in a later step and said second semiconductor region being formed in a manner to substantially surround a semiconductor chip which is cut away from a semiconductor wafer along its dicing line in a later step;

b. forming said semiconductor element on said first semiconductor region; and



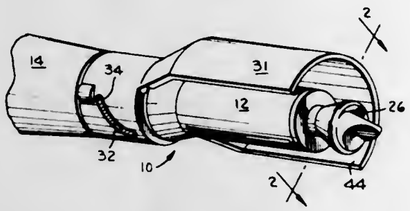
c. cutting said semiconductor chip away from said semiconductor wafer along the dicing line marked on said second region.

4,073,056

VEGETABLE PEELER

Robert L. Schaeffer, LeRoy, and William M. Maher, Churchville, both of N.Y., assignors to General Electric Company, Bridgeport, Conn.

Filed Apr. 11, 1977, Ser. No. 786,651
Int. Cl.² B26B *7/00*
U.S. Cl. 30—123.5 **4 Claims**



1. A vegetable peeler having a handle supporting a cylindrical and electrically rotatable cutter body with a longitudinally removable mounting shaft connected to said handle, a plurality of spaced cutter blades extending longitudinally from the body outer to inner end and a fixed splatter shield partially around and spaced from said body and supported on said handle, a cutter and shield release assembly comprising,

a cylindrical tapered support surface on said handle and a matching tapered support surface on said shield for telescopic locking together,

cam and slot connection means between said surfaces,

a flared inner end on said body, and

abutment means on said shield adjacent said flared end

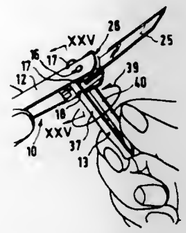
whereby rotation of the shield cams the handle and shield apart to break the tapered connection and simultaneously abuts the body flared end to release the cutter.

4,073,057

FOLDING BLADE KNIFE

Richard Gilbert, Dronfield Sheffield, England, assignor to Stanley Tools Limited, England

Continuation of Ser. No. 713,407, Aug. 11, 1976, abandoned. This application Apr. 4, 1977, Ser. No. 784,068
Claims priority, application United Kingdom, Aug. 26, 1975, 35245/75
Int. Cl.² B26B *5/00*
U.S. Cl. 30—153 **4 Claims**



1. A folding blade knife comprising, in combination:

a blade and a pivot for mounting the blade;

a first generally U-shaped guard member having arms, the free ends of which are pivotally connectable with the pivoted end of the blade to enable relative pivoting of the blade and said first guard member about a first axis to a first relative position in which the blade is stored between the arms of said first guard member and to a second relative position in which the blade is uncovered by said first guard member;

and a second generally U-shaped guard member having arms, the free ends of which are pivotally connectable with the pivoted end of the blade to enable the relative pivoting of the blade and said second guard member about a second axis which is perpendicular to but non-intersecting with said first axis to a first relative position in which the blade is stored between the arms of said second guard member and to a second relative position in which the blade is uncovered by said second guard member;

one of said guard members having its U-shaped end covered by the other of said guard members when the blade is stored by both guard members and the other of said guard members having its U-shaped end covered by the said one of said members when the blade is uncovered by both guard members;

an intermediate portion of at least one of the arms of one of said guard members projecting inwardly to engage the arms of the other of said guard members to latch the guard members together when the blade is in at least one of its relative positions with respect to both of said guard members.

4,073,058

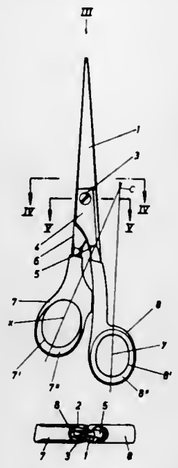
BARBER SCISSORS

Johannes Solf, Sindelfingen, and Rolf Eicker, Solingen, both of Germany, assignors to H. Eicker & Sohne, Solingen, Germany

Filed Dec. 15, 1976, Ser. No. 750,685
Claims priority, application Germany, Jan. 19, 1976, 2601687; May 29, 1976, 2624280
Int. Cl.² B26B *13/00*
U.S. Cl. 30—257 **18 Claims**

1. In a barber scissors having two halves, each including a blade provided with a tip and a cutting edge, a midsection having a pivot point, and a leg connecting said pivot point to a finger ring, said halves being operably linked at the pivot point by a bolt, the scissors having a central axis through said bolt and the tips in a closed position, the improvement wherein:

said finger rings are coplanar, a first half has a long leg while a second half has a short leg, and said bolt makes an acute angle ranging between substantially 60° and 80° with the plane of said finger rings,



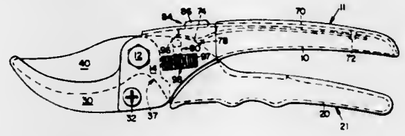
said legs being of different lengths with said finger rings being staggered by a distance of substantially a diameter of one finger ring, the longer leg being curved to cross said axis at an acute angle.

4,073,059

HOOK STYLE PRUNING SHEAR

Edward Morris Wallace, Longmeadow, and Robert George Gosselin, Springfield, both of Mass., assignors to Wallace Mfg. Corporation, Enfield, Conn.

Filed Aug. 30, 1976, Ser. No. 718,827
Int. Cl.² B26B *13/16*
U.S. Cl. 30—261 **6 Claims**



1. A pass-by type pruning shear comprising:

a cutting blade,

a holding blade,

a yoke shaped upper handle straddling the blades,

a lower handle unitary with the cutting blade,

interengaging means between handles and blades,

a cantilever type spring pinned to the upper handle at one extremity for biasing the upper and lower handles to opened position, and a power element mounted within and entirely concealed by the geometry of the upper handle in all operating positions and having a bearing relationship with the upper handle and cutting blade and spring for damping the impact of completion of a cutting function.

4,073,060

POTATO SPIRAL CUTTER

Leonard Monroe Hendricks, 1350 E. Main St., Houma, La. 70360

Filed Dec. 3, 1975, Ser. No. 637,476
Int. Cl.² B26B *3/04*
U.S. Cl. 30—279 R **1 Claim**

1. A device for cutting long spiral ribbons approximately ¼ inch square from a potato, said device is constructed of steel or similar material and consists of a handle to which are attached a blade, very thin, approximately 3 inches long, ¼ inch wide, parallel to the handle and cutter bars, also thin approximately ¼ inch wide, ¼ inch long, perpendicular to the handle and seperated from each other by a distance of approximately ¼ inch being evenly spaced and placed with one end attached to the handle and the other attached to the blade with the sharp edge facing the same direction as the sharp edge of the blade, a guideing spike attached to the end of the blade and handle,



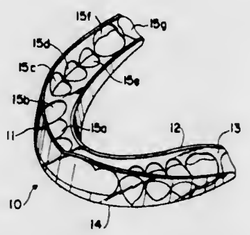
which is opposite the end held in the hand, at an angle approximately 10° from perpendicular and including a driving augar attached to the base of the spike, whereby when said spike is inserted in a potato the potato is pulled into the blade and cutter which will simultaneously disect the potato into ¼ inch spiral ribbons.

4,073,061

CLOSELY ADAPTED ORTHODONTIC APPLIANCE

Earl Olaf Bergersen, 950 Linden Ave, Winnetka, Ill. 60093

Filed June 11, 1976, Ser. No. 695,103
Int. Cl.² A61C *7/00*
U.S. Cl. 32—14 B **36 Claims**



1. An orthodontic appliance of the type which is generally U-shaped in plan view and which includes a tooth receiving trough for at least one of the upper or lower row of a patient's teeth, said trough being formed between a labial-buccal flange and a lingual flange,

said appliance being formed of a material which can be softened and non-elastically reshaped at a softening temperature which is located between 100° and 212° F. and which, below the softening temperature, is relatively hard, stiff and essentially non-resilient,

said appliance, after being reshaped, exactly fitting the teeth of a given patient at least in the area of the occlusal and incisal edges of a row of teeth and from the occlusal or incisal edges thereof to the undercut portion of the clinical crown surfaces of at least some of the teeth of that row,

said material, thus exactly fitting said teeth, being capable of snapping into place onto the said row of teeth to hold the patient's teeth in that position which it exactly fits.

4,073,062

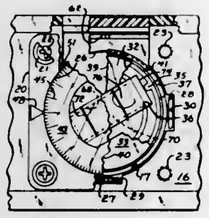
LEVEL

Donald E. Wright, 14265 Juneau Blvd., Elm Grove, Wis. 53122

Continuation of Ser. No. 592,731, July 3, 1975, abandoned. This application Oct. 20, 1976, Ser. No. 734,241

Int. Cl.[2] **G01C** *9/28*

U.S. Cl. 33—388 **6 Claims**



1. A level comprising:

a frame including elongated and substantially planar working surfaces mounted respectively on opposite sides of said frame and in substantially normal relationship therewith;

a level vial containing bubble indicating means and having bubble registry means adapted to register a level position when the longitudinal axis of the vial is positioned in a pre-selected plane;

selectively adjustable mounting means for rotating freely said level vial relative to said frame for variable, selective angular alignment of the longitudinal axis thereof with respect to the plane of the working surfaces;

said mounting means including inner and outer vial support cylinders, the inner cylinder containing the level vial and said inner cylinder being positioned within the outer cylinder, the outer cylinder being supported on the periphery thereof in an aperture in said frame for rotation about an axis disposed perpendicular to the plane of said frame;

said inner vial support cylinders consisting of two halves, each of the halves having opposed fingers and end slots located on its innermost wall to receive the vial in a close-fitting engagement, the outer wall of each of the halves having plural keys extending therefrom;

said outer vial support cylinders consisting of two halves, each of the halves having plural grooves located on its inner wall to accommodate the keys extending from the inner cylinder halves for establishing a pre-determined orientation with the vial contained between the inner cylinder halves with respect to the outer cylinder halves thereby allowing assembly of the vial, inner cylinder halves, and outer cylinder halves without any requirement of skilled adjustment and calibration; and

cover plates secured to said frame for restraining the outer cylinder against axial displacement relative to said frame, whereby the pre-selected orientation of said bubble indicating means with said registry means of said level vial indicates a pre-selected angular relationship of the longitudinal vial axis and the working surfaces when the one of the working surfaces is in contact with the surface being measured.

4,073,063

METHOD AND DEVICE FOR DRYING SURFACE TREATED, ESPECIALLY VARNISHED OBJECTS

Rolf Gutjahr, Stuttgart, Germany, assignor to Firma Otto Durr, Stuttgart, Germany

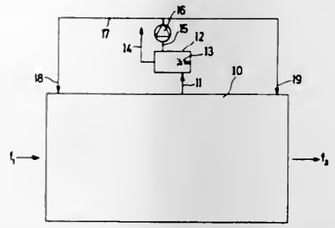
Filed Dec. 8, 1975, Ser. No. 639,003

Claims priority, application Germany, Aug. 19, 1975, 2536935

Int. Cl.[2] **F26B** *3/02*

U.S. Cl. 34—32 **5 Claims**

1. A device for drying solvent-based coatings on objects, comprising a drying housing having an upper wall, a lower wall and spaced end walls intermediate said upper and lower walls, each of said end walls having openings for permitting objects to be passed through said housing, all of said walls together bounding a drying chamber adapted to contain a gaseous atmosphere for drying solvent-based coatings on objects passing through said openings with concomitant charging of the gaseous atmosphere with contaminant solvent-based vapors; means for withdrawing a portion of the contaminant-entrained atmosphere from said drying housing, including an exhaust conduit located on said upper wall substantially centrally of said end walls and being in communication with said drying chamber; means for generating a heated gaseous medium, including heating means in communication with said exhaust conduit and operative for heating the contaminated withdrawn portion to a temperature sufficient to substantially incinerate the contaminants entrained therein to thereby generate a heated purified gas; means for discharging the heated purified gas to the ambient atmosphere, including a discharge



conduit in communication with said heating means and with the ambient atmosphere; and means for admitting the heated gaseous medium into said drying chamber, including a two-branch conduit having an inlet in communication with said generating means and a pair of outlets in communication with said drying chamber and being located on said upper wall, each outlet of said two-branch conduit being proximately located relative to a respective end wall of said drying housing and being spaced on opposite sides of said exhaust conduit at substantially the same distance from the latter, said admitting means further including means in said two-branch conduit for circulating the heated gaseous medium from said generating means through said two-branch conduit to be expelled from the respective outlets of the latter as separate streams which pass through said drying chamber along respective paths of substantially the same length towards said exhaust conduit.

4,073,064

REFRACTORY CONSTRUCTION DOME FOR FLUIDIZED BED REACTOR

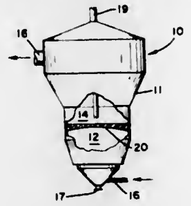
Andrew Beaumont Steever, Old Greenwich, and Richard Ernest Svencer, Norwalk, both of Conn., assignors to Dorr-Oliver Incorporated, Stamford, Conn.

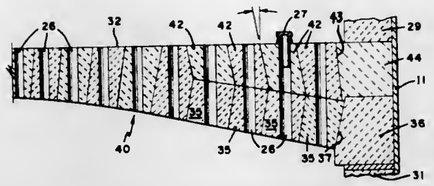
Filed Apr. 12, 1976, Ser. No. 675,858

Int. Cl.[2] **F23M** *5/02*

U.S. Cl. 34—57 A **7 Claims**

1. A fluidized bed reactor having a refractory-lined sidewall, a refractory constriction dome comprising a plurality of concentric courses of refractory brick, means supporting said refractory constriction dome in a position dividing the interior of said reactor into a reaction chamber and a windbox, a layer of refractory brick in said constriction dome arranged in the form of a reverse arch dome to resist upwardly directed forces imposed on said constriction dome, a ring of skewback refractory brick imbedded in said reactor sidewall, said skewback refractory brick engaging the outer periphery of said reverse arch dome to support said dome against said upwardly directed forces, said ring of skewback refractory brick having an inner oblique face, opening downwardly and contacting a





mating face provided on the outer periphery of said reverse arch dome.

4,073,065

METHOD AND APPARATUS FOR REDUCING LIQUID CONTENT OF FILTER CAKES

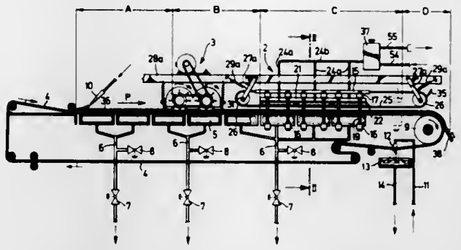
Paul Havalda, Arlesheim, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 7, 1976, Ser. No. 693,393

Claims priority, application Switzerland, June 10, 1975, 7475/75; May 6, 1976, 5690/76

Int. Cl.[2] **F26B** *19/00*

U.S. Cl. 34—71 **11 Claims**



1. Apparatus for reducing the liquid content in a layer of material formed on a filter comprising a mechanically driven belt filter, drying means comprising at least one vacuum chamber below the filter producing a differential gas pressure across the layer of material having a maximum pressure at the exposed surface of the layer of material and a minimum pressure at the filter, a press having a gas permeable pressure surface and means for forcing said pressure surface against the layer of material on the filter, means for moving the press backwards and forwards above the filter belt parallel to the direction of motion of the filter belt and control means controlling the press whereby in cyclic sequence,

a. the pressure surface is forced against the layer of material on the filter belt,

b. the pressure surface moves in synchronism with the belt for a predetermined distance from a starting position,

c. the pressure surface is disengaged from the layer of material on the filter belt, and

d. the pressure surface returns to said starting position.

4,073,066

METHYLENE CHLORIDE PHOSPHATIZING

Edward A. Rowe, Jr., and William H. Cawley, both of Lake County, Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Division of Ser. No. 560,378, March 20, 1975, Pat. No. 4,008,101. This application June 7, 1976, Ser. No. 693,642

Int. Cl.[2] **C23F** *7/08*

U.S. Cl. 34—73 **2 Claims**

1. A vapor zone adapted for rinsing and drying phosphate-coated metal that has been in contact with a phosphatizing liquid composition and thereafter comes into contact with said vapor zone, which zone comprises, in the ambient atmosphere of said zone, a mixture of methylene chloride vapor, solubilizing solvent vapor and water vapor, said vapor zone being maintained at a temperature within the range of from about 100° to about 105° F. at normal pressure, and wherein said vapor mixture will provide, on condensation, a homogeneous liquid condensate.

4,073,067

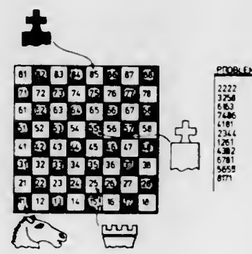
POCKET-SIZE ELECTRONIC DEVICE FOR PLAYING CHESS

Bruce M. Beach, Hornings Mills, Canada

Filed May 9, 1977, Ser. No. 795,177

Int. Cl.[2] **A63F** *3/00;* **G09B** *1/00*

U.S. Cl. 35—8 R **2 Claims**



1. A pocket-size portable electronic device for playing chess problems of the type which have a unique definitive solution within a determined number of white and black moves, said electronic device comprising an electronic visual display, a display driver, an 8-digit keyboard and scanner, function keys and scanner, a random access memory, registers and counters, and a logic control unit which includes a switchable data bus controlled by a read only memory, a read only memory pointer and a clock, said device displaying sequentially in digital form the black moves in opposition to the respective sequential entry of correct white moves, said read only memory by way of said logic control unit controlling the sequence of functions of said device in both a load mode and a play mode; in the load mode of said device, coded groups of data are supplied through said keyboard, which are decoded under the control of said read only memory according to an algorithm, and sequentially stored in said random access memory, the decoded groups of digits signifying the white and black moves in solving the chess problem and the sequence in which they are stored in said random access memory determining sequentially the white and black moves for the single solution, said logic control unit causing display of an indication when there is an incorrect entry of a coded group of digits when the conditions of the algorithm are unsatisfied; in the play mode, a group of digits indicating a user's attempted white move are entered through said keyboard, such group of digits having the same number of digits as the number in said stored decoded group of digits corresponding to the correct white move in the sequence, said logic control unit on a positive comparison direct-

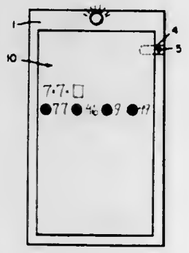
ing the display of the next group of decoded digits in the random access memory signifying the next black move and said logic control unit on a negative comparison causing the display of an indication of an incorrect white move, said logic control unit continuing the comparison of entered white moves with corresponding stored white moves until all of the black moves have been displayed at which point an end of game is displayed.

4,073,068

TEACHING LIGHT

Abraham R. Albenda, 1831 59th St., Brooklyn, N.Y. 11204

Filed June 2, 1977, Ser. No. 802,808
Int. Cl.² G09B *7/06*
U.S. Cl. 35—9 B **10 Claims**



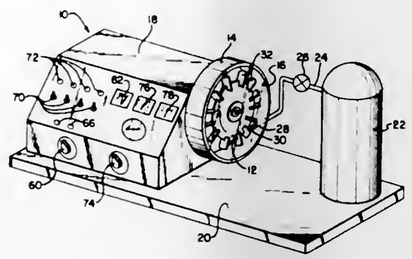
1. An electrical teaching apparatus comprising:
a substantially rigid electrically insulating base member;
a first electrically conducting layer partially covering a face of said base member;
an electrically conducting contact member on said base member, said contact member being spaced from and always out of contact with said first electrically conducting layer;
a source of power coupled between said contact member and said first electrically conducting layer;
an indicator light coupled in series circuit with said power source, said first electrically conducting layer and said contact member;
a question and answer member adapted to overlie said first electrically conducting layer and to engage said contact member, said question and answer member including an electrically insulating bottom layer control sheet which has at least one aperture therein; a second electrically conducting layer on the upper surface of said control sheet and overlying said at least one aperture; an upper electrically insulating question sheet overlying said second electrically conducting layer and having at least one question imprinted thereon and indicia for selecting an answer; said control sheet and question sheet being permanently coupled together at least along an edge thereof in registration with each other and with said at least one aperture in registration with a correct answer indicia, and defining at least one openable flap portion between said control sheet and question sheet, said contact member being passable through said openable flap portion for electrically contacting said second electrically conducting layer;
whereby when pressure is applied in the area of a correct answer indicia, an electrical circuit is completed to said indicator light from said power source, through said contact member and through said first and second electrically conducting layers which contact each other via said pressure in the vicinity of said at least one aperture in said control sheet.

4,073,069

TURBINE DEMONSTRATION

Vahan V. Basmajian, Billerica, Mass., assignor to Megatech Corporation, Billerica, Mass.

Filed Aug. 23, 1976, Ser. No. 716,384
Int. Cl.² G09B *25/02;* **F01D** *15/10;* **H02K** *7/18*
U.S. Cl. 35—13 **1 Claim**



1. Turbine demonstration apparatus comprising,
means defining a turbine wheel for rotating in response to impingement of a driving fluid thereon,
the wheel construction comprising a central circular plate form disc with elongated, circular arc plate turbine blades mounted on and bonded to the disc at close and regular intervals around the disc periphery,
said blades seating in spaced radial notches of the disc and partially overlapping the disc,
means defining a shallow depth turbine wheel housing, with a transparent cover, for enclosing the turbine wheel,
means defining at least one nozzle extending through the housing for ejecting fluid against the blades, said housing providing a stator reaction mount for the nozzle,
means defining a turbine control instrument chassis mounting an electrical generator and generator load circuit therein with a generator driving shaft extending through a chassis opening,
means for suspending said turbine wheel housing from said chassis and for drivingly coupling said shaft to the turbine wheel,
means defining at least one generator output measuring instrument mounted in said chassis and having a viewable display thereon,
chassis mounted means for adjusting the generator load circuit,
chassis mounted means for adjusting the field current of said electrical generator,
said at least one generator output measuring instrument comprising means for measuring the armature current of said electrical generator,
said electrical generator being mounted from a sidewall of said chassis and within said chassis,
a shaft extension suspended from the shaft of said electrical generator and carrying said wheel to constitute said means for drivingly coupling,
means for generating motive fluid,
and common mounting means for said motive fluid generating means and said turbine control instrument chassis.

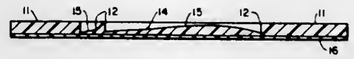
4,073,070

COLORING BOOK FOR THE BLIND

Jacquelin Vaughan Boston, 1101 Palmer Road, Oxon Hill, Md. 20022

Filed Apr. 26, 1977, Ser. No. 790,969
Int. Cl.² G09B *11/04*
U.S. Cl. 35—26 **7 Claims**

1. In a coloring book for the blind, a page comprising at least one image thereon having at least one portion to be colored, said image being recessed within the page thereby forming a tactual outline within which the image is to be colored, raised border lines within the outline of the recessed image to tactually demarcate the respective portions of the image, definitive tactile indicia associated with said images for defining the colors of the respective portions of the images, and coloring means having identifying tactile indicia thereon corresponding to the definitive tactile indicia whereby a blind person may select the appropriate color the respective portions of the images in accordance with the definitive tactile indicia.

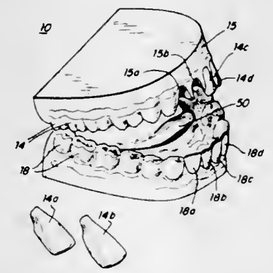


4,073,071

HUMAN MOUTH MODEL FOR SPEECH THERAPY

Norma Angelotti, 24 Trumbull Ave., Haverhill, Mass. 01830

Filed Dec. 30, 1976, Ser. No. 754,445
Int. Cl.² G09B *19/04*
U.S. Cl. 35—35 R **3 Claims**



1. A human mouth model having necessary anatomical structure for demonstrating tongue positions to form sound for speech therapy instruction comprising: a transparent upper jaw portion including a hard palate portion, a soft palate portion, gums and a set of upper teeth; a transparent lower jaw portion including a mouth floor, gums, and a set of lower teeth; at least one of said teeth in either set being replaceably removable; an opening formed by the rearward end of said jaw portions in the area of the oral part of the pharynx; a formable and deformable tongue in said mouth and accessible through said opening for manual manipulation; hinge means interconnecting the rearward ends of said jaw portions; said hinge means enabling said jaw portions to swing apart fully to a generally 180° open position.

4,073,072

AIR CIRCULATION SHOE MATERIAL

Alexander Louis Gross, Aspen, Colo., and Erik O. Giese, Key Biscayne, Fla., assignors to Comfort Products, Inc., Aspen, Colo.

Continuation-in-part of Ser. No. 605,999, Aug. 20, 1975, abandoned. This application Aug. 31, 1976, Ser. No. 719,080
Int. Cl.² A43B *13/38*
U.S. Cl. 36—44 **9 Claims**



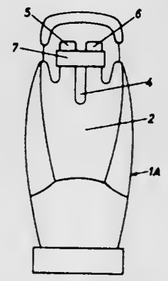
1. An air circulation shoe material comprising a mesh-like plastic first fabric, a mesh-like plastic second fabric spaced from said first fabric, a corrugated plastic separating material extending between and joining said first and second fabrics to form a non-collapsible air space between said fabrics and where said separating material is adapted to resist deformation of said first and second fabrics towards each other to maintain the integrity of the non-collapsible air spaces upon application of a compressive force equal to the body weight of the wearer.

4,073,073

SKIING BOOT

Sigurd Seidel, Graz, Austria, assignor to Skischuhfabrik Dynafit Gesellschaft m.b.H., Graz, Austria

Filed Nov. 15, 1976, Ser. No. 742,061
Int. Cl.² A43B *11/00, 21/00, 5/04*
U.S. Cl. 36—50 **4 Claims**



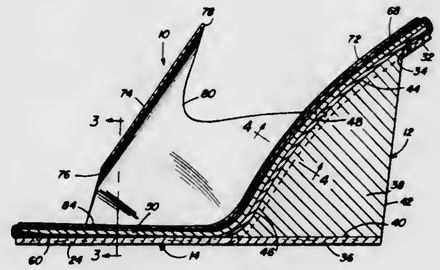
1. A skiing boot comprising an upper having a rear portion that extends upwardly and forwardly and is formed at least at its upper end with a substantially central slot, which is adapted to be closed by means comprising ribs extending along the edges of said slot, and a slider adjustably mounted on said ribs, said slider having a stem extending through said slot, a bearing member carried by said stem and engaging the inside of the upper on both sides of said slot, a clip fitted on said stem and embracing said ribs, and eccentric means adapted to assume an operative position in which said eccentric means forces the bearing member and the clip towards each other so as to grip said ribs between said bearing member and the clip.

4,073,074

LADIES SHOE CONSTRUCTION

Harry H. Rabin, Miami, and Florencio P. Aquino, Hialeah, both of Fla., assignors to Miami Footwear Corporation, Miami, Fla.

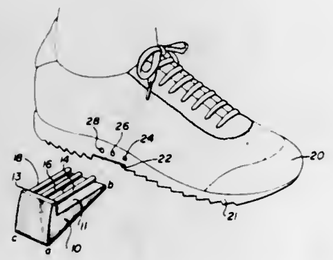
Filed Dec. 29, 1976, Ser. No. 755,199
Int. Cl.² A43B *13/28;* **A43D** *9/00*
U.S. Cl. 36—104 **5 Claims**



1. A shoe comprising an outsole, an insole overlying the outsole, an upper secured to the outsole and insole and a heel supporting the rear of the shoe, said outsole including a panel of unitary construction and including a forepart, a shank portion and heel portion, said outsole including a slot formed in the shank and heel portion defined by a tongue forming an extension of the forepart and engaged with the bottom surface

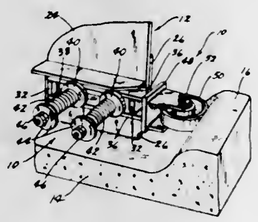
of the heel to complete the bottom construction for the heel, said heel including a heel seat received in the slot and extending substantially throughout the length and width of the slot with the width of the heel being less than the width of the shank and heel portion of the outsole.

4,073,075
GOLF TRAINING DEVICE
John P. O'Brien, 175 E. Delaware Place, Chicago, Ill. 60611
Continuation-in-part of Ser. No. 683,898, May 6, 1976, abandoned. This application Dec. 23, 1976, Ser. No. 753,927
Int. Cl.[2] A63B *69/36;* A43B *5/00*
U.S. Cl. 36—127 **8 Claims**



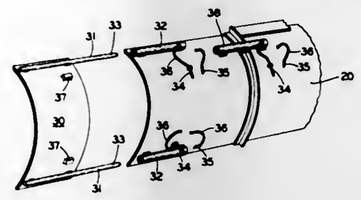
1. A wedge-shaped golf training device adapted to be removably affixed to a shoe, said training device comprising a wedge-shaped body, having a lower, ground engaging surface, and an upper support surface adapted to complement the lower surface of a shoe to be supported, said wedge-shaped body including an upper extension at its thickest end, at least one sole-engaging pin mounted on said upper extension, said sole-engaging pin being mounted approximately parallel to the plane of said support surface and at approximate right angles to said upper extension.

4,073,076
SNOW PLOW BLADE GUARD
William J. Fortune, Ankeny, Iowa, assignor to Great Ideas Corporation, Des Moines, Iowa
Filed Mar. 14, 1977, Ser. No. 777,565
Int. Cl.[2] E01H *5/04*
U.S. Cl. 37—42 VL **10 Claims**



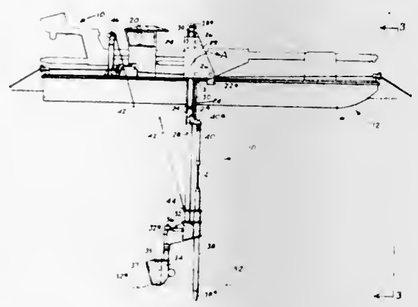
1. A snow plow blade comprising,
an upstanding blade having a lower edge and opposite end edges,
a blade guard connected to said blade extending horizontally outwardly of one of said ends of said blade,
spring means operatively connected between said blade and said guard for allowing said guard to yieldably move horizontally upon engagement with an obstruction outwardly of said one end of said blade, and
said guard including a horizontally extending arm connecting it to a mounting bracket connected to said blade, and said bracket including bolt means with said spring means being mounted thereon operatively engaging said arm.

4,073,077
SNOWPLOW BLADE EXTENSION
Albert E. Essel, deceased, late of Twinsburg, Ohio, and by Virginia G. Essel, executrix, 9310 Ravenna Road, Twinsburg, Ohio 44087
Filed Jan. 3, 1977, Ser. No. 756,148
Int. Cl.[2] E01H *5/00*
U.S. Cl. 37—50 **10 Claims**



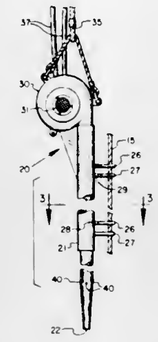
1. The combination of a snowplow blade on a motorized vehicle, with a tubular socket which extends longitudinally of the blade on its back surface and which is an immovable part of the blade structure, and with a removable extension of a shape corresponding to that of the blade and from which projects a longitudinal stud fitting the socket for removably holding the extension in a working position beyond an end of the blade, and a locking device for preventing unintended motion of the stud out of the socket.

4,073,078
ADJUSTABLE DREDGING AND TRENCHING APPARATUS
Julius H. Leitz, 6211 N. Ensign, Portland, Oreg. 97217
Filed Nov. 3, 1975, Ser. No. 628,116
Int. Cl.[2] E02F *3/00*
U.S. Cl. 37—77 **24 Claims**



1. A stowable agitation dredging and trenching apparatus for use on a vessel comprising:
elongate leg means;
a housing adapted to be pivotally mounted on the vessel for slidably receiving said leg means, said housing adapted to be swung between a position permitting said leg means to be vertically extended or retracted and a position for substantially horizontally stowing said leg means;
power driven agitation means disposed adjacent to a distal end of said leg means for producing an eroding current of water against the bottom surface of a body of water; and
impeding means mounted on said leg means including a spud foot and means selectively operable for shifting said spud foot relative to said leg means for penetration into the bottom surface.

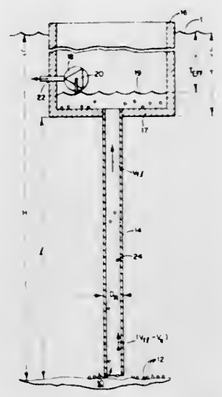
4,073,079
DEVICE FOR PUMPING OUT SANDED IN CRAB POTS
Nathan I. Klinefelter, Rte. 1, Box 830, Brookings, Oreg. 97415
Filed Nov. 15, 1976, Ser. No. 742,361
Int. Cl.[2] E02F *3/00*
U.S. Cl. 37—78 **3 Claims**



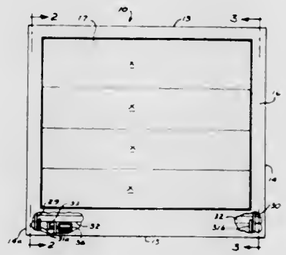
1. A device for pumping out a crab pot on a sea bottom, which has become embedded by drifting sand as a result of ocean currents along the sea bottom, said crab pot having a pot line extending up to the surface of the water for lifting the crab pot; said device comprising a nozzle pipe having guide means to receive said pot line and hold the nozzle pipe substantially paralled with said pot line as the device is lowered along the pot line, a pickup line connected to the upper end of the device for lowering and raising the device on said pot line, a nozzle opening in the lower end of said nozzle pipe, a hydraulic pump on the upper end of said nozzle pipe having an inlet to receive the sea water and arranged to pump said sea water through said nozzle pipe, a motor mounted on said pump for driving the pump, and power conduits of small size in relation to said nozzle pipe, so as not to be seriously disturbed by said ocean currents, extending from said motor to a source of power above the surface of the water to operate said motor; a jet of water from said nozzle opening washing away enough of said drifted sand to allow the crab pot to be lifted away from the sea bottom by said pot line.

4,073,080
METHOD OF UNDERWATER HYDRAULIC CONVEYING FOR OCEAN MINING AND THE LIKE
Jan-Olaf Willums, Massachusetts Institute of Technology, Bldg. 54-1418, Cambridge, Mass. 02139, and Dieter Hody, Tannstr. 2, 8800 Thalwil, Switzerland
Continuation of Ser. No. 294,304, Oct. 2, 1972, abandoned. This application Apr. 5, 1974, Ser. No. 458,414
Int. Cl.[2] E02F *1/00, 3/88*
U.S. Cl. 37—195 **4 Claims**

1. A method of lifting fluid and bodies carried therewith from a region below the surface of a free fluid medium, that comprises providing an at least partly gas-filled chamber with an elongated conduit commencing with an outlet to said chamber at a bottom wall of said chamber and then extending away therefrom externally of the chamber, at least partially submerging the chamber in the fluid medium to a depth of the order of hundreds of meters and extending the conduit downwardly from said bottom wall of the order of thousands of meters to said region below the surface of said medium, whereby fluid carrying said bodies tends to move from said region through said conduit into said chamber, leaving said conduit at said bottom wall and rising in said chamber above said outlet, providing a pump in said chamber adjacent to the bottom wall thereof and operating said pump to pump fluid from said chamber into the fluid medium surrounding said chamber and at a rate to maintain the uppermost fluid level in said chamber sufficiently lower than that of the surrounding fluid medium such that the fluid pressure corresponding to the difference between said levels is at least as great as the sum of the frictional pressure drop of fluid through said conduit and the pressure drop due to the lifting of said bodies in the fluid medium through said conduit, maintaining the velocity of fluid flow through said conduit larger than the steady state sinking velocity of said bodies, and maintaining the gas pressure in said chamber low enough to permit the fluid from said conduit to flow into said chamber.



4,073,081
CHANGEABLE MESSAGE SIGN WITH SINGLE MESSAGE DISPLAY OPENING
E. Tait Hunter, Jr., 384 Redwood Drive, Marietta, Ga. 30060
Continuation-in-part of Ser. No. 602,788, Aug. 7, 1975, Pat. No. 3,983,648, which is a continuation-in-part of Ser. No. 399,537, Sept. 21, 1973, Pat. No. 3,919,794. This application Oct. 1, 1976, Ser. No. 728,860
Int. Cl.[2] G09F *11/02*
U.S. Cl. 40—470 **5 Claims**



1. Changeable message, sign apparatus comprising:
a housing defining a message display region and having a face defining a message display opening which is open to said message display region;
an array of separate elongated message display members disposed in said message support region for oscillation on respective parallel coplanar axes;
each of said message display members including a pair of illumination-transmissive message faces to form a message member having an open side, and additionally including separate end members attached to said message faces at opposite ends thereof;
each of said message display members being supported for oscillation in said message display region by pivot means which extend from said housing to said end members but which does not extend within said message member;
a separate source of illumination fixedly mounted within said housing behind and within said open side of each of said

open message display members so that said message faces are back-lighted;

each of said illumination sources being elongated and disposed in substantially parallel alignment with the axis of rotation of a corresponding said message display member;

each of said illumination sources being located behind the corresponding axis of rotation of the respective message display member to provide substantially uniform internal illumination of said message faces; and

each of said message faces having a flanged extension portion extending a distance rearwardly from an unsupported longitudinal edge thereof in substantially parallel alignment with the confronting undisplayed message face of the adjacent message display member, so that said flanged extension portions block direct illumination which would otherwise pass from said illumination sources through gaps between said message display members during oscillation between first and second message display positions, without interfering with adjacent message display members during said oscillation; and

means operatively connected to each of said message display members for oscillating each of said message display members in unison about said axes to either a first message display position, whereat a first face of each said message member is aligned in said message display opening, or to a second message display position, whereat a second face of each said message member is aligned in said message display opening;

each of said message faces including said flanged extension portion comprises a unitary member which is connected between said separate end members of said message display members, whereby said flanged extensions provide enhanced torsional stiffness for each message member;

each said elongated illumination source is longer than the corresponding message display member; and

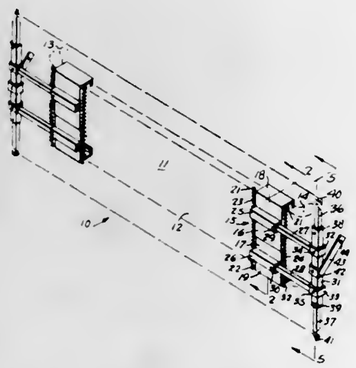
each of said end members of said message display members has a pair of recesses which accommodate said illumination source without interference as said message display member oscillate.

4,073,082

TRUCK BUMPER ATTACHMENT

Delmer L. McWhorter, P.O. Box 220, North Vernon, Ind. 47265

Filed Aug. 6, 1976, Ser. No. 712,050
Int. Cl.² G09F *7/20*
U.S. Cl. 40—591 **1 Claim**



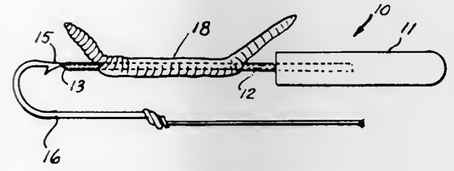
1. An attachment for truck bumpers to hold wide-load signs comprising "C" shaped clamp means for fastening the attachment to the bumper having cushion material on its innerface to prevent marring, hooks for securing the sign, means for adjusting the hooks according to the horizontal measurement of the sign, and means for adjusting the hooks according to the vertical measurement of the sign, said means for fastening the attachment to the bumper includes a pair of spring urged members for encircling the bumper; said horizontal adjustment includes a pair of hollow channels mounted on the attachment, a movable plunger in each channel and screws for fastening the plungers to the channels; said vertical adjustment includes another hollow channel mounted on the outer ends of the pair of plungers, hooks movable out of the top and bottom ends of the other channel, and screws for securing the hooks to the channel; and a short arm attached to said other channel for supporting a separate flag from the wide-load sign.

4,073,083

FISHING WORM THREADER

Chester B. Davis, 3921 Continental Way, Carmichael, Calif. 95608

Filed July 21, 1976, Ser. No. 707,344
Int. Cl.² A01K *97/00*
U.S. Cl. 43—4 **1 Claim**



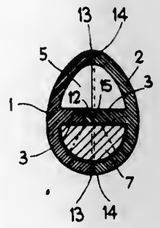
1. A fish hook bait threader comprising a generally cylindrical handle, an elongate hollow needle having one end secured to said handle and the opposite end extending axially outwardly therefrom, and a socket formed in the outer end of said needle to receive the part of a fish hook to permit bait threaded on said needle to be transferred to the fish hook.

4,073,084

ARTIFICIAL BAIT FOR FISHING

Sergio Favron, Milan, Italy, assignor to Giancarlo de Taddeo, Milan, Italy

Filed Apr. 14, 1976, Ser. No. 676,709
Claims priority, application Italy, Apr. 23, 1975, 21300
Int. Cl.² A01K *85/00*
U.S. Cl. 43—42.35 **9 Claims**



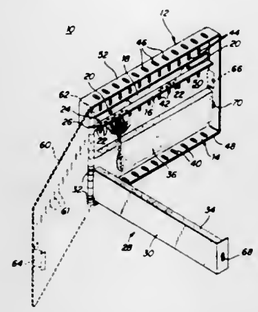
1. An artificial bait comprising: two half-shells joined to each other; an interior separating wall forming two separate chambers with the interior walls of said half-shells; transverse projection means in one of said chambers; a ballast weight member with recesses receiving said projection means, said projection means holding said weight member in clamped position in said one chamber when inserted into said recesses, said ballast weight member being insertable into said one chamber and engaging clampingly said projection means for applying to said chamber ballast weight, said weight member being variable in weight dependent on the length of said weight member; a longitudinal rod-shaped element embedded along its length in a portion of one of said half-shells and having ends projecting to the exterior of said one half-shell from the ends of a longitudinal axis through said one half-shell, said ends of said rod-shaped element being substantially ring-shaped, one of said ring-shaped ends being connectable to fish hook means and the other ring-shaped end being connectable to control fishing-line means.

4,073,085

FISH LURE BOX

Victor Robert Stremeckus, 5 S. Waverly St., Brighton, Mass. 02135

Filed Apr. 2, 1976, Ser. No. 673,191
Int. Cl.² A01K *97/06*
U.S. Cl. 43—54.5 R **6 Claims**



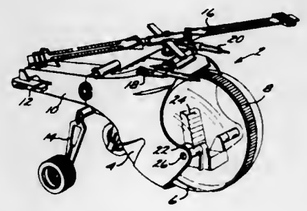
1. A fish lure box comprising: a base including a compartment; an elongate hook rack mounted to said compartment and having a multiplicity of holes for receiving fish hooks; a cover for said compartment; first latch means for releasably securing said cover to said compartment; a clamp assembly intermediate said cover and said compartment and including an elongate clamp arm laterally spaced from said rack; first hinge means for swingably interconnecting said cover and said compartment; said hinge means for swingably interconnecting said clamp arm with said compartment between said compartment and said cover; said first and second hinge means being disposed along an edge of said compartment transverse to the longitudinal axis of said elongate hook rack; a first narrow, elongate resilient member attached to said compartment adjacent said clamp arm, and a second narrow elongate resilient member attached to said clamp arm in juxtaposition to said first resilient member; second latch means for securing said clamp arm to said compartment with said resilient members in close juxtaposition for gently, firmly holding a portion of the bodies of fish lures whose hooks engage said hook rack.

4,073,086

VEHICLE TOY

Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

Filed June 9, 1976, Ser. No. 694,134
Int. Cl.² A63H *23/10, 27/12*
U.S. Cl. 46—91 **23 Claims**



1. A helicopter toy comprising;

a fuselage member having a first longitudinal axis;

a cockpit member connected to one end of the fuselage member;

a helicopter blade mounted on the fuselage member for relatively movement;

means for rotatively connecting the cockpit member to the fuselage whereby the cockpit member can rotate relative to the fuselage member about a second axis, and

transmission means for interconnecting the rotation of the cockpit member with the helicopter blade.

4,073,087

TOY VEHICLE HAVING PARACHUTE ATTACHED THERETO

Michael E. Ieda, Fort Solanga, N.Y., assignor to Ideal Toy Corporation, Hollis, N.Y.

Filed Jan. 30, 1976, Ser. No. 653,975
Int. Cl.² A63H *29/20, 17/42*
U.S. Cl. 46—202 **19 Claims**



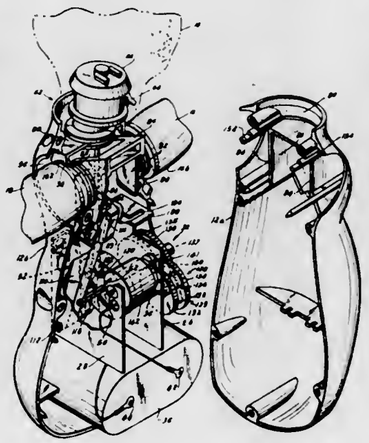
1. A toy vehicle adapted to move along a surface comprising, a vehicle body and a plurality of wheels rotatably mounted thereon, said vehicle body including means for receiving and containing a simulated parachute therein, and means for selectively ejecting a simulated parachute in said receiving means, and means for sensing when said vehicle has passed through a predetermined sequence of different relative positions with respect to the surface along which it is moving during movement along its path of travel and for actuating said ejecting means after said vehicle has passed through said sequence of different relative positions.

4,073,088

TOY DOLL

Janos Beny, Redendo Beach; John W. Ryan, Los Angeles, both of Calif., and Edward Snyder, III, Dix Hills, N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.

Filed Dec. 6, 1976, Ser. No. 747,741
Int. Cl.² A63H *33/26*
U.S. Cl. 46—265 **47 Claims**



30. A toy doll comprising a body, a head, means in said body for mounting the head on the body for fore and aft rocking movement and side to side rotating movement; a pair of arms respectively having opposed hand and shoulder end portions, a frame rotatably mounted in said body adjacent the shoulders of the body for rotation along a first axis extending between said shoulders transversely of the body and pivot means for rotatably mounting the shoulder portions of said arms on said frame

for pivotal movement about second axes extending transversely of said first axis whereby the arms will rotate simultaneously with said frame about said first axis and can rotate independently about said second axes; a drive motor in said body and transmission means operatively connected between said motor and said head and frame for:

i. oscillating said frame between first and second extreme positions about said first axis according to a predetermined pattern selected to move said arms from a first position, corresponding to the first position of the frame, wherein said hands are spaced apart at about the level of the shoulders of the body, to a second position wherein the hands are spaced apart at about the level of the doll's midriff, thence to a third position wherein the hands are adjacent each other at about the level of the doll's midriff and thence back to said first position; and

ii. for rotating said head from a front facing position to a side facing position, as said arms move from their first to their second position and thereafter returning the head to its front facing position;

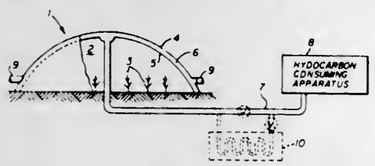
whereby when the doll is placed on a flat surface on its midriff with its hands on the surface and its arms in said first position supporting the shoulders of the doll off of the surface movement of said arms from their first to their third positions and rotation of the head to the side facing position will cause the center of gravity of the doll to shift, thereby tipping the doll over on its back in a direction opposite to the direction in which the doll's head faces in said side facing position.

4,073,089

UTILIZATION OF EXHAUST GASES FOR PLANT GROWTH

Edward A. Maginnes; Eyrle E. Brooks; Maynard O. Haukeness, and George H. Green, all of Saskatoon, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Sept. 27, 1976, Ser. No. 726,582
Int. Cl.² A01G *9/00*
U.S. Cl. 47—17 **6 Claims**



1. A system for utilizing the exhaust gases from a hydrocarbon combusting apparatus to enhance plant growth, comprising an enclosure for plants having an outer covering and an inner permeable membrane spaced from the outer covering, means for conducting exhaust gases to the space between the covering and the membrane, and outlet means for waste gases from said space, said membrane having a lower permeability to the exhaust gas component toxic to plants than to CO_2, limiting the passage of gases into the enclosure to a level tolerated by the plants.

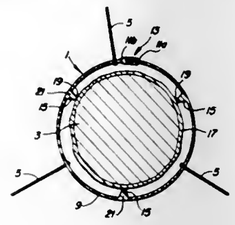
4,073,090

SELF-RELEASING TREE COLLAR AND USE THEREOF IN A TREE TRUNK GUYING SYSTEM

Angelo Peter Lucia, Kent, Ohio, assignor to Tree Guying Systems, Inc., Kent, Ohio

Filed June 28, 1976, Ser. No. 700,502
Int. Cl.² A01G *17/04*
U.S. Cl. 47—43 **15 Claims**

1. A collar capable of closure to a substantially circular form around a tree trunk, in the closed state comprising a strip having at least three inwardly projecting lugs, all of said lugs being substantially, uniformly spaced apart about said collar and being more yieldable than the tree trunk, said collar having means holding said strip in a closed state and for disengagement from said tree trunk by tree growth and concomitant tree trunk expansion.

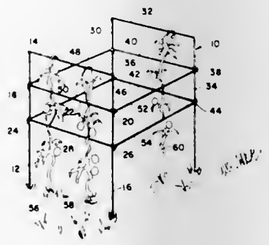


4,073,091

FOLDABLE PLANT SUPPORT

James P. Vogel, 430 - 6 St., SW., Wells, Minn. 56097

Filed June 18, 1976, Ser. No. 697,393
Int. Cl.² A01G *17/06*
U.S. Cl. 47—45 **1 Claim**



1. A foldable plant support comprising

(a) a first frame consisting of a pair of opposed first vertical stakes joined at the top thereof by a first connecting bar transverse to said first vertical stakes, a plurality of horizontally opposed first crimp support means extending into lateral walls transversely from the longitudinal axis of said first vertical stakes;

(b) a second frame consisting of a pair of opposed second vertical stakes joined at the top thereof by a second connecting bar transverse to said second vertical stakes, a plurality of second horizontally opposed crimp support means extending into lateral walls transversely from the longitudinal axis of said second vertical stakes matching said first horizontally opposed support means on said first frame, said first horizontally opposed support means on said first vertical stakes being horizontally opposed to said second horizontally opposed support means on said second frame;

(c) a plurality of first horizontal bar means attached to horizontally span said first vertical stakes and supported thereon through looped ends by said first crimp support means;

(d) a plurality of second horizontal bar means attached to horizontally span said second vertical stakes and supported thereon by said second crimp support means;

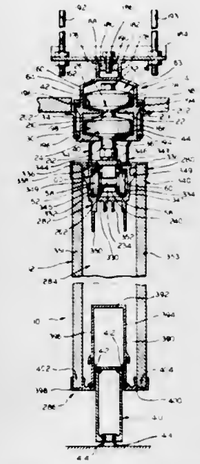
(e) a plurality of third horizontal bars pivotally attached to and horizontally spanning said first vertical stakes and said second vertical stakes through eyelet hinge means on the ends of said third horizontal bars for folding said first frame and said second frames over on one another, the opening in each of said eyelets being greater in diameter than the diameter of the vertical stakes around which it is positioned and said lateral walls are equal to or greater in length than the diameter of said eyelets, said openings in said eyelets also being great enough to take up the slack created where said first vertical stakes and said second vertical stakes are folded over on one another so that said plant support will be substantially flat when so folded, said third horizontal bars being supported on said first vertical stakes and said second vertical stakes by said first support means and said second support means.

4,073,092

LOST MOTION SUSPENSION SYSTEM FOR OPERABLE PARTITIONS

Charles E. Williams, Delavan, Wis., assignor to Hough Manufacturing Corporation, Janesville, Wis.

Continuation-in-part of Ser. No. 590,879, June 27, 1975, abandoned. This application Jan. 19, 1976, Ser. No. 650,125
Int. Cl.² E05D *15/26, 13/02*
U.S. Cl. 49—127 **12 Claims**



1. In an operable panel type partition arrangement including a plurality of discrete panels, an overhead track defining the path of movement of the panels, and a pair of spaced apart carriers supporting each panel and riding on the track to suspend the respective panels for movement along the track, the improvement wherein:

said panels each define a trackway extending along the width dimension of same adjacent the upper end of same,

said carriers of each panel each having a roller device riding on the respective panel trackways for supporting the respective panels from the track,

means for tandem connecting together the carriers of the respective panels to comprise a carrier assembly for the respective panels,

said carrier assemblies being discrete from each other,

and means for resiliently connecting the carrier assembly of each panel to their respective panels for lost motion movement in either direction longitudinally of the respective panel trackways,

said connecting means for each panel being connected between such panel and said carrier assembly thereof to resiliently oppose said lost motion movement for transmitting forward movement momentum of the individual panels on being pushed forwardly for movement in their planes along the track into forward movement of the respective panel carrier assemblies along the track,

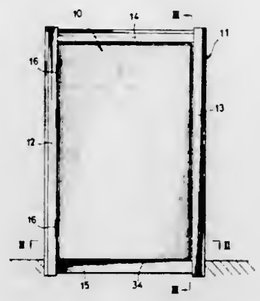
whereby manual pushing of the individual panels to move same in their planes forwardly along the track effects, through said lost motion movement, shifting of the center of gravity of the individual panels forwardly of the direction of movement for transfer to the panel leading carrier of additional weight to be supported by the panel leading carrier, and the carrier assembly thereof is biased for movement along the track in the direction of such panel movement, through said connecting means.

4,073,093

SOUNDPROOF DOOR

Taro Ookawa, Tokyo, and Shuichi Takeda, Ichikawa, both of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Aug. 17, 1976, Ser. No. 715,111
Claims priority, application Japan, Aug. 18, 1975, 50-113573[U]
Int. Cl.² E06B *7/16*
U.S. Cl. 49—381 **5 Claims**



1. In a sound-insulating door construction adapted to be mounted for pivoting about a vertical axis in a doorway having a bottom surface, the combination comprising:

a. means defining a downwardly facing channel extending along the width of the door in its lower edge;

b. an elongated roller supported on the door in said channel and projecting therefrom for rolling engagement with said bottom surface, said roller being spaced along its length from said channel-defining means; and

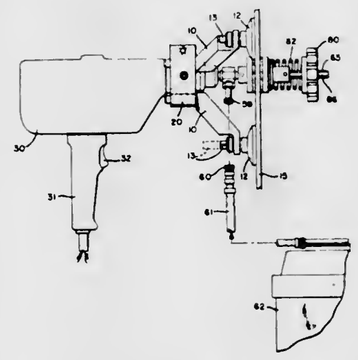
c. an elongated sound-insulating screen disposed in said channel and secured to said door, and tangentially engaging said roller along its length for obstructing the passage of sound between said roller and said channel-defining means.

4,073,094

METHOD AND APPARATUS FOR REPAIRING A CRACK IN A PANE OF PLATE GLASS

Robert A. Walz, 217 Enfield Road, Dayton, Ohio 45459

Filed May 31, 1977, Ser. No. 802,246
Int. Cl.² B32B *35/00*
U.S. Cl. 51—111 R **8 Claims**



1. Apparatus for repairing a crack in a pane of plate glass having a pilot hole therethrough comprising a single drive motor having an extended shaft, an inner cutter, an outer cutter, means for mounting said cutters on said shaft on opposite sides of said pane of glass, and means for yieldably urging said cutters into cutting relation with said pane of glass to

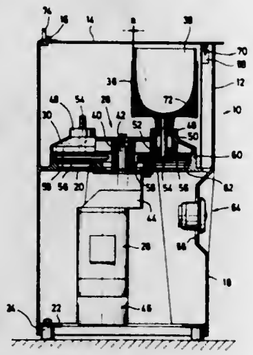
concurrently cut a section therefrom from opposite sides thereof.

4,073,095

CENTRIFUGAL DRUM POLISHING MACHINE

Manfrid Dreher, Haupstr. 74, 7543 Engelsbrand, Germany

Filed Jan. 17, 1977, Ser. No. 759,839
Claims priority, application Germany, Jan. 21, 1976, 2602055
Int. Cl.² B24B *31/04*
U.S. Cl. 51—164 **5 Claims**



1. A centrifugal drum polishing machine for simultaneous surface treatment of small parts, such as grinding and polishing by use of a treatment medium, comprising a stationary support, a rotor mounted on said stationary support for rotation around a vertical axis, and a plurality of drum containers of pot-like configuration which are adapted to be closed by covers and to contain the small parts and treatment medium, said drum containers being mounted on said rotor with their axes in vertical positions at the same radial distance from the axis of rotation of said rotor, each drum container being mounted for rotation about its own axis, said support having a running surface arranged coaxially to the axis of said rotor, and said drum containers being in a friction-drive relationship with said running surface for the purpose of rotating the drum containers in response to rotation of said rotor, said support having a contact ring encircling said axes and said running surface being the inside circumferential surface thereof, said rotor having the shape of an inverted dish with its outer periphery overlying said contact ring in close relationship so that an enclosure is provided by said support and said rotor, and said drum containers being supported on shafts which extend into the enclosure defined by said support and its contact ring and by said rotor, said frictional drive relationship being provided by an impeller on each shaft in frictional engagement with said running surface, and a drive motor mounted on the underside of said support, said drive motor having a drive shaft extending through said support into said enclosure and on which said rotor is mounted for rotation therewith.

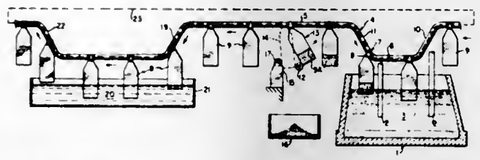
4,073,096

PROCESS FOR THE MANUFACTURE OF ABRASIVE MATERIAL

Herbert F. G. Ueltz, Youngstown; Melvin A. Dashineau, and James J. Pino, both of Niagara Falls, all of N.Y., assignors to U.S. Industries, Inc., New York, N.Y.

Filed Dec. 1, 1975, Ser. No. 636,403
Int. Cl.² C09C *1/68*
U.S. Cl. 51—309 A **26 Claims**

1. A process for manufacturing abrasive material comprising
a) melting an abrasive mix in a furnace,
b) removably dipping a relatively cool object in the melted mix in the furnace for a controlled period of time whereby a portion of the mix solidifies on the object as abrasive material,



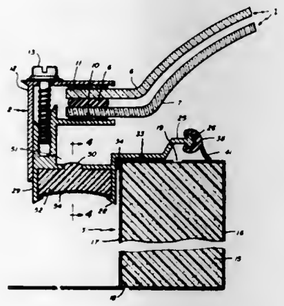
c) withdrawing the entire object and solidified abrasive material from the melted mix, and
d) removing the solidified abrasive material from the object.

4,073,097

ENERGY EFFICIENT SKYLIGHT CONSTRUCTION

Arthur P. Jentoft, York, and Paul A. Couture, Emery Mills, both of Maine, assignors to Wasco Products, Inc., Sanford, Maine

Filed June 29, 1976, Ser. No. 700,787
Int. Cl.² E04B *7/18, 1/62*
U.S. Cl. 52—22 **22 Claims**



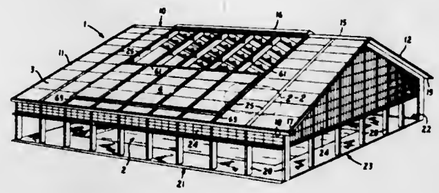
1. In a skylight construction having a skylight cover secured to an annular curb assembly,
said curb assembly including an annular heat insulating core having top, bottom and side wall surfaces,
inner and outer fire shields comprising sheet means covering respectively the inner and outer side wall surfaces of said core,
said inner and outer fire shields extending collectively about the core a distance less than the peripheral distance about the top, bottom and side wall surfaces of the core to thereby define a pair of gaps between ends of the shields for heat insulating the shields from each other,
a frame means for supporting the skylight cover over the curb assembly including flange means cooperating with the curb assembly and support means at one end of the frame means for receiving and at least in part securing an edge of the skylight cover,
said flange means resting upon the top surface of the curb assembly and having thermal conductive contact with only the outer shield.

4,073,098

ROOFING SYSTEM FOR LARGE-AREA BUILDING STRUCTURES

William H. Baker, Rock Hill, S.C., assignor to Paddock Industries, Inc., Boynton Beach, Fla.

Continuation of Ser. No. 390,157, Aug. 20, 1973, abandoned, which is a continuation-in-part of Ser. No. 555,751, March 6, 1975, abandoned. This application Nov. 3, 1975, Ser. No. 627,994
The portion of the term of this patent subsequent to Nov. 27, 1990, has been disclaimed.
Int. Cl.² E04C *2/42*; E04B *1/36*
U.S. Cl. 52—66 **8 Claims**



1. A large-interior-area building roof structure, comprising, in combination, a plurality of beam supports extending in an array approximately in parallel from one side to the other of the building structure, the beam supports comprising a box beam body having on one side thereof a pair of flanged lugs which extend in parallel longitudinally of the box beam, and have slots therethrough for the ends of load-supporting purlins, and an interlocking modular purlin network supported thereon, the network comprising a plurality of load-supporting I-beam purlins extending in an array approximately in parallel in one direction between the beam supports, and a plurality of I-beam purlin spacers extending in an array approximately in parallel between the load-supporting purlins, the purlin spacers being interlocked with the load-supporting purlins, and the ends of load-supporting purlins being interlocked in the slots of the flanged lugs of the beam supports, thereby locking the purlin network to the box beam roof supports; and roofing skins attached on at least one side of the purlin network.

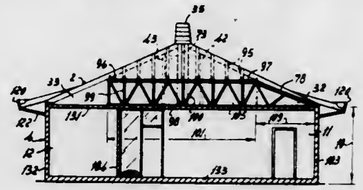
4,073,099

ROOFING OF BUILDINGS

Cornelis van der Lely, 7, Bruschenrain, Zug, and Hendricus Jacobus Cornelis Nieuwenhoven, Hirssattelweg, 6340 Baar, both of Switzerland

Continuation of Ser. No. 545,739, Jan. 30, 1975, abandoned, which is a continuation of Ser. No. 339,366, March 8, 1973, abandoned. This application Feb. 11, 1976, Ser. No. 657,053
Claims priority, application Netherlands, Mar. 10, 1972, 7203175
Int. Cl.² E04B *7/16*
U.S. Cl. 52—69 **26 Claims**

1. A building comprised of a plurality of prefabricated space-bounding sections and a roof spaced over the top of the sections, at least two pairs of roof support members for said roof connected to the top of at least one said section which is elongated and is provided with two longer sides, said pairs of support members being spaced apart, said roof support members in each said pair each being coupled with an opposite one of said longer sides and selectively movable from a substantially horizontal position on the top of said one section to the substantially upright position they occupy supporting said roof in the completed building whereby said one section is adapted to be transported to the building site with said roof support members in said substantially horizontal position, each said roof support member including a supporting beam and connection means at one end of said supporting beam, said connection means including pivot means connected to a first location on top of said one section for pivoting said roof support member from said substantially horizontal position for transport purposes to said substantially upright position it occupies in the completed building, the axis of said pivot means being horizontal and perpendicular to the longer side of said elongated section, said connection means further including securing means connected at least in part to a second location spaced from said first location adapted for rigidly securing said roof support member in said latter position, the other ends of each



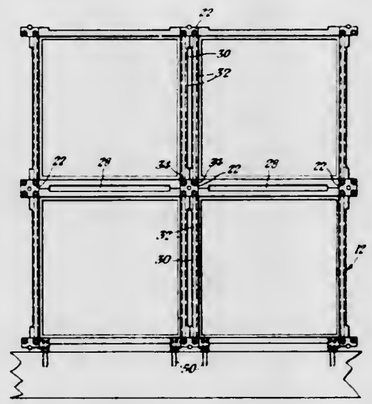
said supporting beam in each said pair being rigidly connected together with a horizontal transverse beam, each said pair of supporting beams being pivoted in opposite directions from the other of said pair and from said horizontal position to said upright position towards each other.

4,073,100

MAUSOLEUM AND METHOD OF CONSTRUCTION

Francis J. DiGiovanni, Jr., 105 Paradise Harbor, Apt. 508, North Palm Beach, Fla. 33408

Filed July 21, 1976, Ser. No. 707,312
Int. Cl.² E04H *13/00*
U.S. Cl. 52—79.3 **4 Claims**



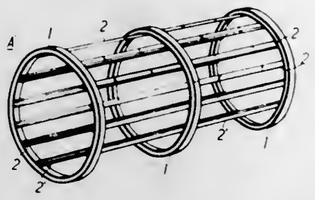
1. An improved mausoleum comprising:
a plurality of rectangular, hollow receptacles stacked upon and adjacent each other to form an array of receptacles disposed in rows and columns, each of said receptacles including a top wall, first and second opposite end faces, first and second sidewalls, and a bottom wall;
a plurality of reinforcing rods disposed substantially vertically near the first and second sidewalls of each of said receptacles and embedded therein and each rod end protruding outwardly from each end face from each sidewall;
a plurality of rigid plates, each of said plates having a plurality of apertures, each plate being attachable to different reinforcing rod ends of different adjacent receptacles; and
connecting means for attaching said plates to said protruding reinforcing ends whereby the corners of each of said adjacent receptacles are connected together by different plates, each plate resisting the shear force on the receptacle array.

4,073,101

UNIT AND COMBINED HOUSING STRUCTURES

Noboru Yoshida, No. 2-18, Shinonome-cho, Yamatotakada, Nara, Japan

Continuation of Ser. No. 529,011, Dec. 2, 1974, abandoned. This application June 21, 1976, Ser. No. 697,830
Claims priority, application Japan, Dec. 24, 1973, 48-2092
Int. Cl.² E04B *1/32*
U.S. Cl. 52—79.1 **7 Claims**



1. A unit housing structure, for stationary on-site installation, comprising, in combination, plural circular rings arranged in axially spaced coaxial relation along a substantially horizontal axis; a plurality of elongated reinforcing bars extending parallel to such substantially horizontal axis and joined to the inner peripheral surfaces of all said rings at circumferentially spaced points therealong to form, with said rings, a horizontally oriented, axially elongated cylindrical framework; a horizontal floor extending chordally of said framework and supported on a pair of longitudinally extending angularly spaced reinforcing bars secured to the inner peripheries of said rings adjacent the lower portion of said framework, said floor extending throughout the length of said framework; a cylindrical side and roof wall on only the interior of said framework, said side and roof wall extending throughout the cylindrical inner periphery of said framework except for the portion thereof beneath said floor, to form a substantially cylindrical laterally enclosed body having said rings projecting radially outwardly from its outer surface; respective end walls closing the axially opposite ends of said body; at least one end wall having a door opening therein closed by an openable door; and interior fittings within said framework enclosed by said walls; said radially outwardly projecting rings protecting said side and roof wall from impacts during transportation and erection of said unit housing structure, and supporting said unit housing structure, with its axis oriented horizontally, on the ground with said side and roof wall and said floor spaced from the ground, and supporting said unit housing structure, with its axis oriented horizontally, on the radially outwardly projecting rings of adjacent said horizontally oriented unit housing structures with said side and roof wall spaced from the side and roof walls of said adjacent unit housing structures.

4,073,102

PREMANUFACTURED MODULAR TOWN HOUSE BUILDING CONSTRUCTION

John Sergio Fisher, 2102 Euclid Ave., Syracuse, N.Y. 13224

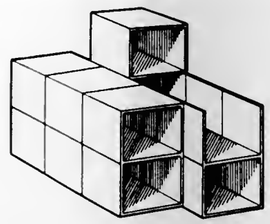
Filed May 29, 1973, Ser. No. 364,808
Int. Cl.² E04B *1/34*
U.S. Cl. 52—79.13 **5 Claims**

1. A building unit of the kind having more than one level and constructed in the field from modules which are preformed and prefinished in a factory, said building unit comprising,

a plurality of lower level rectangular modules which and U-shaped in vertical cross-section, and are in longitudinal alignment, each said U-shaped module being the full width of the building unit and having two load bearing sidewalls laterally spaced apart at opposite sides of the building unit and extending along at least a part of the length of the building unit, said U-shaped module also having a floor connected to the lower edges of the sidewalls and having an open top,

a plurality of upper level rectangular modules which are tube-shaped in vertical cross section and are in longitudinal alignment, positioned on the top of an uppermost U-shaped module, said tube-shaped module having two load bearing sidewalls vertically aligned with the U-shaped module sidewalls and having a floor connected to the lower edges of the sidewalls and a ceiling connected to the upper edges of the sidewalls,

horizontal connecting means connecting the adjacent ends of the U-shaped modules together and also connecting the adjacent ends of the tube-shaped modules together,



said horizontal connection means including a recess extending longitudinally along the outer upper edge of each longitudinally aligned sidewall, a reinforcing bar disposed in said excess and extending along the entire length of longitudinally aligned modules and grout connecting the reinforcing bar to each longitudinally aligned module sidewall, and

vertical connecting means connecting all vertically aligned and adjacent modules together whereby the living unit has no double floors or ceilings,

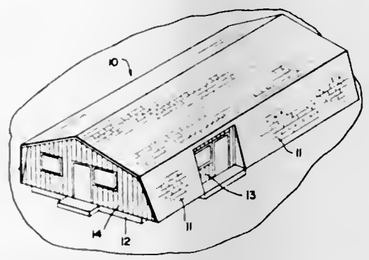
each of said load bearing sidewalls abutting at its lower edge directly upon the upper edge of the adjacent lower sidewall.

4,073,103

BUILDING STRUCTURE AND METHOD OF CONSTRUCTION

Charles Michael McClure, P.O. Box 11165, Tahoe Paradise, Calif. 95705

Filed June 1, 1976, Ser. No. 691,362
Int. Cl.² E04B *7/12*
U.S. Cl. 52—93 **15 Claims**



14. A building structure including:

a. a first plurality of prefabricated joist trusses each comprising a joist member of given common length, a first pair of elongated wall members of given common length each extending normally to said length of said joist members and each having one end rigidly fixed to said joist member at a point spaced a given common distance from a different end of said joist member, and a second pair of elongated wall members each extending only between the free end of a different one of said first pair of elongated wall members and the free end of said joist member adjacent thereto and being rigidly fixed at its ends to said first elongated wall member and said joist member respectively; and

b. a second plurality of prefabricated joist trusses each comprising a short joist member having a length less than the length of said joist members of said first plurality of prefabricated joist trusses by said given common distance, a first elongated wall member having a length equal to said given common length of said first pair of elongated wall members of said first plurality of joist trusses extending normally to the length of said short joist member and having one end rigidly fixed to said short joist member at a point spaced from one end thereof by said given common distance, and a second elongated wall member extending only between the free end of said first elongated wall member and said one end of said short joist member with the opposite ends thereof rigidly fixed to said first wall member and said short joist member respectively; and

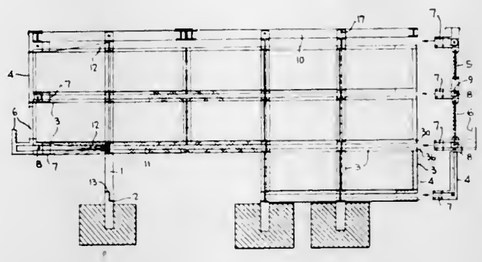
c. a plurality of prefabricated gable trusses each overlying a different one of said joist trusses of said first and second plurality of joist trusses with the free ends of said elongated wall members of said joist trusses rigidly fixed to the adjacent ends of the one of said gable trusses associated therewith.

4,073,104

BUILDING CONSTRUCTION SYSTEM

Gerrit M. Bolanz, Basler Str. 59, D-7858 Weil-Otterbach, Germany

Filed Apr. 8, 1975, Ser. No. 566,059
Claims priority, application Germany, Apr. 19, 1974, 2418824
Int. Cl.² E04G *21/00*; E04B *1/00, 1/74*
U.S. Cl. 52—125 **17 Claims**



1. A building construction system comprising:

a plurality of vertical supports, each having opposing U-shaped grooves extending along its longitudinal axis;

a plurality of horizontal supports adapted to be fixedly connected to said vertical support, each horizontal support having opposing U-shaped grooves extending along its longitudinal axis;

a plurality of rectangular frame members having outwardly exending flanges along at least two of its peripheral surfaces, each frame member being adapted to be freely suspended in a position defined by at least one vertical support and at least one horizontal support by arranging said flanges within corresponding U-shaped grooves, adjacent frame members being spaced from each other by a short distance; and further comprising

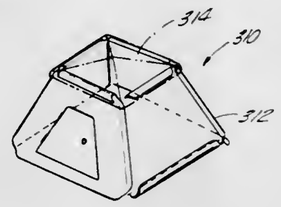
construction members connectable to said frame members and having slideable members adapted to be slideably inserted in the spaces between adjacent frame members for connecting said construction members to said frame members.

4,073,105

TEMPORARY STRUCTURE

Charles R. Daugherty, 29284 Hoover, Warren, Mich. 48093

Continuation-in-part of Ser. No. 310,597, Nov. 29, 1972, abandoned. This application Aug. 30, 1974, Ser. No. 502,172
Int. Cl.² E04B *1/343, 1/348*
U.S. Cl. 52—169.9 **5 Claims**



1. A temporary structure comprising:

a. a plurality of interconnected sidewalls defining an enclosure, each of the sidewalls comprising:

1. a polygonally shaped member having a substantially flat planar surface, and N edges; and

2. curled locking means integrally formed with the flat planar surface at at least N − 1 edges thereof, the curled locking means being contiguous to and substantially co-extensive with the edge associated therewith, an opening being provided at the intersection of any two adjacent edges of the flat planar surface to provide means for the linear translation of any one locking means into any one locking means of another sidewall, to thereby render the locking means receivable within any other locking means, and wherein the curled locking means are formed at the edge of the planar surface such that the plane thereof is uninterrupted;

b. a top wall interconnected to each of the sidewalls, the top wall comprising:

1. a polygonally shaped member having a substantially flat planar surface and configured the same as the enclosure defined by the sidewalls, and

2. curled locking means integrally formed with the flat planar surface at each edge thereof, the curled locking means being contiguous to and substantially coextensive with the edge associated therewith, the member having an opening at the intersection of any two adjacent edges of the flat planar surface to provide means for the linear translation of any one locking means thereof into any one locking means of a sidewall, the curled locking means being formed at the edge of the planar surface such that the plane thereof is uninterrupted; and

c. at least one ground peg having one end insertable into a ground surface and the other end being insertable into the interior space defined by any two interlocked curled locking means; and

wherein the locking means of any one sidewall is received within the locking means of the adjacent sidewall and the locking means of the top wall adjacent thereto to interlock the sidewalls and the top wall.

4,073,106

END CAP AND CONNECTORS FOR ROOF RIDGE VENTILATOR

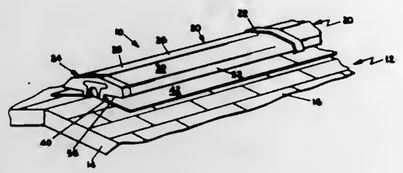
Richard C. Malott, Spring Lake, Mich., assignor to Lehigh Products, Inc., Coopersville, Mich.

Division of Ser. No. 597,036, July 18, 1975, Pat. No. 4,045,928. This application Sept. 24, 1976, Ser. No. 726,203
Int. Cl.² E04D *13/16*
U.S. Cl. 52—199 **4 Claims**

1. In combination, a roof ridge ventilator assembly having ends and being of the type including a plurality of ventilator sections extending longitudinally along the ridge of a roof,

each section having a hood portion integral with sidewall portions, panel portions and outwardly extending, downwardly angled flashing portions, wherein the improvement comprises:

flexible, resilient connectors joining adjacent longitudinally extending ventilator sections, each of said connectors including an intermediate, centrally cutout wall having a main section and depending leg sections, said connector wall being shaped to conform to the general cross section of each ventilator section, an outer connector jacket longi-



tudinally directed from each side of said intermediate wall and extending around the periphery of said wall, and an inner sleeve laterally spaced from and in a parallel relationship with said outer connector jacket and extending adjacent at least a portion of said periphery of said connector wall to thereby define slots adapted to sealingly receive and connect the ends of adjacent ventilator sections; and

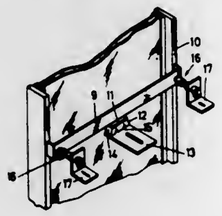
end caps carried by the ends of the roof ridge ventilator assembly to close off the ends of said assembly.

4,073,107

CURTAIN WALL STRUCTURE

Paul E. Rousseau, Uccle, Belgium, assignor to "Applications de la Chimie, de l'Electricite et des Metaux" en abrege:"-SADACEM", Brussels, Belgium

Filed Mar. 8, 1977, Ser. No. 775,545
Claims priority, application Belgium, Mar. 8, 1976, 839314
Int. Cl.² E04H *1/00*
U.S. Cl. 52—235 **6 Claims**



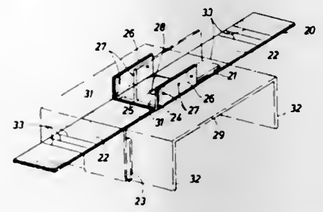
1. Curtain wall structure comprising a metal frame provided with a compensation bar for bearing on or hanging from a projecting element fastened to the building skeleton, each metal frame also comprising members for taking over the forces due to the wind, in which said projecting element is provided with resilient means on which said compensation bar bears, in which said resilient-material block is arranged inside a housing open at the top and soldered with the bottom thereof to said element while being provided with two side cut-outs in the compensation bar plane.

4,073,108

METHOD AND APPARATUS FOR RIGIDLY INTERCONNECTED CEILING AND WALL CONSTRUCTION

Arthur C. Williams, 21711 Glenbranch Drive, Spring, Tex. 77373

Continuation-in-part of Ser. No. 464,192, April 25, 1974, abandoned. This application Apr. 8, 1976, Ser. No. 674,963
Int. Cl.² E04H *1/00*
U.S. Cl. 52—238 **19 Claims**



1. A rigidly interconnected dry wall and ceiling structure for buildings, comprising:

a plurality of spaced inverted tee support members supported in said building,

a plurality of ceiling tiles adapted for supporting placement between said inverted tee support members for forming a building ceiling,

a structural wall channel member having an inverted U-shape for defining the upper structural support for a vertical wall,

a plurality of spaced hangers attachable to the flanges of said inverted tee support members and to said structural wall channel for rigidly interconnecting and supporting said structural wall channel member in closely spaced relation to said inverted tee support members, said hanger comprising a body member having legs extending from opposing ends thereof forming a generally inverted U-shape, said legs formed of a bendable material for forming depending legs spaced to receive at least a portion of said structural channel member therebetween and further bendable for supporting and securely gripping said member, and said body member further having a centrally located raised section for spacing said structural channel member from said inverted tee support member and gripping means located on said raised section of said body member, and

a plurality of wall panel members attachable to said structure wall channels for forming said vertical building wall.

4,073,109

METHOD AND APPARATUS FOR INSTALLING PANELS IN BUILDING CONSTRUCTION

Carlton N. Knutson, Fergus Falls, Minn., assignor to Construction Aids, Inc., Fergus Falls, Minn.

Filed June 30, 1976, Ser. No. 701,349
Int. Cl.² E04B *1/00*
U.S. Cl. 52—281 **1 Claim**

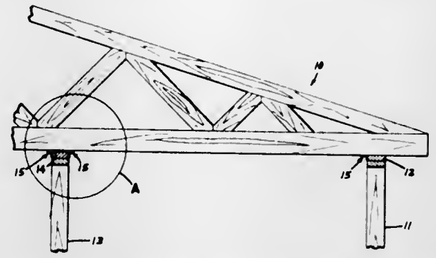
1. In a frame structure comprising truss rafters, outer walls upon which the rafters rest and to which thay are fastened, and an inner partition extending transversely to and having a plate near the lower surface of said rafters but not secured thereto, to permit normal vertical movement of said rafters under large roof loadings, in combination:

a sheet metal right-angle strip secured along substantially the entire top edge of said plate so that one leg of the angle extends downwardly and the other leg extends inwardly;

a sheet of ceiling panel having an edge received beneath and in the angle of said strip to engage the downwardly extending leg thereof;

means securing said ceiling panel to the under surfaces of said rafters by a line of fasteners spaced from said angle strip;

a sheet of wall panel having an edge received beneath and in the angle of said angle strip, to supportively engage the lower face of said ceiling panel in said angle strip, and to laterally engage the downwardly extending leg of said angle strip;



and means securing said wall panel to said plate close to said angle strip,

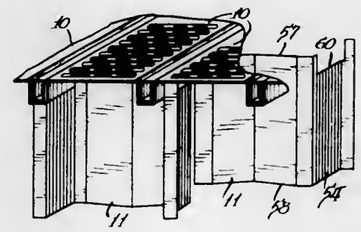
the spacing between the angle strip and the first named means being sufficient for the inherent flexibility of the ceiling panel to accommodate normal vertical movement of the truss rafter with respect to the plate.

4,073,110

FLOOR DECK STRUCTURE

Samuel F. Kennedy, 415 E. Park, Taylorville, Ill. 62568

Filed Sept. 20, 1976, Ser. No. 724,588
Int. Cl.² E04C *1/30*; F24F *7/00*
U.S. Cl. 52—303 **4 Claims**



1. In a fabricated rigid floor deck structure assembled from a plurality of similar floor sections, each section being formed for engagement with an adjacent similar section to form an interlocking floor structure, a floor section comprising:

an elongate plate having generally planar top and bottom surfaces and a plurality of substantially parallel elongate embossments raised from the top surface, said embossments extending laterally continuously between points adjacent the opposite longitudinal edges of said plate and having openings formed through the sides of said embossment in a plane generally perpendicular to the plane of said plate to permit air flow from one side of the plate to the other.

a male flange having a generally U-shaped cross section and having inner and outer leg portions generally perpendicular to the plane of said plate, said male flange having its outer leg downwardly depending from one of said longitudinal edges of said plate, the inner leg of said male flange extending upwardly and having a free end positioned inwardly of said one edge lying above the plane of the bottom surface of said plate, one portion of the bottom surface having a longitudinal groove formed thereon aligned generally with said free end of said male flange with said free end extending into said groove; and

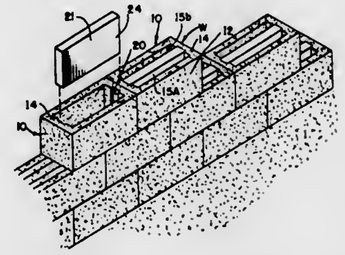
a female flange having a generally U-shaped cross section and having inner and outer leg portions generally perpendicular to the plane of said plate, said female flange having its inner leg downwardly depending from the other of said longitudinal edges of said plate, the outer leg of said female flange extending upwardly and having a free end positioned outwardly of said other edge lying above the plane of the bottom surface of said plate, said female flange defining an upwardly opening channel laterally outward from said plate, said flanges being dimensioned so that adjacent floor sections are locked together in suitable alignment by placing said male flange into the channel defined by the female flange of an adjacent aligned floor section, the free end of the female flange of the adjacent floor section also extending into said groove when said male flange and said female flange of the adjacent floor sections are engaged, whereby the free ends of the respective flanges when engaged are adjacently disposed stabilized against lateral movement within said groove.

4,073,111

INSULATED MASONRY BLOCK

Millard R. Warren, Knoxville, Tenn., assignor to Warren Insulated Bloc, Inc., Knoxville, Tenn.

Continuation-in-part of Ser. No. 649,795, Jan. 16, 1976. This application Feb. 15, 1977, Ser. No. 768,760
Int. Cl.² E04B *2/00, 5/04*
U.S. Cl. 52—407 **12 Claims**



1. A thermally insulated masonry block comprising:

pairs of spaced opposed side walls and spaced opposed web walls defining a cavity therebetween;

a rectangular-shaped insulative plate formed of thermally insulative material disposed in said cavity and extending from one to the other of said web walls;

said insulative plate and said side walls being spaced apart to define air cells on opposite sides of said insulative plate; and

at least two aligned stub walls projecting into said cavity from respective ones of said side walls to reinforce said side walls;

said stub walls being of substantially the same height as said side and web walls and being spaced by a distance approximately the same as the thickness of said insulative plate.

4,073,112

STRUCTURAL PANEL

Gordon Francis Leiblich, Box 157, Kimba, South Australia, Australia

Filed Aug. 15, 1975, Ser. No. 604,987
Claims priority, application Australia, Aug. 20, 1974, 8585/74
Int. Cl.² E04C *5/16*
U.S. Cl. 52—677 **1 Claim**

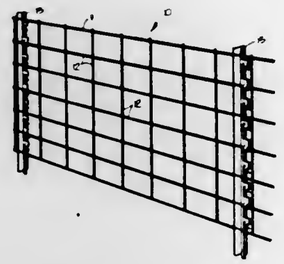
1. A structural panel comprising:

a. a mesh sheet having a plurality of rod portions having the same thickness and which are parallel with one another;

b. a plurality of stiffeners, each stiffener having:

1. a body portion which extends away from the plane in which the rod portions lie;

2. a plurality of tongues each joined to the body portion by a respective bridge portion which spaces the tongue from the body portion by a distance at least equal to said rod thickness, each bridge portion lying in a plane parallel to the plane in which the rod portions lie,
3. each tongue extending upwardly from the bridge portion to form therewith a slot which is open-ended in a first view of the stiffener, and each tongue having a forwardly projecting portion merging into a rearwardly



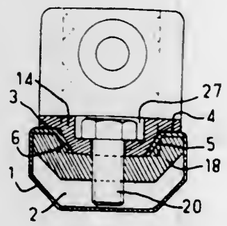
extending return portion to form a hook-like configuration which co-operates with said body portion to form a retaining aperture in a second view of the stiffener at right angles to the first said view; and

c. a plurality of said rod portions extending through respective ones of said retaining apertures to thereby retain the mesh sheet and stiffener as an assembly, the assembly of each stiffener to a mesh sheet being effected by positioning said slots of that stiffener over respective ones of said rod portions and rotating the stiffener through an angle of 90°.

4,073,113
BUILDING FRAME

Pierre Armand Oudot, Chatenay-Malabry, and Leon Petroff, Epinay-sur-Seine, both of France, assignors to Profiles et Tubes de l-Est, Beuilly-sur-Seine and Centre de Recherche d'Architecture d'Urbanisme et de Construction Rauc, Paris, both of France

Filed Aug. 18, 1975, Ser. No. 605,608
Int. Cl.² E04C 5/16; E04B 1/38
U.S. Cl. 52—710 **10 Claims**

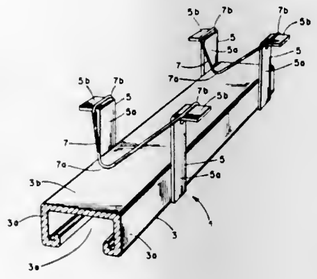


1. A fixing member for a building frame elongate structural element having at least one cavity which as seen in transverse section has a mouth permitting access to the cavity, defined by a pair of opposed flanges which have first portions extending towards each other across the mouth and second portions extending inwardly of the cavity from said first portions and terminating at free edges so as to leave to each side of the mouth an undercut space which is behind the first portion and laterally outside the second portion at that side, the second portions of the flanges being deformable by bending laterally, said fixing member having a body and a cap which has opposite end portions directed towards the body with respect to a central portion, the cap in a first position being insertable into the said cavity of the structural element and being rotatable after insertion from said first position to a second position in which said end portions lie behind said flanges of the structural element, and the fixing member further having means to urge together the body and the cap when the cap is in the second position so as to clamp said flanges, and the body and the cap being so shaped, as to deform at least one of said flanges by bending laterally during the clamping thereby securing the fixing member to the structural element in a manner inhibiting slippage along the structural element.

4,073,114
INSERT ASSEMBLY FOR USE IN PRE-STRESSED CONCRETE STRUCTURES

Elwood Irish, Wayne, Mich., assignor to Unistrut Corporation, Wayne, Mich.

Filed Apr. 1, 1977, Ser. No. 783,677
Int. Cl.² E04B 1/41
U.S. Cl. 52—710 **4 Claims**



1. An insert assembly adapted to be imbedded within a concrete structure, comprising:
an elongated channel section to which structural members may be physically attached, said channel section being adapted to be positioned within and against formwork for a concrete structure and including first and second side walls bridged by a back wall, said side walls having edges turned in the direction of the back wall to form flanges defining a longitudinal opening by which structural members may be physically attached to the channel section;
a plurality of pairs of rigid anchor members fixedly secured to and extending away from the channel section, each of the anchor members including a first portion attached to and extending away from the channel section at the back wall of the channel section and a second portion at an angle to the first portion; and
a plurality of spring members attached to the pairs of anchor members with each of the spring members being suspended between the anchor members of a different pair of anchor members in a direction toward the channel section, each of the spring members including first and second end portions attached to the second portions of a different pair of anchor members and a central portion integral with and intermediate to the end portions and at an acute angle with respect to the plane of the back wall of the channel section, said central portion being intermediate to and extending from the second portions of the anchor members in the direction of the back wall of the channel section, said plurality of spring members being operative to receive an elongated reinforcing member at the central portions thereof and to be deflected by said reinforcing member in a direction toward the back wall of the channel section, whereby when the spring members are deflected forces are established in the direction of the channel section for maintaining the insert assembly in place within and against the formwork for the concrete structure.

4,073,115
PROCESS FOR THE PRODUCTION OF A BRIDGE GIRDER SECTIONAL CANTILEVER CONSTRUCTION

Ulrich Finsterwalder, Munich, and Otto Seidl, Neubiberg, both of Germany, assignors to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Germany

Filed Sept. 27, 1973, Ser. No. 401,098
Claims priority, application Germany, Sept. 28, 1972, 2247609
Int. Cl.² E04G 21/14
U.S. Cl. 52—745 **4 Claims**

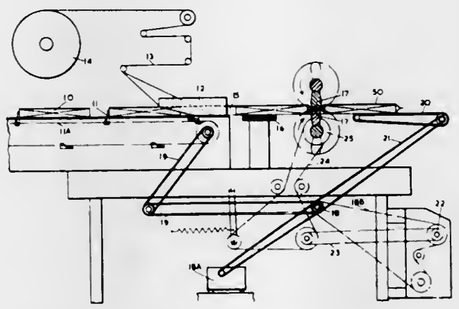


1. The process for the cantilever production of a bridge girder system of prestressed concrete from prefabricated sections which have the hollow box cross-sectional configuration of the whole superstructure and are tightly drawn together to form a monolithically effective girer system comprising the steps of:
(a) providing a shuttering type of casting device of the cross-sectional shape of a substantial proportion of the bridge,
(b) separating the casting device into a plurality of transverse sections by sheet steel as the latter comes from the rolling mill,
(c) adding slack, reinforcing steel to the mold cavities and placing ducts adapted to form conduits for prestressing rods,
(d) casting concrete in the shuttering device,
(e) removing the hardened sections from the shuttering device, and
(f) assembling the sections at the bridge structure in the same order as they were cast and matching slight irregularities in the surfaces produced by the sheet steel on one section with the facing surface of the adjacent section,
(g) prestressing the assembled sections longitudinally whereby said sections are held together frictionally by the matching irregularities in the surfaces thereof.

4,073,116
WRAPPING MACHINES

William Glover, Newcastle-upon-Tyne, England, assignor to Baker Perkins Holdings Limited, England

Filed Nov. 3, 1976, Ser. No. 738,281
Claims priority, application United Kingdom, Nov. 12, 1975, 46763/75
Int. Cl.² B65B 9/06, 51/26
U.S. Cl. 53—182 R **6 Claims**

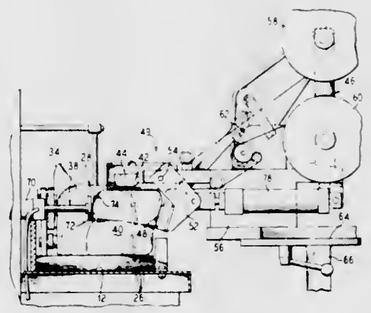


1. A wrapping machine comprising a tube former means for forming a web of wrapping material into a tube with a longitudinal seal;
means for continuously feeding a web of wrapping material to said tube former means;
an infeed conveyer for feeding articles in succession into said tube former means in order to be entubed in a tube of wrapping material;
a pair of opposed crimping dies positioned adjacent an outlet side of said tube former means which periodically contact the tube as it passes out of said tube former means and which then cooperate to form transverse seals in the tube of wrapping material between the succession of articles contained therein as said tube passes out of said tube former means;
a drive shaft;
means connected to said drive shaft to rotate said drive shaft at a constant speed;
means operatively connecting said drive shaft to at least one of said pair of opposed crimping dies for operation of said dies to form said transverse seals;
means for modulating the speed of movement of said pair of dies during their contact with the tube to the speed of movement of said tube out of said tube former means; and
said means operativey connecting said drive shaft to at least one of said pair of opposed crimping dies including an adjustable control mechanism, said control mechanism function into to disconnect operation of said at least one die from said drive shaft based on a predetermined, selected number of rotations of said drive shaft, thereby controlling the distance between transverse seals formed in the tube passing out of said tube former means.

4,073,117
PACKAGING MACHINE WITH INFLATED BAG PRINTER AND METHOD

James L. Shenoha, Lockport, Ill., assignor to Norwood Marking and Equipment Co., Inc., Downers Grove, Ill.

Filed Sept. 2, 1976, Ser. No. 719,823
Int. Cl.² B65B 61/02
U.S. Cl. 53—14 **14 Claims**



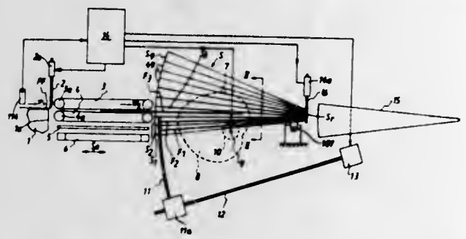
2. A method of imprinting product bags during an accelerated product bagging operation including the steps of continuously moving products along a conveying surface in spaced, aligned end-to-end relationship; positioning a deflated flexible bag in the path of the moving products adjacent the conveying surface; inflating the bag by means of an air jet; laterally shifting a portion of the inflated bag into contact with a marking device disposed off to the side of the moving products while maintaining a second portion of the flexible bag in a fixed position to intercept a moving product; and imprinting the inflated bag by said marking device during the time interval that the space between adjacent moving products is adjoining the marking device.

4,073,118

METHOD AND APPARATUS FOR ASSEMBLING AND POCKETING SECTIONS OF PHOTOGRAPHIC FILMS

Klaus Weber; Heinz Lüdemann; Andreas Schubert, and Karel Pustka, all of Munich, Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Nov. 10, 1976, Ser. No. 740,371
Claims priority, application Germany, Nov. 28, 1975, 2553612
Int. Cl.² B65B *35/30, 63/00*
U.S. Cl. 53—23 **21 Claims**



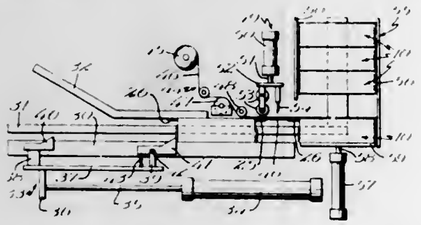
1. A method of inserting sections of elongated photographic films or the like into envelopes or analogous receptacles, comprising the steps of assembling successive pluralities of sections into discrete groups outside of the respective receptacles, including transporting successive sections of the respective plurality in a predetermined direction, arresting successive foremost sections and effecting a relative sidewise movement between each arrested section and the next foremost section such as is sufficient to enable the next foremost section to advance to a position previously occupied by the immediately preceeding section in which it at least partially overlaps the preceding section; and thereupon introducing each of the thus obtained groups into the respective receptacle, said assembling step further comprising maintaining the overlapping neighboring sections of each group out of contact with each other prior to said introducing step.

4,073,119

TAPING APPARATUS

Iver L. Nelson, Minneapolis, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed May 3, 1976, Ser. No. 682,529
Int. Cl.² B65B *57/16*
U.S. Cl. 53—76 **1 Claim**



1. Apparatus for applying tape to the top and ends of a carton of the type having abutting top closure flaps where the tape is located longitudinally to cover the abutting edges of said top closure flaps, and said top closure flaps have end tabs connected to the ends thereof which are folded downwardly to cover at least a portion of the end of said carton such that the tape must extend down the end of the carton to hold said tabs in position, said apparatus being operable sequentially and automatically on successive cartons as they are placed on said apparatus, said apparatus comprising:

rail means on which said cartons may be located at a load station and on which said cartons may be advanced in spaced apart pairs to their longitudinal axis;

reciprocating feed carriage means for engaging each of said cartons when placed on said rail means at said load station and advancing it into position beneath means for dispensing tape continuously and horizontally as said carton moves beneath said tape dispensing means, said tape dispensing means pressing said tape into position to cover a portion of the longitudinally extending abutting edges of said top cover flaps;

said feed carriage means also engagable with each of said cartons positioned beneath said tape dispensing means to advance each of said cartons along said rail means away from said tape dispensing means to a predetermined position leaving a length of tape extending between adjacent cartons;

vertically retractable means for cutting said tape between adjacent cartons being moved through said apparatus, said vertically retractable means also including pressing means for holding that portion of said tape covering the leading end of each of said carton in said tape dispending means down into position; said cutting means biased downwardly to hold said tabs in position on the leading end of a carton which is stationary beneath said dispensing means;

control means for sensing a carton introduced at said load station and activating said carriage means to advance said carton beneath said dispensing means, said control means coacting to retract said cutting means to allow the carton beneath said dispensing means to be moved by said carriage means along said rail means; and

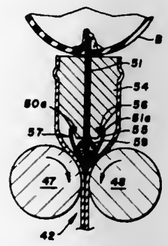
elevator means includng a vertically reciprocating means for supporting a carton after the tape has been applied thereto and, after said tape has been cut, moving it upwardly into a chute which engages the ends of said carton and holds said tape and said end tabs in position to provide time for said tape to adhere to the tabs and ends of said carton.

4,073,120

APPARATUS FOR REPRESSURIZING TENNIS BALLS

Lloyd E. Berggren, 4924 1st Ave. S., Minneapolis, Minn. 55409

Filed Aug. 9, 1976, Ser. No. 712,605
Int. Cl.² B65B *31/08;* **A63B** *41/12*
U.S. Cl. 53—79 **12 Claims**



1. The apparatus for repressurizing balls having a continuous exterior skin including:

a longitudinally extending injecting and penetrating element having one end thereof arranged to penetrate the exterior skin of the ball and having the other end arranged and constructed to receive a supply of pressurized gas and a supply of sealant;

a passage through said injecting and penetrating element for communication between said ends;

means for compressing the ball to expel the air therefrom through said injecting and penetrating element for the building of a negative pressure therein;

sealant supply containing means having a supply of sealant therein and having an exterior skin penetrable by said other end of said injecting and penetrating element for the delivery of sealant therethrough upon penetration thereof and release of the negative prewithin the ball; and,

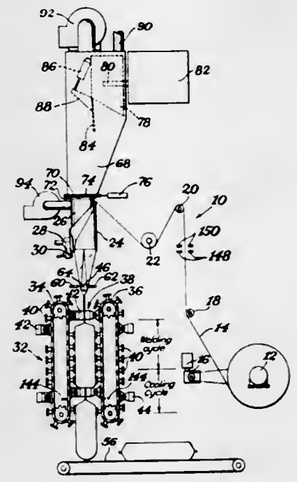
means for providing pressurized gas through said injecting and penetrating element upon removal of said sealant supply.

4,073,121

FORM, FILL AND SEAL INDUSTRIAL BAG MACHINE

Eddie Lee Greenawalt, and Lorenzo Dow Geren, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 572,594, April 28, 1975, which is a division of Ser. No. 460,864, April 15, 1974, Pat. No. 3,925,963, which is a continuation-in-part of Ser. No. 347,923, April 4, 1973, abandoned. This application Jan. 26, 1977, Ser. No. 762,682
Int. Cl.² B65B *9/12, 31/00*
U.S. Cl. 53—112 A **16 Claims**



10. In apparatus for providing a flexible, generally vertical tube, simultaneously with the periodic dumping of premeasured product loads into the tube, and the collapsing and transverse sealing of the tube at spaced intervals to form therefrom filled bags, the combination which includes: a hollow mandrel about which the tube is formed, means to periodically clamp the tube underneath the filling mandrel, and means to draw the tube downwardly to provide a product receiving space for the product load, means in proximate positioning to the clamping means to transversely seal the tube, the improvement which comprises, evacuation means to partially evacuate the product receiving space, means to form a narrow channel between the inside surface of the tube and the mandrel, said channel forming means being adapted to provide communication between the product receiving space and the atmosphere to make available, cooperatively with the evacuation of the product receiving space, a stream of air that is sucked downwardly between the tube and the mandrel, to aspirate the inside surface of the tube to prepare a less contaminated sealing surface.

4,073,122

PRINTING APPARATUS

Peter D. W. Areson, Boston, Mass., assignor to Markem Corporation, Keene, N.H.

Filed Apr. 16, 1976, Ser. No. 677,780
Int. Cl.² B65B *61/26*
U.S. Cl. 53—131 **8 Claims**

2. In combination with a bagging machine for loading a product unit into a bag,

said machine having

bagging machine timing means

feed means to convey product units along a feed path

bag support means to support a stack of generally flat, uninflated bags adjacent said feed path

bag expanding means responsive to the approach of a product unit to said bag stack to expand a top bag of said stack, and

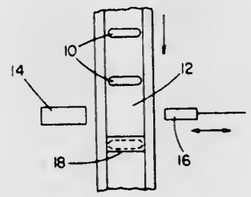
loading means to load a product into said expanded top bag,

printing apparatus comprising

a frame

a print head having a print face

bag deflecting means independent of said bag expanding means to deflect said expanded top bag, exposing at least a portion of the top surface of the next underlying unexpanded bag and



print head carrier means supported on said frame and responsive to said bagging machine timing means to move said print head in a curved path generally horizontally from a position remote from said bag stack to a position above said bag stack, thereafter to move said print head generally vertically downwardly into printing contact with said exposed bag surface, and thereafter to remove said print head to said remote position, before said bagging machine loading means loads a product unit into said expanded top bag

said print head carrier means including

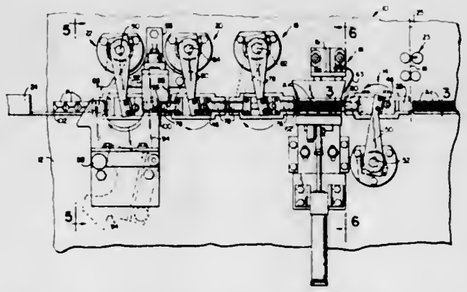
a print head arm carrying said print head, and drive means connected to said arm for moving it bodily generally linearly in the direction of said path.

4,073,123

WRAPPING MACHINE

Lawrence W. Schoppee, Springfield, Mass., assignor to Package Machinery Company, East Longmeadow, Mass.

Continuation-in-part of Ser. No. 606,236, Aug. 20, 1975, abandoned. This application July 2, 1976, Ser. No. 702,036
Int. Cl.² B65B *11/32*
U.S. Cl. 53—234 **33 Claims**



26. In a wrapping machine, a rotary tumble box having a pair of diametrically opposite generally radially outwardly opening pockets each adapted to receive an article and its wrapper and journalled on the machine to alternately position each of said pockets in article receiving and article discharging positions, respectively, and an ejector mechanism including a plunger assembly carried by said tumble box and supported for recipro-

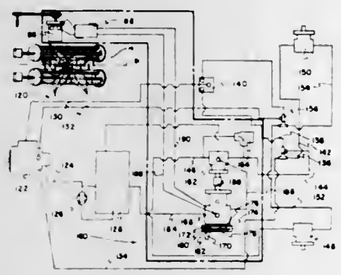
cal movement between article admitting and article ejecting positions relative to said pockets, said plunger assembly including a plunger extending through said tumble box between said pockets and having article engaging parts at its opposite ends, each of said parts being wholly disposed within an associated one of said pockets when said plunger assembly is in an article admitting position relative to said one pocket, said ejector mechanism including a single plunger operating member supported intermediate its ends on said tumble box to pivot about an axis intermediate said pockets, said operating member having an inner end portion operably engaging said plunger intermediate its ends and within said tumble box and having a free outer end portion extending outwardly beyond said tumble box, said ejector mechanism including a drive member supported on the machine for engaging and moving said free end portion to move said plunger assembly from an article admitting to an article ejecting position relative to one of said pockets when said one pocket is in its article discharging position.

4,073,124

TOBACCO HARVESTER HAVING A HYDRAULIC CONTROL SYSTEM FOR AUTOMATICALLY AND CONTINUOUSLY CONTROLLING THE SPEED OF A LEAF DEFOLIATOR ASSEMBLY IN RELATION TO THE HARVESTER GROUND SPEED

Bertram Lee Jordan, and John Davis Mitchell, both of Lewiston, N.C., assignors to Harrington Manufacturing Company, Lewiston, N.C.

Division of Ser. No. 579,195, May 20, 1975, Pat. No. 3,999,359.
This application Oct. 18, 1976, Ser. No. 733,095
Int. Cl.[2] A01D *45/16*
U.S. Cl. 56—1 **2 Claims**



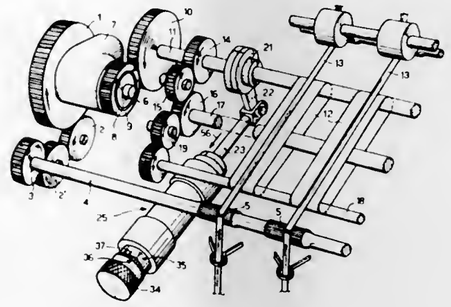
1. A method of harvesting tobacco comprising the steps of:
a. moving a tobacco harvester having a defoliator forwardly along a row of tobacco plants having tobacco leaves extending therefrom, the defoliator being of the type having a plurality of defoliating elements associated therewith and adapted to at least partially surround the respective stalks of the tobacco plants during leaf defoliation;
b. moving respective pairs of the defoliating elements into the plane of the tobacco row being harvested such that adjacent pairs of defoliating elements at least partially surround certain tobacco stalks of the row being harvested;
c. moving the defoliating elements vertically and rearwardly as the harvester and defoliator move forwardly along the row being harvested such that certain leaves extending from the tobacco stalk and are engaged and defoliated by the vertical movement of the defoliating elements;
d. continuously effectively sensing the ground speed of said harvester and variations therein as it moves forwardly along the tobacco row being harvested; and
e. directing a system of hydraulic fluid in response to the effectively sensed harvester ground speed to a hydraulic drive motor operative to drive said defoliator for driving the hydraulic drive motor and defoliator in proportion to the effectively sensed harvester ground speed, and varying the volumetric flow rate of fluid directed to said hydraulic drive motor in response to variations in harvester ground speed so as to continuously drive said defoliator in proportion to the harvester ground speed irrespective of changes therein.

4,073,125

DRIVE MECHANISMS OF SPINNING OR TWISTING MACHINES ADAPTED FOR THE FORMATION OF KNOP YARN

Giuseppe Bolli, Campore di Vallemosso (Vercelli), Italy

Filed Jan. 21, 1977, Ser. No. 761,032
Claims priority, application Italy, Feb. 13, 1976, 67330/76
Int. Cl.[2] D01H *5/36*
U.S. Cl. 57—38.3 **7 Claims**



1. In a spinning machine adapted for the formation of knop yarn and having a draw frame provided with lower yarn feed rollers, and a drive transmission for driving said feed rollers, a drive mechanism including:
a first unidirectional clutch connected to the lower yarn feed rollers and arranged to permit rotation of said rollers in the yarn feed direction at a higher speed than that imparted to said rollers by the drive transmission;
actuator means separate from the drive transmission;
a second unidirectional clutch connecting said actuator means to said lower feed rollers and arranged to permit increase in the speed of said lower feed rollers relative to their normal running speed upon operation of the actuator means, and
control means for effecting operation of the actuator means at predetermined times and for predetermined intervals to cause the formation of knops at intervals in yarn fed through the drawing frame in use of the machine.

4,073,126

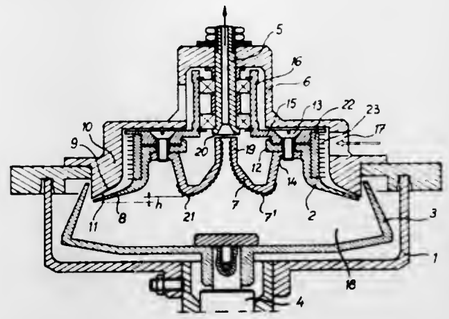
OPEN-END SPINNING DEVICE

Pierre Hubert Marie Joseph Bouhon, Heusy (Verviers), Belgium, assignor to Societe Anonyme des Ateliers Houget Duesberg Bosson, Verviers, Belgium

Filed Sept. 30, 1976, Ser. No. 727,999
Claims priority, application Belgium, Oct. 3, 1975, 834173
Int. Cl.[2] D01H *1/12*
U.S. Cl. 57—58.95 **7 Claims**

1. In an open-end spinning unit for producing yarn from fiber material, said unit comprising a casing having an inlet for the fiber material to be treated and an inlet cone with an edge, a spinning turbine having a circumferential portion to enclose a space in said casing in which said yarn is formed, an opening-up member rotatably mounted in said casing having a substantially cylindrical portion provided on its outer periphery with needle means and a bottom outwardly flaring flange cooperating with the said edge of the inlet cone to form a radial annular slot through which the fibers are introduced from the inlet into the spinning turbine after having been subjected to the needle means, an exit tube for the yarn formed connected with the casing, a sleeve rotatably mounted around the yarn exit tube,

and a hollow funnel-shaped yarn guiding member projecting into said space in said turbine and means fixing said funnel-shaped guiding member to said opening-up member to rotate



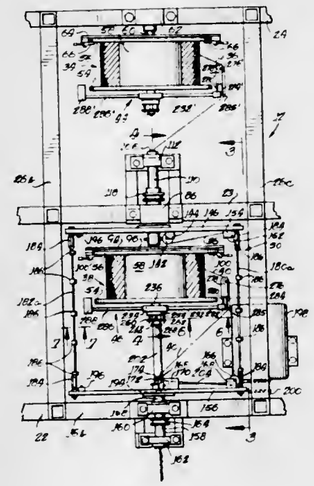
with the latter, the bottom of the funnel-shaped member being at a higher level inside the turbine than the end of the outwardly flaring flange of the opening-up member.

4,073,127

TWINING AND CABLING SYSTEM

John F. Orlandi, Lombard, and John E. Rauch, St. Charles, both of Ill., assignors to Belden Corporation, Geneva, Ill.

Filed Feb. 7, 1977, Ser. No. 765,992
Int. Cl.[2] D07B *3/12, 3/00*
U.S. Cl. 57—58.36 **24 Claims**



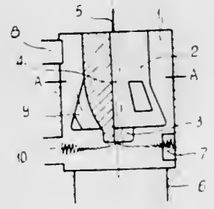
1. Apparatus for uniformly twining a pair of elongate filaments, comprising, in combination, frame means defining forward and rearward ends of said apparatus, first supply reel means adapted to have a first elongate filament wound thereon and being nonrotatably supported by said frame means with the axis of said first reel means substantially horizontal, first payoff arm means supported forwardly of said first supply reel means for rotation about and in a plane substantially perpendicular to the axis of said first supply reel means, said payoff arm means including guide means thereon positioned radially outwardly from the axis of said first reel means a distance greater than the maximum wound radius which said first filament may have on said first reel, said guide means being adapted to receive said first elongate filament in guided relation therewith and being cooperative with said first filament to cause rotation of said first payoff arm means and effect let-off of said first filament from said first reel means under substantially constant tension when said first filament is subjected to an axial force sufficient to draw said first filament over said guide means from said first reel means, second supply reel means adapted to have a second elongate filament wound thereon and being supported by said frame means forwardly of said first supply reel means with the axis of said second supply reel substantially horizontal, second payoff arm means supported forwardly of said second supply reel means for rotation about and in a plane substantially perpendicular to the axis of said second supply reel means, said second payoff arm means including second guide means thereon positioned radially outwardly from the axis of said second reel means a distance greater than the maximum wound radius which said second filament may have on said second reel, said second guide means being adapted to receive said second elongate filament in guided relation therewith and being cooperative with said second filament to cause rotation of said second payoff arm means and effect let-off of said second filament from said second supply reel means under substantially constant tension when said second filament is subjected to an axial force sufficient to draw said second filament over said second guide means from said second supply reel means, flyer means supported by said frame means for guiding said first elongate filament around said second supply reel means and associated second payoff arm means as said first filament is paid out from said first supply reel means, means for receiving said second elongate filament from said second payoff arm means and positioning said second elongate filament in substantially side-by-side relation with said first filament after said first filament is guided around said second reel means and said associated second payoff arm means, and drive means operatively associated with said flyer means in a manner to effect rotation of said flyer guide means substantially about the axis of said second supply reel means so as to effect twining of said first and second elongate filaments about each other after they are positioned in said side-by-side relation.

4,073,128

METHOD AND APPARATUS FOR MANUFACTURING OF YARN

Jerzy Ostrowski; Piotr Sierputowski, both of Warsaw; Lukasz Turkowski, Sule Jowek-Ratajewo; Jerzy Jablkiewicz; Jan Pacholski, both of Lodz, and Tadeusz Jedryka, Warsaw, all of Poland, assignors to Centralny Osrodek Badawczo-Rozwojowy Maszyn Wlokienniczych, Lodz, Poland

Filed Mar. 3, 1977, Ser. No. 774,113
Claims priority, application Poland, Mar. 10, 1976, 187856
Int. Cl.[2] D01H *1/12*
U.S. Cl. 57—58.89 **2 Claims**

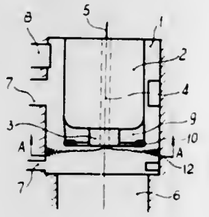


2. An apparatus for manufacturing yarn, employing a cylindrical, non-rotational spinning chamber having a source of vacuum at one end; the other end of said chamber being closed with a cylindrical insert incorporating a concentric channel to discharge ready yarn; duct means for supplying air to said chamber interior; fibre delivery channel means disposed within said chamber including: cylindrical insert means disposed at a yarn discharge side, said insert having peripheral ports diagonally arranged in relation to a centre line of said chamber, and port inlet means disposed between said discharge channel and said duct means.

4,073,129
METHOD AND APPARATUS FOR MANUFACTURE OF YARN

Jerzy Ostrowski; Piotr Sierputowski, both of Warsaw; Lukasz Turkowski, Sule Jowek-Ratajewo; Jerzy Jablkiewicz; Jan Pacholski, both of Lodz, and Tadeusz Jedryka, Warsaw, all of Poland, assignors to Centralny Osrodek Badawczo-Rozwojowy Maszyn Wlokienniczych, Lodz, Poland

Filed Mar. 3, 1977, Ser. No. 774,114
Claims priority, application Poland, Mar. 10, 1976, 187857
Int. Cl.[2] D01H *1/12*
U.S. Cl. 57—58.89 **2 Claims**

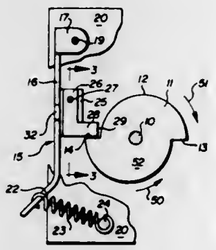


2. An apparatus for manufacturing yarn, employing a cylindrical, non-rotational spinning chamber provided at one end with a source of vacuum, and being closed at the other end by a cylindrical insert incorporating a yarn discharge channel; peripheral duct means disposed in said chamber to supply air; and fibre delivery means disposed within an upper portion of said chamber, wherein: said cylindrical insert lower face being provided with re-stricting blades, and said chamber having outlet means at the vacuum source side provided with air guides.

4,073,130
CHIME CLOCK WITH MINUTE HAND SHAFT ROTATABLE IN BOTH DIRECTIONS

Christian M. J. Jauch, Louisville, Miss., assignor to Spartus Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 671,143, March 29, 1976, Pat. No. 4,036,004. This application June 8, 1976, Ser. No. 693,915
Int. Cl.[2] G04B *21/02*; G04C *21/04*
U.S. Cl. 58—9 **9 Claims**

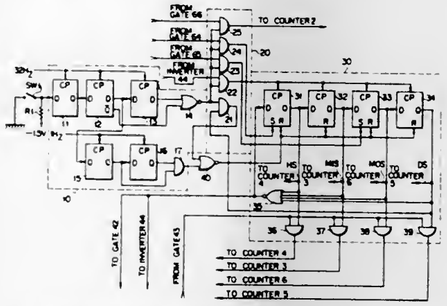


1. In a clock having a minute hand shaft capable of rotation in both clockwise and counterclockwise senses:
- a cam having at least one cam step with an edge;
- means mounting said cam for rotation in said clockwise and counterclockwise senses with said minute hand shaft;
- cam follower means comprising a lever;
- means mounting said lever for pivotal movement toward and away from said cam;
- first biasing means normally urging said lever toward said cam;
- finger means carried on said lever for engaging the periphery of said cam;
- means mounting said finger means on said lever for movement between (a) an operative first position in which said finger means is disposed to engage the periphery of said cam and obstruct counterclockwise rotation of said cam and (b) a displaced second position in which the finger means is incapable of engaging the periphery of said cam or of obstructing said counterclockwise rotation;
- second biasing means normally urging said finger means to its first position;
- and means on said finger means and on the edge of said cam step cooperating to move said finger means to its second position in response to counterclockwise movement of said cam.

4,073,131
TIME-SETTING AND DISPLAYING MODE CONTROL CIRCUIT FOR AN ELECTRONIC TIMEPIECE

Tuneo Takase, and Tetsuo Yamaguchi, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 26, 1976, Ser. No. 679,971
Claims priority, application Japan, Apr. 28, 1975, 50-50793
Int. Cl.[2] G04B *27/08*; G04C *3/00*
U.S. Cl. 58—23 R **13 Claims**

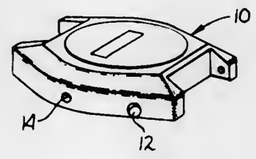


1. A time-setting and displaying mode control circuit for an electronic timepiece comprising a first and a second switch, a first-switch operative condition detecting circuit for generating a signal upon operation of said first switch, a second-switch operative condition detecting circuit for generating a signal upon operation of said second switch, a first ring counter having a first shift register circuit composed of cascade connected shift registers and a first logic circuit whose input terminals are connected to output terminals of said shift registers, respectively, and whose output terminal is connected to the input terminal of the first stage shift register of said first shift register circuit, and adapted to generate a signal corresponding to one of time-setting modes from output terminals of said shift registers of said first shift register circuit, a second ring counter including a second shift register circuit having at least one shift register, a second logic circuit having input terminals connected to said output terminal of said first logic circuit, an input terminal of said second shift register circuit, and an output terminal of said at least one shift register of said second shift register circuit, and controlled by an output signal from said first logic circuit to generate a signal corresponding to one of time-displaying modes, a first mode control circuit connected to said first-switch operative condition detecting circuit and adapted to shift, upon operation of said first switch under a time-setting mode, the content of said first ring counter and to change-over, upon operation of said first switch under either one of first and second specified time displaying modes, said time displaying mode to a corresponding one of first and second specified time setting modes by setting a specified shift register of said first shift register circuit, and a second mode control circuit connected to said second-switch operative condition detecting circuit and said first logic circuit and adapted to generate an output signal to shift the content of said second ring counter each time said second switch is operated during a time-displaying mode period.

4,073,132
WATCH CASE CONSTRUCTION

Sigurd Frohlich, 22951 Aegean Sea Drive, Laguna Niguel, Calif. 92677

Filed Mar. 15, 1976, Ser. No. 666,887
Int. Cl.[2] G04C *3/00*; G04B *37/00*
U.S. Cl. 58—23 BA **8 Claims**



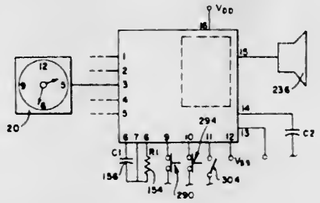
1. An electronic watch comprising:
- a. a case forming a cavity, said cavity adapted to receive an electronic watch module, said watch module having electrical battery terminals disposed on one surface thereof;
- b. a back member disposed on said case so as to close said cavity, said member having an interior surface;
- c. an inner-cover disposed within said case to engage said interior surface of said back member, and resiliently engage said terminals of said module, said inner-cover comprising:
  - i. a generally flat circular cover member, said cover member comprising upper, lower and side surfaces, said side surfaces structured and configured so as to extend perpendicularly from the periphery of said upper surface, such that said side surface may circumferentially engage said watch module, said cover member being electrically conductive,
  - ii. coupling means for electrically coupling said electrical battery terminals of said watch module to said cover member, said coupling means comprising at least one resilient tab portion of said cover member structured and configured so as to have one end of said tab portion coupled to said upper surface of said cover member while having the remainder of said tab portion protruding upward from said cover member such that said protruding portion resiliently engages said electrical battery terminals, thereby flexing said resilient tab such that said portion firmly engages said battery terminals;
  - iii. spring means for urging said coupling means toward said electrical battery terminals, said spring means comprising at least one resilient tab portion of said cover member structured and configured so as to have one end of said tab portion coupled to said lower surface of said cover member while having the remainder of said tab portion protruding downward from said cover member such that said protruding portion resiliently engages said interior surface of said back member, thereby flexing said resilient tab such that said coupling means is urged toward said battery terminals, resulting in electrical coupling of said battery terminals, said cover member and said back member.

4,073,133
ELECTRONIC CHIME AND STRIKE SYSTEM

David E. Earls, Norwalk, and C. N. Damodaran Nampoothiri, Stamford, both of Conn., assignors to General Time Corporation, Thomaston, Conn.

Filed Apr. 13, 1976, Ser. No. 676,485
Int. Cl.[2] G04C *21/04*, *21/16*
U.S. Cl. 58—13 **17 Claims**

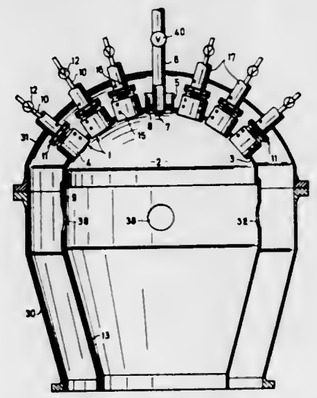
1. An electronic strike and chime generating system and the like comprising in combination:
- a. means commanding a chime program comprising a plurality of notes in ordered sequence;
- b. means activating said chime program commanding means upon at least each hour interval;
- c. means commanding a strike program, said strike program commanding means activated upon each said hour interval after completion of said chime program;
- d. frequency synthesizer means;
- e. means electrically connecting said frequency synthesizer both to said strike and chime program commanding means for response to the same thereby providing a plurality of outputs each comprising a multiple of the frequency of the fundamental tone of at least some of said notes of said programs;
- f. means for generating the fundamental frequency with selected harmonics of all notes of said programs;
- g. a loud speaker responsive to said generating means for sounding said programs; and
- h. means electrically connecting said loud speaker and said generating means.



4,073,134
GAS TURBINE COMBUSTOR FED BY A PLURALITY OF PRIMARY COMBUSTION CHAMBERS

Hans Koch, Zurich, Switzerland, assignor to BBC Brown Boveri & Company, Limited, Baden, Switzerland

Filed Apr. 2, 1975, Ser. No. 564,480
Claims priority, application Switzerland, Apr. 3, 1974, 4664/74
Int. Cl.[2] F02C *9/14*; F02G *3/00*
U.S. Cl. 60—39.29 **6 Claims**



1. A gas turbine combustion system comprising
- a large secondary combustion chamber having a spherical wall about one end;
- a plurality of smaller primary combustion chambers disposed in a spherical array on said wall, each primary combustion chamber having a wall extending through said spherical wall and terminating in an outlet directed into said secondary combustion chamber and each primary combustion chamber being of a length whereby combustion is not completed therein and being operative to project a flame into said secondary combustion chamber

for igniting a mixture of fuel and air in an adjacent primary combustion chamber;

at least one starter burner disposed in the center of said spherical array of primary combustion chambers; and

means for supplying fuel and means for supplying air to each said primary combustion chamber, at least some of said air supply means being adjustable to control the supply of air.

4,073,135

CONTROL VALVES FOR FLUIDS

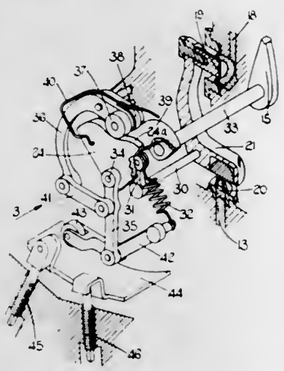
Trevor Stanley Smith, Sutton Coldfield, and Joseph Louis Bloom, Droitwich, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Sept. 20, 1976, Ser. No. 725,049

Claims priority, application United Kingdom, Sept. 26, 1975, 39474/75

Int. Cl.² F02C *9/08*

U.S. Cl. 60—39.28 R **8 Claims**



1. A fluid flow control valve, including an orifice, a control element for said orifice, means, responsive to an input pressure signal, for moving said control element relatively to said orifice, biasing means for urging said control element against the force applied by said input pressure signal, and means responsive to operation of an engine power demand control for varying the force applied by said biasing means to said control element, said force varying means comprising a cam, a cam follower coacting with said cam and with said biasing means, said cam and said cam follower being relatively movable by said engine power demand control, said cam follower including a movable element and first and second rollers mounted on said element, said first roller engaging a surface on said cam, and a resiliently deformable member which is fixed relative to said cam and which engages said second roller in all relative operating positions of said cam and said cam follower, said deformable member acting through said second roller to urge said first roller into contact with said cam surface.

4,073,136

FUEL SYSTEM FOR GAS TURBINE ENGINES

Roger James Symon, Bristol, England, assignor to Rolls-Royce (1971) Limited, Great Britain

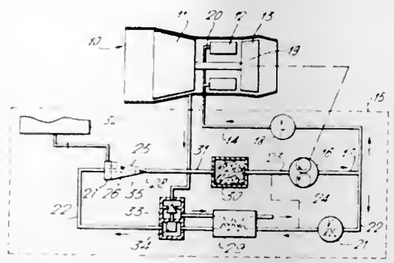
Filed Aug. 27, 1976, Ser. No. 718,418

Claims priority, application United Kingdom, Sept. 12, 1975, 37535/75

Int. Cl.² F02C *9/10*

U.S. Cl. 60—39.28 R **1 Claim**

1. A fuel system for a gas turbine engine, comprising a fuel source, a low pressure jet pump having an inlet chamber connected to said fuel source, said pump including a nozzle for energizing the fluid in the chamber and an outlet for the energized fluid, a filter, a high pressure pump, conduit means connecting in series said outlet of said jet pump said filter said high pressure pump and the engine, and a branch conduit extending from said high pressure pump to said nozzle of the jet pump to supply energizing fluid thereto, said branch including a heater



for the fluid passing through said branch thereby to heat the fluid supplied by said jet pump to said filter.

4,073,137

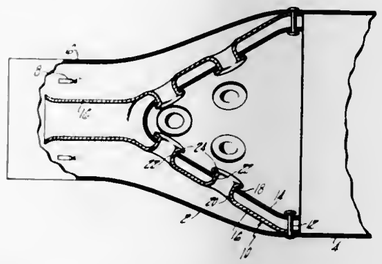
CONVECTIVELY COOLED FLAMEHOLDER FOR PREMIXED BURNER

Richard Roberts, Marlborough, Conn., assignor to United Technologies Corporation, Hartfort, Conn.

Filed June 2, 1976, Ser. No. 692,172

Int. Cl.² F02C *7/22*

U.S. Cl. 60—39.32 **9 Claims**



6. A flameholder for positioning within a burner, the latter including a housing to which combustible fuel-air mixture is supplied, said flameholder including

an outer wall positioned within and spaced from the housing,

an inner wall located within and in spaced relation to the outer wall to define a cooling space therebetween,

said inner and outer walls having aligned openings therein for admitting the combustible mixture to the space combustion chamber within the inner wall,

said outer wall having integral inwardly extending sleeves thereon surrounding at least some of the holes therein and projecting inwardly through the aligned holes in the inner wall, the sleeves being smaller in diameter than the holes receiving them to provide a clearance therebetween, and

lateral flanges on the inner ends of the sleeves to overlie the inner surface of the inner wall adjacent the holes therein, said flanges being free of attachment to the inner wall and being closely spaced from the inner wall to provide a clearance therebetween.

4,073,138

MIXED MODE ROCKET ENGINE

Rudi Beichel, Sacramento, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

Filed May 28, 1974, Ser. No. 473,560

Int. Cl.² F02K *9/02*

U.S. Cl. 60—245 **16 Claims**

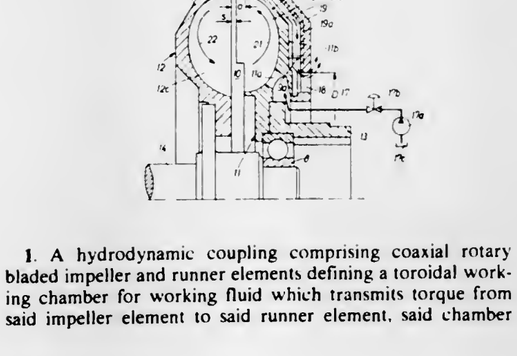
1. A rocket engine for effectively utilizing different propellant combinations having different densities during different portions of a rocket flight, said engine comprising:

a thrust chamber for receiving combustibly interactive propellants and providing a thrust-generating gaseous output flow;

first propellant delivery means for supplying a high-density propellant to said thrust chamber;

second propellant delivery means for supplying a low-density propellant to said thrust chamber; and

third propellant delivery means for supplying a propellant that is combustibly interactive with both said high-density and said low-density propellants to said thrust chamber, said third propellant delivery means including pump



means, first preburner means for combustibly interacting said first and third propellants to produce a gaseous output, second preburner means for combustibly interacting said second and third propellants to produce a gaseous output, and motor means for driving said pump means disposed to receive the gaseous outputs from both said first and second preburner means and be driven by either of said outputs; and

control means for varying the relative quantities of said propellants supplied to said thrust chamber to thereby provide the thrust chamber with different propellant combinations having different densities during different portions of a rocket flight.

4,073,139

HYDRODYNAMIC COUPLING

Waldemar Armasow, and Hans Lindenthal, both of Heidenheim, Germany, assignors to Voith Getriebe KG, Heidenheim, Germany

Filed Mar. 17, 1977, Ser. No. 778,787

Claims priority, application Germany, Mar. 4, 1976, 2614476

Int. Cl.² F16D *33/00*

U.S. Cl. 60—357 **17 Claims**

1. A hydrodynamic coupling comprising coaxial rotary bladed impeller and runner elements defining a toroidal working chamber for working fluid which transmits torque from said impeller element to said runner element, said chamber having a radially outermost region and the magnitude of transmitted torque being dependent on the degree of filling of said chamber with fluid, said torque increasing in response to increasing ratio of RPM of said impeller element to RPM of said runner element whereby the pressure of fluid which circulates in said chamber increases abruptly as a result of abrupt increase of said ratio; and a casing element having at least one section rigid with one of said first mentioned elements and surrounding the other of said first mentioned elements, at least one of the elements including said casing element and said other element defining a compartment in communication with said outermost region of said chamber so that the liquid level in said compartment normally equals approximately the liquid level in said chamber but the liquid level in said compartment advances toward the common axis of said impeller and runner elements in response to abrupt rise of fluid pressure in said chamber, said coupling having at least one opening communicating with said compartment radially inwardly of said outermost region to discharge at least some of the fluid whose level advances in said compartment radially inwardly in response to said abrupt rise of fluid pressure in said chamber and to thereby limit the magnitude of said torque on abrupt change in speed of said impeller element, especially an abrupt increase in RPM of said impeller element.

4,073,140

CONNECTING VALVE FOR RESERVE PUMP

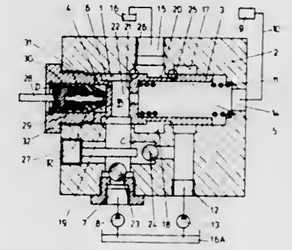
Armin Lang, Schwabisch Gmund, and Rolf Fassbender, Mutlangen, both of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany

Filed Mar. 19, 1976, Ser. No. 668,415

Claims priority, application Germany, Mar. 21, 1975, 2512432

Int. Cl.² F15B *20/00*

U.S. Cl. 60—405 **1 Claim**



1. In a booster steering hydraulic system having a main pump (**8**), a reserve pump (**13**), and a sump (**16**), for operating a pressure operated consumer (**9**);

a valve device for selectively controlling flow to said consumer device from said pumps comprising housing means (**2**) having a pair of pressure chambers (**4,5**) and a bore (**1**) therebetween;

a pressure operable valve member (**3**) movable in said bore, and bias means biasing said valve member to a neutral position within said bore;

said valve member comprising a valve piston having ends effecting walls of respective pressure chambers one said end comprising a radial wall;

said valve member ends being exposed to pressure of respective pressure chambers wherein differential pressure is operative to shift said valve member from said neutral position in opposition to said bias means;

said housing means having pump outlet passages (**7,12**) and a sump passage (**15**) for connection to respective pumps and to said sump;

a radial passage (**21**) through said valve member radial wall connecting with said pump outlet passages;

a throttle (**22**) through said radial wall and said throttle

connecting said radial passage with one of said pressure chambers;

means (11) for communicating said one pressure chamber with a consumer whereby flow from said pumps pass through said throttle to said consumer (9);

a bore (6) in said radial passage whereby pressure in said radial passage is communicated to the other pressure chamber thereby to effect a differential pressure between said pressure chambers for acting on respective ends of said valve member for actuation thereof;

coacting flow control means (25,26) in said housing means and in said valve member operative to block flow to said sump in neutral position of said valve member;

actuation of said valve member to a first position responsive to a predetermined degree of differential pressure between said pressure chambers effecting coaction of said flow control means (25) to direct the flow from said reserve pump to said sump;

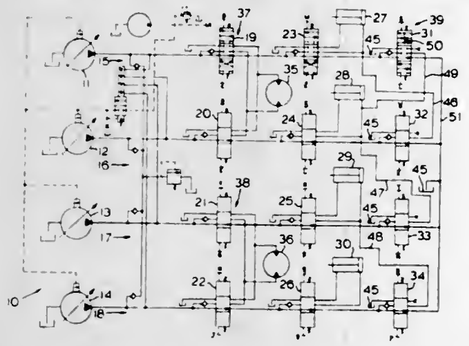
increased pressure differential pressure actuating said valve member to a second position to effect a coaction of said flow control means (26) to also direct a portion of the flow from the main pump to said sump.

4,073,141

FLUID CONTROL SYSTEM WITH PRIORITY FLOW

Kenneth R. Lohbauer, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 17, 1977, Ser. No. 778,651
Int. Cl.² F15B *13/06, 13/09*
U.S. Cl. 60—421 **12 Claims**



1. In a fluid system having a plurality of pumps, left and right track motors, and a plurality of work elements, the improvement comprising:

first means for controllably delivering fluid from a first plurality of said pumps to the left track motor and for controllably bypassing the left track motor and delivering fluid from each of the first plurality of pumps to a separate respective work element; and

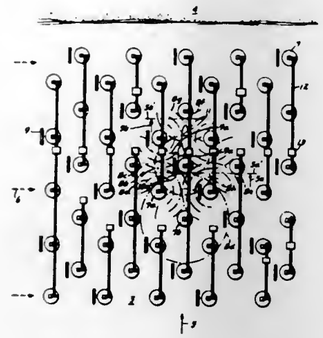
second means for controllably delivering fluid from a second different plurality of said pumps to the right track motor and for controllably bypassing the right track motor and delivering fluid from each of the second plurality of pumps to a separate respective work element.

4,073,142

WAVE-ACTION POWER APPARATUS

Michael G. Tornabene, 462-7th Ave., New York, N.Y. 10018

Continuation-in-part of Ser. No. 507,127, April 11, 1975, abandoned, and a continuation-in-part of Ser. No. 566,984, April 10, 1975, and a continuation-in-part of Ser. No. 566,983, April 10, 1975, and a continuation-in-part of Ser. No. 566,985, April 10, 1975, and a continuation-in-part of Ser. No. 432,211, Jan. 10, 1974, abandoned, and a continuation-in-part of Ser. No. 428,349, Dec. 26, 1973, abandoned. This application May 16, 1975, Ser. No. 578,178
Int. Cl.² F03G *7/10*
U.S. Cl. 60—502 **9 Claims**



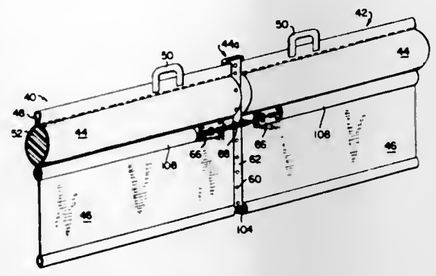
1. A wave energy device comprising in combination: a plurality of floats in water, spaced apart from one-another predetermined distances and positioned in substantially off-set positions from one-another in substantially non-lineal alignment relative to a predetermined direction of wave movement by virtue of said predetermined distances and said positioned state such that different ones of the plurality are intercepted by substantially common waves at different points in time, said predetermined distances being within a range of dimensions sufficiently small and sufficiently great such that floats' substantially concentric waves of turbulence moving substantially radially outwardly from each of the plurality coincide with one-another of others of the plurality at the floats whereby amplified reciprocating upward and downward motions occur to the floats at coinciding waves, at least one of said floats including leverage means for transmitting reciprocating motion of the one of the plurality.

4,073,143

BARRIER FOR WATER CARRIED POLLUTANTS

Paul Preus, 21 Smith Road, Toms River, N.J. 08753

Continuation-in-part of Ser. No. 683,189, May 4, 1976, abandoned. This application July 29, 1977, Ser. No. 820,239
Int. Cl.² E02B *15/04, 3/04*
U.S. Cl. 61—1 F **3 Claims**



1. A barrier for containing and controlling water carried

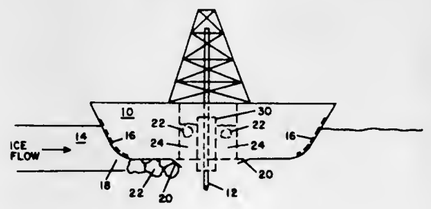
pollutants comprising a series of boom sections, each boom section comprising a generally tubular portion and a skirt portion, each of the tubular portions containing a flotation material, and means connecting the boom sections in end to end relationship characterized by generally liquid impervious connectors for the ends of the boom sections; a first vertical flap extending along one edge of one end of the skirt portion and the tubular portion of each boom section; a pair of flaps extending along the other edge of the opposite end of the skirt portion and the tubular portion of each boom section; said pair of flaps arranged to receive said first flap therebetween; separable connectors maintaining the first flap between said pair of flaps; a pair of rigid metallic plates at each end of each boom section; each said pair of plates being secured together on opposite sides of the skirt immediately below the tubular portion; each plate of each pair of plates having secured thereto a pair aligned eyes; a flexible draft member extending along each side of each boom section just below the tubular portion; each flexible draft member having an eye formed at each end; a double ended shackle detachable connecting adjacent eyes of each flexible draft member, and means cooperating with the flexible draft members and the aligned eyes of each plate connecting the flexible draft members to said plates.

4,073,144

ICE REMOVAL SYSTEM

James F. Lea, Fayetteville, Ark., assignor to Sun Oil Company Limited, Toronto, Canada

Filed June 15, 1976, Ser. No. 696,445
Int. Cl.² E02B *3/00; B63B 35/08*
U.S. Cl. 61—1 R **10 Claims**



1. A system for protecting an object in a frozen waterway from possible damage caused by ice movement, and comprising:

a. a protective structure positioned between the object and the moving ice and having a moon pool therein in which the object is immersed;

b. said protective structure having deflecting means, on its bottom and directly adjacent to said moon pool, for breaking by deflecting downward any ice passing under the protective structure, whereby the downward deflection of the ice causes it to break into pieces which then float into said moon pool from which they may be removed,

c. and wherein said protective structure includes a channel extending from said moon pool to the surrounding waterway, whereby pieces of ice in the moon pool may be flushed out said channel into the surrounding waterway.

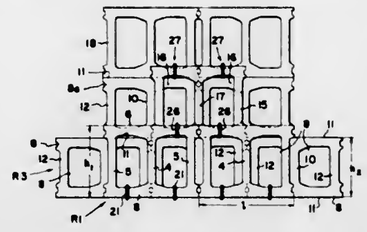
4,073,145

SHORE EROSION CONTROL STRUCTURE

Samuel S. Fair, Bay City, Mich., assignor to Sandgrabber, Inc., Bay City, Mich.

Filed June 17, 1977, Ser. No. 807,560
Int. Cl.² E02B *3/06*
U.S. Cl. 61—4 **15 Claims**

1. A shore erosion control structure comprising a wall extending longitudinally along a shoreline, said wall comprising a plurality of substantially parallel rows of block members arranged end to end, at least some of said rows having a plurality of courses of said block members, each of said block members having at least one opening extending completely therethrough and facing seaward, the openings in the block members of adjacent rows being in communication with each other to enable the passage of water through said wall, but being out of register with each other to provide tortuous passageways through which water may flow, and the block members of the



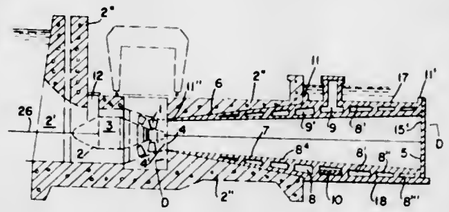
lowermost course of the most seaward row having a height greater than the height of the corresponding block members of the next adjacent row, whereby the block members of the lowermost course of the most seaward row project above the corresponding block members of the next adjacent row and overlap the lower portion of the block members forming the next higher course of said next adjacent row.

4,073,146

SUBMERSIBLE DIFFUSER

Francisco José Gutierrez Atencio, Diamante 3105 Entre Rios, Argentina

Filed July 8, 1976, Ser. No. 703,569
Claims priority, application Argentina, July 14, 1975, 259566
Int. Cl.² E02B *9/00*
U.S. Cl. 61—19 **7 Claims**



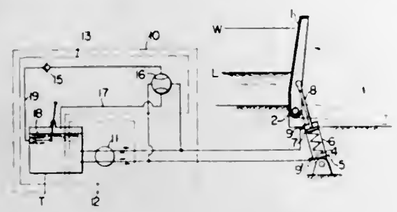
2. In a hydroelectric power plant having means for directing water through a power generation unit for causing actuation thereof; the improvement comprising a diffuser incorporating a hollow body defined by a lateral wall, such body having a first open end positioned against the outlet of said dam water directing means for receiving the water emerging therefrom, and a second open end for discharging the water entering said first end; the opening of said first end of smaller cross sectional area than the opening of said second end; at least one chamber defined in said diffuser body wall and having a volume at least sufficient to cause sinking or flotation of said diffuser when said chamber is filled with liquid or gas, respectively; means for filling said chamber with liquid for sinking purposes or with gas for flotation purposes; means for movably supporting said diffuser downstream of said power hydroelectric plant; said supporting means including two sets of substantially coplanar rollers mounted one set on each side of said hollow body; and two supporting surfaces positioned downstream of said power plant so that said rollers can be made to rest on said surfaces and rolled therealong towards and away from said power plant during mounting or dismounting of said diffuser, respectively.

4,073,147

WATER GATE CONTROL SYSTEM

Takeshi Nomura, 192, Yanagihara, Oyabe, Toyama, Japan

Filed Sept. 8, 1976, Ser. No. 721,298
Claims priority, application Japan, Sept. 18, 1975, 50-113241; May 7, 1976, 51-52464
Int. Cl.² E02B *7/46*
U.S. Cl. 61—26 **11 Claims**



1. A water gate control system comprising

a gate installed across a water-way for swinging motion between a first position where said gate is held upright to prevent the flow of water in said water-way and a second position where said gate is held down toward the downstream side to permit the flow of water through the gate,

a hydraulic cylinder comprising a cylinder block, a piston slidably fitted into said cylinder block and a piston rod formed integral with or joined to said piston, the free end of said piston rod being pivoted to said gate, said hydraulic cylinder comprising a double-acting hydraulic cylinder wherein a spring is loaded in either of two chambers defined by said piston in said cylinder block for biasing said piston in the direction in which said gate is swung to and held in said first position,

first gate control means for resiliently loading said piston in said hydraulic cylinder in such a way that said gate is held in said first position when the level of water in said water-way on the upstream side of said gate is lower than a predetermined level and said gate is automatically fallen down toward said second position when the level exceeds said predetermined level,

second control means including a high pressure hydraulic control circuit for selective hydraulic communication with said hydraulic cylinder for actuating the same, thereby swinging said gate to and holding it at any desired angular position between said first and second positions irrespective of the level in said water-way,

change-over means for bringing said hydraulic cylinder under control with either of said first or second gate control means,

a working oil storage chamber,

a pump for pumping the working oil from said working oil storage chamber and pressurizing the working oil,

a high pressure line with one end communicated with the discharge port of said pump,

a drain line with one end communicated with said working oil storage chamber,

first and second hydraulic lines with one ends communicated with first and second ports, respectively, of said double-acting hydraulic cylinder,

a first selector valve for selectively communicating the other end of said first hydraulic line with the other end of either of said high pressure line or said drain line while communicating the other end of said second hydraulic line with the other end of either said drain line or said high pressure line, and

first and second bypass lines communicating said first and second ports of said double-acting hydraulic cylinder with said working oil storage chamber, and

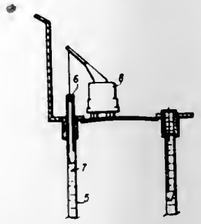
a second selector valve for opening or closing said first and second bypass lines.

4,073,148

PRECAST ELEMENT FOR THE CONSTRUCTION OF TRENCHED STRUCTURES AND THE PROCESS RELATED THERETO

Luigi Zaretti, Milan, Italy

Filed Nov. 12, 1975, Ser. No. 631,088
Claims priority, application Italy, Nov. 12, 1974, 29319/74
Int. Cl.² E01G *4/02*
U.S. Cl. 61—42 **12 Claims**



1. Precast reinforced concrete element for trench construction of structures such as retaining walls and tunnels comprising:

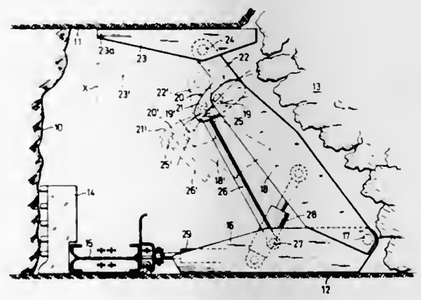
a generally rectangular-shaped wall with at least one of its faces having essentially parallel ribs extending outwardly from the surface of the wall and defining separate volume areas between the base of the wall, the two adjacent ribs and a plane tangent to the outer extension of each rib, said ribs being spaced apart to permit the pouring of liquid concrete down between adjacent ribs for the foundation of said element below said element and to permit the pouring of concrete in between the ribs to provide lateral support for the wall by filling said volume areas.

4,073,149

MINE ROOF SUPPORT ASSEMBLIES

Hans Kauter, Lunen, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Wethmar bei L unen, Germany

Filed Dec. 3, 1975, Ser. No. 637,329
Claims priority, application Germany, Dec. 18, 1974, 2459792
Int. Cl.² E21D *15/44*
U.S. Cl. 61—45 D **5 Claims**



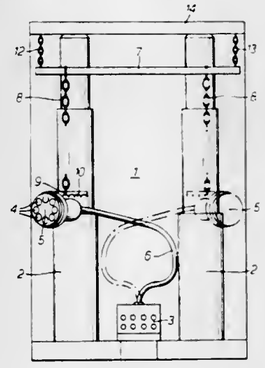
1. A mine roof support assembly comprising: a stowage shield; a floor sill structure for resting on the floor of a mine working; means for pivotably connecting said stowage shield to said floor sill structure; a hydraulic piston and cylinder unit connected between said stowage shield and said floor sill structure and serving to pivot said stowage shield in relation to said floor sill structure, said unit being arranged in an inclined position; a roof bar engageable on the roof of the mine working and displaceable in relation to the roof when said stowage shield is pivoted; and mechanical linkage means interposed between said roof bar and both said stowage shield and said floor sill structure for ensuring that a front end of said roof bar remote from said shield moves along a substantially vertical line when said shield is pivoted.

4,073,150

SUSPENDED VALVE CONTROL DEVICE

Josef Welzel, Wuppertal, Germany, assignor to Hermann Hemscheidt Maschinenfabrik, Germany

Filed May 18, 1977, Ser. No. 798,004
Claims priority, application Germany, May 22, 1976, 2623031
Int. Cl.² E21D *15/00*
U.S. Cl. 61—45 D **4 Claims**



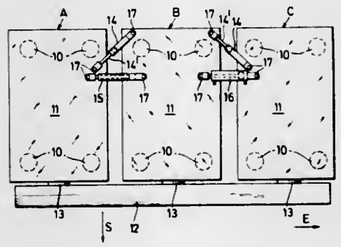
1. An assembly comprising a hydraulic walking mine-roof support frame, a multiple valve control device suspended on said frame, working fluid valves fixed on said frame, a fluid pipe-line connecting said control device to said working valves, a bar carried on the walking mine-roof support frame, a flexible supporting means on said bar for suspending the control device from said bar, a balance beam on said control device, and a line or recesses in the balance beam, said flexible supporting means being releasably fastened in any desired one of said line of recesses.

4,073,151

MINE ROOF SUPPORT ASSEMBLIES

Gunter Harmsma, Bergkamen-Overberge, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Lunen, Germany

Filed Jan. 24, 1977, Ser. No. 761,727
Claims priority, application Germany, Feb. 5, 1976, 2604316
Int. Cl.² E21D *15/44*
U.S. Cl. 61—45 D **8 Claims**



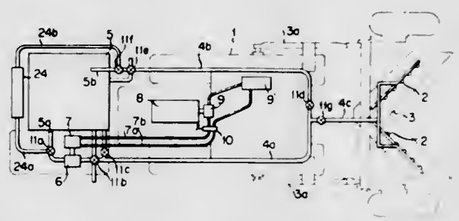
1. Apparatus for guiding and aligning three adjacent units of a mine roof support assembly, the units each comprising a floor sill and a roof cap interconnected by telescopic props, the units being displaceable by shifting ram means, the apparatus comprising first and second pairs of telescopic guide rods, the first pair of guide rods being pivotally connected, by joints, to the units of one pair of adjacent units, and the second pair of guide rods being pivotally connected, by joints, to the units of the other pair of adjacent units, wherein each guide rod of the first pair of guide rods is constituted by a springless, non-hydraulic piston-and-cylinder device and a first of the guide rods of the second pair of guide rods is constituted by a springless, non-hydraulic piston-and-cylinder device and the second guide rod of the second pair of guide rods is constituted by a double-acting hydraulic piston-and-cylinder device, and wherein the guide rods of each pair are inclined to one another at an acute angle and arranged so that the guide rods interconnecting a given pair of units are alternately retracted and extended by alternate displacement of the units of said given pair, with one of the guide rods interconnecting said given pair being completely retracted with its axis perpendicular to the direction of unit displacement when the units are arranged in a side-by-side relationship.

4,073,152

SYSTEM FOR LAYING A SUBTERRANEAN WATER IMPERVIOUS ASPHALT LAYER

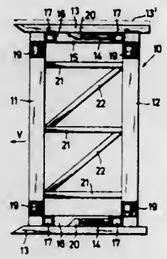
Masatoshi Kishitani, Takatsuki; Yoshiteru Tamagaki, Hirakata; Takeji Matsumoto, Hirakata; Mikio Sugimoto, Hirakata, and Noriaki Namiki, Neyagawa, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 23, 1975, Ser. No. 580,353
Claims priority, application Japan, May 25, 1974, 49-59336[U]; May 27, 1974, 49-59699[U]; May 30, 1974, 49-60259
Int. Cl.² E02B *5/02*; A01C *23/02*
U.S. Cl. 61—63 **7 Claims**



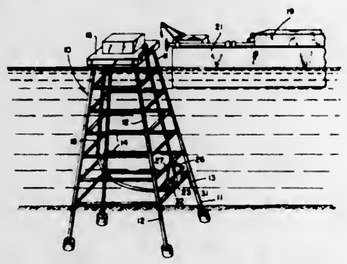
1. In a system for strewing liquidized asphalt mounted on a tractor to lay a subterranean water impervious asphalt layer which includes an engine of the tractor, a liquidized asphalt supply tank, a subterranean plough mounted on the rear side of the tractor body and provided therein with a plurality of outlet ports for discharging liquidized asphalt, a liquidized asphalt supply pipe connected between the liquidized asphalt supply tank and the outlet ports, a liquidized asphalt supply pump provided in the liquidized asphalt supply pipe and a hydraulic motor connected to the liquidized asphalt supply pump for driving the same when the hydraulic motor is energized so as to pump out liquidized asphalt from the liquidized asphalt supply tank through the liquidized asphalt supply pipe to the outlet ports causing liquidized asphalt to be discharged through the outlet ports during the movement of the tractor, thereby permitting a water impervious asphalt layer to be formed into a subterranean cavity, the improvement comprising a hydraulic pump driven by the main engine of the tractor and connected to the hydraulic motor through hydraulic lines for energizing the same and a switching valve provided in the hydraulic lines, thereby permitting the hydraulic motor to be driven in the forward or reverse direction as well as to be held in standstill position together with the liquidized asphalt supply pump by the actuation of the switching valve.

4,073,153
DRIVE SHIELDS FOR TUNNELLING
Dieter Stuckmann, Selm, and Hans Jutte, Dortmund-Brechten, both of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Germany
Filed Oct. 19, 1976, Ser. No. 733,887
Claims priority, application Germany, Oct. 21, 1976, 2547021
Int. Cl.² E21D 19/00
U.S. Cl. 61—85 7 Claims



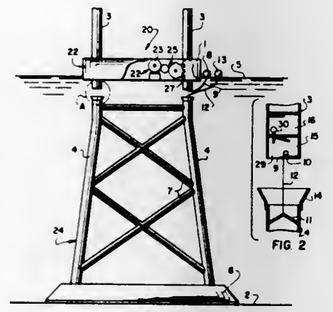
1. A drive shield for use in tunnel driving operations, comprising: a plurality of laterally adjacent support devices carried on an inner frame structure, said support devices being fixed relative to said inner frame structure against movement in the tunnel driving direction; bracing means for individually displacing said support devices relative to said inner frame structure in a direction transverse to the tunnel driving direction; a plurality of drive members mounted on each of said support devices; and shifting means for individually reciprocating said drive members relative to their respective support devices in the tunnel driving direction.

4,073,154
APPARATUS AND METHOD FOR CONNECTING AN OFFSHORE PLATFORM RISER TO A PIPELINE
Ronald D. Seguin, New Orleans, and Douglas D. Raymond, River Ridge, both of La., assignors to Texaco Inc., New York, N.Y.
Filed Oct. 4, 1976, Ser. No. 729,520
Int. Cl.² F16L 1/00
U.S. Cl. 61—86 3 Claims



1. In a marine structure adapted to be anchored to the floor of a body of water and having a product carrying riser depending therefrom through which a fluid is passed to or from a pipeline at said floor to the water's surface,
- a substantially upstanding leg structure of sufficient length to extend from the ocean floor and having bracing means attached thereto,
- said product carrying riser member depending from said leg structure, and having one end terminating at the lower end of the latter,
- a pipe extension member having an elongated conduit extending from said platform lower end, to a point beyond the water's surface when said extension member is disposed in an upright disposition,
- means forming a product carrying flexible joint communicating said riser lower end, with said pipe extension element a first member fixed to said platform, and a second member rotatably engaging said first member, said second member being pivotally movable about a horizontal axis which extends through said first member, whereby to permit controlled pivotal movement of said extension member from its upright position, to a resting position adjacent the ocean floor, and
- joint protection means operably depending from said platform supportably engaging said pipe extension member, being pivotal about said horizontal axis.

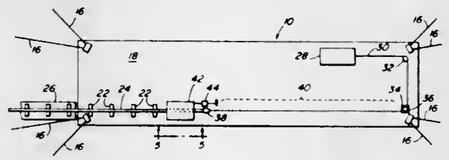
4,073,155
SEA PLATFORM CONSTRUCTION
Peter Schiemichen, Hunxe, Germany, assignor to Deutsche Babcock Aktiengesellschaft, Germany
Filed Oct. 7, 1976, Ser. No. 730,296
Claims priority, application Germany, Oct. 9, 1975, 2545219
Int. Cl.² F02D 23/02; E02B 17/08
U.S. Cl. 61—88 3 Claims



1. A sea platform adapted to rest on the sea floor, comprising a first part comprising a platform, a plurality of first legs extending through said platform, an elevating mechanism connected to said first platform and said legs for raising and lowering said legs relative to said platform, a second part comprising a floatable and ballastible base adapted to be flooded to sink in the water so as to rest on the sea floor, a plurality of second legs corresponding in number and relative location to said first legs connected to said base and extending upwardly therefrom, each of said second legs having a compartment adjacent the top thereof opening upwardly which is of a size to receive a respective one of said first legs therein in telescopic interengagement, said first legs including a working chamber at the lower end thereof opening downwardly into the sea and a lock above said working chamber for access to the working chamber, said working chamber having a compressed air connection thereto to pressurize said chamber to force the water therefrom for controlling the downward positioning of said first legs into said second legs.

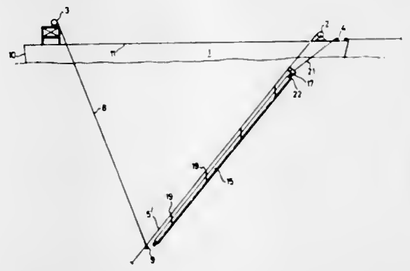
4,073,156
METHOD AND APPARATUS FOR LAYING A SUBMERGIBLE ELONGATE STRUCTURE
Leif Franz Halvor Smith, Great Yarmouth, England, assignor to Brown & Root, Inc., Houston, Tex.
Filed Sept. 7, 1976, Ser. No. 720,641
Int. Cl.² F16L 1/00
U.S. Cl. 61—107 9 Claims

1. Apparatus for laying a submergible elongate structure upon a bed of a body of water comprising:
- a floating vessel having a deck defining a path along which a submergible elongate structure is movable relative to said deck, said path including an assembly region in which additional submergible elongate structure can be assembled from components;
- first tensioning means connected to said deck and selectively connectable to a submergible elongate structure to be laid for applying an axial tension to the submergible elongate structure while said floating vessel is being advanced along a desired laying route, said first tensioning means including
- a winch mounted on the deck of said floating vessel,
- a connector for engaging an end of said submergible elongate structure,
- a cable system linking said connector to said winch, said cable system disposed such that said connector is movable along said path substantially throughout the entire length of said assembly region;



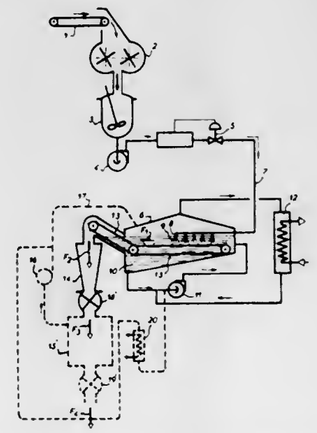
- second tensioning means including a clamp connected to said deck and selectively connectable to the submergible elongate structure at location along said path downstream of said assembly region and a barge anchor winch system for moving said barge;
- whereby said first tensioning means enable payout under tension of assembled submergible elongate structure and said second tensioning means enable the maintenance of tension on existing submergible elongate structure while additional such structure is being assembled in said assembly region.

4,073,157
OFFSHORE METHOD
Norman Noel Aylmer, Cherhill, near Calne; Peter Coe; John Graham Watson, both of London, and Brian Percy Holloway, Epsom, all of England, assignors to Piccal Subsea Limited, London, England
Filed Oct. 26, 1976, Ser. No. 735,543
Int. Cl.² F16L 1/04
U.S. Cl. 61—111 5 Claims



1. A method of laying out lengths of subsea pipline in sequence on the sea bed by lowering the lengths severally to the sea bed from a surface vessel down an anchored cable suspended from the vessel, said anchored cable being wound on a first winch on board the vessel, said method comprising the steps of:
- (a) attaching to a point on the anchored cable adjacent said first winch the free end of a first auxiliary cable which is wound up on a second winch horizontally separated from the first winch by at least a distance substantially equal to a length of the pipe to be laid;
- (b) paying out anchored cable from the first winch while winding said first auxiliary cable on the second winch, to move said point of attachment along the vessel for a distance equal to said length of pipe to be laid;
- (c) hanging along the anchored cable between said point and the first winch travelling supports carrying the length of pipe to be laid and attaching to the length of pipe a second auxiliary cable wound up on a third winch;
- (d) paying out the first auxiliary cable and thereby lowering to a position hanging from the first winch, the anchored cable with the length of pipe supported therealong above said point of attachment;
- (e) detaching the first auxiliary cable from the anchored cable and then paying out the second auxiliary cable, thereby lowering said supported length of pipe down the anchored cable to a position adjacent the anchor point or the next previously lowered length of pipe in the sequence;
- (f) repeating steps (a) to (e); and moving the vessel forward along the direction of the pipeline for a distance equivalent to the lengths of pipe laid.

4,073,158
APPARATUS FOR FREEZING SMALL DROPS OF LIQUID
Jacques Guiller, Rue de France, Ansouis, France
Filed Nov. 4, 1975, Ser. No. 628,785
Claims priority, application France, Nov. 7, 1974, 74 37010; Mar. 13, 1975, 75 07868; Sept. 30, 1975, 75 29923
Int. Cl.² F25C 1/00
U.S. Cl. 62—266 4 Claims

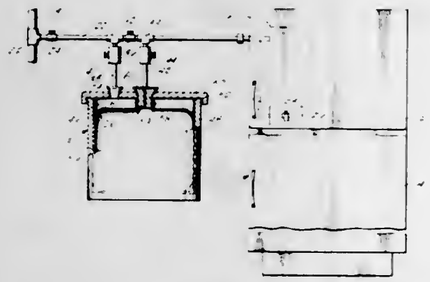


1. An apparatus for the conversion of a mass of non-gaseous fluid product to deep-frozen balls or granules, said apparatus comprising:
- a deep-freeze chamber rendered fluid-tight, in which a refrigerant liquid is contained under the physical conditions of passage to the gaseous state;
- an injector system for injecting said fluid product under pressure into said refrigerant liquid;
- an extractor-conveyor for the deep-frozen balls or granules obtained in said refrigerant liquid;
- an outlet lock-chamber permitting the evacuation of the deep-frozen products without adversely affecting the fluid-tightness;
- means for regulating the flow-rate of said injector system, said means being put into service in order to produce an appropriate over-pressure in the interior of said deep-freeze chamber.

2. An apparatus for converting a mass of non-gaseous fluid product to deep-frozen balls or granules, said apparatus comprising:
- a deep-freeze chamber rendered fluid-tight in which a refrigerant liquid is contained under the physical conditions of passage to the gaseous state;

an injector system for injecting said fluid product under pressure into said refrigerant liquid;
an extractor-conveyor for the deep-frozen balls or granules obtained in said refrigerant liquid;
an outlet lock-chamber permitting the evacuation of the deep-frozen products without adversely affecting the fluid-tightness;
means for regulating the flow-rate of said injector system, said means being put into service in order to produce an appropriate over-pressure in the interior of said deep-freeze chamber;
an expansion chamber arranged following said outlet lock-chamber and said deep-freeze chamber on over-pressure, connected to means for recovery of said quantity of refrigerant fluid impregnating said deep-frozen products passing out of said deep-freeze chamber.

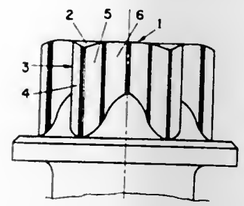
4,073,159
BYPASS DISPENSER UNIT FOR AUTOMATIC ICE MAKER
Anthony C. Trippi, 900 Fallen Leaf Road, Arcadia, Calif. 91006
Filed July 23, 1976, Ser. No. 708,085
Int. Cl.² F25C *1/00*
U.S. Cl. 62—340 **2 Claims**

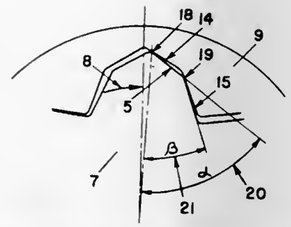


2. In combination with a refrigeration unit having a water supply inlet for receiving water from a pressurized water supply source, a dispenser unit including means providing a sealed chamber, a collapsible fluid container positioned in the chamber, means fluid connecting the chamber to the water supply source for applying pressure to the container, means fluid connecting the collapsible fluid container to the inlet of the refrigeration unit, and mixing valve means connecting fluid from the supply mixed with fluid from the container to the inlet of the refrigeration unit.

4,073,160
TORQUE TRANSMITTING COUPLING
Claude Perret, Belley, France, assignor to Cefilac, Paris, France
Filed Aug. 3, 1976, Ser. No. 711,353
Claims priority, application France, Aug. 14, 1975, 75 25954
Int. Cl.² F16D *1/00*; B25B *13/00*
U.S. Cl. 64—9 R **6 Claims**

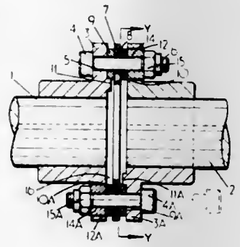
1. A high performance torque transmitting coupling including a drive element and a driven element, one of said elements having at least two teeth symmetrical in relation to the axis of rotation of the corresponding element and having generatrices parallel to this axis, the second element having at least two sockets symmetrical in relation to the axis of rotation of the corresponding element and having generatrices parallel to this axis, said teeth and sockets each being constituted by flat surfaces symmetrical in relation to their bisecting plane and connected by curved surfaces, characterized in that each tooth and socket is provided with at least four flat surfaces, each tooth being engageable with one of said sockets and, when engaged, providing at least two spaced drive generatrices for a given





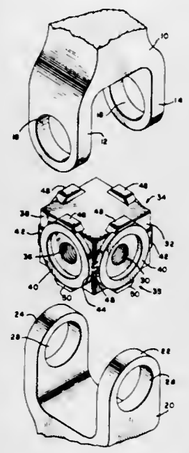
direction of rotation, the drive generatrices having at least two different angles of attack.

4,073,161
FLEXIBLE COUPLINGS
Norman Albert Bury, Warrington, England, assignor to Flexibox Limited, Manchester, England
Filed June 3, 1976, Ser. No. 692,392
Claims priority, application United Kingdom, June 4, 1975, 24032/75
Int. Cl.² F16D *3/78*
U.S. Cl. 64—13 **2 Claims**



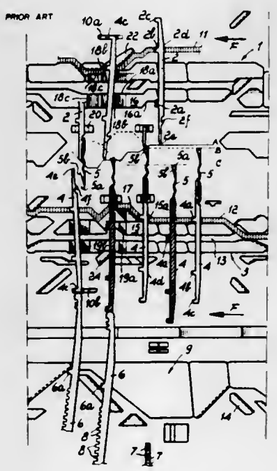
1. A flexible coupling for transmitting power between a driving member and a driven member, the coupling comprising:
a first transmission member connectable with the driving member;
a second transmission member connectable with the driven member and axially spaced from the first transmission member;
a flexible element sub-assembly disposed between the first and second transmission members and drivingly interconnecting them, the sub-assembly comprising a pack of flexible membranes formed adjacent to, but inwardly of their peripheral edges with equi-angularly spaced holes, a sleeve extending through each hole and having a flange abutting one face of the pack of flexible membranes; and
a spigot on each first and second transmission member projecting towards and axially spaced from the other respective transmission member, each spigot having a collar and each being located in such disposition on the transmission member that it peripherally contacts the adjacent collar of the other transmission member with an outwardly-directed force to thereby deform the flexible membranes to a predetermined amount.

4,073,162
THRUST WASHER STRIP
James George DeBisschop, Thomaston, Conn., assignor to The Torrington Company, Torrington, Conn.
Filed Aug. 2, 1976, Ser. No. 710,624
Int. Cl.² B65D *73/02*; F16B *39/28*; F16D *3/33*
U.S. Cl. 64—17 R **6 Claims**



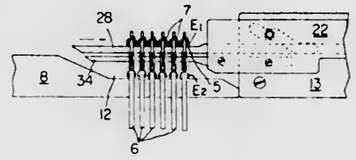
1. A plastic thrust washer strip comprising: a plurality of integral interconnected plastic washers; and at least one tab on a washer at one lateral side of the strip and at least one tab on a washer at the other lateral side of the strip for locating said washer strip on the hub of a universal joint.

4,073,163
CIRCULAR KNITTING MACHINE
Francesco Lonati, via Valsorda, 28, Brescia, Italy
Filed Nov. 8, 1976, Ser. No. 739,930
Int. Cl. D04b *9/10, 15/08*
U.S. Cl. 66—14 **3 Claims**



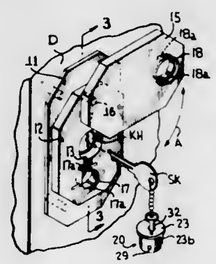
1. A double-cylinder circular knitting machine having latch needles and a safety device for the opening of the needle latches, comprising needles to be transferred from one of the two needle cylinders to the other thereof and needles not to be transferred, a transfer area, transfer members facing each other within the two needle cylinders and having control butts, each of said needles engaging a corresponding one of said transfer members, and control cams for said butts of said transfer members defining at least a first track for the butts of the transfer members associated with said needles to be transferred and at least a second track for the butts of the transfer members associated with said needles not to be transferred, and further comprising an auxiliary cam located upstream of said transfer area and configurated to bring the butts of the transfer members of one of said needle cylinders which are guided in said second track out of said second track and the corresponding needles to a height level of contact with the respective facing transfer members of the other of said needle cylinders, thereby providing a gradual opening of the needle latches by said facing transfer members, and a subsequent cam configurated to bring the butts of the transfer members associated with said needles not to be transferred back to said second track.

4,073,164
GLOVE KNITTING APPARATUS
Masahiro Shima, Wakayama, Japan, assignor to Shima Idea Center Company Ltd., Wakayama, Japan
Filed Sept. 30, 1976, Ser. No. 728,440
Claims priority, application Japan, Oct. 4, 1975, 50-120060
Int. Cl.² D04B *7/34*
U.S. Cl. 66—65 **1 Claim**



1. A loop support device for a flat knitting machine comprising a plate-like main loop support which is provided with a notch extending along the upper edge in the one end portion thereof and is mounted below the lower face of the hooks of needles to be slid along the row of the hooks of needles, and a plurality of rod-like auxiliary loop supports which are disposed to be adjacent to the notch and parallel to the upper edge of the main support and which may be projected slidably toward the notch independently.

4,073,165
LOCKING DEVICE FOR KEYHOLES
Robert Ronnie Grundstrom, 452 Ave. V, Brooklyn, N.Y. 11223, and Arthur Baylis, 156 West End Ave., Brooklyn, N.Y. 11235
Filed Aug. 6, 1976, Ser. No. 712,203
Int. Cl.² E05B *11/00, 17/14*
U.S. Cl. 70—371 **16 Claims**



1. A security locking device for a keyhole and the like com-

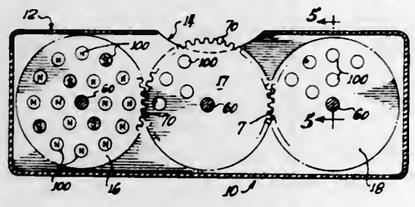
prised of a base plate, means adapted to secure the plate about the keyhole, an opening in the plate adapted to be aligned with the keyhole, a cover plate, means mounting the cover plate to the base plate to selectively cover and uncover the opening, means locking the cover plate to the base plate, said locking means including aligned openings disposed in each of said plates, a locking cylinder disposed in said opening, at least one locking pin disposed in said cylinder, means mounting said one pin for movement into and out of the cylinder and actuating means controlling said mounting means for moving said pin.

4,073,166

MAGNETIC LOCK PICK

William H. Clark, 16521 Queenside Drive, Covina, Calif. 91722

Filed Jan. 3, 1977, Ser. No. 756,080
Int. Cl.[2] E05B *19/20*
U.S. Cl. 70—394 **10 Claims**



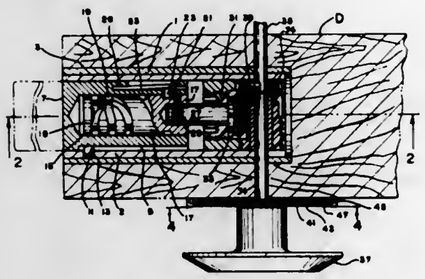
1. A lock pick for opening magnetically operated locks and their like, comprising:
an enclosure, constructed of a non-magnetizable material;
a plurality of code disks of non-magnetic material, rotatably housed within said enclosure, with their rotational axes in parallel alignment and the peripheries of adjoining code disks in mutually entraining relationship;
randomly oriented magnetized domains within said code disks; and
drive means for entraining said code disks into simultaneous rotation, whereby a randomly structured, varying magnetic field is created external to said enclosure.

4,073,167

MECHANISM FOR CONVERTING PREDETERMINED ALTERNATE ROTATIONAL MOVEMENTS TO RECTILINEAR MOVEMENTS

Charles F. Bates, II, 18 St. Andrews Drive, Ladue, Mo. 63124

Filed Feb. 19, 1976, Ser. No. 659,499
Int. Cl.[2] E05B *37/00, 37/20;* **F16H** *25/12*
U.S. Cl. 70—133 **39 Claims**



1. Mechanism for converting predetermined alternating rotational movement to rectilinear movement comprising a translatable non-rotatable element and a rotatable non-translatable element, said rotatable element having a cylindrical surface formed with a groove system, said translatable element having a follower projecting radially into said groove system and having a first position at one end thereof, said groove system comprising a plurality of axially spaced annular grooves and first oblique grooves respectively intersecting adjacent annular grooves, whereby translational movement of said translatable element in one direction away from said first position is achieved by alternate rotational movements of said rotatable element in opposite directions in accordance with the rotational positions of the intersections between said annular and said first oblique grooves, the intersections between said annular and said first oblique grooves being formed to permit only movements in an axial direction away from said first position of said follower from said annular grooves into said first oblique grooves and from said first oblique grooves into said annular grooves, and additional oblique grooves connecting adjacent annular grooves and each extending therebetween in the same rotational direction, the intersections of said additional oblique grooves and said annular grooves being formed to cause said follower to move in a direction axially of said rotatable element toward said first position whereby rotation of said rotatable element in a predetermined single direction causes said follower to return to its first position in said groove system and thereby restore said translatable member to its first position.

15. A combination lock comprising a casing having an elongated recess, a bolt element slidably mounted in said casing for axial movement therein between a retracted unlocked position and a projected locking position, means holding said bolt element against rotation within said casing, a rotatable element held against axial movement relative to said casing and having a cylindrical surface formed with a groove system comprising a plurality of axially spaced annular grooves and oblique grooves intersecting adjacent annular grooves at positions angularly disposed about the axis of said rotatable element, said bolt element mounting a radially projecting follower slidably fitting into said groove system, and means for selectively rotating said rotatable element alternately in opposite directions in accordance with the intersections of said annular and said first oblique grooves whereby to cause said follower in cooperation with said grooves to move said bolt element axially from projected toward retracted position with respect to said casing, the intersections between said annular and said first oblique grooves being formed to permit movements only in bolt-retracting axial direction of said follower from said annular grooves into said first oblique grooves and from said first oblique grooves into said annular grooves, additional oblique grooves connecting adjacent annular grooves and each extending therebetween in the same rotational direction, the intersections of said additional oblique grooves and said annular grooves being so formed and located to cause said follower to move in a bolt-projecting direction axially of said grooved element when said rotatable element is rotated in a predetermined single direction whereby continuous rotation of said rotatable element in said predetermined single direction causes full projection of said bolt to locking position.

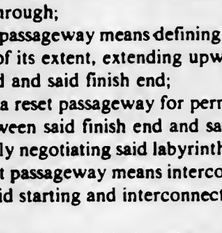
4,073,168

DEVICE FOR RELEASABLY LOCKING A CAP ON A CLOSED POSITION

Shinichi Takada, Koyama, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Apr. 23, 1976, Ser. No. 679,778
Claims priority, application Japan, Oct. 3, 1974, 49-118896
Int. Cl.[2] B65D *55/12, 55/14*
U.S. Cl. 70—165 **3 Claims**

1. In combination with a cap for openly closing a mouth of a container, wherein the cap has lever means to be turned in either direction relative to the container for tightening or loosening the cap with respect to the mouth, a device for releasably locking the cap in a closed position on the mouth of the container, comprising:
a cap cover loosely fitted over said cap and enclosing said lever means, said cap cover having a pair of lugs extending upwardly therefrom;
means on said cap cover for preventing detachment thereof from said cap while permitting said cap cover to be turned relative to said cap;
a pin slidably supported by said cap cover for movement between a first position, where said pin is held out of engagement with said lever means of said cap to permit said cap cover to be turned relative to said cap, and a second position, where said pin engages said lever means of said cap to permit said cap cover to be turned with said cap; said lugs being arranged on opposite sides of said pin and being substantially interconnected at their top ends to provide stop means on said cap cover for preventing detachment of said pin from said cap cover; and
lock means for locking said pin in said first position;
whereby said cap is loosenable via said cap cover only when said lock means is released to move said pin to said second position.

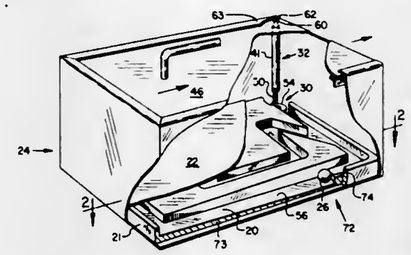


4,073,169

BALL-OPERATED LABYRINTHIC LOCK

Lyle C. Nelson, 1928 Cooper Plaza, Bend, Oreg. 97701

Filed July 21, 1976, Ser. No. 707,294
Int. Cl.[2] B65D *55/02;* **E05B** *37/20*
U.S. Cl. 70—166 **7 Claims**



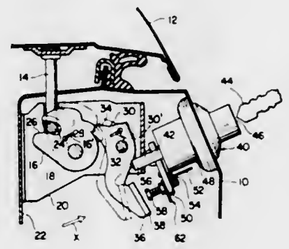
1. A locking device for preventing the unauthorized release of locking means associated therewith, said device comprising:
a. means defining a labyrinthic passageway having a starting end and a finish end;
b. a ball residing in said labyrinthic passageway means and movable therethrough;
c. said labyrinthic passageway means defining a ramp over at least a portion of its extent, extending upwardly between said starting end and said finish end;
d. means defining a reset passageway for permitting passage of said ball between said finish end and said starting end without reversely negotiating said labyrinthic passageway means, said reset passageway means interconnected at one of its ends to said starting and interconnected medially to said finish end;
e. locking means associated with the other end of said reset passageway means, releasable in response to the adjacent presense of said ball at said other end of said reset passageway.

4,073,170

REMOTELY ACTUATED LOCK ARRANGEMENT FOR MOTOR VEHICLE

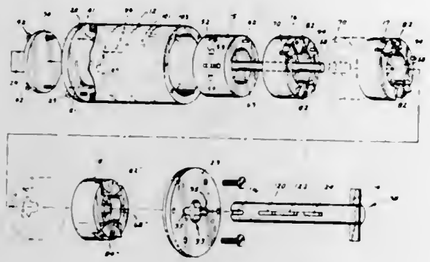
Yoshiyuki Miyabayashi, Tokyo, and Yoshimasa Tsuchiya, Sayama, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Jan. 30, 1976, Ser. No. 653,902
Claims priority, application Japan, Jan. 31, 1975, 50-13005
Int. Cl.[2] E05B *65/12*
U.S. Cl. 70—256 **2 Claims**



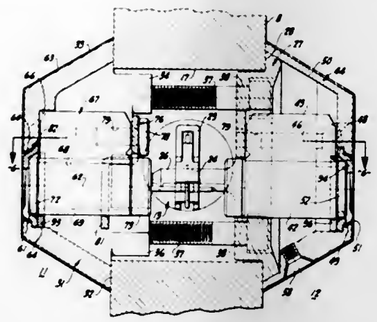
1. In a motor vehicle:
a passenger compartment;
a luggage compartment with a lid;
a casing secured within said luggage compartment;
a latch pivotably supported by said casing and having a latched position for securing said lid and an open position for releasing said lid;
a detent pivotably supported by said casing and operable in one position thereof to retain said latch in the latched position;
first spring means for biasing said latch toward an unlatched position from said latched position;
second spring means for biasing said detent toward said one position thereof;
finger means coactive with said detent in a first position thereof and manually operable from the outside of the motor vehicle to move said detent to release said latch, said finger means being movable between the first position thereof and a second position thereof in which said finger means is out of coactive condition with said detent;
key operable means for moving said finger means between the first and second positions thereof, said key operable means being operable by a key from the outside of the motor vehicle, said key operable means including a swingable arm carrying said finger means, means for toggle operating said arm and first and second stop means fixed with respect to said arm, said first stop means being operative for limiting swingable movement of said arm to define the first position of said finger means, said second stop means being operative for limiting swingable movement of said arm to define the second position of said finger means;
control means for moving said finger means between the first and second positions thereof, said control means being manually operable from said passenger compartment, said control means including a link plate operatively connected to said arm and a manually operable part extending into said passenger compartment, said manually operable control means being operable by said manually operable part to move said arm between said first and second stop means.

4,073,171
LOCK STRUCTURE
John H. Moorhouse, Clear Lake, Minn. 55319
Filed Sept. 11, 1975, Ser. No. 612,306
Int. Cl.² E05B 29/02
U.S. Cl. 70—366 7 Claims



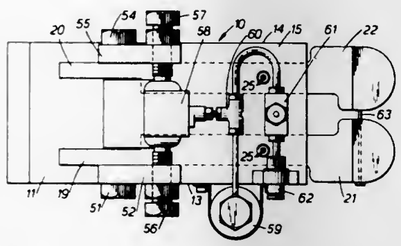
1. A lock structure, having in combination
a housing having a front and rear wall,
a plurality of rotatable members in abutting relationship disposed in said housing,
said front wall and said rotatable members defining a key-way there through,
an arcuate slot through said rear wall,
means disposed through said slot secured to the rotatable member adjacent said rear wall limiting the maximum rotation of movement of said rotatable member into an operating position,
means inter-connecting said rotatable members permitting limited relative rotation of movement of each of said members and in a predetermined sequence causing said rotatable members to progressively move one another until all move unitarily,
each of said rotatable members having one or more tumblers pivoted therein,
said tumblers respectively holding said rotatable members in non-rotatable locked position,
said rotatable members being rotationally positioned in a staggered relation relative to one another to have said tumblers misaligned in an operating direction relative to a common axis,
each of said rotatable members having a bore and a counter bore,
said tumblers being pivotally carried by each of said rotatable members and being mounted therein to project into the counter bore thereof, said counter bores each having a predetermined length, said tumblers respectively having a cam surface extending into said counter bore and having a portion thereof lockingly engaged in said housing,
each of the bores of said rotatable members having a predetermined length,
a key disposed in said key-way, said key having aligned projecting lands,
said key-way defining a slot in said bores, each of said slots having a length equal to the diameter of the counter bore adjacent thereto,
said lands on said key being spaced apart the length of the respective bores of said rotatable members, and
said key being positioned within said key-way to have each land thereof within a respective counter bore and the height of each land being such as to respectively engage the adjacent cam surface of its respective tumbler in said counter bores to pivot and release said tumbler from locking engagement with said housing for the respective rotation of said rotatable members by rotative movement of said key.

4,073,172
HIGH SECURITY DEADBOLT LOCK
Ernest L. Schlage, Burlingame, Calif., assignor to Schlage Lock Company, San Francisco, Calif.
Filed June 7, 1976, Ser. No. 693,191
Int. Cl.² E05B 15/16
U.S. Cl. 70—417 3 Claims



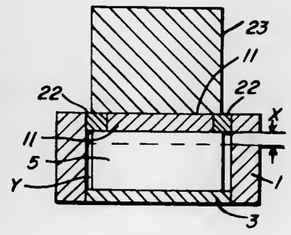
1. A high security lock for use with a door panel comprising a shell having a surface adapted to engage said panel and having a front wall, means defining a substantially circular hole through said front wall, an interior cylindrical counterbore in said front wall larger than said hole and concentric thereto, a lock body in said shell and having a planar end face and a circular-cylindrical bore therein concentric to said hole, a circular-cylindrical plug rotatable in said bore, a flange on one end of said plug abutting said end face and smaller than said hole to leave a space therebetween, means defining a keyway in said plug, said keyway having an edge opening radially through said flange to leave an edge notch therein, a circular guard plate larger than said hole rotatably mounted in said counterbore, said guard plate having a key-receiving opening therethrough and overlying said plug, a tab on said guard plate near the periphery thereof and disposed in said edge notch at the periphery of said flange, means mounting said lock body in said shell, and means separate from said body retaining said guard plate rotatably in said counterbore.

4,073,173
ROLLER GUIDES
Joseph W. Marshall, Sheffield, and Keith C. Gibson, Kingston, both of England, assignors to British Steel Corporation, London, England
Filed Oct. 18, 1976, Ser. No. 733,310
Claims priority, application United Kingdom, Oct. 17, 1975, 42740/75
Int. Cl.² B21B 39/14
U.S. Cl. 72—250 11 Claims



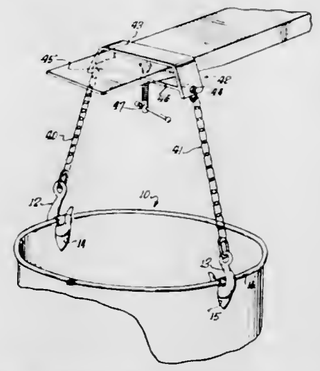
11. A roller guide assembly for guiding a workpiece into a roll pass of a rolling mill which comprises a rigid housing, guide rollers operable to engage the workpiece and to guide it into the roll pass of the mill and comprising a pair of rotatable guide rollers mounted at the exit end of the housing and reaction means operable to transmit a substantially constant load to the workpiece through each guide roller of the assembly irrespective of any lateral displacement of the rollers by the workpiece.

4,073,174
PROCESS OF FORGING LARGE SEAMLESS FERROUS-METAL WELDING NECKS AND OTHER CYLINDRICAL ARTICLES
Charles H. Moore, 645 Matanzas Court, Fort Myers Beach, Fla. 33931
Continuation-in-part of Ser. No. 519,043, Oct. 29, 1974, abandoned. This application Jan. 19, 1976, Ser. No. 650,001
The portion of the term of this patent subsequent to Nov. 22, 1994, has been disclaimed.
Int. Cl.² B21C 23/00, 23/01, 23/20, 35/04
U.S. Cl. 72—254 3 Claims



1. A process for forging large heavy-duty seamless, high-pressure resistant, self-reinforcing ferrous-metal open-ended welding necks and the like having walls of substantial thickness in a forging press possessing the usual lower stationary element and the usual upper vertically movable element, said process including
a. placing on the lower stationary element of the forging press a vertically disposed cylindrical female forging die member provided at the bottom thereof with a removable metallic disc and a peripherally enclosing circular forging knife
b. placing within the vertically disposed cylindrical female forging die member, and atop the removable metallic disc and peripherally enclosing circular forging knife, a steel billet heated to forging temperature
c. placing on top of the heated steel billet an annular billet-contacting metal-working and metal-displacing ring having an external diameter which is less than the diameter of the bore of the cylindrical female forging die member
d. positioning within the opening of the annular billet-contacting metal-working and metal-displacing annular ring a billet-contacting metal-working and metal-displacing metallic disc which is fairly closely fitting and of substantially the same thickness as that of the annular billet-contacting metal-working and metal-displacing ring
e. disposing atop the annular metallic billet-contacting metal-working and metal-displacing ring and the metal-working and metal-displacing metallic disc a round forging press follower of a diameter which is less than the diameter of the die cavity of the cylindrical female forging die member but sufficient to cover both the metallic billet-contacting metal-working and metal-displacing metallic disc and most of the metallic billet-contacting metal-working and metal-displacing annular ring.
f. moving the upper and vertically movable element of the forging press follower onto the annular billet-contacting forging press follower onto the annular billt-contacting metal-working and metal-displacing metallic disc and the billet-contacting metal-working and metal-displacing annular ring and, through said metallic disc and said annular ring, exert forging pressure onto the top of the heated billet, whereby the billet spreads out until the outer periphery thereof makes contact with the inner surface of the die cavity of the cylindrical female forging die member
g. arresting the downward movement of the upper and vertically movable element of the forging press when the immediately aforementioned condition takes place
h. removing the aforementioned round forging press folloer and replacing it with a second round forging press follower having a diameter that is less than that of the billet-contacting metal-working and metal-displacing disc and which is concentric therewith
i. applying pressure through the upper and vertically movable element of the forging press to the top of the second-named round forging press follower, whereupon the latter depresses the billet-contacting metal-working and metal-displacing metallic disc, and the metal of the heated billet is caused to move upwardly into the space between the periphery of the billet-contacting metal-working and metal-displacing metallic disc and the inner surface of the die cavity of the cylindrical forging die member during which the annular billet-contacting metal-working and metal-displacing annular ring moves upwardly on top of the back-extruded metal
j. continuing the immediately aforementioned movements until the metal of the heated work-piece below the metal-working and metal-displacing metallic disc is no less than approximately three inches thick
k. removing the annular metal-working and metal-displacing annular ring from the top of the back-extruded work-piece formed of said heated billet
l. removing the removable disc from the bottom of the vertically disposed cylindrical female forging die member and
m. punching-out the aforementioned three-inch thickness of metal at the bottom of the work-piece and the billet-contacting metal-working and metal-displacing metallic disc through the hereinbefore described circular forging knife and out of the vertically disposed cylindrical female forging die member.

4,073,175
DRUM LIFTING METHOD AND DEVICE
Paul Seamon, 6191 Anthony Ave., Garden Grove, Calif. 92645
Filed Dec. 30, 1976, Ser. No. 755,595
Int. Cl.² B21D 31/02
U.S. Cl. 72—325 8 Claims



1. An improved method for lifting metal drums of about fifty four gallon capacity with the fork of a fork lift truck of the type wherein a drum attachment fixture is affixed to the lifting fork of a fork lift truck, wherein the improvement comprises:
forming at least two reinforced openings in the side of the drum at the bottom edge of the upper lid of the drum, each of said openings being formed by a cutting member having a lever arm and a cutting arm, said lever arm fitting over the upper lid of the drum to be lifted and said cutting arm

having an indented portion having two sharpened edges terminating in a sharpened point whereby a V-shaped portion of said drum is cut and bent to form a generally V-shaped opening in the side of said drum, the wider end of the V-shaped opening having a bentover portion which forms a cushion or support for hook means; and

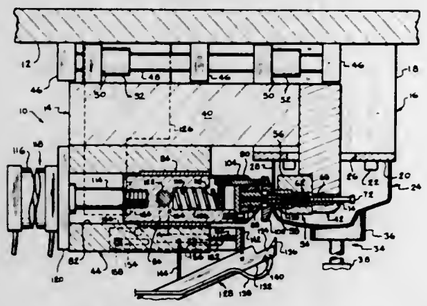
inserting at least two hook means in said openings, said hook means being supported by the fork of a fork lift truck by chain means.

4,073,176

PIERCING AND FLANGING APPARATUS

William A. Paul, 1808 Parkside Blvd., Toledo, Ohio 43607

Filed Jan. 19, 1977, Ser. No. 760,629
Int. Cl.² B21D *37/12, 45/00*
U.S. Cl. 72—328 9 Claims



1. Apparatus for piercing and flanging a workpiece, said apparatus comprising a support, means carried by said support for holding a workpiece, a frame carried by said support for movement along a path, a back-up die assembly, a punch assembly, said assemblies being carried by said frame with one being movable with respect thereto, a ram including a cylinder and a piston rod, one of said cylinder and rod being connected to said frame, and the other of said cylinder and said rod being connected to said movable assembly, said workpiece holding means being positioned to hold a portion of the workpiece between said punch assembly and said back-up die assembly, a discharge chute, means movably supporting said discharge chute by said frame, means for urging said discharge chute away from the portion of the frame which supports it and toward a position in which a portion of the discharge chute is below the workpiece, a holder for carrying said movable assembly, said holder having means for engaging said chute-supporting means for moving said discharge chute toward a retracted position away from the workpiece when said holder is moved away from the workpiece.

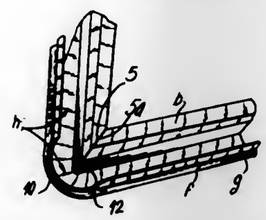
4,073,177

METHOD FOR BENDING THICK PROFILED PARTS, PART OBTAINED THEREBY AND APPLICATION THEREOF TO PANE FRAMINGS AND THE LIKE

Serge Andre Leroux, Vaux-sur-Seine, France, assignor to Etablissements Leroux S.A., Meulan, France

Filed Apr. 9, 1976, Ser. No. 675,330
Claims priority, application France, May 12, 1975, 75 14718
Int. Cl.² B21D *11/00*
U.S. Cl. 72—339 11 Claims

1. Method for angle bending a profiled part of a longitudinal extension and having at least one arm and a main web parallel to the longitudinal extension of the profiled part, comprising the steps of forming in said arm a notch extending on a portion of its width and substantially to said main web, said notch delimiting two segments of profiled part and having two edges making an angle substantially equal to the angle the profiled part has to be bent, and said two edges of the notch leading towards a bottom portion having a width depending on the bending angle and on the non-notched or plain thickness of the material of the profiled part, subsequently applying on the two segments of profiled part on each side of said notch a compression stress combined with a folding force, so that the material of said bottom portion of the notch tends to retract and to flow towards a side of the profiled part opposite the notch during



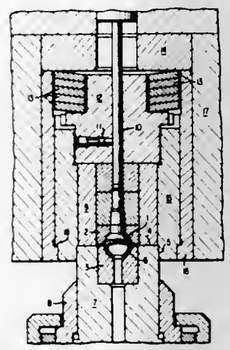
the folding to form an outer round, whereby the material of the profiled part forming the outer round is only submitted to a limited lengthening preventing said material from being submitted to stresses reaching the breaking limit.

4,073,178

DEVICE FOR COLD FORGING THE HOLLOW, SPHERICAL HEADS OF BALL-JOINT PIVOTS

Maurice Dutartre, Boulogne Billancourt, and Yves Roger, Meudon La Foret, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Aug. 26, 1976, Ser. No. 718,034
Int. Cl.² B21D *22/00*
U.S. Cl. 72—352 4 Claims



1. A device for the precision cold forging of hollow, spherical heads of ball-joint pivots comprising:

a pair of hemispherical forming dies closing on a joint plane passing almost through the center of the ball-joint, the pivot rod of said ball-joint pivot being maintained in one of the dies, along an axis perpendicular to the joint plane;

a tool holder providing a bearing edge situated almost on a level with said joint plane of the dies;

said die containing said pivot rod being clamped on said tool holder with one end thereof against said bearing edge;

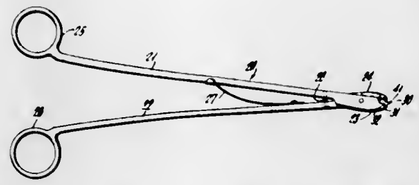
a flexible element providing a thrust against the opposite end of said die containing said pivot rod, said thrust being higher and opposite to the forming pressure created during said forging of said hollow, spherical heads and assuring that said one of said dies is permanently maintained against said bearing edge.

4,073,179

CLIP REMOVING DEVICE

Robert J. Hickey, deceased, late of Halifax, Mass., by Lisa M. Hickey, administratrix, Manomet, Mass., assignors to Codman & Shurtleff, Inc., Randolph, Mass.

Filed June 1, 1976, Ser. No. 691,271
Int. Cl.² B21D *7/00*
U.S. Cl. 72—409 4 Claims



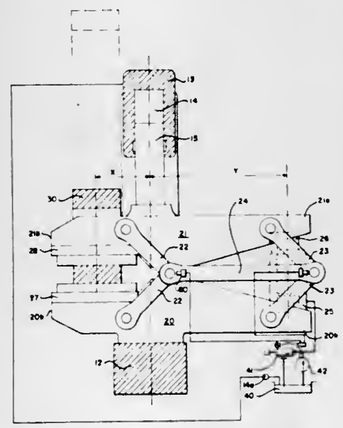
1. For use with a clip member having arms foldable about a midsection into clamping engagement about opposite sides of a tubular member for strangulation when in use, a device for removing said clip member from position of use, comprising: a pair of jaws rockable about a pivot in a direction toward and away from each other between closed and open positions, respectively; an anvil formed on the tip of one of said jaws and facing inwardly toward the other of said jaws; a shoulder on said anvil spaced from the outer tip thereof forming a stop for said clip member; and a clip deforming element on the tip of said other jaw facing said anvil, said element when said jaws are closed contacting said anvil at a location spaced outwardly from said shoulder.

4,073,180

RING FORGING APPARATUS FOR FORMING AND ENLARGING LARGE RINGS

Hans J. Pahnke, and Hans-Albert Schubert, both of Dusseldorf, Germany, assignors to Pahnke Engineering G.m.b.H. & Co. KG, Dusseldorf, Germany

Filed Mar. 24, 1976, Ser. No. 669,902
Claims priority, application Germany, Apr. 3, 1975, 2514898
Int. Cl.² B21J *9/12*
U.S. Cl. 72—453.01 10 Claims



1. In combination a hydraulic press, having a frame, an anvil member and a press piston movable toward said anvil, a pair of generally parallel arms adapted to fit between said piston and anvil and be acted thereon intermediate the ends of said arms by said piston, said arms being connected by a parallel linkage maintaining said arms in generally parallel relationship, a pair of opposed work surfaces at one end of said parallel arms adapted to receive a ring to be enlarged and a compensating hydraulic cylinder between the other ends of said parallel arms acting between said ends to maintain said arms in parallel with minimum pressure on said parallel arms.

4,073,181

AUTOMOBILE BODY DENT PULLER TOOL

Eugene B. Steinmann, Jr., 9140 Fountainblean Blvd., Apt. 402, Miami, Fla. 33172

Filed June 23, 1975, Ser. No. 589,378
Int. Cl.² B21D *1/12*
U.S. Cl. 72—479 3 Claims



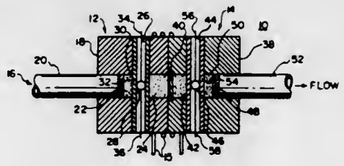
1. A pneumatically-driven auto-body dent puller comprising in combination, a slide shaft, a handle at one end of said slide shaft, means for removably securing a self-tapping screw at the other end of said slide shaft, a cylindrical slide weight having a coaxial bore through which said slide shaft is slidingly received, impact abutment means at the handle end of said slide shaft, a tubular cylinder member concentrically disposed about said slide shaft, a pair of front and rear end cap members centrally apertured for the through passage of said slide shaft and arranged thereon for enclosing the front and rear ends, respectively, of said tubular cylinder member, the outer diameter of said cylindrical slide weight being slightly less than the internal diameter of said tubular cylinder member to permit free sliding movement thereof along said slide shaft and within said tubular cylindrical member, and means for injecting a blast of pressurized air within the front end of said cylinder member forwardly of said cylindrical slide weight while in a forward position within said cylinder to drive said cylindrical slide weight rearwardly for impact against said impact abutment means through said rear end cap member, said end cap members each being provided with peripheral skirt portions slidingly receiving respective end portions of said tubular cylinder member, and vent means in said rear end cap member for discharge therethrough of air in said cylinder displaced upon said rearward driving movement of said slide weight.

4,073,182

TEMPERATURE COMPENSATED OPTICAL MEASURING INSTRUMENTS

Robert William Allington, Lincoln, Nebr., assignor to Instrumentation Specialties Company, Lincoln, Nebr.

Continuation-in-part of Ser. No. 251,712, May 9, 1972, Pat. No. 3,967,492. This application June 25, 1976, Ser. No. 699,877
The portion of the term of this patent subsequent to July 6, 1993, has been disclaimed.
Int. Cl.² G01K *19/00*
U.S. Cl. 73—1 R 24 Claims



1. A method of reducing flow-rate-dependent errors in an instrument for measuring a characteristic of a fluid comprising the steps of:

causing a fluid to flow through said instrument;

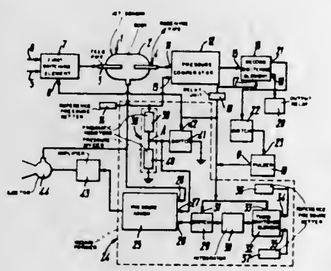
varying the rate of flow of the fluid through said instrument;
detecting the rate of change of the flow-rate-dependent error in said characteristic measurement with respect to the rate of change of the flow of fluid through the instrument; and
adjusting the flow of heat through the instrument until the flow-rate-dependent error is at a relatively low level;
the step of adjusting the flow of heat through the instrument including the step of adjusting the flow of heat until the factors that caused flow-rate-dependent increases are substantially balanced against the factors that caused flow-rate-dependent error decreases with the same magnitude of change in the flow rate of the fluid by adjusting the temperature of the fluid entering the instrument with respect to the temperature of the body of the instrument while the rate of flow of fluid is varied and the rate of change of the flow-rate-dependent error is detected until the flow-rate-dependent error is relatively low.

4,073,183

PNEUMATIC DETECTOR OF GAS AND VAPOR CONTAMINANTS IN ATMOSPHERE OF INDUSTRIAL BUILDINGS

Mikhail Vladimirovich Byalko, Studeny proezd, 38, korpus 2, kv. 388; Elena Viktorovna Kirko, ulitsa Udaltsova, 10, kv. 77; Rafael Shliomovich Perlovsky, Sirenevy bulvar, 27, korpus 2, kv. 113, and Vadim Jurievich Ryzhnev, Ryazansky prospekt, 95 korpus 4, kv. 20, all of Moscow, U.S.S.R.

Filed July 19, 1976, Ser. No. 706,791
Int. Cl.² G01N *33/00*
U.S. Cl. 73—23 **35 Claims**



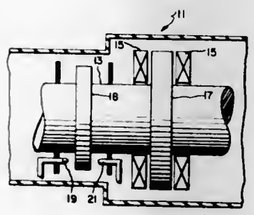
1. A pneumatic detector of gas and vapor contaminants in the air of industrial buildings comprising:
a jet sensor having
a body,
a feed pipe and
a receiving pipe, the feed pipe and the receiving pipe being accommodated in said body;
a reference gas channel conducting a reference gas into said feed pipe;
an analyzed gas channel conducting air of industrial buildings into said feed pipe;
a first switching element with three inlets and an outlet, the first inlet being connected to said reference gas channel, the second inlet being connected to said analyzed gas channel, and the outlet of said first switching element communicating with said feed pipe;
a pulser whose outlet is connected to the third inlet of said first switching element and which serves as an element for setting the operational mode;
a pressure comparator with two inlets and an outlet, the first inlet being connected with said receiving pipe;
a first reference pressure setter communicating with the second inlet of said pressure comparator;
a second switching element with two inlets and two outlets, the first inlet communicating with said outlet of said pressure comparator;
a delay unit having an inlet and an outlet, the outlet being in communication with the second inlet of said second switching element, the inlet being in communication with the outlet of said pulser;
an output relay whose inlet is connected to the first outlet of said second switching element;
a first switch having a control inlet and an outlet, the control inlet being connected to the second outlet of said second switching element, the outlet communicating with an inlet of said pulser;
a vacuum former for building up a vacuum in said body of said jet sensor;
a pressure adder, which is an element of said vacuum former, provided with three inlets and an outlet, the first inlet communicating with an inner space of said body of said jet sensor;
a second switch, which is an element of said vacuum former, having an inlet, a control inlet and an outlet, the outlet being connected to said second inlet of said pressure adder, the control inlet of said second switch being connected to the outlet of said pulser;
an integrator, which is an element of said vacuum former, having an inlet and an outlet, the outlet being connected to said inlet of said second switch;
a third switching element, which is an element of said vacuum former, having two inlets, a control inlet and one outlet, the outlet being connected to the inlet of said integrator, the control inlet being connected to said outlet of said pulser;
a second reference pressure setter, which is an element of said vacuum former, connected to said first inlet of said third switching element;
a third reference pressure setter, which is an element of said vacuum former, connected to said second inlet of said third switching element;
a pressure divider, which is an element of said vacuum former, having a central point, which communicates with said third inlet of said pressure adder, an inlet, which communicates with the first reference pressure setter, and an outlet, which is vented to the atmosphere;
a third switch, which is an element of said vacuum former, having a control inlet connected to the outlet of said pulser, an inlet communicating with the central point of said pressure divider, and an outlet communicating with the atmosphere;
an amplifier whose inlet is connected to the outlet of said pressure adder; and
a vacuum pump connected to an outlet of said amplifier and communicating with the inner space of said body of said jet sensor.

4,073,184

SHAFT AXIAL POSITION MONITORING SYSTEM

David J. Collins, Salem, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 16, 1977, Ser. No. 769,015
Int. Cl.² G01B *13/12*
U.S. Cl. 73—37.6 **8 Claims**



1. A monitoring system for tracking the axial movement of a rotating shaft, said shaft including an annular runner rotatable with said shaft; and, said monitoring system comprising:

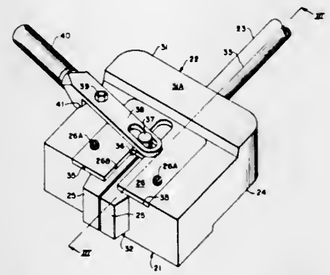
a pair of fluidic nozzles, each nozzle having a discharge end closely adjacent an opposite surface of said shaft runner;
a pressurized air supply to be delivered to each of said fluidic nozzles;
a first flow divider circuit in combination with said air supply and one of said fluidic nozzles;
a second flow divider circuit in combination with said air supply and the other of said fluidic nozzles; and,
each flow divider circuit including three pressure adjustable branches; a first branch providing a setpoint for an alarm amplifier; a second branch providing a setpoint for a trip amplifier; and, a third branch connected to one or the other of said fluidic nozzles and to said alarm and trip amplifiers whereby pressurized air is supplied in parallel at separately adjustable pressures to each of said alarm and trip amplifiers and to each of said fluidic nozzles.

4,073,185

TEST PIECE GRIPPING DEVICE

Alvin G. Griffin, 1006 Old Gate Road, Pittsburgh, Pa. 15235

Filed Nov. 3, 1976, Ser. No. 738,640
Int. Cl.² G01N *3/04*
U.S. Cl. 73—103 **8 Claims**



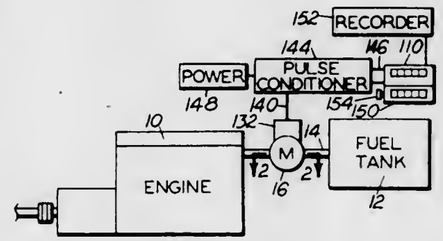
1. A test piece gripping device comprising a housing having a test piece receiving end and an opposite end adapted for connection to physical testing apparatus, said housing having longitudinal side pieces formed with parallel edge surfaces, said side pieces having coplanar front face surfaces terminated by a parallel and raised pad surface defined by a crosspiece connecting said side pieces at corresponding ends thereof, said housing including a wall extending between said side pieces and to said crosspiece while forming a back planar surface parallel with the coplanar front face surfaces of said side pieces, the back planar face surface being terminated by a parallel and raised pad surface extending between said side pieces and to the test piece receiving end of the housing, said raised pad surfaces defining housing reinforcing ribs for maintaining an optimum pull axis along the housing, said longitudinal side pieces providing a pair of opposed wedging surfaces which converge away from said crosspiece, a pair of jaw members slideable over said wedging surfaces and including opposed faces adapted to grip a test piece therebetween along said pull axis, said jaw members having coplanar outer faces, each of said coplanar faces terminating a cam surface which is inclined in a direction opposite the inclination of the wedging surface with which each of said jaw members is engaged, a unitary cam member engaged with said cam surfaces, means projecting outwardly of said cam member for moving the cam member longitudinally of said housing to effect simultaneous movement of said jaw members along said wedging surfaces and hence into a spaced-apart condition for receiving a test piece therebetween, a faceplate secured to said housing and overlying said cam member and said jaw members, said faceplate having a longitudinal slot through which said means extend, and resilient members interposed between said jaw members and said crosspiece for urging said jaw members along said wedging surfaces into a clamping condition.

4,073,186

FLOW METER AND METERING SYSTEMS

Curtis L. Erwin, Jr., 5805 SE. Gladstone, Portland, Oreg. 97206

Filed Nov. 1, 1976, Ser. No. 737,485
Int. Cl.² G01F *9/02*
U.S. Cl. 73—114 **50 Claims**



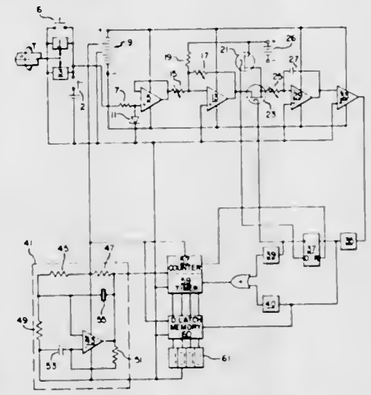
18. A flow meter for measuring fluids comprising a housing having a fluid compartment, movable means in said fluid compartment arranged to be operated by the fluid flow, magnet means in said fluid compartment, an electric circuit, solid state magnetic pickup means in said circuit actuated by said magnet means and having an output, said pickup means being disposed remote from said fluid compartment but within the influence of said magnet means for actuation thereby, and indicating means responsive to the output of said pickup means indicating fluid flowing through said meter.

4,073,187

ELECTRONIC TORQUE WRENCH

John A. Avdeef, 11700 SW. Butner Road, No. 218, Portland, Oreg. 97225

Filed July 19, 1976, Ser. No. 706,921
Int. Cl.² G01L *1/16*; B25B *23/14*
U.S. Cl. 73—139 **3 Claims**



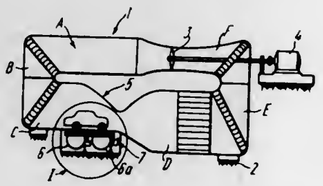
1. Apparatus for measuring torque applied to a structure comprising:
torque applying means:
a piezoelectric element for generating from within the piezoelectric element an electrical signal in response to application of a torque force;
means for amplifying the signal generated by the piezoelectric element;
a selectively operable internal calibrating standard cell operatively connected to the piezoelectric element and to the amplifying means;
means for integrating the amplified signal over a predetermined time interval, the integrating means including timing and counting means;
further means for collecting the integration result, the collecting means operatively connected to a memory unit;

and a readout display associated with the memory unit for displaying the integration result, the readout display selectively adjustable to present measured torque values in one of a plurality of physical measuring units.

4,073,188
WIND TUNNEL

Isaak Isaevich Slezinger, ulitsa Kirova, 40a, kv. 41; Gennady Fedotovich Babkin, ulitsa Tushkovskaya, 9, kv. 13; Samuil Matusovich Gorlin, Leninsky prospekt, 78, kv. 161, and Regina Valentinovna Belyaeva, Teply Stan, 3 mikroraion, korpus 40, kv. 127, all of Moscow, U.S.S.R.

Filed Dec. 27, 1976, Ser. No. 754,679
Claims priority, application U.S.S.R., Dec. 30, 1975, 2306498
Int. Cl.² G01M *9/00*
U.S. Cl. 73—147 **4 Claims**



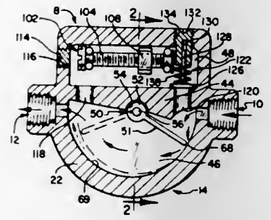
1. A wind tunnel for testing a transport vehicle comprising: a base; a system of channels for an air stream mounted on said base; a working chamber of said system to accommodate the transport vehicle under test; a means for creating the air stream in said system; rotary drums, for studying the power characteristics of the transport vehicle under test, mounted on said base so that their bearing surfaces are located in said working chamber and are essentially level with the floor of said working chamber; means for measuring the power characteristics of the transport vehicle mechanically linked with said rotary drums; a wind tunnel balance mounted on said base in the zone of said rotary drums to measure the aerodynamic forces and moments acting on the transport vehicle, said balance including a frame, which is arranged on the outer sides of said rotary drums so that said drums are inside said frame, said frame being located somewhat below the bearing surfaces of said rotary drums, at least three horizontal links connected to said frame, and vertical links having one end articulated with the ends of said horizontal links and the other end articulated with said base, said vertical links connecting each of said horizontal links with said base, one of said vertical links being directed up and the other being directed down; a supporting platform, on which the transport vehicle under test is placed, located in said working chamber and installed on said frame so that it can turn around the vertical axis in the course of tests of the transport vehicle on said wind tunnel balance, said supporting platform being installed on said frame so that it can be removed for testing the transport vehicle on said rotary drums; means for turning said supporting platform; and dynamometers secured on said base and linked mechanically with said frame.

4,073,189
FLUID FLOW MONITORING DEVICE

Robert N. Draper, Boring, Oreg., assignor to Western Skyways, Inc., Portland, Oreg.

Filed July 22, 1976, Ser. No. 707,621
Int. Cl.² G01F *1/28*
U.S. Cl. 73—228 **12 Claims**

1. A device for indicating a fluid flow rate comprising:
a housing;
partition means for separating said housing into first and second chambers, said first chamber having an inlet port and an outlet port and defining a path for fluid flow between said ports;
a shaft extending through an opening in said partition and projecting at least partially into both of said chambers, the opening being of sufficient size to allow pivoting of said shaft and to allow fluid to pass therethrough around said shaft;
a vane connected to said shaft and disposed at least partially in the first chamber in the path intermediate said ports for movement to positions which vary in accordance with the rate of fluid flow in the path, and wherein movement of said vane causes said shaft to pivot;

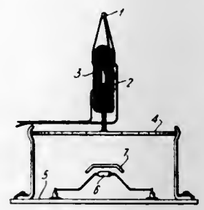


armature means positioned in said second chamber and connected to said shaft, wherein pivoting of said shaft causes said armature means to move from one position corresponding to one position of said vane to other positions each corresponding to a separate other position of said vane;
transformer means positioned in proximity to said armature means and responsive to the position of said armature means for receiving an input excitation signal and for producing an output signal corresponding to the rate of fluid flow in the path.

4,073,190
COLD STRESS METER

Lloyd E. MacHattie, 105 Banstock Drive, Willowdale, Ontario, Canada (M2K 2H7), and Lorne A. Kuehn, 65 Clayhall Cres., Downsview, Ontario, Canada (M3J 1W6)

Filed Sept. 21, 1976, Ser. No. 725,260
Claims priority, application Canada, Sept. 23, 1975, 236085
Int. Cl.² G01K *1/00, 3/00*
U.S. Cl. 73—339 C **13 Claims**



1. A still shade temperature measuring instrument comprising:
(i) a bead transistor element mounted for exposure to the sun and wind,
(ii) a first semiconductor diode longitudinally mounted vertically below said element, covered by a black circular-knit sleeve, of yarn having a low moisture-regain, the sleeve having a diameter of about ¾ inches and a length of about 1 inch,
(iii) at least one second semiconductor diode mounted horizontally below the first diode,
(iv) a metal disc centrally located about ¼ inch above the second diode, for shielding the second diode from the sun, but allowing exposure to ambient air, and
(v) circuit means for applying current to the bead transistor element and to the diodes whereby voltages are obtained and modified representative of the expression

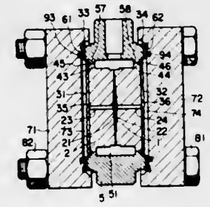
$$T_{ss} = T_a - 0.18H + HI_a + 230\tau\alpha I_a$$

where T_{ss} is an output signal representative of the still shade temperature in degrees Celsius,
T_a is representative of the ambient temperature in degrees Celsius,
H is representative of the non-evaporative rate of body heat loss in KCal/m² hr.,
I_a is representative of the thermal insulation resistance of still air outside of clothing in degrees C m²hr/KCal.,
τ is representative of the sunlight intensity, and
α is representative of the absorptance of clothing, and means for obtaining an output signal from the circuit means having the value T_{ss}.

4,073,191
DIFFERENTIAL PRESSURE TRANSDUCER

Tokuji Saigusa, Musashino, Japan, assignor to Yokogawa Electric Works, Ltd., Tokyo, Japan

Filed Dec. 2, 1976, Ser. No. 747,012
Int. Cl.² G01L *7/08, 9/12*
U.S. Cl. 73—706 **8 Claims**

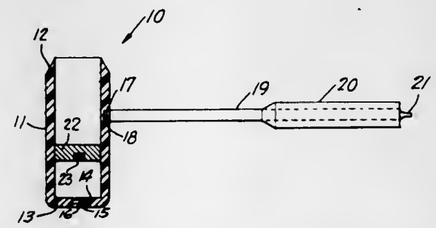


1. In a differential-pressure transducer of the type comprising: a measuring diaphragm mounted in a body forming two internal chambers on opposite sides of the measuring diaphragm; a housing having an internal space within which said body is elastically supported; seal diaphragms forming isolation chambers remote from said internal chambers and having sides subjected to measuring pressures; and fluid passageway means connecting each internal chamber to a respective isolation chamber;
that improvement wherein said seal diaphragms are fastened to said housing.

4,073,192
ADJUSTABLE VOLUME MEASURING CUP

Richard F. Townsend, 1752 North St., Anderson, Calif. 96007

Filed June 16, 1976, Ser. No. 696,555
Int. Cl.² G01F *19/00*
U.S. Cl. 73—429 **1 Claim**

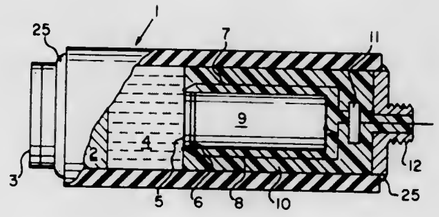


1. An adjustable volume measuring cup comprising a generally cylindrical transparent plastic barrel having inner and outer walls and an open top portion and closed bottom portion, said closed bottom portion includes an opening centrally disposed therein and a removeable plug member formed to seal the opening, a disc frictionally contacted within the barrel's inner walls, said disc being parallel to said top and bottom portions and said cup is provided with removeable hand means which is transversely fastened to a threaded bore in said outer wall and can be removed therefrom to move said disc vertically upward or downward to vary the volume above and below said disc in said barrel to thereby adjust the capacity of said measuring cup, and said outer wall includes a scale for marking the position of said disc.

4,073,193
TRANSDUCER DEVICE

John R. Mastandrea, 8 Stirrup Road, Rancho Palos Verdes, Calif. 90274

Filed Oct. 4, 1976, Ser. No. 728,997
Int. Cl.² G01N *15/00*
U.S. Cl. 73—432 PS **16 Claims**



1. A transducer device comprising:
a housing comprising a material of low elastic wave propagation velocity and high wave attenuation properties;
a front surface element mounted at one end of said housing, said front surface element having a front surface arranged to accept mechanical energy for creating an elastic wave therein, said front surface element comprising a material having high elastic wave attenuation properties;
a rear surface element mounted relative to said housing and spaced from said front surface element, said rear surface element comprising a material having high elastic wave attenuation properties;
a thin transducer element mounted upon the rear surface element between the rear surface element and the front surface element; and
means between the front surface element and the thin transducer for transmitting elastic waves but which means does not transmit transverse elastic waves,
whereby a characteristic of the electrical signal output of said thin transducer element is related to the first and the fastest elastic wave created at the front surface of said front surface element.

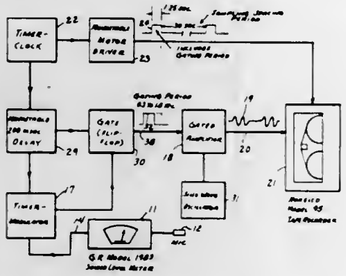
4,073,194
NOISE CHRONO-DOSIMETER SYSTEM

Robert D. Willson, Cincinnati, Ohio, and Terry L. Henderson, Fort Mitchell, Ky., assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Oct. 8, 1976, Ser. No. 731,092
Int. Cl.² G01H *5/00*
U.S. Cl. 73—646 **9 Claims**

1. A system for the periodic sampling and recording of a changeable condition in an area, comprising magnetic tape recorder means, timed clock and operating period-defining means drivingly connected to said tape recorder means and driving said tape recorder means for a predetermined operating period at the end of successive sampling spaced periods, condition-responsive transducer means located in said area to develop an electrical signal changing in strength in accordance with said condition, oscillator means generating constant-frequency waves, variableperiod gating means, means to adjust the gating period of said gating means in accordance with the strength of said electrical signal, means controlled by said timed clock and period-defining means to gate said waves with

said gating means after each sampling spacing period and during an operating period of said tape recorder means, whereby to produce successive timed strings of pulses whose number is in accordance with the respective strengths of said electrical signal after said sampling spacing periods, means to supply said strings of pulses as an input to said magnetic re-



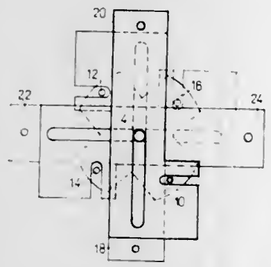
corder means, whereby to provide a tape recording containing the respective strings of pulses representing the respective strengths of said transducer-developed electrical signals during the gating periods, and means to delay each gating of said oscillator waves for a time sufficient to enable said tape recorder means to attain a substantially steady speed.

4,073,195

LOCKING MECHANISM

Matityahu Grosinger, Sokolov Str. 16, Bnei Brak, and Mordechai Salomon, Wilson Str. 5, Tel Aviv, both of Israel

Filed Aug. 26, 1976, Ser. No. 717,904
Claims priority, application Israel, Sept. 5, 1975, 48058
Int. Cl.[2] F16H *21/16*
U.S. Cl. 74—25 **10 Claims**



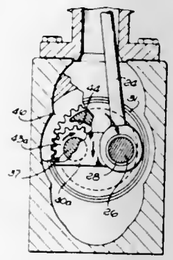
1. A locking mechanism to operate a latching means of multilatch locking device, comprising:
a housing supporting an axle;
a rotatable plate having a central aperture receiving said axle rotatably coupling said rotatable plate thereto, said plate having at least two projecting pins displaced from each other;
at least two linearly displaceable plate members including linkages freely linking said plate members to said rotatable plate and to said axle for transverse linear movement relative to each other and to said axle, said linkages including in each said plate member a pair of slots extending substantially normally to each other, one of said slots extending axially of said plate member and linking thereof to said axle to provide a common connection among said plate members and said axle, and the other of said slots linking said plate member solely to one of said projecting pins; and,
the arrangement being such that upon rotation of said rotatable plate each of said linearly displaceable plate members freely extends outwardly linearly from each other and from said axle to facilitate and effect a linear displacement of the latching means of said multilatch locking device.

4,073,196

CRANKING SYSTEM OF VARYING RADIUS

Basil Dell, Santa Ana, Calif., assignor to Gilbert T. Hendren, Jr., Huntington Beach, Calif., a part interest

Filed Aug. 13, 1976, Ser. No. 714,190
Int. Cl.[2] F16H *37/12*
U.S. Cl. 74—52 **9 Claims**



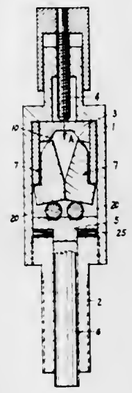
1. A drive mechanism comprising:
a first structure mounted to turn about a predetermined first axis;
a second structure connected to said first structure for rotary movement relative thereto about a second axis which is offset from said first axis and revolves thereabout as said first structure turns;
said second structure having a crank throw;
a part operatively connected to said crank throw in power transmitting relation and for relative rotation about a third axis which is offset from said second axis to rotate thereabout as said second axis revolves about said first axis;
a gear centered about said first axis and relative to which said two structures move; and
a second gear connected to said second structure for movement therewith and meshing with said first gear and having one-half as many teeth as said first gear to maintain the rotary movement of said second structure about said second axis in a predetermined timed relation to the revolving movement of said second axis about said first axis, so that, in a first dead center position, said second axis is offset from said first axis in a predetermined direction and said third axis is offset from said second axis in the same direction, while in a second and opposite dead center position said second axis is offset from said first axis in a direction the opposite of said first direction and said third axis is also offset from said second axis in said opposite direction, whereby said third axis is spaced from said first axis a maximum distance in said dead center positions and shorter distances in positions intermediate said dead center positions;
the spacing between said second and third axes being substantially greater than the spacing between said first and second axes so that, when the mechanism is in a position midway between said two dead center positions, said second and third axes are offset in opposite lateral directions from said first axis, and said third axis therefore follows a generally elliptical path about said first axis.

4,073,197

MECHANICAL POWER AMPLIFIER, IN PARTICULAR FOR A MACHINE VISE

Franz Arnold, Spatzenweg 20, 8906 Kempten, Germany; Oscar Boehm, Basagoiti, 31, Algorta (Viscaya), and Ignacio Cenaruzza, Mocherin 38, Eibar (Guipuzcua), both of Spain

Filed Apr. 19, 1976, Ser. No. 678,267
Claims priority, application Germany, Apr. 22, 1975, 7512789[U]
Int. Cl.[2] F16H *21/44*
U.S. Cl. 74—110 **14 Claims**



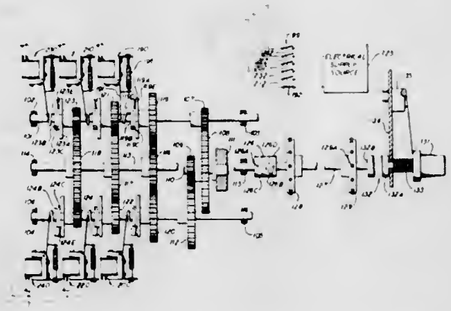
1. A mechanical power amplifier for a vise, comprising:
housing means;
a primary member having cam surface means thereon and a secondary member having abutment surface means thereon, at least said primary member being mounted for movement with respect to said housing means;
force transmitting means mounted for reciprocal movement relative to said housing means;
force amplifying transmitting means mounted in said housing means for effecting an amplification of and a transfer of force from said primary member to said force transmitting means, said force amplifying transmitting means comprising a pair of bell-crank levers arranged in a mirror-image manner relative to the center axis of said housing means, each bell-crank lever having a long lever arm with a wedge surface thereon and a short lever arm, said wedge surface engaging said cam surface means and being movable laterally in response to a movement of said primary member, and a pair of laterally spaced roller means positioned on opposite sides of said center axis of said housing means for rollingly engaging said short lever arm and said abutment surface means and effecting a transfer of force therethrough without a relative sliding movement therebetween;
arcuate surface means on a side of each of said short lever arms remote from said rollers, the center point for said arcuate surface means being radially spaced from the point of engagement of said short lever arm with said roller;
whereby said force transmitting means is moved relative to said housing means in response to a lateral movement of said arcuate surface means of said bell-crank lever caused by a movement of said primary member and said cam surface relative to said long lever arm so that each of said bell-crank levers are rocked about an axis defined by the location of engagement between said short lever arm and said roller.

4,073,198

APPARATUS FOR CHANGING THE SPEED RATIO BETWEEN FIRST AND SECOND DISPLACEABLE MEMBERS

Michael Alan Ford, Maidenhead, England, assignor to Perkin-Elmer Limited, Beaconsfield, England

Filed Aug. 20, 1976, Ser. No. 716,301
Claims priority, application United Kingdom, Aug. 21, 1975, 34750/75
Int. Cl.[2] F16H *3/08, 1/00*; G01D *15/18*
U.S. Cl. 74—360 **22 Claims**



1. Apparatus for obtaining a change in speed ratio to control a scale change comprising:
(a) a first displaceable member;
(b) a second displaceable member;
(c) speed transfer means operatively relating in motion to said first displaceable member for controlling the rate of relative displacement between the two members so as to enable any one of a predetermined range of speed ratios to be established therebetween corresponding to a desired scale in which the displacement of said second member is to be represented relative to the displacement of said first member;
(d) means for selecting a desired speed ratio; and
(e) phasing means which, accounting for a selected speed ratio, enable the relative displacement of the two displaceable members to be adjusted in operation with repeatable accuracy before said selected speed ratio and therefore the corresponding scale is enabled so that, given a basic displacement step of the first displaceable member, successive displacement steps of said first displaceable member from a positional origin thereof, each representing an exact fraction or multiple of said basic displacement step that is determined by the selected scale expansion or compression, respectively, always correspond to successive equal and invariable displacement steps of the second displaceable member from a positional origin thereof no matter where the speed change takes place past the positional origin of said first displaceable member.

4,073,199

BREAK-OVER SHIFT LEVER ASSEMBLY

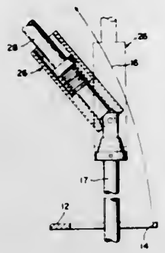
Wayne K. Simons, Federal Way, Wash., assignor to Paccar Inc, Bellevue, Wash.

Filed Oct. 22, 1976, Ser. No. 735,089
Int. Cl.[2] G05G *9/00*
U.S. Cl. 74—473 R **3 Claims**

1. A break-over shift lever assembly for cab-over-engine automotive trucks wherein the entire cab including a floor pivots about a forward pivot axis to expose the engine beneath the cab, comprising:
a transmission shift assembly having a two-piece shift handle connected below the cab floor to shift linkages and movable between fore and aft and lateral positions to operate the shift linkages,
said floor having a slot with said shift handle extending upwardly above the slot but in an interference location

with the path of the floor as the floor is swung about the forward pivot axis, and

means for releasibly breaking the two-piece shift handle into



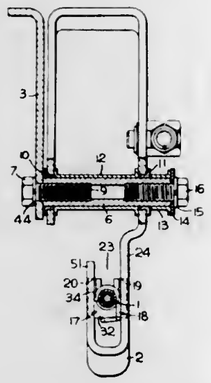
an upper lever section and a lower lever section while still connected together with the juncture between the two sections lying below the path of movement of the floor whereby the cab is pivoted over the shift handle.

4,073,200

CABLE RETAINER

John R. Plate, and James H. Lucas, both of Milwaukee, Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 9, 1976, Ser. No. 712,719
Int. Cl.² F16C *1/10*
U.S. Cl. 74—501 R **10 Claims**



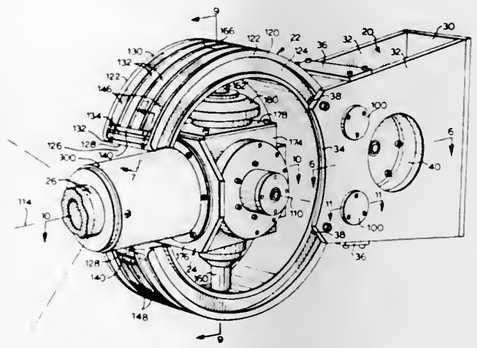
1. A mechanism including a cable retainer comprising, a mounting means, a lever pivotally mounted on said mounting means, a cable support on said lever, a cable, means defining support members in spaced relation on said cable support forming a cable opening, means in said support members defining axially aligned holes, a trunnion received for pivotal movement in said holes, said trunnion defining a transverse slot for alignment with the cable opening between said support members and receiving said cable whereby said cable holds said trunnion on said cable support, a resilient clip including a portion extending under said trunnion and tabs extending over said cable for locking said cable on said trunnion and preventing axial movement of said cable relative to said trunnion.

4,073,201

POWERED WRIST JOINT

Henry James Taylor, Willowdale, and Philip Nicholas Peter Ibbotson, Mississauga, both of Canada, assignors to Spar Aerospace Products Limited, Toronto, Canada

Filed Oct. 15, 1976, Ser. No. 732,733
Int. Cl.² F16H *37/06*; F16M *11/04*
U.S. Cl. 74—665 L **13 Claims**



1. A powered wrist joint comprising,

(a) a base member,

(b) a pitch member having a drive chamber formed therein and a yaw passage opening outwardly from said drive chamber, said pitch member being mounted on said base member for rotation about a pitch axis which extends through said drive chamber,

(c) pitch drive means on said base and drivingly connected to said pitch member for rotatably driving said pitch member about said pitch axis,

(d) yaw shaft means mounted on said pitch member and extending across said drive chamber along a yaw axis which is disposed at right angles to and intersects said pitch axis,

(e) a housing mounted on said yaw shaft means for rotation about said yaw axis,

(f) yaw drive means mounted in said housing and drivingly connected to said yaw shaft for rotatably driving said housing about said yaw axis, and

(g) a roll shaft mounted for rotation in said housing about a roll axis which is disposed at right angles to said pitch and yaw axes and intersects said pitch and yaw axes at their point of intersection and thereby provides a common center of pitch, yaw and roll gyration, said roll shaft projecting outwardly from said drive chamber in a yaw plane which extends through said yaw passage, roll drive means mounted in said housing and drivingly connected to said roll shaft for rotatably driving said roll shaft about said roll axis.

4,073,202

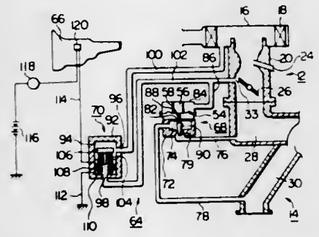
SYSTEM TO FEED EXHAUST GAS INTO THE INTAKE MANIFOLD

Syunichi Aoyama, Yokohama, and Yasuo Nakajima, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Apr. 19, 1976, Ser. No. 678,433
Claims priority, application Japan, May 19, 1975, 50-60023
Int. Cl.² F02B *33/00*; F02M *25/06*; F02D *13/00*
U.S. Cl. 74—860 **4 Claims**

1. An exhaust gas feed system for use with an internal combustion engine having a carburetor, a throttle valve rotatably disposed in an air-fuel mixture passage defined in said carburetor, an intake manifold for conveying the mixture to said engine, and an exhaust manifold for conveying the exhaust gases from said engine before discharging the same into the open air,

said exhaust gas feed system comprising a first conduit fluidly connecting said exhaust manifold with said intake manifold for feeding a portion of exhaust gases in said exhaust manifold into said intake manifold; a restrictor disposed in said first conduit and having therein an opening operable to allow the exhaust gases passing therethrough to have a sonic velocity; valve means for varying the opening degree of said opening of said restrictor when actuated; pressure responsive means including a chamber fluidly connected through a second conduit with a port formed in said carburetor, and a movable member mov-



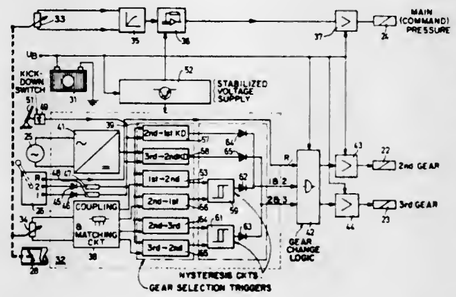
able in response to vacuum supplied to said chamber, said port being located at a place where said port is positioned in the intake manifold side when the throttle valve is rotated at a predetermined angle from its closed position, said movable member carrying said valve means for actuating the same; a third conduit fluidly connecting said chamber of said pressure responsive means with the clean air side of an air filter; and magnetic valve means disposed in said third conduit and arranged to selectively close and open the passage of the same when electrically energized and de-energized.

4,073,203

ELECTRONIC TRANSMISSION GEAR CHANGE CONTROL SYSTEM

Bert Wurst, Moglingen, and Harald Vogt, Schwieberdingen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 10, 1975, Ser. No. 621,513
Claims priority, application Germany, Oct. 11, 1974, 2448540
Int. Cl.² B60K *41/18*
U.S. Cl. 74—866 **32 Claims**



1. Electronic transmission gear changing control system, particularly for automotive automatic transmissions for combination with internal combustion engines, said transmission having at least two forward speed gear ranges (1st, 2nd, 3rd), gear selection operating means (**22, 23, 24**) connected to the transmission and engaging selected gears therein, and transmission output speed transducer means (**25**) coupled to the output of the transmission and generating a transmission speed signal, said engine having an engine controller (**28, 51**) and engine load transducer means (**29**) generating an engine operating signal;

said system comprising first and second separate control means (**53, 54, 88; 55, 56, 89**) connected to and controlling said gear selection operating means (**22, 23, 24**); the first control means (**53, 54, 88**) controlling shifting of gears in the transmission to higher speed ranges (**53, 88**: 1st to 2nd; **54**: 2nd to 3rd) and the second control means (**56, 55, 89**) controlling shifting of gears in the transmission to lower speed ranges (**55**: 3rd to 2nd; **56, 89**: 2nd to 1st) wherein switching thresholds, with respect to engine speed, of said first control means and said second control means, are different;

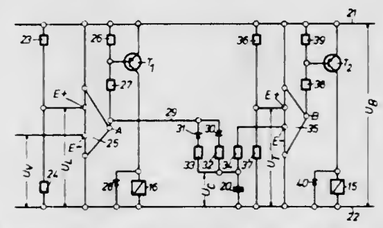
said separate control means each having inputs connected to and responsive to the transmission speed signal and to the engine loading signal.

4,073,204

TRANSMISSION-RATIO-CHANGER FOR MULTIPLE-TRANSMISSION-RATIO TRANSMISSION ARRANGEMENT

Heinrich Dick, Heidenheim, Brenz, Germany, assignor to Voith Getriebe KG, Heidenheim, Germany

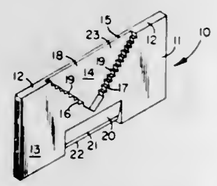
Continuation of Ser. No. 463,379, April 23, 1974, abandoned.
This application Nov. 7, 1975, Ser. No. 629,975
Claims priority, application Germany, Mar. 16, 1974, 2412753; Apr. 26, 1973, 2321090
Int. Cl.² B60K *41/10*; F16H *5/64, 5/61*
U.S. Cl. 74—866 **16 Claims**



1. In a multiple-transmission-ratio transmission arrangement of the type including at least first and second transmission-ratio-establishing units, particularly brakes and/or clutches, having hydraulically activated and unactivated states said first and second transmission-ratio-establishing units together establishing a first transmission ratio when concurrently said first unit is in a predetermined one of its hydraulic activation states and said second unit is in a predetermined one of its hydraulic activation states, said first and second transmission-ratio-establishing units together establishing a second transmission ratio when concurrently said first unit is in the other of its hydraulic activation states and said second unit is in the other of its hydraulic activation states, an arrangement for changing the transmission ratio of the transmission arrangement, comprising, in combination, a source of hydraulic activating fluid; conduits connected to said source and to said hydraulically activatable transmission-ratio-establishing units; first and second electrically controllable valve means in said conduits for alternately permitting and preventing supply of hydraulic activating fluid to said units, said first and second electrically controllable valve means each having a first electrical energization state and a second electrical energization state, said first electrically controllable valve means being operative when in one of its electrical energization states for causing said first transmission-ratio-establishing unit to assume one of its hydraulic activation states and being operative when in the other of its electrical energization states for causing said first transmission-ratio-establishing unit to assume the other of its hydraulic activation states, said second electrically controllable valve means being operative when in one of its electrical energization states for causing said second transmission-ratio-establishing unit to assume one of its hydraulic activation states and being operative when in the other of its electrical energization states for causing said second transmission-ratio-establishing unit to assume the other of its hydraulic activation states; and

electrical transmission-ratio-selecting means connected to said valve means and operative for changing the transmission ratio of the transmission arrangement by effecting a change of electrical energization state of one of said valve means and a change of electrical energization state of the other of said valve means to accordingly cause a change of state of one of said units and a change of state of the other of said units, and including electronic timing means operative during a change of transmission ratio for delaying the initiation of the change of electrical energization state of one of said valve means until after elapse of a predetermined time interval following initiation of the change of electrical energization state of the other of said valve means, to correspondingly delay the initiation of the change of state of one of said units until after the initiation of the change of state of the other of said units has been effected.

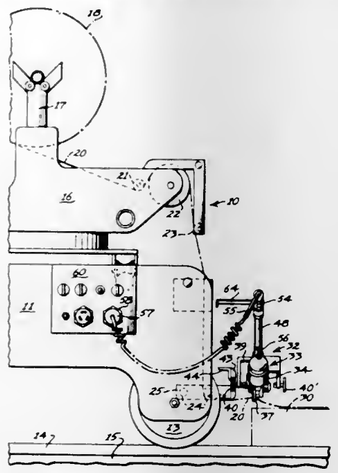
4,073,205
CHILD RESISTANT CONTAINER OPENER
William Arthur Silliman, 1755 Sherington Place, Apartment W102, Newport Beach, Calif. 92660
Filed May 7, 1976, Ser. No. 684,264
Int. Cl.² B67B 7/44
U.S. Cl. 81—3.1 R **2 Claims**



1. A container opener for child resistant containers, comprising:
- a body having a bottom surface, a notch in the bottom surface, and a notch surface;
- friction means on the notch surface; and
- a blade coupled to the body wherein the blade is a thin section of the body and has a prying edge recessed in the body and a metal plate is coupled to the prying edge and extends therefrom wherein the body is plastic and the metal plate is sonic welded to the prying edge.

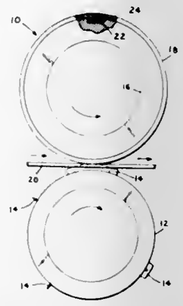
4,073,206
LONG-HANDLED CUTTING APPARATUS FOR A CLOTH SPREADING MACHINE
Jack M. Gratsch, Cincinnati, Ohio, and Cecil S. Frederick, Murfreesboro, Tenn., assignors to Cutters Machine Company, Inc., Nashville, Tenn.
Filed Jan. 27, 1977, Ser. No. 762,948
Int. Cl.² B26D 1/20
U.S. Cl. 83—489 **5 Claims**

1. A cutting apparatus for a cloth spreading machine comprising:
- (a) a cutter head having a knife adapted to cut cloth,
- (b) an elongated track member having a length substantially equal to the width of a cloth spreading machine upon which said track member is adapted to be mounted,
- (c) mounting means for mounting said track member to extend longitudinally widthwise of said cloth spreading machine,
- (d) guide means on said cutter head cooperable with said track member for movement of said cutter head longitudinally of said track member,
- (e) an elongated handle member having a remote end portion and a handle end portion,
- (f) swivel coupling means connecting said remote end portion to said cutter head so that said handle member extends generally longitudinally of said track member and is adapted to swing relative to said cutter head generally toward and away from said track member,
- (g) a sleeve slidably mounted longitudinally upon said handle member between an operative position covering said



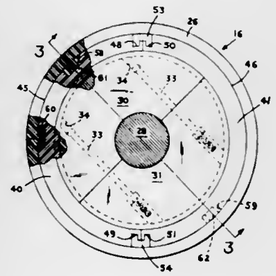
swivel coupling means to render said handle member substantially rigid relative to said cutter head, and an inoperative position uncovering said swivel coupling means to permit said handle member to swing relative to said cutter head.

4,073,207
LOCK FOR ROTARY DIE CUTTING BLANKET
Alan D. Kirkpatrick, Sparta, N.J., assignor to Robud Co., Fairfield, N.J.
Filed Dec. 22, 1976, Ser. No. 753,304
Int. Cl.² B26D 7/20
U.S. Cl. 83—659 **6 Claims**



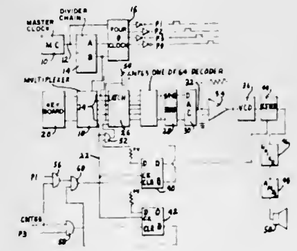
1. A cutting die blanket for use with an anvil roller of a rotary die cutting apparatus comprising:
- a split ring band having a first end and a second end;
- a female connector element secured to said first end of said split ring band;
- a male connector element rigidly secured to said second end of said split ring band;
- a coating material disposed on and securely adhered to one surface of said split ring band, said coating material extendng into and forming a portion of each of said male and female connector elements; and
- projection means riddily secured to said coating material, said projection means including a tapered surface, said tapered surface forming a part of said male connector and cooperating with said female connector element to generate a state of compression in the coating of said female connector element when engaged therewith, said compression being such as to create a resistance to penetration in the coating material of said male and female connector elements which is substantially equal to the resistance to penetration exhibited by said coating material over the remaining surface of said die cutting blanket.

4,073,208
ANVIL STRUCTURE FOR ROTARY DIE CUTTING APPARATUS
Alan D. Kirkpatrick, Sparta, N.J., assignor to Robud Co., Fairfield, N.J.
Filed Mar. 10, 1977, Ser. No. 776,257
Int. Cl.² B26D 7/20
U.S. Cl. 83—659 **11 Claims**



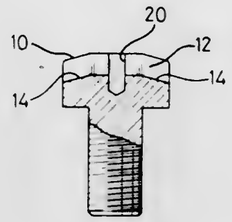
1. Anvil structure for rotary die cutting apparatus, comprising:
- an anvil head suitable for mounting on a rotatable shaft, said anvil head having a peripheral surface;
- a slip ring, said slip ring including an inner surface which is slidable on said peripheral surface of said anvil head, said slip ring being slidably mounted on said anvil head;
- die blanket means mounted on said slip ring; and
- means for releasably locking said die blanket means and said slip ring together.

4,073,209
METHOD AND CIRCUITRY FOR DIGITAL-ANALOG FREQUENCY GENERATION
Billy J. Whittington; Alan B. Welsh, both of Jasper, and Timothy L. Burns, French Lick, all of Ind., assignors to Kimball International, Inc., Jasper, Ind.
Filed Apr. 9, 1976, Ser. No. 675,323
Int. Cl.² G01H 1/02
U.S. Cl. 84—1.24 **23 Claims**



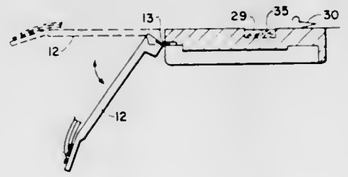
1. A method of generating frequencies corresponding to a predetermined number of actuated ones of a plurality of independently actuatable elements which comprises; repetitively scanning said elements and generating a digital signal corresponding to each said element simultaneous with the scanning thereof, independently storing the digital signals corresponding to actuated ones of said elements during the period of actuation of the respective element, converting each stored digital signal to a respective voltage signal, and supplying the voltage signals simultaneously to the control terminals of respective voltage controlled oscillators.

4,073,210
SCREW
Katsuyuki Totsu, No. 4-7, 3-chome, Oshiage, Sumida, Tokyo, Japan
Filed Sept. 10, 1976, Ser. No. 721,940
Int. Cl.² F16B 23/00
U.S. Cl. 85—45 **4 Claims**



1. A screw having a longitudinal axis and comprising a head portion having a peripheral surface symmetrical about said longitudinal axis and a stem portion extending from one face of the head portion along said axis, said head portion having a second face distant from said one face provided with at least one diametric slot of greater length than width, said slot being continuous entirely across said second face and open at the peripheral edges and being bounded by facing side walls and a bottom wall recessed below the surface of said second face determining the depth of the slot, the bottom wall of the slot comprising a horizontal central section perpendicular to said axis and end sections having a uniform slope forming opposed extensions to said horizontal section from which said end sections downwardly diverge at equal angles with respect to said axis toward said one face, the side walls of said slot bounding said side extensions having throughout their lengths a height relative to the bottom wall at least equal to the height of the side walls bounding the horizontal central section of said slot to thereby present side walls of continuous maximum area terminating at the outer radial extremities thereof.

4,073,211
COLLAPSIBLE GUITAR
Allen C. Jorgensen, Coulee City, Wash., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed July 26, 1976, Ser. No. 708,438
Int. Cl.² G10D 3/00, 1/08
U.S. Cl. 84—291 **3 Claims**



1. A string instrument in the form of a body fitted with a neck that projects beyond the body, on which neck, strings are fixed extending along the neck of the body, in which said body is joined to the neck by a hinge with said neck mounted to the hinge so as to pivot into a recess located in the body and extending from the back panel of the instrument, together with a bridge member to which one end of all the strings are fastena-

ble, said bridge member of a shape to alternatively detachably fasten to

first clamp means fixed to the face of the instrument body, or

second clamp means fixed to a recess section of the instrument body,

said first clamp means located in a position in which the strings are maintained in a first taut condition when the neck is folded to the erect playing position, with the bridge unit attached to said first clamp means, and

said second clamp means located in a position in which the strings are maintained in a second taut condition when the neck is folded into the body recess, with the bridge unit attached to said second clamp means,

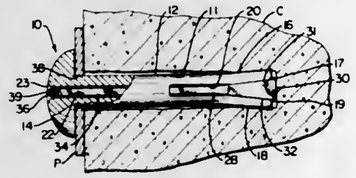
said second taut condition being relatively slack as compared to said first taut condition.

4,073,212

ANCHOR BOLT WITH VISUAL ENGAGEMENT INDICATOR

Lester Lerich, Broomfield, Colo., assignor to Wej-It Corporation, Broomfield, Colo.

Filed Oct. 15, 1976, Ser. No. 732,897
Int. Cl.² F16B *13/04*
U.S. Cl. 85—79 **5 Claims**



1. An anchor bolt adapted for insertion into anchoring engagement with a blind hole, comprising:

an elongated unitary shank portion, an enlarged head portion on one end of said shank portion, and a radially expandible portion on the opposite end of said shank portion having limbs extending longitudinally from said opposite end in spaced-apart relation to each other, said shank portion including an axial bore extending entirely through said head and shank portions into communication with the space between said limbs;

wedge means in the space between said limbs for radially expanding said limbs into frictional and binding engagement with the sides of said blind hole, said wedge means including a flat plate portion thin enough to fit in the space between said limbs and a wedge portion extending longitudinally from said flat plate portion beyond the ends of said limbs and having surfaces diverging away from the longitudinal axis of said bolt in opposite directions such that the largest distance between said surfaces is greater than the space between said limbs, whereby forced movement of said wedge portion between said limbs due to abutment of said wedge portion against the blind end of said hole results in radial expansion of said limbs in relation to the longitudinal axis of said bolt; and

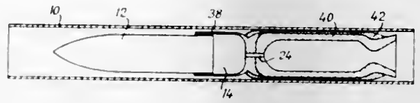
indicator means in said axial bore for providing a visual indication of radial expansion of said limb in relation to the longitudinal axis of said bolt, said indicator means including an elongated finger extending longitudinally from said flat plate portion of said wedge means and is slidably received into said bore such that rearward axial movement of said wedge portion to a position between said limbs resulting in radial expansion of said limbs also causes said finger to slide rearwardly in said bore whereby expansion of said limbs can be detected by visual perception of the position of said finger within said axial bore, said finger being shorter than the combined length of said shank and head portions of said bolt.

4,073,213

ASSEMBLY FOR LAUNCHING A PROJECTILE

Emile J. Stauff, Versailles, France, assignor to Societe Anonyme dite : Societe Europeenne de Propulsion, Puteau, France

Filed June 29, 1976, Ser. No. 700,743
Claims priority, application France, July 2, 1975, 75 20741
Int. Cl.² F41F *3/02, 15/00*
U.S. Cl. 89—1.701 **5 Claims**



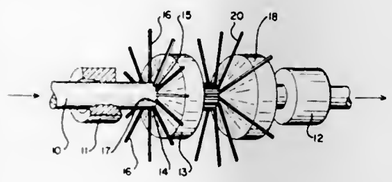
1. A projectile launching assembly including a launching tube, a charge of gunpowder located in said launching tube for firing from said tube a projectile which is loaded in said tube in front of said gunpowder charge, a body of braking propellent powder consisting almost entirely of highly combustible substances positioned in said launching tube behind said gunpowder charge, and comprising a block having, at least, a partially hollow interior forming a tubular nozzle and a cylindrical sleeve connecting said projectile to said body of braking propellent to form a rigid unit which is loadable as a unit into said launching tube, said gunpowder charge being contained within said cylindrical sleeve, and a jacket of resin bonded wound filaments surrounding said body of braking propellent and at least part of said connecting sleeve, said wound filaments and their resin binder both being combustible.

4,073,214

SHAVE FORMING OF WIRE

Milton C. Shaw, Pittsburgh, Pa., and Tetsutaro Hoshi, Kyoto, Japan, assignors to Carnegie-Mellon University, Pittsburgh, Pa.

Filed Sept. 1, 1976, Ser. No. 719,592
Int. Cl.² B23D *1/00, 3/00, 5/00*
U.S. Cl. 90—24 D **6 Claims**



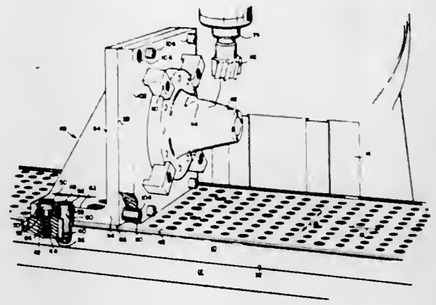
1. The method of manufacturing wire from wire rod comprising moving the rod lengthwise successively past a slotted first cutting edge so as to shave from the rod a plurality of continuous confined chips and leave grooves in the rod separated by a plurality of lands and then past a second cutting edge so as to shave the lands from the rod as unconfined continuous chips, the confined chips being shaved off the rod at an angle sufficient to produce a ratio of worked to unworked chip length of at least about 0.35 and the unconfined chips being shaved off the rod at an angle different from the confined chip angle sufficient to produce a ratio of worked to unworked chip length of at least about 0.35, whereby continuous confined and unconfined chips are produced without cracking.

4,073,215

SUB PLATE ASSEMBLY FOR MACHINE TOOLS

Robert L. Coope, and Lowell W. Munson, both of Phoenix, Ariz., assignors to Stevens Engineering, Phoenix, Ariz.

Filed Oct. 1, 1976, Ser. No. 728,724
Int. Cl.² B23D *7/08*
U.S. Cl. 90—58 R **10 Claims**



1. A tooling setup and subplate means for machine tools comprising: a flat subplate adapted to be supported on and fixed to a conventional flat table of a machine tool; said subplate having an array of openings therein; said openings being in straight parallel spaced apart rows which rows intersect each other at right angles and at centers of said openings; first ones of said openings being internally screwthreaded fixture receiving openings; second ones of said openings being locating openings; each locating opening provided with a first precision bore; a hollow cylindrical bushing precisely engaged in said bore; each bushing having a second precision bore; said locating openings being precisely spaced apart an equal distance in two directions; said directions being 90 degrees apart; a tooling member removeably secured to said subplate; said tooling member having a first portion; said first portion having a first surface engaging said subplate; said first portion provided with fixture receiving openings spaced apart to coincide with said fixture receiving openings in said subplate; said tooling member also having locating openings in said first portion; said last mentioned locating openings spaced apart to coincide with said locating openings in said subplate; said last mentioned locating openings each having a third precision bore; a hollow cylindrical bushing precisely engaged in said last mentioned bore; said last mentioned bushing having a fourth precision bore; and precision dowels precisely interengaged in both the precision bores; in said bushings which are disposed in the locating openings of said subplate and the locating openings in said tooling member.

4,073,216

VALVE CONTROL APPARATUS FOR ROTARY ENGINES

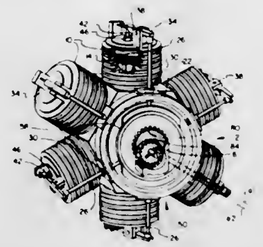
Gilbert E. Davis, Boise, Idaho, assignor to Energy Research, Provo, Utah

Filed July 3, 1975, Ser. No. 593,003
Int. Cl.² F01B *1/06;* F02B *57/08*
U.S. Cl. 91—480 **8 Claims**

1. Valve actuating apparatus for use in a rotary engine or pump which includes a cylinder unit rotatable about an axis and having at least three cylinders radially arranged about the axis and at least three valve means, each associated with a different cylinder, said apparatus comprising

means defining a generally circular cam track having a pair of lobes disposed substantially diametrically opposite one another, each of said lobes extending circumferentially through an angle of substantially 90°, said cam track means including an annular flange disposed at one side of said cam track and extending radially outwardly therebeyond,

means for causing said cam track means to rotate relative to said cylinder unit, and at least three tappet means carried by said cylinder unit and each coupled to a different valve means for coacting with said cam track to operate the corresponding valve means alternately to open and closed positions with each rotation of the cylinder unit and as the cam track is rotated, each tappet means including a generally elongate member one end of which has a generally flat side face disposed in close proximity with one side of said flange, said tappet means thereby being prevented from rotating.

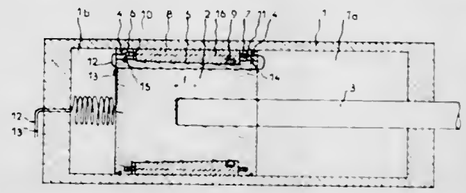


4,073,217

DEVICE ENABLING THE IMMOBILIZING OF A PISTON IN ITS CYLINDER

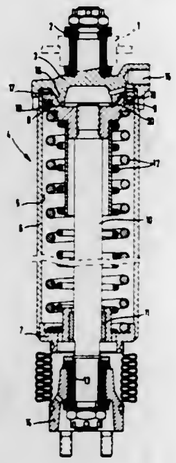
Jean-Paul Colin, Saint-Sebastien, France, assignor to Ste Anonyme dite: Ateliers et Chantiers de Bretagne - A CB, Nantes, France

Filed Aug. 2, 1976, Ser. No. 710,991
Claims priority, application France, Aug. 12, 1975, 75 25038
Int. Cl.² F15B *15/26*
U.S. Cl. 92—27 **5 Claims**



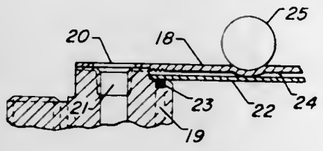
1. A fluid controlled device comprising a cylinder, a piston moveable in said cylinder under fluid pressure and defining therewith two expansible chambers, said piston having an inclining peripheral surface portion intermediate its ends, wedge means mounted on the inclined peripheral surface portion for movement along said surface, annular jacks carried by said piston, said jacks being operatively connected to said wedge means for exerting forces thereon for selective movement of the wedge means towards one or the other ends of said inclining surface portion, means communicating fluid pressure in at least one of the chambers to the piston and cylinder interface, said cylinder having wall portions subject to radial expansion when the cylinder is under pressure to create a clearance between the piston and cylinder wall portions, said wedge means being moveable under the influence of said jacks along the inclined peripheral portion of the piston to a position in which they are radially displaced by an amount essentially equal to the maximum radial clearance between the piston and the wall of said cylinder caused by radial expansion of said cylinder when the cylinder is under pressure.

4,073,218
ACTUATING CYLINDER FOR A MAGNETIC RAIL BRAKE UNIT
Hans Pöllinger, Munich, Germany, assignor to Knorr-Bremse GmbH, Munich, Germany
Filed Aug. 5, 1976, Ser. No. 712,072
Claims priority, application Germany, Aug. 8, 1975, 2535524
Int. Cl.² F01B *11/02*; F16J *11/02*
U.S. Cl. 92—85 R **2 Claims**



1. A fluid pressure device for actuating a magnetic rail brake unit on a vehicle comprising a cylinder having a head end, a piston slidable within said cylinder and having an end position at said head end, a projection on said cylinder head extending toward said piston and having a first conical stop surface thereon, said piston having a recess therein conforming to said projection and having a second conical stop surface thereon, said first and second stop surfaces defining a pair of concentric conical mating surfaces engageable with each other to stop the piston in said end position, said stop surfaces being at an angle of substantially 30° with respect to the longitudinal axis of the cylinder, said piston having a sealing ring around its periphery to define a radial plane, said piston recess having a bottom surface located substantially in said radial plane, said piston recess having an opening of a diameter which is substantially equal to the inner diameter of said piston ring.

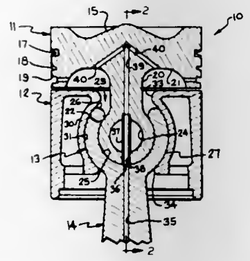
4,073,219
FLUID POWER MOTOR WITH GUARD CYLINDER
Charles W. Bimba, 101 E. Main St., Monee, Ill. 60449
Filed Aug. 16, 1976, Ser. No. 714,796
Int. Cl.² F16J *11/04*; F01B *29/00, 31/00*
U.S. Cl. 92—128 **1 Claim**



1. In a fluid power motor unit a thin cylindrical body portion and end cap members to enclose and accommodate an internal reciprocating piston, separate sealing means at each end of the body portion located between the ends of the body portion and the end cap members for completely sealing the ends of said body portion to said end cap members, at least one piston rod connecting to the piston and extending through an end cap member, and fluid inlet and outlet means for introducing fluid pressure to a working chamber on at least one side of the piston in said body portion, the improved construction to preclude denting of the cylindrical body portion of the unit which comprises:

a. providing an encompassing separate guard cylinder around said body portion and spaced slightly therefrom to effect a closed air space which is out of communication with said working chamber, whereby the inner cylindrical body portion will be protected from accidental denting, said cylinder body portion forming slip-fit connections over said sealing means and portions of said end cap members, said outer guard cylinder having its end portions internally threaded to engage with external threading on said end cap members, whereby the motor unit can be disassembled for access to the piston.

4,073,220
PISTON ASSEMBLY
William D. Guenther, Hagerstown, Ind., assignor to Dana Corporation, Toledo, Ohio
Continuation-in-part of Ser. No. 577,562, May 14, 1975, Pat. No. 4,013,057. This application Dec. 27, 1976, Ser. No. 754,096
Int. Cl.² F16J *1/04, 1/14*
U.S. Cl. 92—190 **3 Claims**



1. A piston assembly comprising, in combination, a connecting rod, an elongated tubular wrist pin attached at the lower center of an external surface to an end of said connecting rod, said external wrist pin surface defining an external journal surface, said wrist pin further having an internal bearing surface and a top opening extending along its length, a piston head having an upper surface for forming one wall of an expansion chamber and having a bearing member defining a journal surface extending substantially across a lower surface engaging said internal bearing surface of said wrist pin substantially along its entire length, said bearing member and said wrist pin cooperating to permit rotation between same and thereby between said connecting rod and said piston head, a piston skirt free of said piston head, and thrust bearing means attaching said piston skirt to said external journal surface on said wrist pin for rotational movement between same and thereby between said piston head and said piston skirt.

4,073,221
LIGHT-WEIGHT PISTON ASSEMBLIES
Alexander Goloff, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed June 21, 1976, Ser. No. 697,896
Int. Cl.² F16J *1/00*
U.S. Cl. 92—221 **1 Claim**

1. A piston assembly comprising:

a generally cylindrical piston body having a crown and a depending skirt and being formed of a light-weight metal;

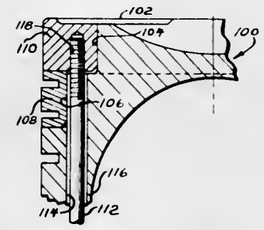
a stepped, peripheral groove in said body adjacent the crown defining a first step opening to the crown and a second step between said first step and said skirt, said first step having a lesser diameter than said second step;

a ring groove protection band formed of a hard metal and having at least one peripheral groove adapted to receive a compression ring received in said groove in said body and in said second step thereof;

a ring-like annular retainer formed of a light-weight metal received in said groove in said body and in said first step thereof and, together with said ring groove protection band, substantially filling said groove in said body;

a bore extending through said body in said skirt and adapted to receive a wrist pin;

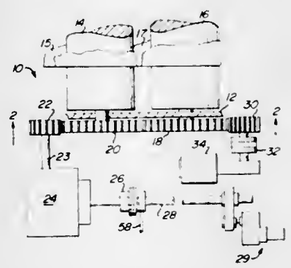
means including a plurality of elongated, threaded fasteners



extending through said body radially inwardly of said second step from at least said bore to said crown at said first step therein and securing said retainer to said crown for sandwiching and clamping said ring groove protection band in said second step between said body and said retainer, and

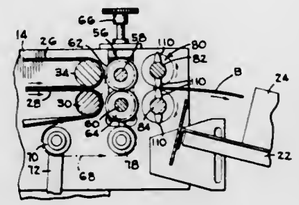
said body being hollow and including a plurality of generally axially extending, radially inwardly directed, hollow bosses located to each side of said wrist pin receiving bore, said threaded fasteners extending through said hollow bosses substantially the entire length of said body.

4,073,222
CONTINUOUS RUNNING MACHINES FOR PRODUCING PAPERBOARD BOX BLANKS
Robert E. Coburn, Warminster, Pa., assignor to Molins Machine Company, Inc., Cherry Hill, N.J.
Filed May 17, 1976, Ser. No. 687,118
Int. Cl.² B31B *1/02*
U.S. Cl. 93—36 M **4 Claims**



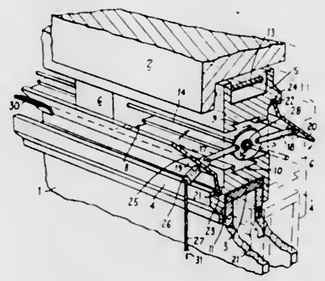
1. Apparatus comprising a continuous running double facer machine having at least one driven pulley for a belt, a tensioner for the belt, a main drive motor coupled to a main drive shaft, means including a first clutch coupling said shaft to said pulley to enable said motor to drive said pulley in a run mode at a first speed, and a discrete auxiliary motor coupled to said pulley by an overrunning clutch for driving said pulley in a continuous run mode at a second speed when said first clutch is disengaged and wherein said second speed is substantially slower than said first speed, said auxiliary motor being of substantially lower horsepower than said main drive motor, circuitry for controlling operation of said belt tensioner and said first clutch so that said first clutch can only be engaged when the belt tensioner is operative.

4,073,223
BAG SLOW DOWN
Donald C. Crawford, Green Bay, Wis., assignor to FMC Corporation, San Jose, Calif.
Filed Oct. 22, 1976, Ser. No. 735,223
Int. Cl.² B31B *1/94*
U.S. Cl. 93—93 HT **2 Claims**



1. In a thermoplastic bag making machine including stacker belts comprising vertically opposed narrow belts for receiving and longitudinally transporting bags, as they are produced, to a stacking table, corrugating wheels and a bag retarding device located at the discharge of said stacker belts, an independent electrically operable variable speed drive driving the stacker belts and the corrugating wheels, said retarding device comprising two contra-rotating vertically spaced shafts mounting axially extending radially projecting pads cooperating to simultaneously momentarily engage opposite panels of each bag adjacent its trailing edge during one revolution of said shafts, the improvement in the combination of said stacker belts and said retarding device comprising adjusting the speed of said variable speed drive for driving said stacker belts at a speed that effects a selected longitudinal separation of the successive bags conveyed to the stacking table, each shaft of said retarding device mounting at least two equally circumferentially spaced pads, drive means derived directly from the drive of said bag machine, for rotating said vertically spaced contra-rotating shafts at a speed such that the peripheral speed of the radially projecting pads is less than the speed of the bags conveyed by said stacker belts, said contra-rotating shafts being synchronized so that the pads on one shaft making contact at a rate corresponding to the rate at which the bags are discharged toward the stacking table by said stacker belts, whereby the rotational rate of said contra-rotating shafts, by virtue of mounting two pads retards two successive bags during one revolution.

4,073,224
VENTILATORS
Johannes Harald Bierlich, Charlottenlund, Denmark
Filed July 7, 1976, Ser. No. 703,294
Int. Cl.² F24F *7/00*
U.S. Cl. 98—41 R **9 Claims**



1. A ventilator, primarily intended to be mounted within a

window sash between the upper rail of the sash and the upper edge of glazing in the sash, said ventilator including

(a) upper and lower bars of uniform cross-section,

(b) a plurality of spacer members located between said bars at spaced intervals along the length of the bars to space the bars apart and defining with said bars at least one ventilation aperture extending from the inside to the outside of the ventilator,

(c) said spacer members having parts shaped to interengage with the cross-sectional shape of the respective bars to connect the bars together in addition to spacing them apart,

(d) a pair of flaps hinged to respective ones of said upper and lower bars each for swinging movement in one direction away from said at least one ventilation aperture to open the ventilator and in the reverse direction for swinging movement towards the bar other than that to which it is hinged to close the ventilator,

(e) a shaft extending between and mounted in the spacer members,

(f) crank means mounted on said shaft, and

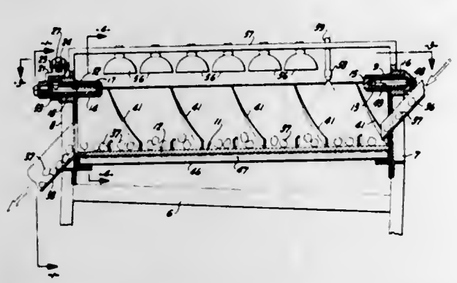
(g) means operatively connecting said crank means with said flaps for simultaneous hinging of the respective flaps in the directions to open and close the ventilator.

4,073,225

ROCKING MEATBALL COOKER

Nils Lang-Ree, Los Altos, Calif., assignor to N.P.I. Corporation, Burlingame, Calif.

Filed Dec. 17, 1976, Ser. No. 751,265
Int. Cl.[2] A47J *27/00*
U.S. Cl. 99—339 **5 Claims**



1. A rocking meatball cooker comprising a frame, an open top trough, means for mounting said trough on said frame for rotation about a substantially horizontal axis, means for repetitively rocking said trough to and fro about said axis through about 90°, means for subjecting said trough to heat, means for supplying one end of said trough with meatballs to be cooked, means for releasing cooked meatballs from the other end of said trough, and vanes in said trough helical about said axis and interrupted partway across said trough for impelling said meatballs from said one end to said other end of said trough.

4,073,226

PROCESSING APPARATUS

Robert J. Shulz, Brookfield, Ill., assignor to Innovative Patent Trust, Palatine, Ill.

Filed Sept. 27, 1976, Ser. No. 726,594
Int. Cl.[2] A47J *27/00*; B65G *19/00*
U.S. Cl. 99—427 **8 Claims**

1. Processing apparatus, comprising

an elongated hollow cylinder open at both ends,

a plurality of imperforate circular partitions,

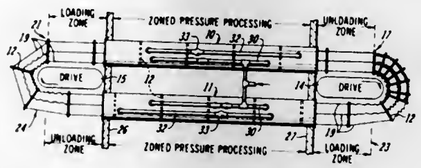
a plurality of sealing means each circumferentially disposed on a respective one of said partitions,

said partitions being movable in spaced apart relationship through said cylinder with said sealing means sealably engaging said cylinder,

said partitions being spaced apart by a distance less than the length of said cylinder to provide a hermetically sealed compartment between said partitions,

a processing fluid inlet port in the wall of said cylinder and spaced from the ends thereof by distances greater than the distance between said partitions,

drive means connected to said partitions for moving said partitions in said spaced apart relationship through said cylinder,



means for connecting a source of processing fluid to said processing fluid inlet port thereby to introduce a processing fluid through the wall of said cylinder into the space between said partitions as said partitions move through said cylinder,

a pair of revent ports respectively provided in said cylinder near the ends thereof, and

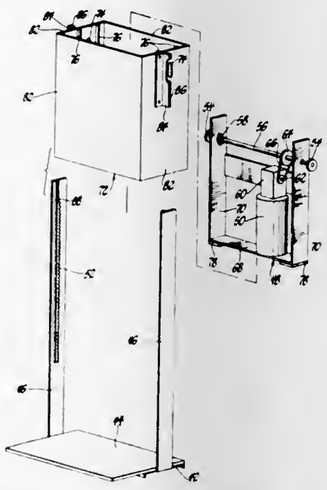
conduit means including a unidirectional flow device connected between said pair of revent ports for coupling steam from a location near the exit end of said cylinder to a location near the forward end of said cylinder.

4,073,227

TRASH COMPACTOR

Dario J. Moriconi, Orange Park, Fla., assignor to Raymond L. Sperry and Selma Sperry, both of Jacksonville, Fla.

Filed Oct. 18, 1976, Ser. No. 733,063
Int. Cl.[2] B30B *15/14, 15/28*
U.S. Cl. 100—52 **17 Claims**



1. An improved trash compactor assembly comprising; a base for supporting a trash receptacle, a reaction arm connected to and extending upwardly from two opposite sides of said base, a drive frame disposed between said arms, a drive motor supported on said frame, drive train means operatively interconnecting said motor and said arms for supporting said frame on said arms and for moving said frame longitudinally of said arms in response to operation of said motor, ram means suspended from said drive frame for insertion into the trash

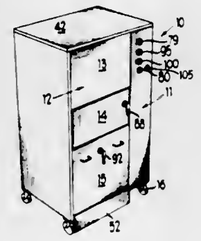
receptacle, and lost motion connection means interconnecting said ram means and said frame for allowing a predetermined amount of lost motion between said ram means and said frame when the force applied to trash in the receptacle by said ram means reaches a predetermined value.

4,073,228

TRASH COMPACTOR

Jerry Henzl, R.R., 2, Box 191, Effingham, Ill. 62401

Filed Apr. 29, 1976, Ser. No. 681,587
Int. Cl.[2] B30B *15/16*
U.S. Cl. 100—52 **10 Claims**



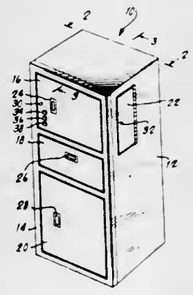
1. A trash compactor comprising a frame having spaced upper and lower braces, vertical posts rigidly connecting said upper and lower braces, a shell covering said frame, said shell forming upper, middle and lower compartments in said frame, an opening in said shell providing access to the middle and lower compartments, a dolly having an open top to receive trash to be compacted, said dolly occupying the lower compartment, a door closing the middle compartment and through which trash is loaded into the open top of the dolly, and means in the upper compartment for compacting the trash in the dolly, said compacting means comprising a plate, a ram below the plate, a pair of hydraulic cylinders connected between the upper brace and plate to lower said plate with reference to the brace, and a second pair of hydraulic cylinders mounted on the plate and connected to the ram to lower the ram with reference to the plate.

4,073,229

VERTICAL WASTE COMPACTING APPARATUS

James O'Rourke, Waldwick, N.J., and Murray Feldberg, Brooklyn, N.Y., assignors to Multi-Pak Corporation, Hackensack, N.J.

Filed Dec. 17, 1976, Ser. No. 751,704
Int. Cl.[2] B30B *9/00, 15/08*
U.S. Cl. 100—98 R **5 Claims**



1. A compacting apparatus for receiving and compacting waste, which comprises:

a compactor housing having an upper portion, a middle portion and a lower portion;

vertically reciprocating ram means for compacting waste, mounted in the upper portion of said housing, said ram means being of rectangular cross section and being extendable downwardly into the lower portion of said housing:

ram driving means for driving said vertically reciprocating ram means;

waste inlet means in the front middle portion of said compactor housing for receiving waste to be compacted;

removable waste receptacle means for containing waste, said receptacle means being horizontally slidable between a first position in the lower portion of said compactor housing in vertical alignment with said ram means and a second position without the lower portion of said compactor housing, said ram means extending downwardly within the receptacle means while said receptacle means is in the first position to effect waste compaction;

vertically reciprocating sleeve means of rectangular cross-section slidably mounted within said housing surrounding said ram means and having an upper portion and a lower portion, said sleeve means having a rectangular waste inlet aperture in its front upper portion and said sleeve means being extendable downwardly from an upper position, in which access from said compactor housing waste inlet means to said waste receptacle means is blocked by said sleeve, to a lower position in which said sleeve waste inlet aperture is aligned with said compactor housing waste inlet means and the lower portion of said sleeve means extends within said removable waste receptacle means to prevent said ram means from damaging said receptacle means as said ram means is extended downwardly within said receptacle means;

sleeve driving means for driving said vertically reciprocating sleeve means;

control means for controlling the operation of said ram driving means and said sleeve driving means; and

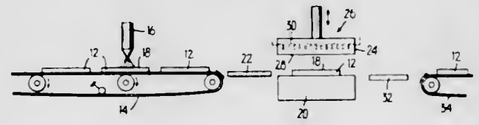
a first shearing knife horizontally mounted on the inner front surface of said sleeve means adjacent to the lower edge of said rectangular waste inlet aperture, and a second shearing knife horizontally mounted on the front edge of said ram means adjacent and parallel to the apertured surface of said sleeve means, said second shearing knife slidably contacting said first shearing knife as said ram means is extended downwardly past said inlet aperture into the lower portion of said housing.

4,073,230

METHOD FOR EMBOSSING MINERAL FIBER BOARD

David Wallace Akerson, St. Paul, Minn., assignor to Conwed Corporation, St. Paul, Minn.

Filed Oct. 20, 1976, Ser. No. 734,326
Int. Cl.[2] B44C *1/24*
U.S. Cl. 101—32 **3 Claims**



1. Method for embossing mineral fiber sheet wherein said sheet is composed of:

(a) from about 75 to about 85% by weight mineral material, said mineral material being composed of;

(i) from about 20 to about 85% mineral fibers;

(ii) from 0 to about 50% perlite;

(iii) from 0 to about 10% of other mineral materials;

b. from about 15 to about 25% of a binding system, said binding system being composed of:

(i) from about 5 to about 15% by weight cellulosic fibers;

(ii) from about 10 to about 20% of a reactivatable binding agent;

(c) said sheet having a thickness of from about ½ inch to about 2 inches and a density of from about 15 pounds to about 25 pounds:

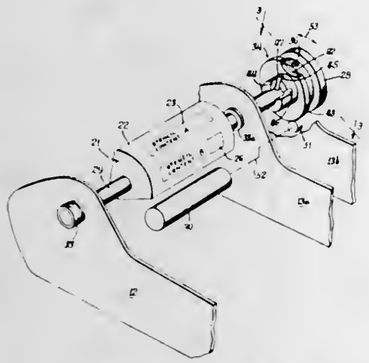
said method comprising the steps of wetting at least one side of the sheet surface with from about 7 to about 15 pounds of water per thousand square feet of board surface and thereafter positioning the sheet on a stationary platen subjecting the sheet surface to treatment with a stationary reciprocating press having a design forming member having a temperature of from about 550° to about 750° F and said design forming member being applied for a period of from about 0.1 seconds to about 2 seconds at a pressure sufficient to deform the surface whereby a permanently embossed pattern is obtained on the surface of the mineral fiber sheet.

4,073,231

SELECTIVE LABEL PRINTER

Gerhard K. Roser, Mount Prospect, Ill., assignor to Weber Marking Systems, Inc., Arlington Heights, Ill.

Filed Nov. 29, 1976, Ser. No. 745,549
Int. Cl.² B41J *3/22*; B41F *15/02*
U.S. Cl. 101—48 **5 Claims**



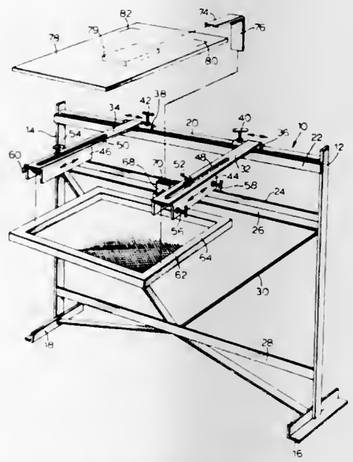
1. A label printer comprising a frame structure, a shaft journally supported in said frame structure, a printing cylinder carried on and affixed for rotation with said shaft, a cam rotor journally mounted for relative rotation on said shaft spaced from said printing cylinder, said cam rotor having a continuously annular outer peripheral cam surface with one indentation therein, means for indexing said cam rotor arcuately relative to said shaft and printing cylinder to either of at least two fixed first and second arcuately spaced apart positions, a cam roller having rolling contact with the outer peripheral surface of said cam rotor, a platen roller cooperating with said printi .g cylinder to effect printing of label stock passed therebetween, means joining said cam roller and said platen roller in a manner to effect movement of said platen roller into and out of engagement with said printing cylinder as the roller rides against the outer peripheral surface of said cam rotor, said one indentation of the cam rotor determining the position and extent of contact of the platen roller with the printing cylinder, said indentation in the first indexed position of the cam rotor coordinated with a first position on said printing cylinder, said indentation in the second indexed position of the cam rotor coordinated with an arcuately spaced apart second position on said printing cylinder, a stencil for mounting on said printing cylinder having at least two spaced apart first and second indicias cut therein, said spacing of the first and second stencil indicias being equal in length to the arcuate spacing of the first and second indexed positions of the cam rotor, means mounting said stencil onto said printing cylinder so the first stencil indicia is on the first position of the printing cylinder and the second stencil indicia is on the second position of the printing cylinder, and whereby when the cam rotor is in the first of its indexed positions the cam rotor indentation is arranged to have the platen engage the printing cylinder for the printing of only the first of the spaced apart indicias on the stencil and when the cam rotor is in the second of its indexed positions the cam rotor indentation is arranged to have the platen engage the printing cylinder for the printing of only the second of the spaced apart indicias on the stencil.

4,073,232

SCREEN PRINTING APPARATUS

Harold Hazen Brewer, 21 Peel St. South, Dundas, Ontario, Canada

Filed Mar. 9, 1977, Ser. No. 775,689
Int. Cl.² B41F *15/26, 15/36*
U.S. Cl. 101—126 **10 Claims**



1. A screen printing apparatus comprising;

a main frame having upright side frame members, an upper cross member and an intermediate cross member;

a pair of printing screen holding arms protruding from the main frame and adjustably mounted on said upper cross member for lengthwise adjustment therealong;

screen clamping means on each of said holding arms releasably and adjustably securing to said holding arms a printing screen for adjustment lengthwise and angularly with respect to the holding arms;

work holding means secured to the intermediate cross member of the main frame;

a workpiece holding member releasably clamped to the work holding means in fixed angular position relative to the main frame, said workpiece holding member having an upper surface and a downwardly extending leg;

said work holding means comprising an upstanding bracket with an upwardly presented aperture therein and horizontally extending clamping means protruding into said aperture;

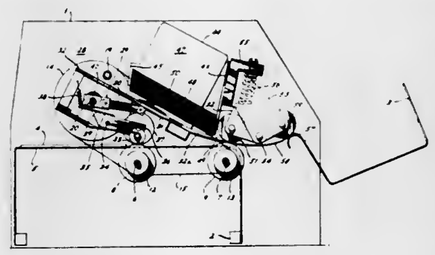
the downwardly extending leg of the workpiece holding member being received in said aperture and releasably securable therein by said clamping means at preadjusted height, so as to permit adjustment of the height of the upper surface of the workpiece holding member relative to the main frame.

4,073,233

PRINT POSITION ADJUSTING APPARATUS FOR ADDRESS PRINTER

Sadaharu Komatsu, Fuchu, Japan, assignor to Scriptomatic, Inc., Philadelphia, Pa.

Filed Nov. 9, 1976, Ser. No. 740,105
Claims priority, application Japan, May 31, 1976, 51-063095
Int. Cl.² R41L *11/08*
U.S. Cl. 101—132.5 **1 Claim**



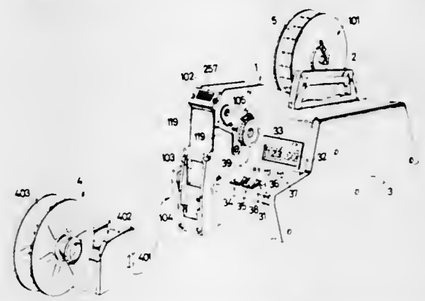
1. A printer comprising roller means for feeding a workpiece on which printed material is to be printed, liquid application roller means for applying a copying liquid on the workpiece being fed, delivery means for delivering a master card on which the printed material is contained, and a pair of print rollers to which said workpiece and said master card are delivered for printing the printed material from the master card to the workpiece, a drive shaft for rotating said roller means and an operating shaft, said operating shaft operatively arranged to operate the said liquid application roller means and said delivery means, and coupling means adjustably coupling said drive shaft to said operating shaft, said coupling means including a first connecting member fixed to said drive shaft and a second connecting member fixed to said operating shaft, one of said connecting members being formed with a tenon and the other of said connecting members being formed with a mortise in which said tenson is rotatably received whereby said first and second connecting members are adjustable for adjusting said drive shaft relative to said operating shaft, said one of said connecting members being formed with a threaded opening and the other of said connecting members being formed with an elongated slot and a set screw received in said slot and said threaded opening for securing said connecting members in an adjusted position whereby said drive shaft and said operating shaft can be fixed in an adjusted position.

4,073,234

PRINTING MACHINE FOR LABEL STRIP, OR THE LIKE

Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Tokyo, Japan

Filed Apr. 21, 1976, Ser. No. 678,760
Claims priority, application Japan, Apr. 26, 1975, 50-050220
Int. Cl.² B41F *1/08*
U.S. Cl. 101—288 **7 Claims**



1. A printing machine for feeding and printing labels, or the like, which are arranged in strip form, said machine comprising:

a machine body having a forward and a rearward end and having an exit and an entrance at said forward and said rearward ends, respectively;

a holder for a rolled strip of labels, or the like; said holder being mounted at said body rearward end near said entrance;

a passage for a label strip, said passage extending through said body from said rearward to said forward ends;

a printing device for printing indicia on labels, or the like; said printing device being supported in said body above said passage; types in said printing device facing toward said passage and defining a type face;

a platen in said body in opposed relationship to said type face and normally positioned below said passage; platen raising means connected with said platen for selectively raising said platen toward and against said type face and across said passage, and for thereafter lowering said platen to its said normal position;

a strip advancing device in said body for advancing the strip of labels, or the like, along said passage toward said body exit; said advancing device comprising a pawl projecting into said passage for engaging said strip, and reciprocating means for reciprocating said pawl along said passage;

means for coordinating the motion of said platen and said advancing device for causing said platen to shift to said type face while said pawl is not advancing the strip, for causing the pawl to retract rearwardly in said body while said platen is raised and for causing said pawl to advance the strip while said platen is in its said normal position;

a strip winding device for winding the strip of labels, or the like; said strip winding device being positioned near said body exit and being detachably mounted to said body; said winding device including a reel on which a strip may be wound; means for rotating said reel for winding the strip on it, and a friction clutch connection between said rotating means and said reel;

said rotating means for said reel is electrically operable, a connection to a source of electric power for said rotating means and said connection being located in said body; a mechanical socket, also having an electric socket associated with it and said mechanical and electric socket being together located on one of said body and said winding device; a mechanical plug and also having an electric plug associated with it being located on the other of said body and said winding device; said mechanical and electric sockets and plugs being connectable such that said winding device is mechanically connected with said body simultaneously as said rotation means is electrically connected with said body;

the one of said electric plug and said electric socket in said body being electrically connected with said connection to a source of electric power; the other of said electric plug and said electric socket in said winding device being electrically connected with said reel rotating means.

4,073,235

EXPLOSIVE ENERGY-INITIATABLE BLASTING CAPS CONTAINING A POROUS IGNITION AND DETONATION SYSTEM AND METHOD

Robert Bartley Hopler, Jr., Succasunna, N.J., assignor to Hercules Incorporated, Wilmington, Del.

Filed July 30, 1976, Ser. No. 710,059
Int. Cl.² F42D *1/04*; F42B *3/10*
U.S. Cl. 102—22 **19 Claims**

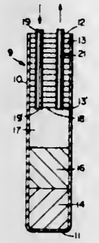
1. A non-electrically initiated blasting cap comprising:

a closed shell, including a plug closure therefor;

an ignition charge in said shell substantially contiguous with said plug closure and initiatable in response to action of explosive energy of an explosive gas mixture, and sufficiently porous and permeable for flow of a gas stream through the interstices thereof;

a first conduit means extending from outside said shell through said plug closure and opening into continguous contact with said ignition charge so as to convey an explosive gas mixture as a confined stream into ignition position in said interstices for responsive initiation of said ignition charge; and

a second conduit means extending from contiguous contact with said ignition charge to the outside of the said shell,



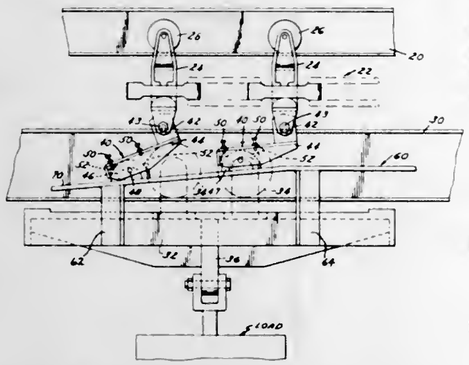
whereby a stream of said explosive gas can be continuously passed from said first conduit means through the interstices of said ignition charge and through said second conduit means to purge and charge said porous ignition charge and thereafter explosive gas in said first conduit means can be ignited for propagation of resulting explosive energy within the interstices of said porous ignition charge for ignition of same.

4,073,236

POWER AND FREE CONVEYOR SYSTEM

Earl J. Harrington, Ferndale, Mich., assignor to Overhead Conveyor Company, Ferndale, Mich.

Filed May 19, 1976, Ser. No. 687,673
Int. Cl.[2] B61B *13/00*
U.S. Cl. 104—172 S **5 Claims**



1. A power and free conveyor system which comprises:

(a) a power track and a drive chain supported to move along said track,

(b) a carrier track mounted colinearly with said power track,

(c) a plurality of dogs on said drive chain having a limited pivotal relation thereto,

(d) a magnet device on an exterior surface of each said dog,

(e) a load car movably supported on said carrier track,

(f) a ramp surface of magnetically attractable material mounted on said load car having a disposition generally aligned with the direction of said carrier track,

said dog being disposed relative to said ramp surface to bring said magnets into contact with said surface to cause acceleration of said load car to the velocity of said drive chain, and

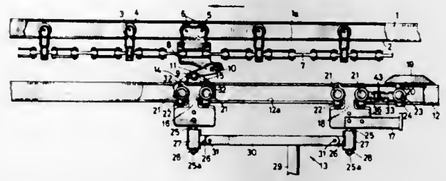
(g) said magnet devices comprising U-shaped pieces having spaced ends with surfaces lying in a plane, and means to mount said pieces for limited motion around the bight to insure proper contact with a ramp surface.

4,073,237

POWER AND FREE CONVEYOR WITH PUSHER DISENGAGING MEANS OPERABLE ON CURVED SECTIONS OF CONVEYOR TRACK

Takao Wakabayashi, Toyonaka, Japan, assignor to Nakanishi Conveyors Co. Ltd., Kanagawa, Japan

Filed June 24, 1976, Ser. No. 699,582
Claims priority, application Japan, June 24, 1975, 50-79028
Int. Cl.[2] B65G *17/42*
U.S. Cl. 104—172 C **7 Claims**



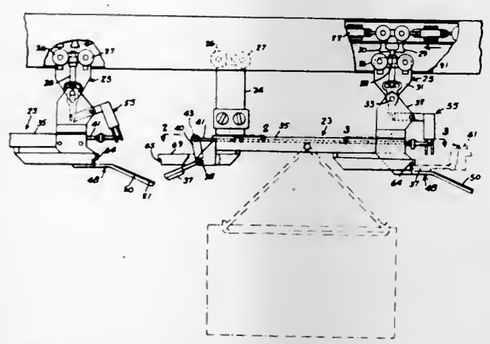
1. In a power and free conveyor including a plurality of upwardly and downwardly pivotable pushers spaced apart by a predetermined distance and attached to a drive chain on a power line, a dog mounted on each of a plurality of carriers on a free line and engageable with the pusher, and pusher raising cams respectively mounted on the carriers and each provided at its rear end with a recess for receiving the dog, the improvement wherein each of the carriers includes at least one main free trolly, a subfree trolley positioned to the rear of the main free trolley, the main free trolley having at least two pairs of vertical rollers for supporting the main free trolley on the free line and the subfree trolley having only one pair of vertical rollers for supporting the subfree trolley on the free line, and a universal joint coupling the subfree trolley to the main free trolley, wherein the dog is mounted on the main free trolley and the pusher raising cam is mounted on the subfree trolley and wherein when said subfree trolley is located on a curve on the free line the pushcr raising cam is aligned substantially parallel to the tangent to the line.

4,073,238

POWER AND FREE CONVEYOR WITH ENGAGING MEANS OPERABLE ON VERTICALLY CURVED SECTIONS OF TRACK

Kenneth F. Knudsen, St. Clair Shores, Mich., assignor to American Chain & Cable Company, Inc., Bridgeport, Conn.

Filed June 16, 1976, Ser. No. 696,576
Int. Cl.[2] B61B *10/00*
U.S. Cl. 104—172 S **24 Claims**



17. A carrier comprising spaced trolleys and means interconnecting said trolleys a conveyor having longitudinally spaced pusher and holdback dogs mounted thereon,

a trailing trolley having a pusher movably mounted thereon for movement into and out of the path of the pusher and holdback dogs on the conveyor,

a bumper,

said bumper being movably mounted on the leading portion of said carrier and adapted to engage a preceding carrier or an obstacle,

and means interconnecting said bumper and said retractable pusher and operable upon engagement of the bumper with the preceding carrier or obstacle to move said pusher out of the path of said pusher and holdback dogs,

said last-mentioned means comprising actuator means movably mounted on said trolley,

means interconnecting said actuator means and said pusher,

and means interconnecting said bumper and said actuator,

said actuator means being pivoted to said trolley about a horizontal axis,

said rear trolley comprising an upper body portion and a lower body portion pivoted to one another,

said pusher being movably mounted in said upper body portion,

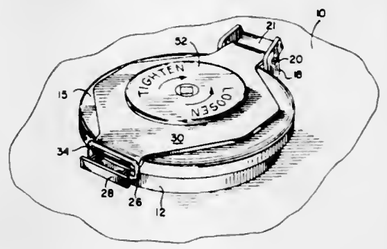
said actuator means being pivoted on said lower body portion.

4,073,239

CLOSING MEANS FOR A HATCH COVER

Franklin P. Adler, Michigan City, Ind., assignor to Apex Railway Products Co., Chicago, Ill.

Filed Sept. 20, 1976, Ser. No. 724,644
Int. Cl.[2] B61D *39/00*; B65D *45/28*
U.S. Cl. 105—377 **8 Claims**



1. Cover means for a hatch opening comprising:

a hatch cover;

hinge means providing for pivotal opening and closing movement of said hatch cover;

a locking strap having lip means overlapping and extending beyond the hatch cover and said locking strap having means attached to said hinge means;

retainer means for attachment to the lip means of said strap for securing the strap in a locked position;

a rotatable hand wheel;

a threaded shaft with means attached to said hand wheel for rotation of said shaft;

said locking strap having a top, an underside, and an opening for passage of said shaft;

said hatch cover having a hub with a chamber therein;

said chamber including closed sides, a closed lower end formed by a removable end cover piece and a threaded open upper end formed by an internally threaded means;

said hub having a shoulder;

said internally threaded means having means mounted upon said shoulder for securely holding the internally threaded means within said chamber;

means attaching the internally threaded means to said shoulder;

said shaft having threaded means extending through the internally threaded means for movement of the shaft into and from the chamber when the shaft is rotated;

said rotatable hand wheel having means adjacent the top side of said locking strap and engageable therewith for urging the locking strap downwardly;

thrust means attached to said shaft adjacent the underside of said locking strap and opposite the hand wheel for urging the locking strap upwardly; and,

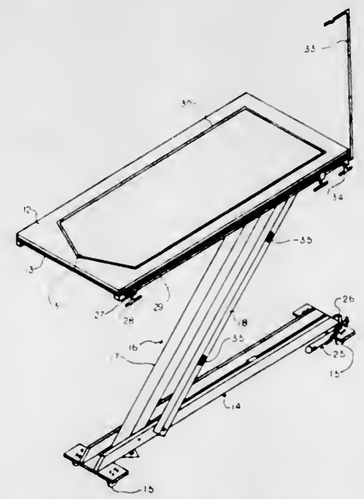
said thrust means and said internally threaded means being spaced apart a first distance when in the locked position and said first distance increasing to a greater distance upon rotation of the hand wheel in one direction whereby the thrust means engages the underside of the locking strap forcing apart the internally threaded means and thrust means to urge the hatch cover down to close off said hatch opening.

4,073,240

PORTABLE ANIMAL HOSPITAL TABLE

Howard G. Fly, Box 63, Ovando, Mont. 59854

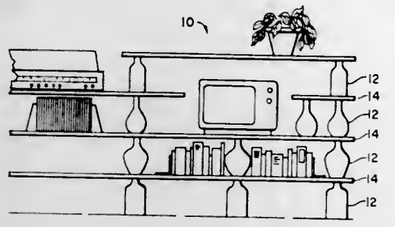
Filed Nov. 2, 1976, Ser. No. 737,903
Int. Cl.[2] A47B *9/00*
U.S. Cl. 108—20 **9 Claims**



1. A portable adjustable animal hospital table comprising a plastic bed surface disposed on an upper frame, a radiation shielding layer positioned below said plastic bed surface and carried by said upper frame, a base frame supported on rolling means, pivotally mounted linkage means operatively connecting said upper frame and said base frame, a pressure cylinder and piston mounted on said base frame and pivotally connected to said linkage means, and means for actuating said pressure cylinder and piston, said base frame including two spaced longitudinally extending members, said linkage means including a central support member and side stabilizing members spaced closely adjacent to said central support member, said central support member being pivotally connected between said longitudinally extending members of said base frame and said side stabilizing members being pivotally connected to the outer sides of said longitudinally extending members of said base frame, the pivotal connections of said central support member and said side stabilizing members with said longitudinally extending members being spaced from each other along said longitudinally extending members in a substantially horizontal plane, and the opposite ends of said central support member and said side stabilizing members being pivotally connected to said upper frame in a similar spaced relationship in a second horizontal plane, and said piston being pivotally connected to the end of said central support member which is

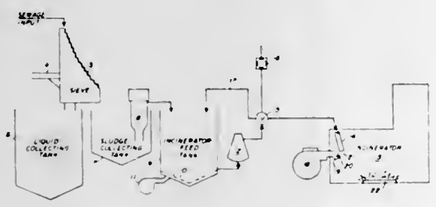
pivotally connected to said longitudinally extending members of said base frame.

4,073,241
BOTTLE SUPPORTED SHELF APPARATUS
Richard J. Wheeler, 17 Ferguson Road, Warren, N.J. 07060
Filed July 29, 1976, Ser. No. 709,838
Int. Cl.² A47B *57/00*
U.S. Cl. 108—91 **14 Claims**



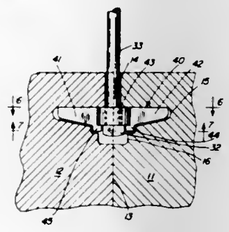
1. A shelf apparatus comprising:
shelf means;
support means comprising at least three bottle means, said bottle means having internal walls which define a cavity having a substantially continuous circular cross-section; and,
attaching means for connecting said shelf means to said bottle means, said attaching means including:
a compressing means attached to said shelf means; and,
an expansible, compressible means having a substantially cylindrical shape in its non-compressed state, said expansible, compressible means being connected to said compressing means and adapted to expand against the walls of said bottle means in response to actuation of said compressing means.

4,073,242
SEWAGE SLUDGE DISPOSAL
William F. Wagner, Brigham City, Utah, assignor to Thiokol Corporation, Newtown, Pa.
Continuation-in-part of Ser. No. 644,479, Dec. 29, 1975, abandoned. This application May 9, 1977, Ser. No. 795,047
Int. Cl.² F23G *5/02*
U.S. Cl. 110—8 R **4 Claims**



1. The method for sewage sludge disposal comprising:
Draining the liquid content from the sludge with a sieve;
grinding the sludge;
agitating the sludge in a tank to maintain uniform consistency and density thereof;
pumping the sludge from the tank through a first pipe that discharges the sludge back into the tank, at a velocity great enough to avoid clogging the pipe;
periodically diverting the sludge from the first pipe into a second pipe, so that the required flow velocity of the sludge in the second pipe is maintained but the average volumetric rate of sludge flow in the second pipe is less than the output of the first pipe; and
discharging the sludge from the second pipe and spraying it in periodic spurts into an incinerator by means of forced air, whereby the average volume of sludge delivered per unit of time to the incinerator is less than that flowing through the first pipe, so that the incinerator can be smaller than would be necessary if the full output from the first pipe were delivered thereto.

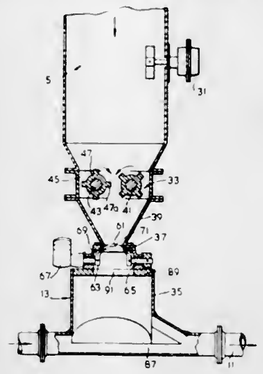
4,073,243
INDUSTRIAL FURNACE ROOF ASSEMBLY AND COMPONENTS THEREOF
Frank P. Merkle, Jr., Barrington, Ill., assignor to Merkle & Associates, Inc., Palatine, Ill.
Filed Dec. 1, 1976, Ser. No. 746,322
Int. Cl.² F23M *5/04*
U.S. Cl. 110—99 R **12 Claims**



1. A high temperature industrial furnace roof assembly comprising:
two refractory bricks having adjacent faces, opposing hanger recesses, locking means well beneath said recesses, hanger rod hole extending from said recesses to the exterior of the top of said assembly, said refractory bricks held in adjacent position by securement means;
a hanger rod having locking means at one end and a hook at the other end;
a hanger having opposed refractory engaging projections adapted to fit said hanger recesses, a hanger rod hole allowing free rotation about said hanger rod one end above said locking means and locking engagement means which when engaged with said locking means prevents rotation of said hanger rod in relation to said hanger at 90° increments and provides that depression of said one end of said hanger rod into said locking means well permits rotation of said hanger rod with respect to said hanger.

4,073,244
MATERIAL HANDLING APPARATUS
Brian Snowdon, Doncaster, England, assignor to Macawber Engineering Limited, England
Filed June 3, 1976, Ser. No. 692,423
Claims priority, application United Kingdom, June 9, 1975, 24642/75
Int. Cl.² F23J *1/00, 3/00*
U.S. Cl. 110—165 R **4 Claims**

1. Material handling apparatus comprising
a pipeline or the like,
means connected to the pipeline for supplying intermittent blasts of high pressure compressed air to the pipeline,
a material outlet at one end of said pipeline, and
at least two material inlet members located between said compressed air supply means and said material outlet. each material inlet member being in the form of a chamber opening at the bottom end thereof into the pipeline and extending upwardly from the pipeline, said chamber having in its upper part a spherical closure member which is movable between an open position at which material may be passed into the chamber and a closed position at which material is prevented from passing into the chamber, said chamber being further provided with an annular seal which is mounted for movement to engage with said closure member when said closure member is in its closed position, thereby providing an air tight seal to prevent



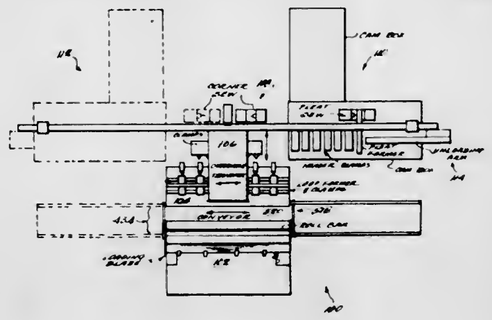
leakage of compressed air from the pipeline via said inlet member.

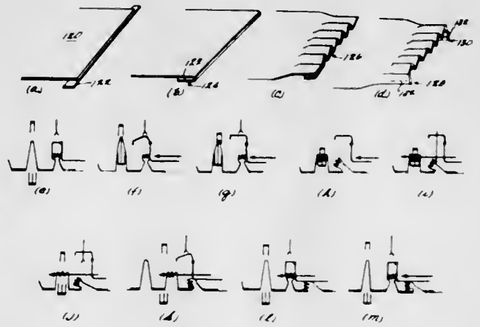
4,073,245
LEVEE FORMING APPARATUS AND METHOD
Everett Anderson, Box 812, Eagle Lake, Tex. 77434
Filed May 13, 1976, Ser. No. 686,163
Int. Cl.² A01C *5/06, 7/08*; A01B *49/04*
U.S. Cl. 111—1 **18 Claims**



1. A method of forming a levee in a field planted with seed, comprising the steps of:
forming a plurality of laterally spaced borrow ditches by removing earth from the ditches without disturbing the ground surface between the laterally spaced ditches;
transporting the removed earth to a predetermined location without disturbing the ground surface between the laterally spaced ditches;
depositing the earth which was removed from the plurality of ditches at the predetermined location;
working the deposited earth to form a levee having a substantially uniform shape without dips and weak spots;
planting the field with seed prior to forming the plurality of laterally spaced ditches and forming the ditches prior to germination of the seed to provide a stand of the crop on the undisturbed ground surface between the laterally spaced ditches;
planting additional seed in the deposited earth forming the levee to provide an adequate stand to maintain a good yield across the levee;
the step of planting additional seed includes adding the seed with the removed earth prior to depositing the earth to form the levee; and
the step of forming the laterally spaced ditches including forming at least two ditches on each of the two sides of the predetermined location and forming the levee at the predetermined location without disturbing the ground surface at the space between each two ditches at each side of the levee.

4,073,246
PLEATING MACHINE
William B. Crawford, Greensboro, and Anthony T. Solomon, Reidsville, both of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.
Filed Sept. 3, 1975, Ser. No. 610,045
Int. Cl.² D05B *35/08*
U.S. Cl. 112—121.11 **27 Claims**





1. An automatic pleating machine for forming pleated drapes from a blank drapery panel comprising loading means for receiving the leading top edge of said panel, loop forming means for simultaneously forming a plurality of equally spaced and sized loops in said panel, corner sewing means for seaming the top corners of said panel, pleat forming means for forming pleats within each of said loops, pleat sewing means for sewing the pleats, transfer means for moving said panel from said looping means to said corner sewing means and thereafter to said pleating means while maintaining the loops in their formed condition and control means for controlling the handling of said panel through said machine.

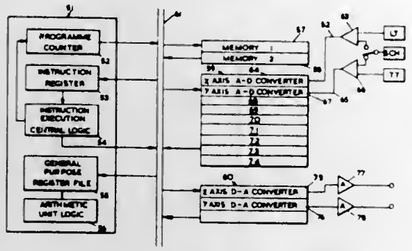
4,073,247
AUTOMATIC MACHINES
Sinclair Upton Cunningham, and Douglas Jackson, both of Glasgow, Scotland, assignors to The Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England
Filed Dec. 23, 1975, Ser. No. 643,834
Claims priority, application United Kingdom, Dec. 23, 1974, 55634/74
Int. Cl.² D05B *21/00*
U.S. Cl. 112—121.12 **11 Claims**

1. An automatic machine for operating upon a work piece at a predetermined position with respect to a preselected physical feature of the work piece comprising:
A work holder for holding a work piece,
Scanning means including a scanning head for scanning the work piece located in the work holder and for determin-

ing with respect to a predetermined coordinate system the co-ordinates of the preselected physical feature and for producing signals representative of said co-ordinates,

An operating head for operating upon the work piece,

Motor means for varying the relative positions of the operating head and the work holder, and



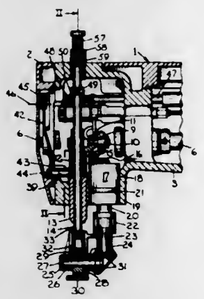
A computer, connected to the scanning means and to the motor means, including a store for storing the co-ordinates of the position of said preselected physical feature and means for extracting data from its store and in accordance therewith means for causing the motor means to vary the relative position of the operating head and the workholder so that the operating head operates upon the work piece at said predetermined position.

4,073,248

UPPER ROLLER FEED MECHANISM FOR A SEWING MACHINE

Nerino Marforio, Milan, Italy, assignor to Rockwell-Rimoldi, S.p.A., Milan, Italy

Filed Sept. 29, 1976, Ser. No. 727,878
Claims priority, application Italy, Oct. 2, 1975, 27870/75
Int. Cl.² D05B 27/06, 27/10
U.S. Cl. 112—207 **1 Claim**



1. An upper roller feed mechanism for sewing machines of the type including a lower feed mechanism operatively associated with an upper feed mechanism with a presser mechanism having a presser bar mounted in the head of the machine for positioning an upper feed roller adjacent said machine's presser foot, the improvement comprising:

(a) a rotatably driven shaft (6) supported within the sewing machine;

(b) an eccentric (7) mounted on said shaft (6) having a rod (8) fixed thereto for converting rotary movement of said shaft to oscillating movement;

(c) means defining a one-way clutch (17) interconnecting the upper feed roller (28) with said rod (8) for changing the oscillating movement of the latter to effect incremental unidirectional rotary movement of said roller;

(d) lifting means within the head for raising the feed roller (28) with the presser bar which includes:

(i) a selectively rotatable shaft (47) having a lever (48) fixed thereon in operative association with an arm (49) fixed on the presser bar;

(ii) a depending rod (42) pivotably attached at one end to said shaft (47) and interconnecting the latter with an arm (39) on a rod (38); and

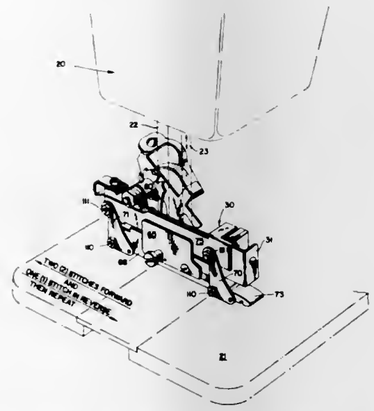
(iii) a roller support (25) attached to said rod (38) for effecting simultaneous vertical movement thereof with the presser bar upon selective rotation of said shaft (47).

4,073,249

ATTACHMENT FOR SEWING MACHINES AND A METHOD OF MAKING OVERLAPPED STITCHES

Dennis A. Mulkey, and C. Kepler Brown, Jr., both of Richmond, Va.

Filed Apr. 27, 1976, Ser. No. 680,862
Int. Cl.² D05B 27/04
U.S. Cl. 112—212 **17 Claims**



1. An attachment for use with a sewing machine, wherein the sewing machine has a reciprocating needle member with an accessory attaching member adjacent the needle, and wherein the sewing machine has at least one intermittently engaged feed dog disposed opposite said needle for advancing fabric being sewn, said attachment comprising:

means for mounting the attachment on the accessory attaching member;

a first movable member on the attachment;

means for coupling the first movable member to the needle to cycle, while the needle reciprocates;

reversing means for engaging the fabric from the top and for reversing the direction of advance of the fabric; and

means disposed between said movable member and said reversing means for activating said reversing means after two cycles of said movable member to thereby form three overlapped stitches for each advance of one stitch length.

4,073,250

INTERMITTENT DRIVE FOR SEWING MACHINE

Noboru Kasuga, Hachioji, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Mar. 24, 1976, Ser. No. 668,565
Claims priority, application Japan, Mar. 27, 1975, 50-36115
Int. Cl.² D05B 69/22
U.S. Cl. 112—274 **15 Claims**

1. A sewing machine comprising:

a housing;

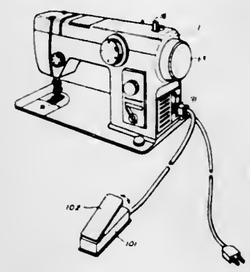
a needle on said housing displaceable between a down position engaging through a workpiece and an up position disengaged therefrom;

a drive shaft on said housing operatively connected to said needle;

a drive wheel on said shaft rotatable thereon relative to said shaft;

means including a clutch having one clutch member mounted on and jointly rotatable with said shaft, another clutch member operatively engageable between said one member and said wheel, and a control element operatively connected to said other member and displaceable between an engaged position for rotationally coupling said wheel and said shaft and a disengaged position for free relative rotation of said wheel and said shaft;

drive means connected to said wheel for rotating same and, in said engaged position of said clutch, for vertically reciprocating said needle between said up and down positions;



means including a formation on said shaft and a stopper on said housing displaceable between an operative position engageable with each other for stopping rotation of said shaft in a predetermined angular position corresponding to said up position and an inoperative position unengageable with each other;

means for displacing said control element from said engaged to said disengaged position on engagement of said stopper in said operative position with said formation, whereby said shaft can be arrested in said predetermined angular position and is substantially simultaneously rotationally uncoupled from said wheel; and

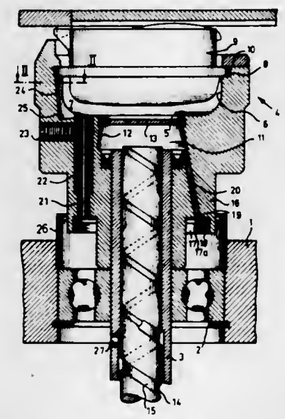
means for substantially simultaneously displacing said control element into said engaged position and said stopper into said inoperative position.

4,073,251

LUBRICATING DEVICE FOR A ROTARY LOOPTAKER

Reinhold Schrudde, Bielefeld, Germany, assignor to Kochs Adler AG, Bielefeld, Germany

Filed Mar. 24, 1977, Ser. No. 780,758
Int. Cl.² D05B 71/00
U.S. Cl. 112—256 **8 Claims**



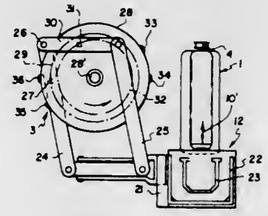
1. A lubricating device for the raceway of the bobbin case of a rotary sewing machine looptaker, comprising: a driven hollow shaft carrying said looptaker; a body with a recess formed by a bottom and a substantially cylindrical sidewall for holding the bobbin case; a hub on said body; an oil collecting chamber in said hub and having an annular cavity with an undercut inside peripheral area; an oil line in said body for leading oil supplied from an oil reservoir via said hollow shaft to said oil collecting chamber; a conduit for leading oil from said oil collecting chamber to said recess and said raceway for said bobbin case by centrifugal action, said conduit being received in a bore in said body and surrounded by a space along a portion of its length by a counterbore; regulating means for regulating the oil delivery to said raceway and comprising adjusting screw means for tilting said conduit in relation to the axis of the looptaker.

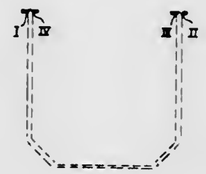
4,073,252

METHOD FOR EFFECTING THE SEWING OF A POCKET STITCH

Reinhold Dobner, and Walter Hager, both of Kaiserslautern, Germany, assignors to Pfaff Industriemaschinen GmbH, Germany

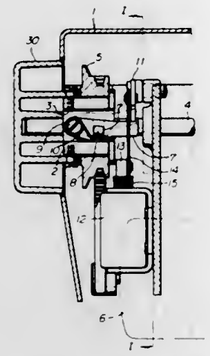
Division of Ser. No. 638,184, Dec. 5, 1975, Pat. No. 3,983,825.
This application July 15, 1976, Ser. No. 705,423
Claims priority, application Germany, Dec. 5, 1974, 2457534
Int. Cl.² D05B 3/12
U.S. Cl. 112—265 **4 Claims**





1. A method of effecting the sewing of a pocket piece on a workpiece which is guided by a separately driven guide into operative association with a reciprocating needle of a sewing machine operative independently of the guide and which effects both a straight stitch when it is reciprocated and a zig zag stitch when it is swung backwardly and forwardly, comprising guiding the workpiece so as to form at least one substantially U-shaped straight stitch having spaced apart leg portions, and securing the straight stitch by guiding the workpiece to effect the formation of a barring stitch at the end of each leg portion of the straight stitch while moving the needle in a swinging motion to effect the formation of a zig zag stitch and in a manner to cause the starting and finishing ends of the bars to be located substantially in the center of the bar.

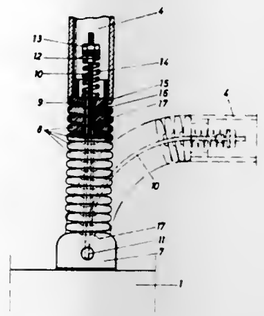
4,073,253
INTERMITTENT STITCHING DEVICE OF SEWING MACHINES
Yasukata Eguchi, Kunitachi, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan
Filed Apr. 23, 1975, Ser. No. 570,701
Claims priority, application Japan, May 2, 1974, 49-48757
Int. Cl.² D05B *69/22*
U.S. Cl. 112—275 **14 Claims**



1. In a sewing machine of the type having both continuous and intermittent modes of operation, a combination comprising means for mounting a top shaft for rotation in the machine; energizable drive means for rotating the shaft; coupling means intermediate the shaft and said drive means and being movable between a disengaged state in which intermittent operation occurs, and an engaged state in which said drive means is in motion-transmitting engagement with the shaft for continuous operation; energizable actuating means having an armature movable between a deenergized condition and an energized condition; decoupling means connected to and movable by said armature from a first position in which said coupling means is in said engaged state when said actuating means is in said deenergized condition, to a second position in which said actuating means is in said energized condition and said coupling means is in said disengaged state upon elapse of a time interval following energization of said actuating means; and switching means connected to said drive means and said actuating means and operative for energizing only said drive means in a first switching position for continuous operation, and for energizing both said drive means and said actuating means in a substantially simultaneous manner in a second switching position for intermittent operation.

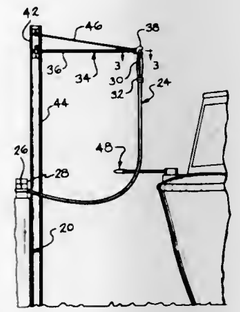
4,073,254
SAILING MAST FOR SAILING BOARDS
Hannes Marker, Hauptstrasse 51-53, 81 Garmisch-Partenkirchen, Germany
Filed July 2, 1976, Ser. No. 702,084
Claims priority, application Germany, July 4, 1975, 2530020
Int. Cl.² B63B *15/02*
U.S. Cl. 114—90 **5 Claims**

1. A sailing mast for sailing boards which can be manually tilted and rotated during sailing, comprising a mast having a flexible lower portion, support means for supporting said mast on the sailing board comprising a mast foot, a resilient mounting means for interconnecting said mast to said mast foot, wherein said flexible lower portion comprises a row of superposed annular discs wherein the apertures of said discs define a passage, and wherein said discs converge towards the outside, said resilient mounting means comprises a rope, said rope



extending through the passage and connected to the adjoining mast portion at its one end and to the mast foot at its other end.

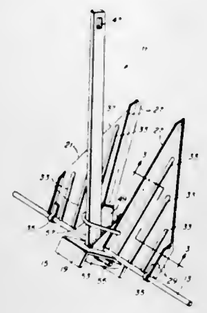
4,073,255
DOCKING DEVICE
William A. Paul, 1808 Parkside Blvd., Toledo, Ohio 43607
Filed Dec. 1, 1976, Ser. No. 746,496
Int. Cl.² B63B *21/00*
U.S. Cl. 114—230 **10 Claims**



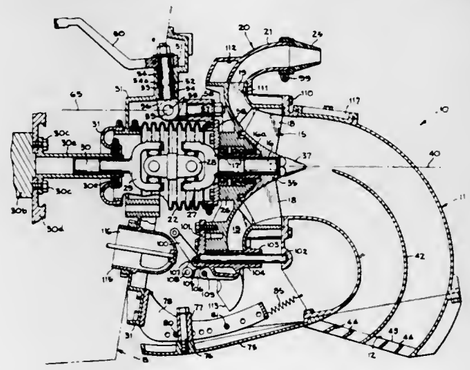
7. Apparatus for aiding in docking a boat to a stationary dock member or the like, said apparatus comprising, in combination, a line-engageable member, means for mounting said line-engageable member on the boat in at least one extended, line-engageable position, said mounting means including a flexible arm connected to said line-engageable member and extending generally horizontally and angularly from the side of the boat when said line-engageable member is in the extended position, a flexible line, and resilient fingers attachable to the dock member for releasably holding a portion of said flexible line and for releasing said line when said line is engaged by said line-engageable member.

4,073,256
LIGHTWEIGHT ANCHOR HAVING HIGH STRENGTH TO WEIGHT RATIO
Alfred P. Rossini, 6 Belmore Road, Framingham, Mass. 01701
Filed Dec. 1, 1976, Ser. No. 746,100
Int. Cl.² B63B *21/44*
U.S. Cl. 114—306 **11 Claims**

1. A lightweight anchor comprising:
a. a stock,
b. a crown mounted on the stock,
c. a shank mounted on the stock, and
d. a pair of flukes mounted on the stock, one on each side of the shank, the flukes and shank being pivotally movable relative to each other, each fluke comprising two sheets of metal of the same size and shape, stacked one on top of the other, in alignment with one another and laminated together, each sheet of metal containing a plurality of integrally formed, raised, longitudinally extending, strengthening ribs, said ribs on each sheet being raised in an outward direction.

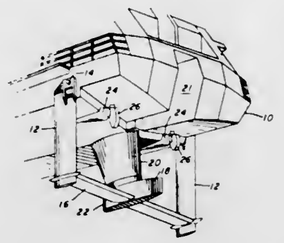


4,073,257
MARINE PROPULSION SYSTEM
Waldo E. Rodler, Jr., San Jose, Calif., assignor to Turbo Engineering Corporation, Signal Hill, Calif.
Filed July 26, 1976, Ser. No. 708,500
Int. Cl.² B63H *11/00*
U.S. Cl. 115—12 R **14 Claims**



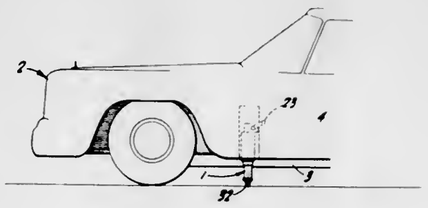
1. A jet propulsion system for mounting on the transom of a water vehicle, comprising:
a. an intake duct;
b. duct support means for supporting said intake duct for movement between an upward tilt angle and downward tilt angle;
c. means connected to said duct support means and defining a reaction center line to urge said duct in a downward tilt angle through a downward propulsive thrust;
d. means connected to said duct support means and defining a thrust center line disposed below the reaction center line to urge said duct in an upward tilt angle through an upward reactive force;
e. a fixed member; and
f. a spring interconnecting said intake duct and said fixed member for regulating the tilt angle movement of said intake duct in the changeover between the upward tilt angle and the downward tilt angle.

4,073,258
LATERAL MANEUVERING CONTROL FOR WATER-JET PROPULSION SYSTEMS
James H. Logan, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed Apr. 7, 1977, Ser. No. 785,433
Int. Cl.² B63H *11/10*
U.S. Cl. 115—12 R **8 Claims**



1. In a watercraft having a propulsion system including two generally parallel water jets directed rearwardly of the craft, each of said jets having associated therewith deflector means for controlling the angular direction of the jet and thrust reverser means for reversing the direction of the jet thrust, control means for said deflector means for normally maintaining the jets parallel to each other and for moving both deflectors means together to simultaneously change the direction of the jets, said control means also including means for moving the deflector means in opposite directions to divergent positions such that the jets diverge at equal angles relative to the center line of the craft, and control means for independently positioning each of said thrust reverser means, whereby the thrust of one of the jets may be reverser means, whereby the thrust of one of the jets may be reversed while the jets are in said divergent position to effect lateral movement of the craft.

4,073,259
AUTOMOTIVE THEFT SIGNALLING DEVICE
Howard J. McCoy, 1538 E. 9th St., Stockton, Calif. 95206
Filed Jan. 7, 1977, Ser. No. 757,741
Int. Cl.² B60R *25/10*
U.S. Cl. 116—33 **10 Claims**



1. An automobile theft signalling device comprising a post unit, means adapted to mount the post unit on an automobile within the confines of the body thereof but with the lower end of the post unit exposed in the direction of the road, said post unit being vertically adjustable between a normally raised out-of-use position clear of the road and a lowered, working position with the lower end of the post unit adjacent the road, a wheel journaled on the lower end of the post unit and running in engagement with the road in said working position of the post unit, and means coacting responsive to rotation of the wheel operative to produce a sound which is heard from exteriorly of the automobile, and means manually actuated from within the automobile to vertically adjust the post unit to

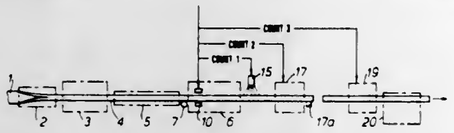
dispose the same in said out-of-use position, or working position, selectively.

4,073,260

APPARATUS FOR REMOVING CROSS WELDS FROM METAL TUBES AND MARKING THE SAME

Clive J. Bosworth; Neil E. Bridgstock, both of Kettering; Raymond S. Stone, Corby, and William L. McLaughlin, Kettering, all of England, assignors to British Steel Corporation, London, England

Filed Apr. 19, 1976, Ser. No. 677,868
Int. Cl.² B05C *5/00*
U.S. Cl. 118—8 **3 Claims**



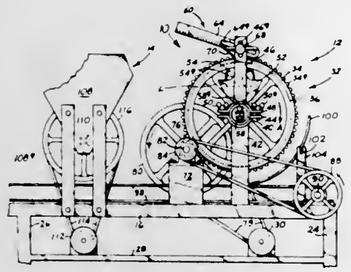
1. Apparatus for removing cross welds from a metal tube moving continuously longitudinally along a path, comprising: means for detecting the presence of cross welds in the tube, cutting means operable to sever said tube, pulse generating means for generating signals representative of predetermined linear movements of the tube, counter means connected to receive pulses from the pulse generating means, and operable in response to a cross weld being detected by said detection means and thereafter in response to a predetermined number of signals being received to actuate said cutting means for removing from said tube a length containing said detected cross weld, said detection means comprising at least two probes positioned about the circumference of the moving tube and operable only simultaneously to relay a signal to said counter means upon a cross weld being detected.

4,073,261

ARTICLE MOISTENER

Samuel J. Teeny, and Parry S. Teeny, both of 1210 SE. 179th, Portland, Oreg. 97233

Filed Sept. 27, 1976, Ser. No. 726,829
Int. Cl.² B05C *1/02, 5/00*
U.S. Cl. 118—16 **11 Claims**



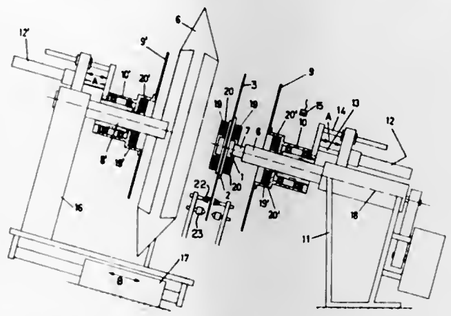
1. Apparatus for applying liquid to one side of a substantially flat article comprising:
- power-driven drum means rotatable about a generally horizontal axis and having a perforate, cylindrical surface for receiving an article on the surface and transporting it for a portion of a drum revolution;
- roller means rotatably disposed within the interior of said drum means and adapted to receive liquid, said roller means arranged for continuous contact with the inside of said cylindrical surface so that rotation of said drum means imparts relative rotation to said roller means; and
- liquid regulating means including a pressure member operable for pressing a portion of said cylindrical surface against said roller means to selectively squeeze and thereby transfer liquid from said roller means to the outside of said cylindrical surface, said liquid regulating means also including guide means for guiding the article onto said cylindrical surface.

4,073,262

APPARATUS FOR THE MANUFACTURE OF THE MAGNETIC COATINGS OF MAGNETIC DISKS

Dieter Scheffel, Neuhofen, and Volker Richter, Heidelberg, both of Germany, assignors to BASF Aktiengesellschaft, Germany

Filed Nov. 9, 1976, Ser. No. 740,088
Claims priority, application Germany, Dec. 5, 1975, 2554692
Int. Cl.² B05C *11/08*
U.S. Cl. 118—52 **5 Claims**



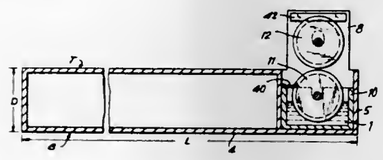
1. An apparatus for the manufacture of the magnetic coatings of magnetic disks by application of a pourable magnetic dispersion to both surfaces of a rotating base plate, followed by centrifuging of the base plate, said apparatus comprising
- a clamp unit for the base plate to be coated,
- a shaft driving said clamp unit,
- means for cleaning the base plate and a unit for applying the magnetic dispersion,
- a pair of flat covering elements mounted opposite said two surfaces, respectively, of said base plate and coaxially with said shaft,
- means for axially moving each said element from an inoperative position to an operative position spaced by a short distance from the respective surface of said base plate, and
- clutch means, whose parts are not in contact with each other, for connecting said flat covering elements to said base plate for rotation in the same direction with said base plate during the centrifuging operation.

4,073,263

LIQUID ADHESIVE COATING MACHINE

Baxter Wayne Melton, 509 Rahway Ave., Westfield, N.J. 07090

Filed May 10, 1976, Ser. No. 684,474
Int. Cl.² B05C *1/08*
U.S. Cl. 118—249 **9 Claims**



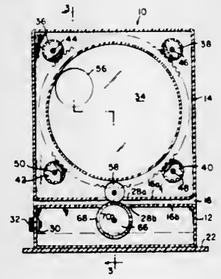
1. A liquid adhesive coating machine for coating pressure sensitive liquid adhesive on one surface of a sheet of material, said liquid adhesive coating machine comprising
- a support member having a length, a width, a depth, a top, a bottom, a pair of spaced opposite ends and a pair of spaced opposite sides, and a trough formed therein at one end thereof extending from the top and from side to side, said trough containing liquid adhesive;
- first and second rollers rotatably mounted in the machine in closely spaced adjacent parallel relation with their axes disposed in a plane perpendicular to the top and bottom of the support member, the first roller being partially immersed in liquid adhesive in the trough and the second roller being positioned above the first, each of said first and second rollers having a substantially cylindrical surface having a plurality of substantially circular notches formed therein in next-adjacent equidistantly spaced relation, each of said notches having a sustantially V-shaped cross-section whereby the surface of each of said first and second rollers is a substantial sawtooth, the outer surface of each of the first and second rollers between the notches therein being rounded and the rounded outer surfaces of the first and second rollers being substantially coplanarly aligned; and
- rotating means affixed to one of the rollers for rotating said one of said rollers thereby rotating the other of the rollers in the opposite direction and moving a sheet of material between said rollers in a direction parallel to the top of the support member and simultaneously applying liquid adhesive to one surface of the material via the first roller.

4,073,264

DEVICE FOR IMPREGNATING PAPER

Ronald M. Stephens, 305-1400 Camosun, Victoria, British Columbia, Canada (V8V 4L4)

Filed Feb. 18, 1977, Ser. No. 770,240
Int. Cl.² B05C *1/02*
U.S. Cl. 118—250 **7 Claims**



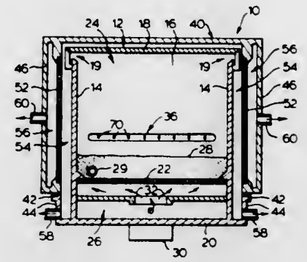
1. A device for impregnating paper comprising:
- a reservoir holding an impregnating solution,
- a housing having a slot extending the width thereof and separating the housing into an upper and lower portion, the lower portion of the housing forming said reservoir for the impregnating solution,
- a first roller having a resilient material covering the periphery thereof rotatably mounted in the lower portion of the housing so as to contact the solution, a portion of the periphery of the roller extending into the slot,
- a second roller mounted directly opposite the first roller rotatably mounted in the upper portion of the housing with a portion of its periphery extending into the slot and engaging and driving the first roller,
- a circular plate of considerably greater diameter than the second roller rotatably mounted in the upper portion of the housing having means to drive the second roller,
- idler rollers rotatably mounted in the upper portion of the housing and spaced about and engaging the periphery of the circular plate to support the circular plate for rotation, and
- means for manually engaging the circular plate for rotation thereof.

4,073,265

ELECTROSTATIC POWDER COATING APPARATUS

Jorg-Hein Walling, St. Hubert, and John Alan Jukes, Pierrefonds, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 15, 1976, Ser. No. 677,222
Int. Cl.² B05B *5/02*
U.S. Cl. 118—634 **5 Claims**



1. In an electrostatic fluidized bed coater having a housing enclosing a plenum chamber and a cloud chamber separated from the plenum chamber by a porous floor plate:
- a cover enclosing at least the upper portion of the housing and spaced therefrom;
- a porous wall plate spaced from the housing and from the cover to provide an inner exhaust chamber and an outer exhaust chamber respectively;
- at least one aperture in the upper portion of the housing opening from the cloud chamber into the inner exhaust chamber;
- means to draw air from the outer exhaust chamber;
- means to remove powder from the inner exhaust chamber; and
- means to pass pressurized air through the porous wall plate into the inner exhaust chamber whereby powder adhering to the wall plate is removed therefrom;
- the means to pass pressurized air into the inner exhaust chamber comprising an elongated cup member located in the outer exhaust chamber and bearing against the porous wall plate, the cup member being movable over the face of the wall plate, and means to introduce pressurized air into the cup member.

4,073,266

APPARATUS FOR DEVELOPING A LATENT ELECTROSTATIC IMAGE ON AN ELECTROPHOTOGRAPHIC COPYING MATERIAL

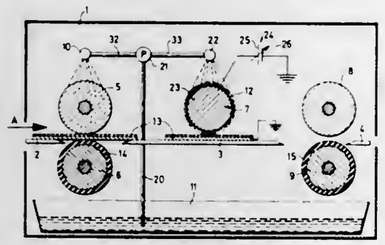
Reinhold Arneth, Budenheim, and Rudi Schwandt, Wiesbaden-Erbenheim, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 17, 1976, Ser. No. 658,504
Claims priority, application Germany, Feb. 20, 1975, 2507221
Int. Cl.² G03G *15/10*
U.S. Cl. 118—647 **8 Claims**

1. An apparatus for developing a latent electrostatic image on an electrophotographic copying material by means of a toner dispersion, the apparatus comprising:
- a. infeed means for applying the toner dispersion to the copying material;
- b. distribution means for the toner dispersion, said distribution means being disposed downstream of said infeed means in the direction of image development, said distribution means having a surface of soft, porous, and nonconductive material for contacting the copying material, said soft surface covering a metal portion of said distribution means;
- c. a controllable voltage source having a first electrode electrically connected with said metal portion of said

distribution means for applying a charge to said distribution means;

d. squeegee means for removing the unused toner dispersion from the copying material, said squeegee means being disposed downstream of said distribution means in the direction of image development; and



e. means, cooperating with said distribution means, for spraying off the toner adhering to said soft surface of the distribution means due to electrostatic attraction during the application of the voltage.

4,073,267

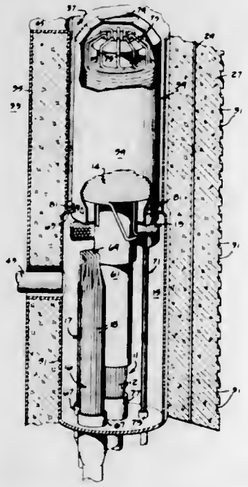
VAPOR GENERATOR

Paul S. Hunt, Poway; James P. Elliott, San Diego, both of Calif.; Johann F. Gulich, Winterthur; Max H. Weber, Wiesendangen, both of Switzerland; Jack S. Yampolsky, San Diego, and George E. Lockett, La Jolla, both of Calif., assignors to General Atomic Company, San Diego, Calif.

Continuation-in-part of Ser. No. 619,317, Oct. 3, 1975, abandoned. This application Aug. 20, 1976, Ser. No. 716,115

Int. Cl.² F22B *1/18*; F22G *1/00*

U.S. Cl. 122—32 **11 Claims**



1. A vapor generator comprising,

a high temperature section having a plurality of substantially straight tubes parallel with each other forming an elongated tube bundle,

a low temperature section having a plurality of substantially helical tubes forming an annular tube bundle positioned coaxially of said high temperature section, said low temperature section having an axial dimension substantially less than that of said high temperature section and being positioned toward one end thereof,

a plurality of reheater sections each having a plurality of elongated substantially straight tubes parallel with each other forming an elongated tube bundle of an axial length substantially less than that of said high temperature section, said reheater sections having their axes oriented substantially parallel with each other and with the axes of said high temperature section and being positioned toward the end of said high temperature section opposite said one end, and

means for directing a heating fluid first transversely over the tubes of said reheater sections, then along the tubes of said high temperature section toward said one end thereof, then over the helical tubes of said low temperature section in a direction parallel with the axis of said high temperature section and away from said one end thereof.

4,073,268

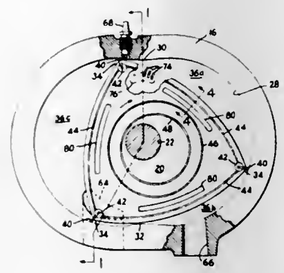
ROTARY COMBUSTION ENGINE WITH SIDE HOUSING BY-PASS PASSAGES

David M. Myers, Upper Saddle River, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Aug. 11, 1976, Ser. No. 713,386

Int. Cl.² F02B *53/00*

U.S. Cl. 123—8.13 **5 Claims**



1. A rotary combustion engine comprising:

a. an outer body including a pair of spaced side walls and an intermediate peripheral wall defining an internal cavity therebetween with the inner surface of said peripheral wall having a multi-lobe profile which is basically an epitrochoid and in which the lobes are joined by regions disposed relatively near to the engine axis;

b. an inner body of generally polygonal profile mounted for relative rotation within said outer body cavity, the apex portions of said inner body having sealing cooperation with said multi-lobe peripheral surface to define a plurality of working chambers between said bodies which vary in volume in response to said relative rotation;

c. seal strip means carried by the inner body on a side face of the inner body adjacent to its periphery and annular seal means co-axially carried by the inner body on said side face radially inwardly of said seal strip means with both said seal strip means and said annular seal means being disposed for sealing contact with the adjacent side wall of the outer body;

d. said last-mentioned side wall of the outer body having groove means on its inner surface disposed adjacent to and on the downstream side of a near-axis region at which combustion takes place such that the radially inner portion of said groove means terminates in a region which at all positions of the inner body relative to the outer body is disposed radially inwardly of the seal strip means and radially outwardly of the annular seal means and the radially outer portion of said groove means does not project radially outwardly beyond the seal strip means until the adjacent working chamber is in a late portion of its expansion stroke with the trailing apex portion for said working chamber being disposed in a region a short distance upstream of said near-axis region; and

e. said last-mentioned side wall also having recess means disposed on its inner surface adjacent to and on the downstream side of another of said near-axis regions for transferring gases from the annular space between said seal strip means and annular seal means of the inner body to the engine working chambers during the intake stroke of said chambers.

4,073,269

FUEL INJECTION SYSTEM

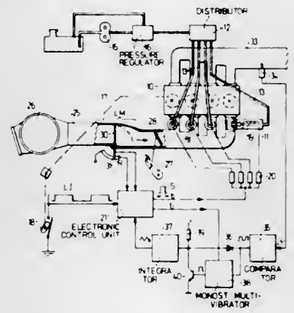
Harro Herth, Schwieberdingen; Bernd Kraus, Stuttgart; Wilfried Sautter, Ditzingen and Wolf Wessel, Schwieberdingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 19, 1975, Ser. No. 605,852

Claims priority, application Germany, Sept. 9, 1974, 2442229

Int. Cl.² F02D *3/00*; F02M *7/00*

U.S. Cl. 123—32 EE **6 Claims**



1. A fuel-air control system for an internal combustion engine, including a controller with integral control characteristic for controlling the fuel-air mixture admitted to the engine (λ -control process) and including

(A) an oxygen sensor, located in the exhaust system of the engine, and capable of providing an output signal; the improvement in said fuel-air system comprising:

(B) a comparator circuit, for comparing said output signal from said oxygen sensor with a reference value and providing an output signal;

(C) an integrating circuit, whose sole control signal input is connected to the output from said comparator circuit and which delivers a changeable output signal;

(D) a flip-flop circuit, including an adjustable monostable multivibrator whose control input is connected to the output from said comparator circuit according to which output the multivibrator is set and which delivers an output signal that in addition to the output of the comparator circuit is continuously connected to the input of said integrating circuit the output signal from said flip-flop circuit inhibits the transmission of one of said output signal from said comparator to said integrating circuit for delaying the change of its output signal in one direction for a period of time corresponding to the time constant of the monostable multivibrator, thereby delaying in one direction the response of said integrating circuit to changes in the output signal from said oxygen sensor;

(E) a control unit, connected to the output from said integrating circuit, for providing injection valve control signals; and

(F) an air-fuel rate adjusting device connected to said control unit.

4,073,270

ELECTRONICALLY-CONTROLLED FUEL INJECTION SYSTEM

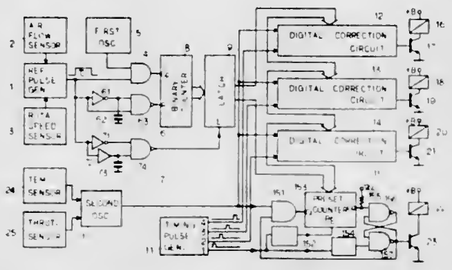
Kunio Endo, Anjo, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed June 24, 1976, Ser. No. 699,608

Claims priority, application Japan, July 2, 1975, 50-82125

Int. Cl.² F02B *3/10*; G06G *7/70*

U.S. Cl. 123—32 EB **7 Claims**



4. An electronically-controlled fuel injection system for a multi-cylinder internal combustion engine comprising:

a reference pulse generator for generating a reference pulse having a pulse width dependent upon air flow amount and rotational speed of said engine;

a counter, connected to said reference pulse generator, for converting said reference pulse width into a plural bit of code signal by counting clock pulses of constant frequency during said reference pulse width;

a memory, connected to said counter, for memorizing said code signal proportional to said reference pulse width;

oscillation means for generating oscillation signals of a frequency variable with other engine operating parameters;

a timing pulse generator for generating timing pulses, each thereof being indicative of fuel injection commencement of each engine cylinder;

a plurality of conversion means, commonly connected to said memory, said timing pulse generator and said oscillation means, for counting said oscillation signals and converting said code signal into injection pulses, each thereof being synchronized with each of said timing pulses and having a pulse width varying with said oscillation signal frequency and said code signal; and

a plurality of fuel injectors, each thereof being connected to each of said conversion means, for sequentially injecting fuel in response to said injection pulses.

4,073,271

TORCH IGNITION TYPE INTERNAL COMBUSTION ENGINE

Masafumi Yamazaki, Yokohama, and Yasuhiko Nakagawa, Kamakura, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed May 12, 1976, Ser. No. 685,451

Claims priority, application Japan, May 13, 1975, 50-57824

Int. Cl.² F02B *19/10*

U.S. Cl. 123—75 B **9 Claims**

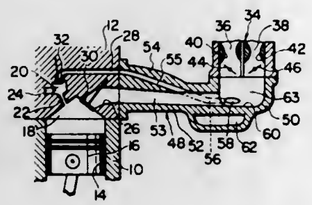
1. A torch ignition type internal combustion engine having fluidly communicated main and auxiliary combustion chambers for each of the engine cylinders, said main and auxiliary combustion chambers being respectively provided with main and auxiliary intake valves, said engine comprising:

a carburetor having a throttle valve;

a cylinder head having therein main and auxiliary intake ports which are respectively and fluidly communicable with said main and auxiliary combustion chambers through the respective main and auxiliary intake valves;

an intake manifold consisting of a main tube portion fluidly communicating with said carburetor downstream of said

throttle valve, main runner portions branched from said main tube portion and formed with main passageways communicating upstream with said main tube portion and downstream with said main intake ports respectively, and auxiliary runner portions formed with auxiliary passageways each providing fluid communication between each



of the auxiliary combustion chambers and said main tube portion through an opening formed in said main tube portion; and

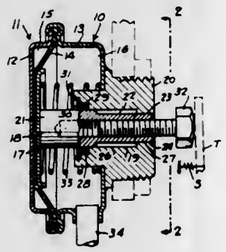
valve actuating means for allowing each of said main intake valves to open earlier than the corresponding auxiliary intake valve during the engine operation.

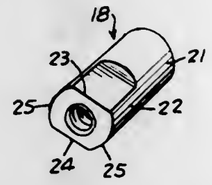
4,073,272

THROTTLE CONTROL SYSTEM

Ronald R. Burgess, Corunna, Mich., assignor to Tom McGuane Industries, Inc., Farmington Hills, Mich.

Filed Oct. 8, 1976, Ser. No. 730,805
Int. Cl.² F02D *11/08*
U.S. Cl. 123—103 B **21 Claims**





1. A vacuum controlled positioning assembly including a housing,

piston means within the housing dividing the housing into two chambers,

a plunger engaging the piston means and extending from the housing,

said housing having an opening therein,

said plunger extending through said opening, said plunger in said housing having a first cylindrical portion and a second portion including opposed parallel flat surfaces connected by arcuate cylindrical portions having the same diameter as the first cylindrical portion,

said opening having longitudinally spaced portions, one said portion being cylindrical and generally complementary to said first cylindrical portion of said plunger and the other said portion having the same configuration as said second portion of said plunger,

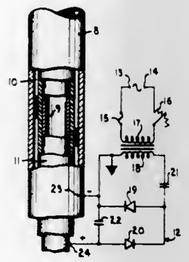
a spring yieldingly urging said piston means in a direction to retract the plunger inwardly of said housing, the outer edge of said plunger being adapted to engage a throttle member to retard the movement thereof against the action of the spring when vacuum is applied to the second chamber of the housing.

4,073,273

METHOD AND APPARATUS FOR IMPROVING ENERGY FUELS

Roy C. McMahon, 7300 Jarboe, Kansas City, Mo. 64114

Continuation of Ser. No. 536,639, Dec. 26, 1974, abandoned.
This application May 11, 1977, Ser. No. 796,032
Int. Cl.² F02M *27/04*
U.S. Cl. 123—119 E **1 Claim**



1. In combination:

(a) a reciprocating internal combustion engine adapted for operation on gaseous fuel and having a carburetor associated therewith,

(b) means connected to said engine and including a power supply directing a fuel modifying electrostatic field of about 6,000 to 14,000 volts across said gaseous fuel prior to the formation of a combustible mixture in said carburetor for use in said engine,

(c) said means including an inner metallic cylinder and an outer metallic cylinder forming a passageway therebetween for said fuel and across which passageway said field is directed,

(d) said inner metallic cylinder having an insulating coating thereover to reduce the tendency for electric discharge across said passageway,

(e) said carburetor being operably located between said means and said engine whereby the fuel is treated by said means prior to carburetion.

4,073,274

AIR-FUEL METERING SYSTEM FOR INTERNAL COMBUSTION ENGINE AND APPARATUS TO CONTROL AIR FUEL RATIO OF AIR-FUEL BEING APPLIED TO ENGINE

Masaaki Saito, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Nov. 11, 1975, Ser. No. 630,802
Claims priority, application Japan, Nov. 12, 1974, 49-129582
Int. Cl.² F02M *59/10*
U.S. Cl. 123—119 R **3 Claims**

2. An air-fuel metering system for an internal combustion engine, comprising:

an induction passage with a venturi section;

a fuel reservoir;

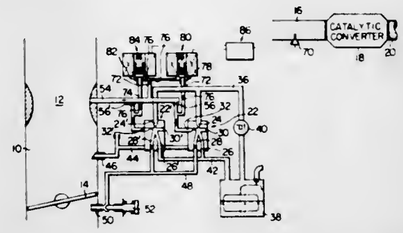
a pump providing a source of fuel flow and pressure;

a fluidic element having a supply port in communication with the fuel from the pump, a vent port in communication with the fuel reservoir and an outlet port, the fluidic element further having a first control port exposed to the atmospheric pressure and a second control port;

a vaccum conduit connecting the second control port with the venturi section of the induction passage, the vacuum conduit having a fixed flow restrictor therein;

air-fuel mixture circuit means connecting the outlet port of the fluidic element with the induction passage;

the fluidic element being so constructed and arranged as to increaseful flow from the supply port to the outlet port in response to an increase in the vacuum applied to the second control port;



a second conduit having one end connected to the vacuum conduit at a location thereof intermediate the fixed flow restrictor and the second control port of the fluidic element and other end opening to the ambient atmosphere;

means for generating an output signal indicative of the character of the exhaust gases;

means for generating a feedback signal responsive to the output signal from the output signal generating means; and

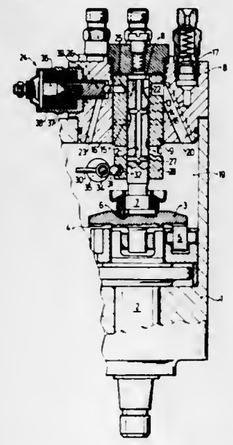
solenoid valve means for restricting fluid flow through the second conduit responsive to the feedback signal.

4,073,275

FUEL INJECTION PUMP

Gerald Hofer, Weissach-Flacht, and Karl Konrath, Ludwigsburg, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 27, 1976, Ser. No. 652,863
Claims priority, application Germany, Jan. 28, 1975, 2503346
Int. Cl.² F02M *59/24*
U.S. Cl. 123—139 AF **8 Claims**



1. In a fuel injection pump including a housing, a fuel storage compartment in said housing, a bushing defining a cylinder, a piston with control grooves moving within said cylinder, shaft means for rotating and reciprocating said piston, said piston and said housing defining a pressure chamber, a channel disposed between said fuel storage compartment and said pressure chamber, and control means for controlling the fuel flow in said channel, the improvement comprising

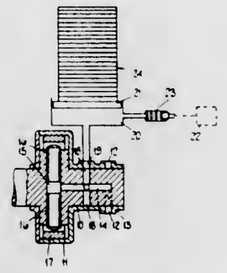
at least one of said control grooves in said piston obturates the terminus of said channel in said cylinder and said control means permits adjustment of the timing of the fuel flow through said channel after said piston has executed a partial compression stroke.

4,073,276

FUEL INJECTION PUMPING APPARATUS

Wilfrid Edward Walter Nicolls, East Molesey, England, assignor to Cav Limited, Birmingham, England

Filed Feb. 23, 1976, Ser. No. 660,665
Claims priority, application United Kingdom, Mar. 4, 1975, 8859/75
Int. Cl.² F02M *51/04*; F04B *35/04*
U.S. Cl. 123—139 E **5 Claims**



1. A fuel injection pumping apparatus for an engine comprising a housing having a plurality of outlet ports, a rotary distributor member located within said housing and operatively connected with said engine so as to be driven in timed relationship with said engine, a delivery passage formed in the distributor member and arranged to register in turn with said outlet ports in said housing, an injection pump which supplies a charge of fuel through said delivery passage each time the delivery passage registers with an outlet port, means for supplying fuel to said injection pump comprising a cylinder, a pumping piston contained within said cylinder, a piezo-electrical crystal unit for actuating said piston, first valve means operable to place said cylinder in communication with said injection pump, and second valve means through which said fuel can be supplied to said cylinder, and a drive circuit for said crystal unit and a transducer for providing first and second signals to the drive circuit to energize and de-energize the crystal unit, a part rotatable with the distributor member, said transducer being positioned adjacent said part, the arrangement being such that when said first valve means is opened, said crystal unit is energized to cause movement of the piston in the direction to displace fuel to the injection pump, the crystal unit being de-energized when said first valve means is closed to move the piston in the opposite direction, thereby to draw a fresh quantity of fuel into said cylinder by way of said second valve means.

4,073,277

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

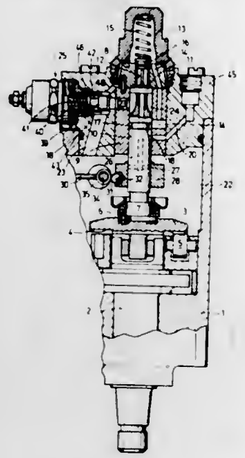
Franz Eheim, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 27, 1976, Ser. No. 652,872
Claims priority, application Germany, Jan. 28, 1975, 2503324
Int. Cl.² F02M *59/42*
U.S. Cl. 123—139 BD **9 Claims**

1. In a fuel injection pump including a housing, a fuel storage compartment, a cylinder in said housing, a piston moving reciprocatingly in said cylinder and defining a pressure cham-

ber, at least one supply conduit between said compartment and said pressure chamber,

a normally closed electromagnetic valve mounted in said housing for controlling the flow of fuel through said conduit, the improvement wherein:



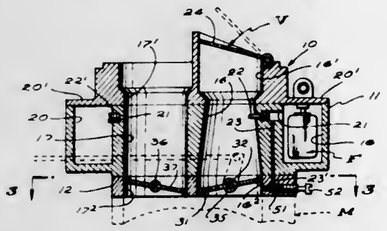
further fuel control means are provided for controlling fluid communication between said compartment and said pressure chamber while said electromagnetic valve is in its normally closed, de-energized condition.

4,073,278

CARBURATOR

Edward R. Glenn, 2300 Laurel, Newport Beach, Calif. 92660

Filed Jan. 16, 1976, Ser. No. 649,869
Int. Cl.² F02D *13/06*
U.S. Cl. 123—198 F **6 Claims**



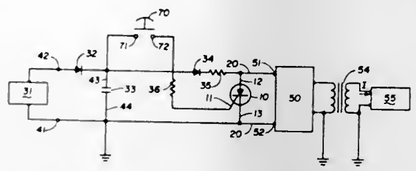
1. In combination a multi-cylinder internal combusion engine with an intake manifold with two related sets of tunnels, each set of tunnels communicating with one half of the cylinders and each having a common upwardly opening inlet end, said carburator releasably secured to the manifold and having two elongate vertically extending venturi throats, each having a lower end communicating with the inlet end of one set of tunnels in the manifold, an air conducting throat communicating with one of said sets of tunnels, throttle valve members in the lower portions of the venturi throats and a shut-off valve member in the air conducting throat, fuel dispensing idle jets in the venturi throats below the throttle valve members and fuel dispensing high speed jets in the venturi throats above the throttle valve members, fuel delivery means to deliver fuel to the jets, manually operable selector means to selectively move the shut-off valve member between open and closed positions and to hold the one throttle valve member in the venturi throat communicating with said one set of tunnels in a closed position when the shut-off valve member is in an open position and manually operable throttle valve operating means to synchronously shift the throttle valve members between open and closed positions when said one throttle valve member is not held closed and to shift the other throttle valve member between open and closed positions when said one throttle valve member is held closed.

4,073,279

INTERNAL COMBUSTION ENGINE SHUT-OFF DEVICE

Wayne S. Fox, Jordan, Minn., assignor to Kawasaki Motors Corporation, U.S.A., Santa Ana, Calif.

Filed May 6, 1976, Ser. No. 683,794
Int. Cl.² F02B *77/00*
U.S. Cl. 123—198 DC **15 Claims**



1. A shut-off device for an internal combustion engine having an electric ignition, said device comprising:

switching means having a first state and a second state;

means connecting said switching means to the ignition of the engine so that the ignition current is not inhibited when the switching means is in its first state and is inhibited when the switching means is in its second state;

means operatively connected to the switching means for causing a transition from the first state to the second state; and

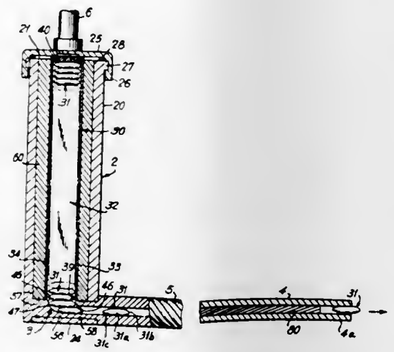
means operatively connected to the switching means, for automatically maintaining the switching means in its second state for a predetermined interval of time sufficient to allow the engine to cease operation.

4,073,280

RAPID FIRE GUN

Wilbur R. Koehn, 160 Main St., Port Washington, N.Y. 11050, and John H. Detwiler, 71 Ridge Crescent, Manhasset, N.Y. 11030

Division of Ser. No. 730,736, May 21, 1968, Pat. No. 3,996,916. This application Dec. 29, 1975, Ser. No. 644,518
Int. Cl.² F41B *11/02*
U.S. Cl. 124—72 **5 Claims**



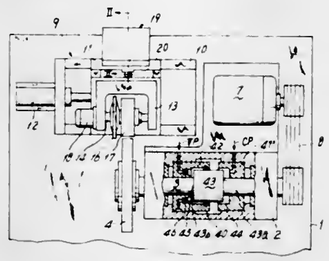
1. A gun capable of firing elongated projectiles at a rapid rate, comprising a barrel having a bore of a given diameter with openings at the front and rear thereof, said gun having a loading chamber of substantially the given diameter of said bore and having a forward opening connected to the rear opening of said bore, a side breech opening which opens into the side of said chamber and being effectively the only opening into said chamber apart from said forward opening, said side breech opening having a forward to rearward dimension at least twice as great as said given diameter, said gun having a passageway connected to said side breech opening of at least said forward to rearward dimension, a gas-source opening into said passageway spaced a substantial enough distance from said side breech opening to be clearly separate from said side breech opening, supply means for supplying motive gas under pressure connected to said gas-source opening for directing gas under high pressure through said passageway, in said side breech opening, through said chamber, and out said bore.

4,073,281

TRUING AND DRESSING APPARATUS FOR GRINDING WHEELS

Toshio Asaeda, No. 1-9-19, Kaminoge, Setagaya, Tokyo; Ikuo Suzuki, Chiryu, Japan; Tomoyasu Imai, Kariya, Japan; Massato Kitajima, Hekinan, Japan, and Kazunori Hota, Okazaki, Japan, assignors to Toyoda-Koki Kabushiki-Kaisha and Toshio Asaeda, both of Tokyo, Japan

Continuation-in-part of Ser. No. 727,678, Sept. 29, 1976, abandoned. This application Oct. 29, 1976, Ser. No. 737,043
Claims priority, application Japan, Sept. 29, 1975, 50-117402; Sept. 29, 1975, 50-117403; Oct. 14, 1975, 50-124084
Int. Cl.² B24B *53/04*
U.S. Cl. 125—11 CD **17 Claims**



1. An apparatus for truing and dressing a grinding wheel made of cubic boron nitride and rotatably mounted on a grinding machine, comprising in combination:

roll carriage means slidably mounted on said grinding machine so as to be moved in a first direction heading for said grinding wheel and in a second direction transversely relative to said first direction;

a truing roll provided at an outer peripheral surface thereof with abrasive grain as hard as diamond and rotatably supported on said roll carriage means with its rotational axis parallel with said second direction;

a dressing roll made of metal and rotatably supported on said roll carriage means with its rotational axis parallel with said second direction, said truing and dressing rolls being arranged to establish a gap of a predetermined distance between said dressing roll and said grinding wheel when said roll carriage means is fed to such a position in said first direction as to contact said truing roll with the grinding wheel;

in-feed means for feeding said roll carriage means toward said grinding wheel so as to give an in-feed movement of a predetermined amount to said truing and dressing rolls;

traverse feed means for moving said roll carriage means in said second direction so as to contact said truing roll with said grinding wheel over the entire width of the same in a truing operation and so as to face said dressing roll with said grinding wheel after said truing operation and prior to a dressing operation; and

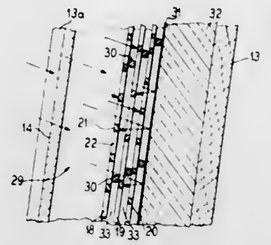
means for supplying liberation abrasive grain toward said gap between said dressing roll and said grinding wheel during said dressing operation, the mean size of said liberation abrasive grain being larger than said gap.

4,073,282

SOLAR PANEL

Arno H. Schriefer, Jr., R.R. 1, Dewey, Ill. 61840

Filed Sept. 16, 1976, Ser. No. 723,987
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **7 Claims**



1. In a solar collector having a housing, a front transparent panel to allow solar energy to pass into the housing, a back panel, and means for delivering forced fluid into and out of the housing, the improvement comprising

a matrix of multiple layers of a black coated sheet, each layer having a plurality of open meshes defined by a closed loop, each loop having a raised side portion and a lowered side portion, and all said raised portions being regularly repeated along a unidirectional line, said unidirectional line in one sheet positioned at 90° relative to a unidirectional line in an adjoining sheet of the matrix, and

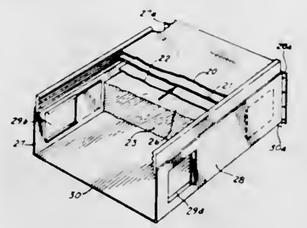
a reflective surface within the housing at said back panel, said reflective surface spaced from said matrix.

4,073,283

MODULAR CONSTRUCTION FOR SOLAR HEAT COLLECTOR

George O. G. Löf, Englewood, Colo., assignor to Solaron Corporation, Denver, Colo.

Filed Feb. 27, 1975, Ser. No. 553,471
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **13 Claims**



1. Modular construction for solar heat collectors using air transfer medium and arranged for connection to similar units comprising:

a. a generally rectangular modular housing member including thin side walls and a bottom arranged to be connected with removable end walls or end to end with adjacent similar members and having an open top including means for securing cover means thereon, said housing member being arranged with a cool air integral, internal manifold section across one end within said side walls and a heated air integral, internal manifold section across the opposite end and within said side walls and a heat absorber internal section between the two with an air passage permitting exchange of heat to air passing through said heat absorber internal section, each said internal manifold having a

cross-sectional dimension greater than said air passage through said heat absorber passage whereby the flow of air through said manifold is at a rate of flow less than the rate through absorber;

b. means for forming an opening in at least one side wall in said cool air manifold section arranged to mate with a similar opening in an adjacent member, and means for forming an opening in at least one side wall in said heated air manifold section arranged to mate with a similar opening in an adjacent member;

c. means for sealing together adjacent units at mated cool air openings forming an internal manifold for both members; and

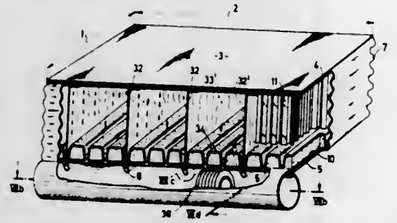
d. means for sealing together adjacent units, at mated heated air openings forming an internal manifold for both members.

4,073,284

PROCESS AND DEVICE FOR UTILIZING METEOROLOGICAL RADIATIONS

Nikolaus Laing, Hofener Weg 35 bis 37, 7141 Aldingen near Stuttgart, Germany

Continuation of Ser. No. 370,830, June 18, 1973, abandoned. This application June 25, 1975, Ser. No. 590,062
Claims priority, application Austria, June 23, 1972, 5406/72
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 **2 Claims**



1. A device for receiving and storing solar energy comprising a coating having a planar area adapted to strongly absorb solar energy where the coating possesses low emissivity in the infra-red region, a crystalline storage mass having a planar area substantially equal to the planar area of said coating and wherein said storage mass has a phase change point at a predetermined temperature equal to the desired working temperature to which the storage mass is to be exposed, said coating being situated above said storage mass, and an automatic vaporization and condensation heat rectifier means between said coating and said heat storage mass having a planar area substantially equal to the planar area of said coating and said storage mass and thermally connecting said coating and said storage mass for restricting flow of heat in one direction from said coating to said storage mass whereby heat absorbed by said coating is transferred to said storage mass where it may be subsequently released during a phase change and whereby a minimum of heat radiated back to said coating from said storage mass is emitted to free space.

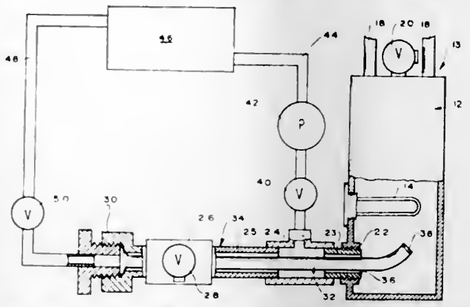
4,073,285

FLUID HANDLING SYSTEM

I. L. Wendel, St. Petersburg, Fla., assignor to James L. Lowe, St. Petersburg, Fla.

Filed Feb. 9, 1976, Ser. No. 656,641
Int. Cl.² F24J 3/02; F22B 5/02
U.S. Cl. 126—271 **8 Claims**

1. A fluid handling installation comprising, a container for fluid, said container having an upper portion for normally containing relatively hot fluid and having a lower portion for normally containing relatively cold fluid, and said container having a connection opening therethrough, an integral fitting for connection with the container, said fitting having a pair of nested tubes transversely spaced apart for receipt of fluid therebetween, an outer one of said tubes being connected with said connection, and said tubes having first open portions opening within the same said portion of said container and said tubes further having second open portions sealed from each other and connected in circuit with a source of relatively hot fluid for delivery to said container and for receiving the rela-



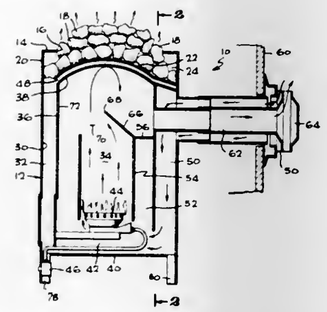
tively cold fluid from said container, the first open portion of said inner tube being spaced longitudinally outwardly from and opening in a direction away from the first open portion of said outer tube to retard direct intermixing of fluid passing through said first open portions, and the second open portion of said outer tube being between the open portions of said inner tube.

4,073,286

SAUNA HEATER

Tauno F. Kartiala, 15836 Lahey St., Granada Hills, Calif. 91344

Continuation of Ser. No. 603,713, Aug. 11, 1975, abandoned. This application Aug. 16, 1976, Ser. No. 714,578
Int. Cl.² F24H 1/00
U.S. Cl. 126—344 **16 Claims**



1. A sauna heater, comprising:

an upright housing having wall structure defining an inner combustion chamber within said housing, said chamber including a top, a bottom and opposite side walls;

a heating element at the bottom for producing combustion gases in said chamber in response to air conducted to said heating element;

air supply means including an air opening through one of said side walls at a position spaced downwardly from said top;

flue means including a flue opening concentrically with said air opening through said one of said side walls at said position spaced downwardly from said top;

rock supporting means carried by said housing at a position spaced upwardly from said top, said supporting means being adapted for indirect heat-interchange between said chamber top and rocks piled on said supporting means to provide steam;

a gas flow conducting element disposed in the path of the ascending gas flow in said chamber on an angle inclined upwardly from said one side wall and having a free edge defining a passageway for gases between said element and an opposite one of said side walls so that the major draft of said heating is directed past said edge and onto said top and thence toward said flue opening; and

drainage means extending axially downwardly from said rock supporting means, laterally and freely spaced from said combustion chamber to a point below said housing to discharge unabsorbed excess water.

4,073,287

URETHRAL PROFILOMETRY CATHETER

William E. Bradley, and Geoffrey Steven Gates, both of Minneapolis, Minn., assignors to American Medical Systems, Inc., St. Louis Park, Minn.

Filed Apr. 5, 1976, Ser. No. 674,061
Int. Cl.² A61B 5/10
U.S. Cl. 128—2 R **8 Claims**



1. A catheter for performing urethral profilometry comprising:

an elongated tubular body portion for insertion into the urethra, said body portion having an urethra engaging end and a fluid input end and comprising a first flexible tube and a second flexible tube coaxially disposed internally of said first tube;

at least one fluid output orifice disposed adjacent said urethra engaging end of said body portion and in fluid flow communication with said fluid input end;

an elongated conductor passage defined between said first and second flexible tubes and extending parallel to the longitudinal axis of said tubes;

conductor means disposed in said elongated conductor passage for delivering electrical signals externally of said catheter;

at least one electrode hole extending through said first flexible tube of said body portion; and

electrode means attached to said body portion for sensing electrical signals, said electrode means comprising an outer circular band portion overlying said first flexible tube for sensing electrical activity, an inner circular band portion disposed below said electrode hole between said first and second flexible tubes in electrical contact with said conductor means, and an integral portion thereof extending through said electrode hole between said inner and outer band portions.

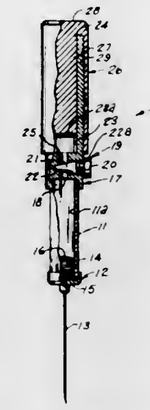
4,073,288

BLOOD SAMPLING SYRINGE

Samuel L. Chapman, 2814 Conner St., Port Huron, Mich. 48060

Filed June 21, 1976, Ser. No. 698,270
Int. Cl.² A61B 5/14
U.S. Cl. 128—2 F **3 Claims**

1. A blood sampling syringe, comprising a hollow cylinder which is closed off by hollow needle means at one end, for receiving a specimen, an expandable encasement means sealingly positioned around the opening of said needle into said cylinder, said encasement means serving to receive said specimen, a cylindrical control valve body threadingly received on the opposite end of said cylinder, by the end wall means of said control valve body, a passage extending through said control valve body, a screw valve means operating transversely of said passage in said control valve body for opening and closing said passage, a bore in said control valve body and communicating with said passage at an end opposite from said hollow cylinder such that said screw valve means is located between said hollow cylinder and said bore, a solid and cylindrical shank means



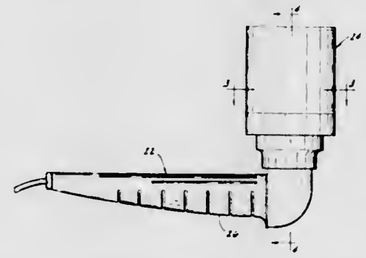
sealingly and slidably positioned in said bore to provide means for creating a vacuum in said bore when said screw valve means is positioned to close said passage and to subsequently draw a specimen through said needle when said screw valve means is positioned to open said passage.

4,073,289

METHOD OF MALE CONTRACEPTION FOR DOMESTIC MAMMALS HAVING A SCROTUM

Mostafa S. Fahim, 500 Halen Drive, Columbia, Mo. 65201

Filed Apr. 30, 1976, Ser. No. 682,062
Int. Cl.² A61H 19/00; A61F 7/00
U.S. Cl. 128—24 A **11 Claims**



1. A method of suppressing spermatogenesis in domestic animals, excluding humans, having scrotal testes which comprises applying continuous ultrasonic vibrations selectively only to the testes of said animal at an effective power level and at a frequency sufficient to penetrate said scrotal testes and for a sufficient time to temporarily or permanently suppress spermatogenesis while causing the subject substantially no discomfort.

4,073,290

PELVIC TRACTION BELT

Edward L. Farrar, Jr., 117 E. Copeland, Orlando, Fla. 32806

Filed May 19, 1976, Ser. No. 687,642
Int. Cl.² A61H 1/02
U.S. Cl. 128—75 **7 Claims**

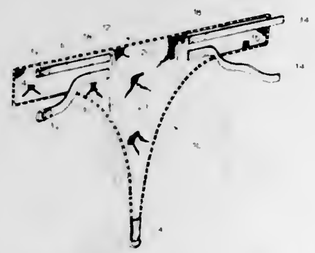
1. A pelvic traction belt for transmitting a longitudinal traction force and a rotary traction force through the pelvic area to

the spinal column of a human wearer located generally in the supine position, said pelvic traction belt comprising:

a circumferential section for encircling the pelvic area of the wearer, said circumferential section having opposing end portions constituting a front of said circumferential section when being worn, said circumferential section having a back portion intermediate said end portion;

fastening means for removably securing said end portions of said circumferential section around the pelvic area of the wearer;

tail traction means comprising a substantially triangular configuration and including a base, said tail traction means through disposition of said base being integrally formed to said back portion of said circumferential section, said tail section means and said back portion formed from a single, generally continuous piece of material, said tail traction means further disposed to depend generally perpendicularly from said circumferential section for communicating



generally upwardly between the legs of the wearer for transmitting said longitudinal traction force and said rotary traction force through the pelvic area to the spinal column, said longitudinal traction force being generally parallel to the spinal column of the wearer and said rotational traction force for effecting a rotation of the lower spinal column about an axis generally parallel to an axis communicating between the pelvic crests of the wearer, said tail traction means being formed to generally cover a broad section of the lower back adjacent the sacrum and to generally cover the buttocks of the wearer for cushioning the communication of said tail traction means with the sacrum and for providing a measure of lateral stability, thereby decreasing the force per unit area exerted thereon; and

coupling means attached to a distended end of said tail traction means for coupling thereto a tension force emanating generally from above the lower extremities of the supine wearer.

4,073,291

TOPICAL DEVICE FOR ADMINISTERING TRETINOIN

John R. Marvel, and James A. Mezick, both of East Brunswick, N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed July 28, 1976, Ser. No. 709,370
Int. Cl.² A61F *13/02*
U.S. Cl. 128—155 **10 Claims**

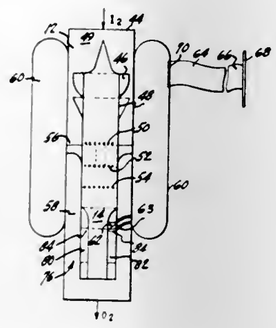
1. A therapeutic device comprising a flexible backing having coated thereon a dermatologically acceptable pressure-sensitive adhesive which is compatible with, and has uniformly distributed therein, a therapeutically effective amount of tretinoin.

4,073,292

CONTROL APPARATUS FOR THE AUTOMATIC TREATMENT OF DIABETES

William Edelman, 43 Livingston Lane, Englishtown, N.J. 07726

Filed Oct. 29, 1976, Ser. No. 736,996
Int. Cl.² A61M *5/00*
U.S. Cl. 128—214 E **8 Claims**



1. Control apparatus for the automatic treatment of diabetes, comprising:

first means for admixing a urine sample from a living body with a chemical solution, a characteristic of which with respect to light varies as a function of the molar concentration of glucose complexes present in said sample;

second means providing said chemical solution;

third means providing a source of light;

fourth means exposed to said source of light via the admixture of said first means and responsive to the light impinging thereon for generating a control signal representative of the molar concentration of said glucose complexes present;

fifth means providing a source of modified insulin of increased pH; and

sixth means responsive to said control signal for automatically injecting a predetermined amount of said modified insulin into an artery of the body to maintain the level of glucose complexes within the blood within prescribed limits;

with said first, second, third, fourth, fifth and sixth means, being adapted to be surgically implanted within the body and with said second and fifth means being replenishable with chemical solution and insulin, respectively, without the need for additional surgical procedures.

4,073,293

NOZZLE TIP

Ian Ross Phillips, Pymble, and Mervyn Frank Reynolds, Dee Why, both of Australia, assignors to N. J. Phillips Pty. Limited, Dee Why, Australia

Filed Sept. 21, 1976, Ser. No. 725,051
Claims priority, application Australia, Nov. 27, 1975, 4086/75
Int. Cl.² A61D *7/00*
U.S. Cl. 128—223 **4 Claims**

1. A drench gun nozzle tip insert to control leakage of drench via the nozzle by providing a region of high surface tension in the drench; said tip comprising a body dimensioned to be sealingly fitted within the nozzle tip so that drench ejected from the gun must pass through the insert, said body having a liquid inlet to be located within the nozzle and a liquid outlet to be located adjacent the free end of the nozzle, duct means providing liquid communication between said liquid inlet and said liquid outlet, said duct means including a main passage extending from said liquid outlet and terminating within said body, said liquid inlet including a series of smaller passages providing communication between the upstream portion of said nozzle with said main passage to thereby form a region of high surface tension in a free surface of said drench adjacent said smaller passages, said body being generally of tubular shape with a flange at one end and with said smaller passages extending radially inwardly from the peripheral surface of the body adjacent the other end to said one end, and said main passage extending longitudinally from the end face of the body adjacent the flange but terminating short of the other end face.

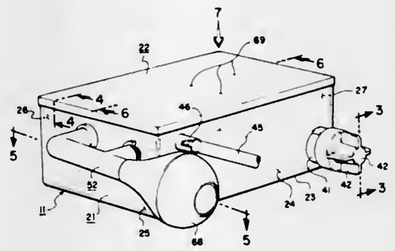


4,073,294

NEGATIVE PRESSURE DRAINAGE VESSEL

James Robert Stanley, and Silas Charles Topham, both of Orem, Utah, assignors to Medical Development Corporation, Salt Lake City, Utah

Filed July 23, 1975, Ser. No. 598,369
Int. Cl.² A61M *1/00*
U.S. Cl. 128—278 **7 Claims**



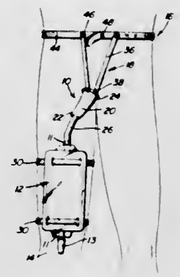
7. An aspiration vessel adapted to be carried on the body of a patient and to be connected to a wound or the like requiring suction drainage of fluids, said vessel comprising wall means defining a substantially rigid container, a resilient, elastomeric diaphragm in the interior of said container sealingly attached to the walls thereof to provide a chamber from which air can be evacuated, said chamber being defined by said diaphragm and a portion of said walls of said container, an aperture being provided in the portion of the wall means of said container which do not define said chamber, a fluid inlet in the portion of the wall means which define said chamber, said fluid inlet being connected through conduit means to the wound to be drained, an air outlet in the portion of the wall means which define said chamber, manually operable pump-down means including a one-way air inlet valve connected to said air outlet and a one-way air outlet valve communicating with the atmosphere whereby the action of the said pump-down means withdraws air from said chamber to allow atmospheric pressure to extend said diaphragm, the resiliency of the diaphragm providing a continuing negative pressure in said chamber to withdraw fluid from the patient, and as negative pressure is dissipated during drainage of said wound, said manually operable pump-down means may be reactivated to reestablish the directed negative pressure without danger of providing a positive pressure in said chamber which could force fluid material back into the wound being drained.

4,073,295

CATHETER

Jennie Laufbahn, Bronx, N.Y., assignor to Henry A. Schon, Brooklyn, N.Y., a part interest

Filed May 12, 1976, Ser. No. 685,884
Int. Cl.² A61F *5/44*
U.S. Cl. 128—295 **1 Claim**



1. A catheter comprising a flexible, resilient and thin tubular member defining a sheath-like bag positioned in enclosing relation to a substantial portion of a male wearer's penis, said bag including a closed end portion having a drain tube communicated therewith and extending to a leg attached urine collecting bag, the open end of said sheath-like bag being defined by a thickened end portion, said thickened end portion including attaching means thereon to which a pair of upwardly extending flexible, resilient support straps are attached, a flexible resilient waist belt encircling the waist of the wearer and having the upper ends of the support straps attached thereto thereby supporting the sheath-like bag in place; said attaching means are in the form of two slots disposed outwardly of the body surface of the wearer; said straps being connected to the attaching means by being looped through the slots with the free end of the strap being reversely folded and secured to the main portion of the straps by double headed buttons; and wherein the straps and the waistband are provided with a plurality of small longitudinally spaced openings whereby the straps and the waistband are adjustably connected by double-headed buttons extending through selected openings.

4,073,296

APPARATUS FOR ACUPRESSURE TREATMENT

Francis J. McCall, Box 236, Lansing, Ill. 60438

Filed Jan. 2, 1976, Ser. No. 646,003
Int. Cl.² A61B *17/00*; A61H *39/04*
U.S. Cl. 128—303 R **3 Claims**



1. An acupressure treatment device comprising:

a plastic mold conforming to a human external ear,

said mold adapted to be removably retained in said ear in a predetermined position, relative to acupuncture points located in the ear and influencing corresponding specific body functions to be treated; and

nodule means embedded in said plastic mold,

said nodule means not less than about one millimeter in diameter,

said nodule means positioned on said mold to depress at least one of said specific acupuncture points and thereby treat said corresponding body function, when said mold is retained in said predetermined position in said ear.

4,073,297

CATHETER

Klaus F. Kopp, Kirchseeon, Germany, assignor to Sandoz Ltd., Basel, Switzerland

Filed Feb. 11, 1976, Ser. No. 657,093
Int. Cl.² A61M 5/14, 25/00
U.S. Cl. 128—214.4 **7 Claims**



1. A catheter for placement in an artery, vein or fistula vessel of a patient, through which blood may be withdrawn or delivered to the patient, which comprises a catheter defining an outer lumen having a cross-sectional area in a proximal end region of the catheter which is larger than the cross-sectional area of the outer lumen in a distal end region of the catheter, at least one opening being provided in the wall of the catheter in the distal end region thereof, a hub having a bore, connected coaxially to the proximal end of the catheter, a hollow cylindrical body coaxially connected to the hub and having connection means at its free end, for connection to a blood line, a hollow cylindrical side arm leading into the side of the hollow cylindrical body and having means for connection to a blood line, a hollow needle defining an inner lumen through which blood may be delivered to the patient which passes coaxially through the hollow cylindrical body, through the hub and through the catheter so that the point of the needle protrudes beyond the distal end of the catheter, the cross-sectional area of the outer lumen diminishing to a minimum cross-sectional area at the distal end of the catheter from a position distal to the distally most extreme opening in the wall of the catheter, said minimum cross-sectional area of the outer lumen corresponding to the outer cross-sectional area of the needle so that the distal end of the catheter seals against the wall of the needle, an annular outer lumen in communication with the hollow cylindrical body and the hollow cylindrical side arm thereby being defined by the inner surface of the catheter and by the outer surface of the needle, which annular outer lumen progressively increases in cross-sectional area rearwardly towards the proximal end of the catheter from the distal end region, the cross-sectional area of the bore of the hub being at least as large as the sum of the outer cross-sectional area of the needle and the largest cross-sectional area of said annular outer lumen.

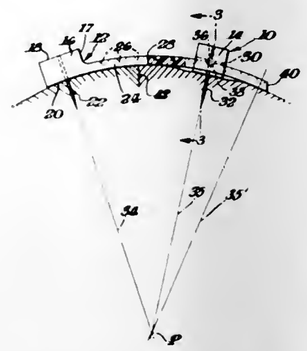
4,073,298

WOUND CLIP

Pierre L. Le Roy, Wilmington, Del., assignor to New Research & Development Lab., Inc., Wilmington, Del.

Filed Aug. 3, 1976, Ser. No. 711,250
Int. Cl.² A61B 17/08
U.S. Cl. 128—337 **12 Claims**

1. A wound clip for use on wound flaps in surgical use comprising an elongated base member, said base member having a head portion at one end of said base member, said head portion having an upper surface and a lower surface, first tine means mounted in said head portion extending outwardly from said lower surface, said first tine means terminating in points disposed remote from said lower surface, said base member having a thin flat bridging member permanently secured to said head portion laterally thereof, said head portion being substantially thicker than said bridging member, said bridging member having an upper surface and a lower surface, a plurality of longitudinally aligned detents in said upper surface of said bridging member, a housing, said housing being substantially thicker than said bridging member, said housing having a horizontal slot extending laterally completely therethrough, said slot being dimensioned for telescopically receiving said bridging member whereby said bridging member may slide in said housing while being maintained in the same lateral orientation in said housing as it does outside said housing, said head portion having a leading face at its junction with said bridging, said leading face being dimensioned to be prevented from being telescopically received in said slot, said leading face being disposed between said first tine means and said housing, second tine means comprising a pair of tines extending from



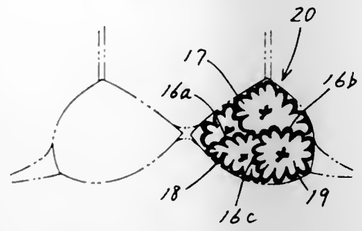
the lower surface of said housing and terminating in points thereof, a locking member mounted in said housing and projecting downwardly into said slot in the generally central area thereof, said locking member being positioned for selectively entering said detents as said bridging member slides in said slot for locking said housing and said base member together whereby said first and said second tine means may be anchored into the patient on opposite sides of a wound flap incision with said bridging member spanning the incision, said clip including resilient means to permit said locking member to selectively move into and out of said detents, and said locking member being a lug permanently fixed to said housing and located in said housing in the general area of said second tine means in line with and between said tines to confine the locking action in the vicinity of said thickened housing where said housing is anchored.

4,073,299

THREE-DIMENSIONAL EMBROIDERED ARTICLE AND THE METHOD FOR THE PRODUCTION OF THE SAME

Shubei Murata, 29-4, Higashimachi, Tojiin, Kita, Kyoto, Japan

Filed May 25, 1977, Ser. No. 800,201
Claims priority, application Japan, Nov. 11, 1976, 51-136598
Int. Cl.² A41C 3/00
U.S. Cl. 128—425 **3 Claims**



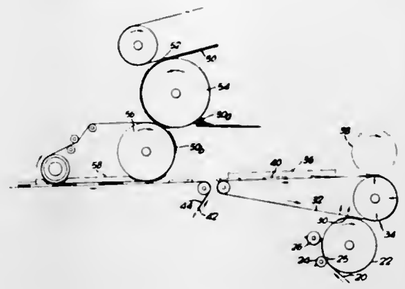
3. A three-dimensional embroidered article comprising a plurality of cloth pieces joined together by seaming to form in a three-dimensional shape, each of said cloth pieces having an elemental embroidery pattern including at least embroidery pattern lines extending substantially along lines of said seaming.

4,073,300

METHOD OF MAKING RUSSIAN CIGARETTES

Desmond Walter Molins, London, England, assignor to Molins Limited, London, England

Filed Nov. 10, 1975, Ser. No. 630,518
Claims priority, application United Kingdom, Nov. 15, 1974, 49663/74; Feb. 5, 1975, 4853/75
Int. Cl.² A24C 5/52
U.S. Cl. 131—61 A **8 Claims**



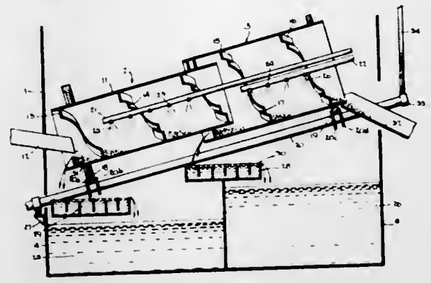
1. A method of making Russian cigarettes, each cigarette comprising axially adjacent tobacco and double-walled tube portions, each said tube portion comprising an inner tube and an outer tube; said method comprising feeding a plurality of reverse folded strip portions, each said strip portion comprising a first part for forming said inner tube and a second part for forming said outer tube, said first and second parts being joined along a longitudinal reverse fold line and lying substantially parallel to each other, said fold lines being parallel to the direction of movement of said strip portions; feeding a plurality of said tobacco portions so as to form an alternating stream of said strip and tobacco portions; forming said strip portions into said double-walled tube portions, each said inner tube comprising said first part and each said outer tube comprising said second part, and wrapping said alternating stream to produce a rod; and dividing said rod into individual Russian cigarettes.

4,073,301

LIQUID TREATMENT OF SMALL ARTICLES

Robert Ian Mackinnon, Tupsley, England, assignor to Huntington Alloys, Inc., Huntington, W. Va.

Filed Sept. 15, 1976, Ser. No. 723,522
Claims priority, application United Kingdom, Sept. 26, 1975, 39560/75
Int. Cl.² B08B 3/02
U.S. Cl. 134—65 **7 Claims**



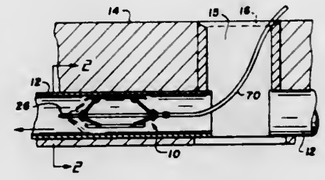
1. Apparatus for treating small articles with liquid comprising an imperforate drum mounted to rotate around an axis inclined to the horizontal, a scroll attached to the interior of the drum and having at least one interruption across the length of the scroll and extending the full depth of the scroll and dividing the scroll into portions, the outer edge of each portion being continuously attached to the interior of the drum and the inner edge being unobstructed to flow of fluid over the edge at places where fluid collects to a depth greater than the depth of the scroll and the leading and trailing ends of each portion of the scroll being overlapped and offset from each other at the place of the interruption sufficiently to provide that articles being treated are deflected across the interruption and prevented from moving back down the drum, means for introducing a liquid into the drum and means for recirculating the treatment liquid out of and again into the drum.

4,073,302

CLEANING APPARATUS FOR SEWER PIPES AND THE LIKE

Thomas E. Jones, 11689-74th Ave., Delta, B. C., Canada (V4C 1E6)

Filed Jan. 18, 1977, Ser. No. 760,345
Int. Cl.² B08B 9/04
U.S. Cl. 134—167 C **1 Claim**



1. Apparatus for cleaning the interior of a pipe comprising a tubular body having a smooth cylindrical bore and rear and front ends, coupling means on the rear end for connecting the tubular body to a conduit leading to a source of cleaning fluid under high pressure, a nozzle on the front end; said nozzle having a first cylindrical chamber of substantially the same diameter as the bore and a second cylindrical chamber of lesser diameter, a front end wall substantially closing one end of the second cylindrical chamber, and a plurality of jets communicating with the first chamber and arranged to discharge outwardly and rearwardly directed jet streams of the cleaning fluid to scour the interior of the pipe and create a forward-propelling reaction force; a carriage assembly including a pair of hubs mounted on the body, at least three legs pivotally secured to inner ends thereof to each hub, said legs being arranged on the pair of hubs as converging pairs of legs, a wheel rotatably mounted on an outer end of each leg for primary engagement with the interior of the pipe, a skid pivotally connected to outer ends of each converging pair of legs, said skids extending parallel to the longitudinal axis of the tubular body and intended for secondary engagement with the interior of the pipe, and means for adjusting at least one of the pair of hubs longitudinally of the tubular body whereby to position the skids a selected distance from said body and locate the nozzle centrally of the pipe.

4,073,303

OIL FIELD PIG LAUNCHER AND RECEIVER

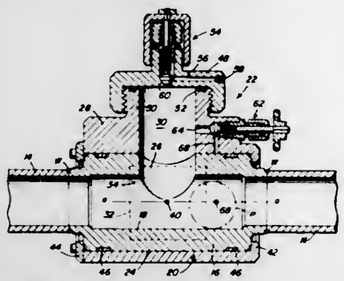
Lawrence E. Foley, Jr., P.O. Box 935, Jennings, La. 70546

Filed Sept. 28, 1976, Ser. No. 727,604
Int. Cl.² B08B 9/04
U.S. Cl. 137—15 **12 Claims**

1. A pig valve for use with a pigging system of a pipeline, comprising, in combination:

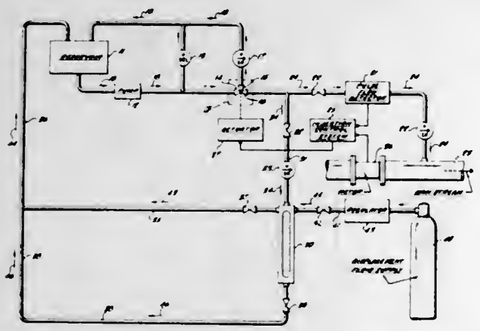
(a) a body providing a straight through passage and insertable into a pipeline, with the passage forming part of a fluid flow path through the pipeline;

(b) a sleeve rotatably disposed surrounding the body; and
(c) access means associated with the sleeve and body for permitting a pig to be transferred between the passage provided in the body and a point outside of the pipeline, the access means including an opening provided in the



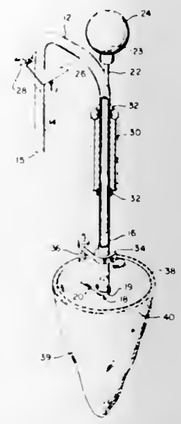
body, with the sleeve having an enlarged portion and the access means further including a chamber formed in the enlarged portion of the sleeve and disposed for communicating with the opening provided in the body in a one axial position of the sleeve relative to the body.

4,073,304
SYSTEM FOR CALIBRATING A PUMP
Julius Lerner, Broomall, and Edmundo J. Iglesias, Lindwood, both of Pa., assignors to Suntech, Inc., Wayne, Pa.
Filed July 12, 1976, Ser. No. 704,204
Int. Cl.² G01F *25/00*; G05D *11/02*
U.S. Cl. 137—101.21 **4 Claims**



1. A closed system for calibrating the pumping rate of a pump so that the fluid being pumped into the calibration system is returned to the fluid supply reservoir to be pumped again, said calibrating system comprising:
(a) means for collecting the fluid being pumped by the pump, said collecting means having a scale for indicating the fluid level in the collecting means, and a first coupling at its upper level and a second coupling at its lower level;
(b) means for providing fluid communication between the first coupling and the reservoir to provide a vapor return line for the collecting means, thereby providing a path for the vapors in the collecting means to be displaced through when the pumped fluid is pumped into the collecting means;
(c) means for providing fluid communication between the second coupling and the reservoir to provide a liquid return line;
(d) means, connected to the collecting means for supplying displacement gas to the collecting means, so that the pumped fluid collected therein is displaced therefrom, back to the reservoir, through the liquid return line; and
(e) means for diverting the flow of pumped fluid from the pump to the collecting means.

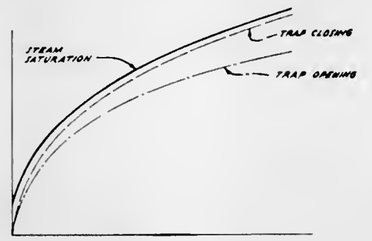
4,073,305
SIPHON PUMP
Amos J. Brown, Alderwood Manor; Thomas E. Belshaw, Seattle; Kenneth L. Knull, Sumner, and Wilbur D. Wilke, Camano Island, all of Wash., assignors to Belshaw Brothers, Inc., Seattle, Wash.
Filed May 20, 1976, Ser. No. 688,175
Int. Cl.² F04F *10/02*
U.S. Cl. 137—140 **6 Claims**



1. A siphon pump for removing liquids from a tank comprising:
elongated hollow outer tube means having a first end and a lower second end,
a cap covering the lower end, means for pressing the cap closed,
an elongated hollow inner tube having an outer end outside of said outer tube, extending through said hollow outer tube and terminating upwardly from said lower second end, and
a bulb air pump enclosing said outer end of said inner tube and so adapted that squeezing said air pump blows a pulse of air out said lower end of said outer tube means and upon closing of the lower end by the cap creates a vacuum within the outer hollow tube means to suck the liquids into the first end of the outer tube means to begin a siphoning effect,
said outer tube means including a single tube having a bent central portion, a short leg terminating at said first end and a longer leg terminating at said second end, said inner tube entering the outer tube at the upper end of the longer leg and extending downwardly at least as far as the first end of the shorter leg whereby the liquid is unlikely to reach the bulb air pump during suction.

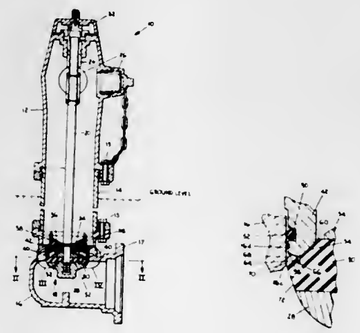
4,073,306
STEAM TRAP
Robert D. Neyer, Oreland, Pa., assignor to Yarway Corporation, Blue Bell, Pa.
Filed Jan. 27, 1977, Ser. No. 762,846
Int. Cl.² F16T *1/02*
U.S. Cl. 137—183 **19 Claims**

1. A steam trap comprising a body including an inlet opening, a discharge opening and a valve seat formed between said inlet and discharge openings, a valve member cooperating with said valve seat to control flow from said inlet opening to said discharge opening, said valve member being movable in a control chamber and being spaced therefrom to form a first orifice through which fluid can flow to said control chamber, said valve member being formed from a material having a coefficient of thermal expansion different from the material



forming said control chamber whereby the size of said orifice and the pressure differential thereacross vary non-linearily with temperature.

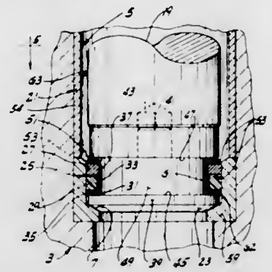
4,073,307
VALVE FOR FIRE HYDRANTS
John H. Royce, Traverse City, Mich., assignor to Traverse City Iron Works, Traverse City, Mich.
Filed July 30, 1976, Ser. No. 710,235
Int. Cl.² F16K *25/00*
U.S. Cl. 137—283 **19 Claims**



1. A fire hydrant comprising:
a water conduit;
connection means for connecting said conduit to a water supply; and
valve means within said conduit for opening and closing said conduit to or from the supply of water; said valve means including a valve seat member with a fluid passage therethrough secured within an inner surface portion of said conduit, first sealing means for preventing fluid flow between said valve seat member and inner conduit surface, and second sealing means for closing said fluid passageway of said valve seat member; said second sealing means including thereon third sealing means for engaging both said valve seat member and inner conduit surface to provide a supplementary fluid seal which completely closes said conduit and seals off said valve seat member from said water supply.

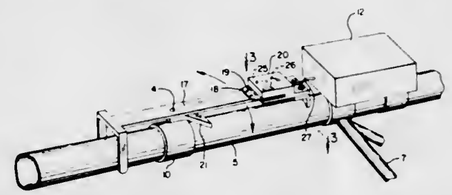
4,073,308
VALVE
Morris Randall Stith, Jr., R.R. #1, Box 13, Webster, Ky. 40176
Filed Oct. 20, 1976, Ser. No. 734,251
Int. Cl.² F16L *53/00*
U.S. Cl. 137—340 **25 Claims**

1. A valve comprising a valve body, the latter having a bore therein, an inwardly projecting seat in said bore, an inlet port in communication with said bore on one side of said bore seat, and an outlet port in communication with said bore on the other side of said bore seat, said inlet port, said outlet port, and a portion of said bore interconnecting said inlet and outlet ports constituting a flow passage, said valve further comprising a valve plunger axially movable within said bore, said plunger having a rigid seat thereon and being movable between an open position in which said plunger is substantially clear of said flow passage so that fluid may flow therethrough substantially without restriction by said plunger and a closed position in which said plunger seat is in substantially leak-tight face-to-face engagement with said bore seat, said plunger carrying pressure-actuated seal means for sealing engagement with the



walls of said bore when said plunger is in its closed position, said pressure-actuated seal means comprising a first deformable seal ring sealingly engageable with the walls of said bore, a second deformable seal ring sealingly engageable with said plunger, means for containing said seal rings and for permitting radial expansion of said first sealing ring into sealing engagement with the walls of said bore and of said second sealing ring into sealing engagement with said plunger when said seal rings are subjected to axial compression loading, and means responsive to fluid pressure for applying axial compression loading to said seal rings for axially compressing them and for effecting generally radial expansion of said seal rings into respective sealing engagement with said bore and said plunger.

4,073,309
IRRIGATION APPARATUS
Arthur D. Fraser, and Dwight A. Inglis, both of Walla Walla, Wash., assignors to Raymond D. Harold, Walla Walla, Wash.
Filed Sept. 15, 1976, Ser. No. 723,500
Int. Cl.² B05B *3/02*
U.S. Cl. 137—344 **17 Claims**



1. In self-propelled sprinkler irrigation apparatus, an alignment control system connected to said irrigation apparatus for controlling the linear alignment of said irrigation apparatus by causing sections of said irrigation apparatus to move or not move in a predetermined, automatic manner, comprising a misalignment sensor mechanically connected to said irrigation apparatus for sensing possible linear misalignments of said irrigation apparatus, correctable by said alignment control system, and for causing electrical circuits to be established or disestablished in response to the presence or absence of said possible misalignments, said misalignment sensor comprising:
permanent magnet means connected to a section of said irrigation apparatus for generating a field of magnetic flux,

magnetic switch means, operable by said field of magnetic flux and also connected to said section of said irrigation apparatus and electrically connected to said electrical circuits,

and magnetic shielding means connected to another and adjacent section of said irrigation apparatus in such position as to magnetically shield or not shield said magnetic switch means from said field of magnetic flux in a predetermined fashion thereby causing said magnetic switch means to establish or disestablish said electrical circuits in accordance with said presence or absence of misalignment of said irrigation apparatus.

12. In self-propelled sprinkler irrigation apparatus, an alignment control system connected to said irrigation apparatus for controlling the linear alignment of said irrigation apparatus by causing sections of said irrigation apparatus to move or not move in a predetermined, automatic manner, comprising an electrical delay circuit for causing the initiation of said movement to be delayed in time by an operably adjustable amount, and for causing the termination of said movement to be substantially undelayed in time.

4,073,310

METHOD AND APPARATUS FOR CONTROLLING THE LIQUID LEVEL ABOVE A SOLID BED

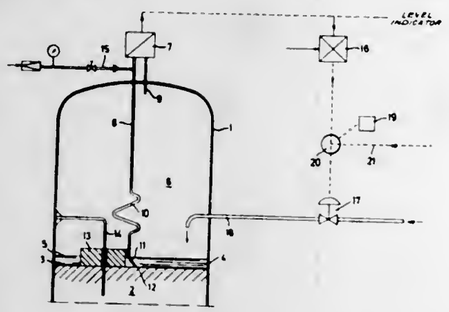
Jiri Mikule, and Wilfried Hecken, both of Cologne, Germany, assignors to Industrial Filter & Pump Mfg. Co., Cicero, Ill.

Continuation of Ser. No. 440,867, Feb. 8, 1974, abandoned. This application Sept. 2, 1975, Ser. No. 609,220

Claims priority, application Germany, Feb. 8, 1973, 2306210

Int. Cl. F16k *21/18*

U.S. Cl. 137—389 **2 Claims**



1. Apparatus for controlling the rate of flow of a liquid through a tank containing a bed of solid granular material so as to maintain a constant depth of said liquid above said bed irrespective of changes in the volume of said bed material comprising,

a float having a specific gravity such that when floating freely in said liquid it has a depth of immersion greater than said constant depth,

said float being located within said tank and resting on said bed,

means providing an output signal related to the pressure differential between two fluid inputs thereto,

a conduit connected between one of said inputs and a position near the top of column,

a bubble pipe carried by said float and connected to the other of said inputs, said bubble pipe having a downwardly facing open lower end disposed in proximity to the bottom of said float,

means for passing fluid into and down through said pipe whereby it flows out said open lower end,

control means responsive to said output signal for controlling the rate of flow of said liquid into said tank to maintain said constant depth of said liquid above said bed, and

time controlled means for periodically supplying liquid to said tank independently of said output signal to maintain a sufficient head of liquid above said bed to cause said float to float above the upper surface of said bed.

4,073,311

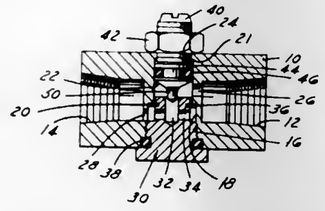
FLOW CONTROL VALVE

Donald E. McGeachy, Highland, Mich., assignor to Numatics, Incorporated, Highland, Mich.

Filed Dec. 10, 1976, Ser. No. 749,384

Int. Cl.² F16K *15/14*

U.S. Cl. 137—513.3 **14 Claims**



1. A flow control valve assembly comprising:

a. a housing having a single cylindrical recess extending therethrough,

b. a valve orifice plug in one end of said recess having an inner end and an outer end and an axial passage terminating at the inner end in an orifice to be controlled, said orifice being open at one end to an inlet and at the other end to an outlet said inner end being constructed to allow flow around said plug between said inlet and outlet independently of said orifice,

c. annular valve means retained on said inner end of said plug movable, in response to fluid flow, to close flow around said plug when flow is in one direction and to open said flow around said plug when flow is in the opposite direction, and

d. a valve insert in the other end of said cylindrical recess having a portion movable toward and away from orifice in said plug to control a flow orifice created by the proximity of said portion and said plug,

whereby flow through said assembly is relatively unrestricted in one direction around said plug and past said annular valve means and is restricted through said orifice in the other direction.

4,073,312

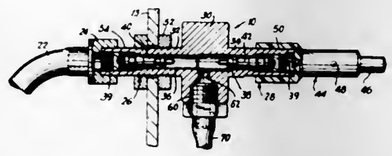
CHARGE AND RELIEF VALVE

Frank J. Voos, Stratford, Conn., and David M. Magoulick, Uniontown, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed June 21, 1976, Ser. No. 698,618

Int. Cl.² F15B *13/04*; F16K *11/00*

U.S. Cl. 137—877 **2 Claims**



1. A dual valve assembly for enabling ready access in relieving air pressure from a utilization device located on one side of a wall, and in furnishing air pressure to said utilization device from a source located on the opposite side of the wall, comprising

(a) a unitary valve structure including a central body section and first and second integrally formed valves, each valve comprising

(1) a hollow valve cylinder extending from said body section, and

(2) a valve core, including a pin, within the bore defined by each valve cylinder;

(b) a passageway through said central body section communicating with the respective bores in the valve cylinders such that said integrally formed valves constitute independently operable means for respectively charging and relieving air pressure in said valve assembly, said passageway intersecting at its one end substantially perpendicularly with the bores; and means at the other end of said passageway for connecting a hose thereto;

(c) threads on the exterior surface of the first valve cylinder and a cap engaging said threads, said cap including a spring-biased plunger for contacting the pin of the valve core within said first valve cylinder so as to relieve the air pressure;

(d) further threads on the exterior surface of the second valve cylinder, and a pair of fastening devices engaging said further threads for engaging respective opposite sides of said wall therebetween so that said valve assembly can be mounted on said wall such that the passageway in said central body section is located on said one side of the wall.

4,073,313

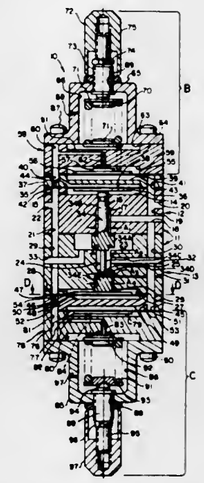
VALVE APPARATUS

John J. Smallwood, King, N.C., assignor to Fairchild Industries, Inc., Germantown, Md.

Filed Dec. 6, 1974, Ser. No. 530,186

Int. Cl.² F16K *11/04, 31/365*

U.S. Cl. 137—625.6 **8 Claims**



1. Valve apparatus comprising a valve body, said valve body having an inlet and an exhaust valve aperture and a locking piston isolation aperture, supply valve means including a locking piston member located within said valve body for controlling fluid supplied to said valve body, means for isolating said locking piston member from the inlet when the exhaust valve aperture is closed, pressure assist means for permitting the pressure of the fluid controlled by said supply valve means to assist in the positive action of said supply valve means and for permitting the pressure of the fluid being controlled to assist in maintaining said supply valve means in the normally open position, said pressure assist means comprising the exhaust valve aperture and the locking piston isolation aperture where the area of the cross section of the exhaust valve aperture is greater than the area of the cross section of the locking piston isolation aperture, and at least one signal valve associated with said valve body for controlling the operation of said supply valve means.

4,073,314

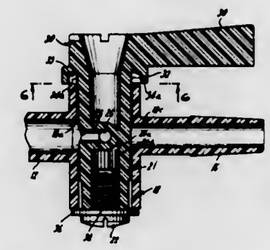
DISPOSABLE VALVE

Irving A. Speelman, East Williston, and Jan Raczkowski, Glendale, both of N.Y., assignors to Propper Manufacturing Co., Inc., New York, N.Y.

Filed Sept. 8, 1976, Ser. No. 721,421

Int. Cl.² F16K *5/16*

U.S. Cl. 137—625.47 **7 Claims**



1. A valve comprising: a hollow body having first and second ends and including a plurality of ports in its periphery; a valve core telescoped in said body and adapted to be rotated therein, said core including means for interconnecting groups of said ports when said core is rotated to different positions within said body, said core having a substantially cylindrical longitudinal bore opening toward the first end of said body and splines disposed on the inside of said bore; means for restraining longitudinal movement of said core towards the first end of said body; and securing means, including a substantially cylindrical threaded shaft constructed to be press fitted inside said core bore and to be wedged therein by said splines, for restraining longitudinal movement of said core towards the second end of said body.

4,073,315

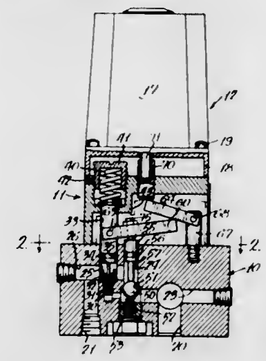
VALVE ASSEMBLY

Samuel B. McClocklin, and James C. Solie, both of Owatonna, Minn., assignors to Owatonna Tool Company, Owatonna, Minn.

Filed Jan. 21, 1977, Ser. No. 761,413

Int. Cl.² F16K *1/00*

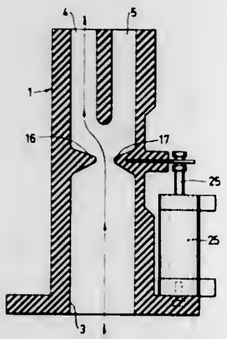
U.S. Cl. 137—629 **14 Claims**



8. A solenoid valve assembly having a valve body with a pressure port, a return port, and a control port, passage means in said body connecting said ports, first and second valves in said body arranged in parallel in said passage means for blocking fluid flow between the control port and the return port, a

solenoid operable to open said valves, and means interconnecting said solenoid and said first and second valves including first and second levers and a spring whereby initial movement of said levers by operation of the solenoid opens said first valve against the action of said spring and after a reduction of fluid pressure said spring acts to open said second valve.

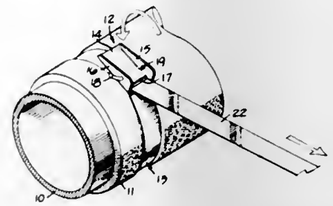
4,073,316
FLEXIBLE FLOW DIVERTER
K. Sture Nyström, Solna, Sweden, assignor to Skega Aktiebolag, Ersmark, Sweden
Continuation of Ser. No. 553,644, Feb. 27, 1975, abandoned, which is a continuation of Ser. No. 358,354, May 8, 1973, abandoned. This application Oct. 19, 1976, Ser. No. 733,928
Claims priority, application Sweden, June 12, 1972, 7717/72
Int. Cl.² F15C *1/08, 1/14, 1/16*
U.S. Cl. 137—829 **8 Claims**



1. A flow device for a fluid stream to control the direction of said stream, said device comprising a conduit having an inlet for the fluid and at least one outlet for the fluid, said inlet and the or each outlet being separated from each other within said conduit by a gap coaxial with the axis of the conduit and defined by opposed offsettable inner edges of two mutually opposite flexibly mounted stream-deflecting members extending inwardly of said conduit in a direction transverse to the axis of said conduit; the arrangement being such that at least one of the stream-deflecting members is movable relative to the other by flexing that member in a direction parallel to the axis of said conduit whereby said inner edge of said one member is brought out of opposition with respect to the inner edge of the other member thereby to effect a corresponding change in the direction of the axis of said gap and consequently a corresponding change in the direction of the stream as it flows through said gap towards the outlet end of the conduit.

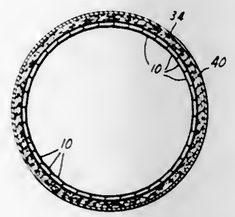
4,073,317
ADJUSTABLE CLAMPING DEVICE
James B. Ellis, Grand Junction, Colo., assignor to Fibreboard Corporation, San Francisco, Calif.
Filed Sept. 20, 1976, Ser. No. 724,418
Int. Cl.² F16L *9/14, 33/02*
U.S. Cl. 138—147 **11 Claims**

1. A clamping device adapted for securing ends of a strap together comprising
- a substantially elongated, co-planar and flat body said device terminating at its ends by the end edges of said body,
- a pair of flanges secured to opposite sides of said body to define a U-shaped cross section throughout the entire length of said clamping device,
- means defining an elongated slot through said body, adjacent a first end edge thereof, to form the sole interruption therein, and



- a ring pivotally mounted on said flanges and sized to freely pivot over said first end edge of said body.

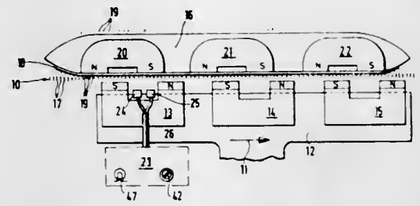
4,073,318
PROCESS FOR WEAR-RESISTANT DUCTS
James R. Close, Roberts, Wis., and James R. Johnson, White Bear Lake, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Nov. 19, 1976, Ser. No. 743,337
Int. Cl.² F16L *9/14*
U.S. Cl. 138—149 **4 Claims**



1. As an article of manufacture a duct consisting essentially of casing, interlocked abrasion-resistant tile lining and expanded intumescent composition between said tile lining and said casing exerting forces thereon respectively centripetally and centrifugally of said tile lining in said casing of at least 2 Newtons per cm^2.

2. A process for providing abrasion resistance to the inner surface of a hollow tube of round to elliptic cross-section comprising
- A. Providing said tube internally with a first layer of insulative sheet material expandable to resilient mat means and a second layer of interlocking refractory abrasion resistant tile temporarily positioned inward of said first layer, clearances between said tube and said first and second layers being sufficiently large to permit relative movement between said tube and said second layer and not being greater than the expanded thickness of said insulative sheet material, and
- B. Heating said tube under conditions of substantially uniform circumferential heat distribution with said first and second layers in position whereby expansion of said insulative sheet material is effected substantially uniformly so that force is exerted centripetally of said tube on said interlocking tile and centrifugally on said tube of at least 2 Newtons per cm^2 and sufficient to hold said tile in securely interlocked relationship within said tube.

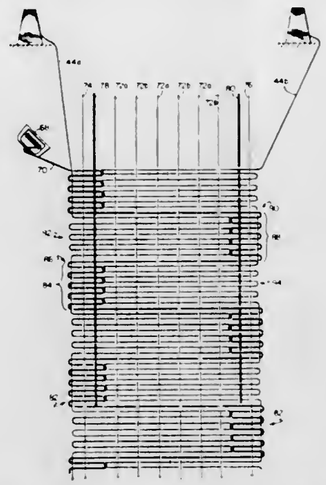
4,073,319
SHUTTLE MONITORING DEVICE, PARTICULARLY FOR MULTIPLE-SHUTTLE WEAVING MACHINES
Adolf Linka, Hechingen-Sickingen, and Gerhard Hamma, Spaichingen, both of Germany, assignors to Mayer & Cie, Tailfingen, Germany
Filed Sept. 22, 1976, Ser. No. 725,529
Claims priority, application Germany, Oct. 4, 1975, 2544530
Int. Cl.² D03D *49/44, 51/40, 47/26*
U.S. Cl. 139—134 **8 Claims**



1. In a weaving machine, particularly a multiple-shuttle weaving machine, of the type in which the shuttle is provided with at least one shuttle magnet, and in which magnetic drive means moves along the shed and acts upon the shuttle magnet to effect positive magnetic transport of the shuttle through the shed, a shuttle monitoring device, the shuttle monitoring device comprising, in combination, a magnetic-field-dependent resistor for each shuttle to be monitored; means for transporting the magnetic-field-dependent resistor in parallel with and in synchronism with the drive means and in a region where the resistor is influenced by at least one pole of the shuttle magnet during the entire transport of the shuttle through the shed, whereby during transport of the shuttle through the shed the magnetic-field-dependent resistor will remain in a predetermined position relative to the at least one pole of the shuttle magnet so long as a predetermined relative position between the magnetic drive means and the at least one shuttle magnet is being maintained; and machine shutoff means connected to the resistor and operative for shutting off the drive means for the weaving machine in response to a resistance change of the resistor indicative of improper relative position between the drive means and the shuttle magnet and thus lack of proper shuttle movement.

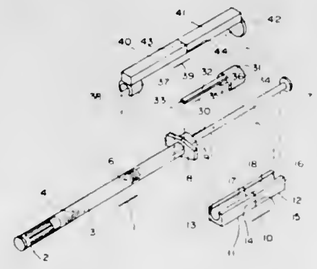
4,073,320
DOUBLE CATCH THREAD NARROW WEAVE FABRIC
Junior C. Spence, Stuart; Robert J. Rorrer, Woolwine, and James L. Holt, Stuart, all of Va., assignors to J.P. Stevens & Co., Inc., New York, N.Y.
Division of Ser. No. 527,438, Nov. 26, 1974, Pat. No. 4,004,617. This application Nov. 1, 1976, Ser. No. 737,319
Int. Cl.² D03D *23/00*
U.S. Cl. 139—383 R **9 Claims**

1. A woven fabric comprising:
- a plurality of warp threads forming a first edge warp, a main warp and a second edge warp;
- a shuttle thread forming a predetermined number of exterior loops about said first edge warp, said shuttle thread further extending across all of said warp threads in an interwoven fashion, and said shuttle thread further forming a predetermined number of exterior loops about said second edge warp;
- a first catch thread being interwoven in said main warp, looping around said shuttle thread, and forming a predetermined number of exterior loops about said first edge warp opposite said exterior loops formed by said shuttle thread about said second edge warp; and
- a second catch thread being interwoven in said main warp, looping around said shuttle thread, and forming a predetermined number of exterior loops about said second edge



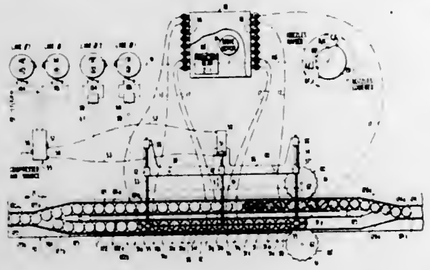
warp opposite said exterior loops formed by said shuttle thread about said first edge warp.

4,073,321
ADJUSTABLE BLOCKING MEANS FOR DOSAGE REGULATION
George Moskowitz, 101 B. Rutledge Ave., Charleston, S.C. 29401
Filed Mar. 15, 1976, Ser. No. 666,957
Int. Cl.² B65B *3/04*
U.S. Cl. 141—27 **18 Claims**



1. A device for regulating the dosage of a fluid in a syringe having a plunger with a fluid-holding barrel and a stop at the top of said fluid-holding barrel comprising blocking means removeably secured to the plunger of the syringe placed between the plunger end of the syringe and the stop at the top of the syringe fluid-holding barrel, said blocking means comprising a top portion, a bottom portion, two side portions, two end portions, and an arcular trough type opening extending from one end portion to the other end portion through said top portion; said blocking means working automatically without being held manually;
- whereby, during the filling of the filling of the syringe, when said plunger end is pressed toward said top, said blocking means allows any excess fluid to be rejected from said fluid-holding barrel, retaining only the desired dosage of said fluid in said barrel.

4,073,322
HIGH-SPEED FILLING MACHINE
Richard Nelson Bennett, Arbutus, Md., assignor to National Instrument Company, Inc., Baltimore, Md.
Filed Oct. 22, 1976, Ser. No. 735,034
Int. Cl.[2] B65B *43/54*
U.S. Cl. 141—169 23 Claims



1. A filling machine for filling containers with a fluid product by the use of several filling nozzles, which comprises a number of filling units performing working cycles, which are operatively connected with a corresponding number of filling nozzles and are operable for filling containers with the fluid product by way of the nozzles during the working cycles thereof, nozzle support means supporting thereon the filling nozzles in proper position, means for lowering and raising the nozzle support means and therewith the filling nozzles into and out of containers held under the filling nozzles, indexing means for holding containers stationary in their filling positions during the filling operation on a continuously running conveyor means, and control means for controlling the operation of the filling machine including means correlating the operation of the indexing means and the lowering and raising of the nozzle support means with the working cycle of the filling units, characterized in that two substantially parallel channel means defined in part by said conveyor means are provided which branch out from a single channel means upstream of the filling station and which recombine again into a single channel means downstream of the filling station, in that said indexing means are coordinated to each channel means to hold a predetermined number of containers corresponding to the number of the filling nozzles stationary in the respective channel means during the filling operation, and in that reciprocating means which are operatively connected with said control means are provided for the nozzle support means to alternately place the filling nozzles over containers to be filled in one channel means during a respective working cycle and after completion of the filling operation thereof, to move the nozzle support means transversely to the direction of movement of the conveyor means over the other of the two parallel channel means to fill the containers which have been brought into filling position in the meantime in said other channel means during the next working cycle and which are held stationary thereat during the filling operation of such working cycle by the respective indexing means.

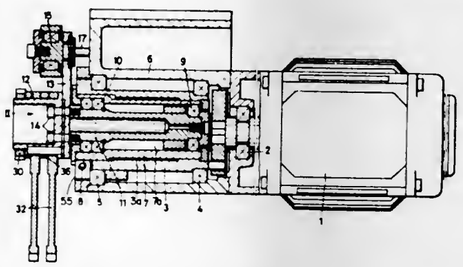
4,073,323
TUBING DEFLECTOR
Eldon Dwayne East, 4522 Casa Oro Drive, Yorba Linda, Calif. 92686
Filed June 30, 1976, Ser. No. 701,225
Int. Cl.[2] B65B *3/00*
U.S. Cl. 141—326 9 Claims

1. A deflector utilizable with a receptacle having a plurality of openings therein for receiving elements in selected ones of said openings as a function of the position of said deflector; said deflector comprising;
a pivot member;
a plate-like member joined to said pivot member;
an abutment member joined to said pivot member;
said pivot member mounted in said receptacle between said openings such that said plate-like member covers one of



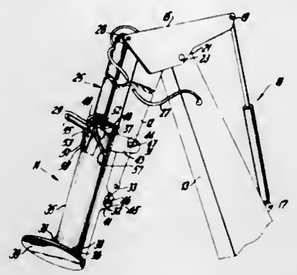
said openings when in an initial position and said abutment member extends into a further opening; and
bias means for establishing said initial position of said plate-like member.

4,073,324
SLOT-MORTISING OR MORTISING MACHINE
Max Mayer, Holzheim, Germany, assignor to Max Mayer Maschinenbau GmbH, Germany
Filed Feb. 13, 1976, Ser. No. 657,725
Claims priority, application Germany, Mar. 13, 1975, 2511081
Int. Cl.[2] B27F *5/02*
U.S. Cl. 144—82 14 Claims



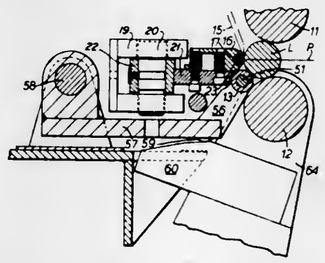
1. A mortising machine, comprising:
a motor having a housing; a rotatable drive shaft extending from said motor and out of said housing; a tubular guide casing mounted so as to be nonshiftable with respect to said motor housing; said casing having an opening therein which is concentric with said drive shaft;
an outer sleeve positioned inside said tubular casing opening, said outer sleeve being supported by and being rotatable in said tubular casing opening concentrically of said motor drive shaft; said outer sleeve being connected to said drive shaft for being rotated thereby; said outer sleeve having an outer sleeve bore therein which is eccentric to said motor drive shaft;
a tool carrier shaft supported in said outer sleeve bore and rotatable with respect to said outer sleeve, whereby as said outer sleeve is rotated concentrically of said drive shaft, said tool carrier shaft moves eccentrically;
rotation control means connected to said tool carrier shaft for limiting rotation thereof in said outer sleeve bore as said outer sleeve is rotated, whereby said tool carrier shaft has limited rotation about its axis.

4,073,325
WOOD-SPLITTING ATTACHMENT
Cecil Krom, Jr., P.O. Box 282, Napanoch, N.Y. 12458
Filed Oct. 12, 1976, Ser. No. 731,518
Int. Cl.[2] A47J *49/02*
U.S. Cl. 144—193 A 7 Claims



1. A wood-splitting attachment for removable attachment to the end of the dip stick of a backhoe, said backhoe having a controlled hydraulic system with a piston and cylinder extending along the upper surface of the dip stick, said wood-splitting attachment including:
an elongated concave trough, said elongated concave trough having an inside end and an outside end;
a means for attaching said elongated concave trough, to the dip stick of a backhoe, said elongated concave trough being longitudinally aligned with said dip stick with the outside end of said elongated concave trough extending beyond the outside end of said dip stick;
means for attaching a wedge means to the piston of the piston and cylinder extending along the upper surface of said dip stick;
a stop means rigidly attached to the outside end of said elongated concave trough at substantially right angles to said elongated concave trough; and
a clamp means for securing the cylinder of said piston and cylinder along the longitudinal axes of said elongated concave trough.

4,073,326
VENEER-PEELING MACHINES
John C. Pank, Pretoria, and Ronald L. E. Clegg, Durban North, both of South Africa, assignors to Lion Match Company Limited, England
Filed Aug. 18, 1976, Ser. No. 715,400
Claims priority, application United Kingdom, Sept. 5, 1975, 36560/75
Int. Cl.[2] B27L *5/02*
U.S. Cl. 144—209 R 10 Claims



1. A veneer peeling machine comprising a frame, three rollers, means mounting said rollers in said frame for rotation on mutually parallel axes, first and second of the rollers being so mounted and so movable relative to each other and to the third roller as to grip and rotate a log disposed between the three rollers, a knife and means supporting the knife relative to a said log to peel a veneer therefrom as the log is rotated by the rollers.

4,073,327
MAGNETIC HEAD HAMMER
Ottis D. Pearson, 104 Gillcrest Ave., Vallejo, Calif. 94590
Filed June 11, 1976, Ser. No. 695,088
Int. Cl.[2] B25C *1/00*; B25D *1/00*
U.S. Cl. 145—30 A 2 Claims



1. A hammer having a magnetic driving head said head comprising:
a drop-forged driving end of heat treated steel having a driving face positioned thereon;
a recessed section counterbored through said face in said end;
a shield member of relatively hard non-magnetic metal;
a permanent magnet member tightly pressed into said shield member;
said shield member and said magnetic member being tightly pressed into said recessed section to form a flush surface with said driving face; whereby said magnetic member forms a part of said driving face;
said magnetic member being further characterized by the complete absence of cushioning or impact absorbing means in connection therewith;
said shield member being further characterized by a cup-like configuration enclosing all but one surface of said magnetic member said one surface forming a part of said driving face.

4,073,328
ARROW QUIVER
Dwaine R. Franklin, 1845 Arizona Ave., Yuma, Ariz. 85364
Filed May 9, 1977, Ser. No. 795,096
Int. Cl.[2] A63B *67/00*
U.S. Cl. 150—1.5 R 10 Claims

1. An arrow quiver including in combination:
an elongated frame member having an abutment member located at one end thereof and extending outwardly from the plane of said frame member; and
a bridge member mounted across said frame member on the same side as said abutment member, said bridge member being formed of resilient material and having a plurality of tapered slots therein, each of such slots for accommodating and gripping the shaft of an arrow and the slots each

being tapered with the narrow end thereof on the side of the bridge nearest said abutment member for impeding



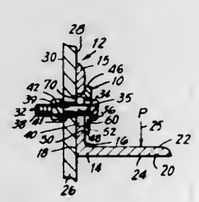
sliding of an arrow shaft through such slot in a direction away from said abutment member.

4,073,329

WEDGE SHAPED LOCK WASHER CONSTRUCTION AND ASSEMBLY

Alfred A. Hala, Islip, N.Y., assignor to Hohmann & Barnard, Inc., Hauppauge, N.Y.

Filed Nov. 10, 1976, Ser. No. 740,383
Int. Cl.² F16B *39/24*
U.S. Cl. 151—20 **73 Claims**



1. A washer for use in conjunction with a fastening system for rigidly locking a first member relative to a second member, one of said members having an aperture formed therein for receiving a fastener adapted to extend through said washer and having an enlarged outer end for engagement with said washer, said first and second members being provided with planar surfaces of engagement permitting adjustment relative to each other along a common plane and being normally subjected to external forces tending to shift said members relative to each other in one direction,

said washer comprising a body element having oppositely disposed ends and spaced apart substantially planar surfaces intermediate said ends, said surfaces being inclined relative to each other, one of said surfaces being capable of engagement with one of said members in abutting relationship therewith and the other of said surfaces being inclined relative thereto.

means cooperating with the aperture in said one of said members for permitting removable positional securement of said body element relative to the aperture in said one of said members,

said body element having an elongated slot extending between said oppositely disposed ends and through said spaced apart surfaces, said slot being positionable in alignment with said aperture for receiving said fastener therethrough, the enlarged outer end of said fastener extending beyond said surfaces for securing said members and said washer together,

said fastener having a longitudinal axis disposed in substantially parallel relationship to a plane which extends through and which is disposed at substantially right angles to said spaced apart substantially right angles to said spaced apart substantially planar surfaces,

said elongated slots having a longitudinal axis disposed in substantially perpendicular relationship to the longitudinal axis of said fastener, and

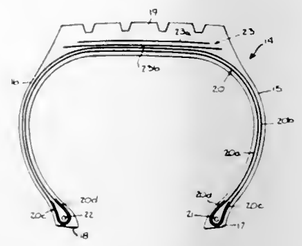
said inclined surfaces of said body element being disposed in wedging relationship between the engaged surface of said one of said members and said enlarged outer end of said fastener in dependence upon the application of said external forces for positively locking said members together.

4,073,330

TIRE CORD FABRICS FOR BELTS OF BELTED PNEUMATIC TIRES

Claude H. Allard, Toronto, Canada, assignor to Uniroyal, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 451,322, March 14, 1974, abandoned. This application June 21, 1976, Ser. No. 697,893
Int. Cl.² B60C *9/22*
U.S. Cl. 152—361 DM **7 Claims**



1. A belted tire comprising a toroidal carcass terminating at its radially inward-most edges in a pair of beads, a tread surrounding the region of said carcass, sidewalls outlying the lateral regions of said carcass from said beads to the marginal regions of said treads, and a tread-reinforcing belt structure disposed circumferentially of the crown region of said carcass beneath said tread, said belt structure including at least one ply of a plurality of first continuous filament tire cords in which the filamentary elements are exclusively of metal wire and a plurality of second continuous filament tire cords in which the filamentary elements are exclusively of a high modulus non-metallic synthetic fiber, each ply of said belt structure having all said cords extending in the same direction in closely spaced, non-intertwined, side by side, relation and being interspersed with one another in such a fashion that at least some of said first cords have disposed therebetween at least one of said second cords.

4,073,331

DEVICE FOR MAKING A CURTAIN HANG IN REGULAR PLEATS

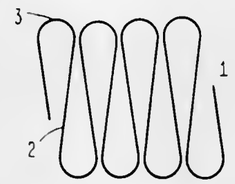
Edwin Zilver, v. Beethovenlaan 115, Doorwerth, Netherlands

Filed Mar. 10, 1976, Ser. No. 665,558
Claims priority, application Netherlands, Mar. 6, 1976, 7602237; Mar. 13, 1975, 7502979
Int. Cl.² A47H *13/14*
U.S. Cl. 160—348 **3 Claims**

1. A device for making a curtain hang in regular pleats, said device capable of assuming two positions, the first position being prior to an elastic deformation of said device and the second position being after elastic deformation of said device, comprising:

an oblong bent shaped resilient member of a plastic material which is a zig-zag type shape such that it can be subjected to an elastic deformation from said first position into said second position and vise versa, said resilient member having a pre-determined total length measured along said zig-zagged shape portions and having two ends, wherein the linear distance between said ends of said resilient member is greater in said second position than in said first position, said linear distance in said second position being at least 50 percent of said total length of said resilient member;

connecting means provided at said ends of said resilient member for connecting said resilient member to another oblong bent shaped resilient member, said connecting means comprising a male connector located at one of said ends and a female connector at the other of said ends



wherein said female connector includes an opening and said male connector comprises an embossment, which is provided with a central opening with slits extending radially from said central opening; and

attaching means for connecting a hanger to said resilient member, said attaching means including a mandrel for engagement with said central opening of said embossment of said male connector,

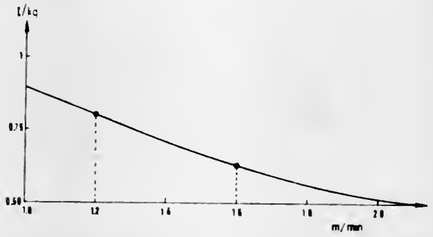
whereby said male connector provides connecting means for connecting said resilient member to another resilient member by inserting said male connector into said female connector and whereby said male connector of said resilient member also provides means for engagement with said mandrel of said attaching means to enable connection of a hanger at the point where said resilient members are connected.

4,073,332

METHOD OF CONTROLLING CONTINUOUS CASTING OF A METAL

Arlette Thérése Etienne, Boncelles, Belgium, assignor to Centre de Recherches Metallurgiques Centrum Voor Research in de Metallurgie, Brussels, Belgium

Filed Sept. 23, 1975, Ser. No. 615,846
Claims priority, application Belgium, Sept. 26, 1974, 820408; Oct. 9, 1974, 820889; Mar. 21, 1975, 827040; Luxembourg, Apr. 13, 1975, 72732
Int. Cl.² B22D *11/16*
U.S. Cl. 164—4 **6 Claims**



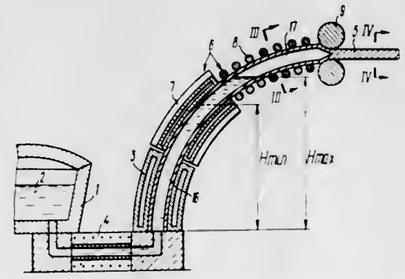
1. A method of controlling the continuous casting of a metal by a continuous casting machine having a liquid-cooled mould in which primary cooling of the molten metal occurs to form a metal strand having a liquid core, issuing from the mould, and passing through a series of secondary cooling zones to which a coolant is supplied through respective flow-control valves, the method comprising the steps of: starting the casting machine at an optimum casting speed; measuring the casting speed, which will vary owing to changes in the rate at which molten metal enters the mould; measuring the surface temperature of the strand in each of the secondary cooling zones; from the measured temperatures and the measured casting speed, determining by means of a computer the time taken by a sector of the metal to pass from its entry into the casting machine to its exit from each of the secondary cooling zones and a specific coolant flow rate at which the coolant is to be supplied to each of the secondary cooling zones in order to maintain a desired thermal profile along the strand at the measured casting speed; and controlling the valves so that the coolant is supplied to each of the secondary cooling zones at the rate determined for that zone, the specific coolant flow rate being reduced as the measured casting speed increases.

4,073,333

METHOD OF CONTINUOUS CASTING OF INGOTS

Evgeny Alexeevich Korshunov, pereulok Otdelny, 5a, kv. 29; Nikolai Ivanovich Bainov, ulitsa Kominterna, 20/17, kv. 1; Igor Nikolaevich Petrov, ulitsa Malysheva, 152b, kv. 30; Georgy Fedorovich Konovalov, ulitsa Bazhova, 130/79, kv. 17, all of Sverdlovsk; Mikhail Iosipovich Arshansky, prospekt Lenina, 23/40, kv. 8, Nizhny Tagil; Petr Genrikhovich Shmidt, ulitsa Gagarina, 35, kv. 186, Sverdlovsk; Valery Pavlovich Kostrov, ulitsa Bazhova, 57, kv. 10, Sverdlovsk, and Petr Evgenievich Efremov, ulitsa Tolyatti, 28, kv. 6, Novokuznetsk Kemerovskoi oblasti, all of U.S.S.R.

Continuation of Ser. No. 535,153, Dec. 23, 1974, abandoned, which is a continuation of Ser. No. 422,151, Dec. 6, 1973, abandoned. This application June 23, 1976, Ser. No. 699,173
Int. Cl.² B22D *11/04, 11/08*
U.S. Cl. 164—66 **5 Claims**



1. A method of continuous casting of an ingot in a plant provided with a vessel for molten metal, a device for the forced feeding of a molten metal, a radially curved cooled mould, a dummy bar having a through channel in its middle portion along its height, and a secondary cooling device with a radial upcast branch, comprising the steps of: (a) introducing the dummy bar into the radially curved cooled mould; (b) forced feeding a molten metal from the vessel into the mould from a bottom until the molten metal contacts the dummy bar and simultaneously forces out air through the channel in the dummy bar; (c) increasing the pressure of the molten metal applied to an ingot skin being formed and holding the ingot skin being formed to a prescribed thickness; (d) reducing the pressure at the end of the holding; (e) drawing an ingot from the mould to a value close to, but not exceeding the length of the mould at a rate of drawing that ensures the presence of a molten metal layer on a lower butt portion of the skin; (f) forming a hole in the skin of the ingot, made through the channel in the dummy bar during one period of drawing the ingot after reducing the pressure therein; (g) supplying a neutral gas to an inner space of the ingot through the channel in the dummy bar and the hole in the ingot skin, in an amount

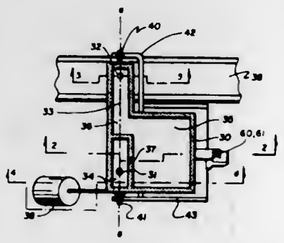
ensuring the equalizing of the level of the molten metal in the mould to a level close to the level of the molten metal in the vessel, as well as forming a gas cushion in an upper portion of the ingot; (h) feeding the molten metal into the inner space of the ingot when the ingot is being drawn from the mould and when a pause starts, in an amount that ensures a pressure causing the fitting of the skin of the ingot along the mould; (i) decreasing the rate of the ingot drawing until the drawing discontinues completely, the supply of the molten metal continuing; (j) returning the ingot to the mould to a distance close to the distance of the longitudinal contraction of a new portion of the ingot being formed; (k) continuing the feed of the molten metal in the direction of the ingot drawing until a preset pressure is created on the newly formed portion of the ingot; (l) repeating the steps (h)-(k) until formation of an upcast branch of the ingot; and (m) straightening and reducing a continuous section of an upper portion of the upcast branch of the ingot, the section being an ingot envelope spaced from the gas cushion to a distance corresponding to the size of a formed lower portion of the ingot, drawn out of the mould.

4,073,334

TILTING TUNDISH

Charles Christian Gerding, Pittsburgh, Pa., assignor to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed Nov. 4, 1976, Ser. No. 738,923
Int. Cl.² B22D *11/06, 11/10*
U.S. Cl. 164—87 **9 Claims**



1. A method for dispensing a substantially constant flow of liquid, comprising:

a. feeding a pulsating flow of liquid into a container that is rotatably supported by a bearing surface having a horizontal axis that is generally coplanar with an opening in said container for receiving said liquid and an opening in said container for dispensing said liquid, said container adapted to hold variable amounts of said liquid and extending laterally beyond said horizontal axis, so as to cause said container to rotate about said axis due to a change in torque applied to said container caused by the change in volume of contained liquid;

b. applying a countertorque from a counterweight system to said container to balance the change in torque caused by said change in volume of liquid, said countertorque being applied on an amount to cause the container to rotate about said axis to a position where the height of said liquid over said dispensing outlet remains essentially constant with the liquid height prior to application of said countertorque; and

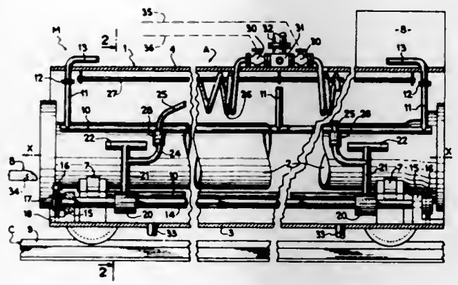
c. dispensing a substantially constant flow of liquid under the influence of gravity from said dispensing outlet.

4,073,335

COOLING DEVICE FOR IRON PIPE CENTRIFUGAL CASTING MACHINE

Pierre Henri Marie Fort, Nancy, and Michel Pierrel, Pont-A-Mousson, both of France, assignors to Pont-A-Mousson S.A., Nancy, France

Continuation of Ser. No. 564,190, April 1, 1975, abandoned. This application Sept. 27, 1976, Ser. No. 727,098
Claims priority, application France, Apr. 1, 1974, 74 11569
Int. Cl.² B22D *13/02*
U.S. Cl. 164—154 **12 Claims**



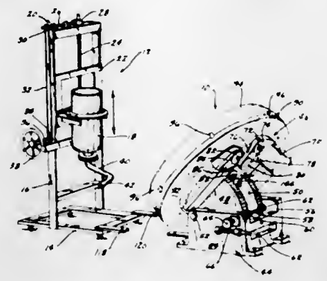
10. A structure comprising in combination a machine for centrifugally casting iron pipes and comprising a rotary mould having an axis of rotation, means for pouring iron into the mould which pouring is achieved by a relative axial movement between said pouring means and the mould, a device for cooling the mould, said device comprising in combination a first cooling water supply pipe, a first valve in the first cooling water supply pipe, cooling water spraying systems connected to the first cooling water supply pipe and extending throughout a length of the mould required to be cooled and capable of supplying cooling water normally required for cooling the mould and an additional cooling water spraying means for spraying any additional localized cooling water found to be required to achieve a cooling of the mould which is substantially uniform throughout said length of the mould, said additional cooling water spraying means comprising a guide bar parallel to the axis of the mould, a slide slidably mounted on the bar to be movable independently of said relative movement between the mould and pouring means merely for purposes of adjustment of the slide to a desired fixed position relative to the mould axially of the mould which position remains fixed for each and during each cooling operation, and a second cooling water supply pipe, a second valve in the second cooling water supply pipe, and a local cooling water spraying element carried by the slide and connected to the second cooling water supply pipe and having a length less than said length of mould required to be cooled so as to spray said additional cooling water onto only a selected fixed fractional part of said length of the mould, a support movable with respect to the mould, a photoelectric cell which is responsive to infrared radiations and carried by the support and directed toward the surface of the mould, said second valve means associated with the additional water spraying element for controlling the supply of water to the additional water spraying element also associated with the photoelectric cell to be controlled in accordance with the infrared radiations detected by the photoelectric cell, the second valve being operative independently of the first valve.

4,073,336

CENTRIFUGAL CASTING MACHINE

Edward A. Roe, R.R. No. 6, Box 26, Omaha, Nebr. 68112, and Harold F. Schulte, 3009 Cass St., Omaha, Nebr. 68131

Filed Sept. 30, 1974, Ser. No. 510,372
Int. Cl.² B22D *13/04*
U.S. Cl. 164—286 **5 Claims**



1. A centrifugal casting machine, comprising,

a support means,

a mold means rotatably mounted on said support means,

power means for rotating said mold means,

means operatively pivotally connecting said mold means to said support means about a horizontal axis, whereby the rotational attitude of said mold means may be selectively varied relative to said support means,

a non-rotatable housing means pivotally secured to said support means,

said mold means comprising a rotatable mold member rotatably mounted within said housing means,

a drive shaft secured to said mold member and extending through said housing means,

said power means being connected to said drive shaft for rotating said mold member relative to said housing means, said drive shaft having a passageway means formed therein extending therethrough for supplying a gaseous material to the interior of said mold member,

said drive shaft having first and second ends, said first end being centrally disposed within said mold member, said second end being disposed outwardly of said housing means,

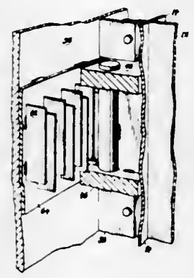
and a gas deflector plate mounted on said first end of said drive shaft.

4,073,337

ROTARY REGENERATOR PIN RACK SEAL

Richard Franklin Stockman, Friendship, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed July 12, 1976, Ser. No. 704,220
Int. Cl.² F28D *19/00*
U.S. Cl. 165—9 **5 Claims**



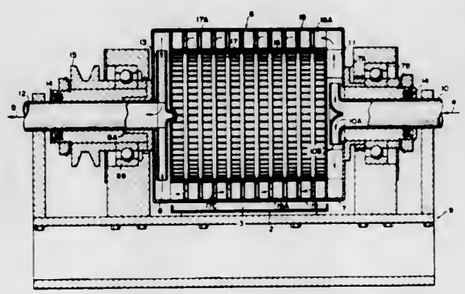
1. A regenerative heat exchange apparatus having a central rotor post, a concentric rotor including a mass of heat absorbent material carried by the rotor post, housing means surrounding the rotor having inlet and outlet ports at opposite ends thereof for a low pressure heating fluid and a high pressure fluid to be heated, bearing means supporting the rotor within the housing for rotation about its axis, sector plates adjacent ends of the rotor lying between ports in the housing to separate the several fluids, axial sealing plates extending axially through the space between the rotor and the rotor housing between ends of the sector plates, an annular drive rack extending circumferentially around the rotor, means engaging the annular drive rack to rotate the rotor about its axis, and baffle means intermediate the axial sealing plates and the annular drive rack adapted to preclude fluid flow therebetween, said baffle means comprising a series of axially disposed plate members carried by the axial sealing means to confront the annular drive rack and restrain fluid flow past the irregular surface of the drive rack that would have a sandblasting effect upon the adjacent parts of the rotor and the rotor housing.

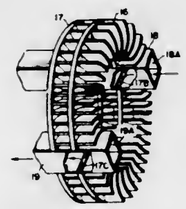
4,073,338

HEAT EXCHANGERS

Kenji Fujikake; Isamu Amaki, and Masatoshi Suzuki, all of Nagoya, Japan, assignors to Toyota Chuo Kenkyusho, Nagoya, Japan

Continuation of Ser. No. 482,464, June 24, 1974, abandoned. This application July 27, 1976, Ser. No. 709,174
Claims priority, application Japan, June 26, 1973, 48-72429
Int. Cl.² F28D *11/60;* A01F *12/44*
U.S. Cl. 165—86 **32 Claims**





1. A heat exchanger having a rotor for generating a stream of a first working fluid and for effecting a heat exchange between said first working fluid being drawn across the exterior surfaces of the rotor and a second working fluid flowing within said rotor, said rotor being rotatably supported in said stream of first working fluid and comprising:

a plurality of hollow annular passage means coaxially disposed in planes extending perpendicularly to the rotor axis and spaced in predetermined intervals therealong, said hollow annular passage means for containing said second working fluid during heat exchange;

a plurality of solid plates secured between said annular passage means and positioned coaxially with respect to said rotor to form plate surfaces extending parallel to the longitudinal axis of the rotor in order to generate said stream of said first working fluid and to provide a princi-

pal means for said heat exchange between said first and second working fluids;

at least one distribution-suction passage means having a first opening at one end thereof and at least one concentration-delivery passage means having a second opening at one end thereof, said distribution-suction and concentration delivery passage means being secured to said annular passage means and positioned oppositely to each other with respect to the longitudinal axis of said rotor and substantially parallel with said axis, and being intercommunicated with said

hollow annular passage means for forming a system of internal ducts in said rotor; and

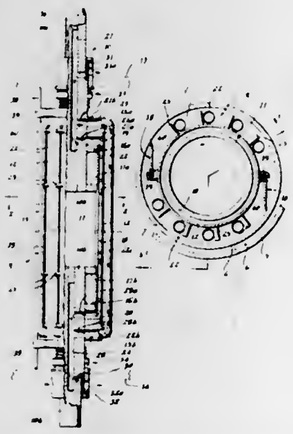
port means connected to said openings of said distribution-suction passage means and concentration-delivery passage means for sucking said second working fluid thereinto and delivering said second working fluid therefrom through each of said openings thereof so that said second working fluid is sucked into said distribution-suction passage means through said port means and flows through said plurality of hollow annular passage means, said concentration delivery passage means and said port means, and so that the heat exchange between the stream of said first working fluid, which stream is generated by said plurality of plates, and said second working fluid is accomplished by said plurality of solid plates.

4,073,339

SWEPT SURFACE HEAT EXCHANGER

James Alvin D'Orsay, Georgetown, Maine, assignor to The De Laval Separator Company, Poughkeepsie, N.Y.

Filed Dec. 6, 1976, Ser. No. 747,912
Int. Cl.² F28F 7/00
U.S. Cl. 165—94 **4 Claims**



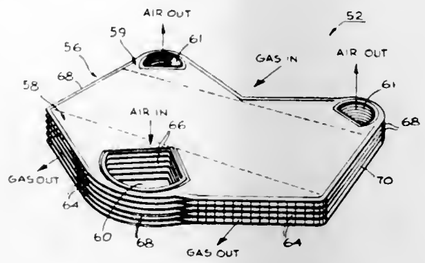
1. In a swept surface heat exchanger having a pair of concentric cylinders forming between them a first passage for throughflow of a first heat exchange medium, the inner cylinder defining a treatment chamber for throughflow of a product to be heated or cooled by said medium, a rotor comprising a shaft mounted for rotation in said chamber substantially on the axis of said inner cylinder, the shaft having a cylindrical outer surface and forming a second passage for throughflow of a second heat exchange medium to heat or cool said outer surface, a plurality of tubes each having opposite ends secured to the shaft and each having an intermediate portion extending outside the shaft in spaced relation to said outer surface thereof, one end portion of the shaft having a medium inlet leading via the shaft to adjacent ends of said second passage and said tubes, the other end portion of the shaft having a medium outlet to which adjacent ends of said second passage and said tubes lead via the shaft, scraper means protruding from the rotor between adjacent tubes and operable to sweep the inner surface of said inner cylinder, and stationary means surrounding said first end portion of the shaft in sealed relation thereto for supplying said second medium to said medium inlet.

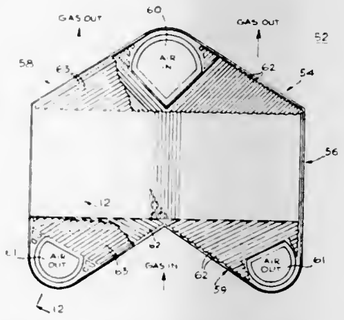
4,073,340

FORMED PLATE TYPE HEAT EXCHANGER

Kenneth O. Parker, Rolling Hills Estates, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Continuation of Ser. No. 351,423, April 16, 1973, abandoned. This application Feb. 18, 1975, Ser. No. 550,895
Int. Cl.² F28F 3/00
U.S. Cl. 165—166 **17 Claims**





1. Heat exchanger apparatus of the counter-flow type having inlet and outlet manifolds integrally combined with the heat exchanger core comprising:

a plurality of formed thin plates each having an offset flange extending about its periphery, each having a central section between opposed end sections, each of said end sections having at least one completely enclosed opening therein with an offset collar portion extending at least partially around said opening, the collar portions of each plate constituting segments of the respective inlet and outlet manifolds;

first and second pluralities of fin elements interspersed with the plates;

the plates being brazed together with interspersed ones of said first fin elements by pairs in back-to-back abutting and sealed relationship at the peripheral flanges thereof to define a first plurality of contained passages for the flow of a first fluid across the central section in a first direction between the inlet and outlet manifold segments;

said pairs of plates being stacked with interspersed ones of said second fin elements in a sandwich configuration with the collar portions of one plate of a pair being joined by brazing in sealing relationship to the corresponding collar portions of an adjacent plate of an adjacent pair to define a second plurality of passages for the flow of a second fluid around said end section openings and across said center section in a second direction generally parallel but opposed to said first direction in layers interspersed with the layers of said first fluid passages, the collar portions of the succession of stacked plate pairs defining integral first fluid manifolds which consist of said manifold segments;

adjoining surfaces of said first and second pluralities of fin elements and said plates being brazed together to establish, with said brazed-together collar portions and peripheral flanges, a rigid, self-contained structure for withstanding internal pressurization without deformation;

said collar portions being configured to define first fluid openings communicating between said manifold segments and the first fluid passages through said center section in each of said joined plate pairs and to prevent communication between said manifold segments and said second fluid passages; and

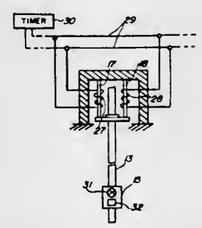
a housing extending about the heat exchanger core for directing the second fluid to and from the second fluid passages at the end portions of the stacked plates.

4,073,341

ACOUSTICALLY CONTROLLED SUBSURFACE SAFETY VALVE SYSTEM

William H. Parker, Hurst, Tex., assignor to Del Norte Technology, Inc., Euless, Tex.

Continuation-in-part of Ser. No. 294,289, Oct. 2, 1972, Pat. No. 3,961,308, and Ser. No. 629,515, Nov. 6, 1975. This application May 3, 1976, Ser. No. 682,196
Int. Cl.² E21B 43/00, 33/03
U.S. Cl. 166—65 R **15 Claims**



1. A system for communicating into deep wells comprising a tubing extending from a point near the surface of the earth downwardly to remote points, signaling means attached to said tubing near the upper end thereof and operating upon the upper portion of said tubing for selectively exciting with sonic energy the tubing wall which acts as a sonic energy transmission line extending from said exciter means to said remote point, remotely controlled means near the remote point for performing at least one desired function, detection means associated with the tubing for detecting said sonic energy when transmitted through the transmission line formed along the length of the tubing wall, means responsive to said detection means for converting said sonic energy transmitted through said line into mechanically effective signals for controlling said remotely controlled means, and means for applying said converted signals to said remotely controlled means.

4,073,342

SAND CONSOLIDATION METHOD

Bobby G. Harnsberger, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 23, 1976, Ser. No. 753,761
Int. Cl.² E21B 33/138, 43/02
U.S. Cl. 166—295 **10 Claims**

1. A method of treating an oil-containing incompetent formation penetrated by a well bore to prevent the movement of unconsolidated sand particles from said incompetent formation to the well bore as the oil is recovered from said formation which comprises the sequential steps of:

1. Injecting a liquid hydrocarbon containing a minor amount of a water wetting nonionic surface active agent and from about 0.5 to about 3% of water into said formation to remove any excess water present therein;
2. Injecting a first treating solution composed of from about 3 to 20% by volume of a inorganic silicon halide and 80 to 97% by volume of a hydrocarbon solvent into the sand formation being consolidated;
3. Injecting a liquid hydrocarbon into the sand formation to effect removal of any excess inorganic silicon halide from the area being consolidated;
4. Injecting a second treating solution composed of from about 3 to about 20% by volume of furfuryl alcohol and from about 80 to 97% of a high in aromatics (80% or more) petroleum fraction into said consolidation area and permitting said second treating solution to contact said first treating solution;
5. Shutting in said well for a period sufficient to effect polymerization and curing of the polymerizable components of said first and second treating solutions, and formation of an oil permeable but sand impermeable barrier therein.

4,073,343

SAND CONSOLIDATION METHOD

Bobby G. Harnsberger, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 23, 1976, Ser. No. 753,760
Int. Cl.² E21B 33/138, 43/02
U.S. Cl. 166—295 **10 Claims**

1. A method of treating an oil-containing incompetent formation penetrated by a well bore to prevent the movement of unconsolidated sand particles from said incompetent formation to the well bore as the oil is recovered from said formation which comprises injecting into said incompetent formation a treating solution consisting essentially of, on a volume basis, 10 to 25% of furfuryl alcohol, 1 to 4% of a nonionic dispersing surfactant, 1 to 4% of water, 0.5 to 1.5% of a silane bonding agent, 1 to 5% of a furfuryl alcohol polymerization catalyst, 5 to 15% of a low-in-aromatics (about 20% maximum) petroleum distillate fraction, and from about 47 to about 76% of a high-in-aromatics (above about 80%) petroleum fraction, polymerizing the furfuryl alcohol component, permitting the polymerized alcohol to set and form a fluid permeable sand, and recovering oil from said formation through said formed consolidated sand.

4,073,344

METHODS FOR TREATING SUBTERRANEAN FORMATIONS

Bobby E. Hall, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Division of Ser. No. 533,375, Dec. 16, 1974. This application Feb. 28, 1977, Ser. No. 772,706
Int. Cl.² E21B 43/27
U.S. Cl. 166—307 **6 Claims**

1. A method of improving the permeability of a siliceous formation comprising the steps of:

preflushing said formation with an aqueous hydrochloric acid solution containing at least one additive for imparting desired properties to said solution and to said formation and containing a chemical having the property of reducing the adsorption of said additive on silicate surfaces present in said formation, said chemical being present in said aqueous hydrochloric acid solution in an amount in the range of from about 1% to about 90% by volume of said acid solution-chemical mixture and having the general formula:

$$C_nH_{2n+1}(OC_2H_4)_xOH$$

wherein:

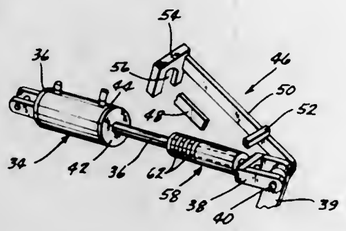
n has a value in the range of from about 4 to about 12;

x has a value in the range of from about 1 to about 10;

and the total number of carbon atoms in said chemical is greater than 12;

treating said formation with an aqueous hydrochloric-hydrofluoric acid treating solution capable of dissolving mineral constituents contained in said formation; and
recovering said preflush and treating solutions from said formation.

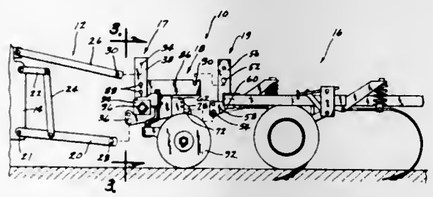
4,073,345
DISC HARROW WHEEL LOCK-DOWN WITH DEPTH CONTROL ADJUSTMENT STRUCTURE
Maurice E. Miller, Stratton, Nebr. 69043
Filed Feb. 14, 1977, Ser. No. 768,202
Int. Cl.² A01B *63/22*
U.S. Cl. 172—413 **9 Claims**



9. In combination,
a frame means having rearward and forward ends,
means on the forward end of said frame means for connection to a prime mover,
a wheel means operatively secured to said frame means and vertically movable with respect thereto so that said frame means may be moved between first and second positions,
said wheel means, when in its said first position, causing said frame means to be moved upwardly relative to the ground,
said wheel means, when in its said second position, permitting said frame means to move downwardly towards the ground,
a hydraulic cylinder comprising a cylinder body having a cylinder rod movably extending therefrom,
said hydraulic cylinder being secured to said frame means and said wheel means for moving said wheel means between the said first and second positions,
said cylinder rod being in an extended position when said wheel means is in its said first position,
and movable lock means operatively pivotally connected to the outer end of said cylinder rod and movable between first and second positions,
a spacer assembly selectively longitudinally movably mounted on said cylinder rod,
said lock means being in operative engagement with said spacer assembly when said spacer assembly is adjacent said cylinder body and said lock means is in its first position to prevent said cylinder rod from slidably moving inwardly into said cylinder body,
said lock means permitting said cylinder rod to move inwardly into said cylinder body when said spacer assembly is not positioned adjacent said cylinder body.

4,073,346
COMBINATION TRACTOR AND FARM IMPLEMENT HITCH MEANS
Roger L. Groth, Battle Creek; Randall L. Harvey, Davenport; Thomas R. Lauer, Iowa City, all of Iowa, and Morris L. Rounebaum, Bismarck, N. Dak., assignors to Iowa State Univ. Research Foundation, Inc., Ames, Iowa
Filed June 4, 1976, Ser. No. 692,934
Int. Cl.² B60D *1/00*; A01B *59/043*
U.S. Cl. 172—439 **2 Claims**

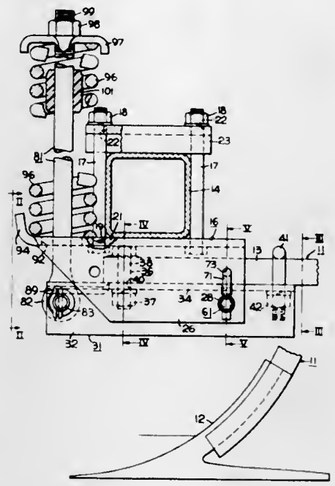
1. In a tractor and farm implement hitch means including a first implement connectible in a three-point hitch connection in a trailing relation with a tractor having a three-point hitch means and connectible in a three-point hitch connection in a towing relation with a second implement having front hitch means including a pair of transversely spaced hitch pins, the combination comprising:
(a) said tractor three-point hitch means which includes:
(1) a center arm, and
(2) a pair of transversely spaced lift arms pivotally connected to the tractor and extended rearwardly therefrom, and
(b) said first implement which includes:
(1) an elongated transverse tool bar,
(2) a rear three-point hitch means comprising:
(a) a center link operatively connected to the tool bar and extended rearwardly thereof,
(b) a connector at the rear end of the center link connectible with the front hitch means of the second implement,
(c) a pair of draft links rigidly secured to the tool bar and extended rearwardly therefrom at positions below and arranged at opposite sides of the center link,
(d) a hook connector at the rear end of each draft link,



each hook connector having an upwardly facing open side for receiving therein one of the transversely extended hitch pins of the second implement, and
(e) a lock member releasably positionable over said open side of each hook connector to prevent the removal of said hitch pin therefrom, and
(3) a front three-point hitch means mounted on the tool bar and attachable to the three-point hitch means on the tractor, said front three-point hitch means having a pair of transversely spaced upstanding mast plates on the tool bar and an upper hitch pin extended between the upper ends of the mast plates for attachment to the center arm of the tractor three-point hitch means, and said center link of the rear three-point hitch means is rigidly connected to the mast plates and extended rearwardly therefrom, and
(4) the first implement, when alone connected to the three-point hitch means of a tractor, being movable therewith and towed thereby, and when the front three-point hitch means of the second implement is connected to the rear three-point hitch means of the first implement, both of said implements being movable as a unit with and towed by the hitch means of the tractor.

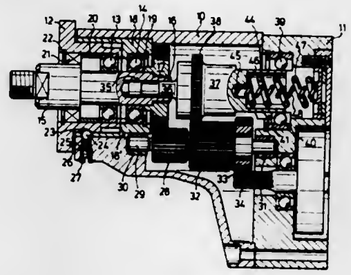
4,073,347
SPRING-LOADED CLAMP FOR AN EARTH-WORKING TOOL SHANK
Marvin J. Philpot, New Berlin, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.
Filed Dec. 6, 1976, Ser. No. 747,693
Int. Cl.² A01B *19/02*
U.S. Cl. 172—710 **19 Claims**

13. In a spring-loaded clamp for the shank of an earth-working tool having a frame, the combination comprising:
a clamping member releasably secured to said frame including a pair of laterally spaced vertical walls having aligned openings,
a rockable member releasably secured to the upper end of said shank including a pair of laterally spaced vertical walls which are in side-by-side relation with said vertical walls on said clamping member and present aligned openings,
a bushing having opposite ends in the aligned openings of only one of said members, said ends of said bushing being in axially confronting relation to said walls of said other member, and said bushing being nonrotatable relative to said one member,



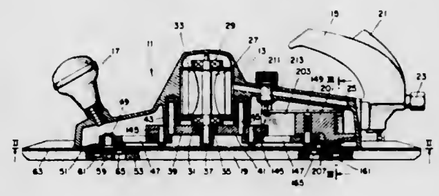
a pin extending through said bushing and having its opposite ends in the aligned openings of the other of said members, said pin being nonrotatable relative to said other member, and
spring means operatively interposed between said clamping and rockable members biasing said shank toward an earth-working position.

4,073,348
IMPACT DRILLING TOOL
Heribert Schramm, Stuttgart, and Steffen Wuensch, Dettenhausen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany
Filed July 13, 1976, Ser. No. 704,783
Claims priority, application Germany, July 25, 1975, 2533284
Int. Cl.² E02D *7/02*
U.S. Cl. 173—48 **20 Claims**



1. A power drill tool comprising in combination, a housing; a spindle element mounted in said housing for rotation about an axis and for displacement in an axial direction; drive means for rotating said spindle element; and means for subjecting said spindle element to axially oriented impacts, including an impact element mounted in said housing at least for reciprocation in direction of said axis, means for reciprocating said impact element driven by said driven means, a blind axially oriented bore in said spindle element and having a first impact surface, and an axially oriented extension on said impact element and received in said blind bore of said spindle element and having a second impact surface which impacts said first impact surface upon axial displacement of said impact element in direction towards said spindle element.

4,073,349
BALANCED RECIPROCATING TOOL DRIVEN BY ROTARY MOTION
Kunio A. Sumida, Los Angeles, Calif., assignor to Robert H. Siegel and Maurice Albin, Chicago, Ill., as coexecutors of the estate of Leonard V. Shapiro, deceased
Continuation of Ser. No. 461,519, April 17, 1974, abandoned, which is a continuation-in-part of Ser. No. 261,096, June 8, 1972, abandoned. This application Jan. 8, 1976, Ser. No. 647,338
Int. Cl.² B23B *17/00*
U.S. Cl. 173—59 **25 Claims**



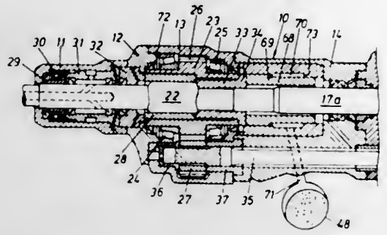
1. A reciprocatable hand tool machine comprising
a housing,
a rotary motor mounted in said housing,
means for actuating said rotary motor,
first drive means in said housing, said first drive means including a first gear driven by said rotary motor,
second drive means in said housing, said second drive means including a second gear driven by said first gear in a first rotary direction and a third gear driven by said first gear in the same rotary direction,
a work-operating tool mounted on said housing for axial movement relative to said housing,
reciprocatable means mounted in said housing for axial reciprocation relative to said housing, the reciprocatable means being balanced relative to said work-operating tool and
link means interconnecting said second drive means with said tool and with said reciprocatable means for reciprocating said tool and said reciprocatable means in opposite directions, said link means including a first eccentric having a first end mounted on said second gear for rotation with said gear and having a second end mechanically coupled to said work-operating tool and further including a second eccentric having a first end mounted on said third gear for rotation with said third gear and having a second end mechanically coupled to said reciprocatable means, one of the eccentrics being angularly offset through a particular distance relative to the other eccentric during the reciprocation of the work-operating tool and the reciprocatable means in opposite directions.

4,073,350

DEVICE FOR DAMPING THE RECOIL OF A WORK TOOL CONNECTED TO A PERCUSSION TOOL

Åke Torsten Eklöf, Skarholmen; Per Tage Allan Fengsborn, Amal, and Gunnar Vigg Riss Romell, Djursholm, all of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Mar. 8, 1976, Ser. No. 665,056
Claims priority, application Sweden, Mar. 18, 1975, 7503097
Int. Cl.² B25D *9/00*
U.S. Cl. 173—139 14 Claims



1. A recoil damping device for a percussion tool which includes a work tool (22), a machine housing (10) coupled to said work tool and adapted to apply a feeding force forwardly to said work tool in a working direction, a hammer piston (17) reciprocating in the machine housing and adapted to deliver impact energy to said work tool, said work tool recoiling after application of impacts thereto, said recoil damping device damping the recoil of said work tool and comprising:

a retard chamber (70) in said machine housing, said machine housing having a surface (73) defining the rearward portion of said retard chamber,

a pressurized hydraulic fluid in said retard chamber,

a retard piston (68) connected to said work tool said retard piston (68) being normally during operation a predetermined forward position which is remote from said surface (73) of said retard chamber (70),

said retard piston (68) having a piston surface (69) which confines axially the retard chamber (70) towards the work tool, and

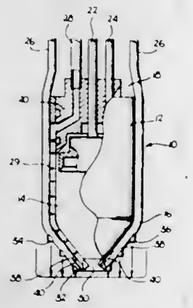
means for maintaining hydraulic pressure in said retard chamber during operation to maintain said retard piston (68) and said work tool out of axial contact rearwardly with said surface (73) and said machine housing.

4,073,351

BURNERS FOR FLAME JET DRILL

Werner Baum, Canoga Park, Calif., assignor to Pei, Inc., Malibu, Calif.

Filed June 10, 1976, Ser. No. 694,592
Int. Cl.² E21B *7/14*
U.S. Cl. 175—14 11 Claims



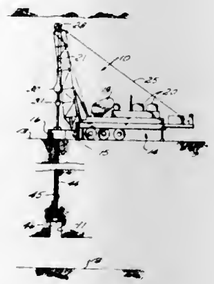
1. A rotatably mounted drill bit engine for liquid fuels having particular utility in a flame jet drill comprising an axially elongated body with a combustion chamber disposed therein, at least one flame jet nozzle opening through said body adjacent the bottom thereof so as to communicate with said combustion chamber, and a first set of liquid jet nozzles disposed on said engine adjacent said bottom thereof, said flame jet nozzle and said first set of liquid jet nozzles mounted substantially parallel to the axis of said body, said first set of liquid jet nozzles configured to direct a pulsating stream of liquid jet projectiles at high velocities such that as said engine is rotated, the area adjacent the bottom of said engine is subjected to flame jets and pulses of liquid projectiles at predetermined intervals whereby spalling of rock and the like is encouraged.

4,073,352

RAISE BORE DRILLING MACHINE

Gene E. Underwood, Casper, Wyo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Mar. 3, 1976, Ser. No. 663,546
Int. Cl.² E21C *23/00*
U.S. Cl. 175—53 77 Claims



1. In a method of raise bore drilling in which a drill string extends in a pilot hole between a raise bore drilling bit at the lower end of the pilot hole and a drill string drive means above and adjacent the upper end of the pilot hole, the drill string drive means including means operable for applying torque and axial tension to the drill string while affording axial motion of the drill string, the improvement comprising using a drill string which is non-round, except at spaced periodic locations along the elongate extent of the drill string, for transmitting torque and axial tension from the drive means to the bit.

4,073,353

SONIC LARGE BORE EARTH AUGER

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406

Filed Mar. 22, 1976, Ser. No. 669,385
Int. Cl.² E21B *7/04*
U.S. Cl. 175—56 5 Claims

1. In an earth hole boring auger having cutter blade means and drive means for driving said cutter blade means rotatably around a centrally positioned axis, the improvement wherein means are provided to sonically drive said blade means unidirectionally with arcuate motion along the extended cutting edge of said blade means comprising:

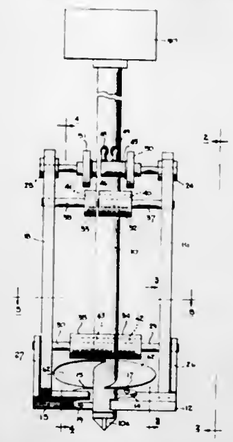
resonant bar means,

means for supporting the resonant bar means on said drive means for rotation therewith, said resonant bar means being supported with a vibratory energy delivering portion thereof in proximity to a face portion of said cutter blade means located radially out from said centrally positioned axis and opposite to the cutting edge thereof,

a mechanical oscillator having an orbiting rotor connected to said resonant bar means, and

drive means for rotatably driving the rotor of said oscillator means so as to set up resonant standing wave vibrations of the resonant bar means,

whereby resonant energy is transferred from said bar means to said cutter blade means in unidirectional torque pulses increasing in vibrational amplitude radially from said axis so as to vibrationally drive the cutting edge of said cutter means against the earthen material with arcuate vibration



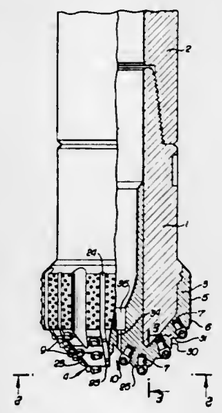
which provides a shearing type of vibratory turning action with resonant pulverizing force as the cutter blade drive means simultaneously drives the cutter blade means rotatably.

4,073,354

EARTH-BORING DRILL BITS

David S. Rowley; Bruce H. Walker, both of Salt Lake City; Coy M. Fielder, Granger, all of Utah, and Heino J. Rohde, Nienhagen, Germany, assignors to Christensen, Inc., Salt Lake City, Utah

Filed Nov. 26, 1976, Ser. No. 745,087
Int. Cl.² E21B *9/36, 13/01*
U.S. Cl. 175—329 32 Claims



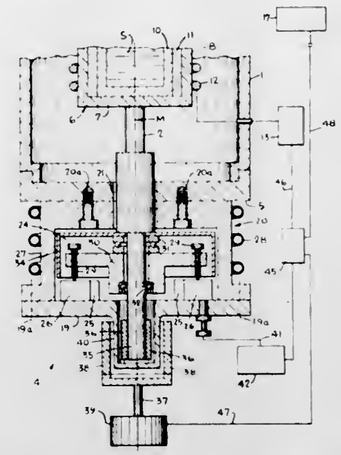
1. An earth-boring bit comprising a metallic shank, having a tubular bore, one end of said shank coated with a hard material bonded to said end and forming a face of said bit, circumambient steps extending across the face of said bit from the central portion of the bit to adjacent the gage of the bit, said steps including a rise and a land, sockets in said hard material of said face positioned between a rise and a land of said steps, preform cutters mounted in said sockets in a plurality of longitudinal arrays spaced from each other about said face, each of said cutters including a plurality of abrasive particles bonded into a preform, said preform cutters formed with a cutting face and back.

4,073,355

CRUCIBLE

Walter Schmidt, and Walter Stählin, both of Schaffhausen, Switzerland, assignors to Prolizenz AG., Chur, Switzerland

Filed Feb. 26, 1976, Ser. No. 661,438
Claims priority, application Switzerland, Apr. 14, 1975, 5461/75
Int. Cl.² G01G *17/00*
U.S. Cl. 177—83 20 Claims



1. A weighing device, particularly for the automatic regulation of a crystal-growing operation, comprising

an upright shaft;

journalling means journalling said shaft for rotation;

load supporting means carried by said shaft and adapted for supporting a load in form of a melt to be weighed so that the weight of said load acts lengthwise of and is borne by said shaft;

weight-responsive signal generating means comprising at least one cell which produces an electric current by semiconductor deformation, of a magnitude which varies as a function of the degree of mechanical compression exerted by the load to which said cell is subjected;

mounting means suspending said shaft on said signal generating means so that the weight of said load is transmitted to said cell of said signal generating means; and

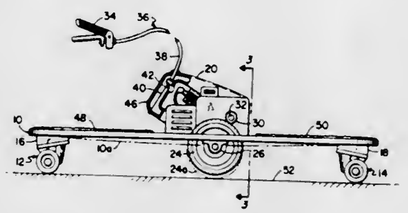
drive means for rotating said shaft without physically engaging the same and without deteriorating or physically influencing the axial freedom of motion of said shaft.

4,073,356

MOTORIZED SKATEBOARD

Dennis Roman Schlicht, 4231 ½ Ocean Blvd., San Diego, Calif. 92109

Filed Jan. 24, 1977, Ser. No. 761,682
Int. Cl.² A63C *17/12*
U.S. Cl. 180—1 G 8 Claims



1. In a motorized skateboard, comprising;

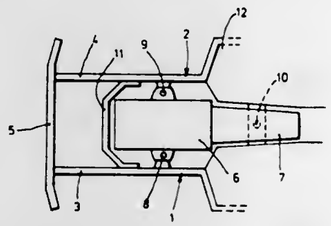
a resilient elongated board for supporting a person riding on the board;
a pair of trucks attached to the board under opposite end portions of the board for supporting the board above the ground; and
a motor supported on the board; wherein the improvement comprises:
a fifth wheel drive means attached to the board and coupled to the motor for driving the board in response to operation of the motor;
the fifth wheel drive means including a drive wheel;
said drive wheel being attached to the board near the longitudinal center of the board, and having a diameter of such dimension in relation to the height of the board above the ground and of the trucks and in relation to resiliency of the board and the height of its attachment to the board that the drive wheel does not contact the ground to drive the board unless the weight of a person on the board is distributed toward the longitudinal center of the board so as to flex the longitudinal center of the board toward the ground.

4,073,357

VEHICLE WITH ENERGY ABSORBING CHASSIS AND ENGINE RESTRAINT

Hermann Danckert, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Germany

Filed Jan. 30, 1976, Ser. No. 654,055
Claims priority, application Germany, Feb. 14, 1975, 2506303
Int. Cl.² B60K 5/12
U.S. Cl. 180—64 R **2 Claims**



1. A motor vehicle comprising:
a chassis having frontal energy absorbing members;
an engine unit;
vibration-dampening, releasable mounts for attaching said engine unit to said chassis behind said energy absorbing members;
and a rigid transverse chassis member arranged behind said energy absorbing members and a short distance in front of said engine unit to enter into force transmitting contact with said engine unit only after release of said mounts and commencement of motion of said engine unit relative to the chassis in the direction of vehicle travel, thereby restraining the forward motion of said engine unit with respect to said chassis on the occurrence of a frontal collision.

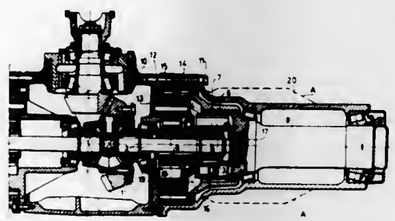
4,073,358

VEHICLE DRIVING GEAR SYSTEM

Gábor Szalai, Gyor, Hungary, assignor to Magyar Vagon- es Gepgyar, Gyor, Hungary

Filed Nov. 8, 1976, Ser. No. 740,346
Claims priority, application Hungary, Nov. 3, 1975, GA 2727
Int. Cl.² B62M 11/16, 11/18
U.S. Cl. 180—75 **4 Claims**

1. A driving gear system, suitable for use in connection with a vehicle having a three speed transmission and for use in connection with a high-power vehicle having an adjustable track width;
said vehicle including a differential gear system having first bearing means;
said driving gear system comprising, in combination:
a bridge housing mounted on said vehicle;
a first planetary gear system disposed in said bridge housing and including:
a first sun wheel; a plurality of first planet wheels, each having a first radius; and first supporting means operable for supporting said first planet wheels;
a second planetary gear system disposed in said bridge housing and including:
a second sun wheel; a plurality of second planet wheels, each having a second radius; and second supporting means operable for supporting said second planet wheels and mounted for coaxial rotation with respect to said second sun wheel;



said second radii being smaller than said first radii;
said first bearing means being disposed in said first supporting means;
housing shells connected to said bridge housing;
connecting means operable for connecting said housing shells to a central portion of said bridge housing and for connecting said first supporting means to said bridge housing;
said first sun wheel being mounted on a portion of said second supporting means for rotation therewith; and
second bearing means disposed between said first and second supporting means and operable to allow the rotation of said second supporting means relative to said first supporting means.

4,073,359

BRAKING SYSTEM FOR AVOIDING A COLLISION OF A VEHICLE WITH AN OBSTACLE THEREOF

Norio Fujiki, Yokohama, and Hiroshi Endo, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Dec. 6, 1976, Ser. No. 747,475
Claims priority, application Japan, Dec. 8, 1975, 50-144954
Int. Cl.² B60T 7/12
U.S. Cl. 180—98 **5 Claims**

1. A braking system for avoiding a collision of a travelling vehicle with an obstacle ahead thereof, comprising:
radar means mounted in use on a vehicle for emitting a radar signal forwardly;
a radar sensor mounted on the vehicle for producing a first and a second signal, the first signal representing a distance between the vehicle and an obstacle, and the second signal representing the relative velocity between the vehicle and the obstacle;
a vehicle velocity sensor mounted on the vehicle, sensing the vehicle velocity to produce a third signal representing the same;
first means connected to the radar sensor for receiving the first and the second signal therefrom, generating, based on the received signals, a sixth signal if the following formula is satisfied,

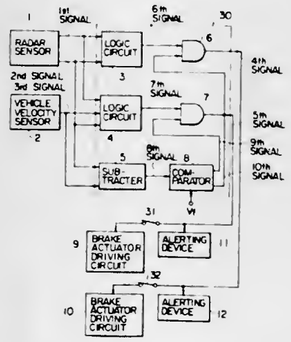
$$V_r^2/2\alpha \geqq R$$

where

V_r: is the relative velocity
α: is the deceleration of the vehicle
R: is the distance between the vehicle and the obstacle;
second means connected to both the radar sensor and the vehicle velocity sensor for receiving the first, the second, and the third signal therefrom, for generating, based on the received signals, a seventh signal if the following formula is satisfied,

$$V_r(2V_a - V_r)/2\alpha \geqq R$$

where
V_a: the vehicle velocity;
third means connected to both the radar sensor and the vehicle velocity sensor for receiving the second and the third signals therefrom, for generating, based on the received signals, an eighth signal representing the difference between the vehicle velocity and the relative velocity;



a comparator connected to the third means for receiving the eighth signal therefrom, generating a ninth signal if the magnitude of the eighth signal is greater than that of the ninth signal, and generating a tenth signal if the magnitude of the eighth signal is smaller than that of the ninth signal;
a first AND gate connected to both the first means and the comparator for receiving the sixth and the tenth signal therefrom, for generating a fourth signal if the sixth signal coincides with the tenth signal, the fourth signal representing a collision imminence with a stationary obstacle;
a second AND gate connected to the second means and the comparator for receiving the seventh and the ninth signals therefrom, for generating a fifth signal if the seventh signal coincides with the ninth signal, the fifth signal representing a collision imminence with a moving obstacle; and
two brake actuator driving circuits connected to the collision imminence computing unit, responding to the fourth and the fifth signals, respectively.

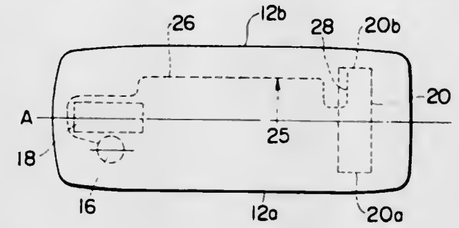
4,073,360

ARRANGEMENT OF FUEL SYSTEM IN MOTOR VEHICLE

Kuniyuki Watanabe, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Oct. 19, 1976, Ser. No. 733,703
Claims priority, application Japan, Oct. 20, 1975, 50-142655[U]
Int. Cl.² B60R 27/00; B65D 25/00
U.S. Cl. 180—104 **4 Claims**

1. In a motor vehicle having an elongated vehicle body having first and second lateral walls and a fuel system including a carburetor disposed in a position laterally deviated from a vehicle longitudinal centerline in the direction toward the first lateral wall, a fuel tank extending laterally of the vehicle body to cross the vehicle longitudinal centerline and terminating at its first and second side walls which are respectively directed toward the first and second lateral walls and a fuel return line establishing communication between the carburetor



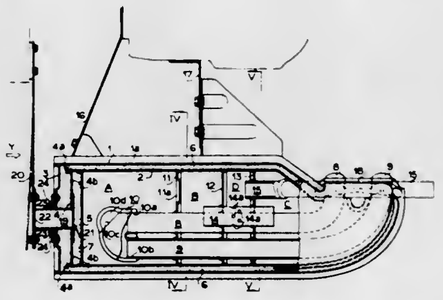
and the fuel tank, the improvement comprising said fuel return line arranged to communicate with the interior of said fuel tank in close proximity to said second side wall.

4,073,361

MUFFLER FOR MOTOR VEHICLES

Kozo Murota, Isezaki; Rempei Matsumoto, Ohta; Toru Yasuma, Ohta; Mamoru Morinaga, Ohta; Shigeo Tajima, Ohta; Masayuki Nakamura, Ohta, and Akira Sakaguchi, Ohta, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 20, 1975, Ser. No. 633,916
Claims priority, application Japan, Nov. 30, 1974, 49-146160[U]
Int. Cl.² F01N 1/08, 7/16, 1/10
U.S. Cl. 181—228 **11 Claims**

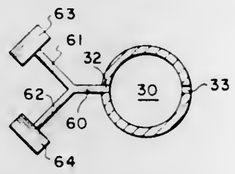


1. A muffler for use in an exhaust system of an internal combustion engine for a motor vehicle, comprising an inner shell, a heat insulating layer covering said inner shell, an outer shell covering said heat insulating layer, wall means for partitioning the space in said inner shell into at least two compartments including a first compartment and a second compartment, two exhaust pipes inserted into said muffler from an end thereof, said exhaust pipes passing through said second compartment, being inserted into and opening in said first compartment so as to discharge engine exhaust gases thereinto, passage means provided in said wall means for communicating said compartments with each other, respectively, said compartments and said passage means comprising expansion chambers and communicating openings to provide noise silencing operation, and a tail pipe communicating with a last of said at least two compartments in said inner shell and having an outlet for discharging the exhaust gases into the atmosphere.

4,073,362
CHARGING AND IGNITION SYSTEM FOR GAS EXPLODERS

Tom P. Airhart, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 16, 1976, Ser. No. 751,406
Int. Cl.[2] G01V *1/12*
U.S. Cl. 181—117 6 Claims

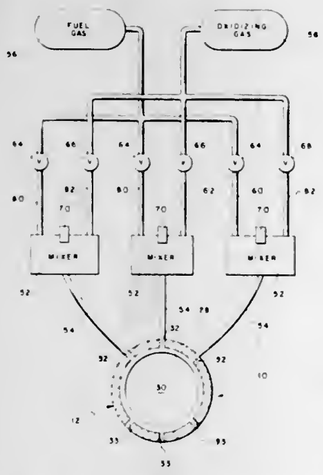


1. In a gas exploder including a housing having an expansible detonation chamber therein, a charging and ignition system comprising:
(a) separate fuel gas and oxidizing gas supply means;
(b) an external main gas flow conduit extending into communication with the interior of said detonation chamber;
(c) at least two branch conduits defining separate gas flow paths interconnected with said main conduit externally of said detonation chamber;
(d) at least two gas mixers, each connected to said fuel gas and oxidizing gas supply means and to the upstream end of a respective one of said branch conduits;
(e) means for controlling the flow from said supply means to said mixers so that said mixers sequentially provide a combustible gas mixture to said main conduit through the downstream ends of their respective branch conduits; and
(f) spark ignition means for separately igniting said combustible gas mixture adjacent said at least two gas mixers in timed relation to the operation of said mixers.

4,073,363
METHOD AND APPARATUS FOR GENERATING A LONG SEQUENCE OF SEISMIC PULSES

Tom P. Airhart, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 16, 1976, Ser. No. 751,407
Int. Cl.[2] G01V *1/12*
U.S. Cl. 181—117 13 Claims

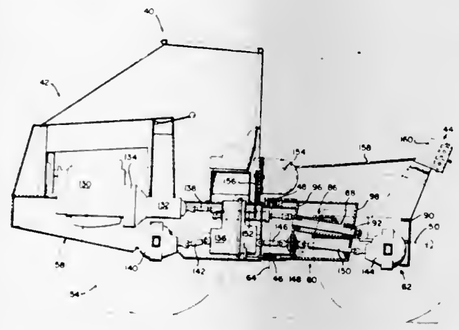


1. A rapid fire gas exploder for generating an extended sequence of seismic pulses comprising:
(a) means defining an expansible closed chamber having a rigid bottom adapted to be coupled to the ground and a rigid top movable reciprocally relative to said bottom;
(b) a plurality of separate fluid conduit means affixed to said chamber in constant communication with the interior thereof;
(c) a like plurality of separate gas mixers whose outputs are connected respectively to said fluid conduit means externally of said chamber;
(d) means for supplying fuel gas and oxidizing gas to each of said mixers;
(e) means for controlling said supply means so that said mixers operate in sequence at a desired rate of fire to provide successive charges of combustible gas mixture; and
(f) means for spark igniting said charges of combustible gas mixture adjacent each of said mixers in timed relation to the operation of said control means, thereby creating a series of detonations within said chamber at said rate of fire adapted to effect a corresponding reciprocal movement of said rigid top.

4,073,364
STABILIZED VEHICLE SUSPENSION

Wilhelm Schmidt, Enumclaw, Wash., assignor to Garrett-Weldco Industries, Inc., Enumclaw, Wash.

Filed Oct. 24, 1975, Ser. No. 625,367
Int. Cl.[2] B62D *5/10*
U.S. Cl. 180—139 6 Claims

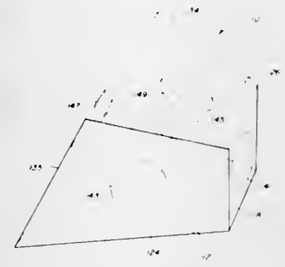


1. A vehicle adapted to travel over irregular terrain, comprising:
a first-end chassis having a pair of transversely spaced wheels;
an intermediate chassis connected to said first-end chassis through an articulation joint, said articulation joint having an articulation axis substantially perpendicular to the transverse and longitudinal axis of the respective first-end and intermediate chassis;
steering means for pivoting said first chassis with respect to said intermediate chassis about said articulation axis;
a second-end chassis having a pair of transversely spaced wheels; and
oscillating connector means rotatably connecting said intermediate chassis to said second-end chassis, said connector means having an axis of rotation extending generally along the longitudinal axis of said intermediate chassis and inclined upwardly toward said second-end chassis such that said axis passes above the center of gravity of said second-end chassis whereby said second-end chassis is in stable condition when the wheels of said second-end chassis lose contact with a vehicle-supporting surface.

4,073,365
SPEAKER SYSTEM

Joseph W. Johnson, 802 E. 227th St., Bronx, N.Y. 10466

Filed July 11, 1977, Ser. No. 814,302
Int. Cl.[2] H04R *1/02, 1/20*
U.S. Cl. 181—147 4 Claims

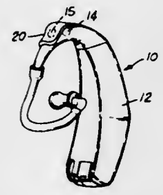


1. A speaker assembly comprising an enclosure body having at least six surfaces including a bottom wall, an upstanding front wall, two upstanding side walls which intersect said front wall at an obtuse angle, at least one inclined rear wall which intersects said bottom wall at an acute angle and an inclined top wall which intersects said front wall at an obtuse angle, said enclosure body being provided with at least one acoustic speaker affixed to each of said front, side, rear and top walls.

4,073,366
DISPOSABLE NOISE REDUCING HEARING AID ATTACHMENT

Roger Q. Estes, c/o P. H. Shelledy, Esq., Peyton Bldg., Spokane, Wash. 99201

Filed July 26, 1976, Ser. No. 708,316
Int. Cl.[2] G10K *13/00;* H04R *25/00*
U.S. Cl. 181—158 8 Claims



1. A disposable noise reducing hearing aid attachment for attaching to a hearing aid that has a housing with a sound inlet formed therein of a specified cross-sectional area to transmit audible sound from the environment to an internal microphone, comprising:
a flexible noise filter layer of an open cellular material for overlying the sound inlet to reduce the amplitude of audible noise transmitted from the environment to the hearing aid sound inlet;
said noise filter layer having extended top and bottom surfaces of greater area than the cross-sectional area of the sound inlet to form a central area region for directly overlying the sound inlet and a circumferential perimeter region for extending outward of the sound inlet;
a flexible wind and dust screen layer of tightly woven fabric coextensive with and engaging the top surface of the noise filter layer;
a stretchable bottom ring layer of sheet material having a central aperture of a cross-sectional area greater than the cross-sectional area of the sound inlet engaging the perimeter region of the bottom surface of the noise filter layer;
said screen layer and said stretchable ring layer being permanently secured to the perimeter regions of the respective top and bottom surfaces of the noise filter layer by rings of adhesive with the central area regions of the noise filter surfaces being free of adhesive;
said ring layer having a bottom surface with a coating of pressure sensitive adhesive thereon to enable the attachment to be releasably mounted to the hearing aid housing over the sound inlet.

4,073,367
LEVEL SUPPORT GUARD

Allen C. Wright, Moraga, Calif., assignor to Utility Products, Inc., Oakland, Calif.

Filed Sept. 30, 1976, Ser. No. 728,308
Int. Cl.[2] E06C *7/44*
U.S. Cl. 182—204 1 Claim



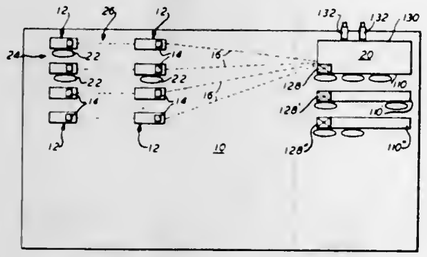
1. A leveler for a ladder or the like comprising a leg extension terminating at one end in a foot, a clutch assembly slidably mounted on said leg extension in normally clutching engagement therewith, means for manually releasing said clutch assembly from such clutching engagement with said leg extention to enable sliding adjustment of said clutch assembly with respect to said leg extension, means for attaching said clutch assembly to a side rail of a ladder, and means protecting said clutch assembly from accidental downward impact capable of releasing said clutch assembly from such clutch engagement with said leg extension, said clutch assembly including a bracket slidably mounted on said leg extension, said bracket comprising a mounting plate having a lateral wing on each end, said wings having aligned holes to receive said leg extension, at least one clutch plate anchored along an edge of said mounting plate and having a hole therethrough to loosely receive said leg extension, resiliant means exerting a lifting force against said plate to normally cause said plate to bite into said leg extension to preclude movement of said leg extension in one direction relative to said clutch assembly, said manual means for releasing said clutch assembly from such engagement with said leg extension comprising an exposed end of said clutch plate and one of said wings to enable one to apply a force to said clutch plate in opposition to said resiliant means, and said protecting means comprising a shroud loosely secured at one end to said mounting plate at a location substantially above the exposed end of said clutch plate and extending beyond said end at a rather steep angle to protect said clutch plate against accidental vertical impact forces sufficient to release said clutch plate and permit relative movement between said clutch assembly and said leg extensions.

4,073,368

AUTOMATED MERCHANDISING SYSTEM

Andrew James Mustapick, 190 Highland Ave., Northport, N.Y. 11768

Continuation of Ser. No. 542,225, Jan. 20, 1975, abandoned. This application July 12, 1976, Ser. No. 704,449
Int. Cl.² E04H *3/04*
U.S. Cl. 186—1 C **8 Claims**



1. An automated merchandising system comprising:
a goods storage building;
a plurality of communications stanchions arranged outside of and remote from said goods storage building but electrically and electronically interconnected therewith;
said communications stanchions being spaced one from the other a distance sufficient to permit an automobile to be parked adjacent thereto;
a goods ordering unit carried by each of said communications stanchions so as to be electrically and electronically interconnected therewith and through said communications stanchion to said goods storage building wherein said goods ordering units are removable from their respective stanchions and into the automobile parked adjacent thereto while still remaining electrically and electronically interconnected to said goods storage building; and
each said goods ordering unit being accessable to an occupant of an automobile when parked adjacent said communications stanchion and being provided with video display means operable by the customer to display goods available at said goods storage building and data transmission means to transmit to said goods storage building data indicative of goods which the automobile occupant desires to obtain.

4,073,369

BRAKE AND TIE-DOWN MECHANISM

Robert A. Nordskog, Tarzana, Calif., assignor to Nordskog Company Inc., Van Nuys, Calif.

Filed Jan. 14, 1977, Ser. No. 759,407
Int. Cl.² B60T *1/14*
U.S. Cl. 188—5 **10 Claims**



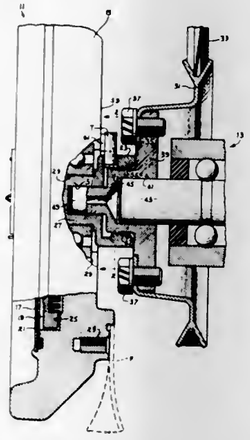
1. A brake and tie-down mechanism for a cart movable on a support surface comprising:
separate support means secured to the bottom of said cart and spaced apart transversely of said cart;
a tie-down mechanism comprising a pair of tie-down locks pivotally mounted at opposite ends on said support means and spaced apart longitudinally of said cart to form a tie down space therebetween;
said space receiving and retaining a tie-down mushroom rigidly secured to said surface in order to restrain the movement of said cart;
brake means mounted on each of said support means comprising brake shoes selectively movable into engagements with said support surface to brake the movement of said cart;
first lever means for moving said brake shoes into engagement with said surface;
second lever means independent of said first lever means for moving said brake shoes away from said surface and simultaneously releasing said mushroom from said tie-down locks;
said second lever means comprising two separate linkages, each linkage being actuated from a different end of said cart to pivot a different one of said locks to release said mushroom, said brake shoes being moved away from said surface by actuation of either of said linkages to move one of said locks;
said first lever means being actuated from either end of said cart for moving said brake shoes into engaging position.

4,073,370

VISCOUS FAN DRIVE ASSEMBLY ARRANGEMENT

Thomas H. Tinholt, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 3, 1976, Ser. No. 738,196
Int. Cl.² F16D *35/00*
U.S. Cl. 192—58 B **7 Claims**



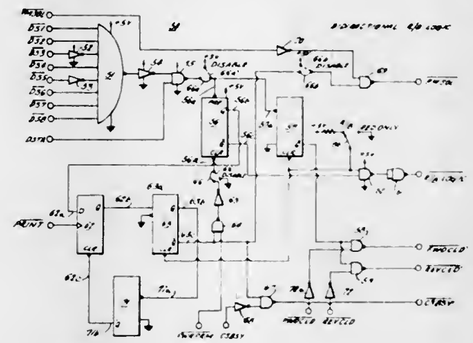
1. A fluid coupling adapted to be mounted on a hub defining a first set of threads, said fluid coupling comprising:
(a) a first rotatable member defining a fluid chamber;
(b) a second rotatable member disposed within said fluid chamber;
(c) said fluid chamber including a volume of fluid for transmitting torque from one of said first and second members to the other of said first and second members in response to relative rotation therebetween;
(d) said second rotatable member including an input shaft and a boss portion defining a second set of threads adapted to be in threaded engagement with the first set of threads defined by the hub;
(e) said boss portion defining a generally radially-extending aperture adapted to receive a connecting member therein; and
(f) said first rotatable member including means defining a slot capable of being positioned radially outward from said aperture and adjacent thereto, said slot-defining means being adapted to receive said connecting member therein when said connecting member is received in said aperture to transmit a rotary motion of said first rotatable member into a rotary motion of said boss portion to selectively effect threaded engagement and disengagement of said boss portion and the threaded hub.

4,073,371

APPARATUS AND CIRCUITS FOR TWO-COLOR PRINTING IN ELECTRONIC IMPACT PRINTERS

Jay Prager, Hudson, N.H., assignor to Centronics Data Computer Corporation, Hudson, N.H.

Filed Nov. 14, 1975, Ser. No. 631,936
Int. Cl.² B41J *33/56*
U.S. Cl. 197—157 **14 Claims**



1. Apparatus for providing two-color printing in an impact printer having platen means for supporting a paper document, a print head assembly and carriage means including means for moving the carriage means and print head assembly across the paper document, said print head assembly including a plurality of print wires and means for selectively activating the print wires to impact said paper document, and means responsive to carriage movement for enabling said activating means, said apparatus comprising:
an elongated inked ribbon extending across the paper document and having first and second colored portions;
means movable between first and second positions for selectively positioning each of said first and second colored portions respectively adjacent said print wires responsive to the receipt of respective first and second signals;
decoder means responsive to a color selection code for generating a ribbon setting signal prior to the printing of each line of characters and/or symbols to select the color in which that line is printed and means for retaining the ribbon setting signal until the line is printed; and
means responsive to completion of the printing of a first group of characters on a line in a first color for operating said carriage moving means to cause the carriage moving means to move the carriage means to a position in readiness for printing additional characters in a second color and to then move the carriage means to begin printing in said second color on the same line;
means responsive to said decoder means for delaying the operation of said carriage moving means for beginning a printing operation, until the selected one of said first and second colored portions is stably positioned between said print wires and said paper document whereby said delaying means assures printing of additional characters on the same line will occur in the proper color.

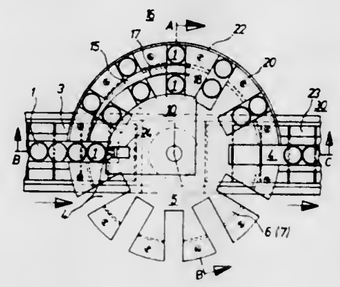
4,073,372

APPARATUS FOR TRANSPORTING CONTAINERS TO AND FROM A WORKING STATION

Hans List, Lau-Strasse 51, 7 Stuttgart 70, Germany

Filed Dec. 22, 1976, Ser. No. 756,338
Claims priority, application Germany, Dec. 27, 1975, 2558886
Int. Cl.² B23Q *7/16*
U.S. Cl. 198—341 **12 Claims**

1. Apparatus for transporting containers to and from a working station comprising intermittently rotatable transport disc means provided with a plurality of cutouts extending from the periphery of the transporting disc means into the latter and dimensioned to each receive at least two containers with clearance to space the containers in the direction of the cutout from each other; means for feeding the containers into said cutouts; means spaced from said feeding means in circumferential direction of said transporting disc means for discharging said containers from said cutouts; a working station between said feeding means and said discharging means; and guide means for moving the containers in each cutout during their movement from said feeding means to said working station away from each other to space the same at a predetermined distance from each other as necessary for the operation to be performed at the working station.

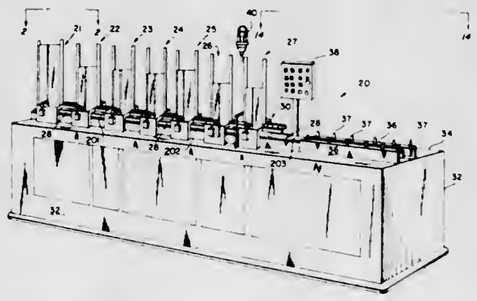


4,073,373

LAMINATE STACKING APPARATUS AND METHOD

Norman R. Crowley, 2 W. Sunrise Drive, Evansville, Ind. 47710, and Charles M. Walker, P.O. Box 3436, Evansville, Ind. 47733

Filed Mar. 26, 1976, Ser. No. 670,739
Int. Cl.² B65G *57/00*
U.S. Cl. 198—421 **40 Claims**



37. Apparatus for making a stack having a predetermined height from a plurality of individual plates, the apparatus comprising:
at least one plate dispensing station means;
transporting means for transporting plates from said dispensing station means; and
wherein said plate dispensing station means comprises a magazine for storing a vertical stack of plurality of individual plates, means for dispensing said plates from the bottom of the stack onto said transporting means, and means for positively downwardly urging the plates for feeding the plates to said dispensing means, said plate urging means comprising a pair of pivotable arms for engaging the stack of plates at opposite sides thereof, and a pair of piston means for pivotably moving corresponding ones of said arms into and out of engagement with said plates and wherein each said arm is mounted for pivotal movement in a vertical plane and is comprised of an angular member connected at one end to said piston means and extending substantially horizontal therefrom, said member having a central vertex, and having a roughened edge at

the other end thereof for frictionally engaging the plates, and wherein said plate urging means further comprises a resiliently and substantially vertically mounted support slide to which said vertex of said angular member is connected, and means for slidably mounting said slide.

4,073,374

APPARATUS FOR HANDLING ROD-LIKE ARTICLES

Dennis Hinchcliffe; Robert Thomas Daisley; Stanley Bernard Harper, and Hilary Mark How'l Kilborn, all of London, England, assignors to Molins Limited, England

Filed Jan. 14, 1976, Ser. No. 648,926

Claims priority, application United Kingdom, Jan. 23, 1975, 2936/75

Int. Cl.² B65G *57/00*

U.S. Cl. 198—425 **24 Claims**



1. Apparatus for filling and unloading a container with rod-like articles, comprising a first conveyor for moving a stream of said articles along said path, a second conveyor for receiving the stream and for moving it along a second path towards a third path, the second path being inclined to the first path and to the third path, a third conveyor arranged to convey the stream along the third path, drive means for moving said second and third conveyors and arranged so that the stream may be conveyed at different speeds on said second and third paths, spaced separating means movable with the third conveyor and arranged to be successively projected into the stream on the second path to divide the stream into batches, means for moving successive batches transversely of said third path off the third conveyor and into a container and for successively removing batches of rod-like articles from a container and transferring them onto the third conveyor between spaced retaining means defined by said separating means.

4,073,375

METHOD OF AND APPARATUS FOR FEEDING RANDOMLY RECEIVED ITEMS

Charles G. Hart, Sheboygan; John S. Gordon, Kohler, and Richard D. Sorenson, Sheboygan, all of Wis., assignors to Hayssen Manufacturing Company, Sheboygan, Wis.

Filed Feb. 9, 1977, Ser. No. 767,041

Int. Cl.² B65G *47/52*

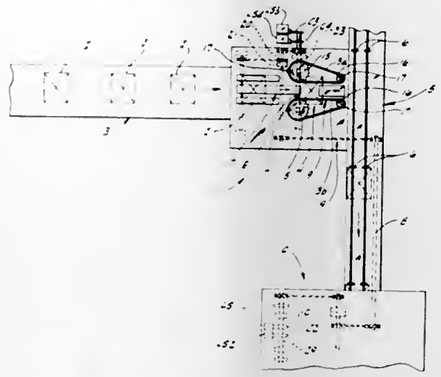
U.S. Cl. 198—466 **13 Claims**

1. The method of feeding items one after another to an apparatus which cycles continuously at a steady rate, referred to as the first rate, with an item being receivable by the apparatus only during a portion of each cycle, items to be fed to the apparatus being randomly delivered one at a time at an average rate, referred to as the second rate, said method comprising the steps of:

feeding the randomly received items one at a time to a holding station where an item may dwell for an interval;

feeding each item which has been delivered to the holding station in time for delivery to said apparatus during said portion of said cycle forward to said apparatus in timed relation with said apparatus for delivery of the item thereto during said portion;

the feeding of a randomly received item to the holding station occurring at a relatively slow speed while the next leading item is at the holding station, and at an accelerated speed when the next leading item is fed forward to said apparatus; and



deferring the feeding forward of an item which has been delivered to the holding station too late for delivery to said apparatus during said portion of a cycle until a next successive cycle.

4,073,376

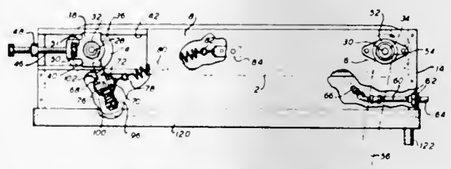
CONVEYOR CLEANING MECHANISM

Robert J. Krooss, 74 Ball Road, Mountain Lakes, N.J. 07046

Continuation of Ser. No. 573,593, April 30, 1975, abandoned. This application Feb. 22, 1977, Ser. No. 770,720

Int. Cl.² B65G *45/00*; B67C *1/08*

U.S. Cl. 198—498 **11 Claims**



1. A conveyor cleaning mechanism positionable against the underside of a conveyor belt:

a horizontally movable cleaning belt of carpet like material adapted to remove undesirable material from the conveyor,

first and second pulleys around which the cleaning belt is positioned,

cleaning means positioned in contact with the cleaning belt,

first biasing means for biasing said cleaning means against said cleaning belt to squeeze the cleaning belt between the cleaning means and a pulley to remove undesirable material from the cleaning belt and,

spray means for applying liquid to the cleaning belt to aid in removing undesirable material from said cleaning belt, said spray means positioned upstream of said cleaning means.

9. A cleaning mechanism adapted to be positioned between two substantially parallel conveyors which conveyors have means provided to cause an item travelling on one conveyor to be transported across the cleaning mechanism onto a second conveyor comprising:

a cleaning belt of carpet like material to remove undesirable material from items travelling on a conveyor,

first and second pulleys around which the cleaning belt is positioned,

cleaning means positioned in contact with the cleaning belt,

first biasing means for biasing said cleaning means against said cleaning belt to squeeze the conveyor belt between the cleaning means and pulley to remove undesirable material from the cleaning belt and,

spray means for applying liquid to the cleaning belt to aid in removing undesirable material from said conveyor belt, said spray means positioned upstream of said cleaning means.

4,073,377

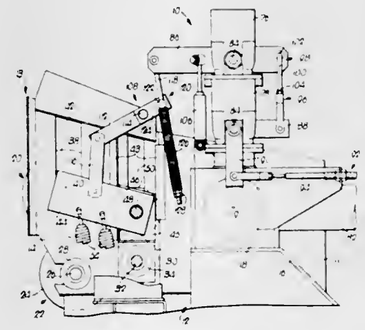
FEED ROLLS HAVING AUTOMATIC SPEED CONTROL

Herman V. Stoessel, and Daniel R. Prichard, both of Wichita, Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Apr. 20, 1976, Ser. No. 678,499

Int. Cl.² B65G *17/00*

U.S. Cl. 198—624 **28 Claims**



1. In a material processing machine, apparatus including:

a pair of adjacent assemblies having a pair of cooperating, rotatable means for conveying material therebetween, said assemblies being relatively shiftable toward and away from one another;

a power train for rotating said rotatable means;

a regulator associated with said power train for controlling the angular velocity of said rotatable means; and

operating means responsive to relative shifting movement of said assemblies and coupled with said regulator in a manner to change the angular velocity of said rotatable means when said assemblies shift relative to one another,

said regulator including a shiftable control lever coupled with said operating means, the latter means including motion dissipating means for permitting independent operation of said control lever without relatively shifting said assemblies.

4,073,378

AUTOMATIC TOBACCO HARVESTER WITH IMPROVED LEAF CONVEYING SYSTEM

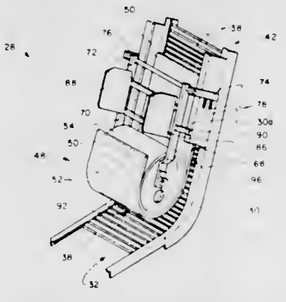
Bertram Lee Jordan, and John Davis Mitchell, both of Lewiston, N.C., assignors to Harrington Manufacturing Company, Lewiston, N.C.

Filed July 19, 1976, Ser. No. 706,612

Int. Cl.² B65G *15/14*

U.S. Cl. 198—627 **3 Claims**

1. In an automatic tobacco harvester of the type having a mobile frame, defoliator means mounted on said mobile frame and carried thereby, and drive means for driving said defoliator means, the improvement comprising a conveyor assembly generally disposed on each side of said defoliator means for receiving leaves defoliated by said defoliator means and conveying said leaves generally rearwardly and upwardly about said harvester where the leaves are discharged therefrom, each conveyor assembly comprising: a conveyor frame structure; a first chain link type conveyor means disposed about said conveyor frame structure and having a generally horizontal conveying section for receiving tobacco leaves and conveying them rearwardly relative to said defoliator means, and a vertical lift section disposed rearwardly of said horizontal conveying sections and having an elevated terminal end; second belt conveyor means disposed adjacent and generally above said vertical lift section of said first chain link type conveyor means and cooperable therewith to convey tobacco leaves therebetween from a lower level relative to said harvester to an upper level where the tobacco leaves may be discharged therefrom; said second belt conveyor means including an endless, flexible and generally slack belt conveyor trained around two independent spaced apart rollers including a lower disposed roller disposed generally adjacent the lower portion of the vertical lift section of said first chain link type conveyor means and an upper roller disposed above and slightly rearwardly of the rear terminal end of said vertical lift section of said first chain link type conveyor means; mounting means movably mounting said lower roller adjacent said first conveyor means for floating back-and-forth bodily movement relative to said first chain link type conveyor means for allowing relatively large masses of tobacco leaves to enter a leaf conveying area defined between the vertical lift section of said first chain link type con-



veyor means and said second belt conveyor means without clogging or jamming; said mounting means movably mounting said lower roller including a pair of laterally spaced holding arms secured to said conveyor frame structure and extending upwardly therefrom; rock shaft means rotatably secured transversely between said holding arms, a pair of laterally spaced pivot arms secured at one end to said rock shaft means and extending therefrom where the other end of said pivot arms are rotatively connected to said lower roller of said second belt conveyor means such that as pivot arms pivot with said rock shaft means said lower roller moves therewith; stop means mounted on at least one of said pivot arms and engageable with the conveyor frame structure for limiting the movement of said lower roller towards said first conveyor means; a pair of laterally spaced belt guide plates disposed adjacent said lower roller of said second belt conveyor means for guiding said belt conveyor about said lower roller of said second belt conveyor means, each of said guide plates being secured to a respective pivot arm intermediately between said lower roller of said second belt conveyor means and said rock shaft means and extending upwardly therefrom.

4,073,379

BOWLING PIN ELEVATOR FOR A BOWLING INSTALLATION

August Schmid, Schwerzenbach, Switzerland, assignor to Patentverwertungs und Finanzierungsgesellschaft, Serania AG, Glarus, Switzerland

Continuation-in-part of Ser. No. 589,267, June 23, 1975, abandoned. This application Sept. 30, 1976, Ser. No. 728,159

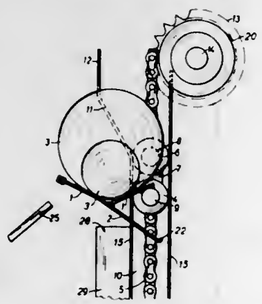
Claims priority, application Switzerland, June 27, 1974, 8827/74

Int. Cl.² A63D *5/00*

U.S. Cl. 198—796 **10 Claims**

1. Bowling pin elevator in a bowling pin installation, having bowling pin transport means to transport bowling pins to a discharge region, comprising

two, each, upper and lower guide wheels (13, 40'), at least one of the guide wheels comprising a sprocket wheel (13);
two spaced upwardly extending endless chains (5) looped over the guide wheels (13, 40'), the guide wheels guiding the chains for endless travel and reversal;
a plurality of elongated bowling pin holders (1) attached to the endless chains (5), the chains moving the holders to the discharge region for the pins (1), said discharge region being located between the upper guide wheels (13);
means (9, 21) pivotably supporting the pin holders (1) on the chains (5);
at least one position control arm (7) fixedly secured to the pin holders (1) to control the pivotal position thereof;
guide track means (10) comprising upwardly directed generally U-shaped channels (15) guiding said pin holder position control arm (7) for holding the arm and hence the bowling pin holder (1) of the bowling pin transport means in a first pin supporting position when the holder is below the discharge region, said channels (15) retaining said chains (5) and being formed at the discharge region with a deflecting surface (11) extending away from the major direction of the channels (15) to guide the arm (7) for pivotal deflection when at the discharge region, and hence tip the bowling pin holder (1) to a pin discharge position;
a control arm guide roller (6) located above the pivot axis of the bowling pin holder (1) and secured to the pin holder position control arm (7), said control arm guide roller (6) and said means (9) pivotally supporting the pin holders on the chains (5) and said chains being retained in and guided by said U-shaped channels (15);



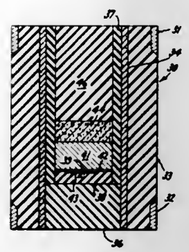
the channels (15), at the discharge region, having a width which is enlarged with respect to the remainder thereof to guide the control arm guide roller (6) away from the path of the chain and hence pivot the pin holder secured thereto, to pivotally deflect the pin holder and release a pin (3) supported by the pin holder,
the enlarged width extending in a direction away from the return run of the chains (5) looped about the upper guide wheel (13), the arm (7) extending upwardly in the region of transport of pin holders (1) below the discharge position from the pivot axis (48) of the pin holder (1);
and centering means (28, 29) fixedly located adjacent the track means (10, 15) below the upper guide wheels (13), extending in a direction towards the center of the pin holders (1) to move a bowling pin (3) located on a respective holder (1) to a predetermined position, so that the pins (3) being discharged from the respective holders at the discharge position will have a predetermined position with respect to the track means (10, 15),
the centering means comprising two centering structures (28) formed with converging surfaces (29) directed towards each other and, in the direction of movement of the pin holders (1), being inclined towards the center of the pin holder, the minimum distance of the inclined surfaces being slightly greater than the length of a pin (3) with which the elevator is to be used;
and clearance slots (30) formed in the pin holders and slightly greater than the wides dimension of the centering structures (28) to provide for passage of the pin holders (1) past the centering structures with clearance.

4,073,380

HIGH PRESSURE REACTION VESSEL FOR QUALITY CONTROL OF DIAMOND GROWTH ON DIAMOND SEED

Herbert M. Strong, Schenectady, and Roy E. Tuft, Guilderland Center, both of N.Y., assignors to General Electric Company, Worthington, Ohio

Division of Ser. No. 412,425, Nov. 2, 1973, Pat. No. 4,034,066. This application July 15, 1976, Ser. No. 705,720
Int. Cl.[2] C01B *31/06*; B65D *25/08, 85/70*
U.S. Cl. 206—219 **4 Claims**



1. In a diamond synthesis reaction vessel for introduction into the reaction volume of a high pressure, high temperature apparatus, said reaction vessel constituting an assembly of interfitting elements for enclosing diamond seed material and a source of substantially pure carbon, said diamond seed material and source of carbon being separated by a mass of metallic catalyst-solvent material for the diamond-making reaction disposed therebetween so as to provide a predetermined temperature gradient between said diamond seed material and said source of carbon under operating conditions of pressure and temperature in the diamond stable region of the phase diagram of carbon, said diamond seed material and said source of carbon being located in separate regions of said reaction vessel such that under said operating conditions said diamond seed material will be heated to a temperature near the minimum value of temperature for said temperature gradient and simultaneously said source of carbon will be heated to a temperature near the maximum value of temperature for said temperature gradient, the combination with said interfitting elements of
a. a layer of metallic isolating material disposed in contact with the diamond seed material and between said diamond seed material and the mass of catalyst-solvent material, said isolating material being unpierced where contact is made with said diamond seed material and being selected from the group consisting of platinum, molybdenum, titanium, tantalum, tungsten, iridium, osmium, rhodium, palladium, vanadium, ruthenium, chromium, hafnium, rhenium, niobium and zirconium and alloys thereof and in any given reaction vessel construction said isolating material having a melting point, when in contact with diamond, that is higher than the melting point of the metallic catalyst-solvent material saturated with carbon dissolved therein when in contact with diamond.

4,073,381

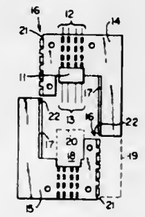
COMPONENT CARRYING

William Luther Patterson, Northboro, Mass., assignor to Adams-Russell Co., Inc., Waltham, Mass.

Filed Aug. 22, 1975, Ser. No. 607,034
Int. Cl.[2] B65D *73/02*
U.S. Cl. 206—331 **10 Claims**

1. Component carrying apparatus comprising,
means defining a thin member of thickness between opposed exterior surfaces much less than its length or width for

accommodating lead channels in which component leads may be inserted for protection and including means defining said lead channels,



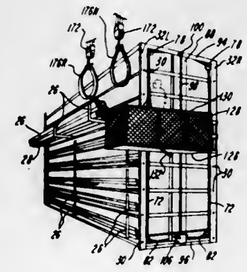
said lead channels being defined by a series of partially overlapping recesses extending into the interior of said member from said opposed exterior surfaces.

4,073,382

APPARATUS FOR RACKING STEEL AND THE LIKE

Thomas D. Fahey, and Samuel Schlagel, both of Denver, Colo., assignors to Steel Storage Systems, Inc., Commerce City, Colo.

Filed Jan. 28, 1977, Ser. No. 763,249
Int. Cl.[2] A47F *5/00*
U.S. Cl. 211—1 **15 Claims**



1. The apparatus for racking steel and the like which comprises: a first two sided rack having a front end with spaced parallel rail-forming uprights defining a vertical track, a plurality of openable open topped drawer-like receptacles arranged one above the other in tiered relation on at least one side thereof, and means accessible at the front end on the side thereof having said receptacles for independently actuating the latter between open and closed positions; elevator means including a cage-carrying frame secured .o said rail-forming uprights for vertical movement along the track defined thereby, and a fence enclosed platform defining an operator's cage-carrying frame for vertical movement therewith and for independent transverse movement in relation thereto from a centered position in front of the rack to at least one offset position shifted to the side of center; and, hoist means operatively connected to the cage-carrying frame for raising and lowering the elevator means.

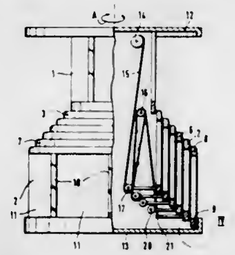
4,073,383

DEVICE FOR DISPLAYING CARPET PATTERNS OR THE LIKE

Jürgen Rümmer, Industriestr. 12, 8602 Troisdorf, Germany

Filed Feb. 18, 1976, Ser. No. 659,007
Int. Cl.[2] A47F *3/11*
U.S. Cl. 211—1.5 **7 Claims**

1. A columnar device rotatable about a vertical axis in both directions of rotation for the display of samples of carpets or the like comprising a plurality of cylindrical rings with an upper fixed ring and a lower fixed ring and shiftable rings between said upper and lower rings for carrying carpet patterns on their peripheral parts and arranged with a stepped increase in diameter coaxially between said axially fixed upper ring with the smallest diameter and an said axially fixed lower ring with the largest diameter, and lifting means for selectively raising and lowering the shiftable cylindrical rings carrying



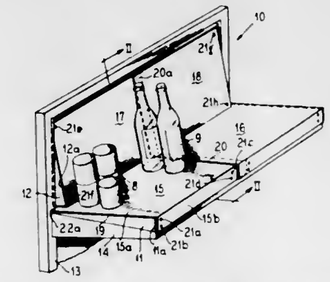
said carpet patterns in an axial direction, said device having a fixed height between said fixed upper ring and said fixed lower ring, said height being substantially less than the sum of individual heights of said cylindrical rings.

4,073,384

SHELF PROTECTOR

Lawrence S. Celeste, 1561 Birch, Hanover Park, Ill. 60103

Filed May 6, 1976, Ser. No. 683,837
Int. Cl.[2] A47F *5/00*
U.S. Cl. 211—134 **6 Claims**



1. A protected shelf assembly comprising in combination:
a. a shelf securely installed on a supporting means and a shelf back secured at approximately right angles to said shelf at an interior edge adjacent said supporting means;
b. a removable shelf protector having a sheet-like main surface portion and a lip, the main surface portion being positioned on a surface of said shelf and the lip portion abutting an outer edge of said shelf remote from said supporting means;
c. a sheet-like shelf back protector having a main surface portion which is positioned against a surface of said shelf back;
d. said shelf back and shelf having wedge-shaped display surfaces and said shelf protector is of a complementary wedge shape; and
e. a plurality of said shelf protectors and shelf back protectors being provided so that at least two adjacent protectors overlap along side edges thereof.

4,073,385

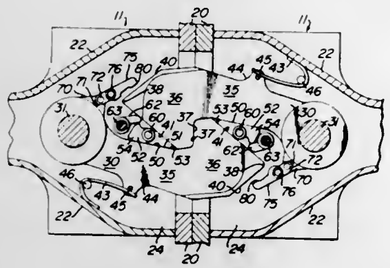
CAR COUPLER

Robert T. Reed, Moorestown, N.J., assignor to Walton Products, Inc., Broomall, Pa.

Filed Jan. 13, 1977, Ser. No. 758,944
Int. Cl.[2] B61G *3/04*
U.S. Cl. 213—100 R **6 Claims**

1. In apparatus for controlling the coupling and uncoupling

of railway vehicles for each of the vehicles to be coupled including a housing at an end of the vehicle to be coupled to another vehicle, said housing having a resiliently biased coupler hook carried therein having a position for coupling engagement and an out of engagement position, said coupler hook having a vertically disposed pulling face and a vertically disposed control face, a cam carried in said housing engageable



with said control face for moving said coupler hook to an out of engagement position, a pawl in engagement with said cam for actuating said cam, and means for moving said pawl for operating said cam, the improvement which comprises

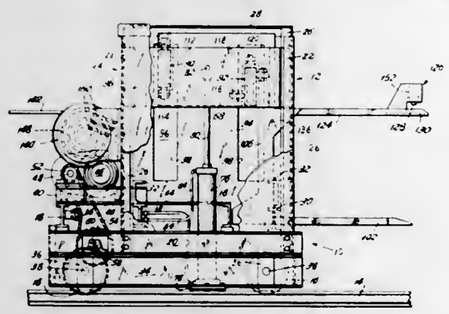
means engaged with a portion of said coupler hook and movable thereby into engagement with another coupler hook positively holding said last mentioned coupler hook in coupled engagement.

4,073,386

POWERED MATERIAL HANDLING APPARATUS

George L. DeNomme, Oxford, Conn., assignor to The Chapin and Bangs Company, Bridgeport, Conn.

Filed Jan. 24, 1977, Ser. No. 762,102
Int. Cl.² B65G *35/00*
U.S. Cl. 214—1 F **13 Claims**



1. Powered material handling apparatus comprising, in combination:

(a) a carriage constituted as a frame construction having a pair of spaced-apart trucks provided with wheels to enable the trucks to travel in parallel directions while secured to the frame construction,

(b) said frame construction including cross members rigidly connecting the trucks together,

(c) a pair of cross beams extending between the trucks,

(d) each truck having a cross-head to which the ends of the cross beams are secured,

(e) vertical guides on the trucks, engaged by the cross-heads and enabling the latter to have raising and lowering movement on the trucks,

(f) power means carried by the trucks, connected to said cross-heads for effecting the raising and lowering movement thereof,

(g) fork structures carried by said cross beams, including tines extending laterally away from the beams for supporting sheared plate sections, and

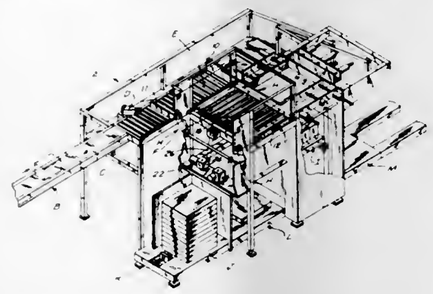
(h) anti-friction means carried by the fork structures, enabling the same to be moved along the lengths of the beams under manual power.

4,073,387

METHOD AND APPARATUS FOR TIER FORMING ON A ROW BY ROW BASIS

Robert E. Bowser, Lynchburg, Va., assignor to Simplimatic Engineering Co., Lynchburg, Va.

Filed Dec. 19, 1975, Ser. No. 642,576
Int. Cl.² B65G *57/26*
U.S. Cl. 214—6 P **27 Claims**



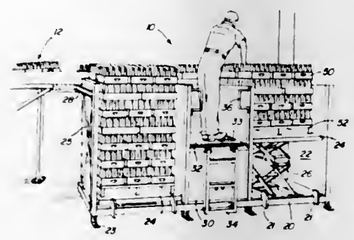
1. Means for forming a tier of R rows of cartons, each row having a given width, for use with a palletizer or the like comprising conveying means having a first side at which rows of cartons are received at spaced intervals and a second side, said conveying means, when actuated, transporting the rows of cartons thereon towards said second side, and means responsive to the number of rows present on said conveying means and effective, subsequent to the entry of each of the incoming rows of cartons at said first side, to actuate said conveying means to transport the rows present thereon a distance substantially equal to the width of the incoming row, when less than R rows are present on the conveying means, and a selected distance sufficient to move the leading row on said conveying means to said second side thereof, when R rows are present thereon.

4,073,388

SEMI-AUTOMATIC LIFTING SYSTEM

Norman R. Carter, Bossier City, La., assignor to Zetco Manufacturing Company, Incorporated, Shreveport, La.

Filed Jan. 6, 1977, Ser. No. 760,133
Int. Cl.² B65G *59/02*
U.S. Cl. 214—8.5 A **5 Claims**



1. In an apparatus for reducing manual handling and lifting of cases which are to be stacked onto and unstacked from pallets by an operator, the apparatus including at least one conveyor on which the cases are movable, the improvement comprising:

a box-like support frame open along at least one vertical face thereof, the conveyor being disposed along the opposite face thereof and adjacent to the support frame, the upper surface portions of the conveyor being disposed slightly below the upper surfaces of the frame;

first station means mounted centrally of the support frame for supporting the operator;

at least one case-receiving station means carried on one end of the frame adjacent the first station means and including a planar support member for receiving one of the pallets thereon, the planar support member being accessible through the open vertical face of the frame;

vertically extensible means disposed in the case-receiving station means for supporting and vertically displacing the planar support member; and,

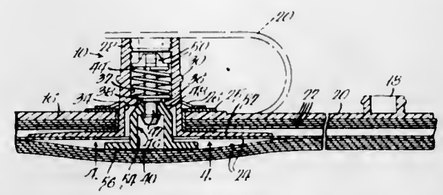
control means disposed on the first station means and operable by the operator for actuating the vertically extensible means, the planar support member being thus positionable to cause at least the uppermost cases stacked on the pallet located on said planar support member to be disposed immediately above the upper surfaces of the frame, whereby the operator can manually displace the cases substantially horizontally toward and into surmounting relation to the conveyor to thereby position the cases on the conveyor, cases already on the conveyor being substationally horizontally displaceable by the operator to positions within the case-receiving station means for receipt into surmounting relation to the planar support member, lifting of the cases on movement to and from the conveyor being minimized.

4,073,389

DUNNAGE BAG FILL VALVE DEVICE WITH INTEGRAL COMBINATION BAFFLE, PLUG-RETAINER, AND BLADDER SEPARATOR

Barry R. Angarola, Schaumburg, Ill., and James A. Robbins, Covington, Tenn., assignors to Signode Corporation, Glenview, Ill.

Filed Nov. 11, 1976, Ser. No. 740,951
Int. Cl.² B60P *7/14*
U.S. Cl. 214—10.5 D **11 Claims**



1. In an inflatable dunnage bag having a relatively thin-film, flexible, airtight bladder, the improvement comprising:

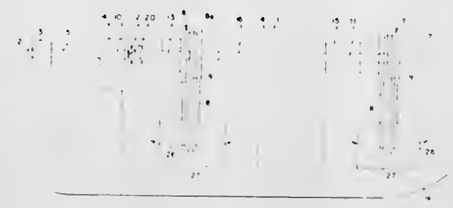
a fill valve device mounted in said bag and extending from the exterior of the bag to the interior of said bladder, said bladder being inflatable with a gas through the fill valve device, said fill valve device having a hollow housing and a plug member disposed therein, said housing having on one end a mounting flange secured to said bladder, the interior surface of said housing defining an orifice, said plug member having a seating surface adapted to seal against said orifice, said plug member further having an extension member projecting from said one end of said housing into said bladder beyond said mounting flange, said extension member having on the distal end a baffle cross wall spaced from, and partially overlapping, said mounting flange whereby, when said bag is being inflated, said baffle cross wall deflects the gas to prevent impingement upon the bladder wall opposite said one end of said housing.

4,073,390

SHIP LOADING SYSTEM

Hendrik Cornelis van Cappelle, Bentveld, Netherlands, assignor to Hoogovens Ijmuiden, BV, Ijmuiden, Netherlands

Filed Nov. 15, 1976, Ser. No. 741,984
Claims priority, application United Kingdom, Aug. 17, 1976, 34269/76
Int. Cl.² B65G *67/58*
U.S. Cl. 214—14 **11 Claims**



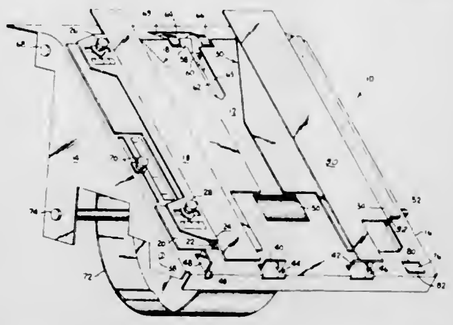
11. In a ship loading system for bulk cargo, having at least two shiploaders for continuous conveyance of the cargo onto the ship and a conveyor system for delivery to the shiploaders, the improvement that the shiploaders are both shiftable along the ship's berth, and the conveyor system comprises an endless main conveyor extending along the ship's berth and having a first tripper at its delivery point to the first shiploader and a second tripper at its delivery point to the second shiploader, a first portion of the conveyor extending to the first tripper and a second portion extending therefrom to the second tripper, the trippers being shiftable along the ship's berth with the respective shiploaders, and at the first tripper the flow on the main conveyor being switchable without interruption between delivery to the first shiploader and delivery onto the said second portion for conveyance to the second tripper.

4,073,391

SHEET JOGGER

John G. O'Brien, Darien, and Franklin J. Calderazzo, New Canaan, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Sept. 24, 1976, Ser. No. 726,108
Int. Cl.² B65H *31/34, 33/08*
U.S. Cl. 214—65 **18 Claims**



1. Jogging apparatus for bringing a plurality of sheets in a stack into a registered bundle comprising:

A. means having an infeed end and an outfeed end for supporting a plurality of sheets;

B. means adjacent said infeed end of said supporting means for conveying said sheets onto said supporting means;

C. means adjacent said outfeed end of said supporting means for registering the leading edges of said sheets;

D. means for jogging the trailing edges of said sheets into registration against said register means;

E. means for jogging the side edges of said sheets into registration;

F. means for discharging said registered bundle of sheets from said outfeed end of said support means, and;

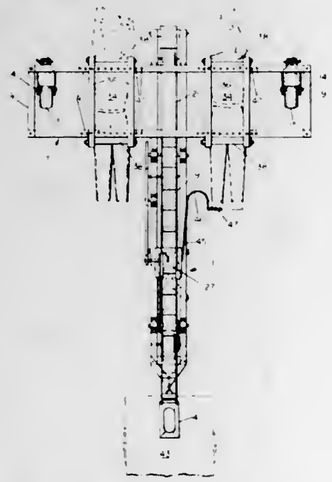
G. unitary cylindrical control means having radial and axial control surfaces, said control means being located below said supporting means for controlling said lead edge register means, said trailing edge jogging means, said side edge jogging means, and said discharging means.

4,073,392

MOBILE SELF-PROPELLED HARVESTER

Carson E. Dibler, Colorado Springs, Colo; Owen O. Cowan, 2420-4th Ave., Pueblo, Colo. 81003; Ruth R. McDonald, 2520-4th Ave., Pueblo, Colo. 81003, Successor of said Carson E. Dibler, deceased

Filed Oct. 18, 1976, Ser. No. 733,160
Int. Cl.[2] B60P *3/14*
U.S. Cl. 214—83.1 **5 Claims**



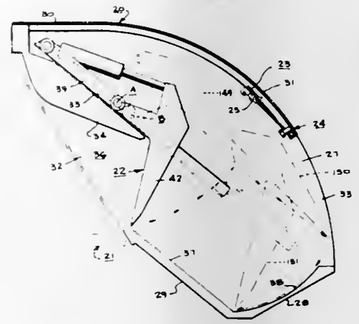
1. A mobile self-propelled crop harvester for harvesting crops planted in rows in a field comprising in combination, an elongation angularly disposed central frame having wheel means at the rear end thereof, a cross frame adjacent and connected to the forward upper end of said central frame, laterally adjustable wheel means depending from the ends of said cross frame, endless conveyor means spacedly supported horizontally above and by said central frame and having a forward portion extending downwardly and forwardly therefrom, power source means arranged on said central frame and drivingly connected to said conveyor and rear wheel means, vertically adjustable bracket means depending from said cross frame on opposite sides of said central frame, and horizontal rigid cradle means carried by said bracket means and contoured and shaped to correspond with a human body torso and legs for supporting a pair of workers in reclining forwardly extending face down positions adjacent the forward end of said conveyor means, said cradle means being formed with neck receiving recesses and diverging supporting portions whereby crops picked by said workers are disposed on said downwardly and forwardly extending conveyor and delivered rearwardly of said harvester, and throttle control means associated with one of said leg supporting portions for operation by one worker to control the actuation of said power source means.

4,073,393

CONTROL SYSTEM FOR REFUSE PACKER ASSEMBLY

Roland W. McKenzie, and Richard Stansberry, both of Culpeper, Va., assignors to City Tank Corporation, Culpeper, Va.

Continuation of Ser. No. 754,071, Dec. 22, 1976, abandoned, which is a continuation of Ser. No. 629,701, Nov. 6, 1975, abandoned. This application Apr. 22, 1977, Ser. No. 790,141
Int. Cl.[2] B65F *3/00*
U.S. Cl. 214—83.3 **20 Claims**



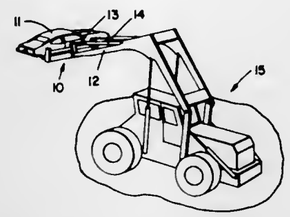
1. In a refuse collection vehicle provided with a mechanism mounted on a refuse receiving hopper thereof for transferring refuse deposited in said hopper into a storage body and compacting the refuse therein, said mechanism including a panel engageable with refuse deposited in said refuse receiving hopper, a first fluid actuated component operatively connected to said panel and a second fluid actuated component operatively connected to said panel and cooperable with said first fluid actuated component for cycling said panel through a predetermined cycle, a control system for operating said fluid actuated components comprising a fluid tank; a pump having an inlet communicating with said tank; a control valve having a main fluid passageway therethrough communicating at an inlet port thereof with the outlet of said pump and at an outlet port thereof with said tank, a pilot fluid passageway therethrough communicating at an inlet port thereof with the outlet of said pump and at an outlet port thereof with said tank, a first valve spool selectively operable for communicating the inlet port of said main fluid passageway with said first fluid actuated component, said first spool being displaceable between a first position obstructing said pilot fluid passageway and a second position not obstructing said pilot fluid passageway, said first valve spool having a surface disposed at an angle relative to a longitudinal axis thereof communicating with said pilot fluid passageway, and a second valve spool selectively operable for communicating the inlet port of said main fluid passageway with said second fluid actuated component, said second valve spool being displaceable between a first position obstructing said pilot fluid passageway at a point thereof between the point of obstruction of said first valve spool and the outlet port of said pilot fluid passageway, and a second position not obstructing said pilot fluid passageway said second valve spool having a surface disposed at an angle relative to a longitudinal axis thereof communicating with said pilot fluid passageway; and a means for shifting said first and second valve spools to said first positions thereof.

4,073,394

LIFT TRUCK WITH ATTACHMENT FOR CARRYING AUTOMOBILES

Benjamin F. Biaggini, and Paul V. Garia, both of San Francisco, Calif., assignors to Southern Pacific Transportation Company, San Francisco, Calif.

Filed Jan. 6, 1976, Ser. No. 646,941
Int. Cl.[2] G02F *3/81*
U.S. Cl. 214—145 R **4 Claims**



1. Apparatus for transporting automobiles comprising:

a. a lift truck having lift arms,

b. an elongated carriage mounted on said lift truck arms for elevation thereby,

c. first and second sets of elongated horizontal tines extending forwardly of said carriage, each set comprising two parallel tines,

d. means mounting said tines on said carriage for horizontal movement of said tines along said carriage,

e. means for fixing the centers of said tine sets relative to said carriage and including a first control therefor for moving the centers of the two sets of tines simultaneously along said carriage in equal and opposite directions from the center of said carriage and a second control for moving the centers of the two sets of tines simultaneously along said carriage in the same direction with a constant spacing between the centers of said sets of tines, said first and second controls being operable independently of each other,

f. means including a third control therefor for moving both of the two tines of each set towards the center of the set and for moving both of them away from the center of the set while the centers of said sets are fixed relative to said carriage, said third control being operable independently of said first and second controls.

4,073,395

TRUNK LOADING APPARATUS

Clyde H. Clement, 8439 N. 13th Place, Phoenix, Ariz. 85020

Filed Feb. 7, 1977, Ser. No. 765,943
Int. Cl.[2] B60R *9/00*
U.S. Cl. 214—450 **10 Claims**

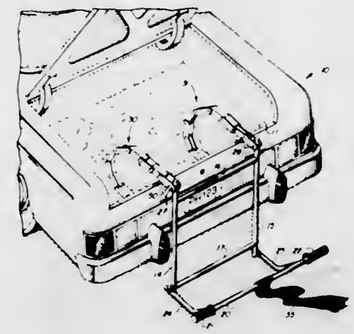
1. An automobile trunk loading apparatus including in combination:

frame means having first and second ends for supporting an object to be loaded into an automobile trunk;

at least one chain-like linkage means extendible to a substantially straight line configuration and comprised of a plurality of pivotally attached interconnected links including mutual engaging portions to limit the minimum radius of curvature attainable by said linkage means to a predetermined amount;

means pivotally attaching one end of said linkage means to a first end of said frame means; and

means for attaching the other end of said means adjacent the linkage interior of the trunk opening near the rear edge thereof to permit said linkage means to extend therefrom and lie on the bottom of the trunk to cause the first end of said frame means to be located in the interior of the trunk remote from the rear edge thereof and to cause the second end of said frame means to be located near the rear edge



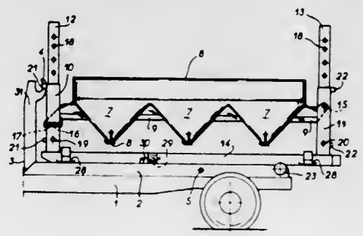
of the trunk when said apparatus is in the trunk in the loaded position.

4,073,396

MOVABLE CONTAINER ADJUSTABLE IN HEIGHT, FOR LOADING ON A VEHICLE

Christian Derain, Saint-Aubin-Le Vieil Evreux Eure, France, assignor to Societe Nouvelle des Bennes Saphem, La Neuve-Lyre, France

Filed Apr. 20, 1977, Ser. No. 789,314
Claims priority, application France, Apr. 21, 1976, 76 11760
Int. Cl.[2] B60P *1/54*
U.S. Cl. 214—515 **10 Claims**



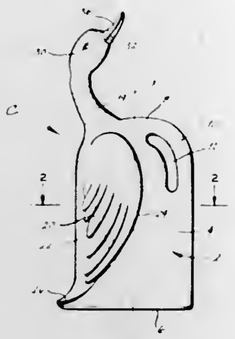
1. In a vehicle having a chassis and intended for the transportation and distribution of materials, a combination comprising:

a chassis extension,

a loading and unloading device mounted on said chassis by means of said chassis extension, and comprising a hoist and a jack, the hoist having at least one vertical branch and one horizontal branch, the vertical branch having an upper end provided with a hook, and the horizontal branch being mounted pivotably around a pivoting axle parallel to the ground and transverse to said chassis so as to be able to cause the hoist to pivot under the effect of said jack; and

a movable container adjustable in height comprising a cradle provided at the front and at the rear with vertical posts, sliders in engaging relationship with said posts and each having at least one hooking member to cooperate with said hook of the upper end of the vertical branch of said hoist, immobilizing means for temporarily immobilizing in a desired position said sliders with respect to said vertical posts, a bridge comprising at least one longitudinal beam and a receptacle supported by said beam, and means for inclining said bridge, connecting the latter, in proximity to its ends, to the sliders, and enabling the latter to take up an inclined position depending on the relative position of the sliders.

4,073,397
FOWL-SHAPED CONTAINER
Elvin E. Snodgrass, Rte. 2, Wappapello, Mo. 63966
Filed June 28, 1976, Ser. No. 700,586
Int. Cl.² B65D *1/02*
U.S. Cl. 215—1 C **7 Claims**



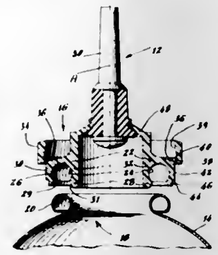
1. A container comprising: a generally tubular body having a longitudinal axis and being shaped to generally resemble the body of a duck or similar fowl, the body including a tubular side wall of generally circular configuration that is generally concentric about the longitudinal axis and the sidewall having embossments on opposite sides of it, with the embossments being in the shape of folded wings, the body also including a bottom wall connected to the sidewall and being generally flat and generally squared off with respect to the side wall so that when the container rests on the bottom wall, the side wall will be in a generally upright position, the bottom wall and the lower end of the side wall being swept outwardly intermediate the rear ends of the folded wings to form an outwardly projected section having the shape of tail feathers, the outwardly projected section having a curved outer margin where the side and bottom walls are connected, the body further including a curved top wall connected to the other end of the tubular side wall, the top wall having a slot therein to provide a handle at which the container may be grasped, with the slot being located in the breast area of the duck-shaped body; and a reduced end section extended generally upwardly from the top wall of the body and being offset from the longitudinal axis and away from and opposed to the handle in the breast area of the duck-shaped body so as to be located intermediate the forward ends of the folded wings, the end section including a neck portion which is connected at its one end to the top wall of the body and a head portion which is connected to the other end of the neck portion, the neck portion resembling the neck of a duck and being extended in generally the same direction as the longitudinal axis so as to project upwardly beyond the end of the side wall and within the circumference of the side wall, the head portion resembling the head of a duck, the end section being separable into a spout and a cap with the spout being hollow and opening into the hollow interior of the body, whereby when the cap is removed from the spout, the relative positions of the handle and the spout facilitate the pouring of liquid contents from the container.

4,073,398
SNAP-LOCK DEVICE FOR SECURING A DISPENSING MECHANISM TO A CONTAINER
Robert S. Schultz, Old Greenwich, Conn., assignor to The Risdon Manufacturing Company, Naugatuck, Conn.
Filed Jan. 28, 1977, Ser. No. 763,568
Int. Cl.² B65D *41/32*
U.S. Cl. 215—253 **9 Claims**

1. A snap-lock device for securing a dispensing mechanism, such as a pump, valve, or the like, to the mouth of a container which has an annular bead about the mouth periphery; said snap-lock device comprising:

A. a bead embracing ring formed with

1. an axially extending, annular recess which is open at one extreme of its axial extent to receive the bead, said recess being shaped so that said ring tightly embraces the bead when received in said recess; and
2. an annular rib, adjacent the open margin of said recess,

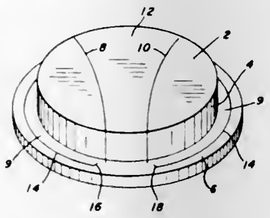


which underlies at least a portion of the bead when received in the recess;

B. retainer means, engageable on said ring when installed on the bead, for exerting a force against said ring in the radial direction to retain said rib in underlying relation to the bead, the dispensing mechanism being mounted with one of said ring and retaining means; and

C. means for positively preventing relative disengagement of said ring and retaining means.

4,073,399
TEAR-OFF CLOSURE
Paul R. Lewis, Richmond, Ind., assignor to Aluminum Company of America, Pittsburgh, Pa.
Filed Feb. 25, 1976, Ser. No. 661,254
Int. Cl.² B65D *41/42*
U.S. Cl. 215—254 **5 Claims**



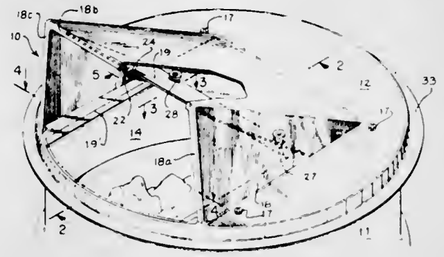
1. A tear-off closure for a container comprising a top end wall, a depending closure skirt around the top end wall and a pull ring around the bottom edge of said closure skirt, said closure having a pair of score lines therein traversing said skirt and top end wall to define a tear strip across said closure with said pull ring integrally connected to said tear strip at the bottom of said closure skirt, and a line of separation between said pull ring and said closure skirt from a location adjacent said score line on one side of said tear strip around said closure skirt to a location adjacent said score line on the other side of said tear strip, with the terminal ends of said line of separation spaced from said tear strip laterally of said score lines on both sides of said tear strip.

4,073,400
GAS CONTAINERS
Greville Bertram Brook, High Wycombe; William Henry Bowyer, Farnham, and Charles Desmond Desforges, Chalfont-St-Giles, all of England, assignors to Fulmer Research Institute, Stoke Poges, England
Filed Nov. 12, 1975, Ser. No. 631,321
Claims priority, application United Kingdom, Nov. 15, 1974, 49576/74
Int. Cl.² B65D *25/14*
U.S. Cl. 220—63 R **5 Claims**

1. A gas container, the walls of which are formed of two bonded layers, the outer layer being formed of a fibre-reinforced synthetic resin having a working strain which is greater than 0.1% and the inner layer of a metal alloy, which inner layer of metal alloy:

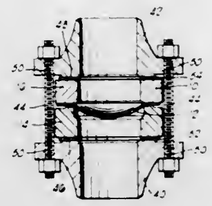
(a) is capable of deforming elastically to the working strain of the outer layer up to a strain of at least about 2%,
(b) is resistant to fatigue damage when cyclic strains up to about 2% are applied,
(c) has an M_s temperature at least 50° C below the operating temperature of the container, and
(d) is resistant to corrosion by the gas which the container is intended to contain.

4,073,401
HEAT ACTIVATED FIRE-SAFE COVER ASSEMBLY
Paul L. Pecchenino, Felton, Calif., assignor to Huggins Engineering Company, Santa Clara, Calif.
Filed Oct. 18, 1976, Ser. No. 723,324
Int. Cl.² B65D *25/00, 43/24, 55/00*
U.S. Cl. 220—88 R **5 Claims**



1. A heat activated fire extinguishing cover assembly for forming an oxygen starved condition within a container comprising a top closure member adapted to extend across the open upper end of the container and form a lid thereto, an unobstructed opening formed through said member for disposing articles into the container, a door and means disposing said door to be movable between open and closed positions relative to said opening, said door when in said open position serving to permit the entry of articles into the container, and when in said closed position serving to sufficiently seal said opening so as to extinguish fire within the container by limiting the supply of oxygen thereto, said top closure member including a hood forming a flue opening disposed above the first named said opening, carried by an edge portion of said flue opening and heat destructible latch means engaging the underside of the forward edge margin of said door for retaining said door in its open position until sufficiently weakened by heat and the weight of the door to release the door to move to close said opening.

4,073,402
PREASSEMBLED PRESSURE RELIEF APPARATUS
Loren E. Wood, Tulsa, Okla., assignor to Black, Sivalls & Bryson, Inc., Houston, Tex.
Filed July 21, 1976, Ser. No. 707,249
Int. Cl.² F17B *1/14*
U.S. Cl. 220—207 **10 Claims**



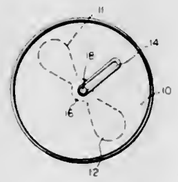
1. A preassembled pressure relief apparatus adapted to be clamped between a pair of conventional pipe flanges, said pipe flanges having raised face annular seating surfaces and a plurality of bolt members disposed through openings positioned in spaced relationship about said annular seating surfaces which comprises:

a pressure rupturable member;

a pair of complementary supporting members adapted to fit between the pipe flanges and the bolt members thereof having central bores disposed therein for providing a flow passageway between the pipe flanges and for sealingly supporting said pressure rupturable member therebetween across said passageway, having annular seating surfaces to coact with the raised face annular seating surfaces of the pipe flanges and being of a size and shape such that portions of said supporting members extend radially outwardly beyond the boundaries of the raised face annular seating surfaces of the pipe flanges, said portions including complementary openings positioned therein; and

bolt members disposed within said complementary openings in said portions of said supporting members extending radially outwardly beyond the boundaries of the raised face seating surfaces of the pipe flanges for clamping said supporting members and said rupture disk together in preassembly.

4,073,403
PUSH-IN CAN TOP
A. C. Orange, 863 Lakehaven Drive, Sunnyvale, Calif. 94086
Filed July 19, 1976, Ser. No. 706,188
Int. Cl.² B65D *41/32*
U.S. Cl. 220—269 **1 Claim**



1. An easily openable end unit for a container or the like comprising an end panel, a weakening line in said end panel defining a tear panel at least partially removable out of the plane of said end panel, a grippable push-member for rupturing said end panel along said weakening line to push the end panel in a container-inward direction, and attachment means for joining said push-member to said tear panel, wherein said weakening line is substantially a figure of eight having a central portion bulging outwardly within said plane, wherein said push-member is a tab attached to said central portion, normally

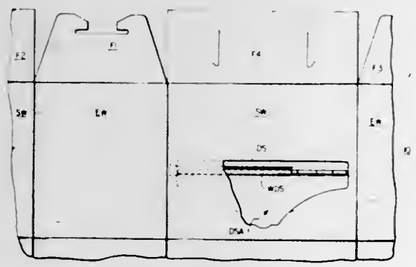
disposed substantially within said plane and liftable therefrom for pushing said tear panel in the container-inward direction and wherein the attachment means is a rivet, whereby upon said push-member being forced in the container-inward direction said tear panel is removed out of said plane.

4,073,404

DISPENSING CARTON FOR WRAPPED DRINKING STRAWS

James R. Brondyke, Finksburg, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Filed Sept. 27, 1976, Ser. No. 726,531
Int. Cl.² B65H *3/34*
U.S. Cl. 221—63 **8 Claims**



1. A dispensing carton for wrapped drinking straws having individual wrappers with tips extending beyond both ends of the straws, comprising:

an elongated hollow carton of a length substantially identical to the length of a drinking straw wrapper;

a plurality of wrapped drinking straws disposed in a mutually parallel stack lengthwise within said carton each said wrapped drinking straw comprising a straw and a tubular wrapper containing said straw, said tubular wrapper including closed end tips extending beyond the ends of said straw; and

an elongated dispensing slot defined in a sidewall of said carton and extending lengthwise thereof substantially parallel to said wrapped drinking straws;

said dispensing slot being of a length less than that of said drinking straw wrappers and greater than that of straws contained in said wrappers to preclude free passage of a said wrapped straw through said dispensing slot by engagement of said sidewall adjacent said slot by the said closed end tips of said wrappers.

4,073,405

GIFT-DISPENSING DEVICE

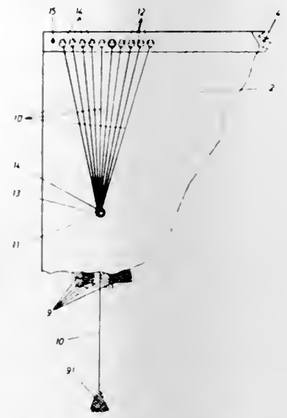
Gabriele Richter, nee Redomske, 8 Wiesenstrasse, D-5481 Remagen-Unkelbach, Germany

Filed Oct. 19, 1976, Ser. No. 733,754
Claims priority, application Germany, Aug. 10, 1976, 7625057[U]
Int. Cl.² A63F *9/00*
U.S. Cl. 221—89 **13 Claims**

1. A gift dispensing device for distributing gifts to children, particularly a replica of a figure which dispenses gifts during the Advent period, comprising:

a. a support upon the front of which a replica of a figure is exhibited with at least one arm;

b. a plurality of containers suspended from each arm;



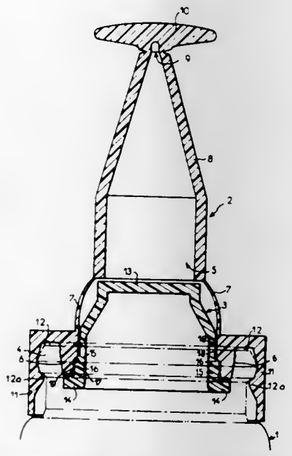
c. dispensing means disengageable with said support and connected to said containers for lowering said containers.

4,073,406

CONTAINER FOR STORING TWO PRODUCTS SEPARATELY AND DISPENSING A MIXTURE THEREOF

Antonin L. Goncalves, Groslay, France, assignor to L'Oreal, Paris, France

Filed Nov. 8, 1976, Ser. No. 740,066
Claims priority, application France, Nov. 17, 1975, 75 35033
Int. Cl.² B65D *35/22*
U.S. Cl. 222—94 **12 Claims**



1. In a container for storing a liquid product and at least one additional product separately, and for dispensing a mixture of said products, said container comprising:

a body for holding said liquid product,

a hollow cap for said body, said cap defining therewithin a chamber adapted to hold said additional product, and an orifice positioned between said chamber and the interior of said body when said cap is in position on said body, and

a separating plug adapted to seal said chamber off from said body,

the improvement which comprises:

an inner skirt formed in said cap encircling said orifice,

a deformable dome formed in said cap above said skirt, and

a relatively rigid dispensing spout connected to the top of said dome said spout being pivotable,

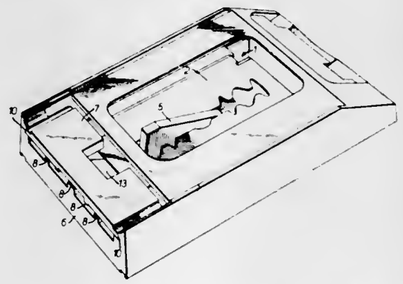
said plug having a lateral wall at least part of which is adapted to be gripped by said skirt and said plug projecting into said dome to an extent such that, when said spout is swung laterally, thus deforming said dome, a part of the spout is pressed against the plug to eject it from said skirt.

4,073,407

DISPENSING CONTAINER WITH FRANGIBLE WEBS

Harry Pentney, Spencers Wood, England, assignor to The Gillette Company, Boston, Mass.

Filed Aug. 16, 1976, Ser. No. 714,509
Claims priority, application United Kingdom, Aug. 15, 1975, 34148/75
Int. Cl.² B65D *83/10*
U.S. Cl. 221—102 **9 Claims**



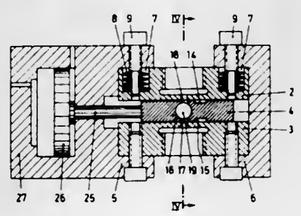
1. A dispensing container for double edged razor blades, comprising a storage compartment for a stack of blades and a dispensing opening at one end of the compartment, wherein the dispensing opening is defined by first and second portions of a single, integral moulding, which portions are substantially spaced apart in the moulded condition of the moulding, but are relatively movable into a final position in which they are closer together to define the dispensing opening, said first portion being fast with said compartment and said second portion being connected initially to the remainder of the moulding by thin webs which are readily frangible to permit displacement of the second portion into its final position.

4,073,408

APPARATUS FOR MIXING PLASTICS

Peter Rudolf Hartwig, Hilchenbach, Germany, assignor to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Germany

Filed Mar. 4, 1976, Ser. No. 663,870
Claims priority, application Germany, Apr. 10, 1975, 2515579
Int. Cl.² B67D *5/60*
U.S. Cl. 222—145 **4 Claims**



1. Apparatus for producing a chemical reactive mixture of two plastic components residing in a first and a second container, comprising:

(a) a main housing (5) having a cylinder bore in which is slidably mounted a first piston witha first piston rod extending out of the housing,

(b) a pair of plates (2, 3) fastened to the housing and having spaced parallel facing plane surfaces extending parallel to the axis of the first piston rod,

(c) a control member 4 fastened to the first piston rod and having opposed parallel planar surfaces which slide between the said facing surfaces, one of the plates being fixedly fastened to the housing, while the other plate is movable laterally of its plane surface, a mixing chamber bore extending through the member with its axis perpendicular to the axis of the first piston,

(d) resilient means pressing the said other plate toward the said one of the plates, thus clamping the control member firmly, and

(e) a cylinder integral with the control member with a second piston slidable therein and having a second piston rod slidable in the mixing chamber bore in the member,

(f) a pair of spaced passages through one of the plates for connection to the first container for providing a first plastic component to the exterior of one of the plates,

(g) a pair of spaced passages through the other of the plates for connection to the second container for providing a second plastic component to the exterior of the other of the plates,

(h) a transverse groove on each side of the control member for connecting each pair of passages on occasion, and

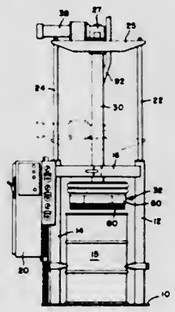
(i) a passage entering each side of the control member and leading to the mixing chamber bore, these passages lining up on occasion with one of each pair of spaced passages.

4,073,409

HOT MELT DISPENSER WITH REMOVEABLE PUMP IN FOLLOWER

James J. Gardner, and Hugh Paul Koppebele, both of Hamilton, Ohio, assignors to Fluid Kinetics, Inc., Fairfield, Ohio

Filed Jan. 12, 1977, Ser. No. 758,571
Int. Cl.² B67D *5/62*
U.S. Cl. 222—146 HE **7 Claims**



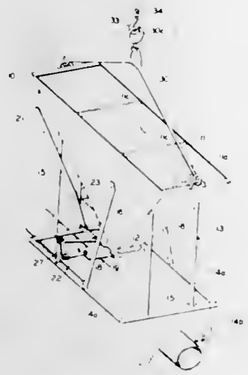
4. In a dispenser having a follower plate carried on a support tube, the improvement comprising means in said plate defining a pump receiving housing in generally axially alignment with said support tube, a cartridge-type gear pump having a cylindrical body received in said housing, means sealing said pump body at said housing, means in a lower end of said body defining a pump inlet to receive material to be dispensed, said pump being removable from said plate pump housing by sliding upwardly from said housing and through said support tube without otherwise disturbing said plate.

4,073,410

CONSTRUCTION FILLER MATERIAL DISPENSING APPARATUS

Herbert R. Melcher, P.O. Box 109, Pound, Wis. 54164

Filed Sept. 8, 1976, Ser. No. 721,472
Int. Cl.[2] B67D *5/06*
U.S. Cl. 222—181 **4 Claims**



1. Construction filler material dispensing apparatus suspendable from an overhanging vertical support, comprising:

a. a rectangular hopper having an open top and converging downwardly to a discharge opening at the bottom thereof which is substantially smaller than the open top of said hopper, the longitudinal dimension of the top of said hopper being greater than the lateral dimension thereof;

b. a support frame for supporting said hopper having a rectangular base and a plurality of support legs extending upwardly from attachment to said base to attachment to said hopper, said rectangular base including longitudinal members extending laterally outward beyond the rectangular top of said hopper and wherein said support legs include a lateral buttress leg on each side of said hopper attached at their bottoms to said longitudinal members and which extend upwardly and inwardly to attachment to said hopper, whereby said dispensing apparatus has substantial lateral stability when said hopper is supported on the ground by said support frame and said hopper may be maintained away from the sides of a trench by said outwardly extending rectangular base;

c. hanger means for suspending said hopper and frame from an overhanging vertical support when said hanger means is engaged thereto;

d. a slide gate mounted to said hopper at the bottom thereof and movable inwardly and outwardly to selectively cover said hopper bottom opening to control the discharge therethrough of construction filler material contained in said hopper;

e. a lever pivotally mounted to said hopper for rotation in a generally vertical plane; and

f. a linkage operatively connected to said lever and to said slide gate such that rotation of said lever about its pivotal mounting moves said slide gate to open or close said hopper bottom opening depending on the direction of rotation of said lever.

4,073,411

FREEZE-THAW STABLE EMULSION COOKWARE LUBRICANT

Charles Doumani, Los Angeles, Calif., assignor to Blue Cross Laboratories, Inc., North Hollywood, Calif.

Filed June 3, 1976, Ser. No. 692,485
Int. Cl.[2] C08L *91/00;* **C09K** *3/30;* **B65D** *83/14*
U.S. Cl. 222—192 **20 Claims**

1. A freeze thaw-, and hydrolysis-stable, water-in-oil emulsion composition of lecithin adapted for aerosol delivery onto cookware for cooking surface lubrication, said emulsion composition consisting essentially per 100 parts by weight of (a) an organic phase free of hydrocarbon liquids having a specific gravity above 0.80, which phase comprises in proportions to provide to the composition an Acid No. not higher than 12: from 1 to 10 parts of a lecithin having an Acid No. between 24 and 35; from 0 to about 8 parts of a vegetable oil having an Acid No. less than about 1; from about 2 to 7 parts of a liquid, saturated aliphatic compound having a specific gravity not higher than 0.75; a freeze thaw-stabilizing effective amount of an organic polyol having a molecular weight between about 76 and 360; and an emulsifying effective amount of an edible fatty acid ester emulsifier having an Acid No. not higher than 15; and (b) an inorganic phase comprising the balance to 100 parts of the composition, which inorganic phase comprises water.

4,073,412

EMULSIFIED COOKWARE LUBRICANT HAVING FREEZE-THAW STABILITY

Charles Doumani, Los Angeles, Calif., assignor to Blue Cross Laboratories, Inc., North Hollywood, Calif.

Filed June 3, 1976, Ser. No. 692,486
Int. Cl.[2] C08L *91/00;* **C09K** *3/30;* **B65D** *83/14*
U.S. Cl. 222—192 **19 Claims**

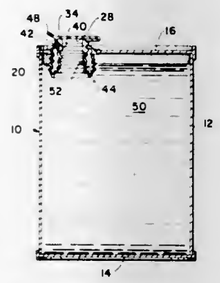
1. A freeze-thaw-stable water-in-oil emulsion composition of lecithin adapted for aerosol delivery onto cookware for cooking surface lubrication, said stabilized emulsion composition consisting essentially per 100 parts by weight of (a) an organic phase free of liquid alkanes having a specific gravity below 0.75, which phase comprises in proportions to provide to the composition an Acid No. not higher than 12: from 1 to 10 parts of a lecithin having an Acid No. between about 24 and 34; from about 0 to about 8 parts of vegetable oil having an Acid No. less than about 1: from 1 to 12 parts of a mineral oil having a specific gravity above 0.80, and an emulsifying effective amount of an edible fatty acid ester emulsifier having an Acid No. not higher than 15; and up to 90 parts of an inorganic phase comprising the balance to 100 parts of the composition, which phase comprises water.

4,073,413

DISPENSING APPARATUS WITH SELF CONTAINED SPOUT

Herman L. Tabler; Regine M. Tabler, and Edwin L. Lokey, all of 313 Ellsworth Place, Oxon Hill, Md. 20024

Filed June 10, 1976, Ser. No. 694,802
Int. Cl.[2] B65D *25/44*
U.S. Cl. 222—529 **5 Claims**



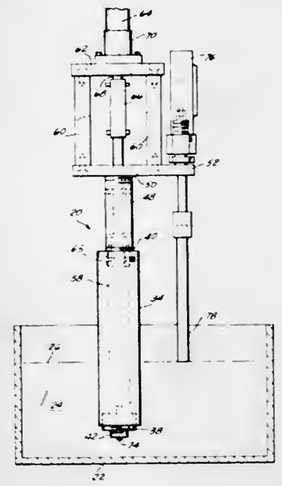
1. A dispensing apparatus with self contained spout comprising a container, an opening in said container, a flexible corrugated elongated cylindrical tubular spout, one end of said corrugated spout fixedly secured to the interior surface of said container surrounding said opening, openable closure means for selective closure of the other end of said corrugated spout, said other end of said corrugated spout passing through said opening and residing outwardly from the exterior surface of said container adjacent said opening, first portion of the length of said corrugated spout being disposed residing within second portion of said length of said corrugated spout when said other end of said corrugated spout is disposed in an adjacent position to said exterior surface, said first portion of the length of said corrugated spout being disposed outwardly and adjacent to said second portion of the length of said corrugated spout when said other end of said corrugated spout is disposed outwardly from said adjacent position, spout locking means for removably locking said corrugated spout in said everted position, said spout locking means including a second flange, said second flange fixedly secured adjacent said other end of said corrugated spout and extending radially outwardly therefrom, a third flange, said third flange being fixedly secured to said exterior surface surrounding said opening and extending radially inwardly therefrom, said second flange being disposed intermediate said third flange and the interior confines of said container when said other end of said corrugated spout is disposed in said adjacent position.

4,073,414

AUTO CRUCIBLE FOR METERING AND TRANSFERRING LIQUID METALS

H. Gary Garab, Rensselaer, N.Y., assignor to Albany International Corporation, Albany, N.Y.

Filed Aug. 9, 1976, Ser. No. 712,938
Int. Cl.[2] B22D *39/00, 41/10*
U.S. Cl. 222—602 **15 Claims**



1. A device for metering and transferring liquid metals comprising:

a support structure;

a hollow sleeve on the supporting structure and an opening at both ends;

a pouring spout on one end and having an orifice therethrough communicating with the hollow interior of the sleeve;

a stopper rod extending into the sleeve from the other end thereof to be shiftable between a position seating on the pouring spout and sealing the orifice therein and a position removed from the pouring spout to permit liquid metal to flow into and out of the hollow sleeve, the stopper rod and the pouring spout having mating surfaces thereon to facilitate sealing engagement therebetween when the stopper rod is in the seating position to prevent leakage;

means for shifting the stopper rod between positions the means for shifting the stopper rod between positions including axial drive means and rotary drive means to permit the stopper rod to be rotated with respect to the pouring spout and sleeve and to be axially shifted with respect to the pouring spout and sleeve and operating so that when the stopper rod is directed into mating engagement with the pouring spout it will be both axially and rotatably brought into mating engagement thereby facilitating sealing of the stopper rod and pouring spout to prevent leakage;

means for transferring the device into and out of a container of liquid metal with the stopper rod being in the seated position on the pouring spout during insertion into the liquid metal to facilitate prevention of accumulation of undesirable materials within the hollow sleeve during the insertion into the liquid metal to the desired depth;

means for cleaning the orifice and for preventing undesirable materials from collecting in the orifice including the end of the stopper rod adjacent the pouring spout having a small diameter tip portion extending therefrom of a predetermind length so that when the stopper rod is seated in sealing position on the pouring spout the tip will extend through the orifice in the pouring spout thereby guarding against the accumulation of foreign matter in the orifice while the device is being transferred into a container of liquid metal, and when the stopper rod is removed from the seating position on the pouring spout the tip will be removed therefrom to permit liquid metal to freely flow through the orifice in the pouring spout and the tip acting to remove any collection of undesirable material from the orifice upon reinsertion therein as it is rotated and axially moved with the stopper rod as the stopper rod is reseated on the pouring spout.

4,073,415

GARMENT HANGER SECURITY DEVICE

Frank Raymond Pegg, Taurus House, Kingfield Road, Coventry West Midlands, England

Filed Nov. 8, 1976, Ser. No. 739,805
Claims priority, application United Kingdom, Nov. 12, 1975, 46807/75
Int. Cl.[2] A47J *51/093*
U.S. Cl. 223—92 **4 Claims**



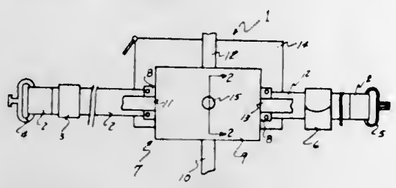
1. A garment hanger with means for securing a garment thereto, said garment hanger comprising a central body; a pair of oppositely directed horizontal arms extending from said central body; a central suspension hook attached to said central body and extending away therefrom, said central suspension hook having a terminal upper end part; a strong, flexible means permanently and securely attached at one end to said upper end part of said central suspension hook, said means being of a sufficient length so that it can pass through the sleeve of a garment when the garment is hung on said horizontal arms of said garment hanger; a pin permanently and securely attached to the second end of said strong, flexible means; and a key-operated lock means permanently and securely attached to said central body for receiving said pin; whereby when a garment is hung on said garment hanger and said garment hanger hung on a rail by means of said central suspension hook, and when said strong, flexible means is passed through a sleeve of said garment, said pin is placed in said lock means, said garment is securely connected to said garment hanger and said garment hanger is securely connected to said rail.

4,073,416

CARRYING BELT FOR CB RADIOS AND SIMILAR DEVICES

Kenneth McComber, 2994 Foxwood, Bridgeton, Mo. 63042

Filed Aug. 6, 1976, Ser. No. 712,354
Int. Cl.² A45F *5/00*
U.S. Cl. 224—5 H **3 Claims**



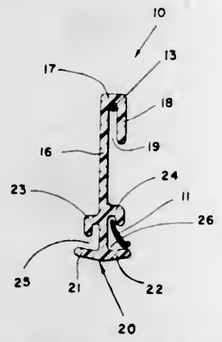
1. A CB carrying belt comprising,
adjustable belt means,
securing means operably mounted on each end thereof,
pocket means mounted on said belt means,
harness means mounted on said belt means, said harness means comprising,
pivotal mounting means operably mounted on said belt means,
pad means operably mounted on said pivotal mounting means so as to allow pivoting of the pad in a plane parallel to said belt means,
a plurality of belt means operably attached to said pivotal mounting means, said point of attachment being disposed between said pad and said belt means, the free ends of said belt means being disposed about the edges of said pad means and secured to ring means disposed on the side of said pad means opposite to said belt means, one of said belt means being provided with snap means on its free end and said snap means connected to said ring means.

4,073,417

VEHICULAR ANTENNA HOLD DOWN BRACKET

Leon F. Fulmer, Sr., Newberry, S.C., assignor to Shakespeare Company, Columbia, S.C.

Filed June 1, 1976, Ser. No. 691,498
Int. Cl.² B60R *11/00*
U.S. Cl. 224—42.1 G **4 Claims**



1. A unitary bracket for holding down a flexible antenna of the type mounted on vehicles, the vehicles having gutter strips thereon the configuration of which may vary from vehicle to vehicle, the bracket comprising an elongate body portion, first fluke means formed on one end of said body portion and engagable with the top of a gutter strip of a first configuration, first wedge means opposed to said first fluke means and engagable with the gutter strip of said first configuration near the bottom thereof to form with said first fluke means a recess for the gutter strip of said first configuration, second fluke means formed on said one end of said body portion and engagable with the top of a gutter strip of a second configuration, second wedge means opposed to said second fluke means and engagable with the gutter strip of said second configuration near the bottom thereof to form with said second fluke means a recess for the gutter strip of said second configuration, said recess for the gutter strip of said second configuration being of lesser longitudinal extent than said recess for the gutter strip of said first configuration, and means formed on the other end of said body portion adapted to receive and hold the antenna.

4,073,418

HOLDER FOR ARTIST PAINT TUBES

Harold C. Edson, 1449 W. 17th, Davenport, Iowa 52804

Filed Feb. 28, 1977, Ser. No. 772,525
Int. Cl.² A45C *11/00*
U.S. Cl. 224—45 R **1 Claim**



1. A holder comprising a pair of hinged rigid jaw members, said jaw members having deeply depressed central portions, a pair of handles connected to said jaw members,
a gripping pad of cushioning material positioned within each of said deeply depressed central portions of said jaw members for holding tubes containing a paste, said gripping pads while said jaw members are closed providing a central opening therebetween, said central opening having a substantially smaller cross section than that of a tube that is to be held between said gripping pads, each of said gripping pads having substantial thickness between the boundary of said opening and said respective jaw members,
at least one of said gripping pads being removably secured to said respective jaw member to facilitate changing pads with cushions of different thickness, said removable gripping pad having an inner thin stiff supporting member conforming to said deeply depressed central portion of said respective jaw member and having on each side thereof a flange extending circumferentially outwardly over the adjacent side of said respective jaw member, said inner stiff supporting member having sufficient elasticity to urge said flanges inwardly tightly against the sides of said respective jaw member to secure said inner stiff supporting member, at least one of said flanges having a slot as a keyway through the rim thereof, and a pin as a key extending through said keyway from the adjacent side of said respective jaw member.

4,073,419

THREAD STORAGE AND DISPENSING SYSTEM

Emanuel B. Tarrson; Steven Tisma, both of Stream Wood, and Donald Ritch, Nile, all of Ill., assignors to John O. Butler Company, Chicago, Ill.

Filed Apr. 19, 1976, Ser. No. 678,138
Int. Cl.² B26F *3/02*; B65H *35/10*
U.S. Cl. 225—44 **10 Claims**

6. A thread holder comprising a two part shell, each of said parts comprises a generally cylindrical container having an open end, said containers snapping together at their open ends, the rim of one of said parts flaring outwardly to form a cylindrical section and the rim of the other of said parts telescopingly fitting into said cylindrical section, an opening formed in the rim of at least one of said parts to enable the thread to pass out of said holder, one of said parts being closed by a closure plate having at least one semipierced detent formed thereon for cutting and anchoring the thread, the other of said parts including a platform for supporting one end of a spool to enable a rotation of said spool inside said holder with a minimum amount of friction between the spool and the holder, and said one part including means for contacting and dragging with predetermined friction against the top of the spool, the friction being great enough to prevent an unwanted and random unwinding of the spool of thread and yet small enough to preclude any substantial opposition to a desired withdrawal of thread, said dragging means comprises a spider assembly including a plurality of arms interspersed with a plurality of fingers spaced around the circumference of the part in which said assembly is positioned, one of said fingers being disposed between each adjacent pair of said arms and adapted to drag with predetermined friction against the top of the spool.

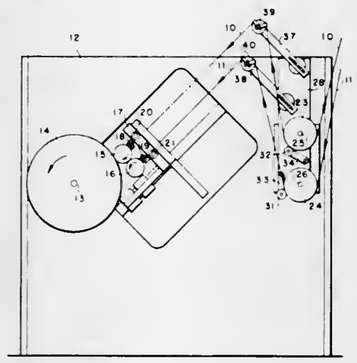


4,073,420

PULL ROLL APPARATUS

John R. Tolan, South Bend, Ind., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 616,500, Sept. 24, 1975, abandoned. This application Dec. 16, 1976, Ser. No. 751,516
Int. Cl.² B65H *25/04*
U.S. Cl. 226—42 **2 Claims**



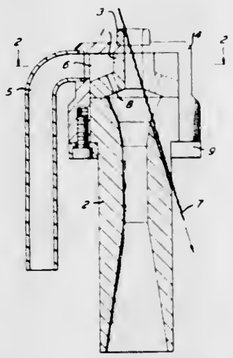
1. Apparatus to supply a plurality of continuous cords to a drum comprising:
a frame;
a drum rotatably mounted on said frame;
a first pulley member having a groove around its outer periphery pivotably mounted on said frame;
a second pulley member having a groove around its outer periphery pivotably mounted on said frame;
a first arm mounted on said first pulley;
a second arm mounted on said second pulley;
a third pulley rotatably mounted on said first arm at one end thereof;
a fourth pulley rotatably connected to said second arm at one end thereof;
a first drive sprocket operably connected to said first arm at the end opposite to said third pulley;
a second drive sprocket operably connected to said second arm at the end opposite to said fourth pulley;
a first roll means for supplying continuous cord over said third pulley to said drum;
a second roll means for supplying a continuous cord over said fourth pulley to said drum;
biasing means biasing each arm against the traction of said cord, each said biasing means including a pin member disposed within the groove of said pulley member, a spring member one end of which is attached to said pin member the other end of which is attached to said frame;
a separate drive means for each of said rolls, each said drive means including a one-way clutch means;
a first potentiometer, having a shaft and operably connected with the drive means for first roll;
a second potentiometer, having a shaft and operably connected with the drive means for said second roll;
a first driven sprocket mounted on the shaft of the first potentiometer;
a second driven sprocket, mounted on the shaft of said second potentiometer;
a first chain means connecting the first driven sprocket to the first drive sprocket; and
a second chain means connecting the second driven sprocket to the second drive sprocket.

4,073,421

APPARATUS FOR PICKING UP RAPIDLY RUNNING FILAMENTS

Christian Reufer, Nottwil, Switzerland, assignor to Viscosuisse SA, Emmenbrucke, Switzerland

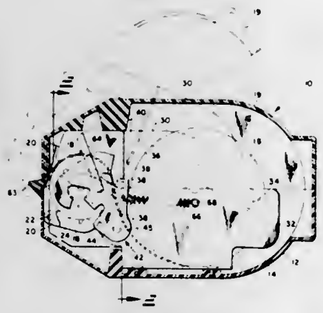
Filed Apr. 2, 1975, Ser. No. 564,235
Claims priority, application Germany, Apr. 22, 1974, 2419298
Int. Cl.² B65H *17/32*
U.S. Cl. 226—97 **6 Claims**



1. In an apparatus for picking up rapidly running filaments comprising an ejector operated by compressed air, said ejector having propulsion jets therein and a propulsion tube leading therefrom, said ejector having an inlet opening disposed above said propulsion jets and an outlet at the end of said propulsion tube, the improvement comprising a lateral lead-in passage formed in the body of said ejector for receiving filaments, said passage providing a path for filaments to be picked up, said path being inclined to the longitudinal axis of the ejector, and said path extending from said inlet opening of the ejector, passing the exit openings of the propulsion jets and leading laterally from said propulsion tube, said propulsion jets being disposed in a generally circular pattern around the interior of

said propulsion tube and adjacent said inlet, the exit openings of said propulsion jets being disposed generally about a single plane passing transversely of the longitudinal axis of said ejector.

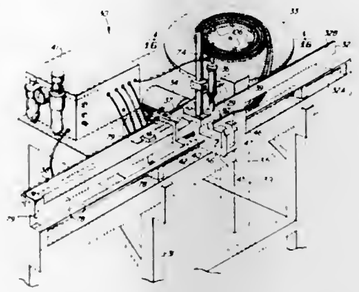
4,073,422
TICKET DISPENSER
Herman Palter, University Heights, Ohio, assignor to Service Sequence Systems, Cleveland Heights, Ohio
Filed Jan. 24, 1977, Ser. No. 761,717
Int. Cl.² B65H *17/26*
U.S. Cl. 226—129 **14 Claims**



1. A ticket dispenser comprising a housing, said housing including a chamber therein for locating a roll of tickets to be dispensed therein, roller means having a plurality of gripping means thereon for gripping tickets on the roll of tickets to effect a positive displacement of a ticket from said chamber in said housing upon rotation of said roller means, cyclicable actuating means for effecting rotation of said roller means to thereby dispense the ticket, and means operatively connected to said roller means and engageable with said actuating means to enable said actuating means to rotate said roller means to dispense a ticket upon movement of said actuating means through a single cycle, said actuating means upon movement through a single cycle effecting rotation of said roller means a first predetermined amount and then positively stopping said roller means in a predetermined position and then effecting rotation of said roller means a second predetermined amount and then positively stopping rotation of said roller means, said means operatively connected to said roller means including a plurality of projections operatively connected to said roller means for rotation therewith and said actuating means includes a plurality of tabs for sequentially engaging said plurality of projections upon movement of said actuating means through a cycle to effect rotation of said roller means a first predetermined amount and then positively stop rotation of the roller means in a predetermined position and then effect rotation of said roller means a second predetermined amount and then positively stop rotation of said roller means.

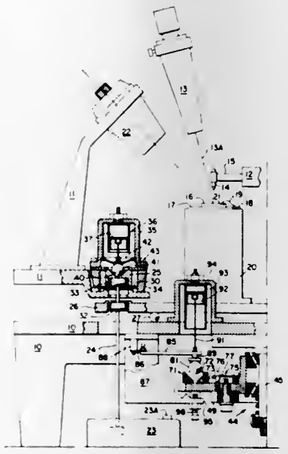
4,073,423
FURNITURE CLIP ATTACHMENT DEVICE
Herbert A. Omley, Wickenburg, Ariz., assignor to Omley Industries, Inc., Wickenburg, Ariz.
Filed Jan. 3, 1977, Ser. No. 756,017
Int. Cl.² B27F *7/00*
U.S. Cl. 227—7 **6 Claims**

1. An automatic driving mechanism for attaching clips used for securing one end of a spring to a furniture frame member comprising:
a frame,
a rail assembly mounted on said frame for guiding an elongated piece of lumber across said frame,
means mounted on said frame for supporting a strip of sequentially interconnected clips,
piston means for reciprocally moving laterally to and from said rail assembly,
clip feeding means for moving the free end of said strip of clips longitudinally of said rail assembly with the foremost clip fed in front of said piston means,
said piston means shearing a clip from said strip and sequentially driving it into the piece of lumber,
circuit means comprising a portion mounted to extend longitudinally of said rail assembly,



means movable along at least a part of said rail assembly and actuated by a piece of lumber moving therealong for periodically completing during its movement an electrical circuit through said circuit means,
the completion of said circuit actuating said piston means for engaging a clip moved into its path of movement, shearing it from the strip of clips, and driving it laterally across at least a part of said rail assembly into the piece of lumber moved along said rail assembly into the path of movement of the severed clip.

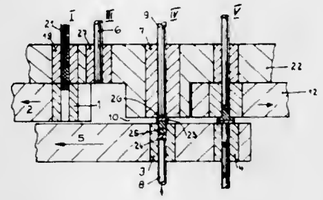
4,073,424
SECOND BOND POSITIONING WIRE BONDER
Frederick W. Kulicke, Jr., Philadelphia; Albert Soffa, Wynnewood, both of Pa.; Dan Vilenski, and Asher Brockmann, both of Haifa, Israel, assignors to Kulicke and Soffa Industries Inc., Horsham, Pa.
Filed Aug. 17, 1976, Ser. No. 715,042
Int. Cl.² H01L *21/60*
U.S. Cl. 228—4.5 **20 Claims**



1. A wire bonding machine of the type having a second bond positioning apparatus comprising:
a rigid frame,
a movable platform supported on said rigid frame,

a manipulator operably connected to said rigid frame for positioning said movable platform in a horizontal plane to a plurality of different first and second bonding positions,
means for disabling said manipulator from its operable connection to said rigid frame,
second bond positioning means comprising a movable frame mounted on said rigid frame and having a plurality of individually adjustable positioning devices thereon,
second bond position actuating means mounted on said movable platform and adapted to cooperate with said individual adjustable positioning devices on said movable frame, and
control means for activating said second bond position actuating means and said means for disabling said manipulator from its operable connection to said rigid frame, whereby said movable table is positioned to one of said plurality of second bond positions defined by said second bond positioning means.

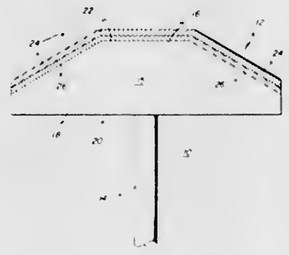
4,073,425
METHOD OF AND APPARATUS FOR MANUFACTURING DOUBLE CONTACT RIVETS
Erwin Bollian, Rastatt, Germany, assignor to Eugen Durrwachter Doduco, Pforzheim, Germany
Filed Dec. 2, 1976, Ser. No. 747,044
Claims priority, application Germany, Dec. 11, 1975, 2555697
Int. Cl.² B23K *21/00*; B21K *1/62*
U.S. Cl. 228—116 **6 Claims**



1. A method of manufacturing double-contact rivets which rivets consist of a support material and materials for the electrical contact providing parts different from said support material, said method comprising the steps of:-
(a) forming three cylindrical sections from supply sources, one section of which is formed from said support material and the others from electrical-contact material;
(b) aligning the three sections to form a basic body, with outer sections of electrical-contact material on either side of a central support material section;
(c) cold welding, at the adjoining ends, a first outer section of the basic body to the central section so that a weld bead is formed;
(d) pressing said weld bead in an axial direction to a substantial flat form and rapidly cooling said pressed bead;
(e) cutting-off said pressed weld bead from the remainder of the basic body;
(f) cold welding the other outer section of electrical-contact material to the central section of support material; and
(g) forming a contact head at the end of the basic body including said other outer section.

4. Apparatus for manufacturing double-contact rivets which rivets consist of a support material and materials different from said support material for the electrical contact providing parts of the rivet, said apparatus comprising:-
(a) means for forming three cylindrical sections from supply sources, one section being formed from support material and the other sections being formed from electrical-contact material;
(b) means for aligning the three sections to form a basic body with outer sections of electical-contact material on either side of a central section of support material;
(c) first welding means for cold welding a first outer section of the basic body to the control section so that a weld bead is formed;
(d) means for pressing said weld bead in an axial direction;
(e) means for cutting-off said pressed weld bead from the remainder of the basic body;
(f) second welding means for cold-welding the other outer section to the central section; and
(g) means for forming a contact head at the end of the basic body including said other outer section; said pressing means comprising an axially-movable die and a sleeve member for receiving the basic body facing and aligned with said die, a gap being provided between said die and said sleeve member to permit the formation of the weld bead, the die being adapted to hold the bead against the sleeve member during bead cutting.

4,073,426
METHOD FOR JOINING AN ANODE TARGET COMPRISING TUNGSTEN TO A GRAPHITE SUBSTRATE
Thomas M. Devine, Jr., Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Apr. 18, 1977, Ser. No. 788,244
Int. Cl.² B23K *31/02*
U.S. Cl. 228—122 **21 Claims**

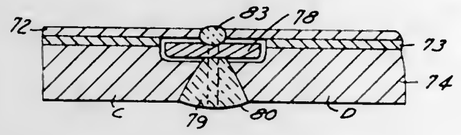


1. A method for joining an anode target to a graphite substrate of a disc for use in a rotating x-ray anode tube comprising the process steps of
a. preparing a graphite substrate for assembling an anode target to a preselected surface area thereof;
b. disposing a layer of a metal of a predetermined thickness on the preselected surface area of the substrate, the layer of metal having a predetermined thickness and comprising a metal selected from the group consisting of rhodium, osmium, ruthenium, platinum, palladium and an alloy of platinum and chronmium, wherein chromium is present in amounts up to about 1 percent by weight;
c. disposing an anode target on the layer of metal, the anode target comprising a metal selected from the group consisting of tungsten and a tungsten-rhenium alloy wherein rhenium is present in amounts up to about 25 percent by weight;
d. preheating the substrate, layer of metal and anode target in a controlled atmosphere at a first elevated temperature of from about 600° to about 900° C for a predetermined period of time;
e. heating the substrate, the metal layer and the anode target to a second elevated temperature of from about 1770° to 1830° C for a predetermined period of time up to 5 minutes in a controlled atmosphere to braze the anode target to the preselected surface area of the substrate, and
f. cooling the substrate, metal layer and anode target in a controlled atmosphere to a low enough temperature to permit exposure to the atmosphere.

4,073,427
LINED EQUIPMENT WITH TRICLAD WALL CONSTRUCTION

Hibbard G. Keifert, Torrance, Calif., and Einar R. Jenstrom, Bridgewater, N.J., assignors to Fansteel Inc., North Chicago, Ill.

Filed Oct. 7, 1976, Ser. No. 730,347
Int. Cl.² B23K 31/02; F16B 5/08
U.S. Cl. 228—165 16 Claims

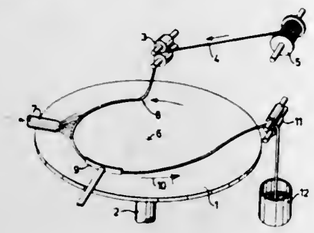


1. A joint for a wall assembly comprising:
(a) abutting edges of a composite wall of a first layer of a first metallic material, an intermediate layer of a second metallic material, and a third layer of a third metallic material, with one face of the first and third materials in a face-to-face relation with a face of the second material, and a channel formed in an area adjacent the edges of the first and third layers extending into the intermediate layer between the first and third layers, the third layer being metallurgically incompatible with and not directly weldable to the first layer,
(b) an inlaid insert of a material selected from metals and alloys comprising titanium, zirconium, hafnium, tantalum, columbium, and vanadium in said channel bridging the abutting edges of and supported between the first and third layers in the area adjacent the abutting edges.
(c) a fusion weld joining the edges of the first layer of the wall assembly to each other, and
(d) a fusion weld joining the edges of the third layer of the wall to each other and to said inlaid insert.

4,073,428
METHOD AND APPARATUS FOR CONTINUOUSLY SOLDERING OF CHAINS OF PRECIOUS METALS OR PLATED THEREWITH

Hans Gustav Erik Wahlbeck, Nybble, S-150 32 Stallarholmen, Sweden

Filed Apr. 8, 1976, Ser. No. 675,229
Claims priority, application Sweden, Apr. 11, 1975, 7504197
Int. Cl.² B23K 1/00
U.S. Cl. 228—178 15 Claims



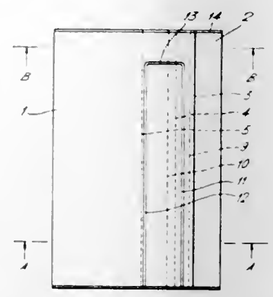
1. Method of continuously soldering the abutting ends of links of chains of precious metals, comprising applying solder at the said abutting ends of each link, feeding and placing the said chain downwardly onto a moving substantially horizontal surface at a speed which is slightly greater than the movement of said surface whereby said links are placed on said surface and pushed into each other, heating said chain on said surface to a temperature at which said solder melts, and removing said heated chain from said surface.

8. Apparatus for continuously soldering the abutting ends of links of chains of precious metals whereby solder is applied to said abutting ends, comprising rotatable horizontal plane means upon which said chain can be continuously placed, feed means for feeding said chain onto said plane means, said feed means having feed control means, and heating means.

4,073,429
PLASTICS BAG

Norman Edward Lawes, Yarm, England, assignor to Imperial Chemical Industries Limited, London, England

Filed June 21, 1976, Ser. No. 698,220
Claims priority, application United Kingdom, July 3, 1975, 28046/75; Aug. 6, 1975, 32850/75; Jan. 23, 1976, 2696/76
Int. Cl.² B65D 31/14
U.S. Cl. 229—62.5 10 Claims

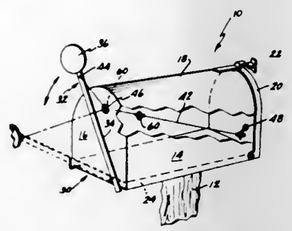


1. A valved bag formed from a length comprising two plies of plastics film, the length being folded and joined to provide a bag having one wall formed by overlapping panels, the ends of the bag being closed and the overlapping panels being joined together by a longitudinal seal located along the edge region of the outer panel, the longitudinal seal being interrupted to provide a valve opening with transverse seals at each side of the valve opening defining a passageway constituting a filling valve between the panels, the outer panel comprising the two plies with their edges coextensive and the inner panel comprising the two plies together with at least one layer of flexible material in addition to said two plies at least throughout the valve region, the two plies and the additional layer which comprise the inner panel being arranged with their edges staggered such that all three edges may contact the inner ply of the outer panel, the additional layer being joined to the two plies of the inner panel at least by the transverse seals and being located with at least one of the plies of the inner panel lying between the additional layer and the outer panel in the area of overlap.

4,073,430
MAILBOX SIGNAL

Albert P. Joris, 80 Maple St., White Cloud, Mich. 49349

Filed Oct. 26, 1976, Ser. No. 735,800
Int. Cl.² B65D 91/00
U.S. Cl. 232—35 18 Claims

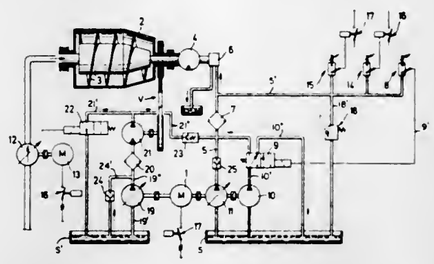


1. A mailbox signaling device for inclusion on a receptacle for receiving mail of the type having top, side, end and bottom portions and a closure movably mounted over an aperture in the receptacle for access to the receptacle interior, said device comprising a signaling member having a signal portion at one end thereof; pivot means for pivotally securing said signaling member to one portion of a mail receptacle of the stated type; elongated, flexible connecting means having opposite ends for extending through the interior of the mail receptacle and outwardly of the receptacle for connection to said signaling member; means for mounting said connecting means for sliding movement including an aperture in the mail receptacle which opens from the interior to the exterior thereof; first means for attaching one of said ends of said connecting means to said signaling member at a location spaced along said signaling member from said pivot means; and second means for releasably securing the other of said ends of said connecting means to an interior surface of the receptacle closure such that said other end will be released when the closure is moved to its open position; said flexible connecting means extending from said closure through said receptacle interior, said aperture and connected to said location on said signaling means with said first means and having an overall length and strength sufficient to hold said signaling member in a raised, visible position such that at least a portion thereof is visible above the top of said receptacle when said releasable second means is secured to said interior surface of the closure and the closure is in its closed position, said raised, visible position being such that release of said second means from said closure will cause said signaling member to drop by gravity to a lower fallen position while pulling a portion of said flexible connecting means through said aperture, whereby opening the closure releases said second means and connecting means and allows said signaling means to pivot downwardly to a fallen position indicating the closure has been opened.

4,073,431
SOLID JACKET WORM CENTRIFUGE WITH RPM DIFFERENTIAL VARIABLE COUPLING BETWEEN JACKET PART AND WORM PART

Ernst Adolf Jäger, Vilsbiburg, Germany, assignor to Flottweg-Werk Dr. Georg Bruckmayer GmbH & Co. KG, Germany

Filed Nov. 18, 1976, Ser. No. 743,077
Claims priority, application Germany, Nov. 18, 1975, 2551788
Int. Cl.² B04B 1/20, 9/10
U.S. Cl. 233—7 18 Claims

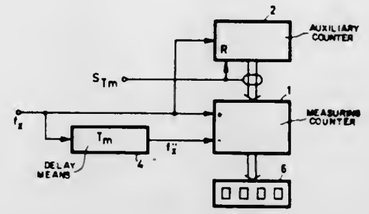


1. A solid-shell screw-conveyor centrifuge which includes a shell and a screw rotating at differential speeds, a drive means for driving one of the shell and screw and a hydraulic motor for driving the other of the shell and screw, and rotary transmission means for supplying a pressure medium to the hydraulic motor, characterized in that the drive means is a second hydraulic motor, which, in a first operating condition, drives one of the screw and the shell and, in a second operating condition, is driven by one of the shell and screw so as to function as a pump, said second hydraulic motor including a pump discharge means, means are provided for communicating said pump discharge means with a pressure medium supply conduit for the rotary transmission means and the first hydraulic motor, and in that control means are provided for controlling the communication between the pump discharge means and the pressure medium supply conduit.

4,073,432
CIRCUIT ARRANGEMENT FOR DETERMINING THE AVERAGE VALUE OF A FREQUENCY

Gerd Schröder, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 12, 1976, Ser. No. 741,213
Claims priority, application Germany, Nov. 20, 1975, 2552079
Int. Cl.² G01R 23/02; G06M 3/14
U.S. Cl. 235—92 FQ 9 Claims

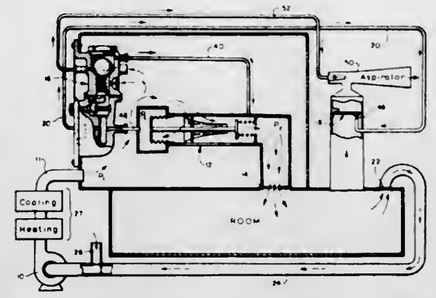


1. A circuit arrangement for determining the average value of the frequency of a measuring signal during a directly preceding time interval of predetermined constant duration comprising, a delay means providing a delay equal to said time interval, a measuring counter having a count-up input which receives a substantially undelayed measuring signal and having a count-down input which receives the measuring signal after being delayed by the duration of the time interval in said delay means, the count in said measuring counter being a measure of the average of the frequency of the measuring signal in the relevant preceding time interval, an auxiliary counter having a count input which receives the substantially undelayed measuring signal, and means for applying a time control signal, which recurs at an interval equal to said predetermined time interval, to the auxiliary counter so that the count of the auxiliary counter is transferred to the measuring counter and immediately thereafter sets the auxiliary counter to zero.

4,073,433
CONTROL APPARATUS FOR WARM UP CYCLE OF AIR DISTRIBUTION SYSTEM

Edward Modes, Deerfield, Ill., assignor to Powers Regulator Company, Skokie, Ill.

Filed July 22, 1976, Ser. No. 707,900
Int. Cl.² F24F 11/04
U.S. Cl. 236—49 14 Claims



1. An apparatus for controlling the ambient temperature in an enclosed area by regulating the flow of variable-pressure, conditioned air into said enclosed area, said apparatus comprising:
pressure regulator means having a pressure chamber for converting a portion of said variable pressure air to sub-

stantially constant pressure air provided in said pressure chamber;

signal generating communicating with said pressure chamber means for generating a pressure signal indicative of said ambient temperature, and including means for sensing said ambient temperature;

an air volume controller for metering said variable-pressure, conditioned air to said enclosed area, said pressure signal acting directly on said air controller; and

overriding means interacting with said pressure regulator means for overriding said signal generating means by reducing the pressure in said pressure chamber to a sufficiently low level so that said pressure signal is at a minimum value regardless of the ambient temperature, whereby said controller provides maximum flow of variable pressure air to said area independently of said ambient temperature sensing means, said overriding means being activated upon the introduction of variable pressure air having a temperature substantially different from that normally used.

4,073,434

SYSTEM FOR HEATING BUILDINGS

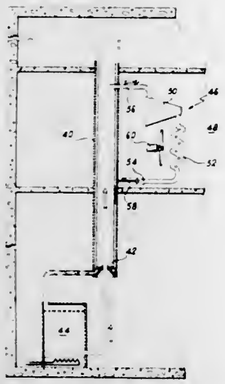
Maurice Dumont, St-Ismier, and Gérard Marie, Eybens, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed July 29, 1976, Ser. No. 709,944

Claims priority, application France, Aug. 5, 1975, 75 24405

Int. Cl.[2] G05D *23/00*

U.S. Cl. 237—2 B **2 Claims**



1. A system for heating buildings, wherein said system comprises:

at least one vertical heating duct through which is passed an upward stream of vapor and a downflowing stream of condensate,

heating units placed in each of the premises to be heated and each comprising a compressor which is connected to one of the heating ducts at the upstream end by means of a branch pipe for drawing-off vapor, a condenser which is connected to said compressor and an expansion valve which is connected to said one of the heating ducts by means of a condensate return pipe,

at the lower end of the heating duct, a liquid-vapor separator which collects the condensate and is followed by an evaporator which delivers vapor to the central portion of the heating duct, said evaporator being supplied from an external heat source.

4,073,435

RAILWAY RAIL-FASTENING CLIP AND A RAILWAY RAIL-AND-FASTENING ASSEMBLY EMPLOYING IT

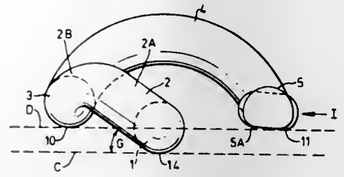
David William Miller, Retford, England, assignor to Pandrol Limited, London, England

Filed Nov. 4, 1976, Ser. No. 738,963

Claims priority, application United Kingdom, Nov. 7, 1975, 46281/75

Int. Cl.[2] E01B *9/30*

U.S. Cl. 238—349 **12 Claims**



1. A railway rail-fastening clip comprising a rod of resilient metal with a length less than 18 times its thickness which has been bent so as to have, progressing from one end of the rod to the other end, a first portion which starts at said one end of the rod and is a substantially straight leg, then a second portion, then a third portion, then a fourth portion and finally a fifth portion which ends at said other end of the rod, these portions being such that, when the clip is in a particular position, the lowermost points on the opposite ends of the first portion are in the same horizontal plane as one another and the lowermost points on the third and fifth portions are in the same horizontal plane as one another, and the second portion, proceeding from the first portion to the third portion, has a rising part followed by a falling part and when the clip is viewed from above the third and fifth portions appear to be on opposite sides of the axis of the first portion and when the clip is viewed in a horizontal direction parallel to a straight line passing through the lowermost points on the opposite ends of the first portion, said rising part of the second portion is seen to be inclined to the horizontal by, everywhere, less than 45°.

4,073,436

MIXING AND/OR DISPERSING AND SPRAYING ARRANGEMENT

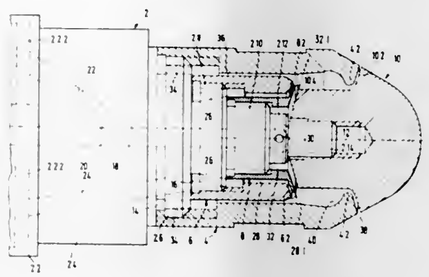
Hans Behr, Lenzhalde 82, 7000 Stuttgart, Germany

Filed Apr. 22, 1976, Ser. No. 679,377

Claims priority, application Germany, Apr. 22, 1975, 2517715

Int. Cl.[2] B05B *7/00*

U.S. Cl. 239—8 **46 Claims**



1. An arrangement for mixing and/or spraying and dispensing a multi-component fluid material through a nozzle means, the arrangement comprising:

at least one bore means arranged in the nozzle means and exclusively associated with a single component of the multi-component fluid material for directing a flow of the respective components of the multi-component fluid material in the nozzle means,

annular chamber means for exclusively receiving and accommodating a single component of the multi-component fluid material, said bore means for the respective components of the multi-component fluid material terminating in a respective annular chamber means,

at least one annular dispersion and mixing chamber means for receiving and accommodating the respective components of the multi-component fluid material,

approximately radially extending discharge passage means for discharging the respective components from the respective annular chamber means to said dispersion and mixing chamber means,

means extending axially of the nozzle means for directing a dispersing medium into the dispersion and mixing chamber means to transform the components therein into at least one of a mist and aerosol, and

an essentially radial annular discharge means communicating with said dispersion and mixing chamber means for discharging the fluid material from said dispersion and mixing chamber means.

4,073,437

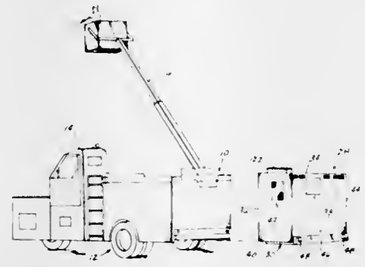
CONVERSION PACKAGE FOR AIRCRAFT DE-ICING MACHINES

Walter Edmond Thorton-Trump, 108 Beaver Lake, Plattsmouth, Nebr. 68048

Filed June 11, 1976, Ser. No. 695,081

Int. Cl.[2] B60S *3/00*

U.S. Cl. 239—131 **10 Claims**



1. A conversion unit for an aircraft deicing apparatus of the type having a wheeled frame means with forward and rearward ends, an aerial platform means on said frame means, a first tank on said frame means, a second tank on said frame means, first pump means fluidly connected to said first tank and a nozzle on said aerial platform means, whereby fluid under pressure can be sprayed onto the aircraft, said conversion unit comprising:

conversion unit frame means for attachment to the rearward end of the wheeled frame means;

heater means on said conversion frame means, said heater means being in fluid communication with said first tank and first pump means;

first conduit means communicating said first tank with said heater means, said first pump means and said nozzle;

second pump means for pumping fluid from said second tank;

proportioning valve means communicating said second pump means with said nozzle, said proportioning valve means being adapted to vary the amount of fluid from said second tank that is sprayed from said nozzle with the fluid from said first tank;

second conduit means communicating said second tank with said second pump means, said proportioning valve and said nozzle; and,

purging means associated with said second conduit means and said first conduit means for selectively circulating fluid from said second tank throughout said first conduit means, said purging means introducing said fluid into said first conduit means at a location intermediate said first pump means and said first tank.

4,073,438

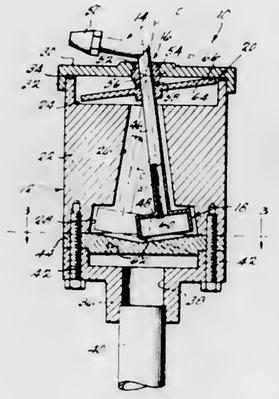
SPRINKLER HEAD

Larry P. Meyer, Walla Walla, Wash., assignor to Nelson Irrigation Corporation, Walla Walla, Wash.

Filed Sept. 3, 1976, Ser. No. 720,395

Int. Cl.[2] B05B *3/04*

U.S. Cl. 239—227 **23 Claims**



1. A sprinkler head comprising;

a stationary sprinkler body structure defining an inlet adapted to be connected with a source of water under pressure and a water-tight chamber communicating with said inlet;

a movable water distributing structure providing inlet means and spaced discharge nozzle means in' flow communication relation therewith,

ball and socket connecting means for (1) mounting said water distributing structure on said sprinkler body structure with said inlet means within said chamber and said discharge nozzle means exteriorly of said chamber for (a) rotational movement about a generally upright axis and (b) orbital movement in which the rotational axis of said water distributing structure describes a pair of cones whose apexes join at a point coinciding with the center of said ball and socket connecting means, and (2) providing a water-tight seal for said chamber between said sprinkler body structure and said water distributing structure in any position of movement thereof,

means within said chamber operable in response to the flow of water from said sprinkler body structure inlet to said discharge nozzle means for effecting the aforesaid orbital movement of said water distributing structure, and

means acting between said water distributing structure and said sprinkler body structure for effecting a fractional rotational movement of said water distributing structure during each orbital movement thereof.

4,073,439

METHOD AND APPARATUS FOR PNEUMATICALLY SPREADING PARTICULATE SUBSTANCES

Xavier Roger Grataloup, Montereau, France, assignor to Societe Anonyme Dite: Nodet-Gougis, Montereau, France

Filed Apr. 12, 1976, Ser. No. 675,927

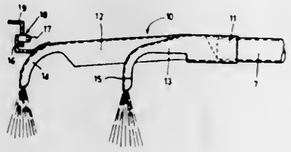
Claims priority, application France, Apr. 14, 1975, 75 11568

Int. Cl.[2] A01C *15/04*

U.S. Cl. 239—655 **6 Claims**

1. A pneumatic spreading apparatus for a particulate sub-

stance for treating the ground, said apparatus comprising a hopper for the particulate substance, a source of compressed air connected to said hopper and providing a blown stream of the particulate substance, a plurality of tubes connected to said hopper and conveying a flow of the blown stream of the particulate substance to distribution points spaced axially with respect to said tubes, said tubes having outlet ends remote from said hopper, and flow control means at the outlet end of each tube for dividing the flow of the particulate substance into



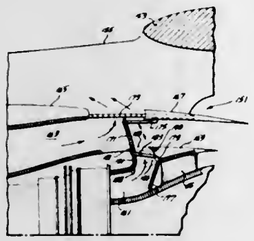
several axially off-set separate parts, each flow control means comprising a nozzle defining flow paths and having a portion secured to its associated tube and at least two separate flow guiding surfaces extending side-by-side in positively stepped relation transversely of the flow paths with adjacent portions of said two guiding surfaces transversely of said nozzle being spaced at different lengths beyond said portion, said guiding surfaces having their extremities curved towards the ground and forming elbows.

4,073,440

COMBINATION PRIMARY AND FAN AIR THRUST REVERSAL CONTROL SYSTEMS FOR LONG DUCT FAN JET ENGINES

Donald W. Hapke, Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash. and Aeritalia S.p.A., Naples, Italy, part interest to each

Filed Apr. 29, 1976, Ser. No. 681,398
Int. Cl.² F02K 3/06
U.S. Cl. 239—265.29 **17 Claims**



1. A combination primary and fan air thrust reversal control system for a long duct fan jet engine assembly adapted to emit fan air and primary air and including a fan air duct and a primary air duct, said combination primary and fan air thrust reversal control system comprising:

fan air control means for controlling the flow of fan air between a fan air duct exhaust nozzle formed by the aft portion of said fan air duct and a plurality of cascade vanes mounted in a fixed position in a nacelle defining the outer wall of said fan air duct, said nacelle being split such that said fan air duct exhaust nozzle is translatable along the longitudinal axis of said fan jet engine assembly, the axial position of said fan air duct exhaust nozzle controlling the exposure of said plurality of fixed position cascade vanes to said fan air, said fan air control means including said fan air duct exhaust nozzle and a fan air duct blocker door coupled to said fan air duct exhaust nozzle in a manner such that the rearward translation of said air duct exhaust nozzle moves said fan air duct blocker door from a fan air duct open position to a fan air duct closed position;

primary air control means for controlling the flow of primary air between a primary air duct exhaust nozzle formed by the aft portion of said primary air duct and a region of said fan air duct located generally between said fan air duct exhaust nozzle and said plurality of cascade vanes; and,

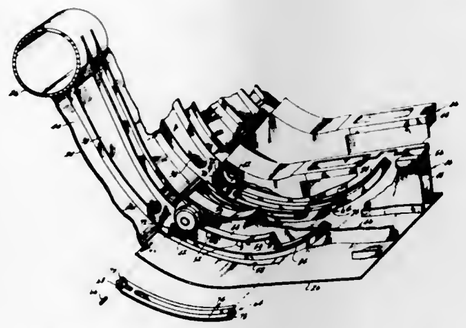
mechanical coupling means for coupling said primary air control means to one of said fan air duct exhaust nozzle and said fan air duct blocker door such that said fan air control means and said primary air control means simultaneously control the flow of fan air between said fan air duct exhaust nozzle and said fixed cascade vanes and the flow of primary air between said primary air duct exhaust nozzle and said region of said primary air duct, respectively, as said fan air duct exhaust nozzle is translated along the longitudinal axis of said fan jet engine assembly.

4,073,441

GAS TURBINE ENGINE NOZZLE APPARATUS INCLUDING A NOZZLE FLAP SLOT SEAL

Dudley O. Nash, Forest Park, and Thomas S. Clayton, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Oct. 4, 1976, Ser. No. 729,594
Int. Cl.² B64C 15/06
U.S. Cl. 239—265.41 **10 Claims**



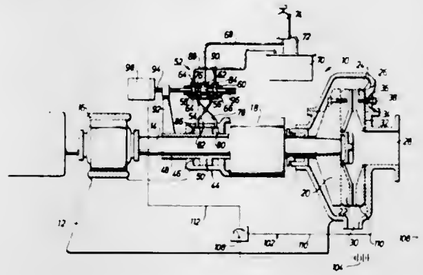
1. In a variable geometry jet nozzle including a pair of articulated flaps arranged in overlapping sliding axial relationship to partially define a fluid flow path and wherein the overlapped flap includes an axially extending slot partially covered by and receiving a portion of the overlapping flap, the improvement comprising seat means associated with the overlapped flap and mounted substantially parallel to the slot, seal means mounted on the overlapping flap for carriage therewith in the substantially axial direction, and connecting means for permitting said seal to float in the vertical direction with respect to the overlapping flap to provide positive seating between the seal means and seat means, and wherein the seal means is slidingly received within the uncovered portion of the slot and is so contoured as to further define the flow path and minimize leakage therethrough.

4,073,442

ELECTRICALLY CONTROLLED SYSTEM FOR REGULATING THE GRINDING SPACE IN A GRINDING APPARATUS

Nils G. Virving, Vallingby, Sweden, assignor to Defibrator Aktiebolag, Stockholm, Sweden

Continuation of Ser. No. 670,359, March 25, 1976, abandoned. This application Apr. 8, 1977, Ser. No. 786,115
Claims priority, application Sweden, Apr. 7, 1975, 7503967
Int. Cl.² B02C 7/14
U.S. Cl. 241—37 **7 Claims**



1. A system for measuring and regulating the interspace between a pair of relatively rotating metallic grinding discs in grinding apparatus for grinding fibrous cellulosic material, comprising:

(a) an electric circuit having its terminals connected to one of said grinding discs at portions electrically insulated from one another;

(b) conductive cell in said interspace bridging the terminals and having a resistance which varies in accordance with variations in the width of the interspace to thereby produce a fluctuating current; and

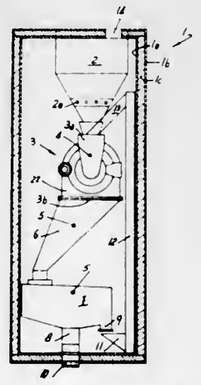
(c) means in said circuit responsive to said current for measuring the width of said interspace.

4,073,443

COMMINUTING PLANT AT CRYOGENIC TEMPERATURES

Francesco Danioni, Milan, Italy, assignor to Italo Danioni S.d.f. and Sio-Societa' per l'Industria dell'Ossigeno e di Altri Gas S.p.a., both of, Italy, part interest to each

Filed Feb. 14, 1977, Ser. No. 768,570
Claims priority, application Italy, Feb. 16, 1976, 20192/76
Int. Cl.² B02C 23/12
U.S. Cl. 241—65 **7 Claims**



1. A plant for comminuting materials that are difficult to comminute at room temperature, comprising:

means defining a closed enclosure having heat insulated walls;

a charging hopper in said enclosure and a charging opening in said enclosure for directing feed material into said hopper;

comminuting means in said enclosure positioned to receive material from said hopper and further means in such enclosure for directing ground material from said comminuter out of said enclosure;

means for directing a cryogenic liquid onto material in said comminuter and additional means for freely releasing cold gas from said comminuter and further means into said enclosure to maintain a refrigerated atmosphere therein; and

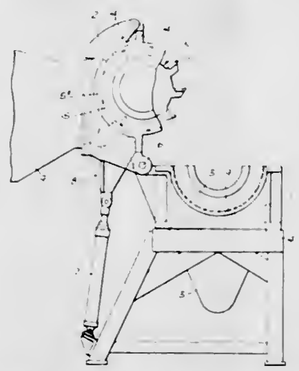
controllable release means for releasing gas from said enclosure at a selected controlled rate to maintain a predetermined temperature and pressure in said enclosure and the means therein.

4,073,444

CUTTING MILL

Jarmil Pav, Reutlingen, Germany, assignor to Bruderhaus Maschinen GmbH, Reutlingen, Germany

Filed Sept. 30, 1976, Ser. No. 728,116
Claims priority, application Germany, Oct. 4, 1975, 2544496
Int. Cl.² B02C 18/22
U.S. Cl. 241—73 **7 Claims**



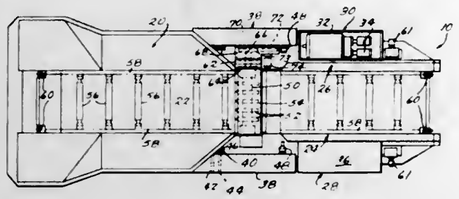
1. A cutting mill comprising a housing having upper and lower parts forming a cutting chamber, a rotor rotatably mounted in the upper housing part on an axis, said rotor having cutting blades mounted thereon arranged in a cylindrical surface defining a circumference of flight of the rotor blades, stator cutting blades mounted in said housing and operatively cooperating with said rotor blades, a sieve removably mounted in the lower housing part, means pivotably mounting said upper and lower housing parts about an axis substantially parallel to the rotor axis, said upper and lower housing parts being pivotable relative to each other between an operating position and an open position, whereby, when said housing parts are relatively pivoted to the open position, the lower housing part is accessible for removal and replacement of the sieve and including spacing means mounted in the upper housing part for spacing the sieve a predetermined radial gap from the rotor blade circumference of flight when said upper and lower housing parts are pivoted to said operating position, said spacing means including arcuate stop surfaces extending radially beyond the circumference of flight of the rotor blades.

4,073,445

FEEDER CRUSHER

David Clonch, Tazewell, Va., assignor to S & S Corporation, Cedar Bluff, Va.

Filed Dec. 1, 1976, Ser. No. 746,819
Int. Cl.² B02C *13/30*
U.S. Cl. 241—101.7 **2 Claims**



1. A feeder-crusher machine for use in low clearance mines comprising an elongated low-profile body supported from the ground on traction means so as to be movable along the ground longitudinally, said body having side walls and a bottom and including, in end-to-end relationship along the length of the machine, a receiving section, a crushing section and a discharge section; said crushing section including a rotary crusher shaft mounted transversely in said body and carrying a plurality of radial breaker arms the outer ends of which define a circle spaced from a wall of the machine; means for urging material residing on said bottom in said receiving section to the space between said circle and said wall so as to be crushed therein and for urging the resulting crushed material along the discharge section in a direction away from said crusher section; and drive means mounted on said body for rotating said crusher shaft, said drive means including a constant-speed motor, a mechanical speed reduction unit having a high speed input driven by said motor, a low speed output driving said crusher shaft, a gear system connected between the input and the output for rotating the output at a speed proportional only to the speed of the input and a flywheel connected to rotate with said high speed input to said speed reduction unit whereby amplified torque produced by the high speed flywheel is transmitted through the gear connections in said reduction unit to the more slowly rotating crusher shaft.

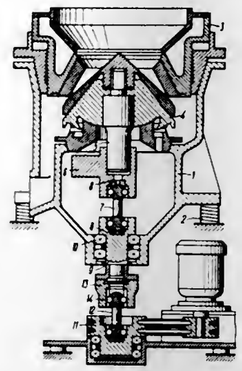
4,073,446

INERTIA CONE CRUSHER

Konstantin Alexandrovich Rundkvist, Shkolnaya ulitsa, 6, kv. 23; Nikolai Alexeevich Ivanov, Novoizmailovsky prospekt, 19, kv. 96; Boris Gavrilovich Ivanov, Basseinaya ulitsa, 5, kv. 18; Leonid Petrovich Zarogatsky, Uglovoi pereulok, 5, kv. 21; Evgeny Sergeevich Mitrofanov, ulitsa Sedova, 69, kv. 30, and Ilya Izrailevich Blekhman, prospekt Kosmonavtov, 46, korpus 1, kv. 194, all of Leningrad, U.S.S.R.

Filed Aug. 13, 1976, Ser. No. 714,257
Claims priority, application U.S.S.R., Sept. 23, 1975, 1422777
Int. Cl.² B02C *2/04*
U.S. Cl. 241—207 **4 Claims**

1. An inertia cone crusher comprising: a shell; vibration dampers adapted for connecting said shell with a base; a crushing bowl mounted in the top portion of said shell for receiving material to be fed therein for crushing same; a breaking head with a cantilevered shaft extending downwardly, said breaking head being mounted in said crushing bowl for crushing the material entering the bowl; an unbalanced weight set on said cantilevered shaft of the breaking head; a rotation drive for said unbalanced weight having a driving member disposed on the base under said shell coaxially with the latter, a countershaft mounted under said unbalanced weight in the bottom portion of said shell coaxially with the latter, a flexible connection for connecting the lower end of said countershaft with said driving member, and a ball spindle intended for connecting the upper end of said countershaft with said unbalanced



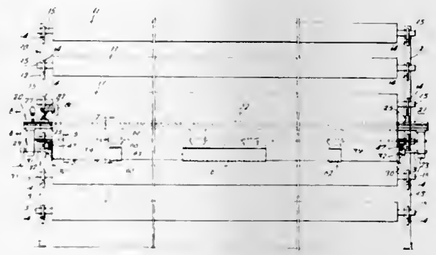
weight and mounted in such a way as to serve as an axial support for said unbalanced weight.

4,073,447

ROLL FORMING, MEASURING AND CUTTING APPARATUS

Francis P. Wrenn, 128 St. Andrews Court, Mount Laurel, N.J. 08054

Filed Dec. 8, 1976, Ser. No. 748,692
Int. Cl.² B65H *19/26, 17/06*
U.S. Cl. 242—56 R **20 Claims**



1. Apparatus for forming a roll of material from another roll of material mounted to rotate about a stationary axis in a roll rack, said apparatus comprising:

a frame having an elongated base member and a pair of arms extending outwardly from opposite ends of said base member;

a pair of mandrels mounted between said arms in spacec confronting relation;

means mounting said mandrels to said arms to rotate about a common axis;

means carried by said mandrels to releasably grip a marginal portion of the material;

means carried by said frame to afford axial movement of said mandrels toward and away from one another;

means for rotating both of said mandrels about their axes;

means carried by said frame for forming material into a roll and supporting the roll between the mandrels;

means carried by said frame for positoning said base member transversely to the path of movement of material onto said mandrels, said positioning means including a pair of hangers extending away from said base member in a direction opposite said arms, means carried by said hangers for releasably engaging said rack adjacent the ends of the roll supported therein, and means on said frame for cooperating with said rack and said hangers to releasably support said frame so that said arms extend outwardly of said rack; and

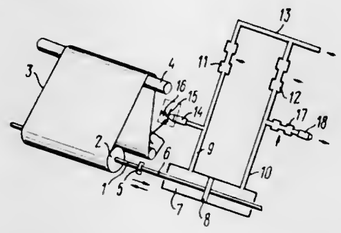
a cutting assembly moveable along said base member for severing the material.

4,073,448

AUTOMATIC DEVICE FOR FIXING THE EDGE OF A MOVING BAND

Ivan Alexandrovich Kolosov, ulitsa Astrakhanskaya, 118, kv. 54, Saratov, U.S.S.R.

Filed Sept. 9, 1976, Ser. No. 721,708
Claims priority, application U.S.S.R., Sept. 10, 1975, 2172470
Int. Cl.² B65H *25/26*
U.S. Cl. 242—57.1 **5 Claims**



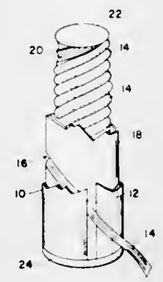
1. An improved device for fixing the edge of a moving band or web of sheet material employing a system of compressed gas supply and a roll holder adapted to feed said band over at least one bar, comprising: a band cross-traverse mechanism including a double-acting air cylinder having a piston and rod coupled to said roll holder and having a pair of opposite chambers in communication with said compressed-gas supply through associated pipings; throttle valves provided in each of said pipings; at least two nozzles, each being connected through its inlet to one of said pipings and each being located between one of said throttle valves and one of the chambers of said air cylinder, thus ensuring a uniform gas discharge simultaneously from both chambers of said air cylinder; and at least one of said nozzles having a closure or band edge position detector means adapted to interact with the edge of said band and being adapted to effect control over the operation of said air cylinder; whereby the edge of said bands or web is automatically maintained in a desired fixed position by said band cross-traverse mechanism which shifts or displaces said roll holder due to to variations in the pressure in said chambers of said air cylinder.

4,073,449

APPLIANCE CORD REEL

Joseph Pilat, 69-29 54th Ave., Maspeth, N.Y. 11378

Filed May 19, 1976, Ser. No. 687,937
Int. Cl.² B65H *75/48*
U.S. Cl. 242—107.1 **5 Claims**



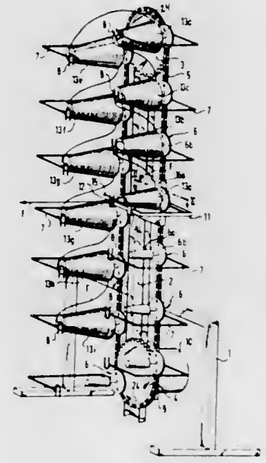
1. An appliance cord reel comprising cord mounting means for distributing turns of said cord in touching engagement to adjacent turns of said cord about an external surface of said cord mounting means, cord distributing means for disposing selective portions of said cord about said surface, housing means enclosing said cord distributing means and said cord mounting means, said cord passing through an opening in said housing means terminating in a receptacle and passing through another opening in said housing means terminating in a plug, said receptacle extending outwardly from said opening and biased inwardly by spring bias means acting upon said cord mounting means, said cord distributing means including a hollow right angle cylinder, said hollow right angle cylinder housing a spirally wound slot located in the cylindrical surfaces thereof, said slot extending substantially along the entire length of said hollow right angle cylinder and having an angular displacement about the longitudinal axis of said hollow right angle cylinder limited to a maximum of 360°, said longitudinal axis of said hollow right angle cylinder co-axially aligned with the longitudinal axis of said external surface of said cord mounting means, said cylindrical surfaces of said hollow right angle cylinder being disposed rotatable about the longitudinal axis thereof relative to said external surface of said cord mounting means.

4,073,450

DEVICE FOR HOLDING YARN BOBBINS

Eric Carlsson; Karl Ivan Gefvert; Thomas Hjalmarsson; Anton Kerff; Karel Pejchal, and Lars Wide, all of Ulricehamn, Sweden, assignors to Aktiebolaget IRO, Ulricehamn, Sweden

Filed Sept. 14, 1976, Ser. No. 723,196
Claims priority, application Germany, Sept. 15, 1975, 2541051; May 21, 1976, 2622989
Int. Cl.² B65H *49/02*; D02H *1/00*; D03J *5/08*
U.S. Cl. 242—131 **20 Claims**



1. In a device for holding yarn bobbins and having at least two bobbin supports each for holding one bobbin, whose thread ends are tied together to permit them to unwind in succession without interruption, and a stationary thread eye which has a specific association with respect to the bobbin which is unwinding at any given moment, the improvement comprising a movable transport device on which more than two bobbin supports are mounted and are movable in common such that the respective bobbin to be unwound can be brought into an unwinding position having a required association with respect to the stationary thread eye, motor means connected to the transport device for moving same, and a thread scanning device provided adjacent the thread as unwound from the bobbin located in said unwinding position for detecting the thread as it jumps from the bobbin just emptied to the next bobbin, means connecting the thread scanning device with the motor means such that, when the thread scanning device detects the unwound thread jumping to the next bobbin, the

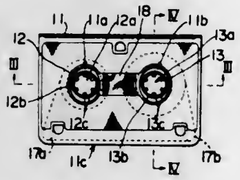
motor means is energized to move the transport device to such an extent that the next bobbin is moved into the unwinding position so as to have the required association with respect to the stationary thread eye.

4,073,451

TAPE CASSETTE

Masaaki Sato, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 577,903, May 15, 1975, abandoned. This application Feb. 15, 1977, Ser. No. 768,854
Claims priority, application Japan, Jan. 6, 1975, 50-4324
Int. Cl.² B65H *59/38;* G03B *1/02;* G11B *15/13, 15/32*
U.S. Cl. 242—191 **18 Claims**



1. A tape cassette for use in a tape recorder having a pair of hub supporting shafts extending upwardly from a cassette mounting plate, said tape cassette comprising a cassette containing at least one guide roller; a pair of tape hubs rotatably disposed within the cassette at positions which are offset at opposite sides from the center thereof; a magnetic tape having its opposite ends secured to the pair of hubs, the tape extending from one of the hubs and around the guide roller before being taken up on the other hub; said cassette comprising front and rear walls joined by a pair of long sides and a pair of short sides defining a substantially hollow housing and having first and second pairs of aligned apertures formed in the walls of the cassette wherein each pair of apertures receives and rotatably supports an associated one of the tape hubs, all of the apertures being in the form of an elliptically elongated slot having its major axis substantially parallel to the short sides of the cassette; said hubs being hollow cylindrical shaped members having their opposite ends provided with ribs respectively extending into associated ones of the pairs of openings and thereby adapted to experience more movement in the direction of said major axis than in the direction perpendicular thereto; the hubs and the pairs of openings enabling rotation of the hubs to be viewed from either wall of the cassette and enabling the hubs to receive the drive shafts through either wall of the cassette, said hubs being free to move in either direction from the center of the elongated slots and along the associated major axes to align the hubs with the drive shafts as the cassette is lowered upon the drive shafts at an angle to said mounting plate, and being adapted to return to the centers of the elongated slots once the drive shafts are fully inserted into the hubs and the cassette is substantially parallel to said mounting plate.

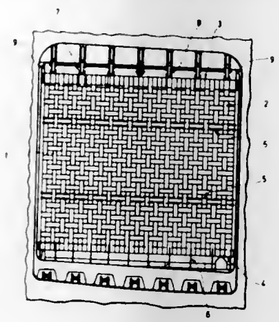
4,073,452

APPARATUS FOR DELAYING THE PRESSURE DROP IN PRESSURIZED CABINS OR THE LIKE ESPECIALLY IN AN EMERGENCY

Dieter Gosau, Hamburg, Germany, assignor to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung, Munich, Germany

Filed July 30, 1976, Ser. No. 710,344
Claims priority, application Germany, Aug. 14, 1975, 2536231
Int. Cl.² B64D *45/00*
U.S. Cl. 244—118 R **19 Claims**

1. An apparatus for delaying the pressure drop due to an explosive decompression in a pressurized aircraft cabin structure, having a door opening therein and door means including a locking mechanism for closing said door opening, following a failure in the locking mechanism said door opening being defined by respective structural elements forming part of said cabin structure, said apparatus comprising air permeable mat means having a defined air permeability, and means for removably securing said mat means to said structural elements defining said opening to cover said opening in addition to said door, said mat means comprising upper and lower edges as well as



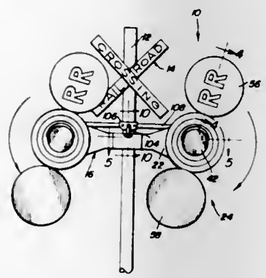
said edges, said securing means comprising means connecting said upper and lower edges of said mat means in a force transmitting manner to said opening defining structural elements whereby the mat means are capable of taking up forces effective on the cabin structure when a pressure drop occurs, said mat means further comprising a plurality of belts, said securing means comprising a plurality of connecting members for connecting said belts to the cabin structure.

4,073,453

RAILROAD WARNING SIGNAL DEVICE

Marion V. Thomas, 545 Thornwood Drive, Baton Rouge, La. 70806

Filed May 12, 1977, Ser. No. 796,471
Int. Cl.² B61L *29/24*
U.S. Cl. 246—125 **11 Claims**



10. A visual warning device adapted to be mounted on a vertically elongated post, comprising a frame extending transversely of the post and having an opening formed therein in laterally spaced relation to the post, a hub having a light emitting surface, means connected to the frame in peripheral relation to said opening for fixedly mounting the hub to establish a rotational axis extending through the opening and intersecting said light emitting surface, and movable alerting means mounted on the hub for rotation about said rotational axis in surrounding relation to the light emitting surface.

4,073,454

OUTRIGGER PAD

Charles J. Sauber, 10 N. Sauber Road, Virgil, Ill. 60182

Filed July 26, 1976, Ser. No. 708,408
Int. Cl.² F16M *11/24*
U.S. Cl. 248—188.2 **14 Claims**



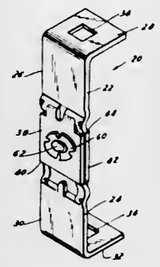
1. An outrigger pad for placement between an outrigger foot and the ground to improve the support given to an outrigger mechanism, said outrigger pad comprising:
a base having a generally planar lower surface;
gripping means on the lower surface of said base for penetrating the ground to a short distance when force is applied from above, thereby restricting lateral movement of the outrigger pad over the ground contacted by said gripping means;
a plurality of raised ribs on the upper surface of said base, said ribs having upper edges lying substantially in a plane that defines an oblique angle with respect to the lower surface of said base;
said ribs having interfitting means for receiving said gripping means on the lower surface of another outrigger pad of like construction, so that a plurality of outrigger pads of like construction can be interfittingly stacked, one on top of another, and restricted from lateral motion with respect to one another.

4,073,455

TILTABLE BRACKET

Conrad J. Gunther, Uniondale, N.Y., assignor to Dzus Fastener Co., Inc., West Islip, N.Y.

Filed Oct. 5, 1976, Ser. No. 729,683
Int. Cl.² A47F *5/00*
U.S. Cl. 248—291 **8 Claims**



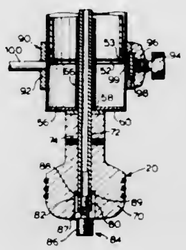
1. A tiltable bracket comprising; a first elongated member and a second elongated member, the members being pivotally interconnected, means for restraining the members in a position with their respective longitudinal axes aligned, means for permitting the relative pivoting of the members a predetermined angular distance, and stop means to prevent further pivoting beyond the predetermined angular distance without restricting return of the members to the position with their longitudinal axes aligned, a shoulder projecting from the surface of one bracket member into engagement with the leading edge of the other bracket member when the bracket members are aligned axially in the longitudinal direction so as to prevent angular pivoting between the bracket members in one direction, a projection formed on the surface of one of the bracket members and extending therefrom in position to engage with the leading edge of the other bracket member and restrain relative movement of the bracket members in the opposite angular direction when the members are axially aligned in the longitudinal direction, and a stop tab extending from the surface of one of the bracket members and spaced from the projection thereon so that when sufficient force is applied to the bracket members so that relative angular movement occurs with the leading edge of the one bracket member extending over the projection on the other bracket member, the angular movement will be permitted until the leading edge contacts the stop tab whereupon further angular movement in the opposite direction is prevented, the tab, projection and shoulder being positioned so that the bracket members can be returned to the axially longitudinally aligned position with the leading edge of the one bracket member passing again over the projection and being restrained from further movement in that direction by engagement with the shoulder.

4,073,456

SUSPENSION SUPPORT

Alexander Donald Karapita, 44 Lyme Regis Cres, Scarborough, Ontario, Canada, and James Douglas Orr, Toronto, both of Canada, assignors to Alex D. Karapita, Scarborough, Canada

Filed July 14, 1976, Ser. No. 706,107
Int. Cl.² B42F *13/00;* A47B *1/06*
U.S. Cl. 248—337 **17 Claims**



1. A suspension support comprising:
a vertical cylinder having an upper end closure with a port therein connectable to a vacuum source;
a piston slidable in the cylinder and forming, with the upper end closure, a closed chamber;
means selectively actuable to brake the piston within the cylinder;
valve means selectively operable to vent the chamber;
a handle positioned outside the cylinder and connected to the piston;
means connected with the handle to support an object; and
means on the upper end of the cylinder to mount the support.

4,073,457

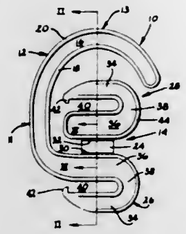
ARTICLE SUSPENSION DEVICE

John H. Batts, Grand Rapids, and Everett L. Duester, Holland, both of Mich., assignors to John Thomas Batts, Inc., Zeeland, Mich.

Continuation-in-part of Ser. No. 647,731, Jan. 9, 1976. This application Apr. 28, 1976, Ser. No. 681,233
The portion of the term of this patent subsequent to May 17, 1994, has been disclaimed.
Int. Cl.² A44B *17/00;* B42F *13/00*
U.S. Cl. 248—340 **6 Claims**

1. An article suspending device, comprising:
a support hook;
a spacer member connected to said support hook;
a pair of wing members, each wing member being connected

to a lateral edge of said spacer member and each of said wing members defining a generally tear-shaped slot having a reduced neck area and opening through one end of each of said wing members, said support hook, said spacer member and said wing members being molded from a resilient, resinous material; and



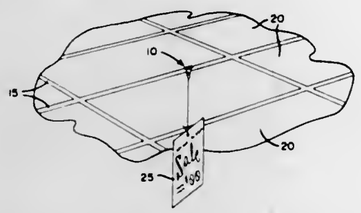
first hinge means integral with an end of said spacer member and with said support hook for hingedly connecting said support hook to said spacer member and wherein said tear-shaped slots open in a direction towards said support hook.

4,073,458

HANGER CLIP FOR DISPLAYING ARTICLES FROM SUSPENDED CEILINGS

True F. Sease, 10491 Air Hill Road, Brookville, Ohio 45309

Filed Oct. 5, 1976, Ser. No. 729,671
Int. Cl.[2] F16M *13/00*; A44B *17/00*
U.S. Cl. 248—340 **7 Claims**



1. A hanger clip for displaying an article from a suspended ceiling of the type which includes a plurality of ceiling panels installed on overhead beams each having a horizontal flange and a vertically upright leg, the clip comprising

a continuous thin elongated strip including

means defining a U-bend portion located generally centrally of said strip having a depth at least sufficient to receive that part of the horizontal flange extending on one side of the vertical leg of the overhead beam,

a vertically downwardly extending portion including means on the lower end thereof for holding an article for display, and

a vertically upright portion adapted to be placed between the vertically upright leg of the overhead beam and the ceiling panel for holding said hanger clip securely in place.

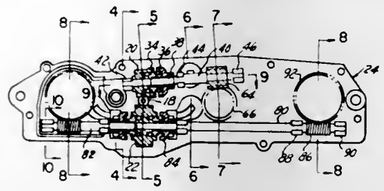
4,073,459

SIX-WAY ADJUSTABLE SEAT SUPPORT

Joseph Pickles, Birmingham, Mich., assignor to Ferro Manufacturing Corporation, Detroit, Mich.

Filed Mar. 10, 1976, Ser. No. 665,536
Int. Cl.[2] F16M *11/12*
U.S. Cl. 248—394 **6 Claims**

1. An elongated transmission support body formed in its entirety of integral injection molded plastic having at one side thereof an integral rigid tubular lateral extension for the reception of a main drive shaft, a plurality of sets of pairs of parallel spaced lift and traverse shaft support arms extending laterally from the other side of said body, said arms being substantially rigid, the junction of said arms and said support body providing for movement of the free ends of the arms of a pair toward and away from each other, cylindrically formed confronting recesses adjacent the free ends of said arms to receive and



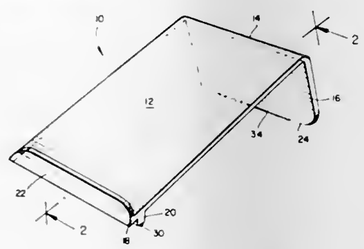
rotatably support the end portion of a shaft, means for supporting end thrust of said shaft comprising a steel disc supported between the arms of one of said pairs and engaging the end of said shaft, and a cover including a pocket in which the free ends of said arms are received, said cover having an abutment screw extending into the space between said arms and abutting the side of said disc opposite the side engaged by said shaft.

4,073,460

STAND FOR CALCULATOR

Richard Dale, New York, N.Y., assignor to Appollon Designs, Inc., New York, N.Y.

Filed July 21, 1976, Ser. No. 707,267
Int. Cl.[2] A47B *19/00*
U.S. Cl. 248—441 R **1 Claim**



1. A supporting stand for a calculator which is removably mountable on a planar support comprising, a substantially rectilinear web having a first elevated end, and a second descendent end substantially contiguous to said planar support; a lip flange connected to said web, said lip flange issuing upwardly from said second descendent end of said web substantially normally thereto, said lip flange providing a bearing support for a calculator overlying said web; a substantially rectilinear butt flange connected to said web, said butt flange issuing downwardly substantially from said first elevated end of said web, and elevating said web at a predetermined angle of inclination relative to a horizontal plane medianly through said stand of about 45° or less a longitudinally extending rail flange connected to said web, said rail flange underlying substantially said second end of said web, and having respective upper and lower oblique surfaces, said upper oblique surface thereof being fixedly connected to said web, said upper and lower oblique surfaces defining an angle corresponding to the angle of inclination of said web and providing a level mount therefor, said butt flange and said rail flange having respective beveled planar support engaging surfaces, and including cooperating means mounted, respectively, in said beveled planar support engaging surfaces of said butt flange and said rail flange, for rendering said stand substantially skid resistant on said planar support, said means comprising a corresponding longitudinally

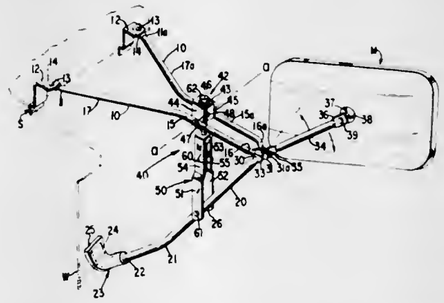
elongated recess in each of said beveled planar support engaging surfaces provided in said butt flange and said rail flange, and a felt strip mounted in each of said recesses spaced from the side walls of said recesses to provide a clearance therebetween, each of said felt strips extending past the mouth of its respective recess to abut a planar support surface on which said stand is mounted.

4,073,461

FENDER-MOUNT REAR VIEW MIRROR SUPPORT

Manuel Lopez, Trumbull, Conn., and Bernard C. Sharp, White Plains, N.Y., assignors to Parker-Hannifin Corporation, Shelton, Conn.

Filed Mar. 4, 1977, Ser. No. 774,332
Int. Cl.[2] B60K *1/06*
U.S. Cl. 248—475 R **9 Claims**



1. A support for mounting a rear view mirror on a vehicle fender, comprising a pair of arms spaced apart laterally at their inner ends and adapted to protrude outwardly from the fender, said inner ends each having means thereon for engaging with a top portion of the fender, a leg adapted to extend outwardly and upwardly from and having means on its inner end for engaging with a bottom portion of the fender, means at a junction of respective outer end portions of the arms and leg for interconnecting the same pivotably, means for supporting a mirror from said junction, and coupling means for interconnecting and converging respective intermediate portions of said pair of arms and said leg so as to clamp said engaging means tightly against the fender, said coupling means including a bracket member having a centrally apertured base portion adapted to be disposed above said arms and leg portions fastened respectively to respective intermediate portions of said arms, a saddle member having leg portions straddling and fastened pivotably to said intermediate portion of said leg, a retainer held in said saddle member, and an elongate rigid coupling element adapted to extend through the aperture in said base portion for engagement with said retainer, said coupling element having a head held above said base portion and by which it is displaceable relative to said retainer for either clamping said engaging means tightly against the fender or releasing the same therefrom.

4,073,462

SUPPORT DEVICE

Edward Whitaker, Box 11284, Cincinnati, Ohio 45211

Filed June 24, 1975, Ser. No. 589,868
Int. Cl.[2] A01K *97/10, 97/12*; F16B *47/00*
U.S. Cl. 248—537 **19 Claims**

1. A support device comprising:

a base which includes a plurality of attaching means for releasably connecting said base to a supporting surface, said attaching means each being connected to said base to form a triangle having a geometric center;

a support rod having an elongate body and being connected at one end thereof to said base adjacent said geometric center and extending outwardly from said base, said rod body being bent at the other end thereof into an S-shape which includes a first loop adjacent said rod body and having an open portion presented toward said base and a second loop remote from said rod body having an open portion presented away from said base;

said rod being inclined with respect to said base so that said second loop is located in vertical alignment with said geometric center and said first loop is located between



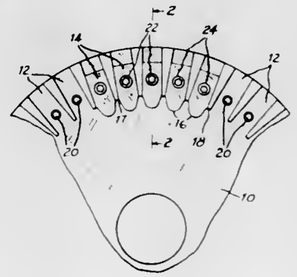
said geometric center and a line connecting two of said attaching means so that force generated by a member bearing against said first loop is essentially evenly distributed via said base among said plurality of attaching means and force generated by a member bearing against said second loop is essentially evenly distributed via said base between said two attaching means.

4,073,463

SPROCKET MOLD

Richard M. Bell, Wells Hill Road, Lakeville, Conn. 06039

Filed June 21, 1976, Ser. No. 697,911
Int. Cl.[2] B29D *15/00*
U.S. Cl. 249—102 **9 Claims**



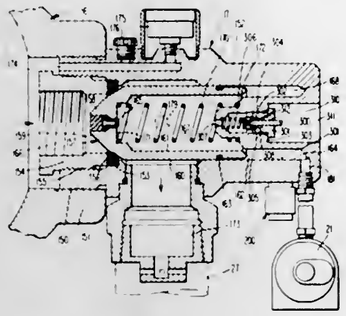
1. A molding system for molding a plurality of different sprockets for operating with a predetermined link diameter, means defining a mold cavity, a plurality of tooth-defining elements adapted to be inserted in the mold cavity, each tooth-defining element having a curved inner end defining the tooth cavity and sides defining the tooth sides, each element side terminating in a shoulder which is tangent to the sprocket tooth outside circumference, a plurality of mold insert plates, each plate being designed to give a different sprocket diameter, each plate having a plurality of element-positioning slots, the number of slots in each plate being different but the arcuate spacing between the inner ends of adjacent slots being identical, a positioning surface associated with each slot, each surface being radially spaced an equal amount from the center of the mold plate.

4,073,464

CYLINDER VALVE FOR GAS FIRE EXTINGUISHING SYSTEM

Arne Hansen, New City, N.Y., and George Troup, Hatboro, Pa., assignors to Chemetron Corporation, Chicago, Ill.

Filed Aug. 24, 1976, Ser. No. 717,279
Int. Cl.² F16K *31/383, 31/40*
U.S. Cl. 251—26 **6 Claims**



1. In a cylinder valve of the fluid operative type for use in a fire extinguishing system of the fluid distribution type, wherein the valve includes a moveable piston slideably disposed in a housing, with the housing having a fluid inlet and a fluid outlet and a valve seat therebetween, with the piston normally having a front end disposed against the valve seat in the closed condition of the valve, with a fluid communication port connecting the front of the piston with a cavity at the rear of the piston for facilitating the equalizing of fluid pressure on opposite sides of the piston while the valve is in the closed condition with the piston seated, and with the fluid communication port being sized to prevent rapid fluid flow across the piston, with means being provided for rapidly evacuating the fluid from the cavity at the rear of the piston relative to the flow of fluid through the fluid communication port and for releasing forces on the rear side of the piston that oppose unseating fluid forces on the piston and thereby unseating the piston, the improvement comprising vent means for maintaining a venting of the cavity at the rearward side of the piston after initial unseating of the piston, wherein said vent means comprises a normally closed vent valve having a plunger extending partially into said cavity for operative engagement by said cylinder valve piston upon its movement to open the valve for outward movement of said plunger, said vent valve being automatically openable by said movement of said plunger.

4,073,465

BUTTERFLY VALVE

William L. Sheppard, Romulus, Mich., assignor to AVM Corporation, Jamestown, N.Y.

Division of Ser. No. 490,232, July 22, 1974, abandoned. This application Apr. 25, 1975, Ser. No. 571,533
Int. Cl.² F16K *31/126*
U.S. Cl. 251—58 **3 Claims**

1. A valve comprising a valve seat having a passageway therethrough and a valve element movable into and out of engagement with said valve seat for opening and closing said passageway, one of said valve seat or element being formed of an elastomeric material and the other thereof being formed of a relatively rigid material;

actuating means operatively connected to said valve element for moving said valve element to and from a closed position in which said valve element engages said valve seat and said passageway is closed by said valve element;

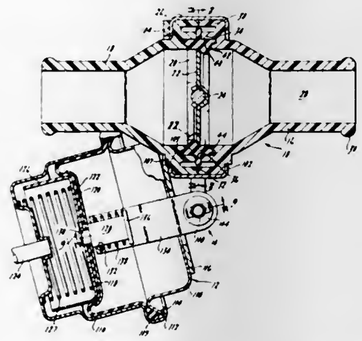
a motor having a fluid responsive diaphragm movable between first and second positions;

a connecting element fixed to and movable with said diaphragm;

an arm having one end slidingly engaging said connecting element for movement in two directions back and forth thereon, and an opposite end connected to said actuating means;

first stop means adjacent said diaphragm and second stop means spaced therefrom for limiting the sliding movement of said arm relative to said connecting element in both said directions; and

a preloaded compression spring operatively disposed between said arm and said second stop means for biasing said arm against said first stop means, whereby movement of said diaphragm to its first position will cause said first stop means to move said arm in a direction to cause said actuating means to move said valve element to its open position, and movement of said diaphragm to its second position will cause said second stop to push against said spring to move said arm in a direction to cause said actuating means to move said valve element to its closed position, with said spring limiting the amount of force which can be exerted by said diaphragm on said valve element in a direction tending to move the latter to said closed position, the preload on said spring and the arrangement of parts being such that on closing said valve element engages said valve seat prior to said diaphragm reaching said second position, whereby said spring is at least partially compressed when said valve is closed, the compession of said spring being sufficient to provide a valve closing force which results in a slight compression of said elastomeric material.



4,073,466

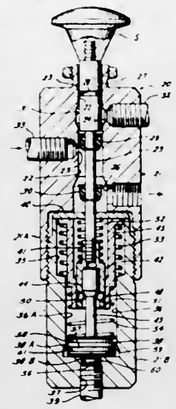
VALVE

David E. Snyder, Longview, Tex., assignor to U.S. Industries, Inc., New York, N.Y.

Filed Mar. 3, 1976, Ser. No. 663,272
Int. Cl.² F16K *11/07, 31/122*
U.S. Cl. 251—63.4 **16 Claims**

1. A valve, comprising a body having a bore extending longitudinally therein and lateral ports connecting with the bore at longitudinally spaced locations, a valving element longitudinally reciprocable within the bore between first and second positions for controlling the flow of a first fluid between the lateral ports in each of said positions, said body having a cylinder at one end of the bore and a port therein connecting with the cylinder to receive a second fluid, a piston sealably slidable longitudinally within the cylinder between first and second positions and adapted to be urged by the second fluid toward its first position, a stem on the valving element extending through the other end of the valve body to provide an externally accessible part which may be manipulated to shift the valving element between its first and second positions, and means automatically and solely responsive to manipulation of the stem to shift the valving element from its

second to its first position for holding the valving element in said first position irrespective of the pressure of said second fluid, and means automatically responsive to a rise in the pressure of said second fluid above a predetermined level for releasing said holding means to permit said valving element to be moved back to its second position.

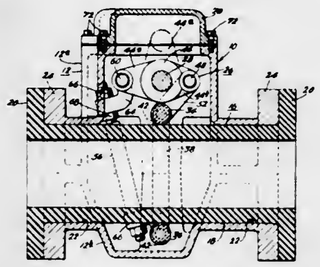


4,073,467

HIGH PRESSURE PINCH VALVE

Robert K. Little, Mount Holly, and Edgar Barry Lincoln, Moorestown, both of N.J., assignors to RKL Controls, Inc., Hainesport, N.J.

Filed June 3, 1976, Ser. No. 692,560
Int. Cl.² F16K *7/06*
U.S. Cl. 251—7 **8 Claims**



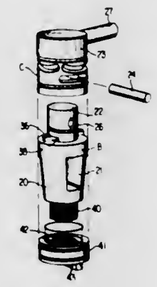
1. A pinch valve comprising a housing, a substantially cylindrical valve body of elastomeric material disposed within said housing, and a valve actuating mechanism on said housing for controlling flow through said valve body by deforming said body, said actuating mechanism including a drive shaft rotatably mounted in said housing perpendicularly to the axis of said valve body and in spaced relation to said valve body, a pair of parallel pinch bars disposed within said housing on opposite sides of said valve body, means on said valve housing for supporting said pinch bars and permitting movement thereof only in a plane perpendicular to said valve body axis and passing through said drive shaft, a pair of crank elements secured in spaced relation to said drive shaft, connecting links pivotally attached to said crank elements and joined to the ends of said pinch bars to produce opposed movement of said pinch bars in said plane upon rotation of said drive shaft, said crank elements being disposed within said housing interiorly of said connecting links, means for rotating said drive shaft through an arc of substantially 90°, said drive shaft when rotated to a first position with the pivot points of said crank arms and connecting links aligned in the same plane with said pinch bars producing a leak tight closure of said valve body and a locking of said actuating mechanism against movement due to line pressures on either side of the valve closure, the rotation of said drive shaft to a position substantially 90° from said first position producing a fully opened condition of said valve body, and means for adjusting the length of a pair of said connecting links to adjust the spacing of said pinch bars in said first position of said drive shaft.

4,073,468

ROTARY PLUG VALVE

Robert L. Erwin, 1702 N. Mesa Verde Ave., Farmington, N. Mex. 87401

Filed Sept. 16, 1976, Ser. No. 724,090
Int. Cl.² F16K *31/44*
U.S. Cl. 251—77 **10 Claims**



1. A rotary plug valve comprising a tapered valve plug, valve plug operating means including a rotary and axially movable plug operating head, a valve casing including a tapered valve chamber for receiving said tapered valve plug, said valve chamber having inlet and outlet ports communicating therewith and a first cylindrical extension for receiving said rotary and axially movable plug operating head therein, cam means responsive to rotation of the operating head for imparting axial movement to the head when the head is rotated, said tapered rotary valve plug fitting within said tapered valve chamber and being provided with a transverse for communicating with the inlet and outlet ports when the valve is in open position, first means interconnecting the operating head and valve plug to provide an immediate lifting operation to the plug when the head is rotated to loosen the plug from its seat, said interconnecting means also serving to provide delayed rotation of the plug after initial rotation of the head until the plug has been raised from its seat, and additional interconnecting means comprising a spring pin interposed between the operating head and valve plug for restoring the head and plug to their initial position relative to each other after the plug has been raised from its seat.

4,073,469

SHUT-OFF VALVE FOR CONTROL OF FLOW OF MOLTEN PLASTIC MATERIAL

Joseph Kodric, Toronto, Canada, assignor to Inventive Plastic Products Ltd., Weston, Canada

Filed Nov. 18, 1976, Ser. No. 742,836
Int. Cl.² F16K *25/00*
U.S. Cl. 251—86 **12 Claims**

1. A shut-off valve comprising:

a cylindrical body,

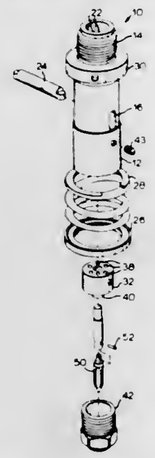
a cylindrical recess formed in one end of said body coaxial with said body,

a diametrically-extending transverse slot formed in said body and elongated axially of said body,

a pin located in and extending through said slot,

means normally biasing said pin towards said one end of said body to space said pin from the end thereof remote from said one end,

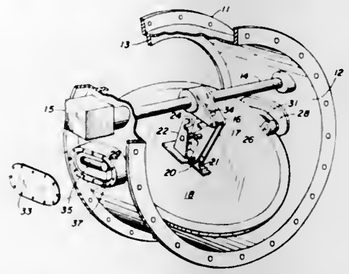
an axial passageway extending between said recess and said slot,
an inlet at the other end of said body,
passage means extending from said inlet to said recess out of fluid flow communication with said slot other than through said axial passageway for conveying liquid material from said other end to said recess,
cylindrical insert means positioned in said recess,
said insert means having an axial bore aligned with said axial passageway and a plurality of equally arcuately spaced bores radially located with respect to and parallel to said axial bore,
means establishing fluid flow communication between the downstream end of said passage means and the upstream end of said plurality of bores,
closure means in said one end of said body,



said closure means having an orifice located on the axis of said body and passage means establishing fluid flow communication between said orifice and said downstream end of said plurality of bores, whereby fluid flow through said valve occurs successively through said inlet, said first-mentioned passage means, said plurality of axial bores, said last-mentioned passage means and said orifice, and
orifice closure means located in said valve for reciprocal motion into and out of engagement with said orifice for opening and closing said valve,
said orifice closure means including pin means extending in sliding fit through said axial bore in said insert, through said passageway and into engagement with said pin located in said slot,
said orifice closure means normally being biased to close said valve by said biasing means through the biasing of said pin located in said slot.

4,073,470
PRESS DISC VALVE
Edward Harris, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.
Filed Jan. 4, 1977, Ser. No. 756,594
Int. Cl.[2] F16K *25/00*
U.S. Cl. 251—163 **9 Claims**

1. A pivotal disc shut-off valve comprising:
(a) a valve body;
(b) a valve seat integrally mounted within said valve body;
(c) a crank shaft positioned perpendicular to, but offset from, the central axis of said valve body;
(d) means for rotating said crank shaft about its axis;
(e) a crank lever fixed at one end to said crank shaft;
(f) a link member pivotally mounted on the other end of said crank lever;
(g) a valve disc pivotally disposed within said valve body and pivotally connected to the other end of each said link member, such that upon rotation of said crank shaft, said crank lever exerts linear force on said link member which, in turn, exerts linear force upon said disc;
(h) a plurality of pivotation extensions fixed to a common axis on said valve disc and extending beyond the periphery of said valve disc;
(i) a plurality of guide means positioned such that each of said pivotation extensions engages one or more of said guide means, said guide means being positioned so as to allow lateral travel of said pivotation extensions in a direction parallel to the central axis of said valve body;
(j) means for directing said pivotation extensions in said guide means, by lever action, initially in a linear direction parallel to the central axis of said valve body until a given position is reached, then redirecting the motion of said pivotation extensions into a rotation about the said common axis of said pivotation extensions such that said linear force exerted by said crank levers through said link members onto the said valve disc, by means of rotation of said crank shaft, causes said valve disc, with said pivotation

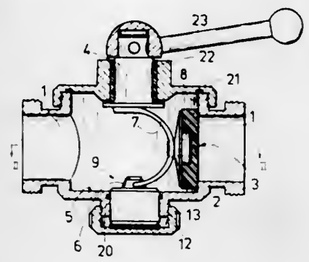


extensions fixed thereto, directed by said directing means, to move, firstly, in a lateral direction along the central axis of said valve body, secondly, to pivot about said common axis of said pivotation extensions, and, thirdly, to come to rest at a position at a right angle to the original position of said valve disc, and wherein said sequence of motion can be reversed by reversing the direction of rotation of said crank shaft.
(k) a hook member fixed at one to the center of, and positioned perpendicular to, said valve disc;
(l) a hook fixed to the free end of said hook member and positioned adjacent to said link member when said valve disc is in a plane parallel to said valve seat;
(m) a hook pin fixed to said link member and engaged with said hook when said valve disc is in the closed position against said valve seat, remaining engaged during said lateral motion of said valve disc, becoming disengaged as said valve disc pivots about said common axis of said pivotation extensions such that said linear force exerted onto said valve disc is transmitted to said valve disc through said hook pin, said hook and said hook member during said lateral motion of said valve disc.

4,073,471
SHUT OFF VALVE APPARATUS
Uuno Johannes Lehtinen, 33940 Pirkkala 4, Finland
Filed June 28, 1976, Ser. No. 700,148
Claims priority, application Finland, Aug. 14, 1975, 752302
Int. Cl.[2] F16K *25/00*
U.S. Cl. 251—176 **10 Claims**

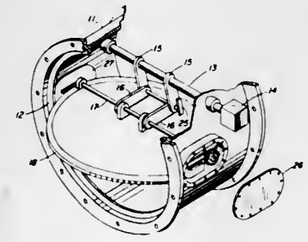
1. Shut-off valve employing a valve body provided with at least two passage ports; a shut-off member cooperating with said passage ports; an operating shaft rotatably disposed in said valve body; said shut-off member being connected to an arcuate spring member braced against a staying member on the bottom of said valve body and connected to the operating shaft

at the top whereby said shut-off member being shiftable from one passage port to another by turning said operating shaft; said shut-off member being urged against said valve body inner surface in a radial direction by said arcuate member; said valve being further defined by an adjustable tensioning means con-



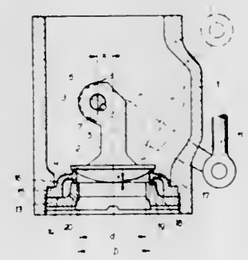
centric with said operating shaft, against which said arcuate member is braced, and by adjustment of which the pressure of said shut-off member against the inner surface of said valve body is adjustable with change of the curvature of said arcuate member.

4,073,472
ARTICULATED DISC VALVE
Henry G. Chasey, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.
Filed Jan. 4, 1977, Ser. No. 756,591
Int. Cl. F10k *31/54*
U.S. Cl. 251—229 **8 Claims**



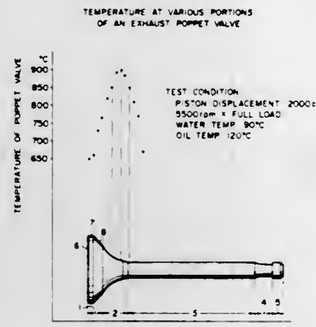
1. A valve for use in a flow line, for controlling the flow of material, comprising:
a. a valve body;
b. a valve seat mounted to the internal periphery of said valve body;
c. a valve disc pivotally mounted within said valve body contiguous to said valve seat whereby said valve is closed;
d. a pivot shaft fixed to said valve disc perpendicular to the central axis of said valve body;
e. a crankshaft pivotally engaged with said valve body parallel to said pivot shaft;
f. a crank lever fixed to said crankshaft and perpendicular thereto;
g. a link member pivotally connected to the free end of said crank lever at one end, the second end being pivotally connected to said pivot shaft;
h. a plurality of slotted guide means, mounted on opposite walls of said valve body, said slots running parallel to the central axis of said valve body and positioned to engage the ends of said pivot shaft;
i. means of directing unilateral motion of said pivot shaft from the closed position of said valve to a point in said slots of said guide means at which said valve disc can be pivoted clear of said valve seat;
j. a plurality of gears fixed to said pivot shaft adjacent to said guide means; and
k. a plurality of racks aligned with said gears positioned so as to engage said gears at all points along said slots in said guide means wherein said valve disc can be pivoted clear of said valve seat.

4,073,473
ROTARY VALVE
Herbert Rihm, Hanau, and Walter Rogge, Erlensee, both of Germany, assignors to Honeywell G.m.b.H., Frankfurt am Main, Germany
Continuation of Ser. No. 522,888, Nov. 11, 1974, abandoned.
This application Dec. 20, 1976, Ser. No. 752,488
Int. Cl.[2] F16K *1/16*
U.S. Cl. 251—298 **5 Claims**



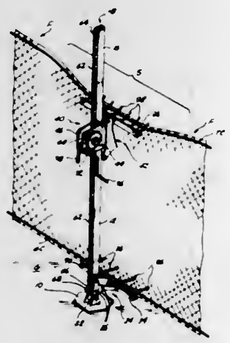
1. A rotary control valve comprising
a valve housing having a longitudinal axis, a fluid inlet, and a fluid outlet,
an axle in said housing having an axis which is at right angles to and is laterally displaced from said housing axis,
a plug mounted on said axle for rotation therewith within said housing, said plug having a spherical sealing surface which is rotated about said axis of said axle upon the rotation of said axle,
a flexible seat ring located in said housing between said inlet and said outlet, said seat ring having an annular outer portion having an axis coinciding with said housing axis and having an annular intermediate diaphragm portion of cup-shaped cross-section which extends from said outer portion substantially in the direction of the said axis of said outer portion and turns through substantially a right angle to terminate in two oppositely-directed annular lips which extend substantially at right angles to said diaphragm portion and parallel to said axis of said outer portion, and
an annular retaining ring having an annular outer collar portion and having an annular inner collar portion constituting a hard seat portion, said outer collar portion being secured in said housing concentrically with said housing axis to secure therein said outer portion of said seat ring with one of said annular lips facing said axle, and with the other of said annular lips facing said hard seat portion,
whereby rotation of said plug which brings said spherical sealing surface into contact with said one of said annular lips establishes sealing engagement between the latter and said spherical sealing surface, and brings said other of said annular lips into sealing engagement with said hard seat portion, thereby to seal said inlet from said outlet.

4,073,474
POPPET VALVE
Kametaro Hashimoto; Kenji Ushitani; Yoichi Serino, all of Toyota, and Tadaoki Arakawa, Seto, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan
Filed Dec. 30, 1975, Ser. No. 645,383
Claims priority, application Japan, Aug. 15, 1975, 50-99389
Int. Cl.² F16K *24/00*
U.S. Cl. 251—368 **3 Claims**



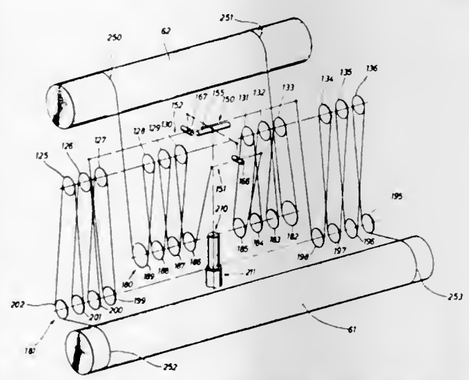
1. An upset-forged poppet valve comprising a first portion which includes the valve head and at least a part of the valve neck and a second portion which includes the remaining portion of the valve including the valve stem, said first and second portions being bordered by a friction-welded joint formed prior to an upset-forging process of the valve, wherein said first portion is made of super alloy having a composition consisting essentially of less than 0.15% C, 15–26% Cr, 1–10% Co, 5–18% Fe, more than 0.8% Ti, more than 0.8% Al, provided that Ti plus Al is between 1.6–5.0% and the substantial balance being Ni and impurities, and said second portion is made of a conventional valve steel.

4,073,475
CHAIN LINK FENCE STRAIGHTENER
Steven R. Gordon, Yakima, Wash., assignor to Fred C. Van Hoose, Yakima, Wash., a part interest
Filed June 10, 1976, Ser. No. 694,688
Int. Cl.² B66F *3/08*; B21F *33/00*
U.S. Cl. 254—66 **15 Claims**



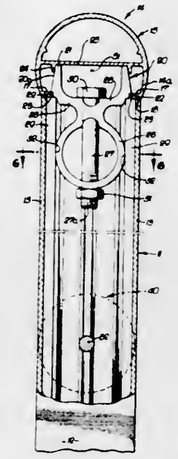
1. A chain link fence straightener for straightening a bent segment of previously installed chain link fence without removal of the segment from the line of fence, said straightener comprising:
a. a ground engageable base member;
b. post means standing upwardly from said base member to a height at least about the normal height of the fence;
c. lower tine means of at least about a 2 foot span affixed to said post means and extending forwardly thereof slightly above said base member in a position for engaging with at least about four tines a plurality of links of the fence segment near the bottom thereof;
d. carriage means which enclose said post means while being carried ther .by and relatively movable therealong;
e. manually actuated drive means carried by said carriage means for moving said carriage means vertically on said post means, and for retaining said carriage means at any desired position on said post means; and
f. upper tine means of at least about a 2 foot span carried by said carriage means and extending forwardly thereof in a position for engaging with at least about four tines a plurality of links of the fence at various points above said lower tine means.

4,073,476
OVERHEAD CRANE WITH REDUNDANT SAFETY FEATURES
Louis N. Frank, Houston, Tex., assignor to Kranco, Inc., Houston, Tex.
Filed May 24, 1976, Ser. No. 689,041
Int. Cl.² B66D *1/26*
U.S. Cl. 254—184 **23 Claims**



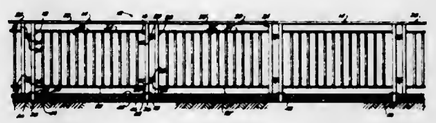
11. In an overhead crane comprising a frame and a hook assembly, extendable and retractable through a plurality of sheave assemblies, the improvement which comprises:
a dual element hook adapted to support plural loads;
two indenpendently reeved hoisting systems, each system independently engaging the dual element hook and each system capable of supporting and lifting a first load on said hook;
the hoisting systems being adapted to operate in unison to provide redundant safety features when supporting and lifting said first load and when supporting and lifting a second load which is greater than said first load;
said two independently reeved hoisting systems including a lower load block assembly suspended from said frame, the lower load block assembly having an upper block sheave assembly associated with one of the independently reeved hoisting systems and a lower block sheave assembly associated with the other independently reeved hoisting system, said upper and lower block sheave assemblies being independently supported from each other, and in engagement with said hook; and
each independently reeved hoisting system includes an independent take-up means for extending and retracting said system.

4,073,477
RAILING WITH INTERFITTING RECTANGULAR AND CURVED CROSS SECTION MEMBERS
Donald H. Walters, 493 Stanford Drive, Arcadia, Calif. 91006
Filed Sept. 13, 1976, Ser. No. 722,739
Int. Cl.² B21F *27/00*
U.S. Cl. 256—22 **12 Claims**



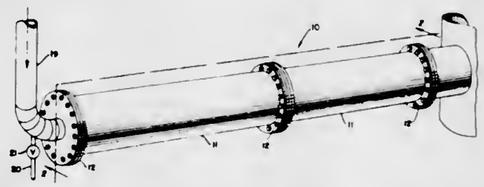
1. In a railing assembly, the combination comprising:
a. an upright post having generally rectangular cross section in horizontal planes,
b. an elongated upper rail including an upper section having an upwardly convex generally semicircular cross section in a plane normal to the direction of elongation, said upper section opening downwardly and extending directly over the open top of said post, the post supporting the upper section,
c. primary anchor means extending upwardly into the rail upper section and downwardly into the top of the post to anchor the rail to the post, and
d. an elongated bottom closure section attached to the rail upper section to close said downward opening, said closure section extending endwise proximate the side of the post,
e. said primary anchor means including a pair of upward projecting camming tines which are laterally spaced apart, each tine defining an upper terminal and a lower step shoulder, and said upper rail upper section defining laterally projecting ledges having detent locking engagement with said step shoulders, said primary anchor means including a downwardly projecting ring received into the post, there being a retainer extending vertically through the ring, the retainer being adjustable to clamp and expand the ring laterally for adjustable frictional retention to interior surfaces on the post, said tines and ring being integral.

4,073,478
FENCE STRUCTURE
Eduardo Bermudez, 610 Solano Prado, Coral Gables, Fla. 33156
Filed Feb. 28, 1977, Ser. No. 772,687
Int. Cl.² E04H *17/14*
U.S. Cl. 256—27 **1 Claim**



1. A fence comprising a pluality of fence sections of two types, a first type and a second type, each type fence section including a pair of spaced end posts, the end posts of said second type being of a second length and the end posts of said first type being of a first length, said first length being longer than that of said second length and defining downwardly extending end post portions, said portions being adapted to be inserted into recesses in a support surface; and fastener means to interconnect the end post of the first type and the second type, said fastener means comprising mating surfaces extending longitudinally from each of the end posts and including mating pin and slot means;
said fastener means including positioning means to guide the fence section in the fastening operation of adjacent fence sections; and
said positioning means comprising guide plates defining abutment surface on adjacent portions of the fastening means;
each of said fence sections includes an upper rail and a lower rail and said rails are spaced from one another defining a decorative panel and said fence including vertically extending, spaced slat members;
said fence being adapted to rest on a support surface having pairs of spaced recesses therealong defining a fence line and wherein the recesses of each pair are equispaced from one another a distance such that the respective vertical centerlines are spaced apart a distance equal to the distance between the end posts of said first type and said recesses are of an axial length depthwise in the support surface at least as long as the difference between said first and second length and the recesses being sized and configured and located on the fence line to receive an end post portion of said first type fence section;
means on said end post portions of the fence sections of said first type to limit penetration of said end post portions in said recesses;
said mating surfaces extending longitudinally from each of the end posts and comprising longitudinally extending surfaces arranged for sliding bypassing relation one over the other.

4,073,479
SULFIDIZATION REACTION
Martin C. Kuhn; John A. Stephens; Michael J. Noakes, all of Tucson, Ariz., and Allen D. Rovig, Butte, Mont., assignors to The Anaconda Company, Tucson, Ariz.
Division of Ser. No. 506,570, Sept. 16, 1974. This application Sept. 29, 1976, Ser. No. 727,648
Int. Cl.² F27B *7/14*
U.S. Cl. 266—173 **5 Claims**



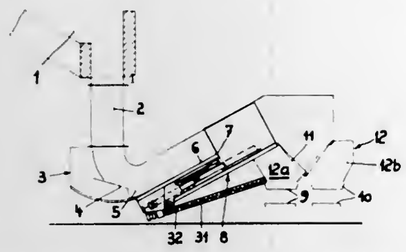
1. A reactor comprising elongated tubular means, shaft means mounted in said tubular means, and a plurality of paired blade members attached to said shaft and radially extending therefrom at spaced intervals therealong at approximately 30° pitch angles relative to the axial direction of the shaft, there being a reverse pitch direction of alternate pairs of said paired blade members extending in the same radial direction.

4,073,480

APPARATUS FOR THE PROCESSING OF SLAG

Johannes Josef Martin, and Erich Weber, both of Munich, Germany, assignors to Josef Martin Feuerungsbau GmbH, Munich, Germany

Filed May 13, 1977, Ser. No. 797,515
Claims priority, application Germany, May 21, 1976, 2622964
Int. Cl.[2] C21C 7/00
U.S. Cl. 266—201 23 Claims



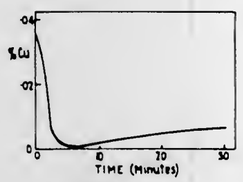
1. Apparatus for processing slag which issues from an industrial furnace or the like, comprising a liquid-containing quenching vessel for reception of slag; a duct having an inlet in communication with said vessel and a discharge end remote from said inlet; means for advancing quenched slag from said vessel into said duct so that the slag is caused to overflow said discharge end; and means for transporting the overflowing slag, including an elongated receptacle having a rear portion below said discharge end and a front portion at a level above said rear portion, a pusher reciprocable in said receptacle between a retracted position behind said discharge end and a forward position, and means for reciprocating said pusher between said positions so that the pusher advances overflowing slag in said receptacle toward said front portion during each movement from said retracted position.

4,073,481

CONTINUOUS SULPHUR DROSSING APPARATUS

Frank Lawson, Glen Waverley; Denby Harcourt Ward, and Robert George Kelly, both of Port Pirie, all of Australia, assignors to The Broken Hill Associated Smelters Proprietary Limited, Melbourne and Monash University, Clayton, both of, Australia

Filed July 14, 1976, Ser. No. 705,256
Claims priority, application Australia, Sept. 8, 1975, 3079/75
Int. Cl.[2] C22B 15/14
U.S. Cl. 266—215 12 Claims



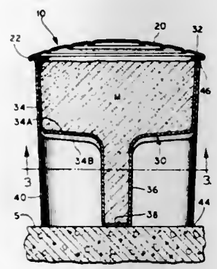
1. Apparatus for the continuous sulphur drossing of lead to reduce the copper content thereof which comprises a plurality of reaction vessels arranged in series, a stirring device in each reaction vessel for vigorously agitating the material therein, means for continuously feeding bullion to the first reaction vessel, means for continuously feeding sulphur to the first reaction vessel, a bullion feed rate controlling device for controlling the feed rate of the bullion, a sulphur feed rate controlling device for controlling the feed rate of the sulphur, means for heating the bullion in each reaction vessel, means for controlling the temperature of the bullion in each reaction vessel, means for continuously and concurrently flowing bullion, dross and any unreacted sulphur from each reaction vessel to the next in sequence, without back-mixing, an unagitated separation vessel, means for continuously and concurrently flowing decoppered bullion and dross from the final reaction vessel to the separation vessel, means for scraping the dross from the surface of the decoppered bullion in the separation vessel, and means for continuously withdrawing decoppered bullion from the separation vessel, wherein the bullion feed rate controlling device splits the feed bullion stream into a controlled bullion stream and a variable excess bullion stream, the controlled bullion stream being fed to the series of reaction vessels.

4,073,482

INERTIAL BARRIER SYSTEM

Wan Seegmiller, and Bruce O. Young, both of Sacramento, Calif., assignors to Energy Absorption Systems, West Sacramento, Calif.

Continuation of Ser. No. 496,784, Aug. 12, 1974, abandoned.
This application Dec. 18, 1975, Ser. No. 641,911
Int. Cl.[2] F16F 7/12; E01F 15/00
U.S. Cl. 267—139 8 Claims



1. An inertial barrier system for attenuating the energy of errant vehicles comprising:

module means defining a frangible container having a generally wine-glass type configuration with an open and enlarged upper portion and a closed and reduced lower stem portion for receiving a continuous mass of dispersible energy-attenuating material having a substantially uniform density throughout the material height so that the center of gravity of said mass is above said lower stem portion;

means to cover said open portion of said module means; and

means to stabilize said module means on a support surface in a manner which will transmit the vibrational energy of said surface to said continuous mass in said module means, said stabilizing means comprising an open-ended member engageable with said upper portion of said module means to stabilize said module means, with said stem portion operatively engaged with said support surface to support said module and said mass and transmit the vibrational energy of said surface to said mass.

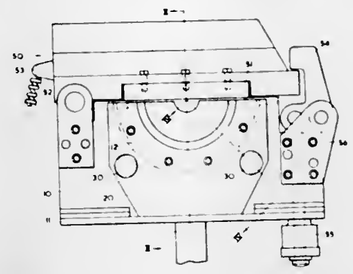
4,073,483

SUPPORTING DEVICE

Jack James Smith, Daventry, England, assignor to BOC Limited, London, England

Filed Jan. 19, 1977, Ser. No. 760,698
Claims priority, application United Kingdom, Jan. 21, 1976, 239876/76
Int. Cl.[2] B25B 1/04
U.S. Cl. 269—25 14 Claims

1. A device for locating parts of a flanged plain bearing which are to be joined together to form the finished article, which device comprises a body part having an arcuate seating surface extending across an upper surface of the body part, at least one substantially planar side surface area adjoining the seating surface, means to clamp an arcuate bearing shell in the seating surface and means to clamp a separate bearing flange against the side surface area with the edges of the arcuate shell and the flange to be joined together, in abutment and exposed for welding by a laser beam, which latter means includes a movably mounted clamping member for engaging the face of the flange remote from said surface area, and means to move the clamping member between a clamping position in which it exerts a force against a flange to hold it against the side surface and a free position in which such force is released.

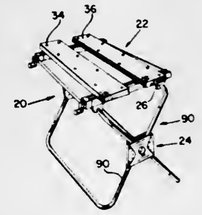


4,073,484

PORTABLE WORKBENCH ASSEMBLY

Gerald Beekenkamp, Etobicoke, Canada, assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed Oct. 4, 1976, Ser. No. 728,940
Int. Cl.[2] B25B 1/22; A47B 3/02
U.S. Cl. 269—321 CF 3 Claims



1. A portable workbench comprising:

a foldable support stand;

a workpiece supporting and clamping assembly supported thereon, the workpiece supporting and clamping assembly including a base frame; a pair of elongated top members located on the base frame and defining upper work supporting surfaces lying generally in a common plane and having opposed side portions defining clamping surfaces; and, clamping means operatively connected between said base frame and one of the top members for moving the latter toward and away from the other top member to provide for the clamping of workpieces between the top members;

said support stand including: a pair of generally rigid frames, each frame including a spaced apart pair of end legs and an upper longitudinally extending generally horizontal member, interconnecting said end legs;

pivot means for pivotally connecting said frames together at corresponding ones of said end legs of said frames below said horizontal members to permit said frames to be pivoted relative to one another between an open support position where the frames are angularly arranged relative to one another with their horizontally extending members being spaced a predetermined distance apart, to a folded position wherein the frames are in juxtaposition to one another, said pivot means including stop means for defining said open position and preventing collapse of said support stand in said open position;

resilient clip means for releasably engaging said upper horizontal members when the support stand is in the open support position to secure said workpiece supporting and clamping assembly to the support stand when in use and to permit the workpiece supporting and clamping assembly to be removed therefrom to facilitate handling and storage of the portable workbench; and,

slot means formed in said base frame so as to extend transversely to said horizontal members;

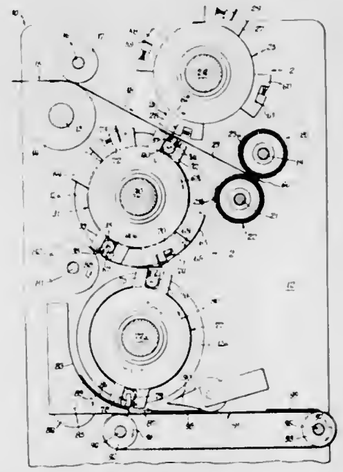
said resilient clip means having engaging means slideably engaging said slot means to permit said horizontal members to move relative to said base frame to change said predetermined distance in response to deflections of said frames about said pivot means produced by forces applied by an operator to said assembly, said forces being transmitted from said assembly to said frames through said resilient clip means.

4,073,485

APPARATUS FOR MAKING MULTIPLE PAGE PRINTED BOOKLETS

Clyde G. Gregoire, Bensenville; James A. Hartman, Brookfield, and Milton J. Gregoire, Lombard, all of Ill., assignors to Gregg Engineering Corporation, Lyons, Ill.

Filed Jan. 10, 1977, Ser. No. 758,079
Int. Cl.[2] B41F 13/56
U.S. Cl. 270—21 6 Claims



1. An apparatus for making multiple page booklets from a continuously printed web comprising a frame support, a pair of cooperative rotatably driven feed rollers carried on said frame support, a spaced apart pair of yieldingly cooperative web pulling members carried on said frame support, said feed rollers adapted to receive a continuously printed web and deliver it to the spaced apart pair of yieldingly cooperative members for pulling and supporting an end of said web, first and second operational rollers carried on said frame support at a location generally between said feed rollers and said yieldingly cooperative members, said first and second operational rollers having tangentially joining surfaces coincident with the path of the printed web disposed between the feed rollers and the pair of yieldingly cooperative web pulling members, a plurality of similarly sized and shaped working boxes, means for adjustably positioning said working boxes about said operational rollers, the first of said operational rollers having one such box equipped with a web tucking member and having another such box equipped with a knife member, and the second said operational roller having one such box equipped with a web grip-

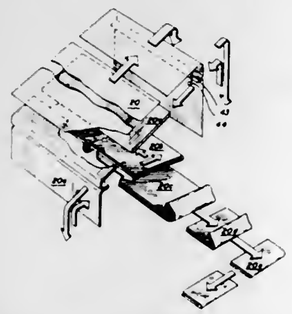
ping means for cooperation with the web tucking member of the one such box of the first of said operational rollers, and the second of said operational rollers having another such box equipped with an anvil for cooperation with the knife member of the another such box of the first of said operational rollers, and a third operational roller carried on said frame support having a tangential joining surface with the second of said operational rollers, said third operational roller having one such box equipped with a web gripping means, and said second operational roller having still another such box equipped with a tucker member arranged for cooperation with the one such box equipped with the gripping means on the third operational roller, and cam means associated with said frame support and said boxes equipped with said gripping means to effect an intermittent opening of said gripping means to receive a bight of the printed web by said tucker members, and means closing said gripping means on said web bight, whereby the continuously printed web is cut and folded into a multiple page booklet at printing press speeds as it is moved in a path around the operational rollers having the working boxes thereon.

4,073,486

FOLDER CONSTRUCTION

Kasimir Kober, Chicago, Ill., assignor to Chicago Dryer Company, Chicago, Ill.

Continuation-in-part of Ser. No. 570,058, April 21, 1975, abandoned. This application Sept. 30, 1976, Ser. No. 728,079
Int. Cl.² B65H *45/00*
U.S. Cl. 270—69 **3 Claims**



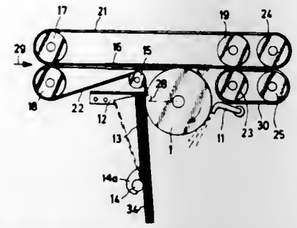
1. In a folding apparatus the combination comprising article folding means adapted to be mounted above a supporting surface; article sensing means; conveyor means for moving a foldable article at a constant speed between said article sensing means and said article folding means in a fixed period of time; said article sensing means being disposed adjacent the conveyor path and being sensitive to passage thereby of the article leading and trailing edges; control means adapted to be activated following receipt of a signal from said article sensing means while sensing a foldable article; said control means comprising a time/count control adapted to count out time at a normal rate and at a less than its normal rate; said control having a count entered therein corresponding to said fixed period of time; said time/count control emitting a signal for activating said folding means after said time/count control has counted out said count entered therein; the entered count being counted out at said rate less than its normal rate while activated by said article sensing means and said entered count being counted out at said normal rate following passage of the foldable item from engagement with said sheet sensing means; an AC time signal having positive and negative half wave pulses operating at a frequency of 60 cycles per second driving said time count control; said time/count control counting the positive half wave pulse only of said time signal during the interval the article sensing means senses the foldable article and thereafter counting both the positive and negative half wave pulses of said time signal until said time/count control has counted out the count entered therein.

4,073,487

DISCHARGING AND STACKING DEVICE FOR FLAT ARTICLES

Harry Schirrmeister, Tegernseer Landstrasse 185, and Markus Haberstroh, Euckenstrasse 21, both of Munich, Germany, assignors to G.A.O. Gesellschaft fur Automation und Organisation mbH, Germany

Filed Nov. 21, 1975, Ser. No. 634,029
Claims priority, application Austria, Dec. 23, 1974, 10263/74
Int. Cl.² B65H *29/12, 29/24, 29/54, 29/58*
U.S. Cl. 271—64 **8 Claims**



1. In a discharging and stacking device for flat articles to be conveyed, such as sheets of paper and documents, of the type including a stacking drum having openings in its periphery by means of which the articles to be conveyed can be held by suction against the drum and accumulated in an orderly stack, with the suction being effective within only a predetermined angular range of rotation of the stacking drum, the improvement comprising, in combination, a conveying system operable to feed flat articles to said stacking drum; means mounting said stacking drum at a position, relative to said conveying system, such that the articles to be conveyed are fed tangentially to said stacking drum; said stacking drum being formed with a single row of openings in its circumferential periphery, with said single row of openings extending parallel to the axis of said stacking drum; stack supporting means, for the articles to be stacked, mounted adjacent said stacking drum; means operable selectively to connect said single row of openings to a source of vacuum, to supply intake air to said openings, or to a source of air under pressure, to supply pressure air for discharge through said openings; whereby, with suction being effective at said openings, the delivered articles to be conveyed are held, by their leading edges, against said stacking drum, discharged around said stacking drum and fed to said stack supporting means while, with air under pressure discharged through said openings, the articles to be conveyed are caused to pass by said stacking drum; and a following conveying system operable to receive articles passing by said stacking drum.

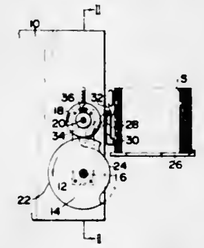
4,073,488

DEVICE FOR DETECTING THE THICKNESS OF SHEETS

Isamu Uchida, Chigasaki, Japan, assignor to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Nov. 26, 1975, Ser. No. 635,764
Claims priority, application Japan, Nov. 29, 1974, 49-138073
Int. Cl.² B65H *7/12*
U.S. Cl. 271—263 **3 Claims**

1. A device for detecting the thickness of bank notes or other sheets comprising a seizing roller, a first shaft mounted for counterclockwise rotation and supporting said seizing roller, a feed roller, a second shaft mounted for clockwise rotation and supporting said feed roller, said seizing roller including a peripheral length slightly longer than each of the bank notes to be transferred and a recess for receiving the forward end of each bank note until it has been engaged between the peripheral portion of the seizing roller and the feed roller to pass the bank note between said rollers, said second shaft supporting the feed roller having a diameter smaller than that of said first shaft to permit upward displacement thereof relative to the first shaft in the event of the passage of at least one bank note and a



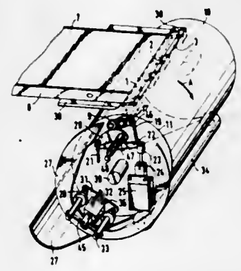
displacement detecting means for directly detecting the displacement of said second roller shaft to produce an electrical signal in accordance with the thickness of said at least one bank note.

4,073,489

DOCUMENT TRANSPORT DEVICE

Hermann Idstein, Oestrich-Winkel, and Peter Loew, Wallau, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 24, 1977, Ser. No. 771,779
Claims priority, application Germany, Feb. 26, 1976, 2607774
Int. Cl.² B65H *29/06*
U.S. Cl. 271—277 **21 Claims**



1. A device for transporting an original to be copied while resting on a supporting surface in a reproduction apparatus, comprising:

a shaft extending across the width of the supporting surface and being arranged in spaced relationship substantially parallel therewith;

a plurality of means in spaced attachment along said shaft and responsive to rotation of the shaft for clamping the leading edge of the original;

a flexible strip member commonly covering said clamping means and being adapted to protect the leading edge of the original in the clamped position;

means engaging one end of said shaft in an original-receiving position for opening and closing said clamping means by rotating said shaft; and

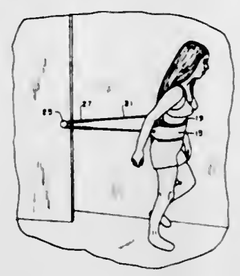
means engaging one end of said shaft in an original-releasing position for opening said clamping means by rotating said shaft.

4,073,490

BODY ATTACHED RESTRAINING TYPE EXERCISING DEVICE

Jack Vincent Feather, P.O. Box 737, Pebble Beach, Calif. 93953

Filed June 4, 1976, Ser. No. 692,900
Int. Cl.² A63B *21/04*
U.S. Cl. 272—136 **5 Claims**



1. An improved exercising device comprising

a relatively wide elastic body engaging band,

a substantially inelastic reinforcement material secured to one side of said body engaging band forming a body support belt,

a relatively wide elastic wrap band means secured to and extending substantially beyond one end of the body support belt whereby said wrap band means may be stretched to tightly encircle the user's body in overlapped relation with said support belt on the inside thereof between the user and the belt to evenly distribute the pressure developed during an exercise program, over the contacted portion of the body and to insulate said body contacted portion,

at least one elastic cord member attached to the reinforcement material of said body support belt, and

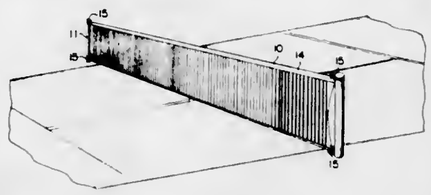
means for releasably hooking the end of said elastic cord member to an anchored object such as the knob of a door whereby a user wearing said body support belt around the waist or midsection can jog in place against the tension of said elastic cord member.

4,073,491

TENNIS NET

Walter J. Sepaniac, Philadelphia, Pa., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Apr. 12, 1976, Ser. No. 675,728
Int. Cl.² A63B *61/00*
U.S. Cl. 273—29 B **2 Claims**



1. A tennis net for use on a conventional lawn tennis court comprising

a pair of horizontally extending, vertically spaced, upper and lower suspension members, and a plurality of horizontally spaced, vertically extending, elastic members, each said vertical member being a section of a continuous elastic cord;

each suspension member being formed of a flexible cable enclosed by a fabric sleeve of U-shaped configuration, the legs of said U-shaped sleeve of said upper suspension member being turned downwards while the legs of said

U-shaped sleeve of said lower suspension member are turned upwards;

means connecting the legs of each U-shaped sleeve in substantially equally spaced locations along the length of said suspension members, said continuous elastic cord being attached between means of said upper and lower U-shaped sleeves to form said plurality of horizontally spaced, vertically extending, elastic members;

the elasticity of said vertical members and the spacing therebetween being functional to cause loss of Kinetic Energy of a conventional tennis ball striking the net but allowing the ball to pass through the net when said suspension members are attached to support posts of a conventional tennis court arrangement.

4,073,492

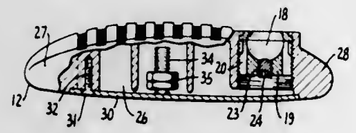
CUSTOMIZED PUTTER

David L. Taylor, 380 W. Carmel Valley Road, Carmel Valley, Calif. 93924

Continuation-in-part of Ser. No. 597,548, July 21, 1975, abandoned. This application Apr. 29, 1976, Ser. No. 681,542

Int. Cl.[2] A63B *53/02*

U.S. Cl. 273—80.2 **6 Claims**



4. The method of adjusting a club head and shaft of a golf club for approved competitive use comprising the following steps, providing the head of said club with movable means for mounting a shaft, said means having a projection positioned to extend above the upper surface of said head and adapted to receive the end of shaft, permanently securing said shaft to said projection on said movable mounting means, moving the shaft and movable mounting means as a unit to an adjusted angular position of said shaft with respect to said head to meet the attitude needs and requirements of the user, and irreversibly securing the movable joint of the club head in the adjusted position.

4,073,493

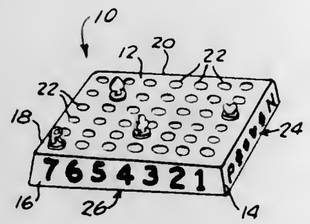
BRIDGE BID RECORDING DEVICE

Stephen T. Moreland, 789 Anita Ave., Grosse Pointe Woods, Mich. 48236

Filed July 30, 1976, Ser. No. 710,234

Int. Cl.[2] A63F *1/18*

U.S. Cl. 273—148 R **11 Claims**



8. A device for recording and retaining the bids of a single player in a game of bridge comprising means providing a plurality of holes formed in a rectangular array of seven rows and six columns; first means identifying each said column with one of the bid types: pass, clubs, diamonds, hearts, spades, and no-trump; second means identifying each said row with the one of the bid levels: one through seven; and a plurality of tokens selectively insertable into each said hole for indicating the type and level of a player's bid during each round of bidding, said tokens including means associating respective ones of said tokens with the bid types: pass, clubs, diamonds, hearts, spades, no-trump, double and redouble.

4,073,494

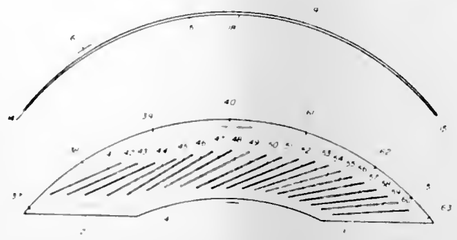
PLAYING CARD HOLDER

Patricia Louise McAdams, 1865-B S. O'Neal Ave., Charleston, S.C. 29404

Filed Aug. 20, 1976, Ser. No. 716,191

Int. Cl.[2] A63F *1/10*

U.S. Cl. 273—150 **17 Claims**



1. A device for holding playing cards for a card player comprising:

(a) a structure operative to rest on a surface;

(b) a plurality of non-parallel slots in the top of said structure operative to hold said playing cards vertically with respect to said surface and said nonparallel slots being angled sufficiently and so disposed relative to each other that an upper corner of said playing cards indicating the identity of said playing cards is visible and readable only to said card player facing said structure, each of said non-parallel slots completely surrounding the lower portion of each of said playing cards when each of said playing cards is inserted in each of said non-parallel slots; and

(c) a shield connected to said structure operative to make said playing cards unreadable to other persons playing with said card player.

4,073,495

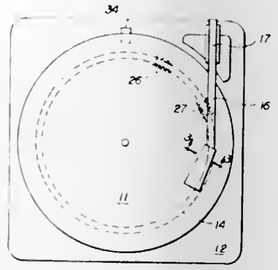
ADVANCEMENT OF STUCK PHONOGRAPH NEEDLES

Peter Royce, 205 S. Linden Ave., South San Francisco, Calif. 94080

Filed Oct. 13, 1976, Ser. No. 732,039

Int. Cl.[2] G11B *3/00*

U.S. Cl. 274—1 R **14 Claims**



1. A device for advancing a "stuck" stylus having a current output for use in a record player having a turntable on which a record having multiple grooves is rotated and a tone arm having a stylus to engage said record, comprising impact means mounted on or in said tone arm of a phonograph operable to deliver an impact to said tone arm to drive said stylus upwardly and inwardly relative to said record to advance said stylus at least one record groove and actuating means for actuating said impact means, said actuating means comprising recording means for temporarily making a temporary record of the output of said stylus for one rotation of said turntable, comparison means for detecting when the current output of said stylus is substantially identical with said temporary record and thereby to detect when said stylus is stuck in a groove, and means responsive to said comparison means for activating said impact means.

4,073,496

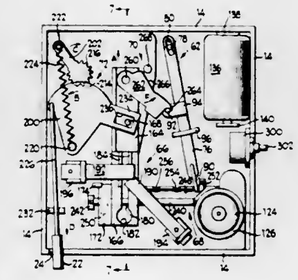
PHONOGRAPH DEVICE

Gordon A. Barlow, Skokie, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Mar. 31, 1976, Ser. No. 672,319

Int. Cl.[2] G11B *25/04*

U.S. Cl. 274—9 B **10 Claims**



1. A toy phonograph comprising, in combination:

a housing including a record-receiving slot;

a turntable rotatably mounted on the housing;

a spindle mounted on the housing to move toward and away from the turntable;

drive means for rotating the turntable;

a tone arm including a stylus, mounted on the housing to track a record groove and to move the stylus off of and onto the record;

cam means including a slider plate having an extended portion for engagement with the periphery of a record to move therewith from a normal eject position to a play position when a record is inserted through the record-receiving slot, and a cam surface engageable with the movable spindle to cause the spindle to move into engagement with the record as the slider plate is moved to the play position during record insertion;

a speaker cone assembly having an armature biased against the tone arm for amplifying vibrations transmitted through the tone arm by the record groove; and

a record comprising a plurality of concentric selections of predetermined size, each selection comprising a spiral groove having an ending circular groove and a blank land area between each of said concentric selections whereby the pickup stylus must be lifted from the record and moved over the land area to the beginning convolution of the next spiral record groove;

tone arm control means for moving the stylus into and out of engagement with the record groove and for moving the tone arm in a plane parallel to the recorded surface, said control means including a pivotally mounted lever means engageable with the slider plate for lifting the tone arm when the slider plate means to the eject position, and said lever means including detent means for moving the tone arm in plane to cause the stylus to skip over the intermediate land area of the record to thereby play the next smaller concentric selection when a record is inserted through the slot.

4,073,497

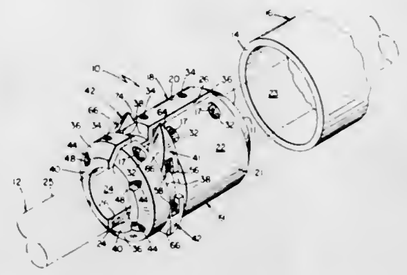
CARE CHUCK STOP ASSEMBLY

Richard Edward Flagg, East Bridgewater, and Blaine Potter, Sharon, both of Mass., assignors to Double E Company, Inc., Brockton, Mass.

Filed Aug. 2, 1976, Ser. No. 710,904

Int. Cl.[2] B23B *31/40;* **B65H** *17/02*

U.S. Cl. 279—2 R **14 Claims**



4. A stop assembly comprising:

a body having an outer surface adapted for engaging the interior surface of a hollow core and arranged for mounting securely on a shaft;

a plurality of fingers secured to said body for pivotal movement relative thereto about respective axes generally parallel to the axis of said outer surface between respective first positions in which said fingers lie within said outer surface and respective second positions in which said fingers project beyond said outer surface; and,

means for biasing said fingers towards said second positions,

said body including a plurality of substantially identical body portions each subtending an arc of less than 180°, defining a portion of said outer surface, including an annular groove in the outer surface thereof and having circumferentially spaced side edges extending generally parallel to the axis of said outer surface,

adjacent side edges of said body portion being spaced from each other when said assembly is mounted on said shaft,

each of said fingers defining a core engagement surface lying in a plane generally perpendicular to the axis of said outer surface and defining a camming surface facing generally away from and inclined relative to said core engagement surface thereof,

said core engagement surfaces of all of said fingers being substantially coplanar and facing in the same direction,

a pair of said fingers being mounted in each said groove with the free end of each of said pair being adjacent and the axis of pivotal movement of each of said pair being spaced from a respective one of said side edges of said each body portion, and

no fixed portion of said assembly lying outwardly of said outer surface whereby said assembly may be inserted into a core having an interior surface not substantially larger than said outer surface.

4,073,498

DRILL CHUCKS

George Cecil Derbyshire, Sheffield, England, assignor to The Jacobs Manufacturing Company, Limited, Sheffield, England

Filed Mar. 8, 1976, Ser. No. 664,489

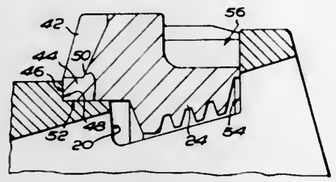
Claims priority, application United Kingdom, Apr. 1, 1975, 13271/75

Int. Cl.[2] B23B *31/04*

U.S. Cl. 279—62 **3 Claims**

1. A drill chuck comprising a body part formed to provide spaced converging bores for the reception of jaws which are movable relative to an axially extending bore formed in the body part, and being further formed to provide a circumferential groove extending about the periphery of the body part and

intersecting the spaced bores, a jaw located in each said bore, each said jaw having a gripping portion and a threaded portion on part of its surface, a ring shaped rotatable means defining an integral bevel gear portion located at an end of said ring and a threaded nut portion located on the internal wall of said ring, said ring being positioned in the circumferential groove with the nut member portion being threadably engaged with said jaws to provide movement of said jaws when the bevel gear



element is rotated with respect to said body, a circumferential collar formed on the rotatable means, said bevel gear element portion having a plurality of gear teeth with inner ends formed integrally with and being bounded by the circumferential collar, an end surface of said collar being in abutment with a radial surface of the circumferential groove, and a cylindrical sleeve at one end of which engages a portion of the rotatable means, the other end of which engages the body part.

4,073,499

STROLLER FOR A CHILD

Frank Damone, 166 Porter St., Stratford, Conn. 06947, assignor to Frank Damone, Stratford, Conn.

Filed June 18, 1976, Ser. No. 697,392
Int. Cl.² B62B 7/00
U.S. Cl. 280—1.1 R **2 Claims**



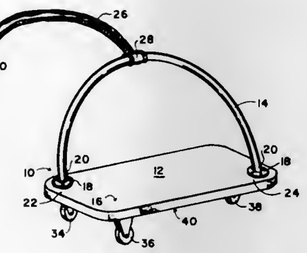
1. A stroller for a child comprising an animal figurine mounted on wheel means for rolling said animal figurine over a surface, a saddle shaped seat positioned on the back of said animal figurine for supporting a child thereon in a seated position astride the back of said animal figurine, back support means comprising parallel rails and a back rest positioned upwardly from said animal figurine for providing back support for a child sitting on said saddle shaped seat, handle means extending upwardly from said back support means for grasping by a person walking behind said stroller and for pushing said stroller; said handle means comprising an adjustable handle retractably extendible from and towards said parallel rails; said parallel rails comprising a first pair of parallel tube members having catch means thereon for releasably securing said handle means in any of a plurality of extended positions, said handle means comprising a second pair of parallel tubes telescopically engaging said first pair of parallel tubes, and releasably securable thereto by said catch means, transverse bar means spanning said second pair of parallel tubes at the uppermost extremity thereof for rigidly separating said second pair of parallel tubes and for grasping by a person walking behind said stroller and for pushing said stroller, said catch means comprises a tube transversely positioned between said first pair of parallel tubes in openings in said first pair of parallel tubes, transversely displacable shaft means in said tube, for operatively engaging said second pair of parallel tubes through said openings in said first pair of parallel tubes, resilient means in said tube for operatively engaging and resiliently biasing said shaft means through at least one of said openings in said first pair of parallel tubes, spaced shaft receiving openings in said second pair of parallel tubes for receiving said shaft means, second handle means extending from said shaft for manually moving said shaft out of said openings in said second pair of parallel tubes.

4,073,500

WHEEL BOARD UNDULATING COASTER

Leo Campeau, 6621 Arcola Street, South Burnaby, British Columbia, Canada (V5E 1H2)

Filed Aug. 24, 1976, Ser. No. 717,041
Int. Cl.² B60D 3/00
U.S. Cl. 280—87.04 R **3 Claims**



1. A wheel board undulating coaster comprising a generally planar platform, three ground contacting wheels mounted for rotation on the underside of the platform and positioned in a triangular arrangement, means for mounting one of the three wheels for swiveling movement about a vertical axis normal to the axis of rotation thereof, and all three wheels having peripheral surfaces eccentric to the axes of rotation thereof, a generally U-shaped support member, said support member affixed on the uppermost side of the platform, the free ends of the U-shaped member being disposed fixedly secured to said uppermost side of said platform, said platform having a generally rectangular shape, said free ends being disposed adjacent diametrically opposed corners of said platform.

4,073,501

VEHICLE ENTRY WAY ELEVATOR STEP

Donald G. Grow, R.R. 1, Perry, Iowa 50220

Filed May 28, 1976, Ser. No. 690,980
Int. Cl.² B60R 3/02
U.S. Cl. 280—164 R **11 Claims**

1. In combination a vehicle, having an access entry way and an elevator step comprising,

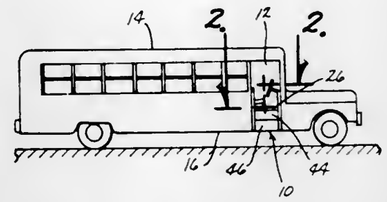
a floor in said vehicle above the outside ground level,

said entryway being defined by a pair of opposite sidewalls, a back wall and a door opposite said back wall,

said elevator step being positioned in said entryway and being movable between a raised position in the plane of said floor and a lowered position adjacent the ground to a position between said floor and the ground substantially in the plane of the bottom of the vehicle,

power means connected to said elevator step for raising and lowering said elevator step, and

a closure plate being positioned below and in operative engagement with said elevator step and being yieldably held in a raised position in the plane of the bottom of the vehicle for closing the bottom end of said access entry-



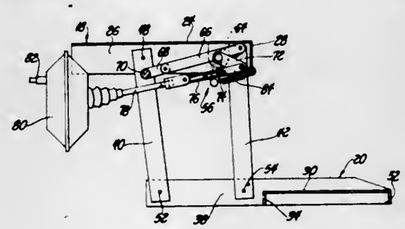
way, and said closure plate being larger in area than said elevator step and said bottom end of said access entryway whereby when said elevator step is lowered below the bottom of said vehicle said closure plate is moved downwardly by said step and when said step is raised above the bottom of said vehicle, said closure plate engages and is retained by the bottom of said vehicle.

4,073,502

RETRACTABLE STEP

Raymond C. Frank, 4083 Second St., Brown City, Mich. 48416, and Ronald R. Frank, 2051 Forest Drive, Lapeer, Mich. 48446

Filed June 21, 1976, Ser. No. 697,959
Int. Cl.² B60R 3/02
U.S. Cl. 280—166 **3 Claims**



1. A retractable step, comprising;

a step supporting member,

a step member,

pivotal linkage connecting said step member to said supporting member for movement between a first position raised and retracted up under said supporting member and a second position lowered and extended in front of said supporting member,

operative means provided on said supporting member and connected to said pivotal linkage for raising and retracting said step member into said first position,

biasing means connected to said operative means and acting to dispose and hold said step member in said second position,

said operative means including an overcenter linkage set by said biasing means for locking said step member in said second position for safe use,

power operated means connected to said operative means and having overriding opposition to said biasing means for unlocking said step member and allowing the raising and retraction thereof,

said power operating means including a diaphragm operated mechanism having one side thereof connected to a vacuum pressure source and the other side to said operative means,

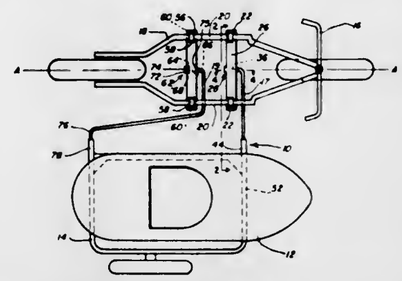
and including door operated switch means interposed between said vacuum pressure source and said operative means for venting the system and inactivating said power operated means.

4,073,503

MOTORCYCLE SIDECAR MOUNTING BRACKET

David H. Hokans, Rte. 3, Box 228A, Plant City, Fla. 33566

Filed Mar. 24, 1976, Ser. No. 669,978
Int. Cl.² B62K 27/12
U.S. Cl. 280—203 **14 Claims**



1. A bracket for mounting the frame of a motorcycle sidecar onto the frame of a motorcycle comprising;

crossbar means adapted to be rigidly mounted on the motorcycle frame, said crossbar means being mounted transversely to the central longitudinal axis of the motorcycle,

bracket member means adapted to extend between the crossbar means and the sidecar frame, said bracket member means having means adapted to connect the bracket member means with the sidecar frame,

a pivotal connection adapted to join said bracket member means and said crossbar means, and adapted to permit pivotal movement therebetween, thereby also permitting pivotal movement of said bracket member means with respect to said motorcycle.

4,073,504

AMUSEMENT DEVICE

Catherine Knapp, 15010 Hamlin, Midlothian, Ill. 60445

Filed Feb. 9, 1976, Ser. No. 656,356
Int. Cl.² B62B 11/00
U.S. Cl. 280—220 **8 Claims**



1. An amusement device for treading thereon, comprising:

a. a cylindrical member comprising a hollow cylinder with a pair of end caps each supporting a bearing,

b. an axle that journals within said cylindrical member and

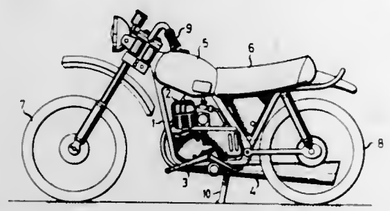
c. a pair of flexible stabilization straps attached at opposite ends of said axle.

4,073,505

STAND DEVICE FOR A TWO-WHEELED MOTORCYCLE

Yorio Yamazaki, Kakogawa, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Filed July 14, 1976, Ser. No. 705,253
Claims priority, application Japan, July 30, 1975, 50-106079[U]
Int. Cl.[2] B62H *1/06*
U.S. Cl. 280—301 5 Claims



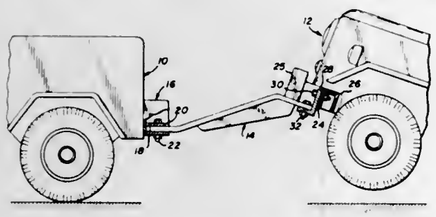
1. A stand device for a two-wheeled motorcycle including a body frame comprising:
   a. a stand pivotally supported by a bracket attached to said body frame of the motorcycle;
   b. a pivotal member capable of moving in pivotal movement about a point at which said stand is pivoted and including an upper portion above said point, said pivotal member moving in pivotal movement independently of said stand and having a portion which moves said stand from its operative position to its neutral position;
   c. a main spring mounted between the upper portion of said pivotal member and said stand; and
   d. an auxiliary spring mounted between the upper portion of said pivotal member and the bracket and adapted to urge by its biasing force the pivotal member to act in such a manner that the stand is restored from its operative position to its neutral position.

4,073,506

VEHICLE TOWING APPARATUS

Paul E. Pressley, 312 Whitecliff Drive, Vallejo, Calif. 94590

Filed Mar. 26, 1976, Ser. No. 671,002
Int. Cl.[2] B60D *1/14*
U.S. Cl. 280—402 9 Claims



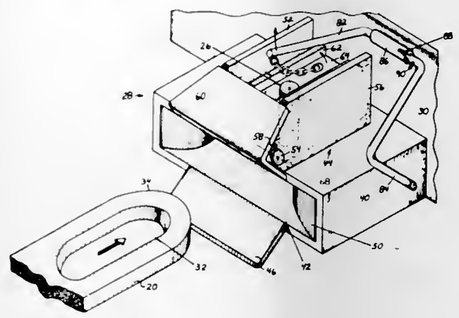
1. A vehicle towing apparatus comprising a rigid plate including;
   an elongated midportion having a top surface and a bottom surface;
   a leading end portion which is deflected upwardly relative to the longitudinal dimension of said midpoint at a first angle between 20° and 25°; and
   a trailing end portion which is deflected downwardly relative to the longitudinal dimension of said midportion at a second angle between 30° and 35°;
   stiffening web means connected to and extending longitudinally along a majority of the length of said midportion and connected to said trailing end portion; and
   means associated with said leading end portion for coupling the apparatus to a towing vehicle and means associated with said training end portion for coupling the apparatus to a towed vehicle whereby the coupled end of said towed vehicle is carried in an elevated position above its normal resting position and is supported in such elevated position by the towing vehicle.

4,073,507

CAR COUPLING

Billy Dingess, Ferrellsburg, W. Va., assignor to Lester Construction Co., Hurricane, W. Va.

Filed Oct. 28, 1976, Ser. No. 736,772
Int. Cl.[2] B60D *1/14*
U.S. Cl. 280—477 11 Claims



1. A mine car coupling apparatus comprising a coupling pin support housing mounted to a first mine car, said coupling pin housing defining two aligned apertures, a coupling pin assembly pivotally mounted on said coupling pin housing with a coupling pin extending through both of said coupling pin support housing apertures, said coupling pin support housing being provided with upper and lower guide surfaces and inner curved side walls to facilitate coupling, a pin receiving assembly mounted pivotally to a second mine car, said pin receiving assembly comprising a torque means defining an elongated receiver hole, said pin receiving assembly being adapted to engage and pivot said coupling pin through at least one of said apertures and subsequently allow said coupling pin to be dropped into said elongated receiver hole, at least one of said apertures being provided with a retaining lip which serves to take the stress of movement of said mine cars off of said coupling pin.

4,073,508

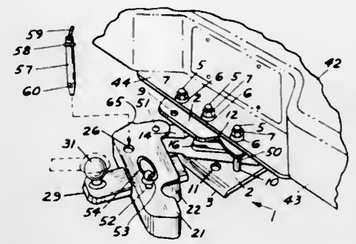
ADJUSTABLE TRAILER HITCH

Jimmie George, P.O. Box 212, and Charles P. Tyson, P.O. Box 191, both of, Mer Rouge, La. 71261

Continuation-in-part of Ser. No. 563,216, March 28, 1975, Pat. No. 3,979,138. This application July 19, 1976, Ser. No. 706,394
The portion of the term of this patent subsequent to Sept. 7, 1993, has been disclaimed.
Int. Cl.[2] B60D *1/06*
U.S. Cl. 280—478 R 24 Claims

1. An adjustable trailer hitch comprising:
   (a) a housing;
   (b) an inner arm pivotally attached to said housing at one end of said inner arm;
   (c) an outer arm pivotally attached to the free end of said inner arm to form an elbow hinge, said inner arm and said outer arm being relatively movable about said housing and said elbow hinge, and further including stop portions in said elbow hinge to permit extension of said outer arm at no greater than an acute angle with respect to said inner arm, said outer arm and said inner arm being foldable about said elbow hinge into abutting relation with respect to each other and with respect to said housing when said inner arm and said outer arm are pivoted on said housing in retracted configuration;

   (d) lock means in cooperation with said outer arm and said housing to secure said inner arm and said outer arm in said retracted configuration; and



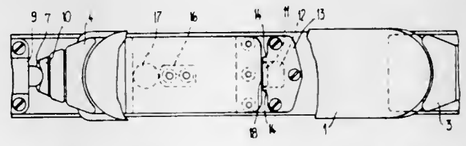
   (e) coupling means carried by said outer arm for coupling to a trailer to facilitate towing.

4,073,509

SAFETY SKI BINDING

Ulrich Gertsch, Matten, Switzerland, assignor to E. + U. Gerstch AG, Ski-Produkte, Interlaken, Switzerland

Filed Feb. 2, 1976, Ser. No. 654,650
Claims priority, application Switzerland, Feb. 14, 1975, 1868/75
Int. Cl.[2] A63C *9/081*
U.S. Cl. 280—618 13 Claims



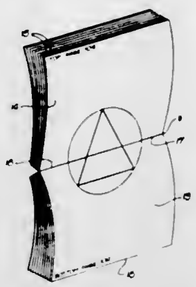
1. A safety ski binding for releasably securing a ski boot having a ski boot sole to a ski, comprising;
   an automatic heel portion means for permitting forward release of the ski boot;
   a toe jaw arranged in spaced relation to said automatic heel portion means, said ski boot being received between said automatic heel portion means and said toe jaw;
   a laterally pivotable plate secured to said toe jaw and extending between said toe jaw and said automatic heel portion means a distance less than the spacing therebetween and from said toe jaw at least to a location beneath the ball of the foot of a skier when said ski boot is disposed in said safety ski binding between said toe jaw and said automatic heel portion means, said plate including an upwardly extending portion having a substantially vertical surface defining abutment means;
   stop means arranged on the underside of said plate in longitudinally spaced, confronting relation with said abutment means;
   counter support means fixed to the ski and arranged beneath said plate in non-contacting relation with the sole of said ski boot, said counter support means having a substantially vertical surface means engaging between said abutment means and said stop means for preventing movement of said plate along the longitudinal axis of the ski and for permitting lateral movement of said plate relative to said counter support means;
   bearing means cooperating with said plate for enabling lateral pivotal movement of said plate about a point longitudinally spaced from said counter support means;
   means for releasably fastening the plate to the ski, said fastening means comprising a spring-loaded locking means arranged forwardly of and cooperating with said plate for enabling lateral pivotal movement of said plate.

4,073,510

LARGE PRINT BOOKS AND METHOD FOR PRODUCING THE SAME FROM REGULAR SIZE BOOKS

John A. Scharlin, 510 E. Andover Drive, Burbank, Calif. 91504

Filed Sept. 15, 1975, Ser. No. 613,620
Int. Cl.[2] B42C *1/00*
U.S. Cl. 281—15 R 7 Claims



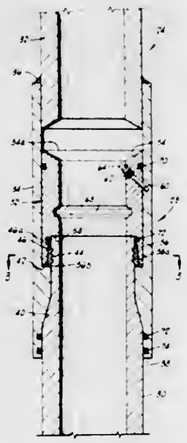
5. A method of producing a large print size book from a book originally of smaller print size, comprising providing a specimen of the top half of each side of each book page and a specimen of the bottom half of the same side of each book page, placing the specimen of the bottom half of each book page above the specimen of the top half of the next succeeding page with the bottom and top halves arranged in a predetermined relation to each other, making an enlarged copy on a one-piece sheet of each combination of bottom and top half specimens arranged in such predetermined relation, folding each sheet in half to provide an outer folded edge of each enlarged sheet and inner free edges, and binding said free edges of said sheets together.

4,073,511

COUPLING ASSEMBLY FOR SUBMARINE CASING SECTIONS

Billie G. Haas, and Carol B. Haas, both of 3232 S. Madole, Oklahoma City, Okla. 73159

Filed July 22, 1976, Ser. No. 707,830
Int. Cl.[2] F16L *35/02*
U.S. Cl. 285—3 10 Claims



1. A coupling assembly for coupling spaced aligned casing sections together comprising:
   an external coupling sleeve having a first open end adapted to telescopingly engage an open end of a first casing sec-

tion, and having a second open end adapted to telescope over an open end portion of a second casing section, said coupling sleeve further including annular shoulder means spaced inwardly from the second open end thereof;

an internal tubular collar slidably positioned in said external coupling sleeve and including:

an annular locking ring forming an end of said tubular collar bearing against said annular shoulder and movable as a part of the tubular collar with the remainder of the tubular collar; and

engaging means for engaging a tool extended through the first casing section into the internal collar to facilitate sliding said collar in said coupling sleeve away from said annular shoulder when said tool is pulled toward the first casing section;

an expandable locking element constrictively positioned within said annular locking ring, bearing against said annular shoulder, and adapted to interlock with the outer surface of said second casing section; and

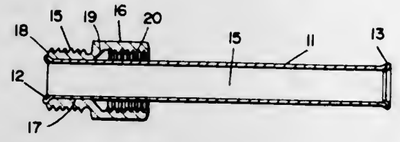
a shearable element interconnecting said sleeve and internal tubular collar, and adapted to shear when said collar is slidably urged upwardly toward said first open end of said coupling sleeve to a position free of said locking element.

4,073,512

QUICK CONNECT DEVICE FOR AUTO RADIATORS

David Roy Vian, Rialto, and Stephen Glenn Price, Riverside, both of Calif., assignors to Hayden Trans-Cooler, Inc., Oakland, Calif.

Filed Dec. 9, 1976, Ser. No. 748,902
Int. Cl.² F16L *25/00*
U.S. Cl. 285—12 **1 Claim**



1. A device for connecting a fluid carrying line to either a male or female threaded connector, comprising a tube provided with a flared portion at each end thereof; an adapter coupling having a bore extending therethrough, the diameter of said bore being less than the diameter of said flared portion at each end; said tube being slidably received in said bore and retained therein by said flared end portions; one end of said coupling including an externally threaded portion and a smooth interior bore, the other end of said coupling including an internally threaded portion; a chamfer extending from said smooth interior bore to said internally threaded portion, said chamfer extending at the same angle as the respective flared end portion of said tube; and an outwardly directed taper extending from said smooth interior bore to said one end of said coupling, said taper extending at the same angle as the respective flared end portion of said tube.

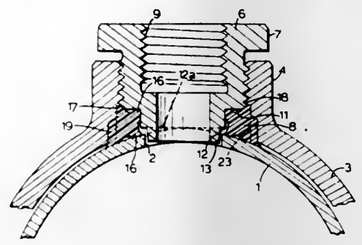
4,073,513

PIPE BRANCH FITTING

James Blakeley, Thornhill, Canada, assignor to Blakeley Engineering Limited, Thornhill, Canada

Filed Sept. 24, 1976, Ser. No. 726,289
Int. Cl.² F16L *41/00*
U.S. Cl. 285—93 **6 Claims**

1. In combination, a pipe, an embracement member having a cylindrical inner surface in embracement around the pipe at a point where the pipe has a pre-cut hole, an upstanding, hollow, internally threaded boss on one side of the member, a resilient sealing gasket at the inner side of the boss, a fitting part threaded in the opening having a planar annular surface bearing rotatably on the gasket and being formed at its inner end with a reduced width spigot portion positioned in the pre-cut hole and at its outer end with a nut extending above the boss so that the fitting part can be turned by a wrench to displace the fitting part inwardly to compress the gasket against the pipe, the spacing between the nut and the upper end of the boss serving to indicate visually the extent of inward movement of the fitting part, and an inward-facing shoulder on the spigot end portion for abutment on the outer surface of the pipe



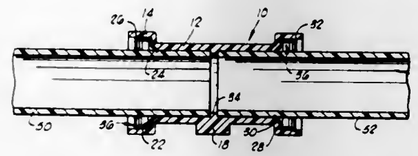
within said gasket whereby the compression applied to the gasket is restricted to a predetermined limit, the spigot end portion extending a short distance beyond said inward-facing shoulder, the gasket having at least one annular upper surface portion lying in a single transverse plane and a saddle-shaped lower surface conforming to the surface of the pipe around the pre-cut hole and being confined between and in substantially complete conformity with the adjacent surfaces of the fitting part, the embracement member and the pipe.

4,073,514

COMBINATION PIPE FITTING AND RETAINER RING

Harold T. Pate, Solon, Ohio, assignor to Indian Head Inc., New York, N.Y.

Filed May 26, 1976, Ser. No. 690,156
Int. Cl.² F16L *25/00*
U.S. Cl. 285—127 **30 Claims**



1. In combination, a pipe fitting and retainer ring comprising:

a fitting having a hollow interior defined by an internal wall, and having an opening in one side thereof communicating with said hollow interior, said fitting further defining an interior seat on said hollow internal wall and extending around said hollow interior;

a spring metal retainer ring in said fitting around said hollow interior and including:

a continuous, endless band seated on said seat;

a plurality of spaced anchor tabs projecting outwardly from said band in a direction generally away from the hollow interior of said fitting and in the direction of said opening into the hollow interior; and

a plurality of pipe-gripping tabs projecting from said band inwardly into said hollow interior and collectively disposed around said hollow interior, said pipe-gripping tabs further projecting from said band in a direction away from said opening and protruding radially inwardly from said seat to a protuberant inward position for engagement with the outer surface of a pipe inserted into said fitting; and

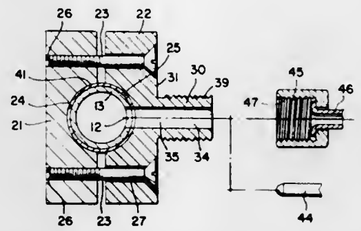
means on said internal wall cooperating with said anchor tabs to prevent shifting of the band and anchor tabs of said spring metal retainer ring in relation to said fitting while allowing a pipe to be inserted through said spring metal retainer ring by deflection of said pipe-gripping tabs.

4,073,515

ATTACHABLE PIPE TEE

Armand Perera, Bristol, Conn., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Jan. 17, 1977, Ser. No. 759,785
Int. Cl.² F16L *41/00*
U.S. Cl. 285—158 **1 Claim**



1. A kit for joining an extension tube to a pipe comprising

a pair of clamp members, each formed with a curved recess on an inner face of a shape to engage a cylindrical pipe wall,

attachment means to fasten both clamp members about a pipe, with

one of said clamp members formed with a threaded nipple that extends from an external face of said clamp member,

said nipple formed with a through circular hole of smooth bore that extends to the face of the curved recess, with

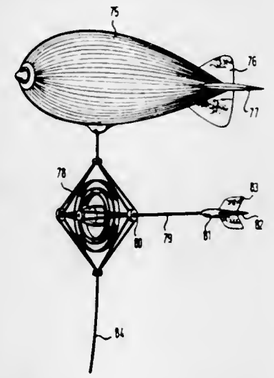
a collar internally threaded to engage the thread of the nipple, said collar adaptable for fastening a length of tube to said nipple, together with a length of solid flat sealing tape adaptable for wrapping about the outer wall of the pipe and between said pipe wall and the recess of each clamp member, when the clamp members are mounted about a section of said pipe, with the sealing tape fixed between the clamp members and said pipe, such that the pipe and the wrapped tape may be pierced simultaneously by a tool inserted into the axial hole of the nipple.

4,073,516

WIND DRIVEN POWER PLANT

Alberto Kling, Am Hugel 14, D-8136 Percha, Germany

Filed June 6, 1975, Ser. No. 584,354
Int. Cl.² F03D *9/00*
U.S. Cl. 290—55 **11 Claims**



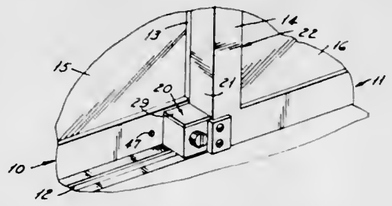
1. A wind-driven power plant comprising current generator, a rotor assembly comprising at least one pair of coaxially and coplanarly mounted counter-rotating rotors having their moments of momentum compensated, at least one rotor being coupled to said current generator, a support means supporting said rotor assembly and current generator, means for aligning said rotor assembly in the wind direction, at least one captivating stay and an anchorage means, said support means comprising at least one aerostatic suspension body carrying its own weight as well as the weight of the rotor assembly, current generator, and alignment means and said suspension body being connected through said captivating stay to said anchorage means.

4,073,517

LOCK FOR SLIDING DOORS

Marius W. Bills, 16220 Schoolcraft, Detroit, Mich. 48227

Continuation of Ser. No. 618,620, Oct. 1, 1975, abandoned. This application Mar. 4, 1977, Ser. No. 774,458
Int. Cl.² E05C *5/02*
U.S. Cl. 292—60 **14 Claims**



1. In a sliding door, the combination comprising

a first door having a frame with a side surface and a front surface,

a second sliding door having a frame,

a lock mounted on said frame of said second door,

said lock having a housing engaging the side surface of the frame of said second door,

said housing having an inner wall adjacent the frame of the first door and an outer wall,

an intermediate wall between said inner and outer walls,

said intermediate wall being positioned closely adjacent said outer wall to define a space between said intermediate wall and outer wall,

a plunger,

said outer, intermediate and inner walls having aligned openings therein through which the plunger extends,

means yieldingly urging the plunger inwardly,

the opening in the outer wall having a noncircular configuration,

the opening in said intermediate wall having a substantially similar configuration but circumferentially oriented with respect to the opening in said outer wall,

said plunger having a laterally extending projection along a portion of the length thereof corresponding substantially to the configuration of the openings in said inner and outer wall,

the axial distance between the outer wall and the intermediate wall being substantially equal to the axial length of the laterally extending projection on said plunger,

said first door having an opening therein into which the plunger is adapted to extend,

such that the plunger may be held outwardly out of locking position by moving the plunger and rotating the same so that the projection thereon moves through the opening in the intermediate wall and the opening in the outer wall and engages the outer surface of the outer wall and the lock may be engaged by rotating the plunger such that the projection is aligned with the opening in the outer wall permitting movement of the plunger under the action of the spring means through the opening in the outer wall

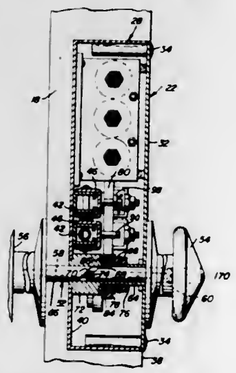
and thereafter further rotation of the plunger brings the projection into alignment with the opening in the intermediate wall to permit movement of the plunger and the projection thereon through the opening in the intermediate wall so that the plunger engages the opening in the first door and further rotation moves the projection on the plunger so that the plunger is held against movement axially outwardly by engagement of the projection thereon with the inner surface of the intermediate wall, the distance between said projection and the end of said plunger being greater than the distance from the space between said intermediate wall and outer wall to the inner wall such that when said plunger is in position with said projection in the space between the intermediate wall and outer wall, the end of said plunger extends beyond said inner wall and is in engagement with the opening in the first door.

4,073,518

ELECTRICALLY AND MANUALLY ACTUATABLE DOOR LOCKING STRUCTURE

Charles M. Goodwin, Rte. No. 2, Mount Vernon, Ohio 43050

Filed May 28, 1976, Ser. No. 691,144
Int. Cl.² E05B *47/06*
U.S. Cl. 292—144 **7 Claims**



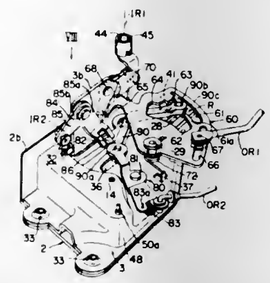
1. A lock including a housing, a lock bar supported from said housing for longitudinal reciprocation between limit positions with one end extended and retracted relative to said housing, lock means shiftably supported from said housing for movement between locking and unlocking positions, said lock means and bar including coacting portions abuttingly engageable with each other to prevent shifting of said bar from said extended position toward said retracted position when said lock means is in said locking position, and operator means operative from the exterior of said housing for shifting said lock means between said locking position and said unlocking position, said operator means including a doorknob assembly journaled through said housing and having operating arm means mounted thereon for oscillation therewith, said arm means being operatively associated with said bar for reciprocating the latter in response to oscillation of said doorknob assembly, said doorknob assembly including a sleeve assembly extending through said housing and having door inner and outer knobs mounted on its opposited ends, said inner knob being secured on said sleeve assembly by means of a through bolt extending through said sleeve assembly and threadedly engaged with said outer knob, said sleeve assembly including opposite end sleeve sections journaled through opposing walls of said housing, said operating arm being carried by a connecting sleeve member into whose opposite ends the adjacent ends of said sleeve sections are telescoped, said operating arm being rotatably mounted on said connecting sleeve and said connecting sleeve and operating arm including coacting slip clutch means connecting said operating arm to said connecting sleeve for oscillation therewith.

4,073,519

NOISELESS LATCH FOR PARTICULAR USE ON VEHICLE DOORS

Toshio Kurozu, Chigasaki, and Yoshikazu Hamada, Tokyo, both of Japan, assignors to Mitsui Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 13, 1976, Ser. No. 676,612
Claims priority, application Japan, Dec. 26, 1975, 50-177775[U]
Int. Cl.² E05C *3/06, 3/16*
U.S. Cl. 292—216 **13 Claims**



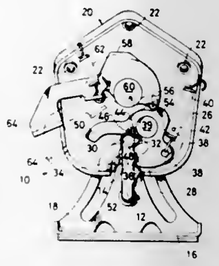
1. A latch comprising a main body defining therein a striker guideway into and out of which a striker is movable, a latching member rotatably disposed across the striker guideway within the main body and having a recess for engagement with the striker, means for controllably restraining the latching member from rotation in one direction, a shaft rotatably supporting the latching member, and a noise suppressor member of resilient material substantially integrally attached to the latching member so as to define part of the recess, said noise suppressor member being so arranged on the latching member as to collide with the striker upon entrance thereon into the striker guideway, said noise suppressor member comprising a mounting plate having a hole for receiving said shaft and a noise suppressor proper formed integral with the mounting plate and secured directly to the latching member.

4,073,520

LATCH MECHANISM

Yoshimasa Tsuchiya, Sayama, and Hiroshi Fujii, Niiza, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed July 21, 1976, Ser. No. 707,402
Claims priority, application Japan, Aug. 31, 1975, 50-105275
Int. Cl.² E05C *3/26*
U.S. Cl. 292—216 **1 Claim**



1. In a vehicle having a vehicle body;
a body element;

a member hinged to the vehicle body and overlapping said body element;
a compressible seal disposed between said body element and said member;
a keeper secured to one of said body element and said member;
a latch plate secured to the other one of said body element and said member, said latch plate having spaced walls defining a keeper receiving slot extending inwardly from the edge thereof, said walls defining an inner section having approximately parallel spaced sides for the reception of said keeper therebetween and a section having outwardly diverging sides for guiding said keeper to said inner section;
a latch member pivotally mounted on said latch plate for rotation between a latched and an open position;
a latch spring mounted on said latch plate urging said latch member toward the open position;
a detent pivotally mounted on said latch plate, said detent having a detent arm positioned to engage the perimeter of said latch member and an actuating arm;
a detent spring mounted on said latch plate urging said detent arm against the perimeter of said latch member;
said latch member having a latch portion, said latch portion having spaced recess walls defining a recess in an edge thereof, one of said recess walls being disposed across said keeper receiving slot in the path of said keeper entering said keeper receiving slot for rotation of said latch member to the latched position against the force of said latch spring in response to movement of said keeper into said keeper receiving slot, the opposite recess wall being positioned to move across said keeper receiving slot behind said keeper as said latch member moves toward the latched position to confine said keeper within said keeper receiving slot;
said opposite wall having a slanted face which is inclined with respect to a plane perpendicular to a line along which said keeper moves to provide an arrangement in which, when said member hinged to the vehicle body overlaps said body element, said compressible seal is compressed to bias said keeper within said keeper receiving slot toward said slanted face to urge said keeper into firm engagement with one of said approximately parallel spaced sides.

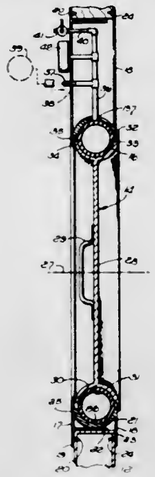
4,073,521

CLOSURE LOCK WITH INFLATABLE BLADDER

Joseph M. Mena, 1961 Greenfield Drive, West Covina, Calif. 91792

Filed Aug. 30, 1976, Ser. No. 718,591
Int. Cl.² E05C *21/02*
U.S. Cl. 292—256.65 **16 Claims**

1. The combination comprising:
a frame structure containing an opening;
a closure structure movable relative to said frame structure between a closed position of extension across said opening and an open position;
an inflatable bladder operable by inflation to lock said closure structure against opening movement and by deflation to permit such opening movement;
said bladder being carried by one of said structures and being engageable when inflated with a shoulder on the other structure in a relation blocking opening movement of the closure structure; and
control means operable from a first side of said frame and closure structures to apply pressure fluid to the bladder and thereby lock the closure against opening movement, and to release pressure fluid from the bladder and permit opening of the closure;
said structures being constructed to block off all access to the bladder from a second side of said structures by puncturing instruments, and thereby positively prevent unauthorized opening of said closure structure from said second side.

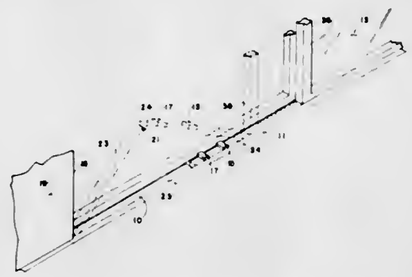


4,073,522

SECURITY STEP OR STOP FOR SLIDABLE DOOR

Timothy P. Tierney, Hazlet, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Nov. 9, 1976, Ser. No. 740,171
Int. Cl.² E05C *17/08*
U.S. Cl. 292—262 **1 Claim**



1. A unit formed of a first bar hinged to a second bar that serves as a security stop for the prevention of opening of a slidable door, when placed on the track of a said slidable door with the lower surface of each bar resting on said track in an extended position of said bars,
said bars joined together by hinge at a first end of each bar so that both bars may be folded in a first circular direction about the pivot axis of the hinge from a first extended position in which a longitudinal axis of each bar forms a common straight line, to a second position in which said axes form two generally parallel lines with the lower surface of each bar facing each other, with means to prevent said bars in said first extended position from rotating to said second position in response to a longitudinal force applied against the opposed end surfaces of the bars, and permanent means to prevent said bars from rotating in said first extended positon in a second circular direction about the pivot axis of the hinge that is contrary to said first circular direction, in which
one of the bars is fitted with means to lengthen the distance

from the hinge to the external end surface of the said bar, and in which

the opposed lower end surfaces of the two bars are each recessed so that the bearing end surface of each said end surface does not intersect the longitudinal axis of the bar that passes through the pivot axis of the hinge when the bars are in the said first position, with said longitudinal axis being spaced from the central longitudinal axis of each bar towards the lower surface of each bar so that a bearing force against said bar end surfaces, in said first extended position, creates a rotational movement contrary to said first circular direction, together with

pivotable means mounted to a first bar which causes the bars to rotate in said first extended position in the said first circular direction so as to cause the pivot axis of the hinge to move past the central longitudinal axis so as to unlatch hinge joint,

said pivotable means in the form of a kicker plate formed with

a first section located so as to contact a base surface on which the lower surface of the first bar rests, in the extended position of the bar and with

a second section located so as to extend beyond the upper profile of said first bar when the said first section is in contact with the base surface of which the first bar rests, with

said kicker plate pivotally mounted to said first bar along a pivotal axis with the said first section located between the said pivotal axis and the second section such that

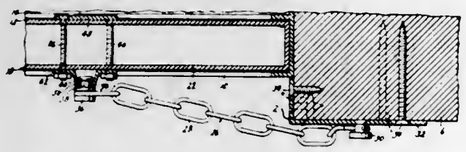
foot pressure applied against said second section towards the base surface, when the bars are in the extended position and resting on said base surface, causes the pivot axis of the hinge to move away from said base surface so that the two bars may fold together to rotate towards the second position in response to a longitudinal applied force against bearing end surfaces of the two bars.

4,073,523

CHAIN LOCK FOR SLIDING DOORS

Donald L. Long, 4806 NE. Winn Road, Apt. 6B, Kansas City North, Kans. 64119

Filed Nov. 11, 1976, Ser. No. 740,824
Int. Cl.[2] E05C *17/36*
U.S. Cl. 292—264 1 Claim



1. In combination with a sliding door including a vertical, generally planar panel horizontally movable in its own plane in a door frame, a vertical edge of said panel being movable into telescoping engagement with a channel member forming an element of said door frame to close said door, a door lock comprising:

a. a strong linked chain adapted to be extended generally horizontally and parallel to the plane of said panel to bridge the juncture of said panel and said frame channel when said panel and channel are in telescoped relation, and

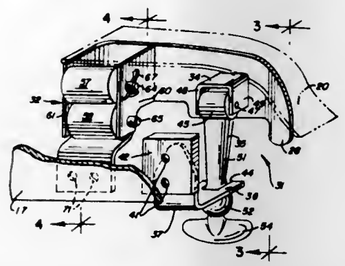
b. means operable to secure the opposite ends of said chain to said panel and to said door frame, the means connecting one of said chain ends to said door frame constituting a right angled plate to which said chain is permanently connected and which embraces a vertical corner of said door frame, and screw-type fasteners securing both of the right-angled plate legs to said door frame, whereby the fasteners associated with the respective plate legs are disposed at right angles to each other; and the means connecting the other of said chain ends to said panel constituting a button affixed to said other chain end and including a neck projecting therefrom laterally of the general extent of said chain and having an enlarged head at its extended end, and a plate affixed to said panel, said plate having a vertical slot formed therethrough, the upper end portion of said slot being large enough to admit said head, and the lower end portion of said slot being of reduced size so as to pass said neck but not said head therethrough, the end connections of said chain to said panel and said door frame being so spaced, relative to the length of said chain, that said panel cannot be moved out of its telescoped engagement with said channel when said chain is connected to said panel.

4,073,524

RESTRAINT ASSEMBLY FOR A TRACTOR HOOD

Albert Gianessi, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 13, 1976, Ser. No. 714,426
Int. Cl.[2] E05C *3/04*
U.S. Cl. 292—341.12 6 Claims



1. In a fastening arrangement for securing a first element to a second element disposed adjacent to the first element including resilient latch means carried by one of said elements and resiliently engaging with the other of said elements to prevent the elements from being moved directly apart, a restraint assembly comprising a pair of spaced walls on the first element, one of said walls being integral with the first element, the other of said walls being defined by a generally Z-shaped bracket having one end portion fixed to the first element and having the other end portion spaced from and generally parallel to the first element to define a space, a pair of resilient rollers carried by the second element and adapted to be inserted into and to span said space between said walls, one of the rollers engaging one of said walls and the other of said rollers engaging the other of said walls to restrict the elements from slidable movement relative to each other.

4,073,525

DOOR LATCH SECURING DEVICE

Marcelo Gurule, 605 - 49th St. NW., Albuquerque, N. Mex. 87105

Filed June 9, 1977, Ser. No. 804,937
Int. Cl.[2] E05C *13/02*
U.S. Cl. 292—346 3 Claims

1. In a door lock including a latch bolt spring biased for latching a door and handle means for manual articulation of said bolt against the spring bias thereof, the improvement comprising:

a support plate adapted for attachment to the surface of said door in substantial alignment over said latch bolt, said plate including an opening in the face thereof aligned over said bolt and a clip structure extending from said plate proximate one horizontal edge thereof conformed in the manner of a substantially semicircular hoop segment adjacent said plate and a straight segment distal thereof substantially parallel to said plate;

a first and second bore formed respectively in said door and said latch bolt in axial alignment with said opening; and

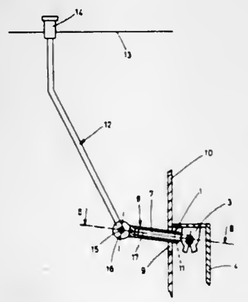
a pin assembly including a pin extending from a handle, said pin being conformed for alternate receipt in said opening and first and second bores and in said hoop segment, and said handle including a detent extending radially from the axis of said pin conformed for receipt between said straight segment and said plate when said pin is inserted in the common interior of said opening and said first and second bore.

4,073,526

LOCK ARRANGEMENT FOR A MOTOR VEHICLE DOOR

Drago Sajfert, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed July 29, 1976, Ser. No. 709,913
Claims priority, application Germany, Aug. 16, 1975, 2536431
Int. Cl.[2] E05C *21/00*
U.S. Cl. 292—347 9 Claims



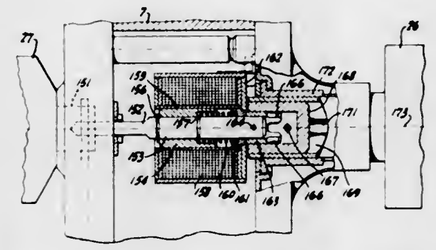
1. In a door having a lock arrangement mounted thereon, said lock arrangement including a lock mechanism mounted in said door and having a latch member which cooperates with a lock member fastened to a door column, a safety device, including a pivotal lever, associated with said lock mechanism, actuating means for said safety device, and means for releasably connecting the end portion of said actuating means facing said lock mechanism with a region of said pivotal lever which is oriented at least approximately in the direction toward the interior of said door; the improvement wherein: said actuating means includes a rigid member forming said end portion and a rod-shaped member which is articulated to said rigid member and is provided with an operating handle; means are provided for supporting said end portion of said actuating means against movement in the direction toward said interior of said door; and said means for releasably connecting said actuating means to said pivotal lever is a plug-in connection.

4,073,527

ELECTRICALLY CONTROLLED DOOR LOCK

Ernest L. Schlage, Burlingame, Calif., assignor to Schlage Lock Company, San Francisco, Calif.

Filed Jan. 12, 1977, Ser. No. 758,691
Int. Cl.[2] E05C *1/16*
U.S. Cl. 292—347 14 Claims



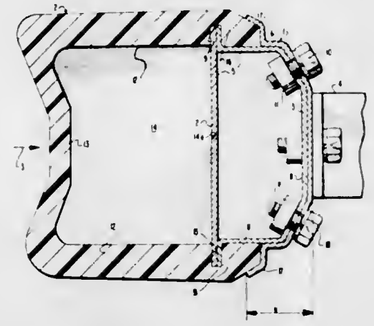
1. An electrically controlled door lock for use in a door panel having a bore therein comprising a lock chassis adapted to be disposed on said door panel, a lock bolt adapted to be disposed on said door panel, a spindle on said chassis rotatable about an axis, means for connecting said spindle to operate said lock bolt, a door handle, means for mounting said door handle on said door panel for rotation about said axis, a clutch including a member adapted to engage and to disengage said handle and said spindle, an electromagnet frame in said bore, an electromagnet on said frame, an armature operable by said electromagnet, and means for interconnecting said armature and said clutch member for conjoint movement.

4,073,528

BUMPER FOR MOTOR VEHICLES HAVING A SHOCK-ABSORBING PROFILE

Wolfgang Klie, Korntal, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Mar. 24, 1976, Ser. No. 669,753
Claims priority, application Germany, Mar. 25, 1975, 2513024
Int. Cl.[2] B60R *19/08*
U.S. Cl. 293—98 14 Claims



4. A vehicle bumper comprising:

(a) a hollow cross bearer;

(b) an impact absorbing hollow profile means;

(c) clamping means for mounting said hollow cross bearer at the vehicle;

(d) mounting means for mounting said impact absorbing hollow profile means at the hollow cross bearer on an impact-endangered side thereof, said mounting means including mounting edges provided on said hollow cross bearer extending transversely to a normal impact direction on said impact absorbing hollow profile means; and

(e) groove means extending in a longitudinal direction of the vehicle bumper provided in said impact absorbing hollow profile means for engaging said mounting edges;

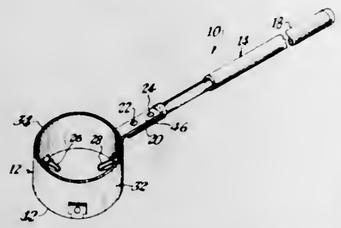
wherein said hollow cross bearer includes a U-shaped profile member opening in a direction facing said impact absorbing hollow profile means, said U-shaped profile member including lateral flanges at each leg end thereof, and a support plate extending transversely of the impact direction secured to said lateral flanges of said profile member, and wherein said lateral flanges and at least a portion of said support plate define said mounting edges.

4,073,529

GOLF BALL RETRIEVER

Albert Ostrin, 441 NE. 195 St., N. Miami Beach, Fla. 33179

Filed Feb. 6, 1976, Ser. No. 655,895
Int. Cl.² A63B *47/02*
U.S. Cl. 294—19 A **1 Claim**



1. A device for retrieving a golf ball from a water hazard to recover a golf ball even if in unstable equilibrium comprising:

an elongated handle;

a cylindrical housing having an open top and bottom connected to one end of said handle;

three spring biased ball engaging gates which allow passage of a conventional golf ball through said housing in one direction from bottom to top, each gate pivotally mounted to the bottom inside of said housing disposed radially inwardly, the spring biasing force increasing gradually from a gate downlocked position to a ball passing engagement position whereby each of said ball engaging gates are biased to return to the downlocked position after passage of said ball within said housing,

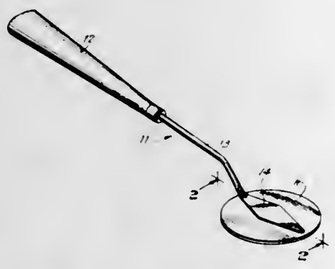
a luminous material disposed on the top of said housing for optically enhancing the positioning of said housing.

4,073,530

PARTS PICK UP AND MANIPULATING DEVICES

David Seidler, 69-10 108th St., Forest Hills, N.Y. 11375

Continuation-in-part of Ser. No. 657,349, Feb. 11, 1976, abandoned. This application Dec. 23, 1976, Ser. No. 753,667
Int. Cl.² B25J *1/02*
U.S. Cl. 294—19 R **15 Claims**



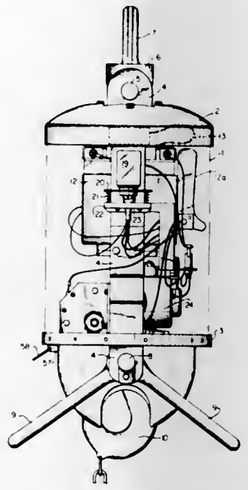
1. A parts pick up and manipulating device for adhesive engagement with a part to be manipulated comprising a rigid handle portion, a pick up portion joined to said handle portion and a pressure sensitive adhesive applied to a selected area of said pick up portion, the extent of said area being selected in relation to the part to be picked up so that the part will not become disconnected during manipulation of the part, the part being disconnectable from the pick up portion by reducing the amount of said area in engagement with the part, said pick up portion being flexible throughout said area whereby the amount of said area in engagement with the part can be reduced by the flexing of said pick up portion through said handle.

4,073,531

REMOTE-CONTROLLED SAFETY HOOK ASSEMBLY

Edward C. Androski, P.O. Box 627, Indian Spring, Nev. 89018

Filed Sept. 13, 1976, Ser. No. 722,816
Int. Cl.² B66C *1/38*
U.S. Cl. 294—83 R **84 Claims**



1. A remote-controlled safety hook assembly which comprises a supporting frame, a hook-shaped member rotatably disposed within said supporting frame, at least one rigid, spring-biased shackle suspended from said supporting frame, said spring-biased shackle functioning to increase the load-carrying capacity of the hook-shaped member, and to retrieve choker members utilized by said hook-shaped member in its load-carrying function, drive means disposed in said supporting frame and a gear assembly operatively connected with said drive mans and said hook-shaped member for automatically swinging said hook-shaped member from a closed position to an open position in response to a specified control signal.

4,073,532

ROUND BALE HANDLER

Calvin B. Blair, P.O. Box 97, Barnard, Kans. 67418

Filed June 9, 1976, Ser. No. 694,198
Int. Cl.² B66C *3/16*
U.S. Cl. 294—107 **1 Claim**

1. A device for handling large round bales of hay comprising:

(a) a frame having:

(1) a top beam,

(2) a bottom beam,

(3) first and second laterally spaced side beams being joined together in a rectangular arrangement with said top and bottom beams,

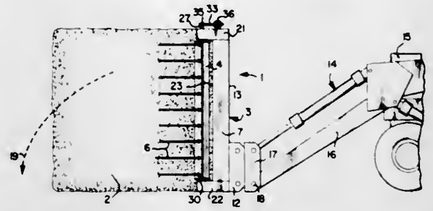
(4) projections extending from opposite ends of said first and second side beams, each of said projections having a bearing member, said bearing member being aligned along said side beam to which said bearing member is connected respectively,

(5) a bale engaging side;

(b) hitch means connected to said bottom beam of said frame for connection with hitch receiving members of a manipulating loader for rotating said frame between a horizontal position and a vertical position;

(c) first and second laterally spaced shafts having coaxial journals fastened at opposite ends of said shafts and a lever arm attached to each said shaft; said shafts being rotatably mounted on said bale engaging side of said frame by positioning said journals in said respective aligned bearing members;

(d) a plurality of curved bale engaging tines secured to and spaced along said respective shafts in generally opposed



relation for mutually penetrating spaced apart lines on the surface of said bale to a substantial depth; each said tine having a generally circular bale engaging portion of substantial arcuate length; each of said circular portion of said tines having an imaginary center generally coinciding with the longitudinal rotational axis of said respective shaft, whereby said circular portion penetrates into said bale without substantial deformation of the passageway formed in said bale by said circular portion; and

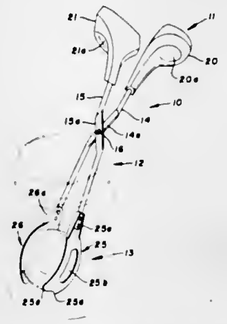
(e) motor means connected to said lever arms, thereby selectively rotating said shafts to effect engagement and disengagement between said tines and said bale when said frame is in either said vertical or horizontal position.

4,073,533

FOOD HANDLING TONGS

Robert J. De brey, 4502 Browndale Ave., Edina, Minn. 55424, and Richard S. Thom, 7941 Colorado Ave., Brooklyn Park, Minn. 55443

Filed Mar. 19, 1976, Ser. No. 668,593
Int. Cl.² B25B *5/04*
U.S. Cl. 294—118 **9 Claims**



1. Tongs for handling food articles and the like, including:

a. a grasping portion including a pair of grasping elements, each said grasping element defining a generally rectangular, longitudinally extending section, said section defining an inwardly directed transverse curve and an inwardly directed longitudinal curve and a drainage aperture formed through said section;

b. a handle portion including a pair of handle elements;

c. a pair of longitudinally extending elements each respectively secured to a grasping element on one end thereof and a handle element on the other end thereof;

d. said support elements being pivotally connected to provide a scissor type connection therebetween; and,

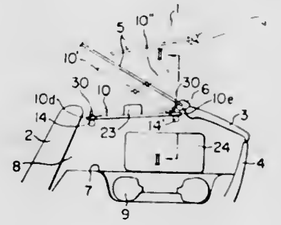
e. said pair of handle elements including a thumb receiving element having a passage arranged therethrough generally parallel to said support element and a finger receiving element having a passage arranged therethrough generally parallel to said support element.

4,073,534

MOTOR VEHICLE WITH A SHELF IN ITS LUGGAGE COMPARTMENT

Kazumi Hira, Fujisawa, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Aug. 2, 1976, Ser. No. 710,720
Claims priority, application Japan, Sept. 5, 1975, 50-122408[U]
Int. Cl.² B60R *3/08*
U.S. Cl. 296—37.16 **1 Claim**



1. In a motor vehicle:

a seat with a seat back;

an open luggage compartment behind said seat back, said open luggage compartment having two transversely spaced side panels which form part of walls surrounding said luggage compartment;

a shelf, in the form of a flat panel, having a first pair of pins laterally projecting, in the opposite directions, from a first end portion said flat panel, and a second pair of pins laterally projecting, in the opposite directions, from a second end portion opposite to the first end portion;

a first pair of means fixed relative to said side panels, respectively, and having U-shaped members made of a resilient material, respectively, for detachably and rotatably retaining said first pair of pins, respectively, said first pair of means being disposed adjacent said seat;

a second pair of means fixed relative to said side panels, respectively, and having U-shaped members made of a resilient material, respectively, for detachably and rotatably retaining said second pair of pins, respectively, said second pair of means being disposed remote from said seat.

4,073,535

AUTOMOBILE ROOF INTERIOR LININGS AND METHOD OF INSTALLATION

Franz-Werner Alfter, Siegburg; Hans-Ulrich Breitscheidel, Troisdorf, and Cosmas Lorry, Niederkassel-Rheidt, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Filed Mar. 24, 1975, Ser. No. 561,167
Claims priority, application Germany, Apr. 10, 1974, 2417491
Int. Cl.² B60J *7/00*
U.S. Cl. 296—137 A **21 Claims**

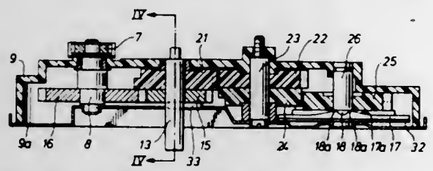
1. An interior lining arrangement for vehicles having a roof structure, said arrangement comprising a roof strut member forming a gap with the interior side of a vehicle roof, a non-self-supporting lining means at least partially adhesively secured to said roof for providing interior lining for said vehicle

roof, said lining means having at least one free edge passing through said gap, and profiled strip means adjacent said gap for clamping a part of the lining means immediately adjacent to said free edge against said roof strut member at said gap, said



profiled strip means being a profiled, continuous elongated member of elastic, compressible material, said elongated member being disposed along the entire length of said gap extending around the interior periphery of said vehicle roof.

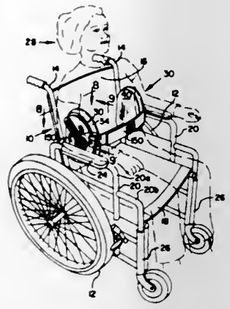
4,073,536
MOTOR VEHICLE ROOF
Walter Schlitzler, Aufhausen, Germany, assignor to Webasto-Werk W. Baier GmbH & Co., Stockdorf, Germany
Filed Dec. 22, 1976, Ser. No. 753,307
Claims priority, application Germany, Dec. 24, 1975, 2558764
Int. Cl.[2] B60J 7/04
U.S. Cl. 296—137 G 31 Claims



1. Movable vehicle panel member apparatus comprising:
a vehicle panel member,
driving means for tiltingly and slidingly moving said panel member with respect to adjacent vehicle structure,
a movement control member operatively engageable and movable with said driving means for limiting movement of said panel member as a function of the position of said movement control member,
and resiliently biased stop means engageable with said movement control member to retain said movement control member in a predetermined control member position corresponding to a predetermined panel member position,
wherein said stop means is configured and arranged to permit movement of said movement control member from said predetermined control member position in response to application of a predetermined moving force at said driving means which overcome the resilient bias of said stop means.

4,073,537
UNIVERSAL SUPPORT PADS FOR WHEELCHAIR
Don D. Hammersburg, 3516 NE. 119th Ave., Vancouver, Wash. 98662
Filed Sept. 23, 1976, Ser. No. 725,692
Int. Cl.[2] A62B 35/00
U.S. Cl. 297—384 14 Claims

1. A device for positioning a patient in a chair having a back and arms, said device comprising
body engaging pad means,
attaching means for attachment to the underside of an arm of the chair and for movement along said arm toward and away from the chair back,
means for securing said attaching means in a selected position on said chair arm,
connecting means operatively connecting said pad to said attaching means accommodating universal movement of the pad relative to said attaching means to place said pad in a selected position relative to said chair for patient positioning, and



securing means for securing said pad in a selected adjusted position.

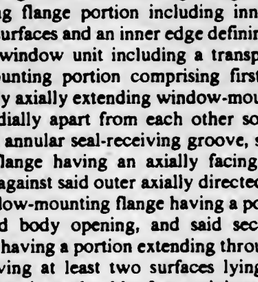
4,073,538
ARM STRUCTURE FOR RECLINING SEAT
George Taylor Hunter, Rte. 3, Box 250, Howe, Ind. 46764
Filed Jan. 3, 1977, Ser. No. 756,171
Int. Cl.[2] A47C 7/54
U.S. Cl. 297—417 8 Claims



1. An arm structure for a reclining seat having a back pivoting from a substantially vertical position to a reclining position, comprising a member for attachment to a lateral side of the back and extending forwardly therefrom, an arm rest pivotally connected to said member, a latch means for retaining said arm rest selectively in at least two angular positions with respect to said back, and means in said latch means operable by a forward movement of said arm rest for releasing said arm rest for angular movement, including a lug extending longitudinally with respect to said arm rest and a pair of arm positioning pins positioned transversely with respect to said arm rest for engagement with said lug to retain said arm rest in selected positions.

4,073,539
BONDED CHAIR CONSTRUCTION
Jerome Caruso, Lake Forest, Ill., assignor to Litton Business Systems, Inc., York, Pa.
Filed May 27, 1976, Ser. No. 690,547
Int. Cl.[2] A47C 7/02
U.S. Cl. 297—455 11 Claims

1. An article of seating comprising:
a shell member; and
a skin member in contact with said shell member;
said skin member being attached to the side of said shell member oppositely of the side of said shell member closest to the body of a seated user by laminating throughout



substantially the entire surface area of mutual contact between said skin member and said shell member.

4,073,540
SEALED HUB CAP AND METHOD
Ronald A. Jackowski, Palatine, Ill., assignor to Chicago Rawhide Manufacturing Co., Elgin, Ill.
Filed Jan. 28, 1976, Ser. No. 652,900
Int. Cl.[2] B60B 27/00
U.S. Cl. 301—108 A 9 Claims

1. A hub cap assembly comprising, in combination, a rigid hub cap body having a generally axially extending sidewall portion, a radially outwardly extending mounting flange formed on one axial end of said sidewall, means on said mounting flange for accommodating a cap fastener, and a radially inwardly extending, window-receiving flange portion, said window-receiving flange portion including inner and outer axially directed surfaces and an inner edge defining an opening in said body, a window unit including a transparent central panel and a mounting portion comprising first and second annular, generally axially extending window-mounting flanges being spaced radially apart from each other so as to define therebetween an annular seal-receiving groove, said first window-mounting flange having an axially facing end portion snugly received against said outer axially directed surface, and said second window-mounting flange having a portion extending through said body opening, and said second window mounting flange having a portion extending through said body opening and having at least two surfaces lying in different planes, thereby forming a shoulder for receiving and locating a locking ring, a generally annular locking ring having a generally radially extending outer portion snugly engaging said inner axially directed surface and having a radially inner portion bonded to said shoulder forming portion of said second window mounting flange along said at least two surfaces forming said shoulder, and a seal ring disposed in said seal-receiving groove, said outer portion of said locking ring and said first window-mounting flange cooperating to compress said seal ring axially thereof between a portion of said groove and said outer axially directed surface, and thereby establishing an oil-tight seal between said cap body and said window unit.

7. A method of forming a seal in a hub cap assembly, said method including providing a rigid hub cap body having a generally axially extending sidewall portion and a radially inwardly extending, window-receiving flange portion having inner and outer axially directed surfaces and an inner edge defining an opening in said body, providing a window unit having a transparent central panel and a mounting portion comprising first and second annular, generally axially extending window-mounting flanges spaced radially apart from each other and defining therebetween an annular seal receiving groove, positioning a seal ring within said seal receiving groove, positioning said window unit such that the axial end face portion of said first window-mounting flange snugly engages said outer axially directed surface, such that said seal ring is compressed between a portion of its receiving groove and said outer surface, and such that a portion of said second window-mounting flange extends axially through said opening, and ultrasonically deforming said portion of said second window-mounting flange radially outwardly into a position of snug engagement with said inner axially directed surface.

4,073,541
ELECTRO-PNEUMATIC CONTROL APPARATUS FOR AN ELECTRIC/FRICTION BRAKE BLENDING SYSTEM
Minoru Nagase, Kobe, Japan, assignor to The Nippon Air Brake Company, Ltd., Kobe, Japan
Filed May 16, 1977, Ser. No. 797,102
Claims priority, application Japan, June 2, 1976, 51-72003
Int. Cl.[2] B60T 13/74
U.S. Cl. 303—3 5 Claims

1. A brake blending control system for a vehicle having electric and friction brake apparatus, said control system comprising:
(a) means for providing a fluid pressure brake command signal representing the desired degree of vehicle braking to be provided by said electric and friction brake apparatus;
(b) said electric brake apparatus being operative responsive to said brake command signal;
(c) means for providing a fluid pressure friction brake control signal comprising:
(i) means for providing an electric feedback signal representing the effective brake effort produced by said electric brake apparatus in response to said brake command signal;
(ii) first transducer means for converting said fluid pressure brake command signal to a corresponding electrical quantity;
(iii) comparison means for providing an error signal in accordance with the difference between said electrical quantity representing said brake command signal and said feedback signal representing the effective electric brake effort; and
(iv) second transducer means for converting said error signal to a corresponding fluid pressure signal to provide said friction brake control signal; and
(d) a fluid pressure operated relay valve device having a first control port to which said friction brake control signal is connected, a second control port to which said brake command signal is connected, and a delivery port, said relay valve device being operative responsive to pressurization of said first or said second control port to provide

fluid brake pressure via said delivery port to effect operation of said friction brake apparatus; and

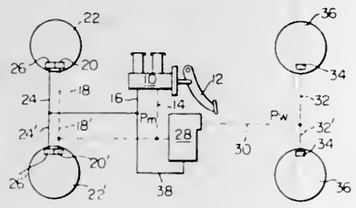
(e) valve means for normally cutting off said brake command signal from said second control port and for connecting said brake command signal to said second control port in response to a malfunction of said means providing said friction brake control signal.

4,073,542

FLUID PRESSURE CONTROL DEVICE AND MOTOR VEHICLE BRAKING SYSTEM INCORPORATING SUCH DEVICE

Keiichiro Yabuta, and Yoshitaka Koike, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Japan

Continuation of Ser. No. 540,001, Jan. 10, 1975, abandoned, which is a continuation of Ser. No. 305,040, Nov. 9, 1972, abandoned. This application Feb. 27, 1976, Ser. No. 662,228
Claims priority, application Japan, Nov. 13, 1971, 46-90986
Int. Cl.² B60T *8/26*
U.S. Cl. 303—6 C **3 Claims**



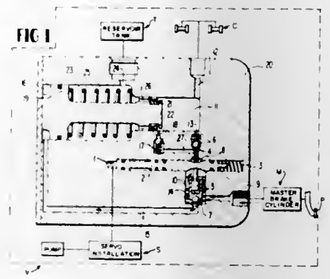
1. A motor vehicle hydraulic braking system comprising a master cylinder of a split type, a main fluid line leading from said master cylinder to rear wheel cylinders, as auxiliary fluid line leading from said master cylinder to front wheel cylinders, and a fluid pressure control device comprising a housing defining a cavity therein, which has an open end, an end plug which is fixedly attached to said housing to close said open end and is formed therein with large and small bores sealed from each other, said small bore communicating with said auxiliary fluid line to deliver fluid pressure into said small bore for threadedly attaching said end plug to said housing, an annular sealing member attached to a wall defining said cavity and dividing said cavity into a first chamber communicating with said main fluid line to deliver input fluid pressure thereinto and a second chamber communicating with said rear wheel cylinders, said first chamber being between said second chamber and said large bore, said large bore being sealed from said first chamber, said sealing member having an aperture formed therethrough, a plunger extending through said aperture and axially movable in said first and second chambers and said large bore and having an annular flange located in said chamber and engageable with said sealing member, said aperture providing an annular clearance between said sealing member and said plunger, and biasing means urging said plunger in a direction to disengage said annular flange from said sealing member, said plunger having a reduced end portion which is slidably fitted in said small bore and on which said fluid pressure in said small bore acts to urge said plunger in said direction, said end plug having further formed therein an air discharge passage opening into said large bore and outside said end plug for accomodating the axial movement of said plunger.

4,073,543

SWITCHING DEVICE FOR THE INDIRECT ALTERATION OF THE MECHANICAL BRAKE PEDAL TRANSMISSION

Reinhard Resch, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Mar. 1, 1976, Ser. No. 662,413
Claims priority, application Germany, Mar. 1, 1975, 2509077
Int. Cl.² B60T *11/28, 13/16, 17/18*
U.S. Cl. 303—10 **13 Claims**



1. A shifting apparatus for indirectly changing a transmission ratio of a mechanical brake pedal in case of a failure of a servo-assist of a motor vehicle brake-force servo-installation, the servo-installation including a pump means for pressurizing a medium to provide a servopressure, the vehicle brake system including wheel cylinders, brake lines communicating with the wheel cylinders, and a master brake cylinder communicating with the shifting apparatus for supplying a pressure medium to the wheel cylinders through the brake lines, characterized in that the shifting apparatus is installed at any desired place of the motor vehicle in communication with the brake lines as well as in brake lines extending between the master brake cylinder and wheel cylinders, said shifting apparatus including a control piston means actuated by the pressure medium from the pump means of the servo-installation for effecting a shifting control of a flow path of the pressure medium from the master cylinder in the shifting apparatus upon a failure of the servo-installation, and in that a differential piston means having at least one large cross-sectional area and small cross-sectional area is arranged in the shifting apparatus for controlling a pressure medium, a valve means arranged in the shifting apparatus for controlling a flow of the pressure medium therein from the master brake cylinder, said control piston means, said valve means and said differential piston means are arranged in the shifting apparatus such that said differential piston means in a normal operating condition is non-actuated by the pressure medium from the master brake cylinder and, upon a failure of the servo-installation, the pressure medium from the master brake cylinder acts upon the large cross-sectional area of the differential piston means by a pressure prevailing in the master brake cylinder so as to exert a pressure on the pressure medium in a brake line communicating with the wheel cylinders by the small cross-sectional area of the differential piston means with a hydraulic transmission.

4,073,544

CONTINUAL QUICK SERVICE VALVE DEVICE

James E. Hart, Trafford, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Mar. 23, 1977, Ser. No. 780,473
Int. Cl.² B60T *17/04*
U.S. Cl. 303—83 **10 Claims**

1. In a fluid pressure brake equipment, the combination of a brake pipe normally charged with fluid to a certain chosen pressure and a continual quick service valve device comprising:

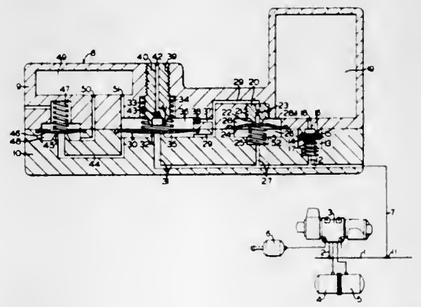
(a) a control volume,

(b) choke means for controlling the rate of flow of fluid under pressure from the brake pipe to said control volume whereby said control volume is charged with fluid under pressure from the brake pipe to the same pressure as that in the brake pipe,

(c) a quick service volume,

(d) a pair of fluid pressure operated valve means arranged in series for controlling flow of fluid under pressure from the brake pipe to said quick service volume, the first of said fluid-pressure-operated valve means being so arranged and constructed as to, when in a first position, enable flow of fluid under pressure from both said control volume and said quick service volume to atmosphere while cutting off flow from the brake pipe to said quick service volume and, when in a second position, enable flow of fluid under pressure from the brake pipe to the quick service volume while cutting off flow from both said control volume and said quick service volume to atmosphere, and the second of said fluid-pressure-operated valve means constituting a spring-biased valve for enabling flow from both the brake pipe and said control volume to said quick service volume while said first valve means is in its said second position,

(e) three choke means so arranged in series as to enable flow of fluid under pressure therethrough from said control volume to atmosphere while said first valve means is in its said first position, the first of said choke means being of such size as to enable the flow of fluid under pressure therethrough at a service rate of reduction of brake pipe pressure and so arranged as to, in cooperation with the



second of said choke means, establish a differential fluid pressure to cause said first fluid-pressure-operated valve means to operate from its first position to its second position, and the third of said choke means being of a size greater than the size of said second choke means and so arranged as to release fluid under pressure from said quick service volume to atmosphere while said first fluid-pressure-operated valve means is in its said first position independently of said first and second choke means, and

(f) a third fluid-pressure-operated valve means for controlling flow of fluid under pressure from said control volume to the first of said choke means, said third fluid-pressure-operated valve means comprising:

(i) a biasing means,

(ii) a valve seat, and

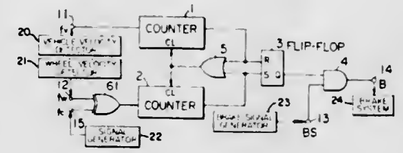
(iii) a movable abutment so arranged as to constitute a valve movable into and out of seating engagement with said valve seat, said abutment being subject on the side thereof adjacent said valve seat to the pressure in said control volume and on its other side to said biasing means and also the pressure of the fluid in the brake pipe so that a reduction of pressure in the brake pipe enables the fluid under pressure in the control volume to unseat said abutment from said valve seat whereby so long as said abutment is unseated from said valve seat, fluid under pressure flows from said control volume through said first and second choke means to establish said differential fluid pressure thereby enabling successive sequential operation of said pair of fluid-pressure-operated valve means to release fluid under pressure from the brake pipe to said quick service volume and thereafter release the fluid under pressure in said quick service volume to atmosphere.

4,073,545

VEHICLE BRAKE CONTROLLING DEVICE FOR ANTI-SKID CONTROL OF VEHICLE WHEELS

Yasuhisa Takeuchi, Yokosuka; Kenji Maio, Tokyo, and Junichiro Matsumoto, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited and Hitachi, Ltd., both of Japan

Filed Apr. 27, 1976, Ser. No. 680,864
Claims priority, application Japan, Apr. 30, 1975, 50-51392
Int. Cl.² B60T *8/10*
U.S. Cl. 303—109 **9 Claims**



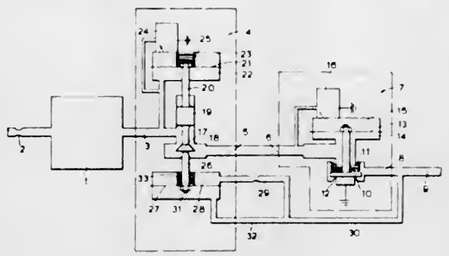
1. A vehicle brake controlling device comprising first detection means for detecting vehicle velocity and providing a first output signal proportional to said vehicle velocity, second detection means for detecting wheel velocity of a vehicle wheel and providing a second output signal proportional to said wheel velocity, signal generating means for generating a fixed third output signal proportional to a predetermined wheel velocity at a low vehicle running speed, addition means for adding said second and third output signals of said second detection means and said signal generating means and providing a fourth output signal representing said addition, comparison means for comparing said first and fourth output signals of said first detection means and said addition means and providing a fifth output signal representing whether or not the ratio of said fourth output signal to said first output signal is less than a predetermined value, and control means for controlling a brake system in response to said fifth output of said comparison means.

4,073,546

ANTI-SKID VEHICLE BRAKING SYSTEM

John Patrick Bayliss, Redditch, England, assignor to Girling Limited, Birmingham, England

Filed Aug. 12, 1976, Ser. No. 713,816
Claims priority, application United Kingdom, Aug. 30, 1975, 35854/75; May 11, 1976, 19240/76
Int. Cl.² B60T *8/02*
U.S. Cl. 303—115 **11 Claims**



1. A fluid pressure-operated anti-skid braking system for rail and other vehicles comprising at least one actuator for applying a wheel brake, a supply of operating fluid for operating said actuator, fluid flow control valve means interposed between said supply and said brake and through which fluid from said

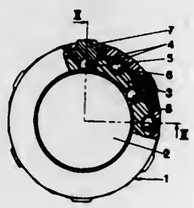
supply is supplied to said actuator, deceleration responsive means responsive to a skid signal for operating said valve means to relieve brake skid pressure applied to said actuator when the deceleration of said wheel is excessive and exceeds a predetermined value, a fluid pressure memory chamber for sensing said skid pressure applied to said actuator on the downstream side of said control valve means whereby said skid pressure sensed by said memory chamber can never exceed the said skid pressure applied to said actuator to cause excessive deceleration of said wheel, wherein said memory chamber provides a changeover point between first and second successive stages of re-application of fluid from said supply to said actuator, said first stage comprising re-application of said fluid at a normal original rate until an intermediate pressure less than said skid pressure is attained at said changeover point, and said second stage comprising continued re-application of said fluid but at a reduced rate, and wherein said valve means comprises a re-application valve in which said memory chamber is incorporated and having an inlet connected to said supply and an outlet, a dump valve assembly having an inlet connected to said outlet of said re-application valve assembly and an outlet connected to said actuator, and a control member for controlling the maximum opening of said re-application valve, said control member having opposed first and second areas exposed respectively to said memory chamber and to a second chamber on the opposite side of said control member from said memory chamber, first and second connections between both said chambers and said outlet of said dump valve assembly, and a first restrictor incorporated in said connection between said memory chamber and said outlet of said dump valve assembly, the arrangement being such that a difference in pressure between the said two chambers biasses said control member in a direction to reduce the maximum opening of said re-application valve.

4,073,547

BALL BUSHING FOR LINEAR MOTIONS

Bengt Lundgren, Ulricehamn, and Sven Walter Nilsson, Partille, both of Sweden, assignors to SKF Nova AB, Goteborg, Sweden

Continuation of Ser. No. 638,634, Dec. 8, 1975, abandoned. This application Dec. 21, 1976, Ser. No. 753,080
Claims priority, application Sweden, Jan. 22, 1975, 7500654
Int. Cl.² F16C *27/00*
U.S. Cl. 308—6 C **8 Claims**



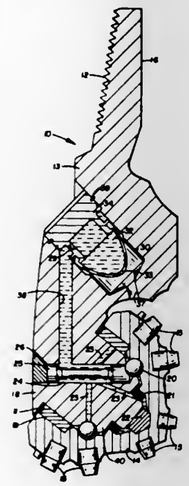
1. A ball bushing for linear motions comprising a circumferentially extending cage member disposed between an outer sleeve and a shaft or the like, means defining a plurality of circumferentially spaced, axially extending grooves in said cage defining closed paths for rolling elements and including at least one path portion wherein the rolling elements are loaded, a radial projection at one axial end of said cage defining an abutment shoulder for said sleeve, said sleeve comprising a plurality of longitudinal sections of predetermined generally equal length interengagable to form an annular member circumscribing the grooves in said cage, adjacent side edges of each section having a complementary close fitting grooves and ridges formed therein permitting assembly of the sections to form the annular member by relative axial displacement, detachable retaining means adjacent the opposite end of the cage adapted to confront one end of the sleeve opposite said radial projection thereby limiting axial displacement relative to the cage.

4,073,548

SEALING SYSTEM FOR A ROTARY ROCK BIT

D. F. Walters, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 1, 1976, Ser. No. 737,634
Int. Cl.² F16C *33/76*
U.S. Cl. 308—8.2 **3 Claims**



1. A drill bit for drilling in a fluid filled borehole, comprising:
- a bit body, said bit body including a bearing pin;
- a roller cutter adapted to be rotatably mounted on said bearing pin;
- bearing means supporting said roller cutter on said bearing pin;
- a seal element located between said bit body and said roller cutter;
- a lubricant reservoir in said bit body;
- lubricant passages extending from said lubricant reservoir to said bearing means;
- lubricant in said lubricant reservoir, lubricant passages and between said bearing pin and roller cutter;
- pressure equalization means within said lubricant reservoir for pressure equalization of said lubricant and said fluid in said borehole, said pressure equalization means encountering volume expansion of said lubricant; and
- a groove for retaining said seal element, said groove having a wedge shaped sidewall surface that allows the volume expansion of said lubricant to move said seal element outward in said wedge.

4,073,549

HYDROSTATIC SUPPORTING DEVICE

Alfred Christ, Zurich; Rolf Lehmann, Mutschellen, and Helmut Miller, Niederrohrdorf, all of Switzerland, assignors to Escher Wyss Limited, Zurich, Switzerland

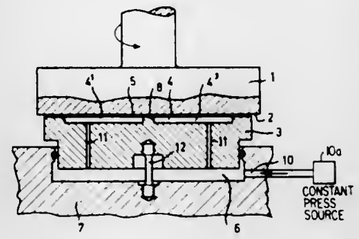
Filed Nov. 23, 1976, Ser. No. 744,253
Claims priority, application Switzerland, July 14, 1976, 9004/76; Dec. 2, 1975, 15610/75
Int. Cl.² F16C *32/06*
U.S. Cl. 308—9 **19 Claims**

1. Hydrostatic apparatus for supporting a mobile part which moves relative to a foundation and has a bearing surface, the apparatus comprising

a. a bearing shoe mounted in the foundation and having a bearing face directed toward said bearing surface which contains a bearing pocket;

b. a hydraulic servomotor having a pressure chamber and serving to urge the shoe toward the mobile part with a force which acts in opposition to a pressure force developed on said bearing face;

c. supply means for delivering hydraulic fluid under pressure to said pocket and pressure chamber; and



d. a support element connected with the shoe and the foundation and positively holding the shoe against movement in at least one direction along its supporting axis,

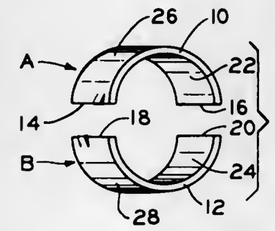
e. the restraint provided by the support element being so correlated with the relative magnitude of the pressure forces that the shoe is rendered non-displaceable in both directions along the supporting axis.

4,073,550

SLEEVE BEARING

William A. Yahraus, Mentor, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.

Filed May 26, 1976, Ser. No. 690,193
Int. Cl.² F16C *9/04*
U.S. Cl. 308—23 **13 Claims**



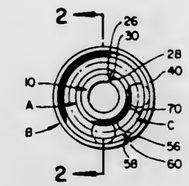
1. In a bearing of the type having a substantially cylindrical bearing area with inner and outer surfaces which surrounds a substantially cylindrical journaled member in a close spaced relationship therewith in a manner defining a clearance area between the inner surface of said bearing area and the outer peripheral surface of said journaled member adapted to receive a load supporting oil film, said bearing area being defined by a bearing material having a substantially constant radial thickness *t* throughout and wherein said bearing area has a substantially constant radius of curvature *r* at said inner surface with said journaled member having a substantially constant radius of curvature *rr* at the outer peripheral surface thereof slightly less than radius *r* and wherein said bearing is subjected to differential loading during cycling, the improvement comprising:
- a first circumferential portion of said bearing area having a thickness slightly greater than *t* so as to reduce the radius of curvature of said inner surface to less than *r* but greater than *rr;* and, a second circumferential portion of said bearing area opposed from said first portion having a thickness slightly less than *t* so as to increase the radius of curvature of said inner surface to greater than *r.*

4,073,551

ROLLING TYPE BEARING AND METHOD FOR MAKING SAME

Walter S. Sutowski, Brecksville, Ohio, assignor to Freeway Corporation, Cleveland, Ohio

Filed July 8, 1976, Ser. No. 703,627
Int. Cl.² F16C *33/60*
U.S. Cl. 308—195 **23 Claims**



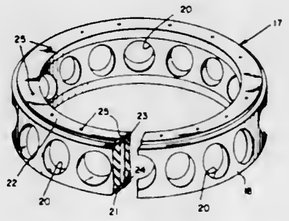
1. A bearing comprising in combination:
- an inner race formed from a strip of sheet metal having spaced apart ends and formed through the plastic range into a first cylindrical configuration with said inner race ends closely spaced to each other and defining a first slot which allows said inner race ends to be selectively moved toward and away from each other, said inner race including at least one integrally formed outwardly opening roller member receiving groove circumferentially disposed in the outer peripheral surface thereof;
- an outer race formed from a strip of sheet metal having spaced apart ends and formed through the plastic range into a second cylindrical configuration having a diameter greater than said inner race with said outer race ends closely spaced relative to each other and defining a second slot which allows said outer race ends to be selectively moved toward and away from each other, said outer race including at least one integrally formed inwardly opening rolling member receiving groove circumferentially disposed in the inner peripheral surface thereof; and,
- a plurality of rolling members disposed between said inner and outer races and closely received in said outwardly and inwardly opening grooves for allowing relative rotation between said races, said first and second slots allowing forced insertion of said rolling members between said races and into said grooves.

4,073,552

BEARING RETAINER

Ronald I. Christy, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 380,031, July 17, 1973, abandoned, which is a continuation of Ser. No. 259,891, June 5, 1972, abandoned. This application Mar. 24, 1975, Ser. No. 561,403
Int. Cl.² F16C *33/46*
U.S. Cl. 308—201 **26 Claims**



1. A ball bearing retainer including in combination, an inner annular body of open pore microporous flexible foamlike material, having sides generally perpendicular to the central axis of the annulus formed by the body and respective annular reinforcing plates of relatively rigid material secured to said sides,

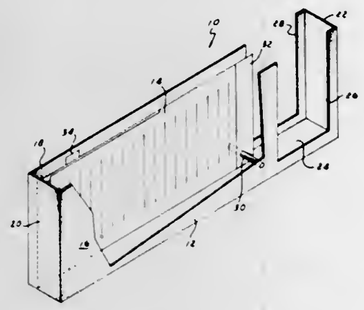
said foamlike material comprising an open pore microporous nitrile acrylic copolymer foam having a Shore A hardness of between 20 and 60.

4,073,553

MAG CARD STORAGE DEVICE

Raymond T. Cassidy, Ashfield, Mass., assignor to National Blank Book Company, Inc., Holyoke, Mass.

Filed May 17, 1976, Ser. No. 687,181
Int. Cl.² A47B 63/00; G09F 11/06
U.S. Cl. 312—184 **3 Claims**



1. Filing device for storing and viewing card holding envelopes comprising an upwardly opening tray having a bottom and fixed upright side and ends walls and defining a continuous compartment from end to end thereof; said envelopes having a width dimension generally on the order of the height of said walls; each envelope including an extension at the lower end thereof which is provided with an oblique slot opening toward a lower corner thereof said envelopes being adapted for opening to provide access for insertion and removal of material from each envelope when in its upright position; a fixed pivot pin disposed transversely of the tray at a distance from one end wall less than the width of said envelopes and defining with that end wall a viewing section and at a distance from the opposite end wall less than the overall length of said envelopes and defining with said opposite end wall a storage section, said pin also being spaced above said bottom sufficient to support the slotted lower corner portions of the envelopes above said bottom wall whereby with said slot fitted onto said pin, the envelopes are freely pivotable between horizontal and vertical positions from the storage to the viewing section with a side resting on the bottom of said tray in the horizontal position, and the lower edge thereof disposed on the bottom of said tray in said vertical position, the slot of each envelope being adapted to fit onto and be removed from said pin only at an oblique angular orientation intermediate said horizontal and vertical positions, said pin and said end walls serving to retain said envelopes within said tray at other than said oblique angular orientation.

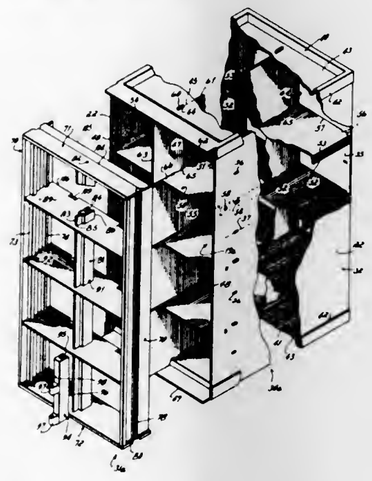
4,073,554

MODULAR SAFETY DEPOSIT BOX SYSTEM

Charles D. Oder, and Harold G. Doehlman, both of Hamilton, Ohio, assignors to The Mosler Safe Company, Hamilton, Ohio

Filed Oct. 18, 1976, Ser. No. 733,053
Int. Cl.² A47B 53/00, 87/00
U.S. Cl. 312—199 **11 Claims**

1. A safety deposit box structure comprising
a casing defining side, top, bottom and rear walls,
at least one shelf mounted in said casing for defining a plurality of box compartments within said casing,
a door frame for said casing, said door frame being comprised of a header, a sill and opposed jambs, said door frame components being structurally rigid, said door frame components being fixedly connected together into a structurally rigid frame configuration, and said door frame being sized to permit connection of said jambs with opposed side walls of said casing and to permit connection of said header and sill with said casing's top and bottom walls respectively,
at least one port plate positioned between jambs of said door frame, said port plate defining a number of access ports in said door frame equal in number to the number of box compartments defined in said casing, and each port plate cooperating with a shelf to extend said shelf to adjacent the leading edge of said door frame,



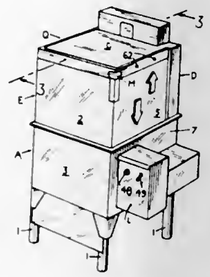
a hinge post fixedly connected to said door frame, and at least one strike plate defined in at least one jamb of said door frame,
a plurality of doors mounted in hinged relation on said hinge post, a single door being adapted to serve as a closure for each of said access ports defined in said door frame,
at least one lock mounted on each door, said lock including a retractable bolt adapted to cooperate with said strike plate for locking that door in a closed relation with said door frame, and
connector means positively connecting said rigid door frame to said casing.

4,073,555

DISHWASHER WITH DOWNWARDLY MOVABLE DOOR COUNTERBALANCED BY SPRING-BIASED TOGGLE JOINTS

Tore H. Noren, 3200 Lakeville Highway, Petaluma, Calif. 94952

Filed Dec. 22, 1975, Ser. No. 643,545
Int. Cl.² A47B 77/06, 51/00
U.S. Cl. 312—229 **3 Claims**



1. A dishwashing machine comprising:

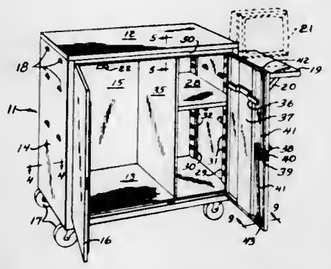
a. a tank for holding water for washing dishes;
b. a dish basket receiving compartment disposed above said tank;
c. a hood covering the top area of the compartment and supported by a back that also forms a wall of said tank;
d. a door movable vertically from a top position where it cooperates with said back and said hood for closing the compartment, to a bottom position where it is received in said tank and permits access into and out of the compartment;
e. spring biasd toggles connected to said door and said tank for counterbalancing said door for supporting it at all elevations from closed to open position, said spring biased toggles including a pair of toggles arranged at opposite sides of said tank, each toggle comprising a lower toggle arm having one end pivotally mounted at the bottom of said tank and adjacent to the vertically movable door, an upper toggle arm having one end attached to the pivotal connection between the two arms and its other end connected to an anchor collar that has means for adjusting its vertical and horizontal position for altering the tension and angle said spring makes relative to the pivotal connection between the two toggle arms;
f. said means for adjusting the vertical and horizontal position of said anchor collars includes an upright mounted in said tank for each anchor collar;
g. a sleeve adjustable vertically on each upright;
h. a threaded rod extending radially from each sleeve and supported thereby;
i. a tubular member for each threaded rod and having a threaded connection therewith;
j. a cross piece interconnecting the two tubular members and supporting said anchor collars; and
k. whereby said anchor collars can be moved into the correct position both vertically and horizontally by adjusting said sleeves on said uprights and adjusting said threaded rods for moving said tubular members so as to apply the proper tension and angle on said springs to substantially counterbalance the weight of said door.

4,073,556

RIGID MOBILE CABINET FOR AUDIO-VISUAL AIDS

Harry Howard Wilson, Jr., Park Forest, Ill., assignor to H. Wilson Corporation, South Holland, Ill.

Filed Sept. 21, 1976, Ser. No. 725,239
Int. Cl.² A47B 43/00
U.S. Cl. 312—250 **10 Claims**



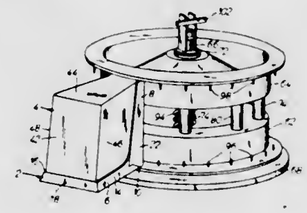
1. A mobile utility cabinet having an open front side, comprising a top wall, a back wall, a bottom wall, and spaced end walls, the latter having front and rear edges, a rigid frame connecting the lower portions of the end and back walls, said frame supporting the bottom wall, doors on the open front side of the cabinet, a top rail bridging the open front and connected at its ends to the end walls, said top rail supporting the front edge portion of said top wall, upstanding stringers one adjacent the front edge of each side wall, upstanding stringers one integral with each end of the back wall and disposed at right angles thereto to lie against the inside surface of the related side wall, all of said stringers being welded to the respective side walls, an inwardly turned flange on the rear edge of each side wall having surface contact with and being welded to the back side of the back wall, said flange and related stringer comprising a rigid post-like corner structure, and vertically spaced horizontally aligned shelf supporting means on each of said stringers.

4,073,557

DISPLAY CASE FOR USE WITH A MERCHANDISE DISPLAY RACK

Louis John Crosslen, Grafton, Wis., assignor to Frank Mayer & Associates, Inc., Grafton, Wis.

Division of Ser. No. 660,867, Feb. 24, 1976, Pat. No. 4,005,775.
This application Oct. 18, 1976, Ser. No. 733,105
Int. Cl.² A47F 5/02
U.S. Cl. 312—284 **9 Claims**



1. In combination, a display case and a merchandise display rack for supporting said display case, said merchandise display rack including a pair of spaced apart support members, means for connecting said support members and whereby one of said support members is shiftable relative to the other support member for varying the distance therebetween, said display case including a base and a removable cover, said display case including a front side and a rear side narrower than said front side and a pair of converging lateral sides, said display case having a generally trapezoidal cross-sectional configuration in a plane transverse to the direction in which said support members are shiftable, said base including a bottom portion and a back portion, a hinge connected to said bottom portion and said back portion and hingedly connecting said portions for movement between an open position and an angular position, latch means on said portions for releasably securing said portions in said open position, said base including a pair of bores therein and said cover including a bore therein alignable with one of said pair of bores when said base and cover are together, said support members each having a projection receivable within said bores in said display case whereby said display case can be releasably mounted on and secured by said merchandise display rack in locked condition.

4,073,558

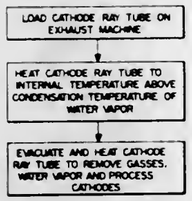
CATHODE RAY TUBE FABRICATING PROCESS

David Benda, Geneva, and Franklin G. Reigel, Waterloo, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Apr. 25, 1977, Ser. No. 790,499
Int. Cl.² H01J 9/385
U.S. Cl. 316—18 **5 Claims**

1. A process for fabricating a cathode ray tube having an envelope with a funnel portion including a viewing screen and a neck portion including an electron gun assembly and said envelope having unwanted gases therein including water vapor, said process comprising the steps of:
loading said cathode ray tube onto a cathode ray tube exhaust machine which includes evacuating and heating apparatus;
activating said heating apparatus to provide a temperature

internal of said envelope in the range of about 40°–70° C; and subsequently



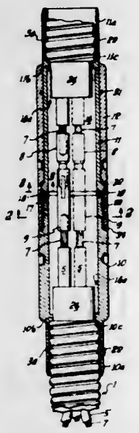
activating said evacuating apparatus to effect removal of said unwanted gases and water vapor from said envelope while said envelope is heated in said range.

4,073,559

ELECTRICAL CONNECTOR FOR SUBMERSIBLE OIL WELL PUMP CABLES

William H. Lawson, Jr., 4715 Webb Canyon Road, Claremont, Calif. 91711

Filed June 20, 1977, Ser. No. 808,327
Int. Cl.² H01R *13/52*
U.S. Cl. 339—94 R **8 Claims**



1. A disconnectable connector for electric power cable of the type having insulated conductors, a jacket, and metallic outer armor, comprising:

a first shell having a cable end receiving portion, external threads, and a generally annular end face portion;

a second shell having a cable end receiving portion and a generally annular end face portion;

a sleeve fitting over said second shell and having internal threads engageable with said external threads to draw said shells axially together and force said face portions together; and

a deformable sealing washer between said face portions,

said cable end receiving portions having internal dimensions to fit said armor and adapted to soldering said armor thereinto;

electrical connector pins on the ends of said conductors inside said shells, and

potting material inside said shells surrounding portions of said pins,

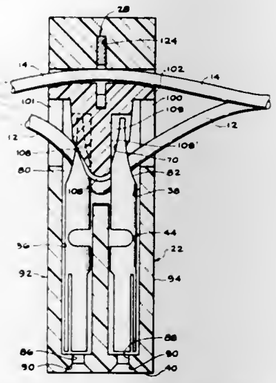
the outer diameters of said first shell and said sleeve being substantially the same to present a smooth outer contour.

4,073,560

ELECTRICAL CONNECTOR

John W. Anhalt, Orange; David S. Goodman, Mission Viejo, and Carl W. Peterson, Westminster, all of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 8, 1976, Ser. No. 664,488
Int. Cl.² H01R *13/38*
U.S. Cl. 339—99 R **12 Claims**



1. An electrical connector for an electrical cable having signal and ground conductors each having a metallic core covered with insulation comprising:

an elongated insulative housing;

said housing having a conductor receiving side and a mating side;

a row of spaced contact receiving cavities in said housing extending from said conductor receiving side to said mating side;

contacts mounted in said cavities, each said contact having a contacting section on said mating side and a termination section on said conductor receiving side;

said termination section of each said contact embodying insulation piercing, core penetrating jaws;

an insulative mandrel removably mounted on said conductor receiving side of said housing;

said mandrel having a first side facing said housing and a second side opposite to said first side, said first side embodying means for forcibly inserting portions of said signal conductors into said jaws to electrically connect said signal conductors to said contacts when said mandrel is mounted on said housing;

a ground buss bar mounted on said second side of said mandrel;

said buss bar embodying a plurality of spaced insulation piercing, core penetrating jaws; and

means on said second side of said mandrel cooperating with said buss bar jaws for forcibly inserting portions of said ground conductors into said buss bar jaws to electrically connect said ground conductors to said buss bar when said buss bar is mounted on said mandrel.

4,073,561

METHOD FOR FORMING A HEAT SINK AND CONNECTOR DEVICE AND THE PRODUCT THEREOF

Conrad J. Baranowski, 27 Elmore St., Arlington Heights, Mass. 02174

Filed Nov. 18, 1976, Ser. No. 743,153
Int. Cl.² H01R *13/00*
U.S. Cl. 339—112 R **4 Claims**

1. A heat sink arrangement comprising:

a substantially straight length of electrical lead material;

a hollow thermally-conductive member having a single wall of uniform thickness forming an elongated figure eight cross section and having a pair of holes through opposite ends thereof in alignment with the direction of elongation of said figure eight cross section;

said length of electrical lead material extending through said pair of holes with edges of said holes biting into opposing sides of said length of electrical lead material;

the portions of said hollow member which form the central



section of said figure eight cross section pressing against said length of electrical lead material from opposite sides thereof; and

said thickness of said wall of said hollow member being approximately two times the thickness of said electrical lead material, and the mass of said hollow member being large compared with the mass of said length of electrical lead material enclosed within said hollow member.

4,073,562

WET CONNECTOR

Neil Karlakind, Chatsworth, Calif., assignor to Gray Tool Company, Houston, Tex.

Filed Aug. 30, 1976, Ser. No. 718,473
Int. Cl.² H01R *13/52, 13/54*
U.S. Cl. 339—117 P **13 Claims**

1. A method for mating two complementary insulated electrical connectors while they are bathed in an electrically conductive medium such as sea water, comprising:

bringing the two connectors into mechanical contact, with their respective matable electrical parts presented in axial alignment across a sealed chamber that is defined between said parts as mechanical contact is accomplished;

pumping an electrically non-conductive fluid under pressure through the chamber to flush electrically conductive medium and any debris therefrom; and

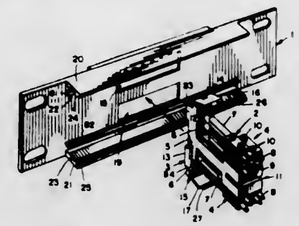
applying an axial force to the matable electrical part of one connector to force that part axially across the chamber and into mating relation with the matable electrical part of the other connector.

4,073,563

STRUCTURE FOR ELECTRICAL CONNECTIONS AND PANEL ASSEMBLY

James R. Bailey, Chicago, and Vernon W. Lavigne, Rolling Meadows, both of Ill., assignors to Switchcraft, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 520,927, Nov. 5, 1974, abandoned. This application Apr. 15, 1976, Ser. No. 677,223
Int. Cl.² H01R *9/16;* H02B *1/02*
U.S. Cl. 339—128 **13 Claims**



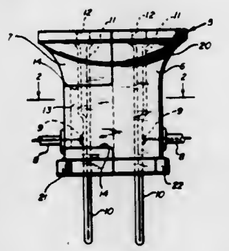
1. A modular jack frame structure for electrical connections adapted to be secured in an opening in a panel comprising a molded rigid frame formed from an electrically insulating material, said frame having a forward rectangular portion of substantial thickness, said forward portion having a front face, a rear face, a top and a bottom with one or more holes therein extending from the front face to the rear face and a rearward portion carrying one or more electrical contact assemblies adapted to be electrically connected to electrically conducting means inserted into said holes, the front face of said forward portion being adapted to fit into an opening in a panel, first slots open outwardly and extending transversely from side to side within the top and within the bottom of said forward portion to receive means for fastening said jack frame in an opening in a panel, second slots open outwardly and extending perpendicularly to said first slots from front to rear within the top and within the bottom of said forward portion to receive alternate means for fastening said jack frame in an opening in a panel, and means engaging one or more of said slots to secure said modular jack frame in an opening in a panel.

4,073,564

CHRISTMAS TREE SERIES LIGHT STRING

George B. Davis, Jr., 7512 Marbury Road, Bethesda, Md. 20034

Continuation-in-part of Ser. No. 751,089, Dec. 16, 1976. This application Feb. 11, 1977, Ser. No. 767,881
The portion of the term of this patent subsequent to Feb. 1, 1994, has been disclaimed.
Int. Cl.² H01R *11/02*
U.S. Cl. 339—157 C **5 Claims**



1. A two prong electrical connector for connecting electrical apparatus to a two conductor electrical outlet comprising, on insulating housing of two seperatable halves, a terminal prong mounted in and extending respectively from each half of said housing and to which may be electrically connected said apparatus and with the longitudinal axis of said terminal prongs positioned substantially parellel with each other when said

connector halves are secured together, means forming at least one pair of arms extending form one half of said housing, arm receiving surfaces formed in the other half of said housing and with said arms and arm receiving surfaces positioned to engage and releasably secure said connector halves together by movement of said connector halves together in a direction substantially transverse to the longitudinal axis of said terminal prongs and to prevent seperation of said connector halves except by movement of said connector halves apart along a plane lying substantially transverse to the longitudinal axis of said terminal prongs.

4,073,565

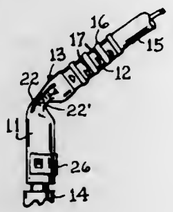
SPARK PLUG TERMINAL

Eugene B. Raymond, 4041 West Grove, Skokie, Ill. 60076

Continuation-in-part of Ser. No. 650,889, Jan. 21, 1976, abandoned. This application June 2, 1977, Ser. No. 802,821

Int. Cl.[2] H01R *11/08*

U.S. Cl. 339—223 S **3 Claims**



1. A spark plug terminal formed from a single sheet of material comprising

a. an elongated body providing at one end a spark plug receiving member and at the opposite end a conductor receiving member,

b. said body having portions of its opposite longitudinal side edges notched to provide a U-shaped medial section,

c. elongated slots formed in said U-shaped medial section, with said slots being equally spaced from each other and from said notched side edges of said body so as to provide a plurality of collapsible strips extending between said spark plug receiving member and said conductor receiving member,

d. each of said strips terminating at its outermost ends into a tapered wall whereby the medial portion of each of said strips lies in a plane different from that of said sparkplug receiving member and said conductor receiving member,

e. said slots being of a length to extend into said tapered walls so as to provide a bendable junction between said outermost ends of said strips and said spark plug receiving member and said conductor receiving member, whereby said members may be bent with respect to each other, with certain of said strips collapsing inwardly with respect to the remaining strips.

4,073,566

BEAM SCANNING DEVICE USING A STATIONARY HOLOGRAM

Masaru Noguchi, Asaka, Japan, assignor to Fuji Photo Film Co., Minami-ashigara, Japan

Filed Sept. 4, 1975, Ser. No. 610,179

Claims priority, application Japan, Sept. 4, 1974, 49-101486

Int. Cl.[2] G02B *5/32*; G03H *1/22*

U.S. Cl. 350—3.71 **6 Claims**

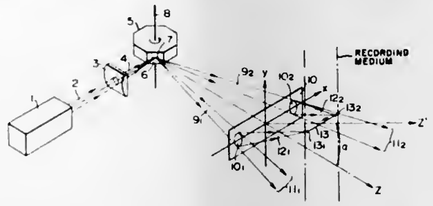
1. A light beam scanning device for scanning a surface with a monochromatic light beam for indicating information thereon comprising in combination:

a light source which generates a collimated monochromatic light beam,

a scanning mirror which is rotatable or swingable about an axis and located in the optical path of said light beam for reflecting and deflecting a diverging light beam,

a converging optical element having one-directional focusing power and located between the light source and the scanning mirror for focusing the light beam generated from the light source only in the direction of said axis and forming a line image on the face of said mirror,

a hologram located between the scanning mirror and said surface in the optical path of the diverging light beam reflected by the face of said scanning mirror, said hologram formed using (a) a spherical wave emerging from a point source removed from the hologram a distance equal to the distance between said hologram and the face of said scanning mirror which reflects said light beam and (b) a converging beam which (1) advances toward the hologram, (2) converges toward a first line disposed on a farther side of said hologram opposite from the side at which the source of said converging beam is disposed, said first line being removed from said hologram a distance which is half of the distance between the reflecting face of



the scanning mirror and the hologram and being oriented perpendicular to said axis and to the direction of general advancement of said converging beam, and (3) converges along a second line disposed on said farther side of said hologram and being removed from said hologram a distance which is equal to the distance between the reflecting face of the scanning mirror and the hologram and being oriented in the direction of said axis and perpendicular to the direction of general advancement of said converging beam, said hologram converging a higher order diffraction beam emerging from said hologram to a point at said surface where said higher order diffraction beam is of an order higher than the zero-order diffraction beam, said point moving along a straight line parallel to said hologram on said surface as the diverging light beam scans the hologram in one direction, said hologram and said surface are so disposed with respect to one another that the distance from the hologram to said straight line is substantially half as long as the distance from the hologram to the scanning mirror face.

4,073,567

PIVOTING MIRROR DEVICE

Herman Gerard Lakerveld, and Gerard Eduard van Rosmalen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

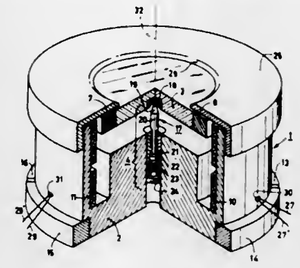
Filed Dec. 8, 1975, Ser. No. 638,510

Claims priority, application Netherlands, Sept. 29, 1975, 7511417

Int. Cl.[2] G02B *27/17*

U.S. Cl. 350—6.5 **6 Claims**

1. A pivoting mirror device for directing a light beam in a video disk player comprising a frame, an elongated pivotal bearing extending from the frame, a mirror centrally supported on said bearing for pivotal motion, said mirror having a reflective surface on a side opposite said bearing, at least one permanent magnet near the edge of said mirror and being radially polarized with respect to said pivot, said permanent magnet on said mirror providing local magnetic field lines extending substantially parallel to the reflecting surface of said mirror, and an electro-dynamic drive means in the path of said magnetic field lines for pivoting said mirror about said bearing under the influence of an electric control signal and comprising



at least one control coil of wire, substantially all of the wire in said control coil extending substantially parallel to the mirror surface.

4,073,568

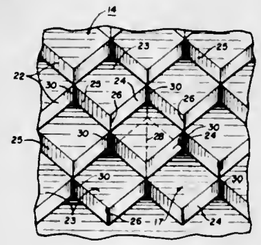
RETROREFLECTOR UNITS WITH THREE MUTUALLY PERPENDICULAR SURFACES DEFINING A TRIHEDRAL ANGLE OF A RECTANGULAR PARALLELEPIPED

James H. Heasley, Shaker Heights, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

Filed Nov. 26, 1975, Ser. No. 635,634

Int. Cl.[2] G02B *5/124*

U.S. Cl. 350—103 **19 Claims**



1. A retroreflector comprising a light-transmitting sheet adapted in use to be disposed in an angled position such that a normal to the sheet is at an angle of about 5° to about 85° from an incident beam of light, said sheet having front and back, opposed, substantially parallel faces, the front face being substantially smooth and defining a light-refracting surface, the back face having a plurality of light-reflecting units, at least some reflecting units comprising three mutually perpendicular surfaces defining a trihedral angle of a rectangular parallelepiped and positioned with respect to said front face that the body diagonal of the rectangular parallelepiped is within an angle of about 15° to incident light refracted by said front face, at least two of said three mutually perpendicular surfaces being rectangular and said two surfaces being vertically disposed.

4,073,569

PRISMATIC STEREOSCOPIC VIEWER

John Rizzo, 1546 W. 11th St., Brooklyn, N.Y. 11204

Filed Mar. 25, 1976, Ser. No. 670,374

Int. Cl.[2] G02B *27/22*

U.S. Cl. 350—137 **1 Claim**

1. A prismatic stereoscopic viewer comprising, in combination,

a housing having separate upper and lower sections and containing a recess in a front portion of said housing,

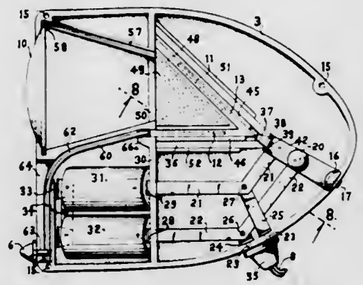
a magnifying lens mounted in said recess,

a prism mounted in said casing behind said lens, said housing containing a V shaped slot in said upper section adjacent to said prism,

a V shaped slide mount removably inserted into said V shaped slot, said housing forming V shaped pairs of ridges adjacent to said V shaped slot,

an acutely bent V shaped diffusion glass supported by said V shaped pairs of ridges inside the housing adjacent to said V shaped slot,

an electrically conductive clip of spring material fixed to said lower section of said housing and extending upward within said upper section of said housing, said upper section containing a slip notch engaged by said clip holding said sections together, said clip having an inward extending portion terminating in an inverted U shaped bend of said clip, said U shaped bend having a vertical arm fixed to said V shaped difusion glass and a switch extending within said V shaped diffusion glass below said V shaped slot,



a light bulb mounted in said housing beyond said diffusion glass on said inward extension of said clip,

battery means within said housing,

an electrical contact,

electrical connectors connecting said contact and said bulb to said battery means so that insertion of said V shaped slide mount moves said switch against said contact lighting said bulb, said housing containing a lateral slot adjacent to said lens,

a black flexible curtain slidably mounted within said casing, and

a sliding nob attached through said lateral slot to said curtain so that said curtain may be slid by said nob into contact with said switch moving said switch against said contact and lighting said bulb while said curtain underlies one side of said V shaped slot for the viewing of conventional slides inserted in the other side of said V shaped slot.

4,073,570

ELECTROCHROMIC DISPLAY DEVICE

Karel Anthony Korinek, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 15, 1976, Ser. No. 667,216

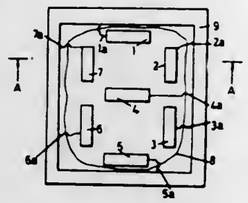
Claims priority, application United Kingdom, Mar. 13, 1975, 10454/75

Int. Cl.[2] G02F *1/36*

U.S. Cl. 350—357 **10 Claims**

1. An electrochromic device comprising a working electrode having radiation reflection or transmission properties, a counter electrode, and an electrochromic medium contacting

the working and counter electrodes, the medium comprising an electrochromically active material, an auxiliary redox system present in a concentration from 1×10^{-5} to 5×10^{-2} M and an inert electrolyte.

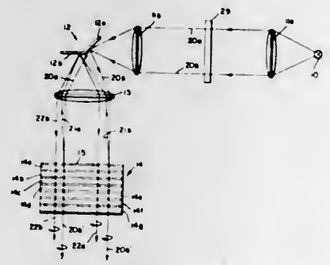


4,073,571

CIRCULARLY POLARIZED LIGHT SOURCE

Jan Grinberg, Los Angeles, and Leroy J. Miller, Canoga Park, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 5, 1976, Ser. No. 683,557
Int. Cl.² G02F *1/13*
U.S. Cl. 350—337 **7 Claims**



1. A circularly polarized light source comprising:

a. at least one circularly polarizing cholesteric liquid crystal cell means, said means reflecting a first portion of unpolarized light incident thereon in one circular polarization handedness sense and transmitting a second portion of said light in the other circular polarization handedness sense within a predetermined wavelength bandwidth around a predetermined central wavelength, the polarization of the light outside said bandwidth being unaffected by the cell and said light being transmitted through said cell unpolarized;

b. mirror means having an acute angle between at least two intersecting tangent lines which are respectively tangent to at least first and second portions of the surface of said mirror means for receiving and reflecting light and for producing a change from one circular polarization handedness sense to the other when circularly polarized light is reflected from said mirror means;

c. a source of unpolarized light;

d. means to focus light from said source onto a first of said portions of said mirror means, said mirror means being positioned relative to said light source and said liquid crystal cell means so that said focused light is reflected from swaid first portion of said mirror means to said cell means;

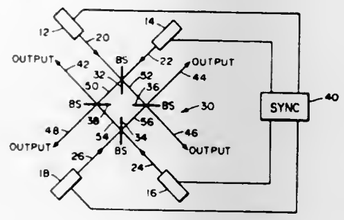
e. collimating lens means positioned between said mirror means and said cell means to collimate said light reflected from said mirror means towards said cell means; the plane of the entrance window of said cell means being positioned at an acute angle with respect to the direction of propagation of said collimated reflected light such that the handedness sense portion of said collimated light which is reflected by said cell means returns through said collimating lens to a second of said portions of said mirror means and after reversal of the sense of circular polarization handedness at said mirror means is again reflected back through said collimating lens to said cell means for transmission therethrough to produce an output beam from said cell means in which all of the light from said light source within said predetermined wavelength band is circularly polarized in the same handedness sense.

4,073,572

SYSTEM FOR INCREASING LASER PULSE RATE WITH BEAM SPLITTERS

Kenneth Avicola, Richland, Wash., assignor to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed Feb. 23, 1976, Ser. No. 660,650
Int. Cl.² G02B *27/14*; B01D *59/44*
U.S. Cl. 350—174 **13 Claims**



1. For use in a system for combining a plurality of beams of laser radiation of different characteristics, an array of beam splitter elements comprising:

a plurality of sets of individual beam splitter elements;

said plurality of sets including a set of input beam splitter elements receiving on opposite surfaces thereof the laser radiation from two of said plurality of laser beams of different characteristics;

said plurality of sets of beam splitter elements including a set of output beam splitter elements with each element thereof receiving on opposite surfaces radiation from two different beam splitter elements of a further set of beam splitter elements other than said set of output beam splitter elements and operative to transmit and reflect a portion of each incident beam to provide two of said plurality of output beams, each beam containing radiation components of all of the input beams of pulsed laser radiation applied to said system; and

a plurality of mirrors for directing radiation from one set of elements diverging from said array to elements of a further set of beam splitter elements.

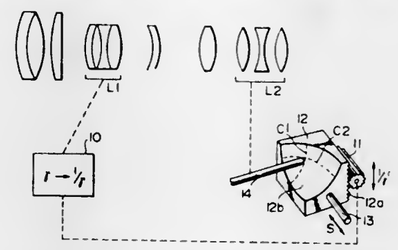
4,073,573

ZOOM LENS SYSTEM

Akira Yamagishi, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Nov. 29, 1976, Ser. No. 745,606
Claims priority, application Japan, Nov. 27, 1975, 50-142119
Int. Cl.² G02B *15/18*
U.S. Cl. 350—187 **5 Claims**

1. A zoom lens system comprising a zooming movable lens group (L1, L11) and a focusing lens group (L2, L12) wherein the focusing lens group (L2, L12) is axially moved to maintain the resultant image position in a stationary image plane when the zooming movable lens group (L1, L11) is axially moved for varying the focal length thereof, wherein the improvement comprising conversion means (10, P1, 20) for converting the distance of axial movement of the zooming movable lens group (L1, L11) to a value representing a reciprocal number of the afocal magnification ($1/\gamma$) of the zoom lens system, calculating means (11, 12, 13; 21) which receives said value (γ) and a signal representing the distance (S) of an object to be photographed from the zoom lens system and gives an output representing a distance (Δx) by which the focusing lens group (L2, L12) should be axially moved to maintain the resultant image position in a stationary image plane, and connecting means (14; 22, M, P2) for connecting said calculating means (11, 12, 13; 21) with said focusing lens group (L2, L12) to move the focusing lens group (L2, L12) in accordance with the output (Δx) from said calculating means (11, 12, 13; 21).

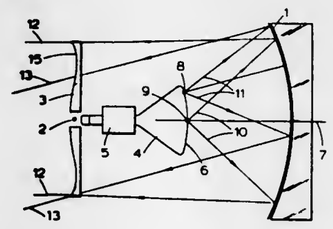


4,073,574

OPTICAL PROJECTOR

John Alfred Clarke, Wallington, and Harry Howden, Smallfield, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 525,664, Nov. 20, 1974, abandoned. This application Oct. 1, 1976, Ser. No. 728,508
Claims priority, application United Kingdom, Nov. 28, 1973, 55177/73
Int. Cl.² G02B *3/04, 17/08*
U.S. Cl. 350—189 **7 Claims**



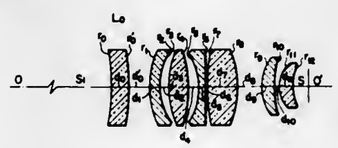
1. An optical system comprising an image forming system and a symmetrical aspheric element placed proximate a principal plane of the image forming system, the thickness of the aspheric element having an aspheric polynomial function including a term proportional to the third power of the distance from the optic axis.

4,073,575

OBJECTIVE FOR VIDEO DISKS

Toshimichi Koizumi, Sagamihara, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 12, 1976, Ser. No. 685,675
Claims priority, application Japan, May 15, 1975, 50-57798
Int. Cl.² G02B *11/32, 11/34*
U.S. Cl. 350—214 **4 Claims**



1. An objective for video disks comprising a front lens group and rear lens group, said front lens group comprising a first, second, third and fourth lens components, said rear lens group comprising a fifth and sixth lens components, said first lens component being a negative meniscus lens, said second lens component being a biconvex lens, said third lens component being a negative lens, said fourth lens component being a positive lens, said fifth lens component being a positive meniscus lens, said sixth lens component being a positive meniscus lens, said objective for video disks satisfying the following conditions:

$$0.52 \geqq d_8/f \geqq 0.42 \quad (1)$$

$$0.97 \geqq f_R/f \geqq 0.93 \quad (2)$$

$$3.5 \geqq f_F/f_R \geqq 3.3 \quad (3)$$

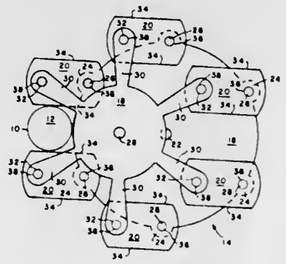
wherein reference symbol f represents the focal length of the lens system as a whole, reference symbol f_F represents the total focal length of the front lens group, reference symbol f_R represents the focal length of the rear lens group, and reference symbol d_8 represents the airspace between the front and rear lens groups.

4,073,576

DEVICE FOR CHOPPING AN OPTICAL BEAM

Robert Edward Bastian, Wyckoff, N.J., assignor to North American Philips Corporation, New York, N.Y.

Filed Aug. 30, 1976, Ser. No. 718,869
Int. Cl.² G05D *25/00*
U.S. Cl. 350—273 **7 Claims**



1. A device for chopping an optical beam comprising at least one chopper blade having parallel edges, and means for moving said blade through said beam so that said edges always remain parallel to themselves through said beam, said blade moving means comprising a rotatably mounted primary disc, a secondary disc eccentrically rotatably mounted with respect to said primary disc and having at least one radially extending spoke extending therefrom, said chopper blade being rotatably mounted on both of said primary disc and said spoke.

4,073,577

CONTACT LENSES OF HYDROPHILIC POLYMERS MADE BY PHOTOPOLYMERIZATION

Peter Höfer, Aschaffenburg, Germany, assignor to Titmus Eurocon Kontaktlinsen KG, Aschaffenburg, Germany

Continuation of Ser. No. 604,516, Aug. 13, 1975, abandoned, which is a continuation of Ser. No. 442,719, Feb. 14, 1974, abandoned. This application Oct. 22, 1976, Ser. No. 735,227
Claims priority, application Germany, Feb. 19, 1973, 2308047
Int. Cl.² G02C *7/04*
U.S. Cl. 351—160 **11 Claims**

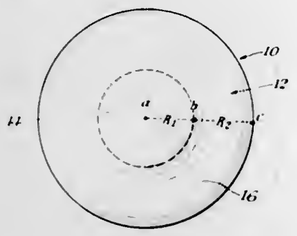
1. Contact lens consisting essentially of a hydrogel of a polymer of a single monomer selected from the group consisting of a hydoxyalkyl acrylate and a hydroxyalkyl methacrylate, said single monomer being photopolymerized in the absence of a cross-linking agent.

4,073,578

SPECTACLE LENS FOR APHAKIA PATIENTS

Robert C. Welsh, Coconut Grove, Fla., assignor to Phillip M. Frieder, Miami, Fla., a part interest

Filed Apr. 21, 1975, Ser. No. 570,218
Int. Cl.[2] G02C 7/02; G02B 3/04
U.S. Cl. 351—167 9 Claims



1. An aspheric cataract spectacle lens for improving the peripheral vision of a person suffering from aphakia by forcing head movement for central viewing of side objects, the improvement comprising:

a lens body, said body having an anterior surface and an interior surface,

said anterior surface having a central spherically curved area and a peripheral aspheric curved area,

said aspheric curved area having a diopter rate of change beginning at the edge of said central vision area and extending to the body periphery of approximately a one-third diopter per millimeter,

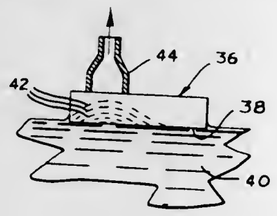
whereby the person is provided with improved peripheral vision of a side object when said person centrally fixates his eye relative to said lens body to further improve vision of said side object when said person rotates his head with his eyes centrally fixated looks directly at said object to make said side object clearer than if the person rotated his eye thus looking through said aspherical portion of said lens body which obscures said side object.

4,073,579

OPHTHALMIC LENS WITH LOCALLY VARIABLE INDEX OF REFRACTION AND METHOD OF MAKING SAME

Emil W. Deeg, Woodstock, Conn., and David A. Krohn, Southbridge, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed June 9, 1976, Ser. No. 694,428
Int. Cl.[2] G02B 27/10; C03C 15/00, 17/00, 19/00
U.S. Cl. 351—169 8 Claims



1. The method of making an ophthalmic lens having locally variable index of refraction comprising the steps of:

shaping a piece of microporous glass to the configuration desired of a blank from which said lens may be formed, said blank being greater in size than desired of said lens;

placing a side of said blank in contact with a solution of an inorganic salt to cause at least partial filling of a preselected portion of said blank with said solution by capillary forces of open pores of said glass;

removing said blank from said salt solution and causing evaporation of the solvent of said solution from said pores and precipitation of said salt in said preselected portion of said blank;

heating the thus dried blank to a temperature and for a period of time sufficient to close said pores and render said blank transparent with local variations of its composition in said portion containing said precipitated salt, said variations in composition causing corresponding variations in refractive index, and

grinding and polishing said heat-treated blank to the meniscus shape, size and surface finish of an ophthalmic lens.

8. The product of the process of claim 1.

4,073,580

FADE PHOTOGRAPHING CONTROL APPARATUS FOR CINE CAMERA

Toshitatsu Kawatsu, Shimosuwa, Japan, assignor to Sankyo Kogaku Kogyo Kabushiki Kaisha, Japan

Filed June 23, 1976, Ser. No. 698,913
Int. Cl.[2] G03B 21/36
U.S. Cl. 352—91 C 11 Claims



1. In a cine camera of the type having means for adjusting a shutter opening comprising:

a pair of sector-shaped shutter blades disposed for rotation into overlapping relationship on an optical axis passing through said shutter opening;

wherein the improvement comprises:

means for fade photographing comprising:

an operating member for initiating a fade photographing operation and rockable between a first and a second position;

detent means for locking the operating member in the second position;

a rotary member capable of rotation in a first direction and in an opposite, second direction;

a motor means for operating in a forward and reverse direction;

energizing means for operating said motor means comprising a cut-off switch and a reverse rotation switch;

means connected to said motor means for driving one of said pair of shutter blades and for driving a film past said optical axis;

clutch means disposed between the motor means and the rotary member for transmitting a drive output from the motor means to the rotary member when the operating member is in its second position;

a cam member including first and second eccentric cam surfaces and disposed on the same shaft as the rotary member for integral rotation with the rotary member only when the rotary member rotates in the first direction;

fade out stop means operable in following relationship with the first eccentric cam surface when the rotary member rotates in the first direction for turning off said cut-off switch and deenergizing the motor means when the rotary member has rotated through 180°;

an operating button means capable of being operated externally of the camera for closing said reverse rotation switch for the motor means, to cause a rotation of the motor in the reverse direction for feeding the film in a reverse direction during the time the rotary member rotates through 180° in the second direction;

reverse film feed stop means for interrupting the rotation of the motor means when the rotary member has rotated through 180° in the second direction;

means for unlocking said operating means;

a third cam surface on the cam member for operating said unlocking means and releasing the operating member from the detent means when the rotary member has again rotated through 180° in the first direction, thereby interrupting the rotation of the rotary member;

shutter opening control means for operating the other of said pair of shutter blades; and

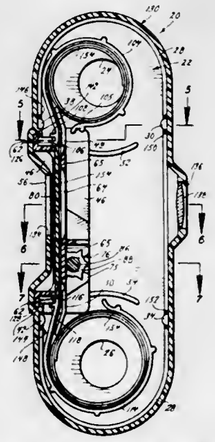
means connecting the second cam surface and the shutter opening control means for varying the shutter opening in a decreasing direction during the initial rotation of the rotary member through 180° in the first direction, and for varying the shutter opening in an increasing direction during the final rotation of the rotary member through 180° in the first direction.

4,073,581

VIEWER FOR A STRIP OF FILM

Herbert F. Rayburn, 3rd & Oak, Box 11, Kimmswick, Mo. 63053

Filed June 9, 1976, Ser. No. 694,189
Int. Cl.[2] G03B 21/00
U.S. Cl. 352—129 20 Claims



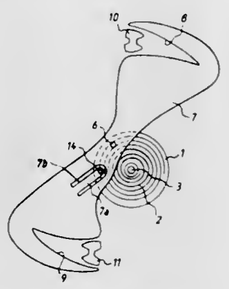
1. A viewer for a strip of film which comprises an open-type support that has a space adjacent one end thereof to accommodate a rolled-up strip of film and that has a second space adjacent the opposite end thereof to accommodate said rolled-up strip of film, a resilient film guide disposed adjacent the first said space to accommodate and help confine said rolled-up strip of film, a movement-limiting surface adjacent said resilient film guide which can receive, and limit movement of, one edge of said rolled-up strip of film as said rolled-up strip of film is moved edge-wise into position to be confined by said resilient film guide, a light-diffusing element which is intermediate said first said space and said second space, a member which is adjacent to but which is spaced from said light-diffusing element to define a passage for said strip of film, a film-moving element which can move said strip of film through said passage, and a walled cover which is selectively engageable with or separable from said support, said resilient film guide having spaced-apart portions which permit direct access to the outermost turn of said rolled-up strip of film to permit a use of said viewer to contact, and apply circumferentially-directed forces to, said outermost turn to facilitate the advancing of the leading edge of said outermost turn into and through said passage and into said second space, said resilient film guide and said light-diffusing element and said member and said film-moving element being adapted to guide and confine said strip of film wholly independently of said walled cover, whereby said strip of film can be secured to and confined and held by said support while said walled cover is remote from, and hence permits full and free access to, said support, said walled cover coacting with said support whenever said walled cover is in engagement with said support to completely enclose said resilient film guide and said member and said strip of film.

4,073,582

CAMERA SHUTTER

Peter Lermann, Feldkirchen, Germany, assignor to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Mar. 16, 1977, Ser. No. 778,138
Claims priority, application Germany, Mar. 18, 1976, 2611351
Int. Cl.[2] G03B 19/18
U.S. Cl. 352—141 10 Claims



1. In a shutter for photographic and cinematographic cameras, a combination comprising at least one diaphragm leaf; pivot means mounting said diaphragm leaf angularly displaceable about a pivot axis; a cam element having an arcuate cam track; a prime mover connected with said cam element for rotating the same; and a cam follower tracking said cam track and engaging said diaphragm leaf at a location which is laterally offset from said pivot axis, so that rotation of said cam element results in angular displacement of said diaphragm leaf about said pivot axis.

4,073,583

PHOTOELECTROPHORETIC HEAT AND PRESSURE TRANSFER MECHANISM

Roger G. Teumer, Fairport; Peter J. Warter, Jr., Penfield; Gino F. Squassoni, Pittsford; Vseevolod Tulagin, Rochester, and Raymond K. Egnaczak, East Williamson, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 24, 1975, Ser. No. 571,170
Int. Cl.[2] G03G 17/04
U.S. Cl. 355—3 P 3 Claims

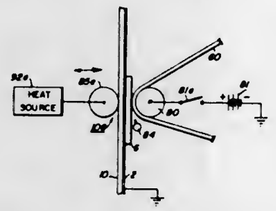
1. A transfer assembly for transfer and fixation of photoelectrophoretic image containing pigment particles and insulating carrier fluid from a flexible charge-conductive belt or web to a transfer sheet, belt, or web containing thermoplastic material comprising:

means for inking and image-wise exposing the charge conductive belt or web in temporary conjunction with a blocking electrode in an electric field to obtain at least one photoelectrophoretic image; and

means for advancing and guiding the flexible charge con-

ductive belt or web and formed image through an image transfer zone having,

heating means in temporary biased movable contact with the non-imaging side of the advancing flexible charge-conductive belt or web, a guide or roll for guiding the transfer sheet, belt or web into temporary contact with



at least part of the biased charge conductive belt and image within the image transfer zone along a line about opposite the biased heating means; and

means for diluting the atmosphere to vary the dielectric properties thereof at one or more nips between the charge-conductive belt or web and the transfer sheet, belt or web.

4,073,584

SLIT EXPOSURE DEVICE FOR USE WITH A STATIONARY ORIGINAL CARRIAGE

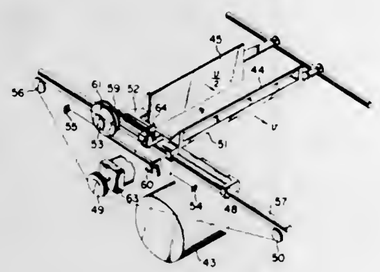
Tadayuki Kitajima, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 589,086, June 23, 1975, abandoned, which is a division of Ser. No. 509,077, Sept. 25, 1974, abandoned. This application Mar. 10, 1976, Ser. No. 665,393

Claims priority, application Japan, Sept. 27, 1973, 48-108676

Int. Cl.² G03G *15/28*

U.S. Cl. 355—8 **3 Claims**



1. An electrophotographic apparatus comprising:

a stationary original carriage for carrying an original thereon;

a first mirror means for reflecting image light of the original, said first mirror means being movable in parallel with said original carriage;

a light source for illuminating the original, said light source being integral with said first mirror means;

a second mirror means for receiving the image light which has been reflected by said first mirror means, said second mirror means being movable in the same direction as that of said first mirror means and at a speed which is one half the speed of movement of said first mirror means to direct the image light to a predetermined position;

projection lens means for focussing the image light which has been reflected by said second mirror means onto a photosensitive member to form an image of the original on a surface of the photosensitive member;

a rotatable pulley movable together with said second mirror means;

a mirror transport wire engaged with said pulley;

driving means for moving said transport wire to move said second mirror means at said half speed and for rotating said pulley; and

an electric wire having one end connected to said light source fixed on said first mirror means, said electric wire travelling around said rotatable pulley for coupling to a power source in such a manner that said electric wire is not damaged due to movement of said light source.

4,073,585

SHEET REMOVING DEVICE FOR USE IN ELECTROPHOTOGRAPHIC COPYING MACHINE

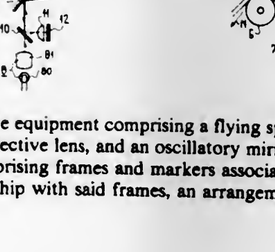
Tatsuo Kobayashi, Machida, and Akira Miyazaki, Isehara, both of Japan, assignors to Rank Xerox Ltd., London, England

Filed July 27, 1976, Ser. No. 709,156

Claims priority, application Japan, Sept. 26, 1975, 50-115656

Int. Cl.² G03G *15/04*; B65H *7/06*

U.S. Cl. 355—14 **3 Claims**



1. In an electrophotographic copying machine wherein a developed latent image is produced on a photosensitive body and transferred to a copy sheet which is thereafter stripped from the photosensitive body for further processing, a sheet removing device comprising:

a reversible feed roll pair adapted to feed sheets to the photosensitive body for transferring a developed latent image thereto;

detector means for detecting a failure in stripping a sheet off the photosensitive body, and

control means actuated by said detector means to reverse said feed roll pair to pull the mis-stripped sheet backward off the photosensitive body.

4,073,586

ARRANGEMENT FOR PROJECTING IMAGES OF MARKERS ON TO A PHOTOSENSITIVE SURFACE IN A TELECINE EQUIPMENT

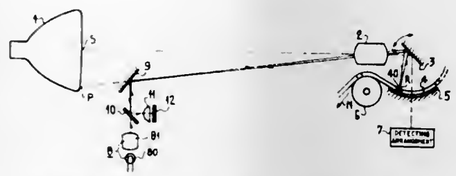
Michel Favreau, and Serge Vidal, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 18, 1976, Ser. No. 687,630

Claims priority, application France, May 23, 1975, 75 16066

Int. Cl.² G03B *27/76, 27/78*

U.S. Cl. 355—20 **3 Claims**



1. In a telecine equipment comprising a flying spot cathode-ray tube, an objective lens, and an oscillatory mirror for scanning films comprising frames and markers associated in a one to one relationship with said frames, an arrangement for projecting on to a photosensitive surface an image of the marker associated with the frame being scanned, said arrangement comprising first means for illuminating the marker associated with the frame being scanned, and second means for forming on said photosensitive surface an image of the illuminated marker, said first means comprising a fixed light source, and an optical channel, including said objective lens and said oscillatory mirror, for forming an image of said fixed light source on the marker associated with the frame being scanned.

4,073,587

COROTRON APPARATUS

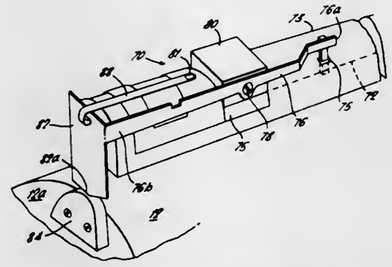
Michael Frederick James Selwyn, Lydney, England, assignor to Rank Xerox Ltd., London, England

Filed Mar. 26, 1976, Ser. No. 671,225

Claims priority, application United Kingdom, Oct. 24, 1975, 43919/75

Int. Cl.² G03G *15/00*

U.S. Cl. 355—3 CH **10 Claims**



1. An apparatus for preventing contamination of a corotron electrode in an electrostatographic copying machine comprising a support means to which the opposite ends of said corotron wire are affixed to hold said wire at a predetermined tension, vibration means positioned adjacent said corotron wire operable to vibrate said wire a predetermined amplitude to prevent the accumulation of contaminants thereon, and means for activating said vibration means periodically in response to the movement of a rotating portion of said electrostatographic machine, said vibration means including a pick means connected to a shaft generally parallel to said corotron wire, said shaft having a follower surface connected thereto, said follower surface being positioned to be struck and oscillated by a striker plate connected to a rotating portion of said electrostatographic machine.

4,073,588

APPARATUS FOR APPLYING INDICIA TO FILMS AND ENVELOPES IN PHOTOGRAPHIC PROCESSING LABORATORIES

Helmut Zangenfeind, Puchheim; Jürgen Burchardi, and Josef Lederer, both of Neubiberg, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

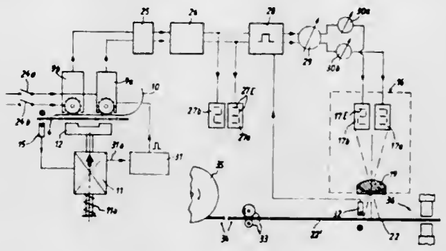
Filed Dec. 9, 1976, Ser. No. 748,721

Claims priority, application Germany, Dec. 13, 1975, 2556281

Int. Cl.² G03B *27/52*

U.S. Cl. 355—41 **28 Claims**

1. Apparatus for the application of indicia to receptacles for films and to associated films, comprising means for transporting successive receptacles and successive associated films along discrete first and second paths; first and second adjustable marking units respectively adjacent said first and second paths and respectively including a first device for applying different first indicia to successive receptacles and a second device for applying different second indicia to successive films, each of said first indicia being normally related to one of said second indicia; first and second detector means for respectively scanning said first and second paths and for respectively transmitting first and second signals on detection of receptacles and films in predetermined positions relative to the corresponding units; means for synchronizing said devices so as to insure the application of related first and second indicia in response to each actuation of said units, including means for



blocking the actuation of at least one of said units in the absence of at least one of said signals; and means for adjusting one of said units upon each actuation of said one unit so as to set the respective device for the application of a different indicium.

4,073,589

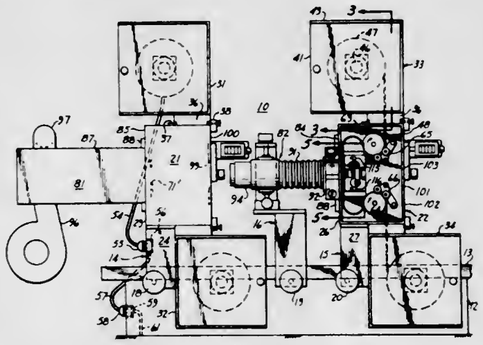
IMPROVED OPTICAL PRINTER

Harold A. Scheib, Encino, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Feb. 13, 1976, Ser. No. 657,341

Int. Cl.² G03B *27/48*

U.S. Cl. 355—50 **3 Claims**



1. In an optical image printer wherein images are copied from a first film onto a photographically sensitive second film, the improvement comprising in combination:

a relatively stationary structure having a bed and including means for providing electric energizing power;

a first carriage slidable along said bed;

a second carriage slidable along said bed;

a projector having a first apparatus including a first housing mounted on said first carriage for receiving said first film and first means in said first housing for positioning said received first film, said projector including means operatively associated with said first apparatus for illuminating said positioned first film and forming a luminous image;

a camera operatively associated with said projector and having a second apparatus including a second housing mounted on said second carriage for receiving said second film and second means in said second housing for positioning said received second film, said camera including means operatively associated with said second apparatus for receiving said luminous image from said projector and projecting said received luminous image onto said positioned second film;

first, second, third and fourth film magazines of identical construction for selectively supplying and receiving either

of said first and second films, each of said first, second, third and fourth film magazines having an individual magazine housing, individual means for rendering said magazine housing light tight, an individual mounting shoe, individual means in the particular magazine housing for coiling either of said first and second films, an individual electric motor coupled to said coiling means for driving said coiling means, and means for mounting said electric motor on the particular magazine housing;

means for releasably mounting said first, second, third and fourth magazines, respectively, on a first side of said first housing, on an opposite second side of said first housing, on a first side of said second housing, and on an opposite second side of said second housing via the mounting shoes of said first, second, third and fourth magazines; and

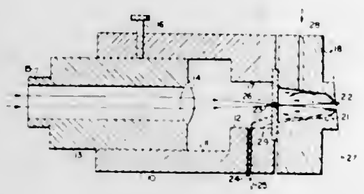
means coupled to the electric motor of each film magazine for selectively connecting each electric motor to said electric energizing power providing means.

4,073,590

LASER TOTAL REFLECTOMETER

R. Bernard Brown, Upper Marlboro, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 18, 1976, Ser. No. 742,815
Int. Cl.² G01N *21/48*
U.S. Cl. 356—209 **7 Claims**



1. A reflectometer for measuring the reflectivity of a test surface which comprises:

a housing,

said housing including a large passage in one end and a smaller passage in the opposite end with said passages axially aligned along the length of said housing;

a lens holder extending into said large passage in said housing with a passage therethrough in coaxial alignment with the large passage in said housing;

a focusing lens secured on the inner end of said lens holder for focusing light on an optical axis in alignment with the axis of said housing;

a mirrored wall element including a mirrored conical inner wall secured in axial aignment with said housing coaxial with said optical axis,

said mirrored wall element including an outlet end with an aperture therein centered on said axis with said outlet end having a curved surface at a slight angle with respect to the optical axis;

a radiation detector secured betrween said smaller-passage end of said housing and said mirrored wall element,

said radiation detector including a passage therethrough on the optical axis, and

means for positioning said lens holder in said housing,

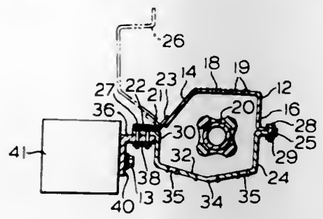
whereby radiation focused by said lens will be centered on said aperture in said mirrored wall element and focused to a point at said passage in said radiation detector.

4,073,591

COMPOSITE U JOINT GUARD-STEP

Gary N. Heitzman, Washington, and Norma G. Shook, Morton, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 3, 1977, Ser. No. 774,006
Int. Cl.² F16C *1/06*
U.S. Cl. 403—24 **10 Claims**



1. A composite "U" joint guard-step, comprising:

a first member having first and second flanges and a middle portion and being of an elongated channel and inverted "U" configuration, said middle portion being generally planar and generally horizontal in the installed position over a "U" joint and having a non-skid means thereon and being of a strength sufficient for providing a step for an operator, said first member being of a configuration sufficient for extending over and being spaced from a "U" joint;

a second member having first and second flanges extending outwardly from said second member, and being of an elongated channel configuration and of a size sufficient for mating with said first member while being spaced from the "U" joint and, in combination with said first member, encompassing said "U" joint;

first means for releasably maintaining the first member in substantial mating alignment relative to the second member flanges; and

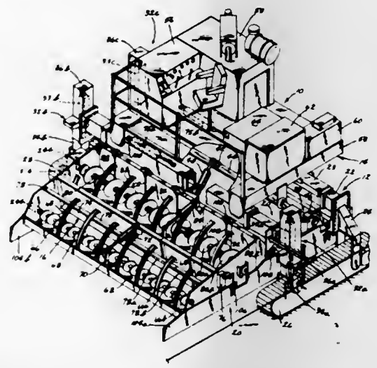
second means for maintaining the second member at a preselected position relative to said "U" joint.

4,073,592

METHOD OF PAVING

Harold W. Godberson, and Gary L. Godberson, both of Ida Grove, Iowa 51445

Filed Jan. 19, 1976, Ser. No. 650,467
Int. Cl.² E01C *23/02*
U.S. Cl. 404—89 **3 Claims**



1. A method of concurrently laying a multiple layered pavement on a base surface by use of a single machine having a normal direction of movement, said machine comprising:

a movable frame;

a first means attached to a front portion of said frame for receiving a first composition;

a first strike-off means attached to said frame behind said first receiving means and being positioned generally transversely of the normal direction of movement of said frame for determining a top level of said first composition;

a second means attached to said frame for receiving said second composition and depositing said second composition on top of said first composition; and

a second strike-off means attached to said frame behind said second receiving means and being positioned generally transversely to the normal direction of movement of said frame for determining a top level of said second composition; said method comprising:

depositing a first homogeneous cementitious composition in a plastic condition on said base surface in front of said first means for receiving said first composition;

leveling said first composition with said first strike-off means;

depositing a second homogeneous cementitious composition in a plastic condition into said second means for receiving the second composition;

leveling said second composition by use of said second strike-off means; and

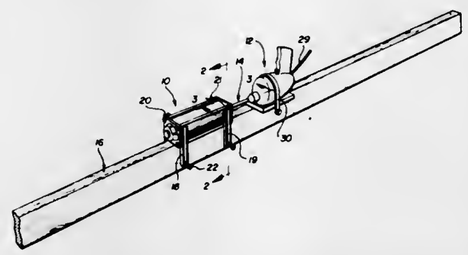
whereby all of the steps of said method are performed simultaneously.

4,073,593

METHOD AND APPARATUS FOR PROVIDING A POWER SCREED BOARD

Nelson "Jack" Storm, Rossville, Ill., assignor to Custom Trailers Mfg., Inc., Westville, Ill.

Filed July 12, 1976, Ser. No. 704,297
Int. Cl.² E01C *23/06*
U.S. Cl. 404—114 **3 Claims**



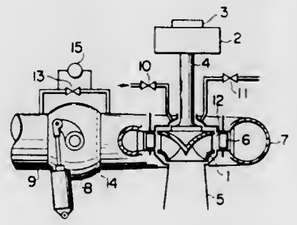
1. A power screed of the type having a screed board, a vibration element for vibrating said screed board, and a source of power for operating said vibration element, said power screed being of a knock-down construction for on-site assembly and disassembly and comprising, in combination, a length of board usable as a temporary screed board, whereby a disposable and replaceable length of board suitably proportioned for a particular job can be simply selected for the screed board; a light-weight vibration element having a housing, an unbalanced rotating element rotatably retained within said housing, and adjustable clamping means integrally formed with said housing for quickly and detachably clamping said vibrator to said length of board, whereby said vibration element is detachable and useable in conjunction with any selected length of board; and a light-weight power hand drill providing a source of power for said vibration element and adapted to be quickly and detachably affixed to said selected length of board and detachably coupled to said vibration element, whereby said source of power is detachable and useable in conjunction with any such vibration element; whereby an inexpensive, light-weight power screed of a knock-down construction for on-site assembly and disassembly is provided simply by selecting any available suitable length of board and detachably clamping the vibration element and the source of power to it and then coupling the vibration element and the source of power together.

4,073,594

PUMP STARTING METHOD FOR HYDRAULIC MACHINERY

Nobuho Takagi, Hitachi; Mituo Takase, Mito; Takashi Itoh, Ibaraki; Katsumi Seno, and Toshihiko Koseki, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed June 4, 1976, Ser. No. 692,995
Claims priority, application Japan, June 11, 1975, 50-69626
Int. Cl.² F01D *17/00*
U.S. Cl. 415—1 **8 Claims**



1. A pump starting method for hydraulic machinery wherein a runner is brought into no discharge operation in water at flow rate 0 in pump starting, said method comprising the steps of:

a main valve included in an inlet valve to the hydraulic machinery disposed on the side of an upper reservoir upstream of said hydraulic machinery being opened when the discharge pressure of the runner reaches a predetermined value; and

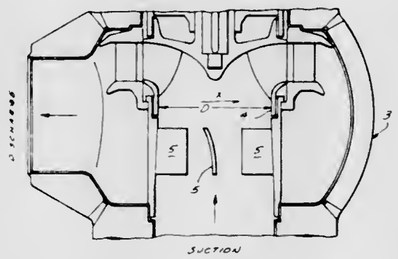
adjustable guide vanes being opened to begin pumping-up while said main valve moves to be fully opened.

4,073,595

METHOD AND MEANS FOR ABRUPTLY TERMINATING THE FLOW OF FLUID IN CLOSED FLUID CIRCULATING SYSTEMS OF NUCLEAR REACTOR PLANTS OR THE LIKE

Otto Schiele, Neustadt, Germany, and Dusan Florjancic, Winterthur, Switzerland, assignors to Klein, Schanzlin & Becker Aktiengesellschaft, Frankenthal, Germany

Filed Sept. 4, 1973, Ser. No. 394,210
Claims priority, application Germany, Sept. 2, 1972, 2243365
Int. Cl.² F03B *15/06*; F04D *1/10*; F01D *17/00*; F15D *1/00*
U.S. Cl. 415—143 **3 Claims**



1. In a closed circuit for the circulation of a fluid, particularly in the primary cooling circuit of a nuclear reactor plant, wherein the fluid is circulated by at least one centrifugal pump which operates without catitation at normal system pressure, the improvement which consists in the provision of an arrangement for effecting the operation of said pump with full cavitation in response to a drop of said system pressure below said

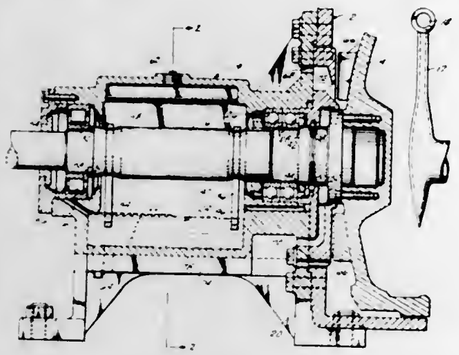
normal pressure to stop circulation of the fluid when a leak occurs in the primary cooling circuit, said arrangement including means for influencing the net positive suction head of said pump over the entire range of fluid flow.

4,073,596

LUBRICANT COOLING FOR HIGH-SPEED PITOT PUMP

John W. Erickson, Huntington Beach, and Carter P. Williams, La Crescenta, both of Calif., assignors to Kobe, Inc., Huntington Park, Calif.

Filed Mar. 18, 1976, Ser. No. 667,891
Int. Cl.² F01D *25/24*
U.S. Cl. 415—180 **50 Claims**



1. In a pitot pump having a fixed housing having a hollow interior, a rotatable casing in the interior of the housing, a fixed pitot tube for withdrawing pressurized fluid from within the casing, and bearing means for mounting the casing for rotation in the interior of the housing; improved means for cooling the bearing means during rotation of the casing, comprising:

a shell located adjacent to the housing, the shell having a hollow interior forming a reservoir for containing a supply of lubricant;

means for lubricating the bearing means with lubricant removed from the reservoir;

a gas inlet opening communicating between the atmosphere and the hollow interior of the housing;

heat exchange means in heat transfer contact with the reservoir shell;

a gas discharge opening communicating with the hollow interior of the housing and facing toward the heat exchange means; and

means for generating a gas pressure gradient in the interior of the housing with rotation of the casing to draw air from outside the housing through the gas inlet opening into the interior of the housing and to discharge the air under pressure from the interior of the housing through the gas discharge opening and toward the heat exchange means to cool said reservoir shell and hence the lubricant contained in the reservoir.

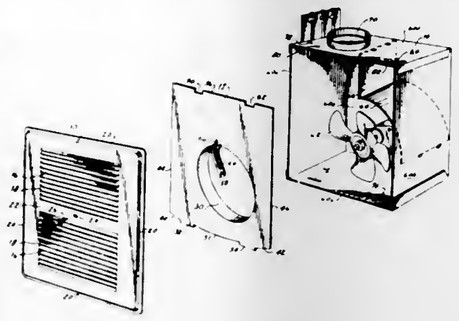
4,073,597

FAN HOUSING ASSEMBLY

David A. Barnhart, Cincinnati, and Gordy E. Loftin, Middletown, both of Ohio, assignors to The Celotex Corporation, Tampa, Fla.

Filed Jan. 28, 1977, Ser. No. 763,290
Int. Cl.² F04D *29/62*; F24F *13/08*
U.S. Cl. 415—201 **4 Claims**

1. In a fan housing assembly comprising a generally rectangular hollow box having an open side, a bottom wall and a top wall, said open side having a predetermined vertical open dimension, an exhaust fan mounted inside said hollow box, baffle means mounted in said hollow box, said baffle means partially surrounding said fan, outlet means penetrating a wall said box so that air may be exhausted from said box, an orifice pan arranged to partially close said open side to restrict air flow into said hollow box, said orifice pan having a circular opening in alignment with said exhaust fan, and a ventilating grille attachable to said orifice pan to form a closure for said open side, the improvement in which said orifice pan has outwardly extending fingers spaced apart with respect to each other along one edge thereof, the edge of said orifice pan opposite said one edge being spaced from said one edge a distance greater than said predetermined vertical open dimen-



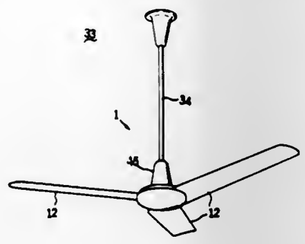
sion of said open side, said bottom wall of said box having slots therein spaced apart a distance equal to the distance between said fingers and being adapted to receive said fingers, and top wall of said box having pairs of inwardly extending detents adapted to receive said opposite edge of said orifice pan, said opposite edge of said orifice pan further having cut out portions located so that when said orifice pan is in its engaged position, a tool can be inserted therein to disengage said orifice pan from said fan housing box, whereby said orifice pan can be easily removed from said open side of said hollow box to permit easy entry for servicing and cleaning said fan.

4,073,598

CEILING FAN

Taketomo Mizutani, Aza-Taka; Takaharu Yasunori, Himeji, and Kazuyoshi Yoshimi, Kasai, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Apr. 14, 1976, Ser. No. 676,888
Claims priority, application Japan, Apr. 17, 1975, 50-52743; Aug. 8, 1975, 50-111538; Aug. 22, 1975, 50-116300; Aug. 29, 1975, 50-119407
Int. Cl.² F04D *29/64*
U.S. Cl. 416—5 **8 Claims**



1. A ceiling fan comprising:

a motor having a stator with a coil winding;

a vertical shaft extending through the center of said stator and having portions positioned above and below said stator;

a rotor positioned outwardly of said stator and rotatable with respect thereto;

a protecting member having an upper portion and at least one bent portion extending downwardly therefrom, said bent portion including a base;

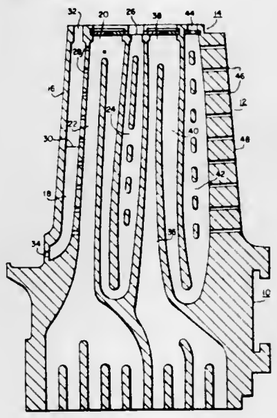
said upper portion of said protecting member having a central opening through which said protecting member is mounted on said portion of said vertical shaft positioned below said stator, said base being located lower than said stator coil winding.

4,073,599

HOLLOW TURBINE BLADE TIP CLOSURE

James M. Allen, Bromall, Pa., and Thomas M. Szewczuk, Claymont, Del., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 26, 1976, Ser. No. 717,967
Int. Cl.² F01D *5/18*
U.S. Cl. 416—97 R **1 Claim**



1. A turbine blade having its main portion of cast material and having at least two internal serpentine coolant passages, comprising:

means forming one coolant passage including an outer return bend space on the leading edge side of an intermediate exhaust opening for the first passage in the tip portion of the blade, and means forming another passage having an outer return bend space on the trailing edge side of said exhaust opening;

said blade having radially extended wall portions along at least the convex and concave face sides of said blade projected in a radially outward direction from said return bend spaces and being devoid of said extended walls in the area of the blade tip around said exhaust opening, said extended wall means including retaining grooves formed in the facing surfaces to receive cover plate means;

cover plate means of a weldable material substantially closing said return bend spaces, said cover plate means comprising a pair of plates for each return bend space, each pair of plates including a lapping joint and each plate having a dimension in a leading-to-trailing blade edge direction which accommodates entry of the plate into the grooves from the area around said exhaust opening;

said extending wall portions include transverse walls, extending between the walls along the convex and concave face sides of said blade, at the ends of said walls opposite exhaust opening, said transverse walls including retaining grooves to receive the leading and trailing end edges respectively of said cover plates means; and

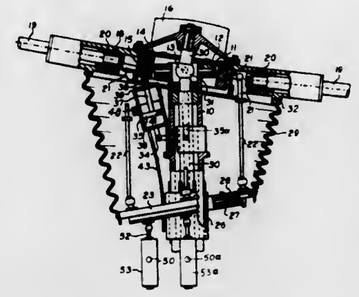
means for holding said cover plate means in position in said grooves comprising a brazed joint between said plate means and said extended walls and pin means projecting through said cover plate means and into said return bend spaces to prevent movement of said plate means back out of said grooves, said pin means being welded to said cover plate means.

4,073,600

DAMPING MECHANISM FOR THE ROTOR HUB OF A HELICOPTER FOR GROUND RESONANCE AND WADDLE AND ITS COMBINATION WITH THE ROTOR

Glidden S. Doman, West Chester, Pa., assignor to William Gallagher, West Chester, Pa.

Filed June 14, 1976, Ser. No. 695,737
Int. Cl.² B64C *27/52*
U.S. Cl. 416—140 **18 Claims**



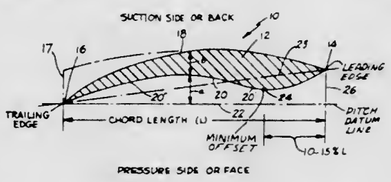
1. A damping mechanism for damping the oscillations of the hub of a rotor head of a helicopter having a fixed point and a non-rotatable gimbal joint with rings for the hub and a linkage between a pilot stick and a swash plate comprising a fluid dashpot having a cylinder with closed ends, attaching means at one end of the cylinder, dashpot piston means including a dashpot piston slidable in the dashpot cylinder providing fluid restraint to piston movement and a dashpot piston rod extending through the other end of the dashpot cylinder and having ends, one end of the piston rod being secured to the dashpot piston, attaching means carried by the other end of the piston rod, spring means between the dashpot cylinder and the dashpot piston means providing spring restraint to movement of the dashpot piston means, the dashpot attaching means being suitable for attaching the dashpot between a ring of the gimbal joint and a fixed point on the helicopter, and the damping mechanism with its fluid damper and spring means connected in tandem providing a substantial delay between the oscillation of of the dashpot and the signal output of the dashpot.

4,073,601

MARINE PROPELLER

Robert F. Kress, Grand Rapids, Mich., assignor to Dana Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 530,696, Dec. 9, 1974, abandoned. This application June 14, 1976, Ser. No. 695,771
Int. Cl.² B63H *1/26*
U.S. Cl. 416—242 **2 Claims**



1. A marine propeller having specially configurated blades exhibiting resistance to ventilation and cavitation at high speed operation, each blade including a leading edge, a trailing edge, a face constituting a pressure side, and a back constituting a suction side;

said face having a contour consisting of a convex surface

extending from said leading edge to a transition zone about 20–25% of the blade chord length toward said trailing edge, and a concave surface extending the remainder of the chord length to said trailing edge;

said convex and concave surfaces having curvatures defined relative to reference pitch datum lines at particular radial blade sections, said reference line at any particular radial blade section being a straight line outside of said blade, intersecting said blade trailing edge, and at an angle ϕ to a plane transverse to the propeller axis, the arc tangent of said angle ϕ being the blade pitch divided by $2\pi r$, where r is the distance of the particular radial blade section from the propeller axis; said blade having its maximum set back from said pitch datum line at said leading edge, said set back being between about 7% of the blade chord length at the inner radii blade sections to about 1% of the blade chord length at the outer blade chord sections;

said blade convex surface having minimum offset from said pitch datum line at about 10 to 15% of the blade chord length from said leading edge, said offset being about 1 to 2½% of the blade chord length;

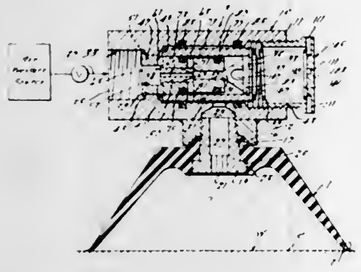
said blade concave surface having a maximum spacing from said pitch datum line at about mid-chord length, said spacing being about 2 to 3½ of the blade chord length from said pitch datum line.

4,073,602

VACUUM PRODUCING DEVICE

Harlan R. Cagle, Cheboygan, Mich., assignor to Sahlin International Inc., Birmingham, Mich.

Filed Apr. 12, 1976, Ser. No. 676,082
Int. Cl.² F04F 5/52
U.S. Cl. 417—185 **18 Claims**



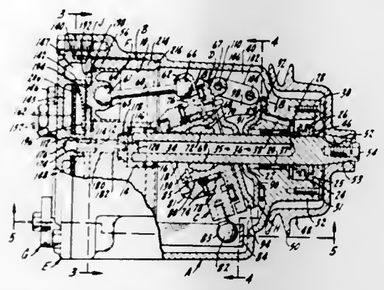
1. A vacuum producing device comprising a housing having an inlet means for pressurized air and an outlet means for pressurized air, said housing having a chamber adjacent said outlet means, a first passage in said housing providing for flow of pressurized air from said inlet to said chamber, venturi means supported in the housing in said first passage between said inlet means and chamber and including a vacuum chamber, said housing including a vacuum outlet and passage means continuously connecting said vacuum outlet to said vacuum chamber, a movable member supported in said housing and defining a wall of said vacuum passage means and having a surface thereon exposed to pressurized air on the upstream side of the venturi means, a valve positioned upon seating to close the end of said first passage and thereby prevent flow of pressurized air to said chamber and the production of vacuum by said venturi means, said movable member being operatively connected to said valve so that movement of said member as a result of sufficient pressure thereon from said pressurized air provides for unseating of the valve to permit air to flow through the first passage to produce vacuum by said venturi means, and spring means in the housing urging the valve to a seated position to close the first passage.

4,073,603

VARIABLE DISPLACEMENT COMPRESSOR

Frederic Henry Abendschein, Columbia, Pa.; John Saxon Ivey, Bloomfield Hills, Mo.; Richard W. Roberts, Lombard, Ill., and Dwight L. Tothero, York, Pa., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Feb. 6, 1976, Ser. No. 655,799
Int. Cl.² F04B 1/26; F16H 23/08
U.S. Cl. 417—222 **7 Claims**



1. A compressor comprising means defining a plurality of gas working spaces each having a piston cooperating with suction and discharge ports to compress a fluid therein; a drive shaft; a cam mechanism driven by said drive shaft; a wobble plate driven by said cam mechanism in a nutating path about the drive shaft axis; means operably connected between said wobble plate and the individual pistons to impart reciprocating drive to said pistons, the length of stroke being a function of the angle at which said wobble plate is supported relative to the drive axis; means connected to said drive shaft including at least one axially extending flange member; lug means associated with said cam mechanism having a portion in spaced, juxtaposed relation with a surface on said flange; a pivot link attached at one end thereof to said flange and at the other end thereof to said lug means, said lug means being spaced from the axis of said drive shaft so that said cam mechanism is pivoted at a point not coincident with said drive shaft axis, there being no drive connection at the drive shaft axis between said cam mechanism and said drive shaft, said link being positioned between said flange and said lug means so that the torque is transmitted from said drive shaft to said cam mechanism without producing a substantial bending moment on said pivot link.

4,073,604

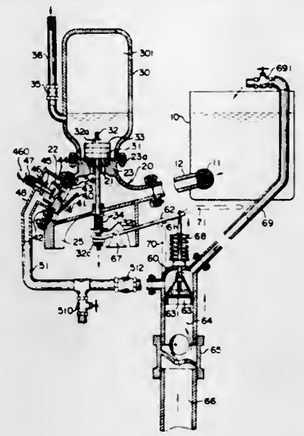
CONSTRUCTION FOR A WATER HAMMER TYPE PUMP

Chun-Pa Chen, 10A, Lane 10, Hsin Sheng S. Road, Taipei, China /Taiwan

Filed Aug. 19, 1976, Ser. No. 715,904
Int. Cl.² F04F 7/02; F16K 17/12, 17/06
U.S. Cl. 417—226 **7 Claims**

1. An improved construction of a water hammer type pump comprising a base, a pump body, means for supplying water to said pump body, a pressure tank secured to said pump body, said pressure tank having a water outlet, a discharge valve disposed between the pressure tank and the pump body for allowing water from the pump body to enter the pressure tank, a waste water outlet including a hole and a flat plate pivotally secured to an inside wall of the pump body so that upon back and forth movement the plate will open and close said hole alternately allowing water to escape from the pump body and preventing such escape for the purpose of initiating water hammer force to force water from the pump body to the pressure tank by way of the discharge valve provided therebetween, the improvement wherein the discharge valve comprises an assembly including a valve stem, a resilient valve piston shaped as an inverted truncated cone disposed on said stem, a plurality of adjustable weights removably mounted on the valve piston for controlling the operation of said piston,

and a spring disposed around said valve stem and biassing the same to urge the weights against the piston to aid in the accuracy and sensitivity of the operation, said assembly being disposed in a hole in said pump body generally corresponding to the shape of the valve piston and including means for slidably supporting the valve stem in said hole in said pump body.

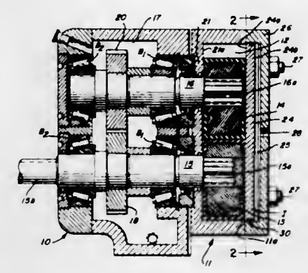


4,073,605

ROTARY PUMP CONSTRUCTION WITH CLEANING FEATURE

Alden H. Wakeman, Lake Mills, and Leonard R. Heiliger, Fort Atkinson, both of Wis., assignors to Crepaco, Inc., Chicago, Ill.

Filed Sept. 15, 1976, Ser. No. 723,456
Int. Cl.² F04B 49/08; F04C 29/00
U.S. Cl. 417—283 **9 Claims**



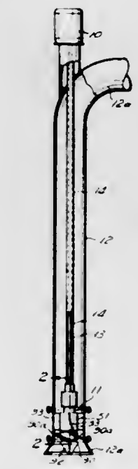
1. A positive fluid pump comprising a housing having formed therein a pump chamber and an outlet and an inlet relatively spaced with respect to one another and communicating with said chamber, said chamber being provided with a pair of opposed side walls, one side wall having a portion thereof in sealing engagement therewith and movable relative to the other side wall between first and second positions; impellers engaging one another and rotatably mounted within said chamber and separating the inlet from the outlet when said wall portion is disposed in said first position and adjacent corresponding impeller end faces, said side wall portion being movable independently of said impellers and, when in said second position, being recessed from said pump chamber and forming therewith a sealed fluid by-pass communicating with said chamber and interconnecting said inlet and outlet, said impellers being axially movable independently of one another and the chamber side walls when said side wall portion assumes said second position; and selectively actuated means communicating with said side wall portion and when actuated to a first selected condition, effecting retention of the side wall portion in said first position and, when actuated to a second selected condition, enabling the side wall portion to be movable from said first position to said second position, said actuated means being sealed from the pump chamber by said side wall portion.

4,073,606

PUMPING INSTALLATION

J. Marlin Eller, 204 NE. 8th Terrace, Deerfield Beach, Fla. 33441

Continuation-in-part of Ser. No. 629,519, Nov. 6, 1975, abandoned. This application Jan. 17, 1977, Ser. No. 759,895
Int. Cl.² F04D 29/10
U.S. Cl. 417—424 **13 Claims**



1. In a pumping apparatus comprising:

a power drive means,

an annular casing at least several feet long extending down from said power drive means,

a rotary drive shaft unit at least several feet long driven by said power drive means and extending down inside said casing,

and an axial flow pump in the lower end of said casing having a rotary pump shaft below the lower end of said drive shaft unit,

the improvement which comprises the combination of:

a slidable coupling means connecting the lower end of said drive shaft unit to the upper end of said pump shaft for imparting the rotation of the drive shaft unit to the pump shaft and at the same time permitting axial expansion and contraction of the drive shaft unit relative to the pump shaft,

an anti-friction radial bearing assembly engaging the pump shaft below said coupling and positioning the pump shaft in vertical alignment with said drive shaft unit;

a fluid seal for the pump shaft below said bearing assembly, said fluid seal comprising a fixed ring which rotatably passes the pump shaft, a second ring which sealingly engages said fixed ring around the complete circumference of the pump shaft, a spring biasing said second ring against said fixed ring and coupling said second ring to said pump shaft for rotation with the pump shaft, and a flexible, elastomeric, annular bellows clamped to the pump shaft around its complete circumference at a location spaced from said rings and having a radially disposed annular end which engages said second ring;

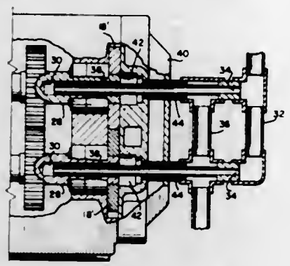
a tube surrounding said drive shaft unit inside said casing;

a housing for the slidable coupling attached to the lower end of the tube;

and a housing for the bearing assembly and the pump shaft

seal attached to the lower end of said housing for the coupling;
said housings and said tube being filled with oil to lubricate said shaft unit, said coupling and said bearing assembly.

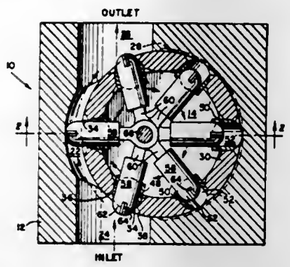
4,073,607
GAS COMPRESSOR SYSTEM
Paul Dale Webb, Tioga, Pa., and Henry William Morse, Savona, N.Y., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.
Filed July 29, 1976, Ser. No. 709,653
Int. Cl.² F04C 29/04
U.S. Cl. 418—86 **11 Claims**



1. A gas compressor system, comprising:
a housing:
said housing having a bore formed therewithin;
first means coupled to said housing for admitting gas to said bore;
second means coupled to said housing for discharging compressed gas from said bore;
means, movably mounted within said bore, operative for compressing gas admitted by said first means and for conducting gas compressed thereby to said second means;
said compressing and conducting means including a shaft which has an axial bore formed therewithin and a piston carried by said shaft; further including
means coupled to said second means for cooling compressed gas discharged by said second means;
means for introducing cooled compressed gas into said axial bore via one end of said shaft for effecting a cooling of said shaft, and means for venting such cooling gas from said shaft via said one end thereof; and
means intercoupling said gas cooling means with said gas introducing means; wherein
said piston is a rotary piston, is overhung on said shaft and, relative to said shaft, has inboard and outboard faces;
said shaft is supported in said housing and is rotatively driven about an axis, to rotate said piston;
said housing has an end cover having an innermost surface which forms an interface with said outboard face of said rotor, and said housing further has an annular cavity formed about said axis which opens onto said interface; and
at least one of said cooled gas-introducing and -venting means opens onto said cavity.

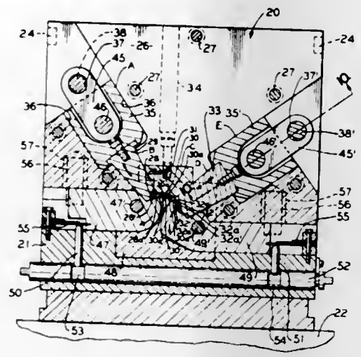
4,073,608
POSITIVE DISPLACEMENT VANE TYPE ROTARY PUMP
Charles A. Christy, P.O. Box 485, Tijeras, N. Mex. 87056
Continuation-in-part of Ser. No. 564,289, April 2, 1975, Pat. No. 4,019,840. This application Dec. 1, 1976, Ser. No. 746,252
Int. Cl.² F03C 3/00
U.S. Cl. 418—241 **15 Claims**

1. A vane rotary device comprising a housing member having a cavity extending therethrough, first and second end closure members, a rotor disposed in said cavity and rotatably supported in said housing member, said rotor having a plurality of radial openings therein, vane means disposed in each of said radial openings for sliding movement therein and rotary movement along with said rotor, an inlet passage and an outlet passage on spaced apart portions of said housing member communicating with said cavity, said cavity including a generally cylindrical circumferential portion and a channel offset radially beyond said generally cylindrical portion and extending from said inlet passage to said outlet passage, said channel in operation of said pump serving as a fluid pumping chamber, said vane means being supported on a fixed journal element concentric with said channel for pivotal movement thereabout and extending radially outwardly of said rotor and in pressure



sealing relationship with said channel while being rotated through said channel by said rotor thereby pumping fluid from said inlet passage to said outlet passage, said cylindrical portion extending between said outlet passage and said inlet passage, said vane means being retracted within said rotor as said rotor passes said cylindrical portion and a circumferential groove extending in said cylindrical portion and having opposite ends confined within said cylindrical portion, terminating short of reaching said inlet and outlet passages providing communication between radial openings simultaneously passing said cylindrical portion to relieve pressure therein and thereby to facilitate radial movement of said vane means.

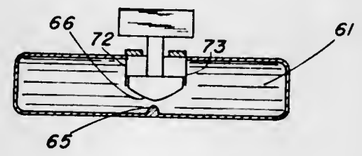
4,073,609
APPARATUS FOR MOLDING IRREGULAR SHAPES
John R. Petrenchik, Pepper Pike, Ohio, assignor to Mercury Machine Company, Warrensville Heights, Ohio
Filed Aug. 19, 1976, Ser. No. 715,857
Int. Cl.² B28B 7/04
U.S. Cl. 425—442 **4 Claims**



1. Mold structure for forming a core shape for incorporation in an airfoil part, such as a blade, a vane or the like, and said airfoil part core having passage-forming deformations with surfaces extending in at least two non-parellel planes; said mold structure comprising an upper mold portion and a lower mold portion having complementary interfitting faces between them, defining a generally horizontal chamber curving in

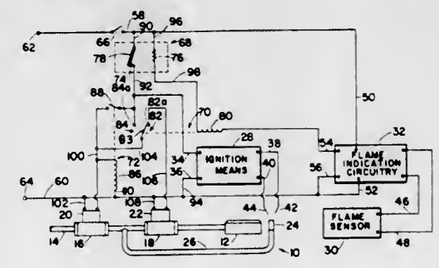
section, and separable in a given generally vertical direction, said horizontal chamber having a generally convex upper surface and a generally concave lower surface; interfitting parts extending from one said mold portion into said other mold portion to insure exact registration when said two mold portions are assembled; coacting core-forming blocks movably held part in said upper mold portion and part in said lower mold portion; each of said blocks having a core-forming partial surface presented inwardly thereof including passage-forming formations complementary to said airfoil core part deformations to be formed; said passage-forming formations having surface portions at right angles to the associated partial surface requiring said blocks to be withdrawn at right angles to said partial surface portions respectively; some of said blocks being withdrawable in a direction different from the direction of withdrawal of others of said blocks; all of said core-forming partial surfaces on all of said blocks coacting to completely enclose said airfoil core part in said generally horizontal chamber when said blocks are in their innermost positions; gate means communicating with said chamber for introduction of molding material into said closed chamber; means moving said blocks held in said upper mold portion at right angles to the asssociated core-forming partial surface inwardly to enclose said chamber and means moving said blocks held in said upper mold portion at the same right angle outwardly, each in line with the associated passage-forming formation surfaces, sufficient to release an airfoil part from said chamber; at least two of said core-forming blocks held in said lower mold portion are spaced apart and having passage-forming formations at two different angles to the direction of separation of said two mold portions; said means moving each of said blocks initially in line with said passage-forming formation surfaces comprises a swing lever block having a pivotal mounting in said lower mold portion; a radius from said pivotal mounting to said associated partial formation surface in its innermost, chamber-closing position is substantially at rignt angles to said direction of withdrawal axially in line with said associated formation surface, whereby upon initial pivoting of said swing lever block to release the finished core shape the swing lever block is caused to move said passage-forming formations substantially along its axis; and another block held in said lower mold portion between said spaced two blocks has passage-forming formations complementary to said airfoil part deformations lying in a plane parallel to the direction of separation of said two mold portions; and means moving said two mold portions apart.

4,073,610
APPARATUS FOR PRODUCING A FOLDABLE PLASTIC STRIP
Bernard K. Cox, R.R. 5, Box 293, Connersville, Ind. 47331
Filed Feb. 5, 1976, Ser. No. 655,518
Int. Cl.² B29F 1/00
U.S. Cl. 425—577 **2 Claims**



1. An injection mold for use in producing a plastic piece comprising:
a mold housing having a cavity in which a plastic piece may be formed, said housing further having inlet means operable to receive and direct liquid plastic into the cavity;
a first elongated projection having a continuous arcuate surface, said first projection being fixedly mounted to the inside wall of said housing and extending at most one-quarter of the distance across the cavity;
a second elongated projection having a continuous arcuate surface, said second projection being positioned opposite said first projection and to be slidable between a pair of rigid, elongated guide brackets which extend into the cavity, said guide brackets being fixed to said mold housing to exclude said liquid plastic from flowing behind said second projection; and,
control means including a push bar in contact with said housing and connected to said second projection for reciprocating said second projection in the direction of said first projection at least one-half the distance across the cavity subsequent to liquid plastic being injected into the cavity thereby forming a portion of reduced thickness in the plastic piece.

4,073,611
CONTROL SYSTEM FOR GAS BURNING APPARATUS
Charles L. Kaduki, Auburn, and Richard D. Stoneking, Corunna, both of Ind., assignors to Essex Group, Inc., Fort Wayne, Ind.
Filed Oct. 15, 1976, Ser. No. 732,615
Int. Cl.² F23Q 9/14
U.S. Cl. 431—45 **5 Claims**



1. In a gas burning apparatus including a main burner, a pilot burner, a gas supply for said burners, a first electrically controlled valve in said gas supply and operable to supply gas to said pilot burner, and a second electrically controlled valve receiving its gas supply through said first valve and operable to supply gas to said main burner, each of said valves having an electrical operator which is energized to open its respective valve and is deenergized to close its respective valve; a control system for controlling the operation of said valves and effecting ignition of gas supplied to said burners comprising:
electrically energized ignition means for igniting gas flowing from said pilot burner;
an ignition energization circuit for said ignition means;
a normally open valve energization circuit for said first valve operator including a subcircuit connecting said second valve operator in parallel with said first valve operator;
a flame sensor responsive to the presence or absence of flame at said pilot burner;
a flame condition circuit including flame indicating switching circuitry operable by said flame sensor to have a conductive condition in the absence of flame at said pilot burner and a non-conductive condition in the pesence of flame at said pilot burner;
flame relay means having a normally open switch in said valve energization circuit in series with said first valve operator and a normally closed switch in said subcircuit in series with said second valve operator;
said flame relay means further including electrical actuating means connected in said flame condition circuit in series with said flame indication switching circuitry for operating said normally open and normally closed switches whereby said flame relay means is effective to complete the valve energization circuit and interrupt said subcircuit

of said second valve operator in the absence of flame at said pilot burner;

holding relay means in said valve energization circuit and operable in response to energization of said flame relay actuating means for maintaining said first valve operator energized independently of said flame relay means and permitting energization of said second valve operator through said normally closed switch of said flame relay means when flame is established at said pilot burner; and

a normally closed time delay switch connected in series with said valve energization circuit and having an electrical actuator connected in said flame condition circuit in series with said flame indication switching circuitry and operable to open said time delay switch after said flame indication switching circuitry remains in a conductive state for a predetermined time interval in excess of a prescribed ignition period for said pilot burner.

4,073,612

DISPOSABLE CIGARETTE GAS LIGHTER

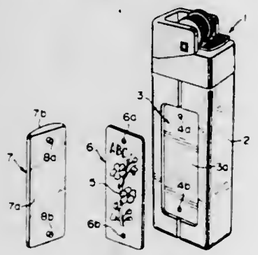
Tomio Nitta, Yokohama, Japan, assignor to Tokai Seiki Co., Ltd., Yokohama, Japan

Filed Mar. 17, 1976, Ser. No. 667,534

Claims priority, application Japan, Mar. 2, 1976, 51-24510[U]; Jan. 2, 1976, 51-56[U]

Int. Cl.² F23Q *2/32*

U.S. Cl. 431—126 **10 Claims**



1. A disposable cigarette gas lighter comprising a plastic gas tank containing therein a liquefied fuel gas, said gas tank having a recess on the surface thereof, lighting means mounted on said plastic gas tank, a printed sheet having printed thereon publicity information, said printed sheet being disposed in the recess, and a transparent plastic lens disposed within said recess and directly attached to the gas tank over the printed sheet to hold and protect the printed sheet, wherein said plastic lens has a projection intergrally fixed thereof on the back surface thereof, and said recess is provided with a hole to receive said projection of said lens, wherein said printed sheet is provided with a perforation to allow said projection of said lens to extend therethrough, said plastic lens has a front surface forwardly curved to form a positive cylindrical lens.

4,073,613

FLARESTACK COANDA BURNERS WITH SELF-ADJUSTING SLOT AT PRESSURE OUTLET

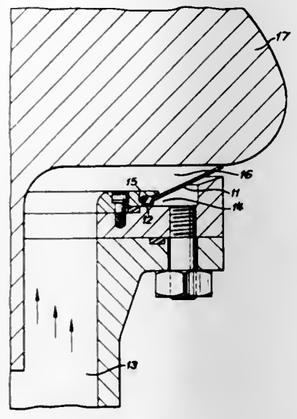
Denis Henry Desty, Weybridge, England, assignor to The British Petroleum Company Limited, London, England

Filed June 23, 1975, Ser. No. 589,085

Claims priority, application United Kingdom, June 25, 1974, 28094/74

Int. Cl.² F23D *13/20*; B05B *1/26*

U.S. Cl. 431—202 **16 Claims**



1. A Coanda unit comprising a supply line for a pressurized gas and a Coanda body positioned across the outlet of the supply line so as to define a slot for discharging the gas along the surface of the Coanda body, one edge of said slot being contiguous with the Coanda surface, the opposite edge of said slot being defined by a resilient flap operatively coupled to said unit, said resilient flap being pre-loaded against said Coanda body so as to keep said supply line closed until a pre-determined gas pressure level is reached and said resilient flap being arranged to flex in response to gas pressures in excess of said pre-determined gas pressure level to form an effective slot width in the range of about 0 to about 0.05 inches, depending on the pressure of the gas supply, so that a stable flame is maintained at variations in gas pressure in excess of said pre-determined gas pressure.

4,073,614

MIXTURE OF BENZONAZINES AND BENZODIOXANES WHICH MAY BE USED AS COLOR FARMERS

Minoru Ozutsumi; Yoshihide Miyazawa, and Masahiko Yamaguchi, all of Tokyo, Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

Filed July 8, 1975, Ser. No. 594,173

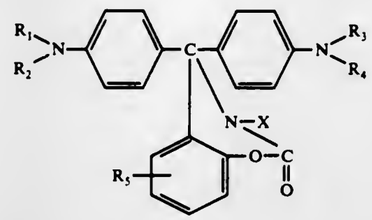
Claims priority, application Japan, July 8, 1974, 49-77348

Int. Cl.² D06P *1/00, 3/00*; C07D *265/00, 273/00*

U.S. Cl. 8—25 **1 Claim**

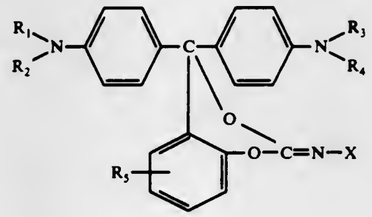
1. A mixture comprising:

a triphenylmethane compound represented by the formula



and,

a triphenylmethane compound represented by the formula



said compounds being present in amounts sufficient to form color;

wherein R_1 and R_3, which may be the same or different, each represents, a lower alkyl group having 1 to 4 carbon atoms, a benzyl group or a phenyl group, in which the aromatic nucleus of the benzyl and phenyl groups may be substituted with a lower alkyl group having 1 to 4 carbon atoms, a lower alkoxy group having 1 to 4 carbon atoms or a di-lower alkylamino group having 1 to 4 carbon atoms in each of the alkyl moieties thereof; R_2 and R_4, which may be the same or different, each represents a benzyl group or a phenyl group in which the aromatic nucleus of the benzyl and phenyl groups may be substituted with a halogen atom or a di-lower alkylamino group having 1 to 4 carbon atoms in each of the alkyl moieties thereof; R_5 represents a hydrogen atom, a lower alkyl group having 1 to 4 carbon atoms, a lower alkoxy group having 1 to 4 carbon atoms, a halogen atom, a di-lower alkylamino group having 1 to 4 carbon atoms in each of the alkyl moieties thereof, a dibenzylamino group, an N-lower alkyl-N-benzyl group having 1 to 4 carbon atoms in the alkyl moiety thereof or an N-lower alkyl-N-phenylamino group having 1 to 4 carbon atoms in the alkyl moiety thereof, in which the aromatic nucleus of the benzyl and phenyl groups may be substituted with a halogen atom, a lower alkyl group having 1 to 4 carbon atoms, or a lower alkoxy group having 1 to 4 carbon atoms; and X represents a lower alkyl group having 1 to 4 carbon atoms; a lower alkenyl group having 2 to 4 carbon atoms, a cyclohexyl group, an aralkyl group having 1 to 4 carbon atoms, in the alkyl moiety thereof or an aryl group, in which the aromatic nucleus of said aralkyl and aryl groups may be substituted with a lower alkyl group having 1 to 4 carbon atoms, a lower alkoxy group having 1 to 4 carbon atoms, a di-lower alkylamino group having 1 to 4 carbon atoms in each of the alkyl moieties thereof, a halogen atom, a nitro group, and when the aralkyl group is a benzyl group, the aromatic nucleus thereof may also be substituted with an N-lower alkyl-N-phenyl group having 1 to 4 carbon atoms in the N-lower alkyl moiety thereof.

4,073,615

STABLE DYE SOLUTION

Roger Lacroix, Huningue, France, and Roland Haberli, Wurenlingen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 8, 1976, Ser. No. 739,407

Claims priority, application Switzerland, Nov. 12, 1975, 14652/75

Int. Cl.² D06P *1/00*

U.S. Cl. 8—25 **10 Claims**

1. Stable dye solution which has a high concentration of dye and is miscible with water in any proportion, which dye solution contains

a. 20 to 40 percent by weight of at least one azo, nitro or anthraquinone dye containing an acid group and,

b. 20 to 80 percent by weight of N-cyclohexylpyrrolidone.

4,073,616

OXIDATIVE AFTER-TREATMENT OF MATERIALS DYED OR PRINTED WITH SULFUR OR VAT DYESTUFFS

Christian Heid, and Johannes Polster, both of Frankfurt am Main, Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Frankfurt, Germany

Filed Dec. 2, 1976, Ser. No. 746,888

Claims priority, application Germany, Dec. 6, 1975, 2555046

Int. Cl.² C09B *9/00*; D06P *1/22, 1/30*; C11D *7/54*

U.S. Cl. 8—34 **6 Claims**

1. In the oxidative after-treatment of fiber that has been dyed with a sulfur or vat dye to bring out the final dye shade and fastness, the improvement according to which the after-treatment is effected at a temperature between about 20° and about 105° C, with



or a protonated product thereof,

R being hydrogen $-SO_3M$, and

M being hydrogen, ammonium, or a metal compatible with the after-treatment.

4,073,617

WATER-DILUTABLE SOLUTIONS OF DICYANDIAMIDE-FORMALDEHYDE-PHOSPHORIC ACID CONDENSATES

Robert Bruce Le Blanc, 99 Main St., and Destin Allen Le Blanc, 115 Main St., both of Wickford, R.I. 02852

Filed Apr. 26, 1976, Ser. No. 680,407

Int. Cl.² D06M *13/26, 13/44, 1/00*

U.S. Cl. 8—116 P **11 Claims**

1. In the process for rendering textile materials fire-resistant wherein dicyandiamide is condensed with formaldehyde and sufficient phosphoric acid ultimately to impart fire-resitance, diluted with water and applied to a textile material, the improvement which comprises effecting the condensation of dicyandiamide, with formaldehyde adding phosphoric acid to produce a solution, and adding additional phosphoric acid more than a day after the reaction and less than about 8 hours prior to the dilution with water, whereby such dilution with water is effected without formation of an insoluble material.

8. A composition capable of being diluted with water to a textle fire-resisting finish, comprising a condensation product of dicyandiamide with about 0.9 – 3 moles of formaldehyde per mole of dicyandiamide in aqueous solution at a pH of about 8 to 13 and an initial addition of about 0.06–0.6 mole of phosphoric acid per mole of dicyandiamide and containing addi-

tional phosphoric acid added more than a day after the initial addition of phosphoric acid but less than 8 hours prior to the dilution of said composition with water whereby such dilution with water is effected without formation of an insoluble material.

4,073,618

ANTI-CORROSIVE AGENT FOR METALS

Tsunesuke Doi, Tama; Hiroshi Komoto, Yokohama; Masazumi Chono, Yokohama; Akira Inoue, Yokohama; Kazuaki Saito, Chigasaki, and Isao Shinozaka, Kawasaki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 667,622, March 17, 1976, Pat. No. 4,028,055. This application Mar. 4, 1977, Ser. No. 774,631
Claims priority, application Japan, Mar. 19, 1975, 50-33392
Int. Cl.² C09K *3/00*; C23F *11/04, 11/06, 11/10*; C23G *1/06, 1/18, 1/26*
U.S. Cl. 21—2.7 R **13 Claims**

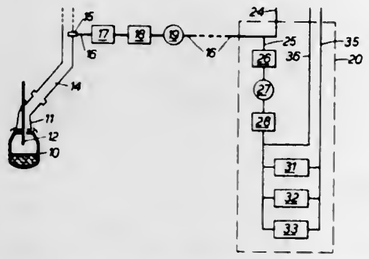
1. A method of inhibiting corrosion of metal surfaces comprising applying to a metal surface a solution or dispersion containing an effective concentration of at least one condensation product of a saturated aliphatic triamine of 9 carbon atoms having a main chain which is branched at the 4-position and having a primary amino group at each carbon atom in a terminal position and at least one member selected from the group consisting of saturated fatty acids, aliphatic hydroxycarboxylic acids, aromatic carboxylic acids, aromatic hydroxycarboxylic acids, natural oil fatty acids, polymers of unsaturated carboxylic acids and amino acids.

4,073,619

SAMPLING GAS FOR ANALYSIS

Robert Lawson, Middlesbrough, England, assignor to British Steel Corporation, London, England

Continuation of Ser. No. 626,045, Oct. 28, 1975, abandoned. This application Mar. 23, 1977, Ser. No. 780,499
Claims priority, application United Kingdom, Oct. 28, 1974, 46432/74
Int. Cl.² G01N *1/22*
U.S. Cl. 23—232 R **12 Claims**



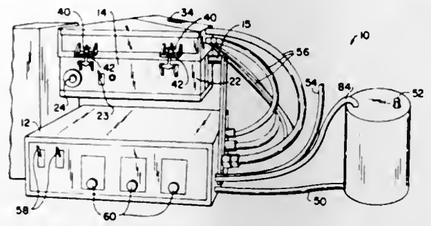
1. A method for the rapid transfer of gas from a sampling probe at a gas source to a gas analyser remote from the gas source to thereby decrease the time interval between sampling and analysis, comprising passing the gas from the probe along a first gas sampling duct intercommunicating at a junction with a second gas sampling duct which transfers the gas sample to the gas analyser; the first gas sampling duct being relatively long compared with the second gas sampling duct and exhausting to the atmosphere after said junction; and second sampling duct having a bleed line just prior to said analyser to exhaust under pressure a proportion of the gas in the second duct to the atmosphere; the gas being transferred along the first duct at a high gas transfer rate relative to the transfer rate along the second duct.

4,073,620

BINDER-SUBSTRATE ANALYZER

Michael James Gray, San Francisco, and Raymond E. Stanton, Alameda, both of Calif., assignors to Gray and Stanton, San Francisco, Calif.

Filed Jan. 3, 1977, Ser. No. 756,311
Int. Cl.² G01N *31/06*
U.S. Cl. 23—253 R **13 Claims**



1. Apparatus for performing binder-substrate processing of clinical substances comprising:

an operating head which includes an array of generally upwardly opening receptacles each having a closed bottom, temperature control means proximate the closed bottom of the receptacles, and a manifold having an influx chamber, an efflux chamber and a plurality of hollow prongs emanating from the influx chamber through the efflux chamber and downwardly into respective of the receptacles to provide fluid communication between the influx chamber and the interior of the receptacles through the prongs, said efflux chamber being in fluid communication with the open ends of the receptacles;

a solid phase binder located at the bottoms of the respective receptacles, said solid phase binder being immersed in said clinical substances which are incubated in an environment controlled by the temperature control means;

means for inverting the operating head after incubation of the clinical substances; and

means for injecting a washing fluid into the influx chamber of the inverted operating head so that the washing fluid flows upwardly through the prongs and into the receptacles to wash excess of the clinical substances from the solid phase binder, said washing fluid containing said excess draining into the efflux chamber.

4,073,621

READER RECORDER FOR TOXIC GAS CONCENTRATION TAPES

Rame Bull, Mount Prospect; Byron A. Denenberg, Northfield, and Djorde R. Popovic, Chicago, all of Ill., assignors to MDA Scientific, Inc., Park Ridge, Ill.

Filed Feb. 25, 1976, Ser. No. 661,134
Int. Cl.² G01D *9/38*; G01N *21/30*
U.S. Cl. 23—254 E **9 Claims**

1. A reader recorder device for producing a graph of gas concentration versus time and of total dosage from a portion of gas sensitive tape exposed over a known time period, said device comprising:

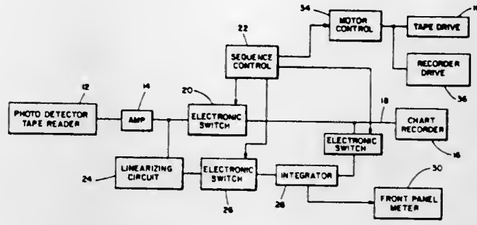
(a) means for reading said gas sensitive tape at a first rate to produce a time varying voltage corresponding to said gas concentration,

(b) means for linearizing the relationship between gas concentration and said varying voltage.

(c) integrator means for performing a voltage versus time integration of the linearized voltage to obtain an electrical signal having a magnitude representative of the area under the graph of said time varying voltage over said known time period, said electrical signal representing said total dosage,

(d) means for recording on chart paper at a second rate said

variation in voltage with respect to time and said total dosage, the relationship between the first and second rates



permitting a determination of the time of occurrence of a gas concentration change of interest.

4,073,622

BLOOD OXYGENATOR WITH HEAT EXCHANGER

Libero Luppi, Via 5 Martiri, 13, Mirandola (Modena), Italy

Filed Mar. 21, 1975, Ser. No. 560,753
Claims priority, application Italy, Mar. 25, 1974, 12654/74
Int. Cl.² A61M *1/03*
U.S. Cl. 23—258.5 BH **11 Claims**



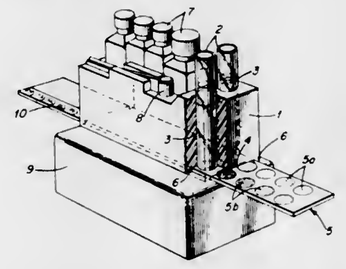
1. A blood oxygenator comprising an upper container and a lower container arranged at a distance therefrom, a tubular member arranged between and connecting said upper and lower containers, concentric cylindrical wall portions defining an annular chamber having an axial extension between said upper and lower containers and surrounding said tubular member, means defining a labyrinth passage in said annular chamber, said labyrinth passage having a start and an opposite end thereof and defining means directing the blood in said labyrinth passage in a direction parallel to said concentric cylindrical wall portions thereof, a heat exchanger unit extending from said upper container through the interior of said tubular member into said lower container, inlet and outlet means for the heating fluid into the heat exchanger, first defoaming means arranged in said upper container and second defoaming means arranged in said lower container, first duct means on one side of said first defoaming means and connecting said opposite end of said labyrinth passage with said upper container, second duct means on the other side of said first defoaming means and extending through the interior of said tubular member around said heat exchanger unit and connecting said upper container with said lower container, first connector means defining a blood inlet at the start of said labyrinth passage for the venous bloody entry, second connector means defining a blood exit at the bottom of said lower container for the arterial blood exit and an oxygen diffuser at said beginning of the labyrinth passage said second duct means ending on one side of said second defoaming means and said second connector means opening with one end thereof at the other side of said second defoaming means and ending with the other end thereof outside said lower lower container, thereby to allow oxygenated blood coming from said labyrinth passage to flow from said upper container past said heat exchanger unit-into said lower container and to undergo a first defoaming action in said first container and after heating action by said heating unit a second defoaming action in said second container.

4,073,623

ANALYTICAL DETERMINATION OF SUBSTANCES IN SOLUTION

Detlef Eugen Bodart, Darmstadt, Germany, assignor to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed Oct. 20, 1976, Ser. No. 734,107
Claims priority, application Germany, Oct. 31, 1975, 2548728
Int. Cl.² G01J *3/52*; G01N *21/02*
U.S. Cl. 23—259 **7 Claims**



1. A device for the analytical determination of substances in solution by color development of a sample solution and then comparison thereof with a comparison solution in tubes; and comprising a block formation with at least two tube-shaped openings in generally side-by-side adjacency passing therethrough for reception of solution-containing tubes; means providing a slot along the block traversing the ends of said openings for receiving color tables movable at a right angle relative to the openings.

4,073,624

METHOD FOR FLUORINATING COAL

John L. Huston, Skokie; Robert G. Scott, Westmont, and Martin H. Studier, Downers Grove, all of Ill., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Dec. 21, 1976, Ser. No. 752,946
Int. Cl.² C10L *9/02*; C07B *9/00*
U.S. Cl. 44—1 R **6 Claims**

1. A method for fluorinating coal comprising:

contacting the coal with elemental fluorine at a temperature between 0° and 80° C and at an initial pressure of from 50 to 300 mm Hg;

maintaining the initial pressure of the fluorine until the coal is partially fluorinated;

increasing the pressure of the fluorine over the partially fluorinated coal slowly to from 1100 to 1600 mm Hg; and

maintaining the pressure of the fluorine for a period of time sufficient to completely fluorinate the coal, thereby forming fluorinated coal.

4,073,625

PROCESS FOR PREPARING BRIQUETTES

Yoshio Kiritani, Osaka; Michio Tsuyuguchi, Wakayama; Tetsuo Ibaragi, Wakayama; Katsuhiro Yano, Wakayama; Yoshihiko Sunami; Kunihiko Nishioka, both of Amagasaki, all of Japan, assignors to Sumitomo Metal Industries Limited, Osaka and Sumikin Coke Company Limited, Wakayama, both of Japan

Filed Sept. 29, 1976, Ser. No. 728,008
Int. Cl.[2] C10L 5/00, 5/16
U.S. Cl. 44—10 R 12 Claims

1. A process for preparing a briquette comprising the steps of blending a caking substance having a softening point of above 20° C to a coal to be used for making briquettes to yield a blend, mixing the blend at a temperature of above 10° C for 1–10 minutes with a mixer capable of applying mixing energy of more than 0.02KW/kg and briquetting at a normal temperature by using a roll press.

12. A process for preparing a briquette comprising the steps of blending a caking substance having a softening point of above 40° C and a solvent which has the fluidity at normal temperature and is compatible with said caking substance to a coal to be used for making briquettes to yield a blend, mixing the blend at a temperature of above 10° C for 1–10 minutes by using a mixer whose mixing tool is rotated at a speed of more than 5m/sec. peripheral velocity to said blend and a mixer whose mixing tools applies a pressure of more than 45kg/cm^2 to said blend, and briquetting by using a roll press.

4,073,626

HYDROCARBON FUEL ADDITIVE AND PROCESS OF IMPROVING HYDROCARBON FUEL COMBUSTION

Richard W. Simmons, Bellingham, Wash., assignor to Ferrous Corporation, Bellevue, Wash.

Continuation of Ser. No. 461,877, April 18, 1974, abandoned, which is a continuation of Ser. No. 798,182, Feb. 10, 1969, abandoned. This application Dec. 17, 1975, Ser. No. 641,647
Int. Cl.[2] C10L 1/22
U.S. Cl. 44—57 9 Claims

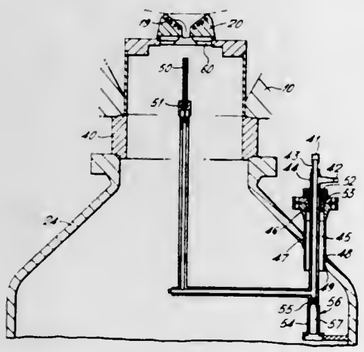
1. An improved liquid hydrocarbon fuel containing at least 0.003% by weight of a mixture of an iron salt of an aromatic nitro acid and a nitroaliphatic compound having from one to four carbon atoms, the weight ratio of aromatic nitro acid to nitroaliphatic compound ranging from 1:10 to 1:100.

4,073,627

COAL GASIFICATION PLANT

John Alfred Anderson, Knowle, England, assignor to British Gas Corporation, London, England

Filed Nov. 22, 1976, Ser. No. 744,028
Claims priority, application United Kingdom, Nov. 27, 1975, 48813/75
Int. Cl.[2] B01J 3/00
U.S. Cl. 48—62 R 9 Claims



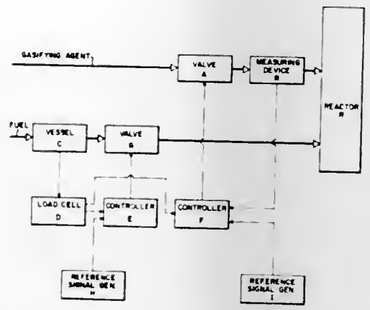
1. In a coal slagging gasifier comprising: a column-like vessel; means for introducing coal or other carbonaceous fuel into the top of said vessel; tuyere means for introducing oxygen and steam into said vessel for gasification of fuel therein; a hearth for collecting molten slag and iron which is formed during gasification of the fuel, said hearth having a slag tap orifice for periodically discharging slag downwardly; a quenching chamber located below said slag tap orifice for quenching slag discharged through said slag tap orifice, said quenching chamber being constructed and arranged to hold a body of quenching liquid therein; a burner located within said quenching chamber for directing hot combustion products adjacent the underside of the slag top orifice to retain the slag and iron in the hearth; means for initiating the tapping of molten slag comprising means for stopping or reducing the burner output and means for reducing the pressure in the quenching chamber relative to that in the gasifier vessel; and an auxiliary burner assembly for freeing the slag tap orifice of a solidified plug of slag and iron, the improvement wherein said auxiliary burner assembly comprises: a substantially U-shaped member having passageways terminating externally of the quench chamber for connection to gas and air or oxygen supplies; a burner head mounted at the free end of one vertical limb member within the quench chamber and connected to the gas and air or oxygen supply passageways; bearing means carried by a wall of the quench chamber arranged to support the U-shaped member by its other vertical limb for rotational and vertical movements; and means for moving the member about said bearing means in said rotational and vertical directions whereby, in use of the gasifier, the burner can be selectively swung to and from a position directly beneath the slag tap orifice and moved to variable positions in vertical directions when it is in said position beneath the orifice.

4,073,628

CONTROL SYSTEM FOR APPARATUS TO GASIFY FINE-GRAIN FUELS IN A REACTOR

Paul Gernhardt, Bochum; Wolfgang Grams, Wanne-Eickel; Wilhelm Danguillier, and Siegfried Pohl, both of Bochum, all of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Filed Dec. 1, 1976, Ser. No. 746,245
Claims priority, application Germany, Dec. 18, 1975, 2556957
Int. Cl.[2] B01J 3/00
U.S. Cl. 48—62 R 8 Claims



1. In combination with an apparatus including a slag bath generator having a reactor for gasifying fine-grain fuel at an elevated pressure while maintaining a bath of liquid slag therein, a pressure vessel containing fine-grain fuel while fluidized with a vehicle gas for delivery into said reactor, and means for supplying a gasification agent into said reactor, a control system for controlling the introduction of the fluidized fine-grain fuel and the said gasification agent, said control system including the combination of:

load detecting means supporting said vessel in a manner for response to the weight of fine-grain fuel therein,

detector means to provide an electrical signal which varies in response to measurements by said load detecting means at predetermined time intervals during the feeding of fine-grain fuel from said pressure vessel into said reactor,

controller means producing the fuel rate control signal in response to a comparison between the electrical signal from said detector means and a predetermined reference value corresponding to a desired fuel supply ratio, and

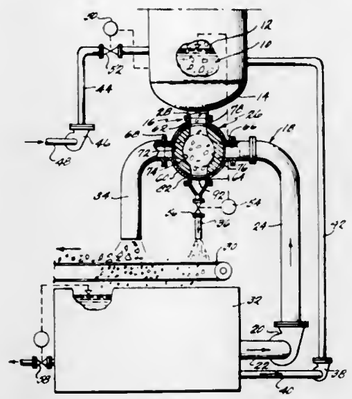
control means responsive to said fuel rate control signal to adjust the supply of vehicle gas used for fluidized withdrawal and transfer of fuel from said pressure vessel for varying the rate of introduction of fluidized fine-grain fuel into said reactor.

4,073,629

COAL GASIFICATION PROCESS WITH IMPROVED PROCEDURE FOR CONTINUOUSLY DISCHARGING ASH PARTICLES AND APPARATUS THEREFOR

Erwin D. Funk, Glens Falls, N.Y., assignor to Kamyr Inc., Glens Falls, N.Y.

Continuation of Ser. No. 546,320, Feb. 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 443,116, Feb. 15, 1974, abandoned. This application Oct. 26, 1976, Ser. No. 735,893
Claims priority, application South Africa, July 30, 1974, 74/4848
Int. Cl.[2] C10J 3/34
U.S. Cl. 48—77 38 Claims



1. A process of producing gas from gas producing material, such as coal, within gasifier means by continuously heating the material under pressure to produce gas and ash particles, and continuously discharging the ash particles from the gasifier means, the improvement wherein said continuous discharging comprises the steps of:

confining water within a first path including a volume having a free surface in communication with the gas pressure at the ash particle discharge end of the gasifier means,

substantially continuously discharging the ash particles into said volume of water through the free surface thereof,

maintaining a continuous flow of water along a second path at an energy level less than the energy level of the water in said first path and

continuously removing successive incremental volumes of ash particles entrained in water from communication with said first path and communicating said successive incremental volumes of water and entrained ash particles with the water flowing in said second path, said successive incremental volumes being removed from said first path by confining ash particles entrained in water to move into an incremental volume removal position within said first path, blocking the movement of the ash particles at said incremental volume removal position and successively removing an amount of blocked particles and the liquid entraining the same at the time of removal equal to said incremental volume.

17. Apparatus for producing gas from gas producing material, such as coal, comprising gasifier means for receiving a supply of gas producing material and continuously heating the same under pressure to produce gas and ash particles and means for continuously removing ash particles from said gasifier means under pressure, the improvement which comprises said ash removal means comprising:

means for confining water within a first path including a volume having a free surface in communication with the pressure within said gasifier means for receiving therein ash particles produced within said gasifier means by passage through said free surface,

means for maintaining a continuous flow of water along a second path at an energy level less than the energy level of the water in said first path, and

means for continuously removing from communication with said first path successive incremental volumes of ash particles entrained in water and continuously communicating said successive incremental volumes of ash particles and entrained water with the water flowing in said second path,

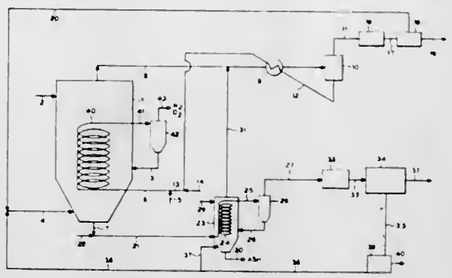
said means for continuously removing and communicating successive incremental volumes comprising a sluicing device comprising housing means having first path inlet means and second path inlet means and outlet means formed therein, a wheel rotatably mounted in said housing means having a plurality of separate pockets extending therethrough for alternately communicating with said first path inlet means and between said second path inlet means and outlet means during rotation thereof within said housing means.

4,073,630

PRODUCTION OF CARBON MONOXIDE

Merritt V. DeLano, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 26, 1976, Ser. No. 735,362
Int. Cl.[2] C10J 3/06
U.S. Cl. 48—197 R 14 Claims



1. A process for the production of carbon monoxide which comprises

a. reacting a first quantity of a solid carbon source in a first reaction zone with zinc oxide at a temperature of 910 ° to 1540 ° C. to produce a first volume of gas consisting essentially of zinc and carbon monoxide and a solids byproduct consisting essentially of ash having zinc values entrained therein,

b. separating zinc from said first volume of gas and recovering a carbon monoxide-containing gas as a product of the process,

c. passing said solids byproduct from said first reaction zone to an oxidation zone wherein said zinc values in said solids

byproduct are oxidized to zinc oxide, thereby forming a solid mixture consisting essentially of ash and zinc oxide,

d. reacting said solid mixture in a second reaction zone at a temperature of 910 ° to 1540 ° C. with a second quantity of a carbon source to produce a second volume of gas consisting essentially of zinc and carbon monoxide and withdrawing solids containing ash which is essentially free of zinc from the second reaction zone, and thereafter

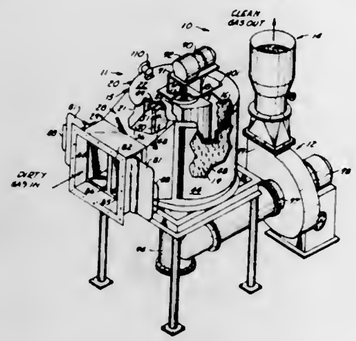
e. separating zinc from said second volume of gas and recovering a carbon monoxide-containing gas as a product of the process, and oxidizing the separated zinc to form zinc oxide which thereafter is recycled to said first reaction zone.

4,073,631

STATIONARY DRUM FILTRATION DEVICE AND METHOD

Jack D. Brady, Fayetteville, and Kenny M. Graves, Atlanta, both of Ga., assignors to Andersen 2000, Inc., Atlanta, Ga.

Filed Feb. 18, 1976, Ser. No. 658,992
Int. Cl.² B01D *46/02*
U.S. Cl. 55—97 **11 Claims**



1. A filtration device for removing particulate matter entrained in a gas stream comprising:

a housing defining a generally cylindrical filtration chamber therein of a first prescribed diameter having a central axis and a main gas inlet to said filtration chamber through which the gas stream enters said housing chamber;

a support drum mounted in said filtration chamber and including an annular perforated side wall concentric about said central axis with a second prescribed diameter smaller than said first prescribed diameter to define an annular inlet subchamber in said filtration chamber between said drum and said housing;

a suction head rotatably mounted on said housing within said support drum for rotation about said central axis, said suction head including a suction head gas inlet adjacent the inside of said support drum and movable around said drum as said suction head is rotated and including a suction head gas outlet about said central axis extending out of said housing, said suction head further including sealing means about said suction head gas inlet for forming a substantially gas tight seal between said suction head gas inlet and said perforated drum side wall as said suction head is rotated so that the gas stream entering said housing can only pass out of said housing through that portion of said perforated drum side wall in registration with said suction head gas inlet, said suction head gas inlet, and said suction head gas outlet;

filter media removably positioned on said perforated side wall of said support drum within said inlet subchamber so that the gas stream passing from said inlet subchamber into said suction head must pass through that portion of said filter media in registration with said suction head gas inlet; and,

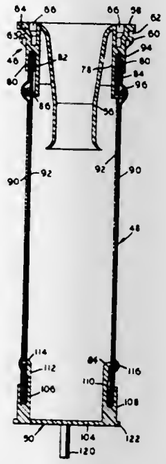
fan means operatively connected to said suction head gas outlet to cause the gas stream entering said main gas inlet to be drawn into said inlet subchamber, then through that portion of said filter media and said perforated side wall of said support drum aligned with said gas inlet to said suction head, then into said suction head gas inlet and finally out said suction head gas outlet whereby the particulate matter is separated from the gas stream by that portion of said filter media in registration with said suction head gas inlet.

4,073,632

FILTER BAG ASSEMBLY

Thomas V. Reinauer, Summit; Robert W. Duyckinck, New Providence, and Frank B. Handwork, Summit, all of N.J., assignors to United States Filter Corporation, New York, N.Y.

Filed July 7, 1975, Ser. No. 593,462
Int. Cl.² B01D *46/02*
U.S. Cl. 55—374 **15 Claims**



1. An improved filter bag assembly for dust collectors wherein particulate matter is separated from a carrier gas stream by selective passage of the carrier gas through an elongate tube of permeable filter medium terminally mounted in fluid communication with a receiving aperture in a gas impervious tube sheet separating the clean air and dirty air plenum chambers of said dust collector, said assembly comprising

a unitary mounting member of relatively rigid elastically deformable material adapted to be disposed within the receiving aperture in said gas impervious tube sheet and selectively shaped to define

a conduit portion for passage of the carrier gas therethrough and into said clean air plenum chamber

a tube sheet engaging portion disposed at one end of said conduit portion, and

a dependent skirt portion for supportively engaging the terminal end of the tube of filter medium suspended therefrom extending downwardly from the tube sheet engaging portion and disposed in spaced surrounding relation with said conduit portion within said dirty air plenum chamber

said tube sheet engaging portion including

an outwardly extending peripheral flange member disposed transverse to the longitudinal axis of said conduit portion and sized to overlie the marginal defining edge of said receiving aperture in the tube sheet, and

displaceable means disposed in adjacent spaced relation with said flange member and defining a transversely disposed perimetric annular tube sheet receiving channel therebetween sized to closely accommodate the marginal defining edge of said receiving aperture in said tube sheet,

said dependent skirt portion including,

a first longitudinally extending dependent sleeve member,

a second longitudinally extending dependent sleeve member disposed in concentrically spaced surrounding relation with said first sleeve member and defining a longitudinally disposed filter medium receiving channel therebetween, and

a plurality of displaceable latching members dependent from said first sleeve member and having hook-like terminal end portions extending outwardly therefrom and disposed in the plane of said filter medium receiving channel,

an elongate filter medium retainer member sheathed by the tube of permeable filter medium disposed within said dirty air plenum chamber,

said filter medium sheathed retainer member having one terminal end portion thereof compressively disposed within said filter medium receiving channel in said mounting member and suspended therefrom by latching engagement of the hook-like terminal end portions of said latching members with said retainer member and a dependent end disposed remote therefrom, and

means closing the dependent end of said filter medium sheathed retainer member to limit the flow of the carrier gas from within said dirty air plenum inwardly through said filter medium and thence upwardly through said conduit portion of said mounting member into said clean air plenum chamber.

4,073,633

TOPICAL NITROGEN FERTILIZATION METHOD

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed May 17, 1976, Ser. No. 686,796
Int. Cl.² C05C *9/00*
U.S. Cl. 71—28 **10 Claims**

1. The method of topically fertilizing soils containing urease enzyme with urea particles under conditions in which a basic environment having a pH of at least about 7 would exist immediately adjacent said particles in the absence of the acid generator hereinafter defined, and minimizing the nitrogen lost by volatilization of said urea, including the steps of surface broadcasting said urea particles on said soil as a particle form combination of urea and at least one acid generator in an amount sufficient to maintain a pH below 7 in the soil immediately adjacent said urea particles, and maintaining (1) said particles on the surface of said soil, and (2) a pH below 7 in said soil immediately adjacent said particles for at least about 24 hours.

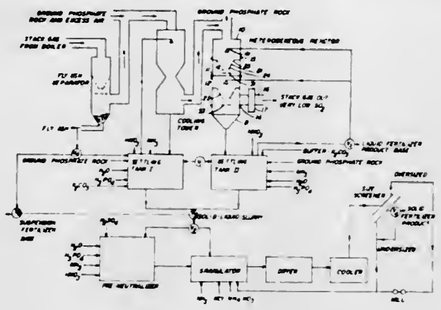
4,073,634

PROCESS FOR PRODUCTION OF FERTILIZERS

Ladislav J. Pircon, 305 Canterbury Lane, Oak Brook, Ill. 60521, and Ralph E. Peck, 3100 S. Michigan Ave., Chicago, Ill. 60616

Filed Apr. 16, 1976, Ser. No. 677,778
Int. Cl.² C05B *11/08*
U.S. Cl. 71—37 **10 Claims**

1. A process for the production of fertilizer and removal of sulfur oxides from stack gases comprising reacting sulfur oxide containing gas and water at a pH of 3 to 8 in a multiple state reactor to form sulfur containing acid, maintaining the pH of solution of said sulfur containing acid at 3 to 8 with a basic ion selected from the group consisting of calcium, ammonium and potassium ions, said calcium being derived from a salt selected from the group consisting of phosphatic and nitrogeneous salts to form a fertilizer selected from the group consisting of phosphatic, nitrogeneous and potassium fertilizers and combinations thereof, said basic ion being rendered water soluble by reaction with said sulfur containing acid at a pH of 2.5 to 4 and the solution increased to a pH of from 3 to 8 so as to facilitate the reaction of the sulfur oxide.



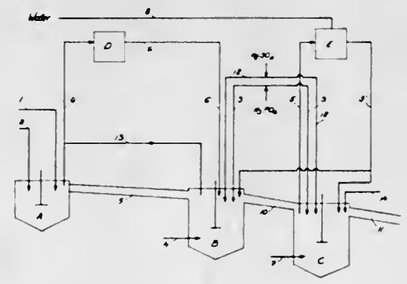
5. The process of claim 1 wherein said sulfur containing acid is mixed with concentrated acid selected from the group consisting of phosphoric and nitric acids and mixtures thereof.

4,073,635

PROCESS FOR PRODUCING A SLURRY SUITABLE FOR THE MANUFACTURE OF A MIXED FERTILIZER CONTAINING NITROGEN PLUS PHOSPHORUS

Pekka Ilkka Juhani Sappanen, Ruomela, Finland, assignor to Kemira Oy, Finland

Filed May 14, 1976, Ser. No. 686,536
Int. Cl.² C05B *13/02*
U.S. Cl. 71—34 **10 Claims**



1. A process for producing a slurry suitable for the manufacture of a mixed fertilizer containing nitrogen plus phosphorus from a crude phosphate which comprises bleaching with nitric acid to produce an acid slurry and neutralizing the acid slurry with ammonia under simultaneous cooling, in two stages in a first and a second neutralization zone, adding phosphoric acid to said acid slurry to reduce the amount crude phosphate required to satisfy the phosphorus requirement of the mixed fertilizer in an amount that at maximum 40% of the phosphoric acid is fed to the first neutralization stage in which the acidity of the slurry is maintained at a pH from 2.5 to 4.5 and adding the remainder of the phosphoric acid at a pH of 5 to 6 in the second neutralization stage.

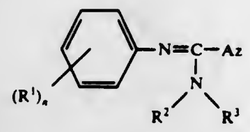
4,073,636

AZOLYLAMIDINE COMPOUNDS AND HERBICIDAL COMPOSITIONS

Erik Regel, Wuppertal; Ludwig Eue, and Robert R. Schmidt, both of Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 459,156, April 8, 1974, Pat. No. 3,993,469. This application Aug. 26, 1975, Ser. No. 607,986
Claims priority, application Germany, Apr. 27, 1973, 2321330
Int. Cl.[2] A01N *9/22*; C07D *231/12*
U.S. Cl. 71—92 23 Claims

1. Azolylamidine compound of the formula



(I)

wherein

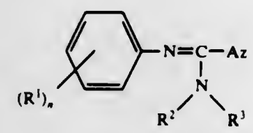
n is an integer from 0 to 5, inclusive, R^1 is individually selected from halogen, alkyl, alkoxy, alkylthio, haloalkoxy, haloalkylthio, halophenoxy and haloalkyl and contains not more than 6 carbon atoms;

R^2 and R^3 are independently selected from hydrogen, alkyl, alkoxyalkyl, cycloalkyl, alkoxy and alkoxycarbonylalkyl and contains not more than 7 carbon atoms;

R^2 and R^3, taken together, represent a lower alkylene bridge; Az is pyrazol-1-yl.

20. Herbicidal composition comprising herbicidally acceptable carrier and, in effective amounts, an azolylamidine compound as claimed in claim 1.

21. Method of combatting undesired vegetation, which method comprises applying to said vegetation or its habitat a herbicidally effective amount of an azolylamidine compound of the formula



(I)

wherein

n is an integer from 0 to 5, inclusive,

R^1 is individually selected from halogen, alkyl, alkoxy, alkylthio, haloalkoxy, haloalkylthio, halophenoxy and haloalkyl and contains not more than 6 carbon atoms;

R^2 and R^3 are independently selected from hydrogen, alkyl, alkoxyalkyl, cycloalkyl, alkoxy and alkoxycarbonylalkyl and contains not more than 7 carbon atoms;

R^2 and R^3, taken together, represent a lower alkylene bridge; Az is pyrazol-1-yl.

4,073,637

CYCLOHEXIMIDE-IMIDE OR CARBAMATE COMBINATIONS AS FRUIT ABSCISSION AGENTS

Robert E. Holm, and Robert D. Battershell, both of Painesville, Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Aug. 11, 1975, Ser. No. 603,289
Int. Cl.[2] A01N *9/22*
U.S. Cl. 71—94 3 Claims

1. A composition capable of promoting fruit abscission, which composition consists essentially of cycloheximide and N-[(trichloromethyl)thio] phthalimide wherein the amount of said cycloheximide in said composition is not in excess of about 20 ppm.

4,073,638

WOODY STEMMED PLANT GROWTH STIMULATION

Robert R. MacMurray, 550 E. Third St., Bloomsburg, Pa. 17815

Continuation-in-part of Ser. No. 526,819, Nov. 25, 1974, Pat. No. 3,967,953, which is a continuation-in-part of Ser. No. 186,508, Oct. 4, 1971, Pat. No. 3,861,801, which is a continuation-in-part of Ser. No. 815,493, April 11, 1969, Pat. No. 3,697,253. This application Apr. 22, 1976, Ser. No. 679,208
Int. Cl.[2] A01N *9/20*
U.S. Cl. 71—100 4 Claims

1. A method of stimulating the growth of woody stemmed plants comprising applying to the foliage and stems thereof a composition including S-ethyl-N,N-dipropylthiocarbamate and N,N-di-n-propyl-4-trifluoromethyl-2,6-dinitroaniline as the active ingredients, the combined concentrations and amounts of both compounds being sufficient to effect growth stimulation.

4,073,639

METALLIC FILLER MATERIAL

David S. Duvall, Cobalt; William A. Owczarski, Cheshire; Daniel F. Paulonis, Moodus, and Robert P. Schaefer, East Hartford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 538,618, Jan. 6, 1975, Pat. No. 4,008,884. This application Nov. 24, 1976, Ser. No. 744,539
Int. Cl.[2] B23K *35/22*
U.S. Cl. 75—.5 R 7 Claims

1. A metallic filler material mix for filling cavities in and between metal articles which comprise:

a first, finely-divided homogeneous particulate component substantially corresponding in composition to that of the metal articles;

a second, finely-divided homogeneous particulate component having as its basis the same basis metal as that of the articles and containing a melting point depressent such as boron in a quantity substantially exceeding that present in the metal articles;

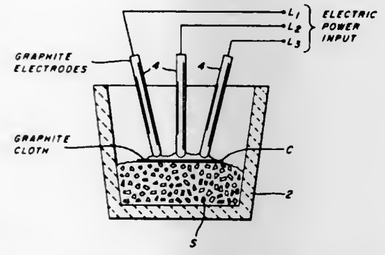
the first and second particulate components being intimately blended to form a powder mix which has an overall composition approximating that of the metal articles, a portion of the mix exhibiting a capability of forming a liquid phase while another portion of the mix remains unliquefied at a processing temperature below the melting point of the articles, the mix being characterized by isothermal resolidification at the processing temperature.

4,073,640

METHOD OF MELTING SLAG

Ferhun H. Soykan, New Hartford, N.Y., assignor to Special Metals Corporation, New Hartford, N.Y.

Filed Mar. 9, 1977, Ser. No. 775,827
Int. Cl.[2] C22B *4/00*; C21C *5/52*
U.S. Cl. 75—10 R 6 Claims



1. The method of melting slag which is not electrically conductive at ambient temperatures which comprises charging a crucible with solid slag, placing on top of said charge a sheet-like covering of an electrically conductive material which sublimes without melting, contacting said covering material with at least two electrodes in spaced apart relationship with the covering providing a good electrical path between electrodes, supplying electric power to said electrodes to cause said covering material to sublime and set a plasma arc between said electrodes to start melting of the scrap, and continuing application of said electric power after initial melting of the slag with current passing through the slag between electrodes to melt said slag in said crucible.

4,073,641

SELECTIVE REDUCTION OF NICKEL ORE WITH A LOW NICKEL CONTENT

Jean Montanteme, Aiguebelle; André Greffe, and François Grandjacques, both of Annecy, all of France, assignors to Societe Francaise d'Electrometallurique, Paris, France

Continuation-in-part of Ser. No. 545,081, Jan. 29, 1975, abandoned. This application Mar. 7, 1977, Ser. No. 774,976
Claims priority, application France, Feb. 21, 1974, 74 05879
Int. Cl.[2] C21C *5/52*
U.S. Cl. 75—11 2 Claims

1. In a process for the selective reduction of oxidized metallic ore or slag containing a number of other metallic oxides and having a nickel oxide content in the order of about 2 to 3% in order to selectively extract from the ore or slag a substantial portion of the nickel present to the general exclusion of the other metallic oxides by admixture of a reducer and the ore or slag to be reduced to form a reaction charge, followed by subjecting the charge to pyrometallurgical reduction and fusion for recovery of the nickel as a nickel rich ferro-nickel alloy the improvement comprising preparing the reaction charge and recovering the ferro-nickel alloy as a melt by the sequential steps of:

a) calculating the substantially precise amount of carbonaceous reducer necessary to reduce only the totality of the reducible nickel present in the ore or slag to limit the reduction of other metallic oxides;

b) calculating the volume of the ore to be reduced;

c) mixing said reducer with a carrier to provide a reducing mass such that the volume of the ore to be reduced will not exceed about three times the volume of the reducing mass;

d) intimately admixing the reducing mass with the ore or slag to provide the reaction charge;

e) subjecting the reaction charge to the pyrometallurgical reduction and fusion by beginning reduction in a rotary furnace and completing reduction in an arc furnace to provide a liquid metal and slag fusion product; and

f) recovering the ferro-nickel melt from the fusion product.

4,073,642

METHOD FOR REDUCING MATERIAL CONTAINING IRON OXIDES

Per Harald Collin, Falun; Sune Natanael Flink; Bjorn Widell, both of Vasteras, all of Sweden; Martin Hirsch, Frankfurt am Main, and Lothar Reh, Bergen-Enkheim, both of Germany, assignors to Stora Kopparbergs Bergslags Aktiebolag, Falun, Sweden

Filed Sept. 4, 1975, Ser. No. 610,391
Int. Cl.[2] C21B *13/02*
U.S. Cl. 75—35 12 Claims

1. A method of reducing a pulverized material containing iron oxides mixed with carbonaceous material, comprising:

(a) maintaining in a vertically uninterrupted, elongated reaction zone a circulating fluidized bed, said circulating fluid bed being maintained by

1) continually withdrawing a portion of fluidized solids and fluidizing gas and a gas formed by reaction in said reaction zone,

2) separating said gas and solids,

3) continually returning a portion of said solid material to said reaction zone for circulating of said solids in said bed without a solid gas interface in said bed, and

4) continually returning said separation gas to said elongated reaction zone as a fluidizing gas, said reaction zone consisting essentially of lower, intermediate, and upper reaction zones;

(b) supplying said bed with a suitable quantity of pulverized material containing iron oxides and pulverized solid carbonaceous material as said solid material and liquid carbonaceous material, said liquid carbonaceous material being from 0 to 60% by weight of the carbonaceous material and, as a gas for reaction with said solid material, a gas containing molecular oxygen;

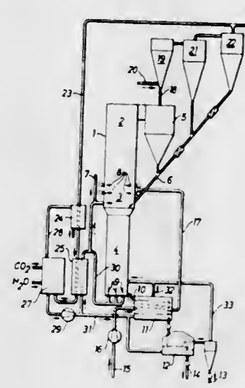
(c) supplying said pulverized material containing iron oxides, said carbonaceous material and said gas containing molecular oxygen, to the intermediate reaction zone of said reaction zone, said intermediate reaction zone being at a position of about middle of said elongated reaction zone;

(d) controlling the carbonaceous material feed into said reaction zone so that there is always sufficient solid carbonaceous material in the bed to prevent the defluidization of said bed caused by sticking;

(e) withdrawing gas and solid material from the upper reaction zone, said solid material being withdrawn, being separated from the gas and said solid material being continually returned to said intermediate reaction zone of said reaction zone;

(f) feeding a portion of said withdrawn gas, after dust separation and elimination of substantially all carbon dioxide and water, to said lower part of said reaction zone as fluidizing and reducing gas, said carbon dioxide being formed by reaction of carbon in said carbonaceous material with oxygen in said ore or molecular oxygen in said molecular oxygen containing gas and said water being formed by reaction of hydrogen from said carbonaceous material with oxygen in said ore or molecular oxygen in said molecular oxygen containing gas; and

(g) withdrawing a solid material containing completely or partially reduced iron oxides from the lower part of the reaction zone.



4,073,643

CONTINUOUSLY CAST STEEL SLABS FOR STEEL SHEETS HAVING EXCELLENT WORKABILITIES AND METHOD FOR PRODUCTION THEREOF

Ko Kunai; Koichi Asano, and Hideharu Bando, all of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 627,869, Oct. 31, 1975, abandoned, which is a continuation of Ser. No. 472,358, May 22, 1974, abandoned. This application July 7, 1976, Ser. No. 703,218

Int. Cl.² C21C *7/10*

U.S. Cl. 75—49 2 Claims

1. A method for producing a continuously cast steel slab for use in manufacturing steel sheets having excellent workabilities which comprises blowing molten steel to a total oxygen content between 600 ppm and 1600 ppm and a silicon content less than 0.02% with a carbon content not more than 0.10%, tapping the molten steel into a ladle, vacuum degassing the molten steel to effect decarburization and deoxidation together with deoxidation adjustment with a material selected from the group consisting of Al and a mixture of Al and Ti to obtain a molten steel containing not more than 0.02% of carbon, less than 0.02% of Si, not more than 0.6% of manganese, not more than 0.005% of sol. aluminum, not more than 0.005% of titanium, not more than 150 ppm of free oxygen with a reduced content of silica inclusions, continuously casting the molten steel and then cold reducing the cast steel at a reduction of not less than 60% to obtain a silicon inclusion clearness of $d_{60} \times 400 \leqq 0.01\%$.

4,073,644

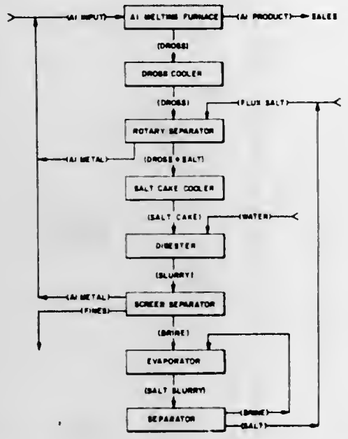
SALT CAKE PROCESSING METHOD AND APPARATUS

Pandelis N. Papafingos, and Richard T. Lance, both of Riverside, Calif., assignors to Alumax Mill Products, Inc., Riverside, Calif.

Filed Feb. 17, 1976, Ser. No. 658,430

Int. Cl.² C22B *21/00*; C21B *3/04*

U.S. Cl. 75—68 R 11 Claims



1. The improved method of recovering metallic values from dross and recovering fluxing salts used in the recovery of such metallic values comprising the steps of:

Step 1: removing dross from the melt and cooling the dross to retain in the dross metallic aluminum entrained therein;

Step 2: heating the dross under a cover of flux salts comprised of chloride salts of metals selected from the group consisting of alkali, alkaline earth metals and mixtures of the same to a temperature above the melting point of aluminum;

Step 3: removing molten aluminum from the dross leaving a flux-dross mixture having entrained therein residual aluminum metal;

Step 4: cooling the flux-dross mixture to form a salt cake product comprising pieces of salt cake having an average size of less than about 1 inch in thickness and about 100 square inches in area;

Step 5: digesting said salt cake product by heating and agitating the same in water to thereby dissolve the salt therein to form a brine slurry of the salt in solution and the insoluble constituents of the dross;

Step 6: separating the brine slurry into at least one cut consisting substantially of larger chunks of metal and dross having an average minor diameter of greater than about 250 microns and a final cut consisting essentially of a slurry of brine and particles having an average minor diameter of less than about 700 microns;

Step 7: separating from the slurry of Step 6 substantially all particles of dross and washing the same to produce a by-product consisting essentially of particles of aluminum oxide and aluminum metal having an average particle size of less than about 700 microns;

Step 8: evaporating a portion of the brine remaining after the separation of Step 7 to thereby cause crystallization of a portion of the salt dissolved therein and form a salt crystal-brine slurry and

Step 9: separating crystallized salt from the crystal-brine slurry of Step 8 to produce a flux salt product suitable for recycling as part of the flux salts of Step 2 and returning the brine remaining from the separation for further evaporation in Step 8.

4,073,645

PROCESS OF SMELTING SULPHIDIC COPPER ORE CONCENTRATES

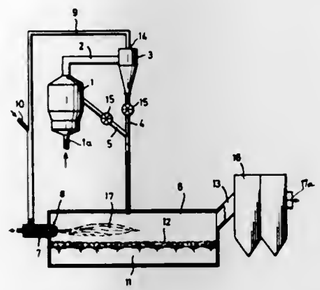
Walter Fritsch, Bergisch-Gladbach, and Gerhard Melcher, Cologne, both of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed Apr. 9, 1976, Ser. No. 675,629

Claims priority, application Germany, Apr. 9, 1975, 2515464

Int. Cl.² C22B *15/00*

U.S. Cl. 75—74 5 Claims



1. A process of smelting a sulphidic copper ore concentrate comprising the steps:

introducing and partially roasting the sulphidic copper ore concentrate in a whirling layer roasting furnace independently from a subsequent smelting operation in a reverberatory smelting furnace;

separating hot roasting gases derived from the partially roasted ore concentrate in the whirling layer roasting furnace;

mixing the separated roasting gases with enrichment oxygen;

joining and mixing into a smelting flame a combustible gaseous fuel and the oxygen enriched separated hot roasting gases;

directing the smelting flame from one side of the reverberatory smelting furnace into a heating zone over the top of a copper matte within the reverberatory smelting furnace;

continuously passing the partially roasted concentrate from the roasting furnace into and through said heating zone above said copper matte in the reverberatory smelting furnace;

in the heating zone effecting smelting of the partially roasted ore concentrate and heating of the copper matte by the heat from said flame;

generating in said heating zone by virtue of said flame an oxidizing atmosphere of such high temperature and oxygen content that sulphur from the molten sulphidic copper is converted into an exhaust gas of high SO_2 content;

and exhausting the exhaust gas from the opposite side of the reverberatory smelting furnace.

4,073,646

METHOD FOR THE THERMAL REFINEMENT OF GREATLY CONTAMINATED COPPER IN MOLTEN PHASE

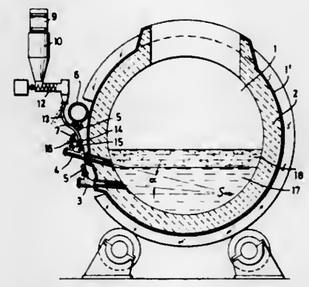
Alfred Kryczun, and Gerhard Melcher, both of Cologne, Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed May 13, 1976, Ser. No. 685,987

Claims priority, application Germany, May 16, 1975, 2521830

Int. Cl.² C22B *15/00*

U.S. Cl. 75—76 6 Claims



1. In a method for the thermal refinement of contaminated copper scrap in the molten phase in which superimposed molten phases are formed in a treating vessel, the lower phase containing black copper and the upper phase containing a slag with impurities such as zinc, tin, lead and the like, the improvement which comprises simultaneously injecting a reducing gas into said upper phase from a plurality of spaced parallel points and an oxidizing gas into said lower phase from a plurality of spaced parallel points, said oxidizing gas being introduced at a rate higher than said reducing gas.

4,073,647

PREPARATION OF CERMETS

Chester S. Morgan, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 26, 1976, Ser. No. 680,606

Int. Cl.² B22F *1/04*

U.S. Cl. 75—235 1 Claim

1. A cermet neutron absorber containing 2-20 volumepercent metal present as a continuous phase throughout the volume of said neutron absorber, said neutron absorber produced by the process comprising the steps of:

mixing a europium sesquioxide powder and an elemental metal precursor compound to form a solid phase mixture, said elemental metal selected from the group of tantalum, rhenium, tungsten and molybdenum;

decomposing said elemental metal precursor compound within said mixture so as to provide a second mixture comprising said europium sesquioxide powder and said elemental metal in an uncombined state; and

densifying said second mixture to provide a cermet neutron absorber having elemental metal present as a continuous phase.

4,073,648

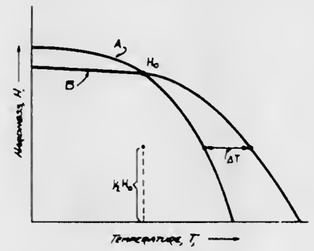
THERMOPLASTIC PREALLOYED POWDER

Timothy Earl Volin, Tuxedo; John Stanwood Benjamin, Suffern; Jay Michael Larson, Warwick, and Robert Lacock Cairns, Suffern, all of N.Y., assignors to The International Nickel Company, Inc., New York, N.Y.

Division of Ser. No. 477,596, June 10, 1974, Pat. No. 3,930,841, which is a division of Ser. No. 316,077, Dec. 18, 1972, Pat. No. 3,865,575. This application Sept. 4, 1975, Ser. No. 610,132

Int. Cl.² B22F *1/04*

U.S. Cl. 75—245 8 Claims



1. As a new article of manufacture, a solid metal body formed from superalloy prealloyed powder containing from up to 60% chromium, up to 30% cobalt, up to 10% aluminum, up to 8% titanium, up to 30% molybdenum, up to 25% tungsten, up to 10% columbium, up to 10% tantalum, up to 7% zirconium, up to 0.5% boron, up to 5% hafnium, up to 2% vanadium, up to 6% copper, up to 5% manganese, up to 70% iron, up to 4% silicon and the balance essentially nickel,

a. the said powder being in the strain energy induced condition with a Thermoplastic Physical Characteristic of at least TPC-1, and

b. hot consolidated at a temperature above its recrystallization temperature, to thereby give a hot consolidated solid metal body,

c. the solid metal body being characterized by fine grains as a consequence of strain energy having been imparted to the superalloy powder prior to hot consolidating above the recrystallization temperature.

4,073,649

DICARBOXYLIC ACID BIS-AMIDES IN IMPROVED IMAGING PROCESS

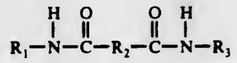
Charles G. Scouten, Webster, N.Y., and Willard C. Hamilton, Morganville, N.J., assignors to Xerox Corporation, Stamford, Conn.

Filed June 3, 1976, Ser. No. 692,258

Int. Cl.² G03G *9/02*

U.S. Cl. 96—1.4 17 Claims

1. In an imaging process comprising the steps of forming a latent image on an imaging surface, developing said latent image by bringing a developing material within the influence of said latent image to form a powder image corresponding to said latent image, and removing at least a portion of at least any residual developed image from said imaging surface; the improvement comprising treating said imaging surface with an effective amount of a deposit forming material comprising amides of the structure



where R_1 and R_3 are H, phenyl, lower alkyl substituted phenyl, or lower alkyl groups, where lower alkyl includes groups having from 1 to about 7 carbon atoms in a branched, unbranched, or cyclic configuration, and where R_2 is an alkylene group of 2 to about 22 carbon atoms, phenylene, naphthylene, and phenylene and naphthylene groups bearing lower alkyl

substituents of 1 to about 7 carbon atoms in either straight, branched, or cyclic chain configuration.

4,073,650

METHOD OF RECORDING ON A MICROFICHE

George J. Yevick, Leonia, N.J., assignor to IZON Corporation, Stamford, Conn.

Division of Ser. No. 474,795, May 30, 1974. This application Feb. 26, 1976, Ser. No. 661,762
Int. Cl.² G03C 11/00, 5/00
U.S. Cl. 96—46 5 Claims

1. A method of recording macro scenes on an optical fiche defined by a transparent sheet having a photographic emulsion on its bottom surface and an opaque coating apertured by a plurality of pinholes on its top surface, including the steps of:

a. projecting a macro scene through a coarse mask provided with a plurality of openings, said macro scene being spaced from said coarse mask, said coarse mask openings being parallel and contiguous to said pinholes,

b. aligning the coarse mask openings with a unique set of pinholes carried by the fiche, the number of coarse mask apertures being less than the number of pinholes, each coarse mask aperture being in a cell defined by opaque septa to thereby prevent optical cross-talk between the pinholes of different sets,

c. whereby disposed micro images of the projected macro scene are formed on the emulsion.

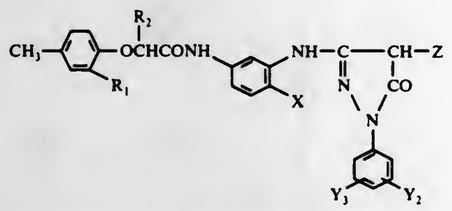
4,073,651

IMAGE-FORMING LAYER CONTAINING SILVER HALIDE EMULSION AND MAGENTA COUPLER

Shoji Yamada; Akira Tanaka; Shoichi Horii, and Kiyoshi Yamashita, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Apr. 21, 1976, Ser. No. 679,083
Claims priority, application Japan, Apr. 28, 1975, 50-51907
Int. Cl.² G03C 1/40
U.S. Cl. 96—100 R 10 Claims

1. An image-forming layer containing silver halide emulsion and a magenta coupler 1-aryl-3-anilino-5-pyrazolones represented by the general formula:



wherein R_1 represents an alkyl group having 10 to 18 carbon atoms, R_2 represents hydrogen atom or an alkyl group having 1 to 4 carbon atoms, X represents a halogen atom, an alkyl group having 1 to 4 carbon atoms, or an alkoxy group having 1 to 4 carbon atoms, Y_1 represents an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, or a halogen atom, Y_2 and Y_3, which may be the same or different, represent hydrogen atoms or have the meaning assigned to Y_1, and Z represents hydrogen atom or the atom or group which splits off by coupling.

4,073,652

DIRECT-POSITIVE SILVER HALIDE EMULSIONS

Raymond Leopold Florens, Edegem, Belgium, assignor to AFGA-Gevaert N.V., Mortsel, Belgium

Filed Aug. 26, 1975, Ser. No. 607,909
Claims priority, application United Kingdom, Sept. 30, 1974, 42459/74
Int. Cl.² G03C 1/30, 1/28
U.S. Cl. 96—101 18 Claims

1. A direct-positive photographic element comprising a support and at least one silver halide emulsion layer with reduction and gold-fogged silver halide grains, characterized in that before development a sulphite selected from the group consisting of ammonium sulphite or an alkali metal sulphite and a gold compound have been added to the fogged silver halide emulsion in an amount sufficient to stabilize the D_{max} of the silver image to be formed.

4,073,653

PRINTING PASTE COMPOSITIONS CONTAINING SODIUM CELLULOSE SULFATE, AND PROCESSES THEREFOR

Thomas A. Lindroth, Spring Valley, and Joseph S. Racciato, San Diego, both of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 10, 1976, Ser. No. 656,920
Int. Cl.² C09D 11/14
U.S. Cl. 106—26 17 Claims

1. An aqueous printing paste containing an acid dye and a thickener composition containing from about 10% to about 60% sodium cellulose sulfate, and from about 90% to about 40% of at least one member selected from locust bean gum, guar gum, a soluble alginate gum, xanthan gum, S-10 heteropolysaccharide gum and S-7 heteropolysaccharide gum, the amount of alginate, if present, being from 10–30%.

4,073,654

OPTICAL ARTICLES PREPARED FROM HYDRATED GLASSES

Che-Kuang Wu, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Dec. 15, 1975, Ser. No. 640,733
Int. Cl.² C03C 3/10, 3/04
U.S. Cl. 106—52 12 Claims

1. A molded glass article comprising a hydrated base glass body having a total water content ranging from about 0.5 to 10% by weight, the base glass constituents comprising in mole % on an oxide basis, 72–82% SiO_2, 10–17% Na_2O and/or K_2O, and 5 to 15% of a member selected from ZnO, PbO, and mixtures thereof; the water content consisting of silanol groups and molecular water in such proportion that the ratio of silanol groups to molecular water is equal to or greater than 1.0; and at least one portion of the article having an optical quality surface such that over a surface distance of at least 0.1 inch, on an arithmetic average basis, the Roughness Height is less than about 3.0 microinches.

4,073,655

GLASSES, THERMALLY STABLE HIGH (BETA)-CRISTOBALITE GLASS-CERAMICS AND METHOD

Chi-Tang Li, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 734,911, Oct. 22, 1976, which is a continuation-in-part of Ser. No. 320,788, Jan. 3, 1973, abandoned. This application Apr. 4, 1977, Ser. No. 784,209
Int. Cl.² C03C 3/04, 3/10, 3/22
U.S. Cl. 106—52 13 Claims

1. A glass crystallizable to a glass-ceramic having stabilized high-cristobalite solid solution crystal phase formed by thermal in situ crystallization, said glass consisting essentially of the composition $MO{\cdot}Al_2O_3{\cdot}nSiO_2$ wherein the (Al_2O_3/MO) molar ratio is 1 and MO is a member of the group consisting of CaO and a mixture of CaO and a metal oxide wherein the metal is a cation selected from iron and the first, second and fourth groups of the Periodic Table and the molar ratio of CaO to said metal oxide is from 4:1 to 1:3 and n is a positive number of from 8 to 37.

4,073,656

FIRED REFRACTORY BRICK AND PROCESS FOR PREPARING THE SAME

Hans-Jurgen Gulas, and Helmut Neuper, both of Leoben, Austria, assignors to Veltscher Magnesitwerke-Actien-Gesellschaft, Vienna, Austria

Filed Oct. 14, 1976, Ser. No. 732,452
Claims priority, application Austria, Oct. 20, 1975, 7955/75
Int. Cl.² C04B 35/48
U.S. Cl. 106—57 4 Claims

1. A fired refractory brick composed of magnesia, 2 to 10% alumina, calcium oxide and up to 1.5% silica, the weight ratio of calcium oxide to silica being more than 1.4 and 2.2 (CaO - 1.4 SiO_2)% to 5.5% zirconia, calculated on an ignition loss free basis, calcium oxide and zirconia forming a calcium zirconate phase in the brick and the content of the calcium zirconate phase being from 0.5 to 8%, all percentages being by weight.

4,073,657

GLASS FOR SEMICONDUCTORS

Earl Klimer Davis, Tempe; William Oakley Rogers, Mesa, and Duane Charles Silvis, Scottsdale, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed July 16, 1976, Ser. No. 705,968
Int. Cl.² C03C 3/04, 3/10; A01L 3/00
U.S. Cl. 106—73.5 1 Claim

1. An insulating and passivating glass and zircon composition consisting of 36 to 40 volume percent of zircon of maximum particle size up to 5 microns and the balance a base glass of particle size less than 44 microns wherein said base glass consists of 3 percent-SiO_2, 73 percent-PbO, 6 percent-ZnO, 3 percent-BaO, 2 percent-CdO, 1 percent-TiO_2 and 12 percent-B_2O_3.

4,073,658

HYDRAULIC CEMENT COMPOSITION

Naoteru Ohtani, Wakayama; Tutomu Koyama, Kainan; Takashi Takeuchi, Wakayama; Toshihiro Azuma, Wakayama, and Morio Matsuda, Wakayama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Jan. 26, 1977, Ser. No. 762,759
Claims priority, application Japan, Mar. 10, 1976, 51-25883
Int. Cl.² C04B 7/352, 7/353
U.S. Cl. 106—92 3 Claims

1. A hydraulic cement composition comprising hydraulic cement, water and, optionally, aggregate, said composition containing from 0.01 to 0.3 weight percent, based on the weight of said hydraulic cement, of a hydrogenated oligosaccharide having an average molecular weight of from 300 to 3500, wherein the hydrogenation has transformed the terminal aldehyde groups of the oligosaccharide to hydroxyl groups.

4,073,659

ASPHALT-GILSONITE EMULSION

Michael V. Burris, 3004 Campbell Circle, Las Vegas, Nev. 89107

Continuation-in-part of Ser. No. 686,733, May 17, 1976. This application Sept. 27, 1976, Ser. No. 726,945
Int. Cl.² C08L 95/00; C09D 3/24
U.S. Cl. 106—277 7 Claims

1. An asphalt emulsion composition comprising:

an asphalt phase of between about 10% and about 33% by weight gilsonite and between about 66 and about 90% by weight penetration grade asphalt having a penetration below 100 dmm at 77° F,

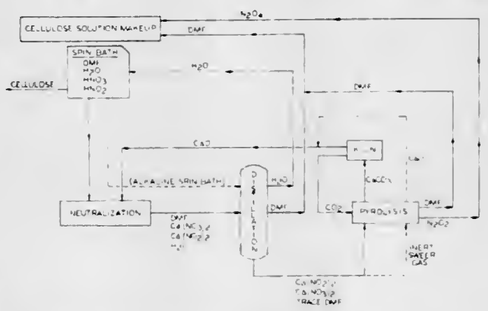
between about 0.1 and about 2% of a cationic emulsifying agent, and water, the ratio of asphalt phase:water being between about 1:1 and 2:1 by weight, respectively, prepared by a method comprising melting the gilsonite at a temperature of at least about 300° F, independently heating asphalt to a temperature of at least about 300° F, mixing the gilsonite and asphalt while maintaining a mixture temperature of at least 300° F, and thereafter blending asphalt-gilsonite mixture with water and emulsfying agent.

4,073,660

RECOVERY OF CHEMICAL COMPONENTS OF CELLULOSIC REGENERATING SOLUTION

Norman A. Portnoy, Hopatcong, N.J., and David Paul Anderson, Amherst, Mass., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 18, 1976, Ser. No. 715,223
Int. Cl.² C08K 5/20; C08B 3/32
U.S. Cl. 106—311 16 Claims



1. A process for the recovery of the chemical components of a cellulosic regenerating solution containing a dialkylacylamide solvent, a regenerant and the metal salts of nitrous and nitric acid comprising

distilling the solution to remove and recover the dialkylacylamide solvent, and

pyrolyzing the metal salts at a temperature of at least 600° C. in the presence of oxygen while passing a sweep gas over said salts to remove and recover nitrogen dioxide gas evolving from said pyrolysis reaction.

4,073,661

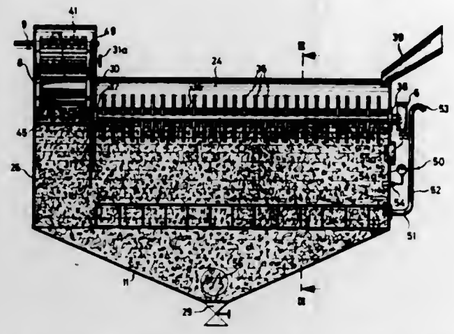
PROCESS FOR CLEANING COMMINUTED PLASTIC MATERIAL

Heinrich Buzga, Grevenbroich; Werner Steprath, Dormagen, and Kurt Pause, Bosau uber Eutin, all of Germany, assignors to Maschinenfabrik Buckau R. Wolf Aktiengesellschaft, Grevenbroich, Germany

Filed June 10, 1976, Ser. No. 694,550
Claims priority, application Germany, June 10, 1975, 2525750; June 10, 1975, 2525749
Int. Cl.² B08B 3/12
U.S. Cl. 134—1 10 Claims

1. A continuous method for preparing and cleaning grossly soiled products of plastic material, such as sheets, bands, sacks or the like for subsequent re-use, comprising the steps of comminuting the plastic material after removing rough foreign objects therefrom; feeding the comminuted plastic material into a washing solution having a greater specific weight than the plastic material; subjecting the washing solution and the comminuted plastic material therein in a washing zone to turbulence; advancing the comminuted plastic material into a turbulence-free zone containing washing solution and located downstream of the washing zone by transferring the plastic material under a submerged edge of a partition which is submerged in the washing solution and separates the washing zone from the turbulence-free zone; continuously removing the

comminuted plastic material from the turbulence-free zone; and thereafter mechanically pre-drying and subsequently thermally finish drying the comminuted plastic material.



4. A method as defined in claim 1, and including the step of increasing speed of solution of soluble foreign material clinging to the comminuted plastic material by subjecting the washing solution in the washing zone to sound waves and interference of said sound waves.

4,073,662

METHOD FOR REMOVING A MAGNESIA DOPED ALUMINA CORE MATERIAL

Marcus P. Borom, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 9, 1977, Ser. No. 775,761
Int. Cl.[2] C23G *1/14*; C01F *7/00*
U.S. Cl. 134—2 **6 Claims**

1. A method for removing a ceramic core material comprising magnesia doped alumina disposed in an abutting relationship of a casting of an advanced superalloy material, wherein the composition of the ceramic material includes a magnesia content of greater than about 1 mole percent but no greater than about 20 mole percent, balance alumina, and the microstructure of the magnesia doped alumina is characterized by a matrix comprising an interconnecting network of magnesia doped alumina defining a plurality of interstices in which the material magnesium aluminate spinel is deposited, comprising the process steps of

(a) placing the casting and the ceramic core material in an autoclave containing a leaching solution selected from the group consisting of a solution of NaOH and a solution of KOH said leaching solution being from about 10 percent by weight to about 70 weight hydroxide and the balance water;

(b) heating the casting, ceramic core material and leaching solution to a temperature of at least about 200° C;

(c) dissolving substantially all of the magnesia doped alumina interconnecting network in the ceramic core material by chemical attack by the leaching solution, and

(d) removing at least some of the undissolved ceramic core material from the casting by the solution agitated by the chemical reaction.

4,073,663

METHOD AND APPARATUS FOR AUTOMATIC BACTERIOLOGICAL CLEANING AND DISINFECTION OF OBJECTS

Ernst Harry Lundgren, Norra Grangesbergsgatan 11, S-214 50 Malmo, Sweden

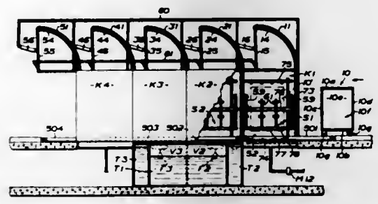
Filed May 20, 1976, Ser. No. 688,360
Claims priority, application Sweden, May 20, 1975, 7505691
Int. Cl.[2] B08B *3/02*
U.S. Cl. 134—10 **11 Claims**

1. In a method for automatic bacteriological cleaning and disinfecting of objects by sequential treatment of the objects in separate liquid-tight compartments, the sequential steps comprising:

a. pumping treating liquid from a first tank to contact objects in the first of a series of the liquid-tight compartments and then discharging the liquid so pumped;

b. moving the objects from the first of said compartments to an intermediate liquid-tight compartment;

c. supplying fresh treating liquid to a second tank;



d. pumping the fresh treating liquid from the second tank to contact objects moved from the first of the series of liquid-tight compartments into the intermediate liquid-tight compartment and then discharging the liquid so pumped directly to the first tank;

e. moving the objects from an intermediate liquid-tight compartment into a final liquid-tight compartment; and

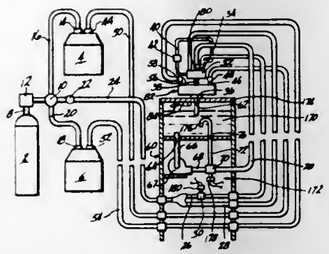
f. drying the objects in the final liquid-tight compartment.

4,073,664

AUTOMATICALLY CONTROLLED CLEANING FLUID CIRCUIT FOR A FOAM GENERATING APPARATUS AND METHOD

John F. Zwirlein, New Haven, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 656,157, Feb. 9, 1976. This application July 1, 1976, Ser. No. 701,703
Int. Cl.[2] B08B *7/04*
U.S. Cl. 134—18 **29 Claims**



12. A method of automatically cleaning the mixing chamber of a foam generating apparatus, said apparatus being of the type wherein at least two inter-reactive materials are mixed and foam generated and including a foam gun head having a mixing chamber, solvent storage means for storing a solvent, and means for supplying solvent to the mixing chamber when an electrically actuated solvent valve is in a first position and for by-passing said mixing chamber and returning said solvent to said storage means when said valve is in a second position said method comprising:

a. electrically sensing the presence of the foam gun head when the foam gun head is in a first position to discharge solvent from the mixing chamber into the solvent storage means,

b. electrically actuating said solvent valve to move said valve to its first position in response to the sensing of the foam gun head in said first position, and

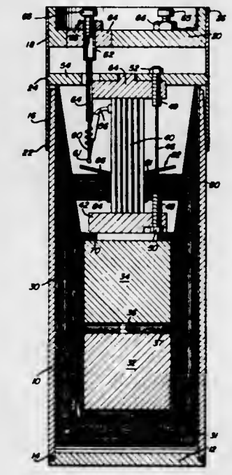
c. electrically actuating said solvent valve to move said valve to the second position in response to the electrical sensing of the removal of said foam gun head from its first position.

4,073,665

MICROWATT THERMOELECTRIC GENERATOR

Harold N. Barr, Baltimore, Md., assignor to Nuclear Battery Corporation, Columbia, Md.

Continuation of Ser. No. 489,737, July 18, 1974, abandoned. This application Oct. 20, 1976, Ser. No. 734,127
Int. Cl.[2] H01L *35/02*; G21H *1/10*
U.S. Cl. 136—202 **4 Claims**



1. In a microwatt thermoelectric generator including a sealed container having a feed-through assembly for making external electrical connection to the interior of the sealed container, a thermopile having a cold end and a hot end located within the sealed container with its cold end adjacent to the feed-through assembly and electrically connected therewith, a nuclear source located adjacent the hot end of the thermopile to furnish heat thereto, a foil insulation package located within the sealed container surrounding the thermopile and nuclear source, and getter means located within said foil insulation package, the improvement of the getter means comprising gas permeable container means containing a sintered mass of barium particles having distributed therethrough thin filler wire.

4,073,666

METHOD FOR MAKING AN INSULATED SUPERCONDUCTOR AND ARTICLE PRODUCED THEREBY

William G. Marancik, and Frederick T. Ormand, both of Basking Ridge, N.J., assignors to Airco, Inc., Montvale, N.J.

Filed Sept. 9, 1976, Ser. No. 721,739
Int. Cl.[2] H01L *39/00, 39/24*
U.S. Cl. 148—11.5 Q **4 Claims**

1. A method for manufacturing an insulated composite conductor comprising the steps of:

a. lining the inner walls of an extrusion can made of a ductile material with a layer of valve metal selected from the group consisting of Ti, Nb, Hf and Ta;

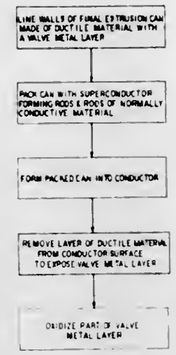
b. packing a plurality of superconductor forming rods made of superconductor forming material into the extrusion can;

c. mechanically forming a composite conductor from the packed can wherein the conductor has filaments of superconductor forming material;

d. removing the ductile material layer of the can from the surface of the composite conductor to expose the underlying layer of valve metal;

e. oxidizing at least part of the exposed layer thereon; and

f. heat treating the product to react components of the superconductor forming rods to form, in situ, filaments of material selected from the group consisting of Nb_3Sn and V_3Ga having superconductive properties at cryogenic temperatures.



4,073,667

PROCESSING FOR IMPROVED STRESS RELAXATION RESISTANCE IN COPPER ALLOYS EXHIBITING SPINODAL DECOMPOSITION

Ronald N. Caron, Branford, and Stanley Shapiro, New Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 655,791, Feb. 6, 1976, Pat. No. 4,016,010. This application Nov. 19, 1976, Ser. No. 743,121
The portion of the term of this patent subsequent to Apr. 5, 1994, has been disclaimed.
Int. Cl.[2] C22F *1/08*
U.S. Cl. 148—12.7 C **18 Claims**

1. A method for obtaining precipitation hardened copper base alloys via continuous, coherent precipitation such as spinodal decomposition having high strength and favorable strength to ductility characteristics which comprises:

a. providing a copper base alloy selected from the group consisting of those Cu-Ti alloys, Cu-Be alloys and Cu-Ni base alloys which exhibit continuous, homogeneous precipitation of coherent particles upon precipitation hardening;

b. hot working said alloy with a finishing temperature in excess of 400° C;

c. solution annealing said alloy for from 10 seconds to 24 hours at a temperature of from 650° to 1100° C; and

d. cooling the alloy to room temperature at a rate of less than 650° C per minute

to provide a spinodal, precipitation hardened copper base alloy wherein the microstructure is characterized by the presence of finely dispersed precipitates of alloying element-rich particles dispersed throughout the copper alloy matrix.

4,073,668

METHOD OF PRODUCING SILICON STEEL STRIP

George E. Wieland, Jr., and Eugene M. Rudzki, both of Bethlehem, Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

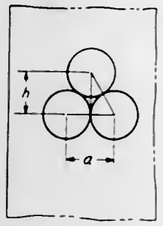
Filed Sept. 15, 1976, Ser. No. 723,365
Int. Cl.[2] H01F *1/04*
U.S. Cl. 148—113 **2 Claims**

1. A method of producing silicon sheet steel comprising:

a. coating both sides of a low carbon steel substrate with a slurry of a silicon-containing powder, at least 90% of the particles of said powder having a diameter equal to or less than *d*, and the maximum diameter of the particles being 1.25*d*, where:

$$d = \frac{1.65t\,(\%Si_{pr})10^7}{(100 - \%Si_{pr})\,(\%Si_p)\,(\rho_p)},$$

in microns, and where t is the thickness of the substrate in inches, $\%Si_{pr}$ is the desired silicon in the final product, $\%Si_p$ is the amount of silicon in the powder, and ρ_p is the density of the powder in g/cm^3,



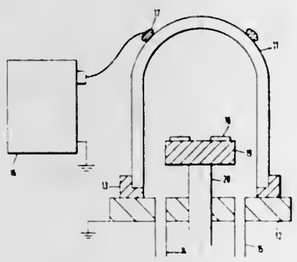
b. drying said slurry on said substrate to provide a coating,
c. compacting said powder particles on said substrate, and
d. heating said substrate with the compacted powder thereon in a protective environment for a time and at a temperature sufficient to cause uniform diffusion of silicon throughout said substrate.

4,073,669

PLASMA ETCHING

Rudolf August Herbert Heinecke, and Geoffrey Laurence Ashcroft, both of Harlon, England, assignors to ITT Industries, Incorporated, New York, N.Y.

Filed Apr. 29, 1976, Ser. No. 681,664
Int. Cl.[2] C23F *1/02*
U.S. Cl. 156—643 5 Claims



1. A method for selectively etching an aluminum film carried on a semiconductor substrate, comprising:
selectively masking the aluminum film with a photoresist material;
exposing the masked film to a radio-frequency glow discharge maintained in an atmosphere comprising carbon tetrachloride together with up to 15 volume percent ammonia; and
stripping of the photoresist mask to obtain a finished semiconductor substrate carrying an aluminum conductor pattern thereon.

4,073,670

METHOD OF FORMING NARROW RIBBONS OF FIBERS IN PLASTIC MATERIAL

Panchanan Mitra, Stapleford, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 16, 1976, Ser. No. 742,308
Claims priority, application United Kingdom, Nov. 27, 1975, 48723/75
Int. Cl.[2] B32B *5/00*
U.S. Cl. 156—179 12 Claims

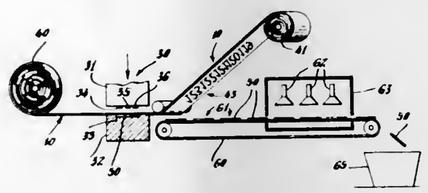
1. A method of preparing ribbons of unidirectional fiber-reinforced plastics material, comprising the steps of
1. laying unidirectional fibers in a series of spaced discrete parallel strips onto a plastics material on a backing comprising a first continuous sheet of release material,
2. applying a second continuous sheet of release material to the fibers,
3. applying heat and pressure such that the plastics material flows about the fibers to form a series of coherent strips,
4. removing only one of the layers of release material,
5. applying a continuous solid sheet which will adhere to surplus plastics material between each coherent strip, and
6. removing the said continuous solid sheet with the surplus plastics material adhering thereto.

4,073,671

COLOR FILLING INDICIA SIMULTANEOUSLY WITH DEBOSSING

Aurelio William Licata, New Haven, Conn., assignor to Seton Name Plate Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 430,092, Jan. 2, 1974, abandoned. This application Nov. 14, 1975, Ser. No. 631,814
Int. Cl.[2] B31B *31/00*
U.S. Cl. 156—219 5 Claims



1. A method of forming color-filled debossed indicia on metal substrates comprising:
a. positioning a metal substrate below means including indicia die means for debossing indicia thereon, said indicia die means having a flat indicia-forming surface;
b. interposing a colored tape comprising a layer of resinous film and a layer of thermoset adhesive between the die means and the metal substrate with the thermoset adhesive layer adjacent to the metal substrate;
c. maintaining the metal substrate and tape at a temperature below the melt point of the thermoset adhesive prior to debossing; and
d. applying the die means to the tape and metal substrate by stamping with sufficient force to deboss the indicia in the metal substrate and to shear the tape along the outline of the indicia whereby a portion of the tape corresponding to the shape and area of the indicia is sheared away from the surrounding tape and positioned adhered on the surface of the debossed indicia.

4,073,672

POST-PRESS EMBOSSING OF A CONSOLIDATED MAN-MADE BOARD

John T. Clarke, St. Charles; Royce K. Harker, Lombard, both of Ill.; Michael E. Hittmeier, Towanda, Pa., and James W. Eaton, Elgin, Ill., assignors to Masonite Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 537,254, Dec. 30, 1974, Pat. No. 4,007,076. This application Sept. 27, 1976, Ser. No. 727,292
The portion of the term of this patent subsequent to Feb. 8, 1994, has been disclaimed.
Int. Cl.[2] B29J *5/04*
U.S. Cl. 156—219 16 Claims

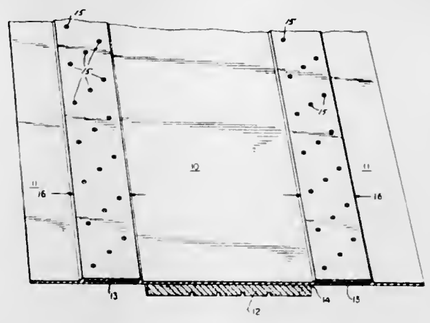
12. In a method of forming a decorative board including depositing fibers onto a surface to form a fibrous mat and compressing said fibrous mat to consolidate said mat into a consolidated board the improvement comprising wetting a surface of said consolidated board with a mineral acid in an amount sufficient to wet substantially the entire surface to be embossed, embossing the wetted surface of said consolidated board with a contoured embossing surface at a pressure of at least 1000 p.s.i., at a temperature of at least 400° F. and for a period of time sufficient to permanently re-shape said wetted surface.

4,073,673

PROCESS FOR PRODUCING AN EXPANSION JOINT COVER

Paul J. Raabe, Oak Brook, Ill., and Harlan E. Tarbell, Torrance, Calif., assignors to Grefco, Inc., Bala Cynwyd, Pa.

Continuation-in-part of Ser. No. 431,766, Jan. 8, 1974, which is a continuation of Ser. No. 346,112, March 29, 1973, which is a continuation-in-part of Ser. No. 113,835, Feb. 9, 1971, abandoned. This application Dec. 23, 1975, Ser. No. 643,807
Int. Cl.[2] B29F *3/10*
U.S. Cl. 156—244 2 Claims



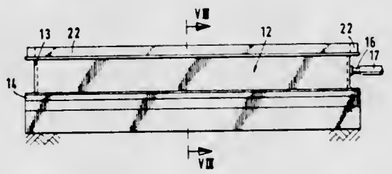
1. A process for producing a flexible, weather resistant, hinged expansion joint cover including a flexible strip and flexible hinged lateral portions having lock-in reinforcing members, and insulating material adjacent said planar strip,
said flexible strip and portions being fabricated of extrudable material, said extrudable material being a resinous polymer extrudable when in a flowable state, and selected from the group consisting of polymers of polyethylenes, polypropylenes, polyurethanes, polyamides, polychloroprenes, polybutadienes, polyacrylonitriles, polyvinyl chlorides or polyacrylates, wherein said resinous polymer remains flexible and penetrable by a nail within the range of from about −50° about +200° F, and withstands prolonged direct exposure to outdoor weathering;
said reinforcing member comprised of a strip of relatively thin planar spring material, said strip being perforated and having a rigidity substantially greater than that of said lateral portions and a thickness less than that of said lateral portions, said reinforcing member if coiled about a 5" diameter mandrel and released, being elastic so as to return to its original shape;
said insulating material being planar and compressible, said insulating material being a polymeric foam selected from the group consisting of foamed polymers and copolymers of ethylene, propylene, choroprene, vinyl halides, urethanes, amides, butadienes, acrylonitriles, acrylates and natural and synthetic rubbers wherein said polymeric foam has a K factor of from about 0.012 to about 0.045 Btu-in/ft^2-hr-=F;
comprising the steps of:
(a) simultaneously extruding said substantially flexible planar strip of said extrudable material, with said lateral portions extended one from each side of said planar strip in the same plane as said planar strip;
(b) simultaneously placing and completely enclosing during said extrusion one of said reinforcing members in each of said lateral portions;
(c) aligning a strip of said planar insulating material adjacent said planar strip subsequent to said extrusion step and confining said insulating material slightly within the edges of said planar strip, and
(d) fastening said strip of said insulating material in said aligned position to said planar strip to form a flexible hinge between said planar strip and said lateral portions and produce said flexible hinged expansion joint cover.

4,073,674

METHOD FOR PRODUCTION OF MULTILAYER COMPOSITE PLATE

Willy Hörtel, An der B4, 3125 Wesendorf, Germany

Filed Apr. 19, 1976, Ser. No. 678,201
Claims priority, application Germany, Apr. 24, 1975, 2518174
Int. Cl.[2] B29C *3/00*
U.S. Cl. 156—285 3 Claims



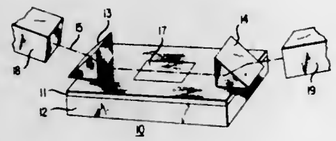
1. A method of producing a multilayer composite plate construction, comprising the steps of laminating at least one hard foam layer of polystyrene having a thickness of at least 40 mm. and a density of at least 25 kp/m^3 between outer layers formed of fibrous materials, said outer layers statically absorbing bending tensile and compressive forces when said plate construction is under load, said laminating step including applying a two-component adhesive having talc as a filler to substantially the entire faces of the mating surfaces of said foam and said outer layers, locating said outer layers with said foam therebetween and the adhesive applied thereto in a pressing frame and applying an exterior force to said layers and foam that is sufficient to produce a bonded laminate while simultaneously reducing the pressure in said frame to a partial vacuum to remove the air pockets and gases in the bonding layers and to stabilize the foam layer.

4,073,675

WAVEGUIDING EPITAXIAL $LiNbO_3$ FILMS

Albert Anthony Ballman, Woodbridge; Harold Brown, Middletown; Raymond John Martin, Middlesex Borough, and Ping King Tien, Chatham Township, Morris County, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 21, 1976, Ser. No. 707,309
Int. Cl.² B01J *17/24*; C01G *35/00, 1/00*
U.S. Cl. 156—600 **8 Claims**



1. A process for producing epitaxial crystalline films of $LiNbO_3$ on $LiTaO_3$ substrates in which the films are grown on a crystallographic plane of $LiTaO_3$ selected from the group consisting of the 10.2, 11.2, 01.2, 10.2, 01.2 and 11.2 planes comprising the steps of:

a. preparing the $LiNbO_3$ in the form of a powder with particle size less than 50 microns,

b. preparing a suspension of $LiNbO_3$ in a viscous liquid organic medium which evaporates or decomposes on heating,

c. spreading some of the suspension of $LiNbO_3$ on the $LiTaO_3$ substrate,

d. heating the $LiTaO_3$ substrate to a temperature between 1260° and 1320° C,

e. maintaining the temperature of the $LiTaO_3$ substrate between 1260° and 1320° C for from 1 minute to 2 hours,

f. cooling the $LiTaO_3$ substrate at a rate of 10°-50° C per hour to below 600° C.

6. A process for producing epitaxial crystalline films of $LiNbO_3$ on $LiTaO_3$ substrates in which the films are grown on a crystallographic plane of $LiTaO_3$ selected from the group consisting of the 10.2, 11.2, 01.2, 10.2, 01.2 and 11.2 planes comprising the steps of:

a. preparing the $LiNbO_3$ in the form of a powder with particle size less than 50 microns,

b. distributing some $LiNbO_3$ powder on the surface of the $LiTaO_3$ substrate,

c. placing a platinum foil on top of the $LiNbO_3$ powder on the $LiTaO_3$ substrate,

d. applying a pressure of 1-20 gms/cm² to the platinum sheet,

e. maintaining the temperature of the $LiTaO_3$ substrate between 1260° and 1320° C for from 1 minute to 2 hours,

f. cooling the $LiTaO_3$ substrate at a rate of 10°-50° C per hour to below 600° C and then to room temperature, removing the platinum foil.

4,073,676

GaAs-GaAlAs SEMICONDUCTOR HAVING A PERIODIC CORRUGATION AT AN INTERFACE

Kunio Aiki, Hachioji; Michiharu Nakamura, Nishitama, and Junichi Umeda, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 18, 1975, Ser. No. 550,769
Claims priority, application Japan, Feb. 18, 1974, 49-18630
Int. Cl.² B01J *17/04*
U.S. Cl. 156—624 **9 Claims**

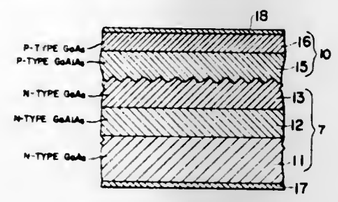
1. A method for fabricating a semiconductor device having a periodic corrugation at an interface between a GaAs crystal and a GaAlAs layer comprising the steps of:

preparing a GaAs crystal;

selectively etching the surface of said GaAs crystal, to form a periodic corrugation on the surface of said GaAs crystal;

preparing a solution including Ga, Al and As therein;

heating said solution to a temperature within a range between 650° C and 750° C;



contacting said heated solution onto said periodically corrugated surface of said GaAs crystal; and

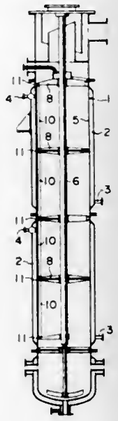
cooling said solution at a cooling rate between 1° C/min. and 10° C/min.

4,073,677

REVERSIBLY ROTATED WIPER IN AN EVAPORATOR

Yasuo Noda, Amagasaki, and Takaya Inoue, Takatsuki, both of Japan, assignors to Kansai Kagaku Kikai Seisaku Kabushiki Kaisha, Japan

Filed Sept. 15, 1976, Ser. No. 723,450
Claims priority, application Japan, Sept. 26, 1975, 50-115537
Int. Cl.² B01D *1/22*
U.S. Cl. 159—6 W **6 Claims**



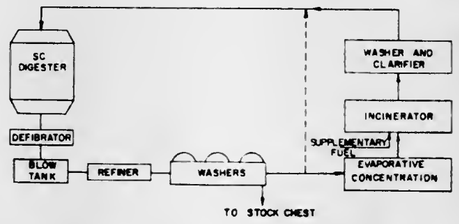
1. A thin-film evaporator comprising a substantially cylindrical heating wall, a rotating shaft disposed coaxially with respect to said heating wall, a reversible motor connected to said shaft for rotating it in opposite directions, blade means mounted on said rotating shaft for applying liquid to be evaporated to said heating wall to form a thin film thereon when said shaft is rotated by said motor in one direction and scraping means on said rotating shaft for scraping possible scales off said heating wall, said scraping means being adapted to rub against said heating wall with slight contact pressure when said shaft is rotated in said one direction and on the other hand to engage with said heating wall with larger pressure when said shaft is rotated in the other direction whereby the scales on the heating wall are scraped off therefrom.

4,073,678

HIGH YIELD SEMICHEMICAL WOOD PULPING PROCESS

Jack A. Hammond, Covington, Va., and Elias M. Karter, Paducah, Ky., assignors to Westvaco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 351,658, April 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 248,868, May 1, 1972, abandoned. This application Jan. 14, 1977, Ser. No. 759,455
Int. Cl.² D21C *3/02, 3/24, 11/04*
U.S. Cl. 162—19 **8 Claims**



1. A method of operating a continuous digester having respective charging and discharging ends for the production of semichemical pulp of greater than 70% yield, said method comprising steps of:

A. Formulating a green liquor pulping solution having 50 to 150 grams per liter total alkali concentration measured as sodium oxide wherein at least 50% of said total alkali is derived from sodium carbonate, said solution further including an effective presence of sodium sulfide;

B. Continuously charging said digester at said charging end with said solution and wood chips at a combined flow rate providing 5 to 10 grams of titratable sodium compounds expressed as sodium oxide per 100 grams of O.D. chips but no more than 2.4 grams of sodium sulfide measured as sodium sulfide per 100 grams of O.D. chips;

C. Continuously combining steam with said solution and chip charge flow at a steam flow rate sufficient to provide a liquor-to-wood ratio of up to 2.5:1 and a combined charge temperature of 170° to 185° C;

D. Continuously transporting said combined charge flow between said digester charging and discharging ends over an interim of approximately 5 to 20 minutes; and

E. Continuously withdrawing said combined charges from said digester at said discharge end.

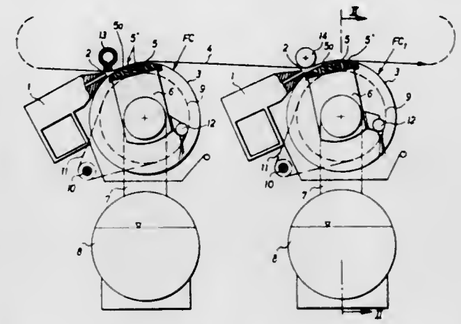
4,073,679

CYLINDER FOR FORMING, GUIDING AND/OR TRANSPORTING PAPER WEBS OR THE LIKE

Christian Schiel, Heidenheim, Germany, assignor to J. M. Voith GmbH, Heidenheim, Germany

Filed Nov. 19, 1976, Ser. No. 743,301
Claims priority, application Germany, Nov. 22, 1975, 2552485
Int. Cl.² D21F *1/46, 1/60, 3/10*
U.S. Cl. 162—306 **18 Claims**

1. In a machine for forming, guiding and/or transporting elongated webs of fibrous material which move along a predetermined path, particularly in the wire section of a papermaking machine, a combination comprising a hollow cylinder including a deformable tubular shell adjacent one side and extending transversely of said path, said shell being permeable to fluids, consisting of intersecting filaments which define a plurality of interstices, and having first and second end portions, an external surface including a web-contacting portion and an internal surface, and rigid rotary walls connected with said end portions of said shell; and a rigid back support located in the interior of said cylinder and having a back support surface contacting said internal surface of said shell substantially only opposite said web-contacting portion of said external surface.

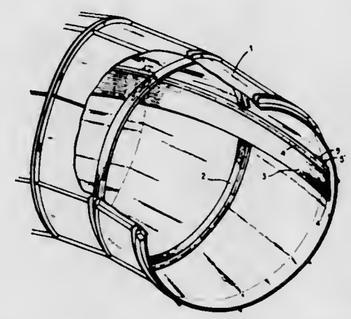


4,073,680

TOROIDAL BAND LIMITER FOR A PLASMA CONTAINMENT DEVICE

George G. Kelley, Kingston, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed June 26, 1975, Ser. No. 590,746
Int. Cl.² G21B *1/00*
U.S. Cl. 176—3 **3 Claims**



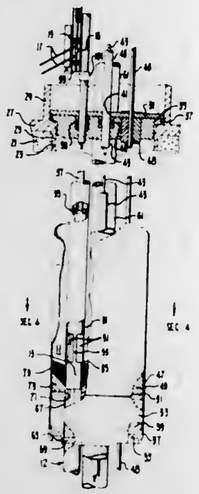
1. In a toroidal plasma confinement device having poloidal and toroidal magnetic fields for confining a toroidal plasma column with a plasma current induced therein along an endless, circular equilibrium axis in a torus vacuum cavity, the improvement comprising a toroidal plasma band limiter mounted on the midplane inside of and to the wall of said cavity and at the outer radius of said plasma, said band limiter extending around the perimeter of said plasma, said band limiter being tangent at its mid-region to the outermost plasma surface and flaring away from said plasma at the top and the bottom of the band to intercept a shell of plasma surfaces in the plasma scrape-off region, thus receiving a generally uniform energetic particle flux therefrom, thereby avoiding intense local heating of said band limiter while at the same time preventing vacuum cavity wall damage.

4,073,681

NUCLEAR REACTOR SHUTDOWN SYSTEM

James M. Glazar, Poway, and Erich H. P. Hoffmann, Escondido, both of Calif., assignors to General Atomic Company, San Diego, Calif.

Filed Mar. 5, 1975, Ser. No. 555,687
Int. Cl.[2] G21C *7/08*
U.S. Cl. 176—36 R **3 Claims**



1. A shutdown system for a nuclear reactor comprising, a poison reservoir, gate means movable from a closed position to an open position by the force of gravity, means for conducting poison in said reservoir to the core of the reactor in response to the opening of said gate means, means for retaining said gate means in the closed position, said retaining means comprising a pulley, a flexible cable passing partially around said pulley, and a pair of fuse links, each linking one end of said cable with said gate means and extending substantially parallel with each other, each of said fuse links comprising two contacting metallic elements capable of alloying rapidly at a given temperature, said fuse links being severable at the given temperature in response to a predetermined magnitude of electric current passed therethrough to allow said gate means to move to the open position, and means for conducting electric current to said fuse links wherein each of said fuse links comprises a main element of sufficient size to support the load of said gate means, a current conducting segment contacting said main element, wherein said current conducting means extend from respective ends of said current conducting segment, and wherein said main element and said current conducting segment are each comprised of a plurality of wires having two contacting metallic elements capable of alloying rapidly and exothermically at said given temperature.

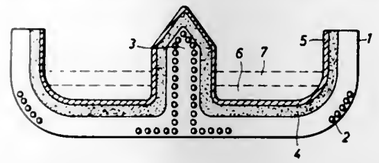
4,073,682

NUCLEAR REACTOR CORE CATCHING APPARATUS

Leopold Barleon, Karlsruhe; Stefan Dorner, Pforzheim; Odo Goetzmann, Philippsburg, and Guenter Kussmaul, Karlsruhe, all of Germany, assignors to Gesellschaft fuer Kernforschung, Karlsruhe, Germany

Filed Dec. 16, 1974, Ser. No. 533,250
Claims priority, application Germany, Dec. 21, 1973, 2363845
Int. Cl.[2] G21C *9/00*
U.S. Cl. 176—38 **5 Claims**

1. Apparatus for containing the components of a nuclear reactor core in a core melt-down accident, said apparatus consisting of a container adapted to be disposed below the neclear reactor core and consisting of stainless steel provided with a layer of compressed graphite, and having disposed at its inside facing the reactor core on top of the compressed graphite layer a top layer of graphite in combination with at least one



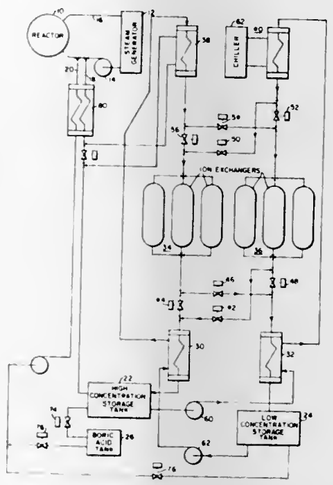
compound of the group consisting of Al_4C_3, α-SiC, β-SiC, TiB_2, ZrB_2, HfB_2, NbB_2 and WSi_2.

4,073,683

BORON CONTROL SYSTEM FOR A NUCLEAR POWER PLANT

Martinus R. Van der Schoot, Swissvale, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 38,711, May 19, 1970, abandoned. This application May 22, 1973, Ser. No. 362,989
Int. Cl.[2] G21C *7/00*
U.S. Cl. 176—86 L **5 Claims**



1. Apparatus for providing an inventory of both a concentrated solution of a neutron capturing material and a dilute solution of same for control of a nuclear reactor, which comprises:

a first vessel and a second vessel connected to said reactor, each vessel having a solution containing neutron capturing material:

at least two ion exchangers being temperature dependent with respect to their storage capacity of neutron capturing material;

conduits connecting the vessels with said ion exchangers;

a heater and pump in the conduit between the first vessel and a first of said ion exchangers, said heater imparting heat to a solution circulated from the first vessel to the first ion exchanger wherein the solution rinses neutron capturing material from the ion exchanger during its flow therethrough thus increasing the concentration of neutron capturing material therein; and

means connecting the discharge side of said first ion exchanger to said second vessel for discharging the solution of higher concentration thereinto;

a cooler and pump in the conduit between the second vessel and the second ion exchanger, said cooler extracting heat from a solution circulated from the second vessel to the second ion exchanger wherein the solution gives up neutron capturing material and stores it in the second ion exchanger thus decreasing the concentration of neutron capturing material in said solution; and

means connecting the discharge side of said second ion exchanger with the first vessel for discharging the solution of lower concentration thereinto and;

separate means are connected to opposite sides of said first and second ion exchangers for selectively diverting the solutions from the heater and cooler respectively to said second and first ion exchangers, and from the outlet of said second and first ion exchangers respectively to the second and first vessels; thereby providing separate solutions of low and high neutron capturing material respectively in the first and second vessels to be separately supplied to said reactor according to reactor requirements.

4,073,684

RELEASABLE EXTENSION SHAFT COUPLING

Martin D. Cepkauskas, Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Sept. 27, 1976, Ser. No. 727,068
Int. Cl.[2] G21C *7/10*
U.S. Cl. 176—86 R **3 Claims**

1. In a nuclear reactor, a control element assembly, including,

a spider from which the control rod assembly depends,

an axial bore in the spider,

collet fingers attached to the spider at a position within the spider bore with their upper ends extended above the spider,

a plunger positioned within the upper ends of the collet fingers to carry a flared surface of the plunger against the internal surface of the collet fingers in applying a lateral force to the fingers when the plunger is moved upward,

a buffer pin fixedly attached to a support plate in the nuclear reactor for cooperation with said control element assembly,

a piston positioned within the axial bore of the spider below the plunger for engagement with said buffer pin inserted into the spider bore from below,

and a spring element positioned in the axial bore of the spider to extend between the plunger and piston and exert its force on both,

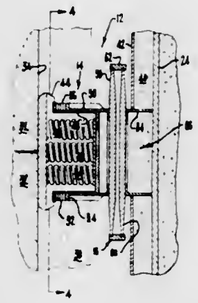
such that collet fingers are spread into engagement with a collet gripper on a control rod extension shaft assembly and the piston exerts a buffer force on said buffer pin contacting the piston from below.

4,073,685

REACTOR CORE LATERAL RESTRAINT ASSEMBLY

Stanley J. Brown, and Wilhelm Gorholt, both of San Diego, Calif., assignors to General Atomic Company, San Diego, Calif.

Filed Feb. 20, 1976, Ser. No. 659,597
Int. Cl.[2] G21C *13/04*
U.S. Cl. 176—87 **9 Claims**



1. In a nuclear reactor including a vessel forming a shielded cavity with a reactor core being arranged within the cavity in generally spaced-apart relation from the vessel and vertically supported in a manner permitting at least limited movement of the core relative to the vessel along three perpendicular axes, a lateral restraint assembly comprising

a plurality of spring packs arranged in spaced-apart relation from each other between lateral surfaces of the reactor core and the vessel, each of the spring packs including

at least one coil spring providing a relatively low-rate spring means and permitting multi-axial movement,

a relatively high-rate spring means,

means connecting the relatively low-rate coil spring with one of the core and vessel,

means connecting the relatively high-rate spring means with the other of the core and vessel,

means interconnecting the relatively low-rate coil spring with the relatively high-rate spring means, and

stop means limiting the spring response of the relatively low-rate coil spring so that initial multi-axial movement of the core relative to the vessel tends to be absorbed by the relatively low-rate coil spring while movement of the core relative to the vessel is resisted by the relatively high-rate spring means after the stop means limits response of the coil spring.

4,073,686

BIOLOGICAL PROCESS FOR SCRUBBING SMOKEHOUSE SMOKE

Jac Adams, Lake St. Louis, Mo., assignor to Krey Packing Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 649,913, Jan. 16, 1976, abandoned. This application Jan. 17, 1977, Ser. No. 760,224
Int. Cl.[2] C12B *1/00*; B01D *47/00*
U.S. Cl. 195—2 **9 Claims**

1. For scrubbing the smokes of meat processing plants, the process comprising the steps of

conducting said smoke containing particulate and gaseous organic matter into a column inlet, up through an air-pervious filler material within such column, and toward an outlet of such column,

mixing into water hydrolytic enzymes and aerobic bacteria,

trickling said water through said filler material thereby to form an interface between said water and said smoke containing particulate and gaseous organic matter,

dissolving such particulate and gaseous organic matter by partial hydrolysis with said enzymes at such interface,

by said enzymes further hydrolyzing said dissolved partially hydrolyzed matter into metabolizable subunits,

maintaining said aerobic bacteria in said mixture without sufficient organic material to support their growth and reproduction, and

oxidizing to substantial completion said metabolizable subunits by said acrobic bacteria without causing same to reproduce,

whereby such particulate and gaseous organic matter is effectively oxidized to carbon dioxide and water without substantial accumulation of sludge, cell mass, or dissolved byproducts of fermentation.

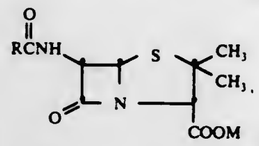
4,073,687

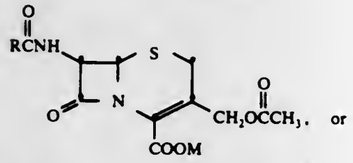
ENZYMATIC ACYLATION TO AFFORD β-LACTAM ANTIBIOTICS

Eiji Kondo, Ikeda, and Takashi Mitsugi, Izumiotsu, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

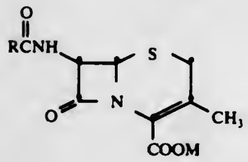
Filed May 12, 1976, Ser. No. 686,219
Claims priority, application Japan, May 14, 1975, 50-57844
Int. Cl.² C12D *1/02*
U.S. Cl. 195—36 P 11 Claims

1. A process for preparing a penicillin or cephalosporin antibiotic of the formula





or



wherein



is an acyl group derived from an α-amino acid, an N- ammonium salt of an α-amino acid or an N—(C_1 to C_{10}) acyl-α-amino acid and COOM is carboxy or a carboxylate salt group, which comprises reacting an amino compound selected from the group consisting of 6-aminopenicillanic acid, 7-aminocephalosporanic acid, 7-aminodeacetoxycephalosporanic acid and salts thereof with an ester of the formula



wherein



is as defined above and R^1 is a (C_1 to C_{10}) alkyl group, by enzymatic acylation effected with mycelium or mycelium preparation from a microorganism belonging to the genus *Aphanocladium* or to *Cephalasporium caremoioides* Raillo.

4,073,688

PROCESS FOR THE PREPARATION OF A PROTEINACEOUS CONCENTRATE

Ladislav Forman; Milos Mergl; Jiri Mostecky; Milos Teply, and Jiri Uher, all of Prague, Czechoslovakia, assignors to Vysoka skola chemicko-technologicka, Prague, Czechoslovakia

Filed Dec. 29, 1975, Ser. No. 644,918
Int. Cl.² C12C *11/00, 11/12;* C12B *1/00*
U.S. Cl. 195—49 4 Claims

1. In a process for the preparation of a proteinaceous concentrate by aerobic activation of yeast wherein a protein-poor whey selected from the group consisting of sweet whey and acid whey is enriched with nitrogenous substances, the pH of the enriched whey is adjusted with an acid, mineral constituents are added to the whey and fermentation thereof is effected in the presence of oxygen, the improvement which comprises, subsequent to the fermentation step, heating the whey to a boil to effect coagulation of foam-forming substances, cooling the whey to a temperature within the range of 26°–34° C, adjusting the pH of the resultant solution to a value within the range of 4.0–6.0 and subjecting said solution to a second fermentation with yeast of the genus CANDIDA in an alcoholic medium, the concentration of which is maintained within the range of from 0.1–0.2%, by weight, ethanol, based on the weight of said medium, under aerobic conditions.

4,073,689

METHOD FOR IMMOBILIZING ENZYME

Ryoichi Senju, 41-18, Higashiwakahisa, Minami, Fukuoka, Fukuoka, Japan, and Hiroo Tanaka, Fukuoka, Japan, assignors to Ryoichi Senju, Japan

Continuation of Ser. No. 653,261, Jan. 28, 1976, abandoned. This application May 9, 1977, Ser. No. 795,133
Int. Cl.² C07G *7/02*
U.S. Cl. 195—63 11 Claims

1. A method for immobilizing an enzyme which comprises reacting an enzyme with a compound or material having multivalent halogenoamide groups obtained by reacting

a. a polycarboxylic acid amide,

b. a water-soluble multi-valent amide compound obtained by carbamoylizing polyhydric alcohols, sugars or water-soluble multi-valent alcohols having high molecular weight, or

c. a carbamoylized solid carrier having amide groups

with a hypohalogenite in an alkaline medium.

11. An immobilized enzyme produced by the method according to claim 1.

4,073,690

CITROBACTER FREUNDII BROTH

Sandra F. Gibson, St. Louis, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed May 3, 1976, Ser. No. 682,654
Int. Cl.² C12K *1/06*
U.S. Cl. 195—100 10 Claims

1. A broth medium for selective identification of *Citrobacter freundii* comprising:

a. a source of nutrients including at least one sugar that specifically enhances the growth of *C. freundii* and is fermentable by *C. freundii* to acidify the said broth, said sugars being selected from palatinose, rhamnose, and combinations thereof,

b. a gram-positive inhibitor, and

c. an inhibitor to inhibit the growth of organisms that give false positive results in tests for *C. freundii,*

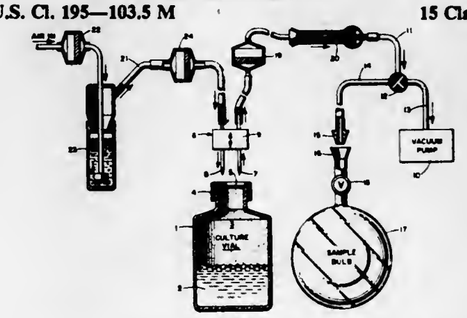
d. said broth medium being responsive to a pH change toward and induced by said sugar fermentation by *C. freundii* to indicate the presence of *C. freundii* in said broth.

4,073,691

METHOD FOR DETECTING THE PRESENCE OF BIOLOGICALLY ACTIVE AGENTS

Joseph E. Ahnell, Baltimore; Rodney L. Broman, Falston, and John R. Waters, Towson, all of Md., assignors to Johnston Leonard L. Ciaccio, 55 Yardley Court, Glen Rock, N.J. 07452, and Klaus Hameyer, 947 Round Bay Road, Norfolk, Va 23502

Int. Cl.² C12K *1/04*
U.S. Cl. 195—103.5 M 15 Claims



1. A method for detecting the presence of bacteria comprising the steps of:

a. providing a sealable, sterile container containing a sterile, non-radioactive culture medium comprising at least one substrate material convertible to a selected gaseous product by direct bacterial action, said container further containing a quantity of culture gas comprising an inert reference gas in said container above said culture medium, said container comprising means to facilitate the introduction of a sample of test material into the container;

b. determining the initial ratio of the selected product gas to the reference gas in said culture gas;

c. introducing a sample of material to be tested for bacterial activity into the container and sealing the container;

d. subjecting the sealed container to conditions conducive to bacterial growth for a predetermined period of time sufficient for fermentation of the culture medium to produce the selected gaseous product;

e. thereafter withdrawing a sample of the culture gas from said sealed container and determining the ratio of the selected product gas to reference gas in the culture gas sample; and

f. comparing the ratio of the selected product gas to reference gas in the culture gas sample to the initial ratio of selected product gas to reference gas in the culture gas.

4,073,692

METHOD AND APPARATUS FOR AUTOMATED MEASUREMENT OF ENERGY OXYGEN

Leonard L. Ciaccio, 55 Yardley Court, Glen Rock, N.J. 07452, and Klaus Hameyer, 947 Round Bay Road, Norfolk, Va. 23502

Filed Apr. 21, 1975, Ser. No. 570,089
Int. Cl.² C12B *1/00*
U.S. Cl. 195—103.5 R 18 Claims

1. Apparatus for determining the amount of dissolved oxygen consumed by microorganisms while assimilating biologically oxidizable material in a liquid medium, comprising:

a. first supply means for producing and supplying a liquid saturated with a gas containing oxygen;

b. second supply means for introducing a measured sample of said liquid medium containing biologically oxidizable material into said oxygen containing liquid;

c. reactor means containing said microorganisms in sessile condition and having an inlet and outlet port communicating with said first supply means, wherein said microorganisms consume a portion of said oxygen in reacting with said biologically oxidizable material;

d. pump means interconnecting said first supply means and said reactor means for continuously recirculating said mixture of sample and oxygen containing liquid medium through said reactor means and said first supply means;

e. analytical means for automatically measuring the amount of dissolved oxygen consumed by said microorganisms in said reactor means; and

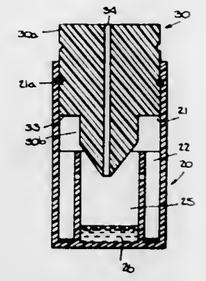
f. timer means interconnected with said second supply means, said pump means and said analytical means for causing the same to operate in a timed relation to one another.

4,073,693

APPARATUS AND METHOD FOR CONDUCTING A PLURALITY OF BIOLOGICAL TESTS

Pierre R. Janin, New York, N.Y., assignor to American Home Products Corporation, New York, N.Y.

Filed June 8, 1976, Ser. No. 693,902
Int. Cl.² C12B *1/00*
U.S. Cl. 195—103.5 K 20 Claims



1. A biological testing device comprising:

a tubular container having an opening in its upper portion extending across the longitudinal axis of the tubular container, the lower portion of the tubular container being closed, structure forming a plurality of tubes disposed adjacent the inside periphery of the lower portion of the container, each tube having its length extending substantially parallel to the longitudinal axis of the container and having an open end portion facing the opening in the upper portion of the container and a closed end portion disposed opposite thereto, the tubes and the closed end portion of the container forming a central open chamber therewithin facing and substantially in alignment with the opening in the container, the chamber holding a biological test suspension; and

a predetermined chemical reagent material disposed at the closed end portion of each of said tubes; and

a plug for closing the upper portion of the container, the plug a cap portion and a neck portion narrower than the cap portion and adjacent thereto, the cap and neck portions forming a shoulder therebetween, the cap portion of the plug fitting slidingly and removably within the upper portion of the container to substantially seal the container, the plug having an initial position with respect to the container in which the cap portion of the plug is engaged with the upper portion of the container and the shoulder portion of the plug is spaced from the open end of each of the plurality of tubes, the plug in the initial position thereof enabling the test suspension to pass from the central open chamber to the shoulder of the plug when the testing device is inverted, the neck portion of the plug fitting slidingly and removably within the central open chamber and substantially sealing said chamber when the plug is fully inserted into the container, the plug having a final position with respect to the container in which the cap portion of the plug is further within the upper portion of the chamber, the neck portion of the plug engages and substantially seals the open central chamber and the shoulder portion of the plug is adjacent the open end of each of the plurality of tubes and substantially divides the test

specimen in an approximately equal amount with respect to each of the tubes, the divided test specimen being confined within the individual tubes as the testing device is reinverted.

19. A method for testing a bacterial suspension against a plurality of testing reagents, by employing a tubular container being open at one end portion and having disposed adjacent the inside periphery of the closed end portion, disposed opposite the end portion, a plurality of microtubes each having an opening facing the open end portion of the container, the container having an open central chamber, each of said plurality of microtubes being provided at its closed end opposite the opening thereof with a predetermined chemical reagent, wherein the method comprises the following steps:

a. depositing a sample of bacterial suspension to be tested into the bottom of the central chamber,
b. inserting a plug of predetermined configuration to a first position to seal the open-end portion of the tubular container, while leaving open the open ends of the microtubes, said plug having an upper portion slidingly fitting in the upper cap portion of the container in first and second positions and a lower neck portion slidingly fitting in the central chamber in said second position;
c. inverting the entire apparatus such that the bacterial suspension flows to the sealed open end portion below the open end portion of the microtubes;
d. moving said plug to said second position to seal the central chamber from the open end of the microtubes while the device remains in its inverted position; and
e. reinverting the device to enable the bacterial suspension to flow in substantially equal amounts to the individual microtubes.

4,073,694

MICROBIOLOGICAL ASSAY OF AMINOGLYCOSIDE ANTIBIOTICS

Dennis Buda, Baltimore; Rodney L. Broman, Baldwin, and John R. Waters, Towson, all of Md., assignors to Johnston Laboratories, Inc., Cockeysville, Md.

Filed Apr. 5, 1976, Ser. No. 673,359
Int. Cl.² C12K *1/00*
U.S. Cl. 195—103.7 **9 Claims**

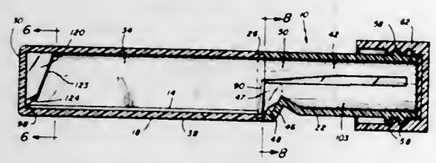
1. In a method of determining the concentration of an aminoglycoside antibiotic in blood wherein an aliquot of the liquid portion of blood from a patient being treated with said aminoglycoside antibiotic is incubated in a urea containing test medium with a susceptible strain of an adaptive urease producing microorganism, the improvement comprising using a microorganism having the characteristics of *Proteus rettgeri* JLI 03, ATCC No. 31168 as the adaptive urease producing microorganism.

4,073,695

LEIGHTON TUBE

George F. Lyman, Weston, Mass., assignor to Data Packaging Corporation, Cambridge, Mass.

Filed Aug. 11, 1976, Ser. No. 713,441
Int. Cl.² C12K *1/00, 9/00*
U.S. Cl. 195—127 **15 Claims**



15. A Leighton tube assembly comprising a tube closed at one end and open at the other, a neck adjacent said open end, a chamber toward said closed end which merges with said neck, means for closing said tube at said open end, and a cover slip,

said chamber having a wall with a flat portion lying, at its outside, in a plane through which no part of said tube penetrates so that said tube may be located in a substantially horizontal incubating position with said flat portion in contact with supporting planar horizontal surface.

an inwardly protruding dam lying between said chamber and neck to prevent the flow of a liquid from the chamber into said neck when the Leighton tube is in its incubating position,

said neck communicating with said chamber above said dam through a passage,

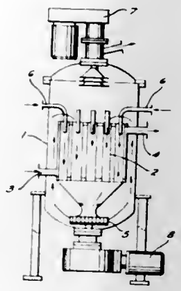
said cover slip having a flat culture segment and a handle, said culture segment and said handle being disposed in separate planes, said handle extending through said passage into and terminating within said neck when the cover slip is positioned in said chamber.

4,073,696

APPARATUS FOR COMBINED COOLING AND AERATION OF BIOCHEMICAL-ACTION VESSELS

Hans Müller, Im Almendli, Erlenbach, Zurich, Switzerland

Filed Mar. 17, 1975, Ser. No. 559,362
Claims priority, application Switzerland, Mar. 18, 1974, 3808/74; Sept. 10, 1974, 12389/74
Int. Cl.² C12B *1/16*
U.S. Cl. 195—142 **3 Claims**



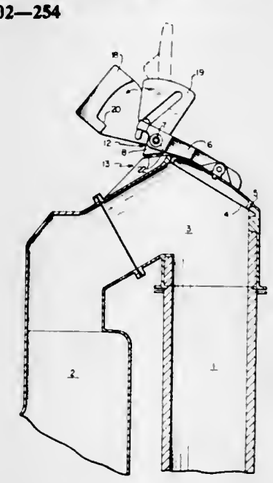
1. In an apparatus for growing microorganisms in a substrate, a combination comprising container means defining a chamber for the substrate; heat-exchange means in said chamber, including wall means defining a plurality of substantially vertically oriented channels for the substrate each having an upper and a lower end portion; means for advancing the substrate through said channels in a downward direction, including an impeller located downwardly of said lower end portions of said channels and operative for generating regions of suction in the substrate in said channels; and means for aerating the substrate, including a plurality of supplying pipes each of which extends from above into a respective upper end portion of one of said channels to bound an annular gap in said respective upper end with said wall means and each of which is operative for supplying an aerating gaseous medium to the respective region of suction in said one channel at the respective annular gap for the aerating gaseous medium to be entrained by the advancing substrate for joint advancement therewith first in said downward direction through the remainder of said one channel downstream of the respective supplying pipe, toward said impeller and then through the remainder of said chamber outside said heat exchange means so that the substrate issuing from said lower end portions of said channels of said heat-exchange means has a degree of aeration and a temperature which are optimum for the growth of the microorganisms present in the substrate.

4,073,697

IMPACT ABSORBING ATTACHMENT FOR RISER COVER

Martin Prötzl, Essen, Germany, assignor to Didier Engineering GmbH, Essen, Germany

Filed Oct. 14, 1976, Ser. No. 732,289
Claims priority, application Germany, Oct. 22, 1975, 7533508[U]
Int. Cl.² C10B *27/06;* F16F *15/04*
U.S. Cl. 202—254 **17 Claims**



1. In a riser for transmitting fill gases from a coke-oven chamber to a collecting main, said riser being of the type including a riser corner element having an opening therein, a cover fixedly mounted on a shaft, said shaft being rotatable to move said cover from a closed position covering said opening to an open position uncovering said opening, and means for rotatably mounting said shaft to said riser corner element, the improvement wherein said mounting means comprises:

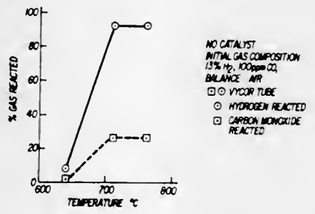
a supporting device rigid with said riser corner element;
a cover bearing member separate from said supporting device, said shaft being rotatably mounted in said bearing member; means for attaching said bearing member to said supporting device; and
at least one shock absorbing means, positioned between said bearing member and said supporting device, for damping impacts imparted to said bearing member due to opening of said cover.

4,073,698

METHOD AND DEVICE FOR THE DETECTION AND MEASUREMENT OF CARBON MONOXIDE IN THE PRESENCE OF HYDROGEN

Keith F. Blurton, Yorktown, and Joseph R. Stetter, Peekskill, both of N.Y., assignors to Energetics Science, Inc., Elmsford, N.Y.

Filed June 4, 1976, Ser. No. 692,919
Int. Cl.² G01N *27/46*
U.S. Cl. 204—1 T **9 Claims**



1. A method for the detection of carbon monoxide in the presence of interfering concentrations of hydrogen which comprises heating a gas sample containing said carbon monoxide and hydrogen in an oxidizing atmosphere at a temperature of at least 700° C in a non-catalytic reaction zone to selectively oxidize the hydrogen to water, and passing the gaseous reaction product from the selective oxidation to an electrochemical carbon monoxide detection instrument.

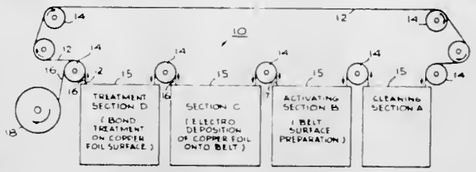
4. An apparatus for detecting carbon monoxide in gas samples containing interfering concentrations of hydrogen in admixture with said carbon monoxide which comprises a reactor comprising a non-catalytic reaction zone, inlet and outlet means to and from said reaction zone, means for heating said reaction zone to a temperature in excess of about 700° C in combination with an electrochemical carbon monoxide detection instrument, communication means between said detection instrument and the outlet of said reaction zone, means for drawing said gas sample through said reaction zone and into said detection instrument at a controlled flow rate and read out means for reading the quantity of carbon monoxide detected.

4,073,699

METHOD FOR MAKING COPPER FOIL

Irving J. Hutkin, 8983 Complex Drive, San Diego, Calif. 92123

Filed Mar. 1, 1976, Ser. No. 662,551
Int. Cl.² C25D *1/04, 1/20, 1/22*
U.S. Cl. 204—13 **12 Claims**



1. An improved method of continuously making high quality pore-free copper foil, said method comprising:

a. moving into an operative position an endless, continuous belt, said belt comprising a metal selected from the group of stainless steel, aluminum, nickel, titanium, copper, brass, bronze, or alloys thereof, or mild steel, iron, lead or alloys thereof;
b. electro-chemically depositing in a deposition zone a clean fresh, removable, endless, seamless and continuous plateable layer of metal selected from the group of chromium, nickel and cobalt;
c. depositing in a deposition zone a coating of porefree copper onto said metal to form a copper foil;
d. stripping said copper foil from said metal layer in a separation zone;
e. chemically removing the plateable layer from said belt in a cleaning zone in a manner to substantially preserve the structural integrity of the belt; and
f. repeating the above steps a plurality of times, whereby a continuous method for producing copper foil is provided.

4,073,700

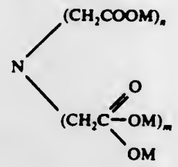
PROCESS FOR PRODUCING BY ELECTRODEPOSITION BRIGHT DEPOSITS OF GOLD AND ITS ALLOYS

Alfred M. Weisberg, 48 Barberry Hill, Providence, R.I. 02906, and Harry Kroll, 408 Fair St., Warwick, R.I. 02888

Continuation of Ser. No. 556,691, March 10, 1975, abandoned, which is a continuation of Ser. No. 425,182, Dec. 17, 1973, abandoned, which is a continuation of Ser. No. 319,157, Dec. 29, 1972, abandoned, which is a continuation of Ser. No. 166,030, July 26, 1971, abandoned. This application July 2, 1976, Ser. No. 702,041
Int. Cl.² C25D *3/48, 3/62*
U.S. Cl. 204—43 G **8 Claims**

1. In a process for producing bright gold or gold-base alloy deposits, in a pH range between 3 and 8, from an aqueous

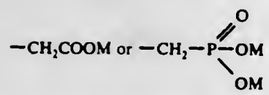
solution containing a water soluble complex of gold cyanide, the improvement comprising carrying in solution in said solution a chelating agent selected from the group consisting of those represented by the formula:



where m and n are either 1 or 2 and $m + n = 3$, and M is hydrogen or an alkali metal cation, and those represented by the formula:



where n is 1, 2, or 3 and R may be either



at least one R group being either a methylene carboxylic acid group or a methylenephosphonic acid group, and not all R's the same, and

M is hydrogen or an alkali metal cation

which process comprises electrolyzing said solution employing a metal object to be electroplated as a cathode in said electrolytic operation.

4,073,701

ACID ELECTROTINNING BATH

Richard N. Steinbicker, Coopersburg, and Stewart E. Rauch, Bethlehem, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Oct. 15, 1976, Ser. No. 732,821

Int. Cl.² C25D *3/32*

U.S. Cl. 204—54 R **27 Claims**

1. An improved aqueous acid halogen electrotinning bath for electrolytically depositing tin onto a steel substrate, containing bivalent tin ions, sodium fluoride, sodium chloride, stabilizing and solubilizing agents, addition agents for electrodepositing a smooth coherent layer of tin onto said substrate and at least about 0.10 grams per liter of solution of at least one acetanilide taken from the group consisting of para-aminoacetanilide and para-nitroacetanilide, said bath being characterized by having reduced susceptibility of the bivalent tin ion to oxidation to the quadrivalent tin ion.

6. An improved aqueous acid halogen electrotinning bath for electrolytically depositing tin onto steel sheet and strip containing bivalent tin ions, sodium fluoride, sodium bifluoride, sodium chloride, sodium ferrocyanide, addition agents necessary to deposit a smooth, coherent layer of tin onto said steel sheet and strip and at least about 0.10 gram per liter of solution of at least one organic ring compound containing at least one radical taken from the group consisting of the amino group, $-NH_2$, and the nitro group, $-NO_2$, in the ortho or para position, said organic ring compound taken from the group consisting of para-aminoacetanilide, para-nitroacetanilide, para-aminophenylacetic acid and 4-aminoantipyrine.

4,073,702

ELECTROCHEMICAL CELLS

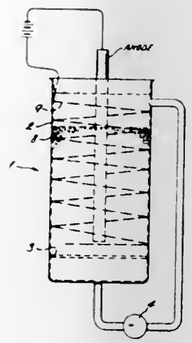
Martin Fleischmann, Eastleigh; Francis Goodridge, Newcastle-upon-Tyne, and Christopher John Vance, Jarrow, all of England, assignors to National Research Development Corporation, London, England

Filed Oct. 12, 1976, Ser. No. 731,374

Claims priority, application United Kingdom, Oct. 10, 1975, 41622/75

Int. Cl.² C25C *1/00, 1/12, 7/06, 7/02*

U.S. Cl. 204—59 R **11 Claims**



1. An electrochemical cell comprising a particulate electrode having a current feeder member and a mass of particles, the particles having surfaces at least some of which are electronically conductive, means for passing an electrolyte through said particulate electrode such as to expand the mass of particles at least into a fluidized bed in contact with said current feeder member and a counterelectrode in direct contact with at least some particles of said particulate electrode, the material of the surface at least of said counterelectrode being electrically conducting, but the contact resistance in air between a surface of said material and the superficial area of a copper test surface being at least about 10 times the contact resistance under the same conditions of measurement between the said area of said copper test surface and another surface of copper.

4,073,703

ELECTROLYTIC PRODUCTION OF MAGNESIUM

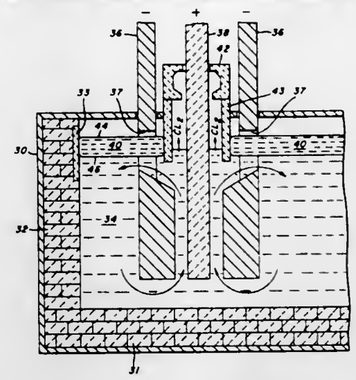
Donald L. Kinosz, Lower Burrell, and Warren E. Haupin, New Kensington, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 14, 1976, Ser. No. 750,506

Int. Cl.² C25C *3/04*

U.S. Cl. 204—70 **9 Claims**

1. An electrolytic cell having a refractory lining therein and an anode and a cathode for the production of magnesium by decomposition of molten magnesium chloride contained in an electrolyte, the magnesium produced at the cathode and chlorine at the anode, said magnesium accumulating in a layer at the surface of said molten magnesium chloride containing electrolyte, a shroud having a skirt portion thereon projecting into the electrolyte such that said chlorine produced at said anode is removed from said cell without contacting the molten magnesium layer, said shroud formed from a nitride-based refractory material selected from the group consisting of silicon oxynitride, silicon nitride bonded fused silica, silicon nitride and boron nitride resistant to said molten magnesium, magnesium chloride containing electrolyte and gases emanating therefrom.



4,073,704

METHOD FOR MAGNESIUM PRODUCTION USING TUNGSTEN OR MOLYBDENUM

Alvin Francis Beale, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 8, 1976, Ser. No. 739,768

Int. Cl.² C25C *5/04, 3/04*

U.S. Cl. 204—70 **8 Claims**

1. A continuous method for the production of metallic magnesium by electrolytically decomposing magnesium chloride with a cathode and an anode in a molten salt bath comprising an alkali metal chloride and magnesium chloride the steps which comprise

A. heating and fusing the salt bath at a temperature in the range from about 660° to about 900° C.,

B. passing direct current through said bath to decompose the magnesium chloride,

maintaining a concentration of magnesium chloride in the salt bath in the range from about 5 to about 35 percent by weight by periodic additions thereof,

D. adding periodically to the salt bath sufficient amounts of an additive selected from the group consisting of inorganic salts of molybdenum, inorganic salts of tungsten, metallic molybdenum, metallic tungsten or mixtures thereof which will coat the cathode surface with said metal and thereby increase the agglomeration of molten magnesium, and

E. recovering molten magnesium from said salt bath.

4,073,705

METHOD FOR TREATING USED OR EXHAUSTED PHOTOGRAPHIC FIXING SOLUTION

Eiichi Torikai, Yao, and Youji Kawami, Kawachinagano, both of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Oct. 12, 1976, Ser. No. 731,687

Claims priority, application Japan, Oct. 20, 1975, 50-126749

Int. Cl.² C25B *1/00*

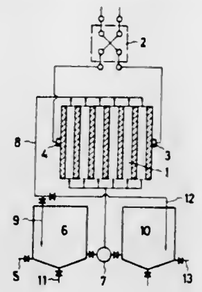
U.S. Cl. 204—92 **2 Claims**

1. A method for treating a used or exhausted photographic fixing solution containing silver and sulfur components in an electrolytic cell which comprises

a. electrolyzing the solution for a period of time sufficient to convert the silver component to a silver sulfide precipitate while reversing the polarity of the electrodes,

b. separating the precipitate from the solution, and

c. electrolyzing the resulting solution to lower the COD value while repeatedly reversing the polarity of the electrodes,



whereby the reversing of the polarity of the electrodes in steps (a) and (c) prevents the adherence of any colloidal silver sulfide or sulfur to the electrodes.

4,073,706

BRINE TREATMENT FOR TRACE METAL REMOVAL

Zoltan Nagy, Mentor, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Feb. 6, 1976, Ser. No. 655,691

Int. Cl.² C25B *1/16*

U.S. Cl. 204—98 **8 Claims**

1. A method for reducing the trace metals content of an aqueous alkali metal chloride solution containing less than abaout 5 ppm of magnesium followed by electrolysis of the solution, which comprises

a. adding soluble magnesium compound to the solution to establish a magnesium concentration of greater than 5 ppm,

b. precipitating the magnesium as $Mg(OH)_2$,

c. separating the precipitate containing said trace metals from the solution, and

d. electrolyzing the solution to produce chlorine and alkali metal hydroxide.

4,073,707

METHOD OF OPERATING A CIRCULATING BED CELL

Placido Maria Spaziante; Rinaldo Santi, both of Milan, Italy, and Vittorio De Nora, Nassau, Bahamas, assignors to Parel Societe Anonyme, Luxembourg

Filed Dec. 22, 1976, Ser. No. 753,228

Int. Cl.² C25C *1/00, 1/12*

U.S. Cl. 204—105 R **19 Claims**

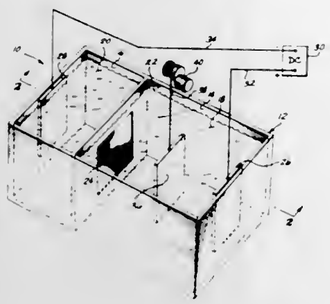
1. A method of controlling the size distribution of electroconductive particles constituting a particulate cathode in an electrochemical cell during operation of the cell to deposit metal from solution onto the particles of the particulate cathode whereby the size of the said particles increases progressively, which method comprises extracting particles from the particulate electrode and subjecting the extracted particles to elutriation, the flow of elutriating fluid being such that particles larger than a predetermined size are able to settle against the flow of elutriating fluid, while the other particles, which are to be returned to the electrochemical cell, are carried along by the flow of elutriating fluid and are then returned to the electrochemical cell after separation from the elutriating fluid or along with the elutriating fluid.

4,073,708

APPARATUS AND METHOD FOR REGENERATION OF CHROMOSULFURIC ACID ETCHANTS

Harry Clark Hicks, Jr., Puyallup, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed June 18, 1976, Ser. No. 697,600
Int. Cl.[2] C25C *1/12*; C25F *3/02*; C25C *7/04, 7/06*
U.S. Cl. 204—106 6 Claims



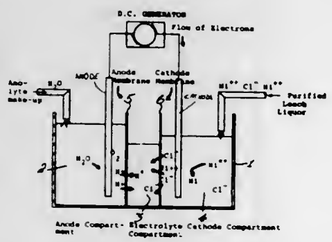
1. An apparatus having a tank for etching copper in a chromic-sulfuric etchant and for regenerating the etchant and depositing out dissolved copper within the tank, the apparatus comprising: means for dividing an etchant tank into two compartments adapted to contain an aqueous copper etching hexavalent chromic oxide-sulfuric acid etchant in an etching compartment and adapted to contain an aqueous solution consisting essentially of alkali metal sulfate or sulfuric acid in a cathode compartment, a permeable membrane communicating between the two compartments, an anodic electrode located in the etching compartment, an electrode located in the cathode compartment, means for passing an electric current between the electrodes, and means for introducing a copper containing article into the etching compartment to permit simultaneous etching of the article regeneration of the etchant and deposition of copper in the etchant tank.

4,073,709

ELECTROLYTIC RECOVERY OF NICKEL AND ZINC

Willem Hubert Pittie, Rooderpoort, Transvaal, and Gerhardus Overbeek, Florida, Transvaal, both of South Africa, assignors to Anglo-Transvaal Consolidated Investment Company Limited, Johannesburg, South Africa

Filed Sept. 2, 1975, Ser. No. 609,812
Claims priority, application South Africa, Sept. 4, 1974, 74/5625
Int. Cl.[2] C25C *1/08, 1/16*
U.S. Cl. 204—113 9 Claims



1. A method for electrolytically recovering a metal selected from the group consisting of nickel and zinc from a solution containing nickel or zinc ions and anions, wherein the anions are substantially purely chloride, comprising:

introducing the solution into a cathode containing compartment of an electrolytic cell which is divided into three compartments, namely an anode containing compartment, a cathode containing compartment, and an electrolyte compartment therebetween, the anode containing compartment being defined by a porous aluminum silicate diaphragm of low permeability to substantially inhibit migration of chloride ions into the anode containing compartment and which separates anolyte from electrolyte, the anolyte comprising a solution containing anions which have an oxidation potential sufficiently high to ensure that substantially only the decomposition of water takes place at the anode under operating conditions and wherein the cathode containing compartment is defined by a diaphragm of relatively high permeability, and

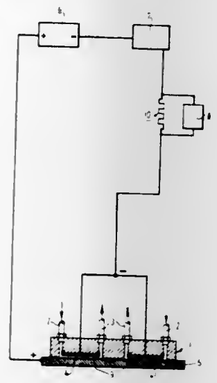
applying an electrical potential to said anode and cathode to cause migration and deposition of said metal at said cathode, to cause hydrogen ions to migrate through the porous aluminium silicate diaphragm by the Grotthus mechanism, and decomposition of water at said anode.

4,073,710

METHOD OF MACHINING ELECTRICALLY CONDUCTING SUBSTANCES BY ELECTROCHEMICAL ATTACK

Kommer Visser, Amsterdam-Bijlmermeer, Netherlands, assignor to Ultra Centrifuge Nederland N.V., The Hague, Netherlands

Filed July 14, 1976, Ser. No. 705,174
Claims priority, application Netherlands, Aug. 11, 1975, 7509529
Int. Cl.[2] C25F *3/00, 3/02*; C25D *17/12*
U.S. Cl. 204—129.65 7 Claims



1. A method of removing material from the surface of a workpiece made of an electrically conducting substance by electrochemical attack comprising:

providing a non-conducting template in association with the workpiece and flowing a liquid electrolyte into contact with the surface of the workpiece at at least one exposed place determined by the template, the template being adapted in shape to the surface from which material is to be removed and being provided with at least one elongated channel for the afflux of the liquid at the places where an elongated recess or groove is desired in the workpiece; and passing a direct current in pulses of 5-20 milliseconds between the exposed surface of the workpiece and at least one electrode which has the form of the desired recess and which is provided in the channel in the template.

4,073,711

METHOD OF PRODUCING LITHIATED BETA-ALUMINA ARTICLES

Robert W. Powers, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 22, 1976, Ser. No. 743,633
Int. Cl.[2] C25D *1/14, 1/20*
U.S. Cl. 204—181 F 4 Claims

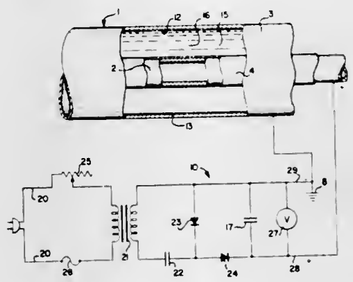
1. A method of producing a lithiated beta-alumina article comprising providing a suspension of beta-alumina particles and soda alumina particles with a soda content from 14 to 30 weight percent, providing lithia in at least one of the types of particles, the majority of the particles having a diameter in the range of 1 to 2 microns in an organic liquid having a dielectric constant at 25° C from 12 to 24, electrophoretically codepositing the particles from the suspension as a dense deposit onto a charged electrode in a DC field of from 100 to 10,000 volts per centimeter, drying the deposit on the electrode, removing the deposit from the electrode, and sintering the deposit in an oxidizing atmosphere at a temperature between 1500° and 1775° C resulting in a dense, fine-grain sintered article containing from 0.1 to 1.0 weight percent lithia.

4,073,712

ELECTROSTATIC WATER TREATMENT

Eldon A. Means, Wichita, Kans., and Roy C. McMahon, Kansas City, Mo., assignors to Electrostatic Equipment Company, Kansas City, Mo.

Filed Nov. 19, 1976, Ser. No. 743,139
Int. Cl.[2] B03C *5/00*
U.S. Cl. 204—186 30 Claims



1. A device for treating a fluid with an electrostatic field comprising:

(a) a pair of electrodes mounted in spaced relation;

(b) means for directing a fluid between said electrodes;

(c) said electrodes each having a respective dielectric covering insulating said electrodes from said fluid, said insulating covering on at least one of said electrodes being a hard anodized coating;

(d) power supply means establishing a direct current potential between said electrodes, said power supply means having a positive terminal connected to one of said electrodes and a negative terminal connected to the other electrode; and

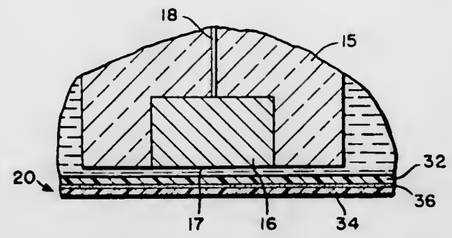
(e) said electrodes, dielectric coverings and fluid forming the equivalent of three capacitors connected in series, said electrodes being spaced apart and sized and said dielectric coverings having thicknesses and dielectric constants whereby the percentage of said potential appearing across said fluid exceeds 50%.

4,073,713

MEMBRANE FOR ENZYME ELECTRODES

David P. Newman, Yellow Springs, Ohio, assignor to The Yellow Springs Instrument Company, Inc., Yellow Springs, Ohio

Continuation-in-part of Ser. No. 616,326, Sept. 24, 1975, Pat. No. 3,979,274. This application July 26, 1976, Ser. No. 708,399
The portion of the term of this patent subsequent to Sept. 7, 1993, has been disclaimed.
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—195 B 9 Claims



1. A polarographic cell structure for use in polarographic analysis of an unknown comprising an electrically insulating support means, and electrode means mounted in said support means, said electrode means mounted in said support means, said electrode means including means defining an active exposed working face, wherein the improvement comprises:

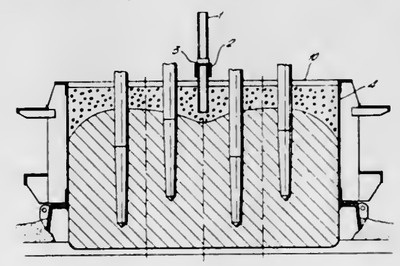
a laminated membrane of a total thickness of less than 25 microns positioned between said working face and said unknown, said membrane consisting essentially of a first layer of an essentially homogeneous material selected from the group consisting of silicone rubber, methyl methacrylate, and cellulose acetate and having a thickness of less than 2 microns, a second layer of a support material which permits passage of low molecular weight substances but excludes high molecular weight substances, said support material having a thickness of between 1 and 20 microns, and an adhesive layer positioned between and bonding said first and second layers, an enzyme being included in said adhesive layer.

4,073,714

MEANS FOR COOLING OF SELF-BAKING ANODES IN ALUMINUM ELECTROLYSIS CELLS

Finn Roed, Havik, Norway, assignor to Norsk Hydro a.s, Oslo, Norway

Filed Apr. 9, 1976, Ser. No. 675,567
Claims priority, application Norway, Apr. 10, 1975, 751257
Int. Cl.[2] C25C *3/06, 3/16, 7/00*
U.S. Cl. 204—243 R 14 Claims



1. A device for cooling a self-baking anode in an electrolysis cell for the producing of aluminum, such anode being of the type including a mantle open at the top and bottom thereof and filled with anode mix, and having first and second groups of

anode bolts extending into opposite sides of said anode mix, said device comprising:

a plurality of solid and unperforated, vertically positioned, longitudinal cooling rods; and

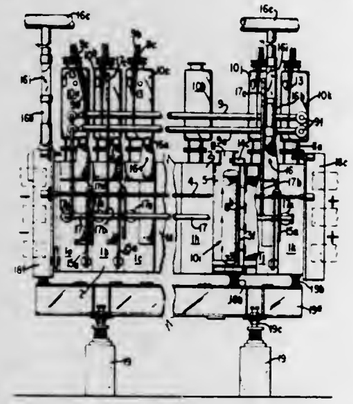
means for supporting said cooling rods peripherally thereof in a row extending only along a narrow band-shaped zone encompassing the longitudinal center line of the anode between the groups of anode bolts, such that a lower portion of each said cooling rod may be submerged in the anode mix and an upper portion of each said cooling rod may extend above the anode mix.

4,073,715

ELECTROLYSIS CELL WITH VERTICAL ANODES AND CATHODES AND METHOD OF OPERATION

Oronzio De Nora, Milan, Italy, and Vittorio De Nora, Nassau, Bahamas, assignors to Oronzio de Nora Impianti Elettrochimici, S.p.A., Milan, Italy

Filed Feb. 5, 1976, Ser. No. 655,493
Claims priority, application Italy, Nov. 28, 1975, 29782/75
Int. Cl.[2] C25B *1/34, 9/00, 11/03*
U.S. Cl. 204—256 **30 Claims**



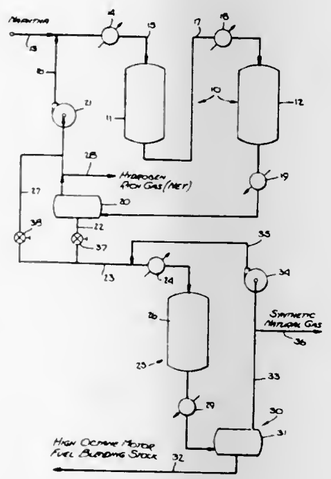
1. Electrolysis cell units for the electrolysis of alkali halide brines, having an anode compartment and a cathode compartment therein, a metal separating partition between each said cell unit and the next adjacent cell unit, comprising a ferrous metal in the cathode compartment and a valve metal in the anode compartment, a metal frame around said anode and cathode compartments, a continuous, imperforate valve metal lining in the anode compartment of said frame and on said separating partition, resistant to the corrosive conditions in said anode compartment, an electrolyte in said cell units, valve metal support studs projecting from said continuous, imperforate valve metal lining, anode support bars connected to said support studs, said anode support bars forming a substantially imperforate separating wall within said anode compartments, separating the anodes from said valve metal separating partition and providing a space at the rear of the anodes for downward recirculation of said electrolyte, a plurality of hollow finger-like valve metal anodes supported on said support bars, a plurality of hollow finger-like cathode waves between said valve metal anode waves, means to pass an electrolysis current through said cell unit and the electrolyte contained therein to circulate said electrolyte upward along both the front and in the interior of said anode waves by the gas lift effect of the gases formed in the electrolysis, and downward behind said anodes, means to collect anodic gases produced in said cell unit and means to collect cathodic gases and cathode liquor produced in said cell unit.

4,073,716

PROCESS FOR PRODUCING SYNTHETIC NATURAL GAS AND HIGH OCTANE MOTOR FUEL COMPONENTS

William C. Pfefferle, Middletown, and William P. Hettinger, Jr., Mountainside, both of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Iselin, N.J.

Filed Nov. 7, 1975, Ser. No. 629,858
Int. Cl.[2] C10G *13/30, 39/00*
U.S. Cl. 208—66 **9 Claims**



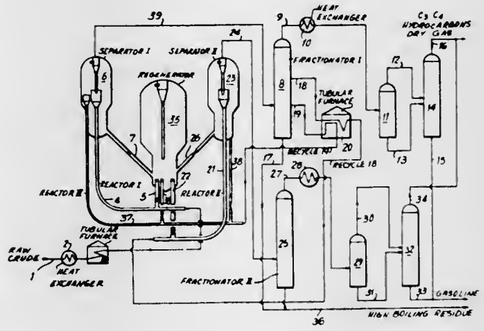
1. A process for producing synthetic natural gas and a motor fuel blending stock component having a high unleaded research octane number, which process comprises catalytically reforming in a reforming reaction zone a naphtha feed-stock containing naphthenes by contacting in said zone said naphtha in the vapor phase and in the presence of hydrogen with a reforming catalyst at low severity reforming conditions selected to maximize the formation of aromatics by dehydrogenation of naphthenes and to minimize hydrocracking of components of said feed-stock; cooling the effluent from said reaction zone and separating said effluent in a first separation zone into a hydrogen-rich gas stream and a liquid low octane reformate, said reformate comprising predominantly aromatics and paraffins and less than about 10% naphthenes, and having an octane number of less than about 95; introducing said reformate into a methanation zone for conversion of non-aromatic hydrocarbons to methane and into contact with a methanation catalyst in the presence of hydrogen, and separating in a second separation zone the effluent from said methanation zone into only two streams, said streams being a high octane motor fuel blending stock component comprising predominantly aromatics and having a higher percentage of aromatics than in said low octane reformate and a synthetic natural gas stream comprising essentially, on a carbon dioxide-free basis, methane and less than about 5% hydrocarbons having more than one carbon atom per molecule, and not more than 10% hydrogen.

4,073,717

PROCESS FOR PRODUCING GASOLINE

Vagab Safarovich Aliev, ulitsa Nizami, 66, kv. 40, Baku; Georgy Georgievich Markarian, Teply stan, 5 mikroraion, korpus 65, kv. 230, Moscow; Musa Ismail ogly Rustamov, ulitsa Gadzhibekova, 16, kv. 3; Evgeny Ivanovich Pryanikov, prospekt Kirova, 65, kv. 17, both of Baku, all of U.S.S.R.; Rustam Gadzhi Ali ogly Ismailova, deceased, late of Baku, U.S.S.R.; Amina Kyazim Kyzy Ismailov, administrator, 1 Chkalovsky pereulok, 7, kv. 8, Baku, U.S.S.R.; by Ali Rustam ogly Ismailova, administrator, 1 Chkalovsky pereulok, 7, kv. 8, Baku, U.S.S.R.; by Dzhulietta Rustamovna Ismailova, administrator, 6 Kommunistichesky pereulok, 10, Baku, U.S.S.R., and by Zhanna Rustamovna Kulieva, administrator, Erevansky pereulok, 2, Baku, U.S.S.R.

Filed Jan. 26, 1976, Ser. No. 652,578
Int. Cl.[2] C10G *11/04;* B01J *8/24, 29/12*
U.S. Cl. 208—74 **2 Claims**



1. A process for producing gasoline which comprises cracking a heavy petroleum feedstock in the presence of aluminosilicate zeolite-containing catalyst which is in a condition of an ascending flow at a temperature ranging from 480° to 520° C and at a mass velocity of said feedstock of from 6 to 40 hr^{-1} in the direction of said ascending flow with the formation of a first reaction mixture containing gasoline, a fraction with a specific gravity of from 0.75 to 0.85 and a fraction with a specific gravity of from 0.85 to 0.95; separating said first reaction mixture from the catalyst and separating from said first reaction mixture a fraction A with a specific gravity of from 0.75 to 0.85 and a fraction B with a specific gravity of from 0.85 to 0.95; cracking said fraction A in the presence of said catalyst which is in a condition of an ascending flow at a temperature of from 460° to 520° C and at a mass velocity of said fraction A of from 6 to 40 hr^{-1} in the direction of said ascending flow with the formation of a second reaction mixture containing gasoline; separating said second reaction mixture from the catalyst; recovering gasoline from said second reaction mixture; cracking said fraction B in the presence of said catalyst which is in a condition of an ascending flow at a temperature of from 460° to 520° C and at a mass velocity of said fraction B selected within the range of from 5 to 8 hr^{-1} with the formation of a third reaction mixture containing gasoline and a fraction C with a specific gravity of from 0.85 to 0.95; and combining fraction C with said first reaction mixture; whereby concentration of the catalyst is increased in the direction of the feedstock stream, due to effecting cracking at a diminishing mass velocity of the feedstock stream.

4,073,718

PROCESS FOR THE HYDROCONVERSION AND HYDRODESULFURIZATION OF HEAVY FEEDS AND RESIDUA

Glen P. Hamner, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 685,500, May 12, 1976, Pat. No. 4,051,021. This application Oct. 18, 1976, Ser. No. 733,717
Int. Cl.[2] C10G *13/06, 39/00;* B01J *8/24*
U.S. Cl. 208—80 **26 Claims**

1. A process for the hydroconversion and hydrodesulfurization of a sulfur-bearing heavy hydrocarbon feed which comprises

splitting said heavy hydrocarbon feed into a high boiling component having a low end boiling point within a range of from about 850° to about 1100° F, and a low boiling component having a high end boiling point within a range of from about 850° to about 1100° F,

contacting said high boiling component feed in a first stage, in the presence of added hydrogen, with catalyst comprising a composite of a porous inorganic oxide support and a metal hydrogenation-dehydrogenation component constituted of from about 5 to about 30 percent of a Group VIB metal, or compound thereof, and from about 1 to about 12 percent of a Group VIII metal, or compound thereof, or admixture of said Group VIB and VIII metals or compounds thereof, said catalyst composite comprising greater than 50 percent of its total pore volume of absolute diameter within the range of from about 70A to about 200A, to convert at least about 30 percent by weight of the 1050° F+ hydrocarbons to 1050° F− hydrocarbons,

separating hydrogen, light ends and by-product hydrogen sulfide from the effluent, and separating therefrom a product having a high end boiling point ranging from about 850° to about 1100° F,

blending said product of high end boiling point with the low boiling component split from the original heavy hydrocarbon feed, and then

contacting said blended low boiling material in a second stage with catalyst comprising a composite of a porous inorganic oxide support and a metal hydrogenation-dehydrogenation component constituted of from about 5 to about 30 percent of a Group VIB metal, or compound thereof, and from about 1 to about 12 percent of a Group VIII metal, or admixture of said Group VIB and VIII metals or compounds thereof, said catalyst composite comprising greater than 50 percent of its total pore volume of absolute diameter ranging from about 50A to about 120A, at severity sufficient to desulfurize from about 80 to about 99 percent of the blended low boiling materials, based on the weight of the liquid introduced as feed to said second desulfurization stage.

4,073,719

PROCESS FOR PREPARING LUBRICATING OIL FROM USED WASTE LUBRICATING OIL

Marvin L. Whisman; James W. Reynolds; John W. Goetzinger, and Faye O. Cotton, all of Bartlesville, Okla., assignors to United States Department of Energy, Washington, D.C.

Filed Apr. 26, 1977, Ser. No. 791,076
Int. Cl.[2] C10M *11/00*
U.S. Cl. 208—180 **14 Claims**

1. A process for preparing lubricating oils from used waste lubricating oils containing additives, oxidation products and the like comprising:

a. vacuum-distilling the used oil to strip water and volatile materials boiling below 600°–700° F;

b. mixing the stripped oil with a solvent consisting of about 1 part 2-propanol, about part 1 methylethyl ketone and about 2 parts 1-butanol, whereby the oil dissolves in the solvent and the additives, oxidation products and the like precipitate out as a sludge forming a partially purified oil;

c. separating the partially purified oil-solvent mixture from the sludge;
d. separating the partially purified oil from the solvent solution;
e. vacuum-distilling the partially purified oil and collecting the distillate overhead boiling from about 700° to about 1000° F, thereby forming a lubricating oil distillate;
f. decolorizing and deodorizing the lubricating oil distillate, thereby forming a lubricating oil base; and
g. mixing the lubricating oil base with appropriate additives and viscosity index improvers to form a finished lubricating oil.

4,073,720

METHOD FOR RECLAIMING WASTE LUBRICATING OILS

Marvin L. Whisman; John W. Goetzinger, and Faye O. Cotton, all of Bartlesville, Okla., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 22, 1976, Ser. No. 734,838
Int. Cl.² C10M *11/00*
U.S. Cl. 208—180 **6 Claims**

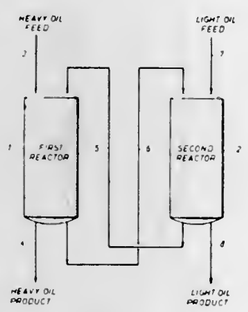
1. In a process for reclaiming used lubricating oil wherein the oil is stripped of water and volatile constituents and subsequently subjected to conventional lubricating oil refining steps, the improvement which comprises removal of sludge components of the used oil by contacting the oil with a solvent mixture consisting of about 1 part 2-propanol, about 1 part methyl ethyl ketone and about 2 parts 1-butanol following the stripping step and prior to the conventional refining steps whereby the oil dissolves in the solvent and the sludge components precipitate out.

4,073,721

CATALYST REGENERATION BY CIRCULATING CATALYST IN A HYDROTREATING OIL PROCESS

Dirk Kanbier, The Hague, and Frans Goudriaan, Amsterdam, both of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed June 23, 1977, Ser. No. 809,256
Claims priority, application United Kingdom, July 6, 1976, 28067/76
Int. Cl.² C10G *23/08*
U.S. Cl. 208—251 H **6 Claims**



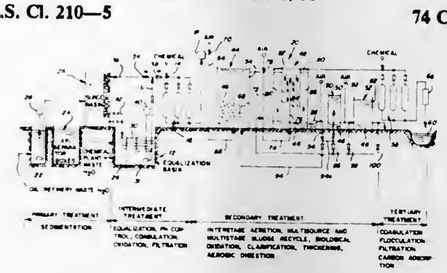
1. A process for hydrotreating (1) a light mineral hydrocarbon oil feed having an atmospheric final boiling point less than 371° C and a measurable Conradson Carbon residue, and (2) a heavy mineral hydrocarbon oil feed at least part of which has an atmospheric boiling point above 371° C, and having a Conradson Carbon residue at least twice that of said light oil feed, which process comprises:
(a) contacting said heavy oil in a first reactor and said light oil in a second reactor at an elevated temperature and pressure with hydrogen and with a hydrotreating catalyst
(b) separating a heavy oil product of lower metal content than said heavy oil feed from said first reactor and a light oil product from said second reactor, and
(c) circulating regenerated catalyst from the bottom of said second reactor to the top of said first reactor and at least partly deactivated catalyst from the bottom of said first reactor to the top of said second reactor.

4,073,722

PROCESS FOR THE PURIFICATION OF WASTE WATER

James F. Grutsch, Hammond; Russell C. Mallatt, Crown Point, both of Ind., and Benjamin F. Steely, Chicago Heights, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 401,652, Sept. 28, 1973, abandoned. This application Feb. 12, 1976, Ser. No. 657,497
Int. Cl.² C02C *1/06*
U.S. Cl. 210—5 **74 Claims**



1. In the activated sludge process wherein a first stage contaminated water containing less than about 20 ppm of hydrocarbons and less than about 20 ppm of solids is contacted with activated sludge for a period of time sufficient to biologically degrade contaminents in the water and in a second stage decontaminated water is separated from the activated sludge, a first portion of said separated sludge being recycled for recontact with the water in the first stage and a second portion of said separated sludge being treated in downstream operations, the improvement comprising:
introducing oxygen into the water and sludge mix entering the second stage so that the sludge in the second zone is maintained in an aerobic state and separated decontaminated water from said second stage contains at least about 3 parts of dissolved oxygen per million parts of water.

4,073,723

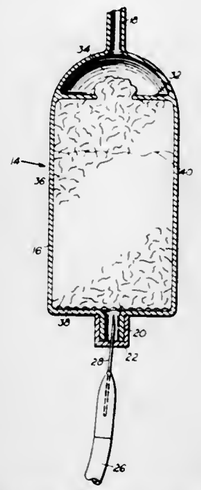
ANTI-COAGULATING AND FILTERING BLOOD

Roy L. Swank, 2211 S.W. 1st, Portland, Oreg. 97201, and David Danon, 16 Henkin St., Rehovot, Israel

Filed Nov. 15, 1976, Ser. No. 741,553
Int. Cl.² B01D *13/00*
U.S. Cl. 210—23 R **23 Claims**

1. The method of treating blood which comprises
(a) soaking in an aqueous solution of heparin at least one filamentous material of the class consisting of filamentous polyester resin, polyamide resin, polyacrylic resin, glass, steel, cotton and cellulose,
(b) draining the excess heparin solution from the filamentous material,
(c) drying the filamentous material, whereby the dry heparin forms a coating on the surface of the filamentous material,
(d) the heparin concentration of the aqueous solution and the soaking time of the filamentous material therein being chosen so that the amount of dry heparin coating is from about 0.00025 to about 0.0025 percent, dry weight basis,

(e) and thereafter passing blood through a fluffed mass of a blood anti-coagulating quantity of said heparin-coated



filamentous material at a rate to effect anti-coagulation of substantially all of said blood.

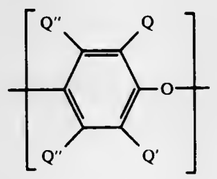
4,073,724

ANISOTROPIC PHENOLIC POLYETHER MEMBRANE

Robert Chapurlat, Ecully, France, assignor to Rhone-Poulenc, S.A., Paris, France

Filed Feb. 22, 1974, Ser. No. 445,287
Claims priority, application France, Feb. 27, 1973, 73 06869
Int. Cl.² B01D *31/00*
U.S. Cl. 210—23 H **10 Claims**

1. A reverse osmosis membrane which consists essentially of a polymer comprising a plurality of units of the formula:



(I)

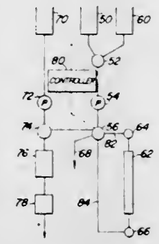
in which each of the symbols Q, Q' and Q'', which can be identical or different, represents a hydrogen atom, an alkyl radical with 1 to 4 carbon atoms or a $-SO_3H$ radical, the number of $-SO_3H$ radicals in the polymer being such that the ionic capacity of the polymer is from about 0.5 to about 5 meq/g, in the form of a layer which exhibits a degree of salt rejection, said layer having an equivalent thickness of from about 0.01 to about 5 μ, and a highly porous support layer, of thickness up to about 1 mm.

4,073,725

METHOD AND APPARATUS FOR LIQUID CHROMATOGRAPHY UNDER ELEVATED PRESSURE

Seiji Takeuchi, Hitachiota; Kazunori Fujita, Ibaraki, and Ikuo Shimokobe, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 23, 1976, Ser. No. 679,750
Claims priority, application Japan, May 9, 1975, 50-54466; May 19, 1975, 50-58515
Int. Cl.² B01D *15/08*
U.S. Cl. 210—31 C **15 Claims**



1. A method for liquid chromatography for high pressure separation, which comprises:
feeding a sample to be separated to components to a separation column packed with an ion exchange resin deformable under pressure,
feeding an eluting solution containing counter ions to the separation column,
detecting a plurality of the components leaving the separation column, and
feeding a regenerating solution containing metal ions having the same electric charge as that of the counter ions and a larger hydration number than that of the counter ions to the separation column to regenerate the ion exchange resin.

4,073,726

REMOVAL OF TRINITROTOLUENE FROM AQUEOUS MEDIA

Yoshiyuki Okamoto, Fort Lee, N.J.; Joseph Y. Wang, Alkhart, Ind., and Eng J. Chou, Sunnyside, N.Y., assignors to Polytechnic Institute of New York, Brooklyn, N.Y.

Filed Oct. 18, 1976, Ser. No. 733,707
Int. Cl.² C02B *1/20*
U.S. Cl. 210—45 **12 Claims**

1. A process for the treatment of waste water from the manufacture of trinitrotoluene, said process comprising:
a. forming an admixture of (i) waste water comprising an aqueous solution of trinitrotoluene and (ii) an amino group containing compound of the formula

$$(C_nH_{2n+1})_m(NH(CH_2)_x)_yNH_z$$

wherein n is 1 to 25, m is 1 to 3, x is 1 to 5, y is 0 to 5, z is 0 to 2, alone or with a cationic compound of the formula

$$(C_nH_{2n+1})_4N^+X^-$$

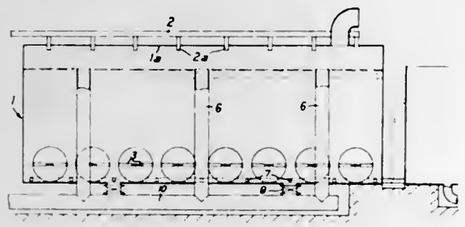
wherein n is 1 to 25, and X^- is Cl^-, Br^-, SO_4H^-;
b. stirring the mixture to form a water insoluble reaction product of trinitrotoluene, and
c. recovering the water insoluble reaction product from the waste water.

4,073,727

PROCESS FOR THE OXIDATION OF WASTE LIQUORS ARISING FROM THE MANUFACTURE OF PAPER PULP

Yves G. Garrigues, Rueil-Malmaison, France, assignor to Groupement Europeen de la Cellulose, Paris, France

Filed Mar. 20, 1974, Ser. No. 453,046
Claims priority, application France, Mar. 28, 1973, 73.11209
Int. Cl.[2] C02B *1/34*
U.S. Cl. 210—63 R 5 Claims



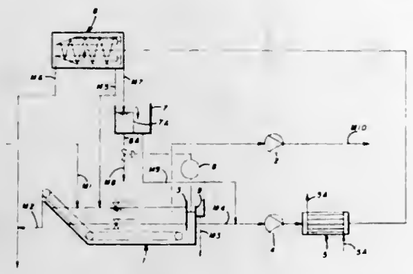
1. In a process for the oxidation of an aqueous liquor containing caustic soda and sodium sulphide arising from the manufacture of paper pulp, the improvement which comprises: oxidizing the liquor in a reservoir in which are located horizontally disposed candles of a sintered material through which air for oxidation is blown, the air for oxidation being introduced into the candles at about 90° C and oxidation being carried out at a temperature of from 70° to 90° C.

4,073,728

PROCESS FOR TREATING FLUSHING LIQUOR

Hansjürgen Ullrich; Heinz Dippel, and Karl Loss, all of Bochum, Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Filed Dec. 27, 1976, Ser. No. 754,502
Claims priority, application Germany, Dec. 27, 1975, 2558857
Int. Cl.[2] B01D *35/18;* C02B *1/02*
U.S. Cl. 210—71 7 Claims



1. A process for treating flushing liquor discharged from a gas main of a coke oven to obtain an aqueous liquid substantially free of tar and solids suitable for reuse as flushing liquid in the gas main and to obtain tar having a low water and solids content, said process including the steps of:

separating said flushing liquor in a preliminary gravity separator into an aqueous liquid phase substantially free of tar and solids and into a tar phase,

using said aqueous liquid phase for washing gases in said gas main of a coke oven,

feeding said tar phase into a circuit forming a closed loop which includes a pump and a centrifuge for three-phase clarification and separation, the circulation in said circuit being at a flow rate greater than that of said tar phase which is introduced from said preliminary gravity separator said flow rate being sufficient to provide substantially constant operating conditions within said process and said circuit functioning to provide three-phase separation of said tar phase,

withdrawing clean tar which is substantially free from contaminants, from said circuit at a flowrate less than the flow rate of said tar phase in said circuit,

withdrawing an aqueous liquid from the centrifuge for subsequent use in the circuit, and

withdrawing a thick tar from the centrifuge out of the circuit.

4,073,729

FILTERING PROCESS USING INORGANIC SYNTHETICALLY PREPARED FILTER SAND

Stefan Kraemer, Essen; Michael Seger, Krefeld-Linn, and Alois Seidl, Thurnstein, all of Germany, assignors to Wasag-Chemie AG, Munich, Germany

Continuation of Ser. No. 217,643, Jan. 13, 1972, abandoned. This application Dec. 12, 1973, Ser. No. 426,617
Int. Cl.[2] B01D *23/16*
U.S. Cl. 210—80 9 Claims

1. In a process for removing solids from a liquid wherein said liquid is passed through a bed of filter media consisting of discrete, inorganic, artifically produced filter sand having the same chemical composition, the improvement comprising passing said liquid over artifically produced filter sand having grain densities of between about 1.0 and 2.2 grams per cubic centimeter, and grain diameters of between about 0.3 and 10 mm, wherein the grain density decreases with increasing grain diameter, backwashing said artifically produced filter sand and settling said artifically produced filter sand with sand grain diameters distributed from the largest to the smallest in the direction of liquid passage, said discrete, inorganic artifically produced filter sand consists essentially of a preliminary product mixed with a powder selected from the group consisting of amorphous particles, crystalline materials, and mixtures thereof, granulated with addition of water, dried, expanded at a temperature up to about 400° C, melting the outside at a temperature of about 700° C, and cooling to form spheres, said preliminary product produced by:

(a) forming a solution containing in parts by weight about 1 part sodium silicate, having a molar ratio of $Na_2O:SiO_2$ of 1:2.5 to 1:4.5, 0.02 parts to 0.8 parts of inorganic fibrous silicate or finely powdered silicate and 2–10 parts of water;

(b) adding means for producing foaming gas to the solution; and

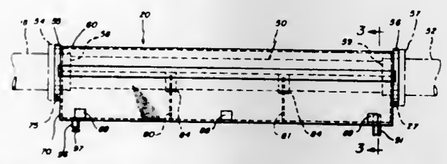
(c) heating the solution to about 140° - 360° C to drive off any free water phase.

4,073,730

ULTRAFILTRATION WATER COLLECTOR

Jacob Shorr, Lexington, and Herbert Fishman, Newton Center, both of Mass., assignors to Systems Engineering & Manufacturing Corporation, Stoughton, Mass.

Filed July 8, 1976, Ser. No. 703,625
Int. Cl.[2] B01D *13/00*
U.S. Cl. 210—321 R 8 Claims



1. An ultrafiltration purified water collector comprising:

a box for completely enclosing an ultrafiltration filter unit and having a separable section,

a first drain having an inlet elevated a distance above the bottom of said box,

a second drain having an inlet located below the level of said first drain inlet,

an entrance port through which a conduit carrying wastewater passes into said box,

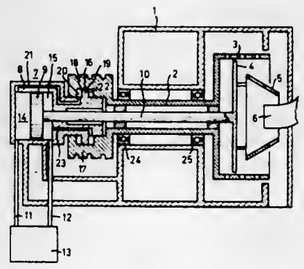
and an exit port through which a conduit carrying wastewater passes out of said box.

4,073,731

PUSH-TYPE CENTRIFUGE

Peter Fanta, Schlieren, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed Oct. 13, 1976, Ser. No. 732,053
Claims priority, application Switzerland, Oct. 21, 1975, 13602/75
Int. Cl.[2] B01D *33/10, 35/16*
U.S. Cl. 210—376 3 Claims



1. In a push-type centrifuge having a stationary housing; a rotor comprising a shaft, a centrifuging drum and a push plate; and a double-acting fluid pressure operated push motor which is coaxial with the rotor and has a cylinder which is fixed to the housing and contains opposed working spaces, and a piston which is connected and rotates with the push plate and moves the latter forward or backward depending upon which of the working spaces is subjected to the higher pressure, and wherein the cylinder and the shaft are subjected to axial forces which act in opposite directions as the push plate is moved; the improvement which comprises a double-acting axial bearing which is positioned and reacts between the cylinder and the shaft and serves to apply directly to the cylinder and the shaft, respectively, said axial forces acting on the shaft and cylinder, said axial forces counteracting each other directly through the axial bearing so that the load on the housing attributable to those forces is reduced.

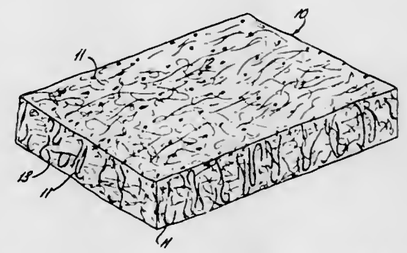
4,073,732

MEDIA FOR FILTERING BLOOD

William Lauer, Madison, N.J., and Herman Charles Mouwen, Ventura, Calif., assignors to Johnson & Johnson, New Brunswick, N.J. and Purolator, Inc., Del.

Continuation-in-part of Ser. No. 462,453, April 19, 1974, abandoned. This application Oct. 10, 1975, Ser. No. 621,262
Int. Cl.[2] B01D *25/04, 25/16*
U.S. Cl. 210—491 4 Claims

1. A blood filter media comprising in combination the elements of an upstream filter sheet of a woven synthetic fiber fabric having a pore size of about 180 microns, a first downstream filter sheet of a layer of polyester or polyamide fibers, said layer having a thickness of at least 0.015 inch and a pore opening size in the range of from 8 - 38 microns, said layer consisting of fibers locked in position by the frictional entanglement of fibers with each other, such that said layer maintains said pore opening size range while uniformly filtering blood during extended use, and a second further downstream filter sheet of a woven synthetic fiber fabric having a pore size of about 20 microns, and the elements of said combination being co-operative to produce an efficiency of 100% in the removal of particles of size greater than 16 microns in the filtration of at least five pints of blood.



4,073,733

PVA MEMBRANE AND METHOD FOR PREPARING THE SAME

Kazuhisa Yamauchi, Kurashiki; Koichi Takakura, Okayama; Syuji Kawai, and Akio Ohmori, both of Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Apr. 22, 1976, Ser. No. 679,441
Claims priority, application Japan, Apr. 22, 1975, 50-48995
Int. Cl.[2] B01D *31/00*
U.S. Cl. 210—500 M 16 Claims



1. A polyvinyl alcohol membrane prepared by the process which comprises:

extruding an aqueous PVA polymer composition containing a polyalkylene glycol having an average molecular weight of 600 to 3,000 and a carbon-to-oxygen atom ratio of not more than 3 in a proportion of 15 to 150 part by weight per 100 parts by weight of PVA, wherein said composition satisfies the relationship: $0.65 \leqq CBR \leqq 1.0$; wherein CBR is defined as the critical blending ratio onto a coagulation bath and

coagulating the extruded composition such that a resultant shaped article is formed.

4,073,734

MARINE SEPARATOR

Neely E. Lowrie, Tulsa, Okla., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Aug. 25, 1976, Ser. No. 717,793
Int. Cl.[2] B01D *21/10*
U.S. Cl. 210—532 R 4 Claims

1. A separator structure for the fluids of oil well production adapted to be mounted in a marine environment, including,

a marine platform located where it will be subject to wave action which will pitch and roll the marine structure,

a shell in the form of a horizontally extended cylinder and mounted on the marine platform to pitch and roll with the marine platform,

a source of oil well production at the location of the marine platform,

an inlet through one end of the shell and connected to the source to direct production from the source into the shell,

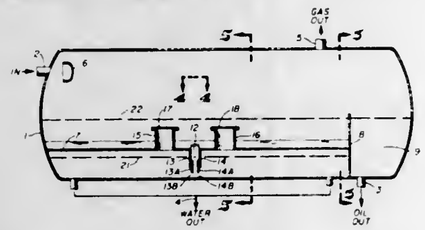
a plate member mounted within the shell to extend horizontally and parallel the longitudinal axis of the shell from the inlet end of the shell and beneath the inlet to divide a substantial length of the shell into upper and lower volumes,

a vertical baffle plate sealed to the bottom and sides of the shell and extending its upper edge as a weir above the horizontal plate member to which it is sealejd to form a compartment below the horizontal plate for the lower volume,

an opening through the horizontal plate member at substantially its midpoint,

baffles depending vertically downward from the plate opening,

a conduit with open ends on each side of the midpoint opening and extending upward,



a first outlet through the shell wall and from the compartment below the plate member,

and a second outlet through the lower portion of the shell wall and beyond the vertical baffle plate,

whereby, as the shell is pitched, the plate member receives all of the mixed liquids of the production on its upper surface, the heavier of the liquids flowing through the midpoint opening of the plate member and the interface between the liquids which is formed beneath the plate member while lighter liquids carried beneath the plate member return up through the conduits on each side of the opening and over the weir of the vertical baffle plate to the second outlet while the heavier liquids flow to the first outlet to complete the separation during pitching of the shell.

4,073,735

RINSE CYCLE FABRIC SOFTENER

Pallassana Ramachandran, Robinsville, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

Filed Feb. 19, 1976, Ser. No. 659,603
Int. Cl.² D06M *13/34*
U.S. Cl. 252—8.8 **11 Claims**

1. A fabric-softening composition especially effective in the rinse cycle for reducing fabric discoloration consisting essentially of cationic softener and alkali metal silicate in the weight ratio of 4:3 to 4:1 of cationic:silicate, said silicate having an Na_2O to SiO_2 ratio of from 1:1.6 to 1:3.2.

4,073,736

METAL WORKING COMPOSITIONS

John W. Schick, Cherry Hill, and Robert H. Davis, Pitman, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 559,103, March 17, 1975, abandoned. This application Oct. 20, 1976, Ser. No. 734,215
Int. Cl.² C10M *3/06, 1/38, 3/32, 5/28*
U.S. Cl. 252—31 **13 Claims**

1. A metalworking composition which comprises: (1) a base lubricant selected from the group consisting of mineral oils, synthetic oils and greases thereof; (2) an antiwear amount of a polypropylene glycol and sulfur; (3) a solubility improving amount of a monohydric alcohol of the formula R—OH where R is an alkyl or alkenyl group of from 5 to 30 carbon atoms.

4,073,737

HYDROGENATED COPOLYMERS OF CONJUGATED DIENES AND WHEN DESIRED A VINYL AROMATIC MONOMER ARE USEFUL AS OIL ADDITIVES

Robert L. Elliott, Scotch Plains, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Apr. 19, 1976, Ser. No. 678,144
Int. Cl.² C10M *1/32*
U.S. Cl. 252—51.5 A **11 Claims**

1. In a lubricating oil composition comprising:

a. a major amount of a mineral lubricating oil; and

b. a minor but effective pour point depressing amount of a polymeric pour point depressant for said oil selected from the group consisting of

i. long chain C_{15} to C_{60} alkyl aromatics wherein the aromatic may be a hydrocarbon or a hydroxy substituted hydrocarbon said aromatic containing a maximum of three said substituent groups, condensed rings, and mixtures thereof;

ii. polymers comprising C_8 to C_{20} alkyl esters of C_3 to C_8 mono- and dicarboxylic monoethylenically unsaturated acids; and

iii. copolymers comprising styrene and maleic anhydride esterfied with C_2 to C_{26} alcohol; the improvement of including

c. 0.1–10 percent by weight of an oil soluble hydrogenated block terpolymer viscosity index improver compatible with said pour point depressant, so as not to unduly interfere with the pour depressing action of said pour point depressant, said terpolymer having the structure

$$(A)_x(B)_y(C)_z$$

wherein:

A is a conjugated diene of the formula

$$CH_2{=}CH{-}\overset{R}{\overset{|}{C}}{=}CH_2$$

wherein R is a C_1 to C_8 alkyl group and present in mole % proportion as indicated by x which may vary from 45 to 99 mole %;

B is butadiene and present in mole % proportion as indicated by y which may vary from about 2 to about 9 mole %; and,

C is a C_8 to C_{20} monovinyl aromatic hydrocarbon monomer, and present in mole % proportion as indicated by z which may vary from 5 to 40 mole %; said block terpolymer being prepared by copolymerizing A and B to form a first block, and then copolymerizing C to form a second block and wherein about 75 to 95% of the diene monomers are in the 1,4-configuration.

4,073,738

LUBRICATING OIL COMPOSITIONS CONTAINING ALKYL ACRYLATE OR METHACRYLATE POLYMERS AND COPOLYMERS OF STYRENE AND CONJUGATED DIENE

Volker Ladenberger, Schwetzingen; Klaus Bronstert, Carlsberg; Friedrich Hovemann, Hockenheim, and Petr Simak, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Jan. 11, 1977, Ser. No. 758,435
Claims priority, application Germany, Jan. 28, 1976, 2603034
Int. Cl.² C10M *1/28, 1/18*
U.S. Cl. 252—56 R **2 Claims**

1. A mineral lubricating oil composition containing

(a) a predominant proportion by weight of mineral lubricating oil,

(b) from 0.05 to 2.5% by weight, based on the mineral lubricating oil, of a pour point depressant based on an alkyl acrylate or alkyl methacrylate polymer and

(c) from 0.5 to 6% by weight, based on the mineral lubricating oil, of a selectively hydrogenated, random butadiene-styrene copolymer comprising from 35 to 45% by weight of styrene units and from 65 to 55% by weight of hydrogenated butadiene units, which copolymer, prior to hydrogenation, has a 1,2-vinyl content of the polymerized butadiene units of from 23 to 40% by weight, based on copolymerized butadiene units, and which has a ^{13}C-NMR spectrum in which the ratio of the sum of the intensities of the signals of the CH_2 groups in the β-position and the CH_2 groups of the ethyl branches, ΣCH_2 (β + ethyl), to the sum of the intensities of the signals of the γ-CH_2 and δ-CH_2 carbon atoms and CH_2 carbon atoms more remote from the branch points, ΣCH_2 (γ, δ and more remote), is from 1:1 to 1:1.4, and has an IR spectrum in which the ratio of the extinctions, E, of the styrene bands at 1,180 cm^{-1} and 1,150 cm^{-1}, E(1,180)/E(1,150), is from 0.6 to 0.73 and the ratio of the extinctions, E, of the styrene bands at 1,190 cm^{-1} and 1,180 cm^{-1}, E(1,190)/E(1,180), is from 0.15 to 0.22, and in which the content of olefinic double bonds has been reduced to a residual proportion of less than 5% as a result of the selective hydrogenation.

4,073,739

TONER POWDER FOR ELECTROSTATIC IMAGES COMPRISING EPOXY RESIN

Martinus T. J. Peters, Venlo, Netherlands, assignor to Oce-van der Grinten, N.V., Venlo, Netherlands

Filed Nov. 24, 1975, Ser. No. 634,777
Claims priority, application Netherlands, Nov. 25, 1974, 7415325
Int. Cl.² G03G *9/08*
U.S. Cl. 252—62.1 P **9 Claims**

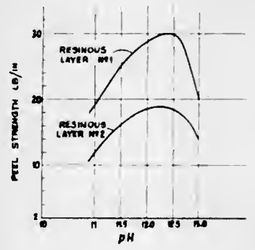
1. Toner powder for the development of electrostatic images, the individual particles of which comprise thermoplastic resin consisting essentially of epoxy resin and organic dye that in itself is insoluble in the epoxy resin, characterized in that said particles contain in an amount enhancing dissolution of said dye in said resin at least one substance selected from the group consisting of complete esters and alkyl and aryl amides of o- and m-phthalic acid, carbonic acid, phosphoric acid, benzoic acid and benzenesulphonic acids and condensation products of formaldehyde with alkyl, cycloalkyl and aryl amides of benzenesulphonic acids.

4,073,740

COMPOSITION FOR THE ACTIVATION OF RESINOUS BODIES FOR ADHERENT METALLIZATION

Joseph Polichette, South Farmingdale; Edward J. Leech, Oyster Bay, and John G. Branigan, Smithtown, all of N.Y., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Division of Ser. No. 587,831, June 18, 1975, Pat. No. 4,042,729, which is a division of Ser. No. 314,748, Dec. 13, 1972, abandoned. This application Feb. 28, 1977, Ser. No. 772,820
Int. Cl.² C11D *7/06, 7/12*
U.S. Cl. 252—156 **12 Claims**



1. A stable, readily disposable composition for treating a resinous surface to receive an adherent deposit of electrolessly formed metal, said composition comprising water, permanganate ion and manganate ion in the molar ratio of manganate ion to permanganate ion of up to 1.2, said composition having a pH in the range of 11 to 13.

4,073,741

COBALT OXIDE CHLORATE CANDLE

Clifford E. Heintz, Buffalo, N.Y., assignor to A-T-O Inc., Willoughby, Ohio

Filed Mar. 5, 1976, Ser. No. 664,279
Int. Cl.² A62B *21/00*; C01B *13/02*
U.S. Cl. 252—187 R **18 Claims**

1. A substantially fuel-free oxygen-generating candle comprising a compressed active oxygen source consisting essentially of an alkali metal chlorate with from 0 to about 1% of alkali metal perchlorate;

a sufficient amount of cobalt oxide selected from the group consisting of CoO and mixtures of CoO and Co_3O_4 to maintain a self-sustaining catalytic decomposition admixed therewith;

said mixture being substantially fuel-free; and

an ignition material on an end of the candle whereby when ignited the candle generates oxygen by relatively low temperature catalytic decomposition of the chlorate.

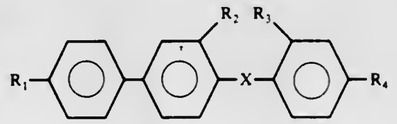
4,073,742

CYANO-SUBSTITUTED BIPHENYL COMPOUNDS AND LIQUID CRYSTALLINE DIELECTRICS CONTAINING THE SAME

Dietrich Erdmann; Rudolf Eidenschink; Joachim Krause, and Ludwig Pohl, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed Mar. 25, 1977, Ser. No. 781,276
Claims priority, application Germany, Mar. 29, 1976, 2613293
Int. Cl.² C09K *3/34*; G02F *1/13*; C07C *121/60, 121/64*
U.S. Cl. 252—299 **10 Claims**

1. A biphenyl compound of the formula



wherein X is —CO—O or —O—CO, R_1 and R_4 are alkyl of 1–10 carbon atoms, and wherein R_2 is CN and R_3 is hydrogen when X is —O—CO and R_3 is CN and R_2 is hydrogen when X is —CO—O.

6. In a liquid crystalline dielectric composition having a negative dielectric anisotropy and comprising at least one liquid crystalline compound free of —CN, —NC and NO_2 radicals, the improvement wherein the composition contains 0.5–40% by weight of a compound of claim 1.

4,073,743

PROCESS FOR PREPARING AN EMULSION

Michael Midler, Jr., East Brunswick, and Edward Paul, Chatam Township, Union County, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 569,022, April 17, 1975, abandoned. This application Aug. 13, 1976, Ser. No. 714,428
Int. Cl.² B01J *13/00*
U.S. Cl. 252—309 **12 Claims**

1. The method of preparing a water-in-oil emulsion, wherein the oil phase contains isomannide monooleate and a non-hydrated physiologically acceptable fatty acid metal salt, which comprises:

mixing the aqueous and oil phases at about 9° to about 35° C. at a relatively low agitator speed such that the value of the term N^3D^5/V remains below about 80×10^9 wherein N =

rpm, D = agitator diameter (inches), V = emulsion volume (liters); and

increasing the agitator speed such that the value of the term N^3D^5/V wherein N, D, and V are as defined above, is above about 140×10^9 to form a stable emulsion.

4,073,744

NITRITE BASED RUST INHIBITOR COMPLEX

Theo Ioannou Eliades, and Noemi Bernardo Ramirez, both of Scarborough, Canada, assignors to Surpass Chemicals Limited, Scarborough, Canada

Filed Jan. 3, 1977, Ser. No. 756,087
Int. Cl.² C23F *11/14*
U.S. Cl. 252—389 R **18 Claims**

1. A rust inhibitor which is dispersible in petroleum based compositions consisting of a complex of a metal nitrite with a hetero-atomic aprotic polar organic solvent, which is miscible with at least 5% water and the hetero-atom being nitrogen, sulfur or oxygen; said complex being represented by the empirical formula:

$$M^{n+}(NO_2)_nL_z$$

wherein

M is a metal ion of said metal nitrite

L is said hetero-atomic aprotic polar organic solvent

n is an integer of 1 or 2, and

z is equal to or greater than *n*.

8. A method for producing a nitrite based rust inhibitor which is dispersible in a petroleum based composition comprising reacting nitrous acid with a basically reacting metal salt in a medium consisting of a hetero-atomic aprotic polar organic solvent which is miscible with at least 5% water and the hetero-atom being nitrogen, sulfur or oxygen, and removing excess basically reacting metal salt after completion of the reaction to give a solution containing the desired nitrite based rust inhibitor.

4,073,745

MULTICHROMOPHORIC BENZOTRIAZOLE ULTRAVIOLET STABILIZERS AND THEIR USE IN ORGANIC COMPOSITIONS

Richard H. S. Wang, and Joseph S. Zannucci, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

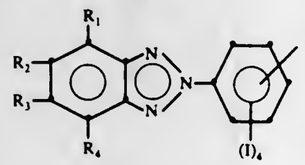
Division of Ser. No. 502,333, Sept. 3, 1974, Pat. No. 3,981,884.
This application May 14, 1976, Ser. No. 687,080
Int. Cl.² C09K *15/32, 15/30;* C08K *5/34*
U.S. Cl. 252—403 **34 Claims**

1. An organic composition susceptible to ultraviolet light degradation stabilized against such degradation with a stabilizing amount of at least one multichromophoric compound having the formula:

A—B—C

wherein

A is a group having the structure

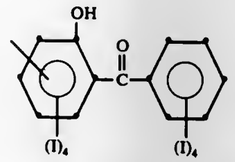


wherein

R_1, R_2, R_3 and R_4 are hydrogen, chloro, bromo, lower alkyl, substituted lower alkyl, cycloalkyl, substituted cycloalkyl, aryl, substituted aryl, lower alkylaryl, aryl-substituted-aryl, alkoxy, substituted amino, cyano, carboxy and the substituents R_1 and R_2, R_2 and R_3, and R_3 and R_4, combined with the carbon atoms to which they are attached, are joined alkylene groups completing a carbocyclic ring, which ring can also be substituted with one or more of the substituents listed above for R_1, R_2, R_3 and R_4;

I is the same as R_1, R_2, R_3 and R_4 and is present on all positions of the benzenoid ring, except the carbon atom attached to the heterocyclic ring and the carbon atom attached to the B group connecting the heterocyclic aromatic A group with the aromatic C group, wherein B is a group connecting A and C and can be alkylene, arylene, carbonyloxy, oxycarbonylalkyleneoxy, oxycarbonyl, alkyleneoxycarbonyloxy, oxyalkylenecarbonyloxy, oxycarbonyloxy, alkyleneoxy, oxyalkylene, alkyleneoxyalkyleneoxy, oxyalkylenearylenealkyleneoxy, thio, thioalkyleneoxy, sulfinyldioxy, oxy(alkoxy)phosphinooxy, aminocarbonyl, N-alkylaminocarbonyl, N-arylaminocarbonyl, aminocarbonylalkyleneoxy, N-alkylaminocarbonylalkyleneoxy, N-arylaminocarbonylalkyleneoxy, aminocarbonylamino, N-alkylaminocarbonylamino, N,N-dialkylaminocarbonyl, N-arylaminocarbonyl, N-alkylaminocarbonyl, N,N-diarylaminocarbonyl, amino, N-alkylamino, N-arylamino, N-alkylaminoalkyleneoxy, N-arylaminoalkyleneoxy, oxyalkyleneoxy, oxyaryleneoxy, alkyleneaminoalkylene, aryleneaminoarylene, aryleneaminoalkylene and alkyleneaminoarylene; and

wherein C is a hydroxybenzophenone group having the formula



where I is the same substituent as listed above and is present in all positions of the benzoid rings except the carbon atom attached to the B group connecting the A and C moieties, said B connecting group is attached to the benzoid ring in the ortho, meta or para position from the keto group of the benzophenone, and said I substituents can all be one of the substituents listed above or different listed substituents.

4,073,746

MIXTURES OF α,α'-BIS-(2-HYDROXY-3,5-DIALKYLPHENYL)-P-AND -M-DIISOPROPYLBENZENES, A PROCESS FOR THE PREPARATION THEREOF AND THE USE THEREOF AS STABILIZERS

Hans-Josef Buysch, Krefeld; Harald Oertel, Odenthal-Globusch, and Ernst Roos, Odenthal-Osenau, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed May 20, 1976, Ser. No. 688,146
Claims priority, application Germany, May 24, 1975, 2523106
Int. Cl.² C09K *15/08*
U.S. Cl. 252—404 **8 Claims**

1. A mixture comprising at least 20 %, by weight, of an α,α'-bis-(2-hydroxy-3,5-dialkylphenyl)-m-diisopropylbenzene and an α,α'-bis-(2-hydroxy-3,5-dialkylphenyl)-p-diisopropylbenzene.

4,073,747

REGENERATION OF SPENT ACTIVATED CARBON WITH FORMALDEHYDE

Karel Popper, Danville; Wayne M. Camirand, El Cerrito; Gerald S. Williams, Richmond, and Edward P. Mecchi, Lafayette, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Dec. 13, 1976, Ser. No. 750,340
Int. Cl.² B01J *21/20*
U.S. Cl. 252—412 **2 Claims**

1. A process for regenerating spent carbon, which comprises contacting the spent carbon with an aqueous solution of formaldehyde in an amount sufficient to and for a period long enough to regenerate the carbon and

removing the aqueous solution of formaldehyde from the regenerated carbon.

2. The process of claim 1 wherein the regenerated carbon is rinsed with water to remove residual formaldehyde.

4,073,748

METHOD FOR PREPARING WETPROOFED CATALYST PARTICLES AND PARTICLES PRODUCED THEREBY

Glendon W. Brown; Mary Jane Fine, both of Chillicothe, and Larry O. Hill, Frankfort, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Jan. 21, 1977, Ser. No. 761,264
Int. Cl.² B01J *31/06*
U.S. Cl. 252—428 **6 Claims**

1. A method for preparing wetproofed carbon particles comprising:

a. mixing a measured amount of carbon particles having a size between 2 and 30 mesh with 0.6 - 20 percent by weight polytetrafluoroethylene resin,

said polytetrafluoroethylene resin being in an aqueous emulsion, and said aqueous emulsion being added to said carbon particles in amounts of less than approximately 100ml/100 grams, and

b. heating for a sufficient period of time to drive off the water from said aqueous emulsion and thereby setting said polytetrafluoroethylene resin as deposited non-uniformly on said carbon particles to yield a mixture of polytetrafluoroethylene coated carbon particles, some having a higher weight percent polytetrafluoroethylene resin thereon and others having a lower weight percent polytetrafluoroethylene resin thereon.

4,073,749

PROCESS FOR MANUFACTURING A CATALYST FOR THE SYNTHESIS OF AMMONIA AND PRODUCT THEREBY OBTAINED

Attilio Passariello, Tivoli (Rome), Italy, assignor to S.I.R.I. Societa' Italiana Ricerche Industriali S.p.A., Terni, Italy

Filed Dec. 18, 1975, Ser. No. 642,152
Int. Cl.² B01J *29/14, 23/76*
U.S. Cl. 252—455 R **2 Claims**

1. A process for manufacturing a pellettized magnetite catalyst containing aluminum oxide, potash, calcium oxide as promoters and magnesium oxide, the percent by weight of said parameters being within 2.0 - 3.5 aluminum oxide, 0.8 - 2 potash, 2 - 3.5 calcium oxide and 0.1 - 0.4 magnesium oxide, consisting essentially of mixing the components, melting the mixture in a furnace at a temperature of at least 1600° C, cooling the melted mass in air, removing melted slag, crushing and powdering the remaining solid mass, adding water and bentonite, mixing the crushed and powdered mass, water and bentonite, granulating said mixture, dehydrating the granulate product at a temperature between 100° and 200° C, and sintering the granulates in an argon atmosphere at a temperature ranging between 1250° and 1350° C.

4,073,750

METHOD FOR PREPARING A HIGHLY DISPERSED SUPPORTED NICKEL CATALYST

David J. C. Yates, Westfield, and Lawrence L. Murrell, Elizabeth, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed May 20, 1976, Ser. No. 688,154
Int. Cl.² B01J *29/14, 23/74*
U.S. Cl. 252—459 **12 Claims**

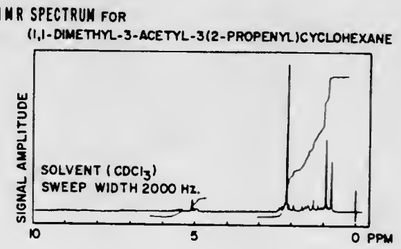
1. A highly dispersed nickel catalyst having a nickel surface area of from 200 to 400 m^2/gm nickel prepared by the method which comprises slurrying a nickel metal precursor dissolved in a nonaqueous organic liquid solvent with a high surface area refractory oxide support, removing the solvent to obtain a composite of said nickel metal precursor and said support, and activating said composite by reducing in hydrogen or hydrogen dilutes with an inert gas at conditions sufficient to convert substantially all of the nickel metal precursor to nickel metal.

4,073,751

1-ACETYL-3,3-DIMETHYL-(2-PROPENYL)CYCLOHEXANE PERFUME COMPOSITIONS

John B. Hall, Rumson; Mark A. Sprecker, Sea Bright; Frederick Louis Schmitt, Holmdel, and Manfred Hugo Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 713,429, Aug. 11, 1976, Pat. No. 4,021,488.
This application Feb. 4, 1977, Ser. No. 765,866
Int. Cl.² C11B *9/00*
U.S. Cl. 252—522 **2 Claims**



1. A perfume composition comprising the compound 1-acetyl-3,3-dimethyl-(2-propenyl) cyclohexane and at least one adjuvant selected from the group consisting of natural perfume oils, synthetic perfume oils, alcohols, aldehydes, ketones, nitriles, esters and lactones.

4,073,752

HIGH NORMALITY ION EXCHANGE MEMBRANES CONTAINING ENTRAPPED ELECTROSTATICALLY BULKY MULTICHARGED IONS AND METHOD OF PRODUCTION

Floyd Lester Ramp, Richfield, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

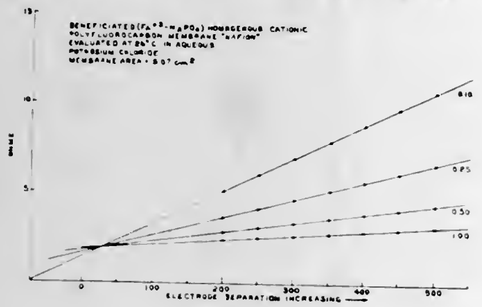
Filed June 2, 1975, Ser. No. 582,707
Int. Cl.² C08J *5/20;* C08F *8/42*
U.S. Cl. 260—2.1 R **6 Claims**

1. An organic polyfluorocarbon ion exchange material containing an effective total ion concentration of at least 0.25N and comprising from about 0.01 to about 0.2N of ion sites originally present on and covalently-bonded to the material of said ion exchange material and the remaining ion sites being electrostatically bulky multi-charged ions of electric sign the same as said covalently-bonded ion sites and entrapped in the ion exchange pathways of the said ion exchange material.

2. An ion exchange material as defined in claim 1 and further characterized by membrane form, by said covalently-bonded ion sites being sulfonic acid groups, and the said entrapped ion sites being electro negative metal anion sites associated with

materials selected from the class consisting of phosphoric acid/iron reaction products, phosphoric acid/aluminum reaction products, the hydrous oxides of platinum, palladium, ruthenium and rhodium, and the highly electro negative oxide complexes of tantalum and niobium having the formula $[M_6O_{19}]^{-8}$ where M is a tantalum or niobium atom.

6. The method of increasing the total effective ion concentration of an organic polyfluorocarbon ion exchange material containing between about 0.01 and 0.2 N of covalently-bonded ion sites to a total effective ion concentration of at least 0.25N



comprising swelling said organic polyfluorocarbon material in the presence of an essentially electrically neutral Reagent A selected from the group consisting of vinylidene monomers containing at least a single $CH_2{=}C<$ group per molecule, aromatic ethers, aromatic amines, and salts of polyvalent metals and treating the resulting swollen material with an essentially neutral reagent known to interact with said Reagent A forming reaction products ionizable in water to form electrostatically-bulkyl multi-charged ions of the same electric charge as said covalently-bonded ions.

4,073,753

OUTDOOR SURFACE COMPOSITIONS

Stein Hauge, P.O. Box 462, Mercer Island, Wash. 98040

Filed Apr. 7, 1975, Ser. No. 566,034
Int. Cl.[2] C08J *11/04;* C08K *7/18, 3/34*
U.S. Cl. 260—2.3 7 Claims

1. A resilient, water pervious composition for playing surfaces and/or other utility areas, consisting of a mixture of particulate rubber and particulate inorganic solids, the particulate rubber being 10–50% by volume and having a particle size such that not more than 10% by volume passes a No. 100 sieve and substantially all passes a No. 8 sieve, the particulate inorganic solids being 90–50% by volume having a particle size such that 80–100% by volume passes a No. 8 sieve and not more than 15% by volume passes a No. 200 sieve.

4,073,754

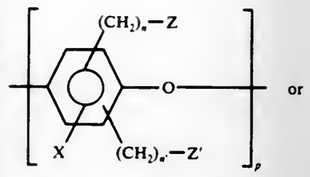
POLYMER ALLOYS OF PHOSPHONYLATED POLYSTYRENE OR POLYPHENYLENE OXIDE WITH CELLULOSE ESTER, POLYSTYRENE, OR UNSATURATED POLYESTER

Israel Cabasso, 627 Burgundy St., New Orleans, La. 70112; Joseph Jagur-Grodzinski, 22 Moskovitz St., and David Vofsi, Meonot Wolfson B, both of Rehovot, Israel

Continuation-in-part of Ser. No. 569,055, April 17, 1975, Pat. No. 4,008,191, which is a continuation of Ser. No. 358,061, May 7, 1973, abandoned. This application Aug. 14, 1975, Ser. No. 604,683
Claims priority, application Israel, May 12, 1972, 39426
Int. Cl.[2] B01D *13/04;* C08L *1/10*
U.S. Cl. 260—17 R 9 Claims

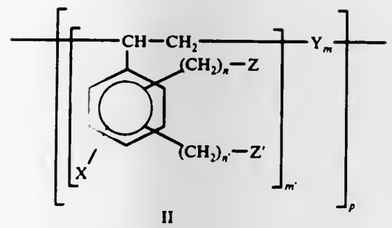
1. A polymer alloy of

a. a phosphorus-containing polymer component having the formula:



I

or



II

wherein X is hydrogen or halo; Z and Z' are each hydrogen or a phosphonate group $PO(OR)(OR_1)$ in which R and R_1 may be the same or different and are each alkyl or aryl, and in which Z and Z' are not both hydrogen; Y is a bivalent radical from an ethylenically unsaturated monomer copolymerized with styrene; *m* is zero or an integer less than 10; *m'* is an integer less than 10; *n* is any integer; *n'* is zero or any integer; and *p* is an integer greater than 10; and

b. a second polymer component compatible with and alloyed with the phosphorus-containing polymer component, said second component being a cellulose ester, or a polystyrene or unsaturated polyester resin.

9. A non-flammable or self-extinguishable fiber, film, fabric or shaped or foamed plastic article, constituted of the polymer alloy of claim 1.

4,073,755

PULVERULENT, TACKFREE, POURABLE, FILLER-CONTAINING ELASTOMER MIXTURES OPTIONALLY CONTAINING PLASTICIZER OIL, AS WELL AS PROCESSES FOR THEIR PRODUCTION AND UTILIZATION

Gerhard Berg, and Karl-Heinz Nordsiek, both of Marl, Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Germany

Filed Aug. 13, 1975, Ser. No. 604,133
Claims priority, application Germany, Aug. 16, 1974, 2439237
Int. Cl.[2] C08K *3/36;* C08L *1/28, 9/00*
U.S. Cl. 260—17.4 BB 22 Claims

1. In a process for the production of pulverulent, tack-free, pourable, filler-containing elastomer particles by preceipitating a stable, emulsified, homogeneous mixture of an aqueous elastomer emulsion and an aqueous dispersion of a solid filler for said elastomer in the presence of sufficient sodium silicate to form an aqueous suspension of the precipitated elastomer and the filler, the improvement which comprises:

a. precipitating the silicic acid in the aqueous suspension at a pH of 4.0 to 9.0 in the presence of 50–99% of the total amount of filler added to form said filler-containing elastomer particles, and then

b. mixing the thus-produced suspension of elastomer, filler and precipitated silicic acid with additional filler in the form of an emulsifier-free aqueous suspension.

4,073,756

SOLID ADHESIVE COMPOSITIONS

Yoshihiko Yotsuyanagi, Kobe; Naganori Araki, Sakai; Shigeru Nagasawa, Ageo, and Toshinao Okitsu, Tokyo, all of Japan, assignors to Konishi Co., Ltd., Osaka, Japan

Filed Apr. 26, 1976, Ser. No. 680,392
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—18 N 24 Claims

1. An adhesive composition comprising:

(a) an N-fatty acid acylated amino acid or a salt thereof in an amount of about 2 to 30% by weight of the total amount of the adhesive composition;

(b) a compound having in its molecule a polyoxyalkylene structure containing at least four oxyalkylene units in an amount of about 2 to 30% by weight of the total of the adhesive composition;

(c) a water soluble or water dispersible polymer having adhesive properties in an amount of about 5 to 50% by weight of the total amount of the adhesive composition; and

(d) water or a mixture of water and one or more organic solvent(s) and/or one or more plasticizer(s), wherein the total amount of component (d) is about 30 to about 80% by weight of the total adhesive composition, but wherein the proportion of the one or more organic solvent(s) and/or one or more plasticizer(s) is less than the amount of water used together therewith.

4,073,757

HARDENABLE, BORON-CONTAINING REINFORCING RESINS FOR RUBBER

Manfred Schmidt; Dieter Freitag, both of Krefeld; Hermann Fries, Schildgen, and Erich Esch, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 10, 1976, Ser. No. 749,456
Claims priority, application Germany, Dec. 20, 1975, 2557613
Int. Cl.[2] C08C *4/00;* C08G *8/32*
U.S. Cl. 260—19 R 10 Claims

1. A process for the production of hardenable boroncontaining reinforcing resins for rubber by reacting diphenylol alkane novolaks with boron compounds and unsaturated fatty acid or fatty acid esters, wherein 100 parts by weight of diphenylol alkane novolaks with an average molecular weight of from 400 to 1600 are reacted with from 20 to 100 parts by weight of a boric acid trialkyl ester containing from 1 to 4 carbon atoms in the alkyl chain or with from 18 to 90 parts by weight of boric acid or with from 10 to 50 parts by weight of boron trioxide in the presence of C_1–C_4-alcohols, and the boric acid ester resins obtained are reacted at elevated temperatures with from 15 to 35 parts by weight of an unsaturated fatty acid or esters thereof.

4,073,758

EMULSION COMPOSITIONS

Yasuharu Nakayama; Tadashi Watanabe; Yoshio Yamashita; Tetsuo Aihara, and Isao Toyomoto, all of Hiratsuka, Japan, assignors to Kansai Paint Company, Limited, Amagasaki, Japan

Filed Aug. 30, 1976, Ser. No. 718,767
Claims priority, application Japan, Sept. 12, 1975, 50-111225
Int. Cl.[2] C08L *63/10*
U.S. Cl. 260—23 EP 17 Claims

1. An emulsion composition prepared by the emulsion polymerization of a polymerizable vinyl monomer in the presence of an emulsifier in which the emulsifier is a neutralized addition polymerization polymer having as a side chain a maleinized, partially maleinized, fumarized or partially fumarized drying and/or semi-drying oil fatty acid residue linked to the main chain of the polymer by an ester bond, the emulsifier having an acid value of about 20 to about 350 prior to neutralization and being used in proportion to the vinyl monomer such that the total solid content of the resulting emulsion has an acid value of about 3 to about 150.

4,073,759

PROTECTING RUSTY METAL

James M. Lowry, and David Azar, both of Baton Rouge, La., assignors to Roadways International Corporation, Baton Rouge, La.

Continuation-in-part of Ser. No. 577,829, May 14, 1975, abandoned. This application June 3, 1976, Ser. No. 692,556
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—28.5 AS 16 Claims

1. A process for protecting corrodible metal against corrosion, which processs comprises applying to the metal a layer of an emulsion of asphalt and rubber in water, the emulsion containing at least about ½% of a polyamine surface active agent based on the weight of the dry asphalt, about 2 to about 5% dispersed rubber based on the weight of the dry asphalt and about 20% of a dispersed acrylate resin based on the weight of the dry asphalt, the surface active agent being an N-alkyl alkylene diamine in which the alkyl is 12 to 30 carbons long and the two amine groups have from one to three carbon atoms separating them.

4,073,760

METHOD OF PACKAGING ASPHALT MATERIAL AND IMPROVED PRODUCT RESULTING THEREFROM

Robert J. Harris, Marrero, and Gail T. Sikes, Harvey, both of La., assignors to H. C. Price Co., Bartlesville, Okla.

Filed July 23, 1976, Ser. No. 708,196
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—28.5 AS 4 Claims

1. A method of providing asphalt base coating material for pipe wherein said material comprises about 10% to 25% by weight asphalt and about 75% to 90% by weight aggregate, said method comprising:

supplying said coating material in a plurality of individual containers, each of which has a weight of no more than about 5% of the weight of the coating material contained thereby, and each of said containers being constructed primarily from a material containing at least one member of the group consisting of polyethylene, polypropylene, and polyethylene-polypropylene copolymer;

chopping said containers and said coating material to reduce the size thereof and present a mixture of said container and said coating material particles;

raising the temperature of said mixture to melt said particles and present a flowable liquid; and

stirring said liquid to distribute the melted container particles throughout the melted coating material particles and present a coating composition.

4,073,761

POLYETHYLENE EMULSION CONTAINING RESIN BINDER COMPOSITIONS AND PROCESSES

Richard C. Bowman, Sanborn, and Daniel J. Kay, Williamsville, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 174,217, Aug. 23, 1971, abandoned, which is a continuation of Ser. No. 880,408, Nov. 26, 1969, abandoned, which is a continuation-in-part of Ser. No. 818,076, April 21, 1969, abandoned. This application Apr. 11, 1975, Ser. No. 567,332
Int. Cl.[2] C08L *61/10*
U.S. Cl. 260—29.3 10 Claims

4. In a binder composition comprising (a) a resinous binder and (b) an accelerator, wherein the resinous binder comprises a one-step phenol-formaldehyde resin and a urea resin component selected from the group consisting of a urea-formaldehyde resin and a thiourea-formaldehyde resin, wherein the improvement comprises the accelerator consisting essentially of a mixture of (1) an aqueous emulsion of polyethylene, (2) an

aqueous solution of a compound selected from the group consisting of a strong mineral acid, an organic acid, an ammonium salt of a strong mineral acid and an ammonium salt of an organic acid, and (3) a compound selected from the group consisting of urea, thiourea, and mixtures thereof.

4,073,762

AQUEOUS EPOXY RESIN PAINT COMPOSITION

Minoru Hosoda, No. 2473-89, Shimonagaya, Kohnan, Yokohama, Kanagawa; Eiichi Kasiwagi, 7-7-407 Zengyo-danchi, No. 3768-3, Fujisawa, Fujisawa, Kanagawa; Fumio Murayama, No. 95-3, Wada, Hodogaya, Yokohama, Kanagawa, and Kohei Isayama, No. 20-41, 2-chome, Dai, Kamakura, Kanagawa, all of Japan

Division of Ser. No. 509,315, Sept. 25, 1974, Pat. No. 3,983,056. This application Mar. 12, 1976, Ser. No. 666,453

Claims priority, application Japan, Sept. 27, 1973, 48-108808; Sept. 27, 1973, 48-106809; Oct. 1, 1973, 48-110393; Dec. 24, 1973, 48-3633

The portion of the term of this patent subsequent to Sept. 28, 1993, has been disclaimed.

Int. Cl.² C08L *61/06*

U.S. Cl. 260—29.3 **7 Claims**

1. An aqueous epoxy resin paint composition comprising an epoxy resin emulsion formed by emulsifying in water (A) 98 to 50% by weight of a bisphenol type epoxy resin and (B) 2 to 50% by weight novolak type epoxy resins, with a non-ionic surface active agent, and a curing agent incorporated in said epoxy resin emulsion.

4,073,763

STABILIZATION OF CATIONICALLY MODIFIED ACRYLAMIDE POLYMERS

Wun Tea Tai, Palos Hills, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 489,966, July 19, 1974, abandoned. This application Nov. 3, 1975, Ser. No. 628,016

Int. Cl.² C08L *33/26*

U.S. Cl. 260—29.4 UA **3 Claims**

1. A method for improving the stability of a water-in-oil emulsion of a finely divided cationically modified acrylamide polymer, said polymer being made essentially by the steps of:

A. Preparing an aqueous solution of formaldehyde and a secondary amine containing 2 to 8 carbon atoms with the molar ratio of formaldehyde to secondary amine containing 2 to 8 carbon atoms being from 10:1 to 1:10 to provide a formaldehyde adduct; and,

B. Adding the formaldehyde adduct prepared in Step A to a water-in-oil emulsion of a finely divided acrylamide polymer in an amount sufficient to provide a molar ratio of formaldehyde adduct to acrylamide polymer of from 10:0.1 to 0.1:10, said water-in-oil emulsion of finely divided acrylamide polymer containing from:

a. 10–50% by weight polymer;

b. 30–95% by weight of an aqueous phase consisting of the polymer and the water present;

c. 5–70% by weight of a hydrophobic hydrocarbon liquid; and,

d. 1.0 to 21.0% by weight of a water-in-oil emulsifying agent; followed by,

C. Mixing the formaldehyde adduct and said water-in-oil emulsion of a finely divided acrylamide polymer for a period of time sufficient to produce a stable water-in-oil emulsion of a finely divided cationically modified acrylamide polymer;

said improvement comprising adding to said water-in-oil emulsion of a finely divided cationically modified acrylamide polymer at a temperature of from about 0° to about 40° C. a stabilizer selected from the group consisting of SO_2, $NaHSO_3$, $KHSO_3$, $Na_2S_2O_5$, and $K_2S_2O_5$ to adjust the pH of said water-in-oil emulsion to between 1 and 7, over a time sufficient to produce a water-in-oil emulsion of a cationically modified acrylamide polymer having increased stability.

4,073,764

DEGRADABLE PLASTIC COMPOSITION

Heinz-Peter Hemmerich; Gerhard Winter; Hans Jurgen Roseakranz, and Peter Woditsch, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 18, 1975, Ser. No. 597,269

Claims priority, application Germany, July 27, 1974, 2436260

Int. Cl.² C08J *3/20*

U.S. Cl. 260—37 N **8 Claims**

1. A plastic composition degradable under the influence of weather or light, cimprising a plastic material and about 0.1 to 60% by weight of the composition of finely divided titanium dioxide with a specific surface of more than about 20 m^2/g, the titanium dioxide having been obtained by hydrolyzing a titanium compound in aqueous solution.

4,073,765

FILLED POLYPHENYLENE ETHER COMPOSITIONS HAVING IMPROVED TOUGHNESS

Arthur Katchman, Delmar, and Gim Fun Lee, Jr., Albany, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 21, 1976, Ser. No. 753,510

Int. Cl.² C08G *65/44*; C08K *3/24*

U.S. Cl. 260—40 R **8 Claims**

1. A filled thermoplastic molding composition which, after molding, has enhanced impact strength and enhanced tensile elongation, said composition comprising in admixture:

(a) a polyphenylene ether resin;

(b) a styrene resin;

(c) a titanate filler; and

(d) an adipic acid based polyester in an amount at least sufficient to provide enhanced impact strength and enhanced tensile elongation in the molded article.

4,073,766

ORGANIC BORATE COUPLING AGENTS

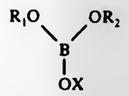
Marvin Michael Fein, Westfield; Birendra Kumar Patnaik, Parsippany, and Frank K. Y. Chu, Ramsey, all of N.J., assignors to Dart Industries, Inc., Los Angeles, Calif.

Filed Dec. 15, 1976, Ser. No. 750,753

Int. Cl.² C08K *9/04*

U.S. Cl. 260—42.14 **18 Claims**

1. A method of improving the properties of a filler for polymers, which comprises coating the filler with from about 0.5 to about 5 percent based on the weight of the filler of a coupling agent having the general formula



wherein R_1 is an alkyl group having from about 1 - 6 carbon atoms, and R_2 and X each is a long chained hydrocarbon group containing from 8 to 22 carbon atoms.

4,073,767

HYDROGEN PHOSPHONATES AND POLYMERS CONTAINING THEM AS FLAME RETARDANTS

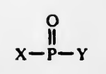
Gail H. Birum, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Sept. 3, 1976, Ser. No. 720,487

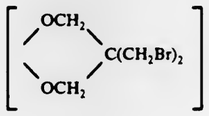
Int. Cl.² C07F *9/08*; C08K *5/53*

U.S. Cl. 260—45.8 R **17 Claims**

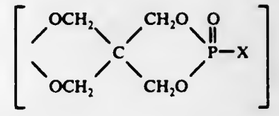
1. A cyclic phosphorus compound having the formula



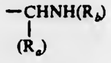
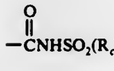
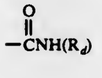
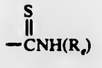
where Y is selected from the group consisting of



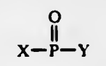
and



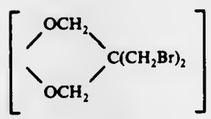
and where X is selected from the group consisting of

	where R is an alkyl radical of 1 to 4 carbon atoms, and R_b is a phenyl radical of 6 to 10 carbon atoms,
	where R_c is phenyl with 0 to 2 halogens, or phenyl with 0 to 2 nitro groups, or phenyl with 0 to 2 methyl groups,
	where R_d is phenyl with 0 to 2 halogen atoms, or phenyl with 0 to 2 methyl groups, or an alkyl or alkenyl radical of 1 to 3 carbon atoms, and
	where R_e is phenyl with 0 to 2 halogens, or alkyl or alkenyl of 1 to 3 carbon atoms.

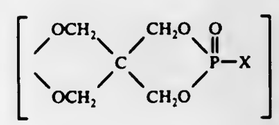
11. The combination of an organic polymer together with a phosphonate adduct having the formula



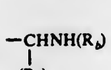
where Y is selected from the group consisting of



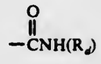
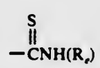
and



and where X is selected from the group consisting of

	where R is an alkyl radical of 1 to 4 carbon atoms, and R_b is a phenyl radical of 6 to 10 carbon atoms,
	where R_c is phenyl with 0 to 2 halogens, or phenyl with 0 to 2 nitro groups, or phenyl with 0 to 2 methyl groups,

-continued

	where R_d is phenyl with 0 to 2 halogen atoms, or phenyl with 0 to 2 methyl groups, or an alkyl or alkenyl radical of 1 to 3 carbon atoms, and
	where R_e is phenyl with 0 to 2 halogens, or alkyl or alkenyl of 1 to 3 carbon atoms.

4,073,768

NON-OPAQUE FLAME RETARDANT POLYCARBONATE COMPOSITION

Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 429,126, Dec. 28, 1973, Pat. No. 3,978,024. This application Oct. 29, 1975, Ser. No. 626,935

Int. Cl.² C08K *5/42*

U.S. Cl. 260—45.7 S **18 Claims**

1. A non-opaque flame retardant carbonate polymer composition selected from the group consisting of:

a. an aromatic carbonate polymer having in admixture from 0.001 to about 2.0 parts per hundred parts of the carbonate polymer of an additive selected from the group consisting of the metal salts of unsubstituted and substituted monomeric phenol ester sulfonic acid and the metal salt of unsubstituted and substituted polymeric phenol ester sulfonic acid, and mixtures thereof, wherein the metal salts are selected from the group consisting of the alkali metal salts and alkaline earth metal salts and mixtures of these metal salts, and the substituent on the metal salts of the substituted monomeric and polymeric phenol ester sulfonic acid is selected from the group consisting of an electron withdrawing radical, and mixtures of electron withdrawing radicals;

b. an aromatic carbonate polymer containing from 0.001 to about 2.0 parts per hundred parts of the carbonate polymer of a metal salt of a sulfonic acid substituted carbonate polymer; and

c. mixtures of (a) and (b); said carbonate polymer and additive having a refractive index in the range of 1.54 to 1.65.

4,073,769

ESTERS OF PHOSPHOROUS ACID

Erich Elmers; Dieter Margotte, both of Krefeld; Helmut Schmid, and Rolf Dhein, both of Krefeld-Bockum, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 409,503, Oct. 25, 1973, abandoned, which is a continuation-in-part of Ser. No. 278,909, Oct. 9, 1972, Pat. No. 3,794,629. This application Nov. 25, 1975, Ser. No. 635,010

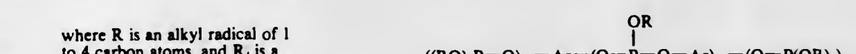
Claims priority, application Germany, Aug. 11, 1973, 2140207

The portion of the term of this patent subsequent to Feb. 26, 1991, has been disclaimed.

Int. Cl.² C08K *5/52*

U.S. Cl. 260—45.8 R **6 Claims**

1. A plastics material comprising an aromatic polycarbonate and 0.01 to 0.2 weight %, based on the weight of the aromatic polycarbonate and the phosphite, of a phosphite of the formula



wherein

n_1 is an integer;

n_2 is 0 or an integer;

n_3 is an integer;

at least one of the groups R is an oxetane group or a hydrocarbon radical being substituted by at least one oxetane group; the remaining groups R are identical or different and are selected from alkyl, aralkyl, cycloalkyl, aryl and hetaryl groups; and Ar are the same or different at-least-divalent aromatic groups, the free valences of which are directly linked to the aromatic nuclei.

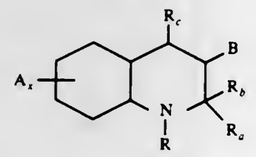
4,073,770

SUBSTITUTED DECAHYDROQUINOLINES AND THEIR USE AS ULTRAVIOLET LIGHT STABILIZERS

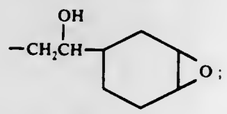
Pyong-Nae Son, Akron, and Robert Wesley Layer, Cuyahoga Falls, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed June 18, 1976, Ser. No. 697,345
Int. Cl.² C08J 3/20
U.S. Cl. 260—45.8 NW **11 Claims**

1. Compositions comprising (A) materials subject to ultraviolet light degradation and (B) from about 0.05 part to about 10 parts by weight per 100 parts by weight of the material of substituted decahydroquinoline compounds and the dimers thereof having the structural formula



wherein R is selected from the group consisting of alkyl groups containing 1 to about 24 carbon atoms, aralkyl groups of 7 to about 14 carbon atoms, cyclohexylalkyl groups of 7 to about 14 carbon atoms total, hydroxyalkyl groups containing 1 to about 12 carbon atoms, haloalkyl groups containing 1 to about 12 carbon atoms, cyanoalkyl groups containing 2 to about 12 carbon atoms, aminoalkyl or iminoalkyl groups containing 2 to about 12 carbon atoms, ether groups containing 3 to about 18 carbon atoms total in the group, hydroxyalkylether or cyanoalkylether groups containing 4 to about 18 carbon atoms total in the group, and the group



R_a, R_b, and R_c each independently are alkyl groups containing 1 to about 12 carbon atoms, cyclohexyl groups, or cyclohexylalkyl groups containing 7 to about 14 carbon atoms; A is selected from the group consisting of alkyl groups containing 1 to about 24 carbon atoms, hydroxyalkyl groups containing 1 to about 12 carbon atoms, alkoxy groups containing 1 to about 12 carbon atoms in the group, ester groups containing a total of from 2 to about 24 carbon atoms in the group, a cyclohexyl group, cyclohexylalkyl groups containing 7 to about 14 carbon atoms in the group, a hydroxy group, amino groups and aminoalkyl groups and alkyl-substituted amino and aminoalkyl groups wherein the alkyl contains 1 to about 12 carbon atoms; x is 0, 1, 2, or 3; and B is hydrogen, an alkyl group containing 1 to about 12 carbon atoms, a cyclohexyl group, or a cyclohexylalkyl group of 7 to about 14 carbon atoms in the group; and, further, wherein the dimers of the above compounds are essentially two decahydroquinoline compounds of the above structural formula attached to each other at the 4-positions, the 6-positions, the 8-positions, the 4'-,6'-positions, and the 4'-,8-positions on the molecule.

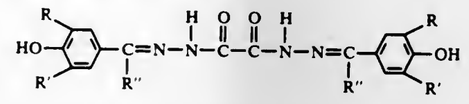
4,073,771

STABILIZED POLYMERIC COMPOSITION AND PRODUCT USING SAME

Ray Lawson Hartless, Lopatcong Township, Warren County, N.J., and Anthony Marion Trozzolo, South Bend, Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 500,957, Aug. 27, 1974, abandoned. This application July 29, 1976, Ser. No. 709,603
Int. Cl.² C08K 5/20
U.S. Cl. 260—45.9 NC **5 Claims**

1. A composition consisting essentially of a polymeric composition, the said polymeric composition exclusive of filler being at least 90 percent by weight of essentially saturated polyolefin polymer selected from the group consisting of homopolymers and copolymers, said polymer containing a stabilizer composition characterized in that the said stabilizer composition contains only one thermal oxidation stabilizer, said thermal oxidation stabilizer consisting essentially of at least one compound chosen from the group consisting of compounds in accordance with the formula



in which R is an alkyl substituent containing a tertiary carbon, said tertiary carbon being attached directly to the phenyl ring, in which R' is hydrogen or an alkyl substituent which may also contain a tertiary carbon, and in which R'' is hydrogen or an alkyl substituent, and in which any of the phenyl hydrogens bonded directly to either of the phenyl rings may be replaced by a hydrocarbon substituent, wherein said saturated polyolefin polymer contains a percentage by weight of said thermal oxidation stabilizer in the range of .01 to 0.5.

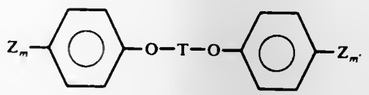
4,073,772

PLASTIC COMPOSITIONS

Arnold L. Anderson, Antioch, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 499,727, Aug. 22, 1974, Pat. No. 4,016,138, which is a continuation of Ser. No. 330,823, Feb. 8, 1973, abandoned. This application June 7, 1976, Ser. No. 693,321
The portion of the term of this patent subsequent to Apr. 5, 1994, has been disclaimed.
Int. Cl.² C08K 5/05
U.S. Cl. 260—45.75 B **26 Claims**

1. A plastic composition comprising a three component system consisting of (1) a poly(phenylene oxide), (2) a bisphenoxy compound, which functions as a flame retardant for said composition, having the formula



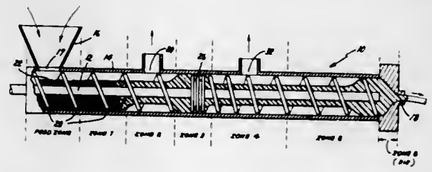
wherein (a) Z is bromine; (b) m and m' are independent and are integers having a value of from 1 to 5 with the proviso that the bromine atom content is from 6 to 10 bromine atoms; and (c) T is a straight or branched chain carbon group having from one to four carbon atoms, and (3) a flame retardant enhancing agent.

4,073,773

MELT POLYMERIZATION METHOD FOR MAKING POLYETHERIMIDES

Eugene G. Banucci, Scotia, and Gary A. Mellinger, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

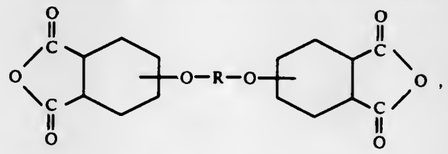
Filed Dec. 30, 1976, Ser. No. 755,686
Int. Cl.² C08G 73/10
U.S. Cl. 260—47 CP **16 Claims**



1. In an extrusion melt polymerization method for making polyetherimides wherein a reaction mixture containing as essential ingredients (I) an organic diamine of the formula,

$$H_2NR^1NH_2$$

and (II) an aromatic bis(ether anhydride) of the formula,

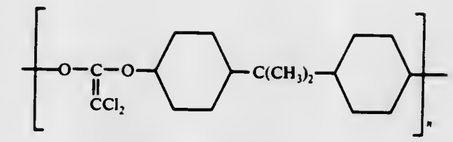


and (I) is present in an amount of 0.5 to 2.0 moles per mole of (II), is continuously fed through an inlet opening into a screw extruder having a barrel maintained at melt polymerization temperatures and water of reaction is continuously vented from the extruder, where R is a divalent aromatic organic radical having from 6 to 30 carbon atoms, R^1 is a divalent organic radical selected from the group consisting of said R radicals, alkylene radicals having from 2 to about 20 carbon atoms, cycloalkylene radicals, and $C_{(2-8)}$ alkylene terminated polydiorganosiloxane radicals, the improvement comprising:

(A) using a screw extruder having a second opening through the extruder wall and having an outlet orifice, said second opening being in a second barrel zone intermediate said inlet opening and said orifice, said second barrel zone being maintained at melt polymerization temperature;

(B) continuously conveying the reaction mixture through a first barrel zone maintained at a temperature below the melting point of the lowest melting essential ingredient, said first barrel zone extending from said inlet opening to said second barrel zone; and

(C) continuously venting water of reaction at a temperature of up to 400° C through said second opening while continuously feeding reaction mixture through said inlet opening.



where n is a whole number greater than 1, which comprises effecting reaction between a dialkali-metal salt of bisphenol-A and tetrachloroethylene in an aprotic solvent and thereafter isolating the formed polymers, there being employed a molar ratio of from 0.9 to 1.1 mols of the dialkali-metal salt of bisphenol-A per mol of the tetrachloroethylene.

4,073,774

PREPARATION OF DICHLOROETHYLENE POLYMERS

Clayton B. Quinn, Mount Vernon, Ind., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 20, 1977, Ser. No. 789,028
Int. Cl.² C08G 63/62
U.S. Cl. 260—47 UA **7 Claims**

1. The process for making solid polymers comprising units of the formula

4,073,775

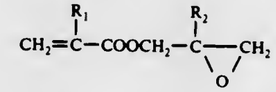
POWDER COATING COMPOSITION

Shunji Matsuo; Kiichiro Sasaguri; Katsuyuki Nakamura, all of Fuji; Yoshio Matsumoto, Nobeoka, and Mikio Sato, Fuji, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed June 8, 1976, Ser. No. 693,913
Claims priority, application Japan, June 12, 1975, 50-70178
Int. Cl.² C08G 51/84, 45/04, 45/00; C08F 24/00
U.S. Cl. 260—47 EP **10 Claims**

1. A powder coating composition comprising (A) 100 parts by weight of an epoxy group-containing copolymer of

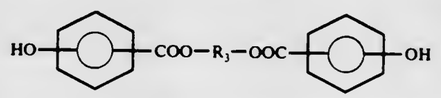
1. from 3 to 35% by weight, based on said copolymer, of a monomer represented by the following general formula



wherein R_1 and R_2 stand for a hydrogen atom or a methyl group, and

2. from 97 to 65% by weight of an ethylenically unsaturated monomer selected from the group consisting of acrylic acid esters, methacrylic acid esters, acrylonitrile, methacrylonitrile, styrene, vinyltoluene and α-methylstyrene, said copolymer having a glass transition point of 30° to 90° C,

and (B) 3 to 40 parts by weight of at least one of compounds represented by the general formula



wherein R_3 stands for a hydrocarbon radical having 2 to 20 carbon atoms or a linking group containing, at least at its both terminals, hydrocarbon radicals and in its main chain at least one member selected from the group consisting of an ether linkage, ester linkage, urethane linkage and amide linkage, and having totally 4 to 20 carbon atoms.

4,073,776

TACKIFIERS FOR ELASTOMERS

Thomas M. Galkiewicz, Schenectady; Kenneth C. Petersen, Scotia, and John L. Sullivan, Ballston Lake, all of N.Y., assignors to Schenectady Chemicals, Inc., Schenectady, N.Y.

Filed Jan. 28, 1975, Ser. No. 544,772
Int. Cl.² C08G 8/20, 16/04
U.S. Cl. 260—51 EP **23 Claims**

1. A tackifier suitable for use with sulfur curable hydrocarbon, halohydrocarbon or hydrocarbon-acrylonitrile elastomers, comprising a resin reaction product AB, wherein A is the residue of an alkyl phenol novolac resin, wherein the alkyl of

said alkyl phenol novolac is a hydrocarbon radical of 4 to 16 carbon atoms; and wherein B is a residue of an oxirane bearing material, wherein B comprises 1 to 38 weight percent of AB; wherein AB is substantially a thermoplastic resin, characterized by a WPE of at least 2000.

4,073,777

RADIATION CROSSLINKABLE POLYESTER AND POLYESTERAMIDE COMPOSITIONS CONTAINING SULFONATE GROUPS IN THE FORM OF A METALLIC SALT AND UNSATURATED GROUPS

George J. O'Neill, and James G. Pacifici, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 17, 1975, Ser. No. 541,965
Int. Cl.² C08G 63/20
U.S. Cl. 260—75 S 15 Claims

1. A linear, radiation crosslinkable, water-dissipatable polymer having carbonyloxy interconnecting groups in the linear molecular structure and having an inherent viscosity of at least about 0.1 measured in a 60/40 parts by weight solution of phenol/tetrachloroethane at 25° C. and at a concentration of about 0.25 gram of polymer in 100 ml. of said solvent, said polymer being prepared from components comprising:

a. at least one unsubstituted saturated aliphatic, unsubstituted saturated cycloaliphatic or unsubstituted aromatic dicarboxylic acid combining no ethylene unsaturation;

b. at least one difunctional glycol containing two —CH₂—OH groups of which at least 15 mole percent is a poly(ethylene glycol) having the structural formula:

$$H(OCH_2\text{-}CH_2)_nOH$$

n being an integer in the range between about 2 and about 20;

c. an amount sufficient to provide said water-dissipatable characteristic of said polymer of at least one difunctional sulfomonomer containing at least one metal sulfonate group attached to an aromatic nucleus wherein the functional groups are hydroxy, carboxyl or amino;

d. an α,β-unsaturated acid having the formula:

$$R—CH=CH—R^1$$

wherein R is H, alkyl or arylcarboxy and R^1 is carboxy or arylcarboxy.

4,073,779

HYDROLYSIS-RESISTANT, FILM-FORMING COPOLYMER DISPERSIONS

Hubert Wiest; Rainer Berger, and Erwin Lieb, all of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Aug. 11, 1976, Ser. No. 713,420
Claims priority, application Germany, Sept. 19, 1975, 2541934
Int. Cl.² C08F 210/02; C08L 23/08
U.S. Cl. 260—79.3 MU 10 Claims

1. A hydrolysis-resistant film having a hydrolysis resistance measured in a 5 × 5 cm film having a thickness of 0.1 ± 0.02 mm, such that after maintaining for four days in a 25% aqueous sodium hydroxide solution, the weight loss of said film is less than 10%, consisting essentially of a dried film of an emulsion polymerized copolymer of a mixture of

(a) from 5% to 50% by weight of ethylene units,

(b) from 10% to 60% by weight of vinyl acetate,

(c) from 20% to 70% by weight of vinyl chloride units,

(d) from 5% to 30% by weight of alkyl methacrylate units having from 1 to 8 carbon atoms in the alkyl moiety,

(e) from 0 to 5% by weight of olefinically unsaturated monomer units copolymerizable with components (a) to (e) selected from the group consisting of alkenoic acids having from 3 to 8 carbon atoms, amides of said alkenoic acids, N-methylol amides of said alkenoic acids, alkenedioic acids having from 4 to 8 carbon atoms, monoalkyl esters of said alkenedioic acids having from 1 to 8 carbon atoms in the alkyl moiety, water-soluble salts of vinylsulfonic acid, vinylpyrrolidone and N-vinylmethyl-acetamide, and

(f) from 0 to 2% by weight of poly-olefinically-unsaturated monomer units copolymerizable with components (a) to (e).

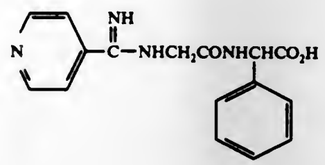
4,073,780

4-PYRIDYLFORMIMIDOYLGLYCYL-D-PHENYLGLYCINE

Thomas M. Brennan, Old Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 692,323, June 3, 1976, abandoned. This application Feb. 24, 1977, Ser. No. 771,773
Int. Cl.² C07C 103/52
U.S. Cl. 260—112.5 R 1 Claim

1. The compound, 4-pyridylformimidoylglycyl-D-phenylglycine, of the formula:



4,073,776

CROWN ETHER ACTIVATED LACTAM POLYMERIZATION

James P. Collman, Stanford, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed June 7, 1976, Ser. No. 693,578
Int. Cl.² C08G 69/20
U.S. Cl. 260—78 L 22 Claims

1. A process for the anionic polymerization of a lactam to a polylactam, capable of being made into filaments, films or shaped articles, which comprises polymerizing a mixture of lactam, anionic catalyst and a catalytically effective amount of a crown macrocyclic polyether having the ability to form complexes with said anionic catalyst and having 12-30 atoms in its polyether ring including 4-10 oxygen atoms and wherein said oxygen atoms are separated from each other by two or three carbon atoms.

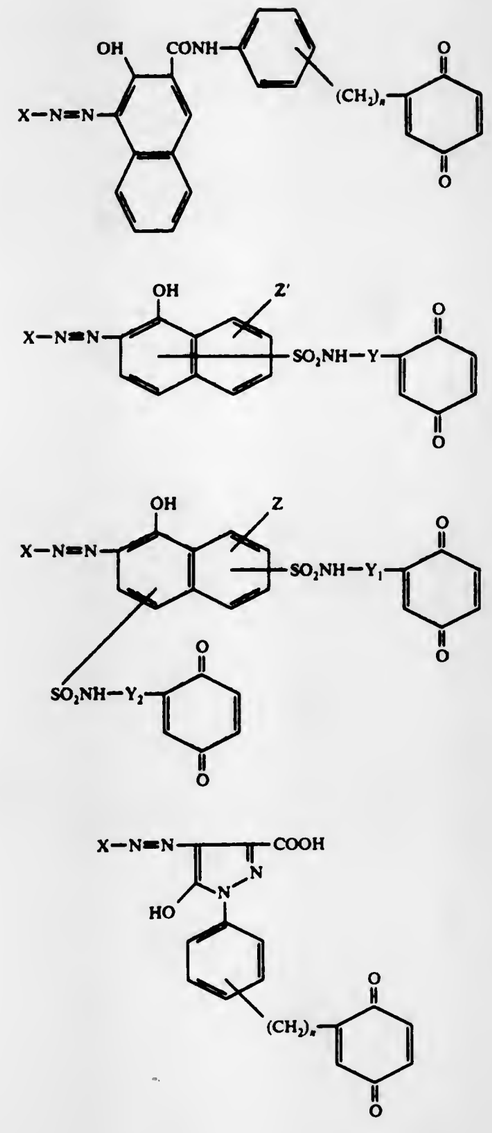
4,073,781

METHOD OF PRODUCTION OF AZO DYES FROM A QUINONE CONTAINING COMPOUND AND A DIAZONIUM COMPOUND

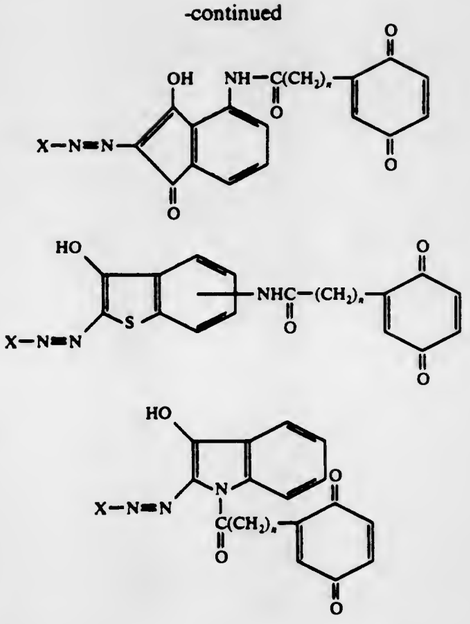
Yukio Maekawa, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed June 19, 1975, Ser. No. 588,438
Claims priority, application Japan, June 20, 1974, 49-70668
Int. Cl.² C07C 107/02, 107/04, 107/08
U.S. Cl. 260—152 7 Claims

1. A method for preparation an azo dye containing a quinone residue comprising reacting a p-quinone residue-containing coupler with a diazonium compound, the reaction taking place preferentially at a position other than at the p-quinone nucleus, to produce an azo dye containing a quinone residue selected from the following general formulae:



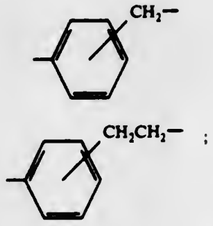
-continued



wherein

X represents an aryl group or an aromatic heterocyclic group;

Y represents a methylene group, an ethylene group,



or

;

Z′ represents hydrogen or an acylamino group;

Z represents an acylamino group;

Y_1 and Y_2 each represents the same groups as Y;

R represents a lower alkyl group containing from 1 to 6 carbon atoms or a phenyl group; and

n represents 1 or 2.

4,073,782

WRAPPING FILM

Hidehiro Kishi; Hiroshi Harakawa, both of Ichihara; Kazuo Ogawa, Chiba, and Seiko Tsutsui, Ichihara, all of Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed Jan. 27, 1976, Ser. No. 652,765
Claims priority, application Japan, Jan. 31, 1975, 50-12348
Int. Cl.² C08L 91/00
U.S. Cl. 260—23 H 8 Claims

1. A wrapping film comprising a composition which comprises (I) 100 parts by weight of a film forming polymeric material selected from the group consisting of (A) polyethylene, (B) copolymers of 25% by weight or less of vinyl acetate and 75% by weight or more of ethylene, and (C) mixtures of (A) and (B), (II) 0.5 to 6 parts by weight of sorbitan monoleate and (III) 0.5 to 6 parts by weight of a liquid paraffin having a dynamic viscosity of 30 to 80 centi-stokes determined at a temperature of 38° C.

4,073,783

BROAD SPECTRUM ANTIBIOTICS

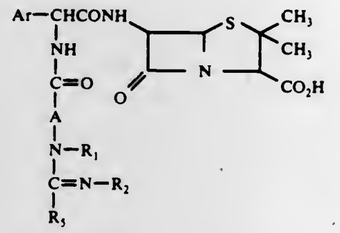
Ernest S. Hamanaka, Groton, and John G. Stam, Lyme, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 424,891, Dec. 14, 1973, Pat. No. 3,951,952, which is a continuation-in-part of Ser. No. 277,064, Aug. 2, 1972, abandoned. This application Dec. 15, 1975, Ser. No. 640,573

Int. Cl.[2] C07D *499/68*

U.S. Cl. 260—239.1 **29 Claims**

1. A compound selected from the group consisting of those of the formula



and the pharmaceutically acceptable basic salts thereof, wherein

Ar is selected from the group consisting of phenyl, 4-hydroxyphenyl, 2-thienyl and 3-thienyl;

A is methylene;

R_1 and R_2 are each selected from the group consisting of hydrogen and alkyl containing from 1 to 3 carbon atoms;

R_5 is selected from the group consisting of naphthyl; phenyl, benzyl; monosubstituted phenyl wherein said substituent is selected from the group consisting of fluoro, chloro, iodo, bromo, methyl, methoxy, acetyl, dimethylamino, amidino, phenyl, cyano, trifluoromethyl, amino, hydroxy, alkanoylamino containing from 2 to 5 carbon atoms, methylthio, nitro, carbethoxy, carboxamido, methylsulfony, sulfamoyl, N-methylsulfamoyl and N,N-dimethylsulfamoyl; disubstituted phenyl wherein each substituent is selected from the group consisting of hydroxy, alkoxy containing from 1 to 5 carbon atoms, methylthio, acetoxy, methylsulfonyl, trifluoromethyl, N,N-dimethylsulfamoyl, iodo, chloro, fluoro, bromo, cyano, carbethoxy, and allyloxy; trisubstituted phenyl wherein each substituent is selected from the group consisting of fluoro, chloro, bromo, iodo and methoxy; and substituted benzyl wherein said substituent is selected from the group consisting of chloro, fluoro, methoxy, hydroxy, dichloro, methyl and trifluoromethyl.

4,073,784

CERTAIN AS-TRIAZINO[4,3-A][1,4]BENZODIAZEPINE-1,2-DIONE COMPOUNDS

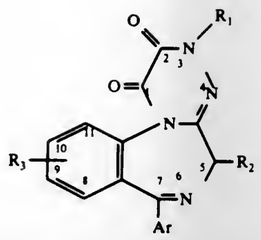
Robert Bruce Moffett, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 9, 1977, Ser. No. 775,728

Int. Cl.[2] C07D *487/04*

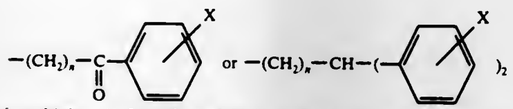
U.S. Cl. 260—243.3 **10 Claims**

1. A compound of the formula V:



V

wherein R_1 is hydrogen, alkyl of 1 to 3 carbon atoms, inclusive,



in which n is 2 or 3, and X is hydrogen, fluoro or chloro; wherein R_2 is hydrogen, methyl or ethyl; wherein R_3 is hydrogen, fluoro, chloro, bromo, trifluoromethyl and nitro; and wherein Ar is phenyl, o-chlorophenyl, o-fluorophenyl, 2,6-difluorophenyl or 2-pyridyl or the pharmacologically acceptable acid addition salts thereof.

4,073,785

CERTAIN AS-TRIAZINO [4,3-a][1,4]BENZODIAZEPINE DERIVATIVES

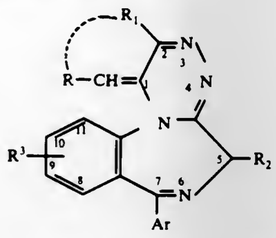
Gerald Norman Evenson, Cooper Township, Kalamazoo County, and Robert Bruce Moffett, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 9, 1977, Ser. No. 775,725

Int. Cl.[2] C07D *243/20, 401/04, 487/04*

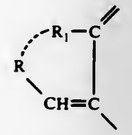
U.S. Cl. 260—243.3 **16 Claims**

1. A compound of the formula IV:



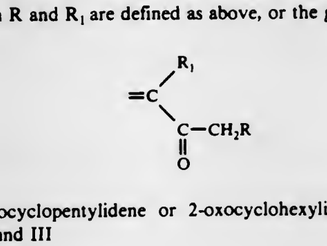
IV

wherein R is hydrogen or alkyl of 1 to 2 carbon atoms, inclusive; wherein R_1 is alkyl of 1 to 3 carbon atoms, inclusive, or



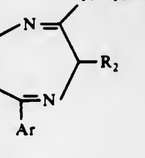
is a 2-cycloalkenylidene ring of 5 or 6 carbon atoms; wherein R_2 is hydrogen, methyl or ethyl; wherein R_3 is hydrogen, fluoro, chloro, bromo, nitro and $-CF_3$; and wherein Ar is phenyl, o-chlorophenyl, o-fluorophenyl, 2,6-difluorophenyl, and 2-pyridyl, or the pharmacologically acceptable acid addition salts thereof.

15. A process for the production of a compound of formula IV:



IV

wherein R is hydrogen or alkyl of 1 to 2 carbon atoms, inclusive; wherein R_1 is alkyl of 1 to 3 carbon atoms, inclusive, or

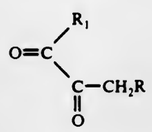


is a 2-cycloalkenylidene of 5 or 6 carbon atoms, inclusive; wherein R_2 is hydrogen, methyl or ethyl; wherein R_3 is hydrogen, fluoro, chloro, bromo, nitro and $-CF_3$; and wherein Ar is phenyl, o-chlorophenyl, o-fluorophenyl, 2,6-difluorophenyl, and 2-pyridyl, which comprises: treating a hydrazino compound of the formula:



I

with a dicarbonyl compound II



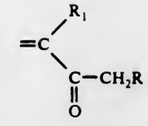
II

wherein R and R_1 are defined as above, or the group

is 2-oxocyclopentylidene or 2-oxocyclohexylidene to give compound III

III

wherein R, R_1, R_2, R_3 and



are defined as above, and treating compound II with a cyclizing agent to obtain the compound of formula IV.

4,073,786

2-AMINO-4-HYDROXY-6-HYDROXYMETHYL-7,7-DIETHYL-7,8-DIHYDROPTERIDINE AND THE 7-SPIROCYCLOHEXYL ANALOGUE THEREOF

Hamish Christopher Swan Wood, Bearsden, Scotland, and Irene Stirling, Worcester Park, England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 383,698, July 30, 1973, Pat. No. 3,963,719. This application July 31, 1975, Ser. No. 600,921

Int. Cl.[2] C07D *475/04*

U.S. Cl. 260—251.5 **4 Claims**

1. 2-amino-4-hydroxy-6-hydroxymethyl-7,7-diethyl-7,8-dihydropteridine or a tautomeric form thereof.

3. 2-amino-4-hydroxy-6-hydroxymethyl-7-spirocyclohexyl-7,8-dihydropteridine or a tautomeric form thereof.

4,073,787

MANUFACTURE OF PYRIDINE AND METHYLPYRIDINES

John Irvine Darragh, Runcorn, and Hugh Stewart Inglis, Stockton-on-Tees, both of England, assignors to Imperial Chemical Industries Limited, United Kingdom

Filed Jan. 17, 1977, Ser. No. 760,145

Claims priority, application United Kingdom, Jan. 30, 1976, 3789/76

Int. Cl.[2] C07D *213/12*

U.S. Cl. 260—290 P **5 Claims**

1. A process for the manufacture of pyridine which comprises the vapor-phase reaction, in the presence of a catalyst comprising silica-alumina and at a temperature in the range from 300° C to 550° C, of 1,3-butadiene, formaldehyde and ammonia in the presence of a gaseous diluent comprising steam wherein the proportions of the reactants are at least 0.5 mole of ammonia per total mole of formaldehyde and butadiene and at least 0.2 mole of formaldehyde per mole of butadiene and wherein the proportion of steam is at least 3 moles of steam per total mole of formaldehyde and butadiene.

4,073,788

PARTIALLY IMIDIZED POLYAMIDE-ACID POLYMERS, AQUEOUS COATING COMPOSITIONS, COATED WIRE AND METHOD, AND PARTIALLY IMIDIZED INTERMEDIATE

Marvin A. Peterson, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Continuation of Ser. No. 822,899, May 8, 1969, abandoned, and a continuation of Ser. No. 324,987, Jan. 19, 1973, abandoned. This application May 6, 1974, Ser. No. 467,615

Int. Cl.[2] C08J *3/06*

U.S. Cl. 260—29.2 N **36 Claims**

1. In a process for producing a high solids content polyamide acid solution for use in the preparation of a coating medium for applying a curable polyamide acid coating on magnet wire which includes the steps of reacting in a solvent an aromatic dianhydride reactant with an aromatic diamine reactant to produce a solution of a polyamide acid polymer wherein said reactants are present in approximately equal molar quantities, the improvement comprising:

(a) forming an anhydrous mixture of an aromatic dianhydride reactant and an aromatic diamine reactant in an

organic solvent wherein the reactants are in the molar ratio of about two-to-one;

(b) reacting said reactants at a temperature below that at which imidization occurs to form an amide acid intermediate having two free carboxyl groups each ortho to an amide group;

(c) partially imidizing said amide acid intermediate to an imidization level greater than a negligible amount up to but not more than 56% to provide the desired viscosity of the final polyamide acid polymer solution;

(d) further reacting said amide acid intermediate with a reactant of the character of the original reactant initially present in the lesser amount with said additional reactant being in a molar amount equal to the molar amounts of said lesser initial reactant;



(e) the total amounts of dianhydride reactant and diamine reactant being sufficient to produce a polyamide acid polymer solution having a solids content of between about 25% and about 70% by weight.

33. A stable amide acid intermediate composition for use in preparing a high solids content polyamide acid coating composition, comprising the reaction product of an aromatic diamine reactant and an aromatic dianhydride reactant in an anhydrous organic solvent, wherein the reactants are in the molar ratio of about two moles of one reactant to about one mole of the other and wherein said product is partially imidized to a level greater than a negligible amount up to but not more than 56% to provide the desired viscosity of the high solids content polyamide acid coating composition.

4,073,789

INDOLOBENZOXAZEPINES

Richard E. Brown, Hanover, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

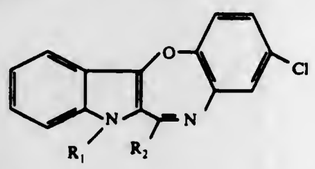
Division of Ser. No. 627,159, Oct. 30, 1975, Pat. No. 4,013,660. This application Nov. 2, 1976, Ser. No. 737,969

Int. Cl.² C07D *491/00*

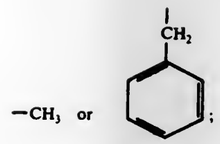
U.S. Cl. 260—293.58 **8 Claims**

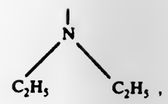
1. A compound of the formula:

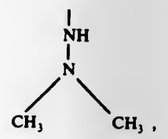
I

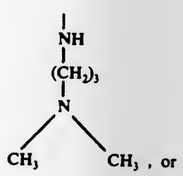


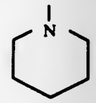
wherein R_1 is











4,073,790

PIPERIDINO UREAS AND THIOUREAS

John Leheup Archibald, Windsor, and John Lambert Jackson, Exmouth, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

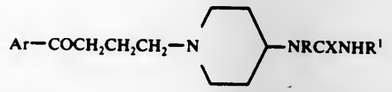
Filed Feb. 12, 1975, Ser. No. 549,271

Claims priority, application United Kingdom, Feb. 18, 1974, 7278/74

Int. Cl.² C07D *211/58*

U.S. Cl. 260—293.73 **15 Claims**

1. A compound of the formula:



in which

R is hydrogen or lower alkyl;

R^1 is hydrogen, lower alkyl, cyclohexyl, benzyl, phenyl, benzoyl, substituted phenyl wherein the substituent is at least one member selected from the group consisting of halo, lower alkyl, lower alkoxy and trihalo(lower)alkyl, or substituted benzoyl wherein the substituent is at least one member selected from the group consisting of halo, lower alkyl and lower alkoxy;

Ar is phenyl or substituted phenyl wherein the substituent is at least one member selected from the group consisting of halo, lower alkoxy, benzyloxy, hydroxy, lower alkyl and triflouromethyl);

X is oxygen or sulphur;

or a pharmaceutically acceptable acid addition or quaternary ammonium salt thereof.

4,073,791

1-SUBSTITUTEDPHENYL-4(1H)-PYRIDINONE HYDRAZONES

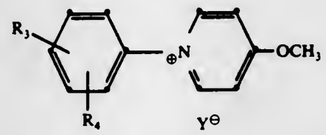
Michael H. Fisher, Bridgewater, and William V. Ruyle, Scotch Plains, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 19, 1976, Ser. No. 743,388

Int. Cl.² C07D *213/04*

U.S. Cl. 260—294.8 R **3 Claims**

1. The compound having the structure:



wherein R_3 is halogen, haloalkyl, alkylthio or cyano wherein the alkyl group contains 1 to 3 carbon atoms; R_4 is hydrogen or halogen; and Y is SO_3F or CH_3OSO_3.

4,073,792

5-ARYL-PYRIDO-(b-6,7)-1,4-DIAZAEPINE WITH AN ADDITIONAL FUSED HETEROCYCLIC RING

Walter vonBebenburg, Buchschlag, and Heribert Offermanns, Grossauheim, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler, Frankfurt, Germany

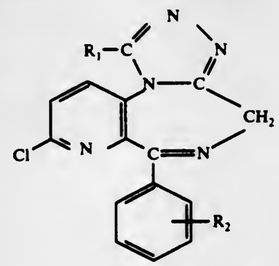
Filed Apr. 9, 1974, Ser. No. 459,371

Claims priority, application Austria, Apr. 12, 1973, 3241/73

Int. Cl.² A61K *31/55, 31/625;* C07D *471/14*

U.S. Cl. 260—296 H **6 Claims**

1. A 5-arylpyrido-(b,6,7)-1,4-diazepine of the formula:



where R_1 is an alkyl group of 1 to 6 carbon atoms and R_2 is hydrogen or halogen of atomic weight 19 to 80 or the tautomeric form thereof or a pharmacologically acceptable salt thereof.

4,073,793

5-ALKYLUREIDO-1,3,4-THIADIAZOL-2-YL-SULFONYL-ACETIC ACID DERIVATIVES

Friedrich Arndt, and Ludwig Nüsslein, both of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

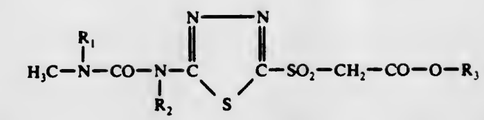
Filed Jan. 14, 1977, Ser. No. 759,558

Claims priority, application Germany, Jan. 16, 1976, 2601988

Int. Cl.² A01N *9/12;* C07D *285/12*

U.S. Cl. 260—306.8 D **5 Claims**

1. (5-alkylureido-1,3,4-thiadiazol-2-ysulfonyl) acetic acid derivatives of the general formula



in which R_1 and R_2 are hydrogen or methyl and R_3 is hydrogen alkyl of 1 to 4 carbon atoms, a univalent metal equivalent selected from the group consisting of Na, K, Ca/2, Mg/2 and NH_4, an ammonium group or an alkyl ammonium group selected from the group consisting of triethylammonium, tris-(2-hydroxy-(ethyl)-ammonium, tetramethylammonium and tetrabutylammonium.

4,073,794

7,8 DIACYL BICYCLO[2.2.2]BIS(2,3-DICARBOXIMIDE) COMPOUNDS

Steven A. Cerefice, Naperville, and Ellis K. Fields, River Forest, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 18, 1976, Ser. No. 733,118

Int. Cl.² C07D *209/34*

U.S. Cl. 260—326 C **4 Claims**

1. A compound selected from the group consisting of 7,8-diacyl bicyclo[2.2.2]oct-5-ene-bis(2,3-dicarboximide) and 7,8-diacyl bicyclo[2.2.2]octane-bis(2,3-dicarboximide).

4,073,795

SYNTHESIS OF TRYPTOPHANS

Andrew David Batcho, North Caldwell; Urs Oskar Hengartner, Roseland; Willy Leimgruber; John William Scott, both of Upper Montclair, and Donald Valentine, Jr., Highland Park, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

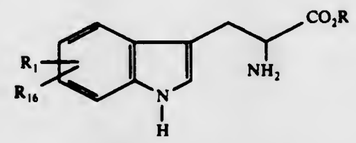
Filed June 22, 1976, Ser. No. 698,573

Int. Cl.² C07D *209/20*

U.S. Cl. 260—326.14 T **11 Claims**

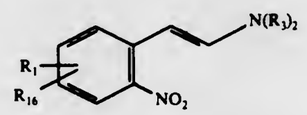
1. A process for the preparation of a compound of the formula:

I



wherein R_1 and R_{16} are halogen or lower alkyl, hydroxy, lower alkoxy, aralkyloxy, amino, trihalomethyl and hydrogen, and R is hydrogen or lower alkyl; which comprises reacting a compound of the formula:

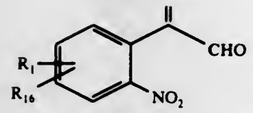
III



wherein R_1 and R_{16} are as above and R_3 is lower alkyl which may be taken together to form lower alkylene, which foramaldehyde/lower alkylamine to form a compound of the formula:

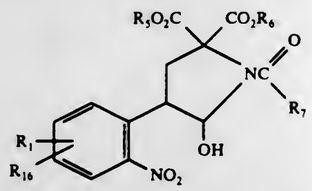
V

-continued



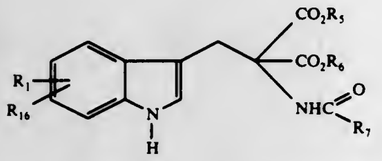
wherein R_1 and R_{16} are as above, followed by treatment of compound V with a lower acylamino malonate, in the presence of a base selected from the group consisting of ammonium hydroxide, alkali or alkaline earth metal hydroxides or alkoxides to form a compound of the formula:

VI



wherein R_1 and R_{16} are as above, R_5 and R_6 are hydrogen or lower alkyl, and R_7 is lower alkyl, hydrogen, aryl, halo-lower alkyl or alkyloxy; followed by reduction of compound VI to a compound of the formula:

VII



wherein R_1, R_2, R_6, R_7 and R_{16} are as defined above; followed by saponification and decarboxylation of compound VII; said decarboxylation being conducted in the presence of a lower alkyl monocarboxylic acid.

4,073,796

N-(1-SUBSTITUTED-3-PYRROLIDINYL)-1-NAPHTHALENE CARBOXAMIDES

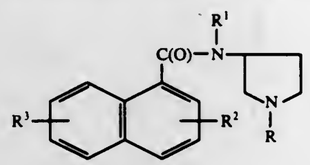
Albert Duncan Cale, Jr., Mechanicsville, Va., assignor to A. H. Robins Company, Inc., Richmond, Va.

Division of Ser. No. 536,514, Dec. 26, 1974, Pat. No. 4,002,757. This application May 5, 1976, Ser. No. 683,605

Int. Cl.[2] **C07D** *207/14;* **A61K** *31/40, 31/47;* **C07D** *401/12*

U.S. Cl. 260—326.33 **5 Claims**

1. A compound selected from N-(1-substituted-3-pyrrolidinyl)-1-naphthalenecarboxamides having the formula:



wherein;

R is cycloalkyl having 3 to 9 carbon atoms,

R^1 is selected from the group consisting of hydrogen, lower-alkyl having 1 to 8 carbon atoms, phenyl or substituted phenyl wherein one to three substituents are selected from halogen atoms of atomic weight less than 80, lower-alkyl having 1 to 8 carbon atoms, lower-alkoxy having 1 to 8 carbon atoms,

R^2 is selected from the group consisting of hydrogen, lower-alkyl having 1 to 8 carbon atoms, halogen of atomic weight less than 80, lower alkoxy having 1 to 8 carbon atoms, amino or nitro,

R^3 is selected from the group consisting of hydrogen, lower-alkyl having 1 to 8 carbon atoms, lower-alkoxy having 1 to 8 carbon atoms, halogen atom of atomic weight less than 80, amino or nitro and the pharmaceutically acceptable acid addition salts thereof.

4,073,797

SULPHUR CONTAINING DERIVATIVES

Henri Ramuz, Birsfelden, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

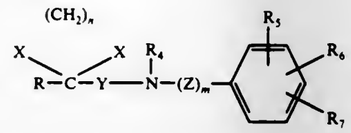
Division of Ser. No. 532,990, Dec. 16, 1974, Pat. No. 4,003,914. This application Oct. 1, 1976, Ser. No. 728,668

Claims priority, application Switzerland, Dec. 21, 1973, 18030/73; Nov. 16, 1974, 15248/74

Int. Cl.[2] **C07D** *339/08*

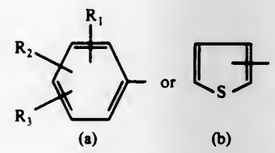
U.S. Cl. 260—327 M **6 Claims**

1. A compound of the formula



(I)

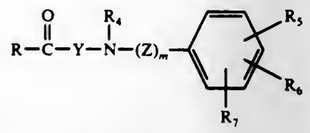
wherein R is a group of the formula



(a) (b)

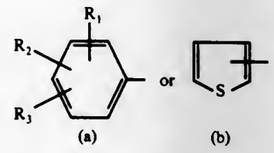
in which two adjacent R_1, R_2 and R_3 symbols together are methylenedioxy, ethylenedioxy or butadien-1,3-ylene-1,4; R_4 is hydrogen or lower alkyl; R_5, R_6 and R_7 each independently is hydrogen, halogen, lower alkyl, lower alkoxy, hydroxy or benzyloxy or two adjacent R_5, R_6 and R_7 symbols together are methylenedioxy or ethylenedioxy; X is a sulphur atom, SO or SO_2; Y is a straight-chain or branched-chain, aliphatic group which may be substituted with hydroxy and containing 2–8 carbon atoms, of which 2–4 carbon atoms are present in the chain; and Z is a straight-chain or branched-chain aliphatic group which may be substituted with hydroxy and containing 1–8 carbon atoms, of which 1–4 carbon atoms are present in the chain; *m* is zero or 1 and *n* is 2 or 3, and acid salts thereof.

4. A compound of the formula



(IV)

wherein R is a group of the formula

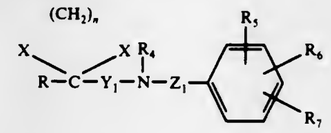


(a) (b)

in which two adajcent R_1, R_2 and R_3 symbols together are methylenedioxy, ethylenedioxy or butadien-1,3-xylene-1,4; R_4 is hydrogen or lower alkyl; R_5, R_6 and R_7 each independently

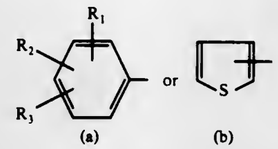
is hydrogen, halogen, lower alkyl, lower alkoxy, hydroxy or benzyloxy or two adjacent R_5, R_6 and R_7 symbols together are methylenedioxy or ethylenedioxy; y is a straight-chain or branched-chain, optionally hydroxy-substituted, aliphatic group containing 2–8 carbon atoms, of which 2–4 atoms are present in the chain, and Z repesents a straight-chain or branched-chain, optionally hydroxy-substituted aliphatic group containing 1–8 carbon atoms, of which 1–4 carbon atoms are present in the chain, and *m* stands for zero or 1, and acid addition salts thereof.

5. A compound of the formula



(XII)

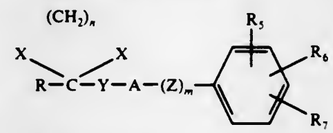
wherein R is a group of the formula



(a) (b)

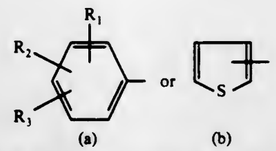
in which two adjacent R_1, R_2 and R_3 symbols together are methylenedioxy, ethylenedioxy or butadien-1,3-ylene1,4; R_4 is hydrogen or lower alkyl; R_5, R_6 and R_7 each independently is hydrogen, halogen, lower alkyl, lower alkoxy, hydroxy, or benzyloxy or two adjacent R_5, R_6 and R_7 symbols together are methylenedioxy or ethylenedioxy; X is a sulphur atom, SO or SO_2; Y_1 is a straight-chain or branched-chain aliphatic group which may be substituted with hydroxy and containing 2–8 carbon atoms, of which 2–4 carbon atoms are present in the chain; Z_1 is a straight-chain or branched-chain, aliphatic group which may be substituted with carbonyl and containing 1–8 carbon atoms, of which 1–4 carbon atoms are present in the chain; *m* is zero or 1 and *n* is 2 or 3, and acid addition salts thereof.

6. A compound of the formula



(XIII)

wherein R is a group of the formula



(a) (b)

in which two adjacent R_1, R_2, and R_3 symbols together are methylenedioxy, ethylenedioxy or butadien-1,3-ylene-1,4; R_5, R_6 and R^7 each independently is hydrogen, halogen, lower alkyl, lower alkoxy, hydroxy or benzyloxy ot two adjacent R_5, R_6 and R_7 symbols together are methylenedioxy or ethylenedioxy; X is a sulphur atom, SO or SO_2; Y is a straight-chain or branched-chain aliphatic group which may be substituted with hydroxy and containing 2–8 carbon atoms, of which 2–4 carbon atoms are present in the chain; Z is a straight-chain or branched-chain aliphatic group which may be substituted with hydroxy and containing 1–8 carbon atoms, of which 1–4 carbon atoms are present in the chain; *m* is zero of 1; *n* is 2 or 3 and A is the group



wherein R_4 is hydrogen or lower alkyl.

4,073,798

PREPARATION OF ETHYLAMINE DERIVATIVES

John T. Suh, Mequon, Wis., assignor to Nicholas International Limited, Australia

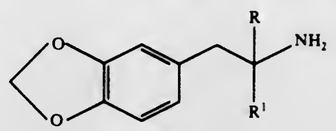
Filed Nov. 19, 1976, Ser. No. 743,400

Claims priority, application United Kingdom, Nov. 27, 1975, 48709/75

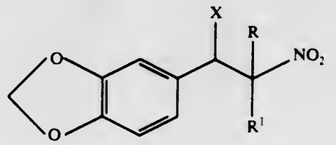
Int. Cl.[2] **C07D** *317/44*

U.S. Cl. 260—340.5 R **4 Claims**

1. A process for preparing a compound of formula I



wherein R and R^1 independently are selected from hydrogen and C_1–C_4 alkyl groups, which comprises catalytically hydrogenating under super-atmospheric pressure and at above ambient temperature a compound of formula (IV)



wherein R and R^1 are defined above and X is halogen using platinum oxide as catalyst.

4,073,799

PROCESS FOR PRODUCING 3-FORMYLCYCLOPENTANONE DERIVATIVES

Kiyoshi Kondo, Yamato; Daiei Tunemoto, Sagamihara, and Etsuko Hiro, Tokyo, all of Japan, assignors to (Zaidanhojin) Sagami Chemical Research Center, Tokyo, Japan

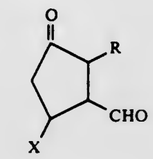
Filed Feb. 25, 1976, Ser. No. 661,263

Claims priority, application Japan, Feb. 27, 1975, 50-23451; Feb. 27, 1975, 50-23452; Feb. 27, 1975, 50-23453; Feb. 27, 1975, 50-23456

Int. Cl.[2] **C07C** *69/74, 49/40*

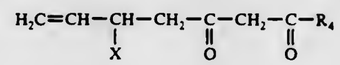
U.S. Cl. 260—345.8 P **1 Claim**

1. A process for producing a 3-formylcyclopentanone derivative having the formula

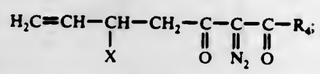


which comprises:

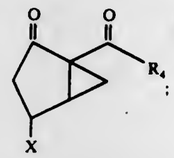
reacting a β-dicarbonyl compound having the formula



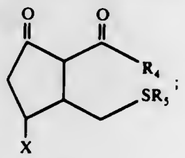
with an azide under basic conditions to produce an α-diazo-β-dicarbonyl compound having the formula



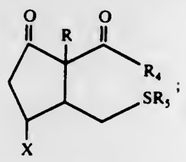
treating said product under conditions suitable for producing a carbene or carbenoid to produce a bicyclo hexane-2-one derivative having the formula:



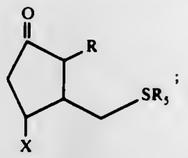
reacting said product with a mercaptan having the formula, R_5SH, in the presence of a base to produce a cyclopentanone derivative having the formula



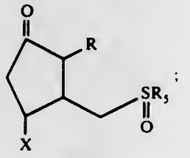
reacting said product with an alkylating agent having the formula RZ in the presence of a base to produce a cyclopentanone derivative having the formula



decarboxylating said product to produce a cyclopentane sulfide derivative having the formula



oxidizing said product to produce a cyclopentanone sulfoxide derivative having the formula



reacting said product with an acid anhydride; and
treating the obtained product with an acid or a base;
wherein R_4 is an alkyl or an alkoxy group; R_5 is a hydrocarbon group having less than 10 carbon atoms; R is a $C_{1\text{-}10}$ alkyl or $C_{2\text{-}10}$ alkenyl group substituted by a lower alkoxycarbonyl group, X is a hydrogen atom, an alkoxy group, a tetrahydropyranyloxy group or a silyloxy group; and Z is a leaving anion.

4,073,800

POLY-CARBONYLOXYURETHANES

John Langshaw Brooks, and Richard Budziarek, both of Blackley, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Feb. 23, 1976, Ser. No. 660,117
Claims priority, application United Kingdom, Mar. 26, 1975, 12677/75
Int. Cl.² C07C *125/06*
U.S. Cl. 260—404.5 **7 Claims**

1. A poly-carbonyloxyurethane of the formula:

$$A + O{-}CO{-}NH{-}O{-}CO{-}R]_n \qquad (1)$$

wherein n is 2 or 3, A is a linking group to which the oxygen atoms are attached through carbon atoms, A being selected from the class consisting of alkylene radicals of formula $(CH_2)_m$ where m has a value of 2 to 10, phenylene, xylylene, and polyethyleneoxy radicals of the formula:

$$-CH_2CH_2{-}OCH_2CH_2{-}_p$$

where p is 1 or 2 when n is 2 and A being selected from the class consisting of tri(ethylene)amino and tri(methylenepropane) when n is 3, and each R, which may be the same or different, is selected from the class consisting of alkyl radicals of 1 to 17 carbon atoms, phenyl, dimethylaminophenyl, nitrophenyl, hydroxyphenyl, chlorophenyl and tolyl.

4,073,801

PROCESS FOR THE PREPARATION OF LINEAR AND BRANCHED CHLOROSILOXANES

Hans-Heinrich Moretto; Armand de Montigny, both of Leverkusen; Karl-Friedrich Thom, and Reinhard Schliebs, both of Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 30, 1975, Ser. No. 627,302
Claims priority, application Germany, Nov. 12, 1974, 2453482
Int. Cl.² C07F *7/08*
U.S. Cl. 260—448.2 E **6 Claims**

1. A process for the preparation of chlorine-substituted siloxanes comprising reacting at least one chlorosilane of the formula

$$R_a R_b' SiCl_{(4-a-b)}$$

or a partial hydrolysis product thereof, with at least one siloxane having structural units selected from the group consisting of

$$[R_2R''SiO_{1/2}],\ [RR''SiO],\ [R''SiO_{3/2}] \text{and } [SiO_2]$$

wherein
$a = 0, 1, 2$ or 3,
$b = 0, 1, 2$ or 3,
$a + b \leqq 3$,
R and R' each independently is hydrogen or an aliphatic, aromatic, araliphatic, saturated or unsaturated, optionally halogen-substituted or cyano-substituted, monovalent hydrocarbon radical with up to 18 C atoms,
R'' is chlorine or hydroxyl or has the meaning indicated for R and R',
at least one of R, R', and R'' being an organo group, and the number of Si—Cl groups exceeds the number of all Si—OH groups,
the reaction being carried out at about −10° to 200° C in the presence of about 0.1 to 3% by weight of the reaction mixture of each of (i) at least one protonic acid equilibration catalyst for siloxanes and (ii) a hydrogen halide acid.

4,073,802

PROCESS FOR THE PREPARATION AND PURIFICATION OF 3-(4-LITHIOSULFOPHENOXY)-1,2-PROPANEDIOL

Ludwig Albert Hartmann, and Richard Lowell West, both of Wilmington, Del., assignors to ICI Americas Inc., Wilmington, Del.

Filed Sept. 16, 1976, Ser. No. 724,028
Int. Cl.² C07C *143/46*
U.S. Cl. 260—512 R **8 Claims**

1. The process for preparing 3-(4-lithiosulfophenoxy)-1,2-propanediol from lithium p-phenolsulfonate and a compound selected from the group consisting of glycol chlorohydrin and epichlorohydrin in aqueous medium which comprises the steps of:
(1) reacting said sulfonate and compound in the presence of substantially stoichiometric amounts of an alkaline calcium compound selected from the group consisting of calcium oxide, calcium hydroxide and calcium acetate to form by-product calcium chloride and 3-(4-lithiosulfophenoxy)-1,2-propanediol,
(2) forming calcium sulfate and liberated hydrochloric acid by the addition of sulfuric acid,
(3) removing precipitated calcium sulfate,
(4) removing the liberated hydrochloric acid from the aqueous medium by vacuum-stripping until a semi-solid mass is obtained, and
(5) recovering relatively pure 3-(4-lithiosulfophenoxy)-1,2-propanediol product from said semi-solid mass substantially free of chloride ion by recrystallization.

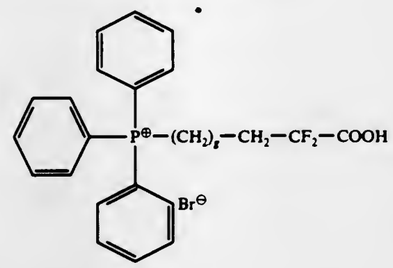
4,073,803

TRIPHENYLPHOSPHONIUM BROMIDE INTERMEDIATE FOR 2,2-FLUORO-PG ANALOGS

Udo F. Axen, Plainwell, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 552,708, Feb. 24, 1975, Pat. No. 4,001,300. This application Sept. 17, 1976, Ser. No. 724,154
Int. Cl.² C07F *9/54*
U.S. Cl. 260—515 A **1 Claim**

1. A phosphonium salt of the formula



wherein g is 2 to 4, inclusive.

4,073,804

PRODUCING GLYCINE BY THE REDUCTIVE AMINATION OF GLYOXYLIC ACID

William Montgomery Hearon, Portland, Oreg., and Lo Cheng Fan, Vancouver, Wash., assignors to Boise Cascade Corporation, Portland, Oreg.

Filed May 4, 1976, Ser. No. 682,831
Int. Cl.² C07C *99/00, 101/06*
U.S. Cl. 260—534 R **9 Claims**

1. The process for the production of glycine which comprises:
a. forming a solution of glyoxylic acid, ammonia, water and a water-soluble organic solvent,
1. the ammonia being used in an amount of at least 2 mols of ammonia per mol of glyoxylic acid,
2. the solvent being used in an amount sufficient to substantially dissolve the glyoxylic acid, ammonia and water; the intermediate reaction products of glyoxylic acid with ammonia; and the glycine product,
b. hydrogenating the solution in an atmosphere of hydrogen in the presence of a metallic rhodium hydrogenation catalyst for a time sufficient to convert a substantial proportion of the glyoxylic acid to glycine, and
c. separating the glycine product from the resulting reaction mixture.

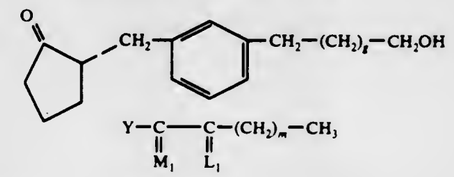
4,073,805

2-DECARBOXY-2-HYDROXYMETHYL-3,7-INTER-M-PHENYLENE-11-DEOXY-PGE$_1$ COMPOUNDS

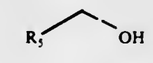
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,363, Jan. 8, 1976, Pat. No. 4,028,419. This application Mar. 17, 1977, Ser. No. 778,756
Int. Cl.² C07C *49/82*
U.S. Cl. 260—590 C **22 Claims**

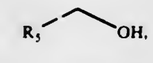
1. A prostaglandin analog of the formula



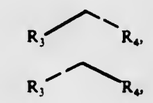
wherein Y is trans-CH=CH-;
wherein M_1 is



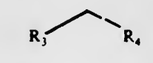
or



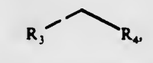
wherein R_5 is hydrogen or methyl;
wherein L_1 is



or a mixture of



and



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein g is 1, 2, or 3; and
wherein m is 1 to 5, inclusive.

4,073,806

PROCESS FOR THE PREPARATION OF PHOSGENE

Serge Doubovetzky; Peter Forschner, both of Toulouse, and Francois Montazeau, Portet sur Garonne, all of France, assignors to Societe Toulousaine de Produits Chimiques "Tolochimie", Courbevoie, France

Filed Dec. 31, 1975, Ser. No. 645,938
Claims priority, application France, Jan. 8, 1975, 75.01201
Int. Cl.² C07C *51/58*
U.S. Cl. 260—544 K **13 Claims**

1. A process for the preparation of phosgene which comprises catalytically interreacting chlorine and carbon monoxide gases in plural stages wherein the chlorine requirement and at least some but less than all of the carbon monoxide requirement is introduced to a first stage reaction zone, with the remaining required carbon monoxide being introduced to at least one downstream reaction zone, said at least one downstream reaction zone being in serial communicating relationship with said first stage reaction zone.

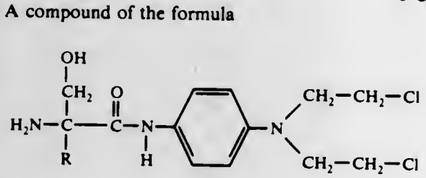
4,073,807

PROPIONAMIDE ANTITUMOR AGENTS

Stephen M. Coppell, Chinnor, and Terence A. Harrow, High Wycombe, both of England, assignors to G. D. Searle & Co., Chicago, Ill.

Filed Jan. 21, 1977, Ser. No. 760,871
Claims priority, application United Kingdom, Jan. 23, 1976, 2654/76
Int. Cl.² C07C *103/44*; A61K *31/16*
U.S. Cl. 260—562 N **3 Claims**

1. A compound of the formula



wherein R is hydrogen or hydroxymethyl.

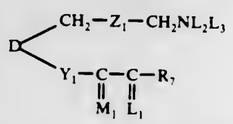
4,073,808

2-DECARBOXY-2-AMINO-METHYL-PGA AND 9-DEOXY-9,10-DIDEHYDRO-PGD ANALOGS

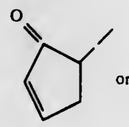
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 645,276, Dec. 29, 1975, abandoned. This application Aug. 30, 1976, Ser. No. 719,055
Int. Cl.² C07C *87/24*; A61K *31/13, 31/135*
U.S. Cl. 260—563 R **11 Claims**

1. A prostaglandin analog of the formula

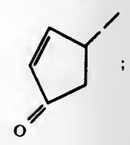


wherein D is

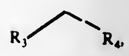


or

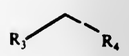
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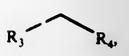
wherein L_1 is



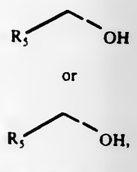
or a mixture of



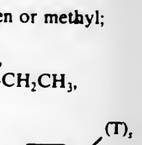
and



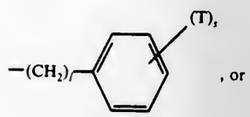
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein L_2 and L_3 are hydrogen or alkyl of one to 4 carbon atoms, inclusive;
wherein M_1 is

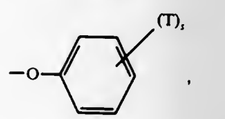


or



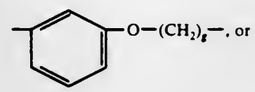
wherein R_5 is hydrogen or methyl;
wherein R_7 is
(1) $-(CH_2)_m-CH_3$,
(2) cis$-CH=CH-CH_2CH_3$,

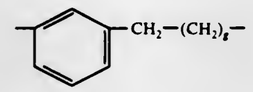

(3)


(4)

wherein l is zero to three, inclusive, wherein *m* is one to 5, inclusive, s is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, or alkoxy of one to 3 carbon atoms, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;
wherein Y_1 is
(1) trans$-CH=CH-$,
(2) cis$-CH=CH-$,
(3) $-CH_2CH_2-$, or
(4) $-C\equiv C-$; and
wherein Z_1 is
(1) cis$-CH=CH-CH_2-(CH_2)_g-CH_2-$,
(2) cis$-CH=CH-CH_2-(CH_2)_g-CF_2-$,
(3) cis$-CH_2-CH=CH-(CH_2)_g-CH_2-$,

(4) $-(CH_2)_3-(CH_2)_g-CH_2-$,
(5) $-(CH_2)_3-(CH_2)_g-CF_2-$,
(6) $-CH_2-O-CH_2-(CH_2)_g-CH_2-$,
(7) $-(CH_2)_2-O-(CH_2)_g-CH_2-$,
(8) $-(CH_2)_3-O-(CH_2)_g-$,


(9)


(10)

wherein g is zero, one, two, or three.

4,073,809

METHOD FOR PRODUCING TRIALKYLPHOSPHINE OXIDES

Jury Vasilievich Kandui, bulvar Lesi Ukrainki, 8, kv. 3; Valery Yakovlevich Semeny, ulitsa A.Navoi, 57, kv. 27; Mikhail Danilovich Pivovarov, ulitsa Sh.Aleikhema, 19, kv. 68; Vladlen Vasilievich Malovik, ulitsa A.Malyshko, 33, kv. 125; Ivan Karpovich Mazepa, ulitsa A.Dovbusha, 12, and Ninel Gavrilovna Feschenko, ulitsa E.Potie, 11, kv. 67, all of Kiev, U.S.S.R.

Filed May 26, 1976, Ser. No. 689,980
Int. Cl.² C07F *9/53*
U.S. Cl. 260—606.5 P **3 Claims**

1. A method for producing a trialkylphosphine oxide having the formula R_3PO, where R is an alkyl having from 1 to 16 carbon atoms, comprising reacting red phosphorus with an alkyl iodide where the alkyl group has from 1 to 16 carbon atoms in the presence of a catalyst selected from the group consisting of iodine and hexaalkyliodophosphoranphosphonium pentaiodide, by gradually adding alkyl iodide to the reaction mixture and maintaining the temperature at 180°–230° C, with subsequent isolation of the end product.

4,073,810

PRODUCTION OF ORGANOPHOSPHINES

Klaus Hestermann, Erftstadt Bliesheim; Bernd Lippsmeier, Hurth-Knapsack, and Gero Heymer, Erftstadt Liblar, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 12, 1975, Ser. No. 549,172
Claims priority, application Germany, Feb. 16, 1974, 2407461
Int. Cl.² C07F *9/50, 9/54*
U.S. Cl. 260—606.5 P **18 Claims**

1. In the process for making organophosphines of the formula R_nPH_{3-n}, in which R is alkyl having from 1 to 4 carbon atoms, and *n* is a whole numnber of 1 to 3, the improvement which comprises continuously reacting hydrogen phosphide as starting material with alkyl halide of the formula RX, in which R has the meaning given hereinabove and X is chlorine or bromine, at temperatures of 100° to 600° C within a gas atmosphere inert to the reaction mixture and under pressure of up to 20 atmospheres in contact with a catalyst in a reactor for a period within the range 0.1 and 60 seconds wherein the catalyst is selected from the group consisting of active carbon, a finely divided metal from the first or eighth subgroup of the Periodic System of the elements and blends of such metals; cooling gaseous matter issuing from the reactor; and hydrolyzing the resulting organophosphonium halides $(R_nPH_{4-n})X$ to the corresponding organophosphines.

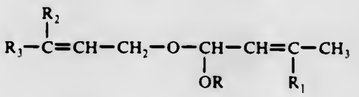
4,073,811

PROCESS FOR THE PREPARATION OF ALDEHYDES

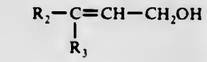
Willy Leimgruber, Montclair, and Donald Herman Valentine, Jr., Westfield, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 442,991, Feb. 15, 1974, Pat. No. 4,016,212, which is a continuation-in-part of Ser. No. 340,496, March 12, 1973, abandoned. This application Dec. 30, 1976, Ser. No. 755,695
Int. Cl.² C07C *43/30, 41/06*
U.S. Cl. 260—611 A **1 Claim**

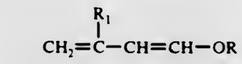
1. A process for forming an acetal of the formula:



wherein R_1 and R_2 are lower alkyl; R_3 is hydrogen, lower alkyl; and —OR is lower alkoxy or benzyloxy; comprising reacting at a temperature of from −35° to 50° C. an alcohol of the formula:



wherein R_2 and R_3 are as above;
with a butadienyl ether of the formula:



wherein R_1 and R are as above; said reaction being carried out in the presence of a dichloro-bis(benzonitrile) palladium or dichloro- phenanthroline palladium.

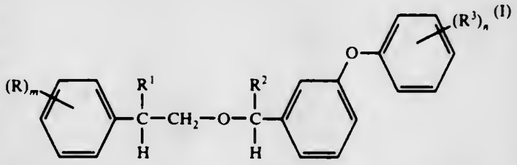
4,073,812

BENZYL ETHERS

Michael J. Bull, Lower Halstow, and Robert J. G. Searle, Sittingbourne, both of England, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 1, 1977, Ser. No. 773,355
Claims priority, application United Kingdom, Mar. 5, 1976, 8905/76
Int. Cl.² C07C *43/22*
U.S. Cl. 260—613 R **2 Claims**

1. A compound of the formula:


(I)

wherein *m* is one or two, R is halogen, or is straight-chain or branched-chain alkyl or alkoxy of one to six carbon atoms, R^1 is branched-chain alkyl of three to six carbon atoms, R^2 is hydrogen or alkynyl of two to four carbon atoms, *n* is zero or 1, and R^3 is fluorine.

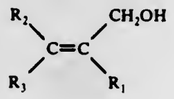
4,073,813

PROCESS FOR THE PREPARATION OF UNSATURATED ALCOHOLS

Georges Cordier, Francheville, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Oct. 18, 1976, Ser. No. 733,470
Claims priority, application France, Nov. 3, 1975, 75 34364
Int. Cl.² C07C *29/14*
U.S. Cl. 260—617 C **31 Claims**

13. A process for the preparation of α,β-ethylenic alcohols of the general formula:



(I)

in which:

R_1 symbolizes hydrogen or:

(a) an alkyl radical having from 1 to 8 carbon atoms;

(b) a lower alkoxy radical;

(c) a cycloalkyl or cycloalkenyl radical containing from 5 to 6 carbon atoms;

(d) an aryl radical containing 1 or 2 fused benzene nuclei;

(e) an aralkyl radical containing from 1 to 2 carbon atoms in the alkyl radical and 1 or 2 fused benzene nuclei in the aryl radical.

R_2 and R_3 represent hydrogen or:

(a) alkyl radicals containing from 1 to 30 carbon atoms;

(b) lower alkoxy radicals;

(c) alkenyl radicals containing from 2 to 30 carbon atoms and from 1 to 12 conjugated or non-conjugated ethylenic double bonds;

(d) cycloalkyl or cycloalkenyl radicals containing from 5 to 8 carbon atoms;

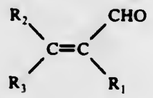
(e) aryl radicals containing 1 or 2 fused or nonfused benzene nuclei;

(f) aralkyl radicals containing from 1 to 5 carbon atoms in the alkyl radical and 1 or 2 fused or non-fused benzene nuclei;

(g) heterocyclic radicals with 5 or 6 chain members, containing a hetero-atom selected from the group consisting of sulphur, oxygen and nitrogen;

said R_2 and R_3 can form, with R_1, an aliphatic hydrocarbon ring containing from 5 to 7 carbon atoms and 1 or 2 ethylenic double bonds, a heterocyclic ring with 5 or 6 chain members,

and together, said R_2 and R_3, with the carbon atom to which they are bonded, can form an aliphatic hydrocarbon ring; which process comprises hydrogenation of an α,β-ethylenic aldehyde of the general formula:



(II)

in which:

R_1, R_2 and R_3 have the meaning given above, in the presence of a catalyst consisting of supported platinum, which is pre-reduced by prior reduction, by hydrogen, of the platinum, at a temperature of at least about 50° C.

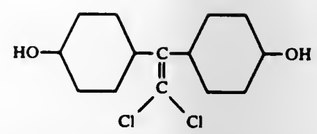
4,073,814

DEHYDROCHLORINATION METHOD

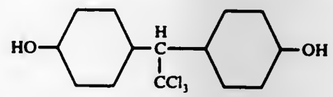
Philip L. Kinson, Clifton Park, N.Y., and Clayton B. Quinn, Mount Vernon, Ind., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 14, 1977, Ser. No. 768,209
Int. Cl.² C07C *37/00*
U.S. Cl. 260—619 A **10 Claims**

1. A method for making the dichloride of the formula,



by dehydrochlorinating the trichloride of the formula,



which comprises,

(1) heating to a temperature in the range of 40° C to 120° C, a mixture containing as essential ingredients,

(a) the trichloride,

(b) a dipolar aprotic solvent,

(c) a basic halide-free alkali metal compound selected from sodium compounds and potassium compounds,

where, per 100 parts by weight of (b), there is present from 5 to 100 parts of (a), and per mole of (a), there is present at least 1.1 moles or molar equivalents of alkali metal of (c),

(2) adding water and a member selected from the class consisting of organic acid and mineral acid in amounts sufficient to produce a mixture comprising from 0.8 to 2 parts of water per part of dipolar aprotic solent,

(3) effecting the crystallization of dichloride crystals from the mixture of (2) at a temperature of from about 35° C to 120° C, and

(4) recovering the crystalline dichloride from the resulting mixture of (3).

4,073,815

PROCESS FOR THE PREPARATION OF 2,2-BIS(3,5-DI-T-BUTYL-4-HYDROXYPHENYL)PROPANE

John W. Cornforth, Lewes; John A. Schofield, Sittingbourne; Sidney J. French, Canterbury, all of England, and Robin T. Gray, Heemstede, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 19, 1976, Ser. No. 733,816
Claims priority, application United Kingdom, Oct. 21, 1975, 43140/75
Int. Cl.² C07C *37/00, 39/16*
U.S. Cl. 260—619 A **6 Claims**

1. A process for producing 2,2-bis(3,5-di-t-butyl-4-hydroxyphenyl)propane which comprises contacting diphenylolpropane and isobutylene in a hydrocarbon solvent at a temperature between about 30° and about 70° C in the presence of a substantially anhydrous p-toluene sulfonic acid catalyst.

4,073,816

PROCESS FOR THE CONTINUOUS PRODUCTION OF MONOCHLOROALKANES

Rudolf Herrmann, Homberg, Ndrh., Germany, assignor to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Filed July 16, 1975, Ser. No. 596,330
Claims priority, application Germany, July 20, 1974, 2435029
Int. Cl.² C07C *17/16, 23/10*
U.S. Cl. 260—648 R **8 Claims**

1. In a method for the continuous production of a monochloroalkane or a monochlorocycloalkane which comprises reacting a monohydric alcohol with hydrogen chloride in the presence of a zinc chloride catalyst, said monohydric alcohol being selected from the group consisting of monohydric alkanols and monohydric cycloalkanols having above 4 and up to 12 carbon atoms and said catalyst consisting of an aqueous solution of zinc chloride consisting of at least 50 weight percent of zinc chloride, the improvement which comprises mixing said monohydric alcohol and said aqueous zinc chloride solution to form a liquid phase reaction mixture, saturating said reaction mixture with hydrogen chloride to form a liquid phase hydrogen chloride-saturated reaction mixture, passing said hydrogen chloride-saturated reaction mixture into a reactor to form a downwardly flowing thin layer of said liquid phase hydrogen chloride-saturated reaction mixture in said reactor, maintaining the temperature in said reactor above about 50° C, contacting said hydrogen chloride-saturated reaction mixture with a counter-current flow of hydrogen chloride gas in sufficient amount to provide an excess of said hydrogen chloride reactant in said reactor and recovering a reaction product containing said monochloroalkane or monochlorocycloalkane issuing from said reactor.

4,073,817

PROCESS FOR THE MANUFACTURE OF PERFLUOROALKYL IODIDE-OLEFINE ADDUCTS

Horst Jäger, Bettingen, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Continuation-in-part of Ser. No. 172,574, Aug. 17, 1971, abandoned. This application Dec. 2, 1974, Ser. No. 528,621
Claims priority, application Switzerland, Aug. 24, 1970, 12590/70
Int. Cl.² C07C *17/28*
U.S. Cl. 260—653.1 T **19 Claims**

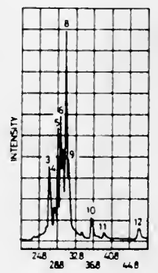
1. Process for the manufacture of perfluoroalkyl iodide olefin adducts, which comprises reacting a) a linear or branched perfluoroalkyl mono- or di-iodide with 6 to 24 carbon atoms with b) a C_2-C_{12} alkene or C_2-C_{12} alkene substituted with a member selected from the group consisting of halogen a lower alkyl, wherein the carbon atoms of the olefinic double bond have at least two hydrogen atoms and wherein the alkene chain is linear or cyclic, in the presence of c) a basic primary, secondary or tertiary alkanol amine having 2 to 6 carbon atoms, and d) a halide, a sulphate, a cyanide, or an alcoholate of a metal of groups Ia to IVa or Ib to Vb and VIII of the periodic system, as catalyst pair, at 0° to 350° C and 0 to 200 atmospheres gauge.

4,073,818

PROCESS OF PRODUCING ACENAPHTHENES

Hiroshi Ichikawa; Michio Sugimoto; Shigeyoshi Mizokami; Kosaku Honna, and Hirozo Sugahara, all of Sodegaura, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 661,731, Feb. 26, 1976, abandoned. This application Mar. 28, 1977, Ser. No. 782,038
Int. Cl.² C07C *15/20*
U.S. Cl. 260—668 F **15 Claims**



1. A process of producing an acenaphthene which comprises contacting a reaction charge consisting essentially of cyclododecatriene with a zeolite ion-exchanged with ions of one or more metals selected from the group consisting of an alkaline earth metal, a metal of the manganese group and a rare earth metal.

4,073,819

2,6-DIMETHYLNAPHTHALENE EXTRACTION PROCESS

Walter H. Seltzer, West Chester, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed June 17, 1977, Ser. No. 807,697
Int. Cl.² C07C *7/01*
U.S. Cl. 260—674 N **5 Claims**

1. In a process for the separation of 2,6-dimethylnaphthalene from isomeric mixtures containing the same by selective clathrate complexation of said 2,6-dimethylnaphthalene with m-nitrobenzoic acid, followed by separation and breaking of the complex to recover said 2,6-dimethylnaphthalene in concentrated form, the improvement which comprises first recrystallizing the m-nitrobenzoic acid from water or a suitable organic solvent, if necessary followed by grinding the recrystallized acid before contacting it with said isomeric mixture.

4,073,820

OLEFIN METATHESIS PROCESS

Jin-Liang Wang; Melvin Brown, both of Akron, and Henry R. Menapace, Stow, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 584,244, June 5, 1975, abandoned, which is a continuation of Ser. No. 252,178, May 11, 1972, abandoned, which is a continuation-in-part of Ser. No. 99,258, Dec. 17, 1970, abandoned. This application Nov. 11, 1976, Ser. No. 740,902
Int. Cl.² C07C *3/62*
U.S. Cl. 260—683 D **2 Claims**

1. An olefin metathesis process which comprises forming olefins containing a higher number of carbon atoms and a lower number of carbon atoms and the same number of double bonds per olefin than the original olefin feed, by subjecting at least one olefin feed to a catalyst system consisting of

1. tungsten halides or the reaction product of these tungsten halides with carboxylic acid, phenols and 1,3-diketones,

2. a material selected from the group represented by the formulae:

$$R_{3-n}AlX_n$$

and

$$R_3Al_2X_3$$

wherein R is an alkyl radical containing from 1 to 12 carbon atoms, Al is aluminum, X is a halogen from the group of fluorine, chlorine, bromine and iodine, and n equals 0, 1 or 2, and

3. a compound defined by the formula:

$$NR_1R_2R_3$$

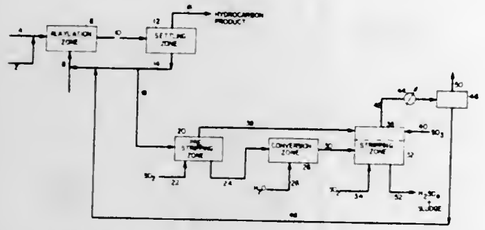
in which R_1 and R_2 are selected from the group of hydrogen, alkyl, aralkyl, aryl, alkenyl and alkaryl, R_3 is selected from the group of hydrogen, alkyl and alkenyl, said R's containing from 1 to 20 carbon atoms

to produce olefins containing a higher and lower number of carbon atoms than the original olefins, in which the molar relationship of catalyst component (3) to catalyst component (1) ranges from 0.5/1 to 3.0/1 and the molar relationship of catalyst component (2) to catalyst component (1) ranges from 0.5/1 to 5.0/1.

4,073,821
SO_2 STRIPPING IN FLUOROSULFURIC ACID CATALYST REGENERATION

Michael Siskin, Maplewood, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Feb. 28, 1977, Ser. No. 772,639
Int. Cl.² C07C 3/54
U.S. Cl. 260—683.47 8 Claims

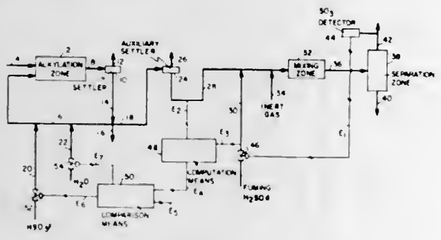


1. In an alkylation process which comprises:
a. contacting an olefin with a paraffin in an alkylation zone under alkylation conditions and with a catalyst comprising fluorosulfuric acid to form a reaction mixture of fluorosulfuric acid phase and a hydrocarbon phase including alkylate product,
b. separating said hydrocarbon phase from said fluorosulfuric acid catalyst phase, said fluorosulfuric acid catalyst phase being at least partly deactivated,
c. regenerating at least a portion of said acid catalyst phase separated in step (b); the improvement which comprises;
d. employing sulfur dioxide as the stripping agent during said regeneration, in step (c).

4,073,822
METHOD FOR CONTINUOUSLY CONTROLLING THE EQUIVALENT WATER CONTENT OF FLUOROSULFURIC ACID CATALYSTS

Ivan Mayer, Summit, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 645,270, Dec. 29, 1975, Pat. No. 4,018,846. This application Jan. 3, 1977, Ser. No. 756,479
The portion of the term of this patent subsequent to Apr. 19, 1977, has been disclaimed.
Int. Cl.² C07C 3/54
U.S. Cl. 260—683.47 9 Claims



1. In an alkylation process wherein a paraffin is reacted with olefins in the presence of an acid catalyst formed from at least fluorosulfuric acid and water according to the reaction

$$HSO_3F + XH_2O \rightleftarrows XHF + XH_2SO_4 + (1-X)HSO_3F$$

where X is the moles of water per mole of fluorosulfuric acid, to provide an acid catalyst-hydrocarbon mixture to a settling zone wherein a hydrocarbon product is separated from the acid catalyst, a major portion of the acid catalyst from said settling zone is being recycled to the alkylation zone, and wherein fresh fluorosulfuric acid, water or mixtures of said fluorosulfuric acid and water are added to said alkylation process, the improvement which comprises continuously controlling the equivalent water content of said acid catalyst by continuously controlling the addition rate of fresh fluorosulfuric acid, water or mixtures thereof to said alkylation process, according, to the steps:
1. withdrawing a sample of the acid catalyst from said settling zone;
2. intimately contacting said sample with a stream of fuming sulfuric acid in an amount sufficient to ensure substantially complete reaction of the HF present in said sample with the SO_3 present in said fuming sulfuric acid when $X \leqq 1$ and to ensure substantially complete reaction of the HF, water or mixtures of said HF and water present in said sample when $X > 1$;
3. sensing the presence of SO_3 evolved in step (2) after said complete reaction of the HF, water or mixtures of said HF and water present in said sample and providing a control signal in accordane with said sensed presence of SO_3;
4. controlling the rate of fuming sulfuric acid addition in step (2) in response to the control signal of step (3) such that said concentrated acid in step (2) is at the point of incipient fuming;
5. sensing the flow rate of the sample being withdrawn in step (1) and the flow rate of said fuming sulfuric acid stream being added in step (2);
6. providing a signal corresponding to the equivalent water content of the sample of step (1) in accordance with the sensed flow rate of said sample and the flow rate of said fuming sulfuric acid of step (5);
7. providing a reference signal in a computation means corresponding to a desired equivalent water content in said acid catalyst;
8 comparing the signals from step (6) and step (7) to provide a control signal;
9. controlling the addition rate of fresh fluorosulfuric acid, water or mixtures of said fluorosulfuric acid and water to said process in accordance with the control signal from step (8) and thereby controlling the equivalent water content of the acid catalyst during said alkylation.

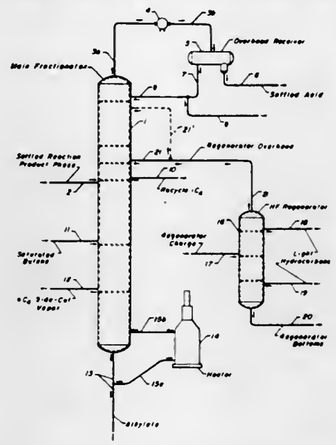
4,073,823
ALKYLATION PROCESS UTILIZING HF REGENERATOR STREAM TO A MULTI-TRAY MAIN FRACTIONATOR

Bipin V. Vora, Wheeling, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 660,900, Feb. 24, 1976, abandoned, which is a continuation-in-part of Ser. No. 533,421, Dec. 16, 1974, Pat. No. 3,956,416. This application May 2, 1977, Ser. No. 793,225
Int. Cl.² C07C 3/54
U.S. Cl. 260—683.48 5 Claims

1. In a process for producing an alkylation reaction product from an isoparaffin reactant and an olefinacting reactant using liquid HF catalyst wherein said reactants and said catalyst are admixed in a reactor at alkylation conditions, a reactor effluent is settled to form a settled HF phase containing acid soluble oils and a settled hydrocarbon product phase containing alkylate product and unreacted isoparaffin reactant, said product phase is fractionated in a multi-tray fractionator having an overhead vapor withdrawal locus for separation of HF phase and propane product phase, an alkylate product withdrawal locus at the bottom of said fractionator for withdrawal of alkylate product, a feed point at an intermediate locus of said fractionator for introduction of said settled hydrocarbon product phase into said fractionator, and an isoparaffin reactant recycle locus above said feed point, and wherein at least a portion of said settled HF phase is introduced to an HF regenerator and therein contacted at stripping conditions with a light hydrocarbon to strip HF from said acid soluble oils, withdrawing said acid soluble oils from a lower part of said regenerator, the improvement which comprises introducing

the regenerator overhead vapor to said fractionator at a locus at least two theoretical trays below the top of said fractionator and above said isoparaffin recycle locus and wherein the fractionation conditions in said fractionator are maintained to prevent formation of a separate liquid hydrogen fluoride phase within said fractionator.

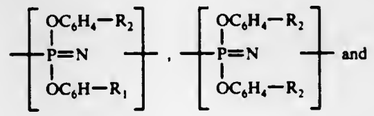


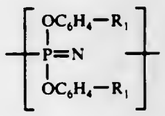
4,073,824
POLYPHOSPHAZENE BLENDS

Ronald L. Dieck, and Edwin J. Quinn, both of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

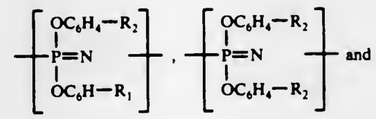
Division of Ser. No. 705,116, July 14, 1976. This application June 1, 1977, Ser. No. 802,307
Int. Cl.² C08J 9/06
U.S. Cl. 260—823 5 Claims

1. A composition comprising a blend of at least one relatively elastomeric polyphosphazene copolymer having a Young's Modulus of in the range of 1×10^6 to 5×10^8 dyne/cm² and having randomly repeating units represented by the formulas

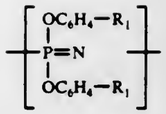




wherein R_1 and R_2 are the same or different and are hydrogen, a C_1-C_{10} linear or branched alkyl radical, or a C_1-C_4 linear or branched alkoxy, with the proviso that when R_2 is alkoxy, R_1 and R_2 are different; with at least one relatively stiff or rigid polyphosphazene homopolymer or copolymer having a Young's Modulus in the range of 5×10^8 to 6×10^{10} dynes/cm² and having randomly repeating units represented by the formulas



-continued



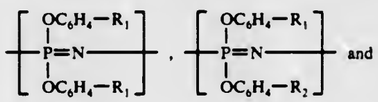
wherein R_1 and R_2 are the same or different and are hydrogen, a C_1-C_{10} linear or branched alkyl radical, or a C_1-C_4 linear or branched alkoxy, said relatively elastomeric copolymer:relatively stiff or rigid homopolymer or copolymer being present in said blend in a ratio of from about 1:3 to about 3:1.

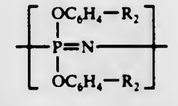
4,073,825
POLYPHOSPHAZENE POLYMER/SILICONE RUBBER BLENDS AND FOAMS THEREFROM

Ronald L. Dieck, and Edwin J. Quinn, both of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Division of Ser. No. 718,412, Aug. 30, 1976, Pat. No. 4,026,839. This application Dec. 20, 1976, Ser. No. 752,570
Int. Cl.² C08L 43/02
U.S. Cl. 260—824 R 8 Claims

1. A curable polymer blend comprising:
A. a polyphosphazene comprising randomly distributed repeating units represented by the formulas:





wherein R_1 and R_2 are the same or different and are hydrogen, a C_1 - C_{10} linear or branched alkyl radical, or a C_1 - C_4 linear or branched alkoxy radical substituted or any sterically permissible position on the phenoxy group,
B. a poly(organosiloxane) elastomer,
C. said polymer (A) being present in an amount of about 15% to about 85% by weight and said polymer (B) being present in an amount of about 85% to about 15% by weight, based on the combination of (A) and (B).

4,073,826
TACKIFIERS FOR ELASTOMERS

Thomas M. Galkiewicz, Schenectady; Kenneth C. Petersen, Scotia, and John L. Sullivan, Ballston Lake, all of N.Y., assignors to Schenectady Chemicals, Inc., Schenectady, N.Y.

Continuation-in-part of Ser. No. 544,772, Jan. 28, 1975. This application May 5, 1975, Ser. No. 574,625
Int. Cl.² C08G 8/20, 16/04
U.S. Cl. 260—831 37 Claims

1. An admixture of a tackifier resin comprising a resin reaction product AB, wherein A is the residue of an alkyl phenol novolac resin, wherein the alkyl or said alkyl phenol novolac is a hydrocarbon radical of 4 to 16 carbon atoms; and wherein B is a residue of an oxirane bearing material, wherein B comprises 1 to 38 weight percent of AB; wherein AB is substantially a thermoplastic resin, characterized by a WPE of at least 2000, with a sulfur-curable elastomer which is a hydrocarbon, halohydrocarbon or hydrocarbon-acrylonitrile elastomer, wherein said tackifier resin comprises 0.5 to 20 parts by weight to 100 parts by weight of elastomer.

4,073,827
THERMOPLASTIC RESINOUS COMPOSITION
Hotsuma Okasaka, Nagoya; Kiyokazu Nakamura, Chiryu; Masanobu Morikawa, Nagoya; Kenji Tsuneshima, Kyoto, and Atsuhiko Soda, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan
Filed Feb. 6, 1976, Ser. No. 656,080
Claims priority, application Japan, Feb. 10, 1975, 50-16292
Int. Cl.² C08L 63/00
U.S. Cl. 260—835 8 Claims

1. A thermoplastic resinous composition which comprises a blend of:
(a) 50 to 99% wt % of a polyester comprising a dicarboxylic acid component, wherein at least 50 mol % of said dicarboxylic acid component is terephthalic acid, and a glycol component, wherein at least 50 mol % of said glycol component is 1,4-butanediol;
(b) 50 to 1 wt % of α-olefin copolymer, wherein the weight percentages are based on the total weight of (a) and (b), said α-olefin copolymer being a copolymer of α-olefin selected from the group consisting of ethylene and propylene, in combination with at least one vinyl monomer selected from the group consisting of vinyl acetate acrylic acid, zinc acrylate, calcium acrylate, sodium acrylate, methyl acrylate, glycidyl acrylate, methacrylic acid, maleic acid, and maleic anhydride, and
(c) 0.1 to 20 parts by weight on the basis of 100 parts by weight of (a) and (b) of an epoxy compound having one or two epoxy groups attached to a molecule.

4,073,828
ETHYLENICALLY UNSATURATED MONOMER SOLUTIONS CONTAINING URYLATED LINEAR POLYESTER/POLYURETHANE RESINS
James Ferrarini, Aston, Pa., and Erich Kuehn, Wilmington, Del., assignors to ICI Americas Inc., Wilmington, Del.
Filed Apr. 12, 1976, Ser. No. 676,531
Int. Cl.² C08L 75/00
U.S. Cl. 260—859 R 29 Claims

1. A solution comprising a homogeneous mixture having 5–70 percent by weight of a linear polyester urethane urea resin wherein the number of urylene and urethane groups are substantially equal and free of ethylenic unsaturation formed by urylene-linking a linear isocyanate terminated polyester free of ethylenic unsaturation having a molecular weight within the range of 500–3000 and 30–95 percent by weight of an ethylenically unsaturated monomer.

4,073,829
PHOSPHORUS FLAME RETARDANT COMPOSITIONS
Kurt Moedritzer, Webster Groves, Mo., assignor to Monsanto Company, St. Louis, Mo.
Filed June 14, 1976, Ser. No. 695,702
Int. Cl.² C08L 67/02
U.S. Cl. 260—860 2 Claims

2. The combination of polyethylene terephthalate together with 1–20 wt.% of a polymeric ester having as moieties thereof, (A) an aliphatic alcoholic moiety of an alcoholic reactant of 5 to 20 carbon atoms, and from 2 to 6 hydroxyl functional groups, with the proviso hat there is no hydrogen atom on the carbon atoms beta to the hydroxyl oxygen, (B) a moiety of a phosphorus-containing acid halide, ester or amide reactant of 0 to 20 carbon atoms having from 1 to 4 functional groups, and (C) a different alcoholic moiety as defined in (A) or a different phosphorus-containing moiety defined in (B), the said ester having a degree of aggregation of 2 to 100, and with each of (A), (B) and (C) being present at from 1 mole to 99 mole %, with the proviso that the number of alcoholic functional groups on the alcoholic reactants is equal to the number of the said functional groups on the phosphorus-containing reactants.

4,073,830
POLY(TETRAMETHYLENETEREPHTHALATE) CROSSLINKED BY IRRADIATION
David Dolph Nyberg, Sunnyvale, Calif., assignor to Raychem Corporation, Menlo Park, Calif.
Continuation-in-part of Ser. No. 405,522, Oct. 11, 1973, Pat. No. 3,968,015. This application July 2, 1976, Ser. No. 702,202
Int. Cl.² C08L 67/00; C08F 8/00
U.S. Cl. 260—860 11 Claims

1. A composition comprising a blend of poly(tetramethyleneterephthalate) and a block copolymer of polytetramethyleneether and poly(tetramethyleneterephthalate) said composition containing an effective crosslinking amount of a member selected from N,N'-m-phenylenedimaleimide and triallyl cyanurate.

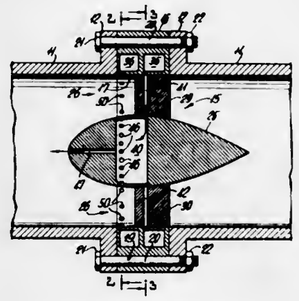
4,073,831
THERMOPLASTIC RESIN COMPOSITION
Minoru Tabana, Suita; Tatsuyuki Mitsuno, Toyonaka; Hiroshi Maki, Takatsuki, and Shizuo Narisawa, Ichihara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan
Filed Jan. 30, 1975, Ser. No. 545,350
Claims priority, application Japan, Feb. 2, 1974, 49-13924
Int. Cl.² C08L 53/00
U.S. Cl. 260—876 B 6 Claims

1. A resin composition consisting essentially of
polystyrene having a molecular weight of 150,000 to 500,000 and
a styrene-butadiene block copolymer represented by the formula $A_1—B_1—C—B_2—A_2$,
wherein A_1 and A_2 represent non-elastomeric blocks composed of polymeric styrene chains, B_1 and B_2 represent elastomeric blocks composed of random-copolymer chains containing styrene and butadiene units uniformly distributed therein, C represents an elastomeric block composed of a polymeric butadiene chain or a styrene-butadiene copolymer chain, the total amount of A_1 and A_2 is 40 to 80% by weight, the total amount of B_1 and B_2 is 10 to 60% by weight, the amount of C is 0 to 25% by weight provided that the amount of C is smaller than the total amount of B_1 and B_2, the weight ratio of A_1 to A_2 is 2:8 to 8:2, the weight ratio of B_1 to B_2 is 0:10 to 10:0, the weight ratio of styrene to butadiene in B_1 and B_2 is 10:90 to 75:25, and the weight ratio of styrene to butadiene in C is 0:100 to 10:90, the total styrene content to said styrene-butadiene block copolymer being 65 to 90% by weight, the total butadiene content of said block copolymer being 10 to 35% by weight, and said block copolymer having an intrinsic viscosity of 0.35 to 1.8 dl/g, as measure in toluene at 30° C, said resin composition obtained by mixing said polystyrene and said block copolymer.

4,073,832
GAS SCRUBBER
Rodney McGann, Northridge, Calif., assignor to Texaco Inc., New York, N.Y.
Filed June 28, 1976, Ser. No. 700,622
Int. Cl.² B01D 47/10
U.S. Cl. 261—118 2 Claims

1. A carbon scrubber for removing carbon from a synthesis gas stream, comprising in combination
a ring having a ring cylindrical inner surface the diameter of which is equal to the inside diameter of a conduit for said synthesis gas stream,
said ring having an outside diameter sufficient for cooperating with coupling flanges on said conduit,
a tear shaped plug coaxially located centrally of said ring for forming an annular venturi passage for said synthesis gas stream,
a plurality of radial struts for supporting said plug in said ring,

said struts being streamlined for minimizing flow disturbance in said gas stream,
a pair of manifolds in said ring for supplying water for scrubbing said gas stream,
a plenum centrally located in said plug,
passages inside said struts for connecting one of said manifolds to said plenum,



a first plurality of ports located peripherally on said plug and connected to said plenum for spraying water outward into the throat of said annular venturi passage,
a passage from said plenum to the nose of said plug for keeping the front surfaces wet and clean, and
a second plurality of ports located on the inside of said ring radially opposite said first ports and connected to the other of said pair of manifolds.

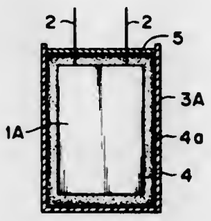
4,073,833
ENCAPSULATION PROCESS
Robert Gene Laughlin, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Dec. 8, 1975, Ser. No. 638,774
Int. Cl.² A61J 5/00; A61M 31/00
U.S. Cl. 264—4 8 Claims

1. In a process for releasably enclosing an aqueous solution of a micelle-forming spermicidal nonionic surfactant in a receptacle, wherein at least one portion of a wall of said receptacle ultimately comprises a microporous cellulose membrane, by initially fashioning a receptacle containing said surfactant solution comprising an acylated cellulose membrane precursor and thereafter deacylating said membrane precursor by contacting same with an aqueous solution comprising from about 3% to about 50% by weight of ammonia or water-soluble primary or secondary amine, the improvement which comprises: dissolving sufficient electrolyte selected from alkali metal chlorides and ammonium chloride in said solution of ammonia or watersoluble amine to avoid osmotic rupture of the membrane precursor or resulting membrane.

4,073,834
METHOD OF MAKING NUCLEAR FUEL ELEMENTS
Karol J. Mysels, La Jolla, Calif., assignor to General Atomic Company, San Diego, Calif.
Filed Mar. 5, 1975, Ser. No. 555,688
Int. Cl.² G21C 21/00
U.S. Cl. 264—0.5 12 Claims

1. A method of making a nuclear fuel element, which method comprises
providing a porous graphite block having a plurality of fuel chambers formed therein and also having a plurality of open holes for the flow of coolant therethrough,
disposing nuclear fuel material in said fuel chambers,
closing the nuclear fuel-containing fuel chambers,
impregnating said nuclear-fuel-containing porous block with a liquid carbonizable impregnant under conditions which cause the impregnant to penetrate from said open holes through the walls formed by said porous block and into said closed fuel chambers so as to enter said nuclear fuel material disposed in said fuel chambers, and
heating said impregnated block to carbonize said impregnant in situ whereby said nuclear fuel material becomes integrally bound to said porous graphite block at the interior wall surfaces of said fuel chambers thus providing excellent heat transfer therebetween.

4,073,835
METHOD OF RESIN ENCAPSULATING ELECTRICAL PARTS WITH UV CURING OF FIRE RETARDANT RESIN
Akira Otsuki, and Makoto Nishino, both of Tokyo, Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan
Filed Jan. 30, 1976, Ser. No. 653,878
Int. Cl.² B29C 5/00; B29D 3/00; B29G 3/00
U.S. Cl. 264—22 8 Claims

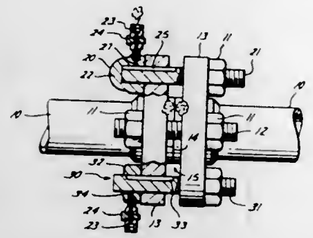


1. A process for encapsulating an electrical element comprising the steps of:
placing an electrical element in a mold made of an ultraviolet light transmissible material;
introducing a liquid resin composition capable of being cross-linked and cured by the action of ultraviolet light and heat into the space between the mold and the electrical element enclosed therein, said composition containing a fire retardant
selected from the group consisting of aluminum hydroxide, a combination of a halide and antimony oxide, and phosphoric acid esters and is contained in the liquid resin composition in an amount by weight of 10–70 parts per 100 parts by weight of the resin composition;
irradiating said composition in the mold with ultraviolet light to crosslink and cure at least the outer portion of the liquid resin composition and make the resin removable from the mold without deformation;
removing from the mold the at least partially crosslinked and cured resin composition with the electrical element enclosed therein; and
heating said at least partially crosslinked and cured resin composition to complete the cure thereof, thus obtaining an encapsulated electrical element.

4,073,836
METHOD AND APPARATUS FOR SEALING A PIPELINE LEAK
George W. Harrison, 2119 Sieber Drive, Houston, Tex. 77017, and Billie G. Moore, 319 Meyer, Alvin, Tex. 77511
Filed Apr. 16, 1976, Ser. No. 677,864
Int. Cl.² B29F 1/10; B32B 31/00
U.S. Cl. 264—36 6 Claims

1. A method for sealing leaks at bolted flanged connections of pipelines comprising
replacing at least one of the flange bolts with a valve means opening to a gap between the flange faces,
venting the gap through the valve means,
wrapping wire over the exposed flange bolts in the gap

between the pipeline flange faces so as to form one or more layers of wire in the gap, and



injecting a sealant through the valve means to fill the interior of the gap to stop the leak.

4,073,837

PROCESS FOR PRODUCING WHOLLY AROMATIC POLYAMIDE FIBERS

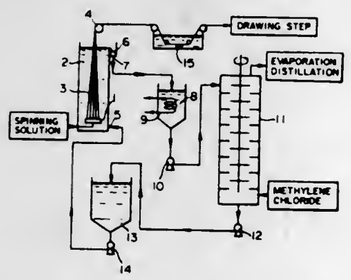
Keiji Kouzai; Yutaka Tabe; Eiji Masunaga, all of Iwakuni, and Kichiro Matsuda, Hino, all of Japan, assignors to Teitin Limited, Osaka, Japan

Continuation of Ser. No. 360,535, May 15, 1973, abandoned. This application Aug. 26, 1975, Ser. No. 607,790

Claims priority, application Japan, May 18, 1972, 47-48521; June 13, 1972, 47-58264

Int. Cl.² D01F *7/00*

U.S. Cl. 264—38 **6 Claims**



1. A process for producing wholly aromatic polyamide filaments having at least 75 mol% of the recurring units being derived from m-phenylene isophthalamide, said process comprising extruding a spinning solution of said wholly aromatic polyamide in an amide solvent having a polymer concentration of 15 to 30 % by weight and being free of inorganic salts through a spinneret into an aqueous coagulating bath containing a total concentration of calcium chloride, magnesium chloride, calcium nitrate and zinc chloride of at least 35% by weight of liquid and a concentration of calcium chloride of at least 20% by weight of liquid and having an amide solvent concentration of not more than 3% by weight of liquid to the vicinity of said spinneret, said amide solvent essentially consisting of N-methyl-2-pyrrolidone, taking-up the coagulated filaments from the lower portion to the upper portion of the coagulating bath, flowing the coagulating liquid in said bath at an average velocity from 0.04 to 0.1 times the velocity of filament take-up in the filament advancing direction, discharging the coagulating liquid having a specific gravity, measured at 60° C of at least 1.36 and an amide solvent concentration of not less than 4% by weight from said bath, extracting N-methyl-2-pyrrolidone from the discharged coagulating liquid with an organic solvent consisting essentially of methylene chloride, and recovering the N-methyl-2-pyrrolidene from the organic solvent.

4,073,838

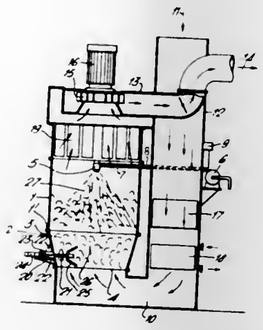
GRANULATING PROCESS

Heinrich Barnickel; Winfrid Sigl, and Jorg Schwable, all of Biberach an der Riss, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Continuation-in-part of Ser. No. 496,864, Aug. 12, 1974, abandoned. This application May 19, 1976, Ser. No. 688,104

Int. Cl.² B01J *2/16*

U.S. Cl. 264—37 **4 Claims**



1. A batch process for forming a product granulate having a predetermined granule size distribution from a powdered starting material selected from the group consisting of a single powdered solid substance or a mixture of powdered solid substances, the particles of the granulated product being larger than the particles of the powdered starting material, which comprises the steps of

(a) blowing air at an elevated temperature upwardly through a batch of said powdered starting material to form a fluidized bed having a lower portion and an upper portion,

(b) spraying into the upper portion of said fluidized bed a bonding agent solution at a rate sufficient to cause particles of powdered starting material in the upper portion of the fluidized bed to coalesce and build-up granules, whereupon large granules migrate from the upper portion to the lower portion of the fluidized bed,

(c) breaking up large granules in the lower portion of the fluidized bed into smaller granules by impact with rigid blades moving at high speed such that the build-up of granules in the upper portion of the fluidized bed slightly exceeds the break-up of granules and until the desired granule size distribution is achieved,

(d) stopping the bonding agent spray, the blade motion and the air blowing, and

(e) recovering the product granulate.

4,073,839

METHOD OF ZONE POURING FOAM PRODUCTS

Theodore B. Burkholder, Perrysburg; Robert J. Stalter, Bowling Green, and Paul N. Skotynsky, Oregon, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

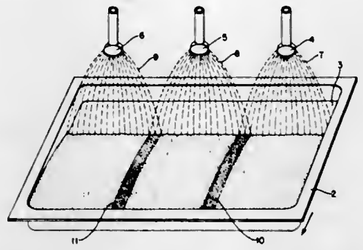
Filed Apr. 19, 1976, Ser. No. 677,943

Int. Cl.² B29D *27/04*

U.S. Cl. 264—45.1 **4 Claims**

1. A method of forming a foamed article having zoned of varying hardness comprising moving a shaping means relative to a bank of at least two foam pouring means which are aligned in a direction transverse to the direction of relative movement of said shaping means, causing each of said pouring means to distribute a foamable mixture over the surface of the shaper in a fan-like planular pattern transverse to the direction of said shaping means in response to the relative motion between the pouring means and the shaper, adjusting the fan-like planular pattern between the adjacent pouring means to control the area of overlap of said patterns to define zones in the foamed article

of different physical characteristics and adjusting the nature of the foamable mixture exiting each pouring means whereby a



foamed article having different physical characteristic is formed.

4,073,840

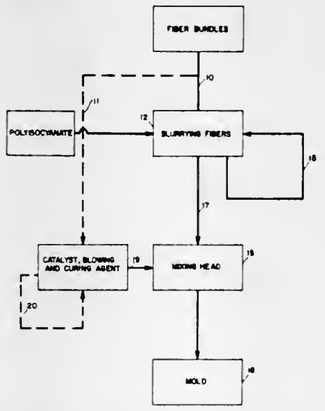
METHOD FOR FORMING A FIBER REINFORCED FOAM ARTICLE

Glen E. W. Saidla, Hampton Falls, N.H., assignor to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 407,829, Oct. 19, 1973, abandoned. This application Apr. 7, 1975, Ser. No. 565,949

Int. Cl.² B29D *27/04*

U.S. Cl. 264—45.3 **8 Claims**



1. A method of forming a foam article having a predetermined distribution of randomly oriented fiber filaments of staple length throughout the article and a substantially uniform weight ratio of fiber filaments to foam resin throughout comprising:

a. adding fibers of staple length to at least one major component of a foamable resin composition thereby forming a fiber slurry;

b. pumping said slurry through a circulating line for a time sufficient to separate the fibers into discrete fiber filaments and to wet said fiber filaments with said major component while maintaining the structural integrity of said fiber filament thereby forming a substantially uniform dispersion of randomly oriented fibers in said component;

c. mixing said dispersion with the balance of components necessary to form a foamable resin composition;

d. thereafter allowing the resin composition to foam in an appropriate mold whereby a foam article is provided having a substantially uniform weight ratio of fiber filaments to foam resin throughout.

4,073,841

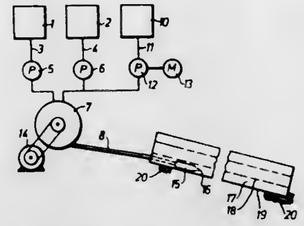
PROCESS FOR UNIFORMLY FILLING CAVITIES WITH A FOAM INSULATING MATERIAL

Gerd Dültgen, Dabringhausen, and Wolfgang Schmidt, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 2, 1975, Ser. No. 619,090

Int. Cl.² B29D *27/04*

U.S. Cl. 264—46.6 **3 Claims**



1. A process for filling a cavity with insulating material, comprising introducing a liquid, foamable reaction mixture into the cavity through the outlet nozzle of a mixing head while simultaneously drawing the mixing head through the cavity and accelerating the reactivity of the reaction mixture from the beginning of the filling procedure to its end by increasing the amount of catalyst to the foamable reaction mixture.

4,073,842

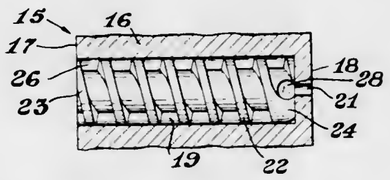
METHOD FOR PREPARING FOAM PLASTIC LOOSE FILL PACKING

Layle V. Smith, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 182,137, Sept. 20, 1971, abandoned, which is a continuation-in-part of Ser. No. 831,572, June 9, 1969, abandoned. This application June 11, 1973, Ser. No. 368,793

Int. Cl.² B29D *27/00*; B29B *1/03*

U.S. Cl. 264—53 **6 Claims**



1. In a method for the preparation of synthetic resinous dunnage material, the method comprising

providing a heat plastified expandable extrudable synthetic resinous composition,

extruding the synthetic resinous composition to form at least one strand,

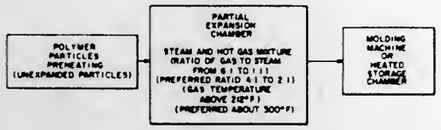
severing the strand to provide a plurality of strand segments which can form a plurality of expanded or foamed strand segments, the improvement which comprises

extruding the thermoplastic composition through a die having a generally helical die extrusion passageway immediately prior to the discharge end of the die, passing the thermoplastic composition through the helical die extrusion passageway, thereby imparting helical molecular orientation to the material within the die passageway and to the strand being extruded, the molecular orientation imparts a generally helical configuration to the strand segments when foamed.

4,073,843
PROCESS OF PARTIALLY EXPANDING THERMOPLASTIC PARTICLES USING A MIXTURE OF STEAM AND A HOT DRY GAS

Stuart Bruce Smith, Chelmsford, Mass., assignor to Foster Grant Co., Inc., Leominster, Mass.

Continuation-in-part of Ser. No. 288,230, Sept. 11, 1972, abandoned, and Ser. No. 399,578, May 11, 1973, abandoned. This application Jan. 15, 1975, Ser. No. 541,302
Int. Cl.² B29D *27/00*
U.S. Cl. 264—53 **6 Claims**



1. An improved process for preparing thermoplastic polymer particles for molding by partial expansion thereof, said thermoplastic particles containing a normally liquid blowing agent, comprising:

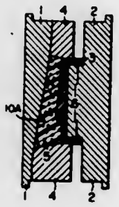
charging an amount of said particles into a chamber;

heating said particles while agitating them in said chamber to a temperature above the atmospheric boiling point of the blowing agent and the softening temperature of the particles with a gaseous heating medium comprised of a mixture of steam and another dry hot gas, the ratio of the other dry hot gas to steam in the mixture being in the range of about 6:1 to about 1:1 and wherein the other dry hot gas of the mixture when added thereto is at a temperature above 212° F., but below the temperature at which said polymer particles liquify and flow, a substantial portion of the steam penetrating the particles to heat the inner portions thereof and a substantial portion of the other dry hot gas serving to heat the outside of the particles to keep them dry by immediately evaporating any condensation from the steam on the outside of the particles.

4,073,844
PREPARATION OF CROSSLINKED POLYOLEFIN FOAMS AND THE MOLD

Motomu Wada, Nagaokakyo; Masakazu Inoue, Ibaragi; Kazunori Furukawa, Takatsuki, and Shigeyoshi Matsubara, Settsu, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 15, 1976, Ser. No. 667,137
Claims priority, application Japan, Mar. 22, 1975, 50-34820; Apr. 15, 1975, 50-46246
Int. Cl.² B29D *27/00*
U.S. Cl. 264—55 **1 Claim**

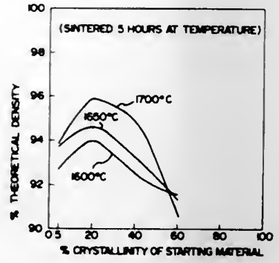


1. In a method for the preparation of crosslinked polyolefin foams comprising charging a heated expandable sectioned mold with crosslinkable polyolefin foamable components, said components being in the form of a melt while decomposition of the crosslinking and foaming agents occurs, increasing the size of the mold cavity and simultaneously cooling the mold, while permitting said components to foam the improvement comprising rapidly moving a predetermined distance to permit subsequent enlargement of the mold cavity one section of the mold to which is slidably mounted a sliding piece which is not moved and remains in contact with said charged components and permitting said sliding piece to move said predetermined distance by means of the expanding foam.

4,073,845
HIGH DENSITY HIGH STRENGTH Si_3N_4 CERAMICS PREPARED BY PRESSURELESS SINTERING OF PARTLY CRYSTALLINE, PARTLY AMORPHOUS Si_3N_4 POWDER

Sergej Tomislav Buljan, Towanda, Pa., and Philip Eli Stermer, Waverly, N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 29, 1976, Ser. No. 653,507
Int. Cl.² C04B *33/32, 35/58*
U.S. Cl. 264—65 **15 Claims**



1. A powder mixture consisting essentially of Si_3N_4 powder of average particle size below about 3 microns characterized in that the Si_3N_4 powder consists of from about 5 to 60 weight percent crystalline Si_3N_4, remainder substantially amorphous Si_3N_4.

6. A powder compact of the powder of claim 1 and a volatile binder to provide green strength to the compact.

11. A method of producing a ceramic body, the method comprising:

(a) mixing starting materials consisting essentially of Si_3N_4 powder of average particle size below about 3 microns, the powder consisting of from about 5 to 60 weight percent crystalline Si_3N_4, remainder amorphous Si_3N_4,

(b) consolidating the powder with a volatile binder to produce a powder compact having adequate green strength and density, and

(c) sintering the compact in a non-reactive atmosphere without pressure at a temperature of from about 1400° to 1700° C for at least about one hour to achieve a dense Si_3N_4 ceramic body having a density of at least 90 and up to 96 percent of theoretical density and a room temperature modulus of rupture value approaching 100,000 psi.

4,073,846
REDUCTION-REOXIDATION TYPE SEMICONDUCTING CERAMIC CAPACITOR

Hitoshi Masumura; Shinobu Fujiwara, and Hitoshi Tanaka, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Division of Ser. No. 497,333, Aug. 14, 1974, Pat. No. 3,995,300. This application Feb. 3, 1976, Ser. No. 654,979
Int. Cl.² C04B *35/46*
U.S. Cl. 264—65 **1 Claim**

1. A method for producing semiconducting ceramic bodies which comprises:

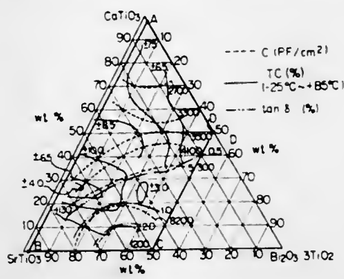
(a) mixing strontium titanate, calcium titanate, bismuth oxide and titanium oxide so as to give the composition falling within the tetragonal area described by the line A-B-C-D in FIG. 6, and further adding at least one member selected from the group consisting of manganese, cobalt, nickel, chromium, vanadium, niobium, tantalum, lanthanum and cerium ions in total amounts of 0.025 to 0.4% by weight to the resulting mixture;

(b) pressing the compositions into desired shape;

(c) sintering the thus obtained shaped bodies at a temperature of about 1350° C in an oxidizing atmosphere for about 2 hours;

(d) firing the composition of at (C) a temperature of about 850° C in a reducing atmosphere for about an hour, and;

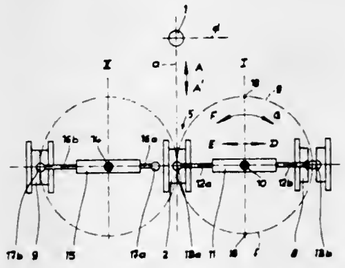
(e) further firing the composition at a temperature of about 780° C in an oxidizing atmosphere for about an hour.



4,073,847
MULTI-STAGE BLOW HOLDING METHOD

Gottfried Mehnert, Messelstrasse 25, D-1000, Berlin 33, Germany

Continuation of Ser. No. 415,802, Nov. 14, 1973, abandoned. This application Sept. 22, 1975, Ser. No. 615,796
Claims priority, application Germany, Nov. 18, 1972, 2256684
Int. Cl.² B29C *17/07*
U.S. Cl. 264—89 **5 Claims**



1. A method of converting plasticized parisons consisting of synthetic thermoplastic material into hollow shaped articles in respective open-and-shut final molds which are each located at respective final blowing stations and which each cooperate with at least two blowing mandrels, comprising the steps of inserting blowing mandrels of the respective final blowing stations into successive parisons and pneumatically expanding the latter into hollow preforms at a pre-blowing station which is located centrally of said final blowing stations; transferring successively produced preforms alternately to the respective final blowing stations by moving the respective blowing mandrels together with the preforms along circular paths each of which passes through the respective final mold when the same is in open condition, and concomitantly moving the other blowing mandrel of the same final blowing station from the final mold thereof to the vicinity of said pre-blowing station; closing the respective final mold about a preform located at the respective final blowing station; and converting the preforms at said final blowing stations into hollow shaped articles, the length of the intervals for conversion of parisons into preforms being equal to or approximating m/n wherein n is the number of final blowing stations and m is the length of the time interval for conversion of a preform into a shaped article.

4,073,848
SYNTHETIC SLATE

Melvin C. Kuehn, Grand Rapids, Minn., assignor to Ormite, Inc., Grand Rapids, Minn.

Division of Ser. No. 576,750, May 12, 1975, Pat. No. 4,038,242. This application Dec. 21, 1976, Ser. No. 752,921
Int. Cl.² B29G *1/01*
U.S. Cl. 264—120 **10 Claims**



1. A method of producing a solid dense synthetic slate-like material comprising:

(a) mixing at least 5 parts by weight of a finely divided taconite iron ore material which contains at least about 1 percent magnetite therein with about 1 part by weight of an amine-formaldehyde resin precondensate to form a substantially uniform mixture;

(b) casting the mixture into a vessel;

(c) preheating under pressure said mixture to a temperature from about 200° F. to 300° F. for a period of time to cause formation of gaseous products;

(d) removing said gaseous products;

(e) heating the mixture to a temperature of from about 275° F. to 400° F. under pressure to cause solidification of the mixture; and

(f) cooling the formed solid product.

4,073,849
PROCESS FOR FORMING ELASTOMER FILMS

Norman G. Bartrug, Allison Park, and Donald L. McDaniel, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 587,471, June 16, 1975, which is a continuation of Ser. No. 475,705, June 3, 1974, abandoned. This application Jan. 29, 1976, Ser. No. 653,323
Int. Cl.² B29H *8/00*; B32B *25/04*
U.S. Cl. 264—236 **2 Claims**

1. A method of forming a continuous film from an aqueous admixture comprising an elastomeric latex and a phenolic resin, comprising:

spraying an amount of said admixture onto a surface to form a coat thereon, said surface being maintained at a temperature greater than 120° F., the amount of sid admixture sprayed thereon being sufficient to form a base film coat of less than about 0.7 mil thickness, and the adhesion between said surface and said film being less than the cohesion within said film, and

spraying a plurality of additional coats of said admixture over said base film, each of said additional coats being regulated in the amount sprayed to impart a coat thickness of each coat of less than about 0.7 mil to thereby form a continuous, uniform final film having a thickness greater than 4 mils,

removing said final film from said substrate,

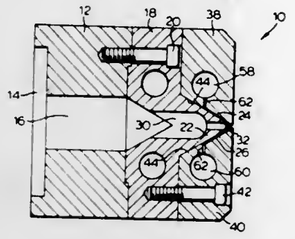
drying said film to remove substantially all water therefrom and then subjecting said final film to heat at sufficient pressure to cure said film.

4,073,850

METHOD OF PRODUCING POLYMERIC MATERIAL

Warren A. Brackmann, Cooksville, and Daniel DiIanni, Toronto, both of Canada, assignors to Rothmans of Pall Mall Canada Limited, Toronto, Canada

Filed Dec. 9, 1974, Ser. No. 530,708
Int. Cl.² B29C 17/06
U.S. Cl. 264—93 4 Claims



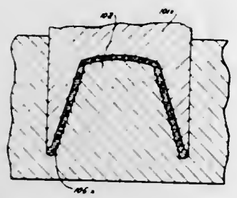
1. A method of extruding molten polymeric material in fiber form which comprises:
converging two individual streams of air of narrow width to a merging zone for formation of a single combined air stream flowing away from said merging zone,
conveying molten polymeric material along a flow path towards said merging zone in straight line alignment with the flow path of the single combined air stream,
said flow path of said molten polymeric material and the paths of said converging individual air streams lying in a first plane,
extruding molten polymeric material from said conveyed molten polymeric material separately and simultaneously into each of said converging air streams over a predetermined path length of said air streams immediately upstream of said merging zone while preventing the extrusion of said conveyed molten polymeric material other than into said converging air streams over said predetermined path length,
drawing a single fiber from said extruded polymeric material, and
conveying said fiber away from said merging zone in said single air stream.

4,073,851

METHOD OF MAKING MOLDED BODIES FROM LIGNO-CELLULOSE PARTICLES

Edmund E. Munk, Oberstenfeld, Germany, assignor to Werzalit Pressholzwerk J.F. Werz K.G., Oberstenfeld near Stuttgart, Germany

Continuation of Ser. No. 101,028, Dec. 23, 1970, abandoned. This application Mar. 15, 1973, Ser. No. 341,607
Claims priority, application Germany, July 15, 1970, 2035053
Int. Cl.² B29J 5/06
U.S. Cl. 264—109 5 Claims



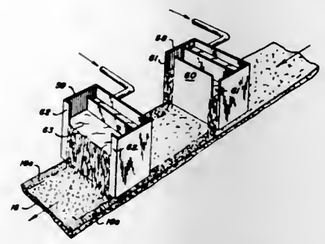
1. A method of making a molded body from ligno-cellulose particles in a cavity, comprising the steps of providing a first die section and a second die section having a cavity which is formed with an open side, a surface opposite said open side, and an exposed face extending at a steep angle to said surface from the periphery of the latter to said open side; pouring a tacky but pourable mixture of ligno-cellulose particles and an adhesive binder material into said cavity to a depth which is greater in the region of said periphery and lesser in the region inwardly spaced from said periphery; inserting said first die section into said open side and effecting relative movement of said die sections in a sense advancing said first die section along said exposed face and towards said surface; and retarding the pourable mixture in a space between said first die section and said exposed surface against displacement in direction towards said surface so that due to such retardation the mixture will be subjected to uniform pressure everywhere in said space.

4,073,852

METHOD OF MANUFACTURE FOR A FABRIC USEFUL IN A DISPOSABLE DIAPER

Frederick K. Mesek, Tinley Park, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Continuation-in-part of Ser. No. 475,081, May 31, 1974, abandoned, which is a division of Ser. No. 345,348, March 26, 1973, Pat. No. 3,837,343, which is a continuation-in-part of Ser. No. 187,249, Oct. 7, 1971, Pat. No. 3,730,184. This application May 13, 1976, Ser. No. 685,961
Int. Cl.² D04H 1/58
U.S. Cl. 264—122 8 Claims



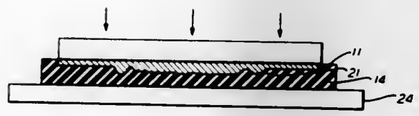
1. The method of forming a non-woven fabric comprising: forming a mixed assemblage of short and long fibers into a web; impregnating said web with a liquid binder material in an amount sufficient to retain the fibers in assembled relationship when the liquid binder material is solidified, said impregnating step being performed by differential application of the liquid binder material to said web across its width so as to give different sections of said web different degrees of wettability for water, and thereafter solidifying said binder material to thereby form said non-woven fabric.

4,073,853

METHOD OF FORMING A DESIGN AND AN ACCESSORY ARTICLE

Robert E. Chestnov, Wayne, N.J., assignor to Jaclyn, Inc., West New York, N.J.

Filed Dec. 31, 1975, Ser. No. 645,798
Int. Cl.² B29C 3/00
U.S. Cl. 264—132 6 Claims



1. A method of forming a three-dimensional colored design in a piece of production material, comprising:

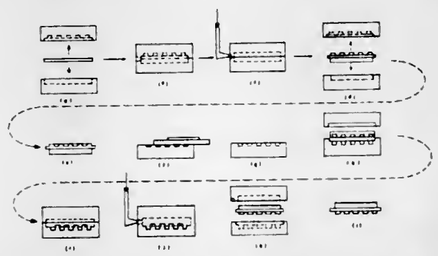
a. preparing a master, including forming a three-dimensional design on a piece of master material;
b. forming a mold having a cavity having a three-dimensional design portion therein from the prepared master, including positioning an enclosure having a cavity therein over the master such that the three-dimensional design on the master faces into the cavity in the enclosure, so as to form a chamber therebetween, filling the chamber with liquified mold-forming material, and hardening the liquified mold-forming material;
c. applying a two-dimensional colored design, in a two-dimensional pattern corresponding to the pattern of the three-dimensional design, to a portion of the piece of production material at a location thereon corresponding to the location of the three-dimensional design cavity portion of the mold;
d. forming a piece of light-transmitting material in the shape of the two-dimensional pattern of the three-dimensional colored design;
e. positioning the piece of production material and piece of light-transmitting material in the cavity of the mold so that the piece of light-transmitting material is disposed intermediate the two-dimensional colored design portion of the piece of production material and the three-dimensional design cavity portion of the mold; and
f. heating and pressing together the piece of production material, the piece of light-transmitting material, and the mold in a high frequency heating press so that the production material flows to conform to the three-dimensional design cavities in the mold with the piece of light-transmitting material substantially covering the three-dimensional colored design portion of the piece of production material, and hardening the piece of production material and piece of light-transmitting material.

4,073,854

METHOD OF MULTI-MATERIAL INJECTION MOULDING

Arthur Burry, 290 Adelaide Street West, Toronto, Ontario, Canada

Continuation-in-part of Ser. No. 456,752, April 1, 1974, abandoned. This application Jan. 19, 1976, Ser. No. 650,373
Claims priority, application Canada, Mar. 12, 1974, 194754
Int. Cl.² B29F 1/12
U.S. Cl. 264—161 7 Claims



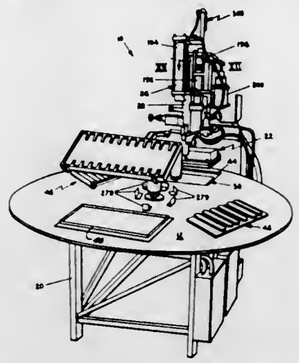
1. A method of moulding at least in part a three material, multi-material article in a plurality of stages which comprises:
a. assembling a first mould including a transfer plate and a first mould cavity at a first moulding station, said transfer plate having a surface defining a part of said first mould and having at least three channels spaced from each other and extending therethrough, at least one of said channels being in communication with said first mould cavity;
b. injecting a first mouldable material through said communicating channel in said transfer plate to create a first moulded stage in the first mould cavity, aid stage being held in fixed and oriented relationship to said transfer plate by integral connection with the moulded material in said channel;
c. removing said first moulded stage and transfer plate from the first mould cavity and transferring it into registration with a second mould cavity having a different configuration at a second moulding station to assemble a second mould, said transfer plate defining a part of said second mould and wherein a second channel in said transfer plate communicates with the second mould cavity;
d. injecting further mouldable material through said second channel in the transfer plate into the second mould cavity whereby a second state is formed and held in fixed and oriented relationship to said transfer plate;
e. moulding at least one or more additional stages in succession by repeating steps (c) and (d) for each stage to form at least in part a three material, multi-material moulded article; and
f. when the article is completed, severing the transfer plate from the completed multi-material moulded article.

4,073,855

MIRROR ASSEMBLY METHOD

Marc A. Kamerling; Jeffrey L. Franks, and Harold R. Wilson, all of Holland, Mich., assignors to Donnelly Mirrors, Inc., Holland, Mich.

Filed Mar. 5, 1974, Ser. No. 448,275
Int. Cl.² B29C 27/30; B29D 3/00
U.S. Cl. 264—249 16 Claims



1. A method for forming mirror assemblies comprising the steps of:
(1) grasping and holding a thermoplastic mirror case having side edges extending from a back portion in an inverted manner such that said side edges extend downwardly;
(2) immersing a portion of said case including a predetermined length of said extending side edges in a heated bath maintained at a predetermined elevated temperature for a predetermined period of time;
(3) immediately pressing said heated portions of said case into contact with a forming die having a reflective mirror element previously positioned thereon, said forming die having a forming groove, said mirror element prior to and during contact between said heated case portions and the forming die being positioned on said forming die and held in a predetermined position with respect to said forming groove by engaging positioning means with at least a portion of the mirror element which aligns the periphery of the mirror element with the forming groove prior to said pressing of the heated case portions into engagement with said forming die, and thereafter holding the mirror element on said forming die and aligned with the forming groove with holding means separate from said case and said positioning means such that the periphery of said mirror element and a portion of said mirror element spaced inboard from the periphery is left free and extending over said forming groove, and forming said heated portions into a lip extending around the edge of said mirror element with the lip contacting the surface of said mirror element which will be exposed in the finished mirror assembly at a position spaced inboard of the pe-

ripheral edge of said mirror element while holding said mirror element with said holding means, said lip being formed by forcing and urging said heated case portions around the peripheral edge of said mirror element and along and in contact with the surface of the forming groove in said forming die and under said peripheral edge and into contact with said mirror element at said inboard position whereby said lip covers the edge of said mirror element and retains said mirror element against support portions within said case; and

(4) cooling said formed portions of said case while maintaining said formed portions in their formed configuration and in contact with said mirror element.

4,073,856

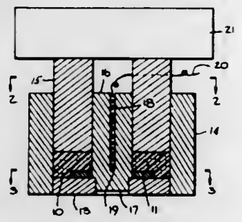
METHOD OF FABRICATING WELDED PFA-TO-PTFE STRUCTURES

Edward J. Chu, Parsippany, N.J., assignor to Resistoflex Corporation, Roseland, N.J.

Continuation of Ser. No. 484,852, July 1, 1974, abandoned. This application Jan. 16, 1976, Ser. No. 649,831

Int. Cl.[2] B29B *3/00*

U.S. Cl. 264—259 **16 Claims**



1. A method of forming a fluorocarbon resin structure in which a body of PFA resin is fused to a body of sintered PTFE resin which comprises the steps of confining a quantity of particulate PGA resin in a zone contiguous to said body of sintered PTFE resin, heating said quantity of PFA resin and at least the PTFE resin which is adjacent said zone to a temperature above the gel point of said PTFE resin and above the melting point of said PFA resin to melt said PFA resin, maintaining said elevated temperature while compacting said PFA resin against said PTFE resin under positive pressure just sufficient to urge said PFA resin melt at a very slow rate without fault producing flow therein into intimate surface contact with said PTFE resin until said former wets the surface of said latter over an area to be fused, after establishing said intimate contact, maintaining the conditions static at the fusing interface by increasing the pressure applied to said PFA resin to a predetermined level at a rate which is sufficiently slow so that there is a minimum tendency for said PFA resin to flow along the surface of said mating PTFE resin, and permitting said resins to cool slowly without force cooling toward ambient temperature while maintaining said pressure near said predetermined level where said predetermined level is chosen sufficient to prevent the formation of sinks and voids in said PFA resin while cooling but below the level at which noticeable flow is induced in said PFA resin, and continuing said cooling at least until said PFA has solidified, thereafter completing said cooling and removing said pressure, whereby said PFA resin becomes fused to said body of PTFE resin at the interface therebetween.

4,073,857

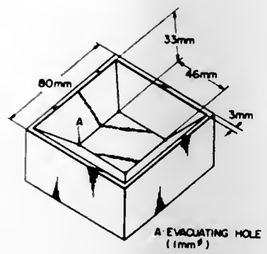
DEEP-DRAWING OF A MONOAXIALLY ORIENTED, HEAT RELAXED POLYESTER FILM

Tamio Arakawa, Hino, Japan, assignor to Teijin Limited, Osaka, Japan

Continuation-in-part of Ser. No. 504,747, Sept. 10, 1974, abandoned. This application Sept. 16, 1975, Ser. No. 613,741

Int. Cl.[2] B29C *17/03*; C08G *63/12*

U.S. Cl. 264—291 **2 Claims**



1. A process for producing a polyester shaped article comprising heating a polyester film to a temperature above its glass transition point but below 170° C and deep-drawing the preheated polyester film using a mold heated at a temperature at least 10° C higher than the temperature of the heated polyester film but below 200° C, wherein the starting polyester film is a monoaxially oriented, post-heat treated polyester film which contains at least 85 mol% of ethylene terephthalate units and has the following properties (i) to (iv):

i. the through-view pattern of wide angle X-ray diffraction of the film is diffuse halo,

ii. when the film is heated, while maintained at a fixed width and length, from room temperature to 160° C at a rate of 10° C/minute, and then at 160° for 30 minutes, the azimuthal scan of (100) diffraction in the through-view pattern of the film shows four peaks, and when measured with the monoaxially oriented direction of the film being caused to correspond with the meridian direction of the pattern, two pairs of the above peaks confronting each other across the equator, connected by straight lines passing through the center of the pattern, form a central angle (θ) of at least 35° but less than 180° including the equator line,

iii. when the film is dipped in hot water at 90° C for 10 seconds, the shrinkage of the film in the monoaxially oriented direction is not more than 25% based on the original length of the film before the dipping, and

iv. the film has a density of not more than 1.340 g/ml at 25° C.

4,073,858

SHOCK ABSORBING UNIT MOLDED FROM POLYURETHANE (UREA) RUBBER COMPOSITION

Daniel A. Chung, North Canton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 565,998, April 7, 1975, abandoned. This application Aug. 2, 1976, Ser. No. 710,497

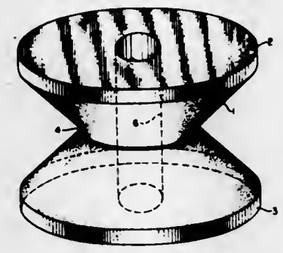
Int. Cl.[2] B32B *31/06*; C08G *18/32, 18/42*; F16F *3/08*

U.S. Cl. 264—262 **11 Claims**

1. A shock absorbing element, suitable for use in a railroad draft gear, which comprises a shaped resilient polyureaurethane composition, characterized by (A) withstanding compressive cycling for at least about 500 cycles under constant compression alternating between a maximum of about 45 to about 55 percent and a minimum of about 8 to about 12 percent of its original uncompressed height, (B) requiring at least about 4,200 pounds per square inch to compress said unit 55 percent of its original uncompressed height after 500 cycles of said compressive cycling, and (C) deflecting from about 0.3 to about 0.6 inch at about 25° C. upon the application of about

1800 pounds per square inch uniformly to the end surface areas of the said resilient compositions in its uncompressed state when the said composition is a generally disc-shaped cylindrical element with circular parallel end surfaces, said surfaces covered and adhered to circular steel plates, having a diameter of about 6.5 inches, a height of about 1.5 inches and a sidewall connecting the end surfaces substantially in the form of a V-shaped groove having substantially equal length sides, the said groove extending between the said end surfaces, the volume of the solid portion of said element being from 140 to about 160 percent of the volume of the said groove, where said resilient shock absorbing polyureaurethane composition is prepared by the method which comprises reacting a mixture of 100 parts by weight of a complex, dispersed in about 50 to about 150 parts by weight dioctyl phthalate, of 4,4'-methylene dianiline and a salt selected from sodium chloride, sodium bromide, sodium iodide, sodium nitrate, lithium chloride, lithium bromide, lithium iodide, lithium nitrite and sodium cyanide, where the mole ratio of said dianiline to said salt is about 3/1, with the reaction product of (A) a diisocyanate selected from toluene diisocyanate, 1,5-naphthalene diisocyanate, 3,3'-bitolylene-4,4'-diisocyanate, diphenylmethane-4,4'-diisocyanate, and 3,3'-dimethyldiphenylmethane-4,4'-diisocyanate and (B) a mixture of at least one polymeric polyol having a total average molecular weight in the range of about 1,150 to about 1,500, selected from:

1. a mixture of (a) about 55 to about 70 weight percent of at least one polymeric polyol having an average molecular



weight of about 1,800 to about 2,200 comprised of (i) about 25 to about 40 weight percent polytetramethylene ether glycol and, correspondingly, (ii) about 75 to about 60 weight percent polyester polyol and, correspondingly, (b) about 45 to about 30 weight percent polytetramethylene ether glycol having a molecular weight in the range of about 800 to about 1,200,

2. a caprolactone polyester of ϵ-caprolactone and diethylene glycol having a molecular weight in the range of about 1,000 to about 1,400, or

3. a mixture of about 55 to about 70 weight percent of at least on polyol having an average molecular weight in the range of about 1,800 to about 2,200 which comprises (a) about 25 to about 40 weight percent polyester polyol and (b) about 75 to about 60 weight percent polytetramethylene ether glycol and, correspondingly, about 45 to about 30 weight percent of at least one polyol selected from polyester and polytetramethylene ether glycol having a molecular weight in the range of about 800 to about 1,200; wherein said polyester polyol is selected from at least one of (i) caprolactone polyester of ϵ-caprolactone and diethylene glycol and (ii) polytetramethylene azelate, where the ratio of isocyanato groups to the sum of hydroxyl groups of the polyols is in the range of about 1.9 to about 2.2, where the ratio of primary amino groups of the diamine to excess isocyanato groups over the sum of said hydroxyl groups is about 0.85 to about 0.98 and where the acid number of the polyols is less than about 1.

4,073,859

TECHNIQUE FOR MAKING SILICON U-SHAPED MEMBERS

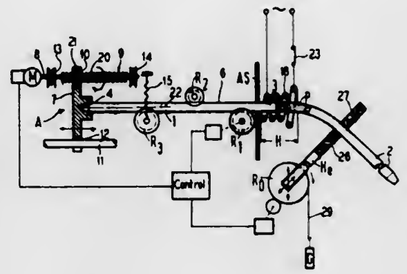
Werner Baumgartner, Munich, and Manfred Schaeffler, Haimhausen, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Dec. 4, 1975, Ser. No. 637,520

Claims priority, application Germany, Feb. 10, 1975, 2505540

Int. Cl.[2] B29C *17/02*

U.S. Cl. 264—322 **9 Claims**



1. A method for bending an initially substantially straight, uniform silicon starting rod into a U-shaped member such that the product member is uniformly electrically heatable thereafter having an axis and a pair of spaced, parallel leg members interconnected together across a pair of adjacent end portions thereof by an integral, hemicircular curved section having a substantially constant predetermined angle of curvature, said method comprising the steps of

A. exposing a region in horizontally extending such starting silicon rod to a heating zone which warms said region to its softening temperature, said region having an axial length of from about ½ to 5 times the average transverse thickness of said rod, said softened region being located generally adjacent one edge of the predetermined mid-section of said rod, said rod being simultaneously supported on each side of said softened region, then

B. simultaneously

1. pushing said rod from a portion of the leg thereof which is remote to that leg thereof which is adjacent said softened region through said heating zone at a constant rate whereby said softened region progresses along said mid section with concurrent cooling to point of rigidity occurring on either longitudinal side of said softened region,

2. bending downwardly said rod at a portion of said adjacent leg thereof, the bending occurring in said softened region and the bending being at a predetermined constant angle,

3. pulling said rod from a portion of said adjacent leg thereof from said heating zone, the rate of said pulling being substantially equal to the rate of said pushing,

said pushing, said bending, and said pulling, being conducted

a. with the axis of said rod being maintained in a substantially planar configuration,

b. until said mid section is formed into a hemicircular configuration having a substantially constant predetermined angle of curvature, and

c. while maintaining said rod at a substantially constant length, and then

C. simultaneously removing said heating zone from said rod, ceasing said pushing, said bending and said pulling, and supporting said rod until said softened region solidifies.

4,073,860

PRECIPITATION OF FILTERABLE NICKEL AND/OR COBALT SULFIDES FROM ACID SOLUTIONS

David A. Huggins, Sudbury, and Norman C. Nissen, Toronto, both of Canada, assignors to The International Nickel Company, Inc., New York, N.Y.

Filed July 23, 1973, Ser. No. 381,861
Claims priority, application Canada, Sept. 11, 1972, 151413
Int. Cl.[2] C01G *51/00, 53/00*
U.S. Cl. 423—140 9 Claims

1. A process for the precipitation of sulfides of the group consisting of nickel and cobalt sulfides and mixtures thereof comprising contacting at a temperature of about 50° C. to about 100° C. an aqueous solution having a pH of about 2.0 to about 3.0 and containing ion of metal of the group consisting of nickel and, cobalt with atmospheric pressure hydrogen sulfide and maintaining the pH of said solution within said range of about 2.0 to about 3.0 throughout the duration of reaction with said hydrogen sulfide by addition of base to said solution whereby sulfide thus precipitated is a fast settling, readily filterable, low moisture, large particle size product having a high-bulk density when dry.

4,073,861

METHOD OF USING DRYING OILS AS OXYGEN SCAVENGER

Rudolfo D. Cilento, North Brunswick, and John Anthony Hill, New Brunswick, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 31, 1975, Ser. No. 627,565
Int. Cl.[2] C01B *13/00;* C09K *3/00*
U.S. Cl. 423—219 6 Claims

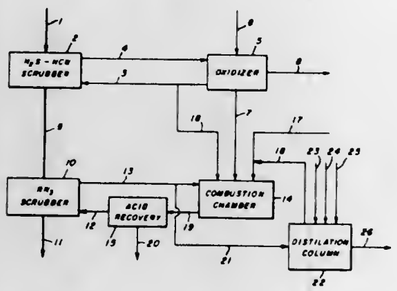
1. A method for reducing and substantially eliminating the presence of oxygen in a sealed container or package, which comprises disposing in said container liquid linseed oil retained or sorbed in a porous or particulate substrate material, said linseed oil-substrate combination being disposed in a protective capsule or ampul which includes openings to allow admission of oxygen into contact with the linseed oil, said linseed oil being present in an amount ranging from about 0.002 to about 0.02 cc/cc of air present in the package or container said amount being sufficient to react with substantially all of the oxygen in the container.

4,073,862

PROCESS FOR REMOVING AMMONIA, HYDROGEN SULFIDE AND HYDROCYANIC ACID FROM GASES

Egon Haese, Bochum-Linden, Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Continuation of Ser. No. 500,712, Aug. 26, 1974, abandoned.
This application June 14, 1976, Ser. No. 695,380
Claims priority, application Germany, Aug. 24, 1973, 2342757
Int. Cl.[2] C01B *17/16, 31/20*
U.S. Cl. 423—220 3 Claims



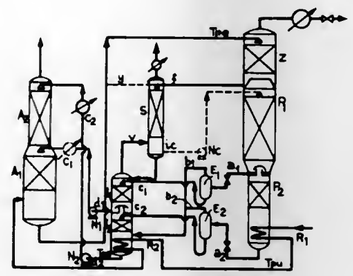
1. A process for removing ammonia, hydrogen sulfide and hydrocyanic acid from gases in which ammonia-containing condensates are also initially present, said process comprising subjecting the gas to be cleaned to a first washing step with an alkaline solution adapted to absorb hydrogen sulfide and hydrocyanic acid, said solution being selected from the group consisting of sodium and potassium salts and alkaline ammonia solutions, treating said solution with air following said first washing step to oxidize the hydrogen sulfide absorbed by the solution to form elemental sulfur and removing said sulfur, said air and ammonia absorbed thereby being continuously discharged from said oxidation step, diverting a portion of said treated solution following the oxidation step and recycling the remaining solution for reuse in said first washing step, the treated solution containing cyanide and sulfur compounds, subjecting the gas to be cleaned to a second washing step with an inorganic acid solution selected from the group consisting of sulfuric acid, hydrochloric acid and ammonium bisulfite to remove ammonia from the gas by formation of an ammonia salt solution, mixing at least a part of said ammonia salt solution with said diverted portion of the solution from the first washing step, supplying to said mixture the air and absorbed ammonia discharged from the oxidation step, burning said mixture with a fuel gas and said air at a temperature to decompose the ammonia and the cyanide containing constituents of the mixture to nitrogen, carbon dioxide and water vapor, and to convert said sulfur compounds to sulfur dioxide, recovering from the products of combustion any other components present therein including sulfur dioxide and said inorganic acid, separating said sulfur dioxide, recirculating said recovered acid for reuse in said second washing step, adding sulfur dioxide recovered from said products of combustion to the inorganic acid recovered from the products of combustion to be carried by said inorganic acid through the second washing step, diverting a portion of the resulting salt solution carrying a predetermined amount of sulfur dioxide, adding said diverted salt solution to said condensates with an alkali solution, distilling the mixture thus formed to separate ammonia therefrom, and burning said distilled ammonia with said mixture of solutions from the first and second washing steps to decompose the ammonia.

4,073,863

REGENERATION OF ABSORBENT SOLUTIONS USED FOR REMOVING GASEOUS ACID IMPURITIES FROM GASEOUS MIXTURES

Giuseppe Giammarco, and Paolo Giammarco, both of San Marco 3242, Piazzale Morolin, Venice, Italy

Filed Nov. 28, 1975, Ser. No. 635,823
Claims priority, application Italy, Nov. 28, 1974, 70464/74
The portion of the term of this patent subsequent to June 8, 1993, has been disclaimed.
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—222 43 Claims



1. In a process for eliminating and recovering gaseous impurities such as CO_2, H_2S, HCN, SO_2 from a gaseous mixture containing them by an absorption technique carried out at a temperature of from 40° to 135° C, wherein said gaseous mixture is brought into contact with an alkaline absorbing solution selected from the group consisting of solutions of alkali metal carbonate, alkali metal carbonate solutions activated by glycine, an amino acid, ethanolamine or As_2O_3, amino acid solutions, ethanolamine solutions; solutions of alkali metal phosphates, sulfites, bisulfites and borates; and a regeneration step wherein the exhausted absorbing solution is regenerated by steam stripping and expulsion of the impurities previously absorbed, said regeneration step actually consisting of two columns, respectively a main column and a secondary column, the main column operating at a higher pressure than the secondary column, the improvement which comprises:

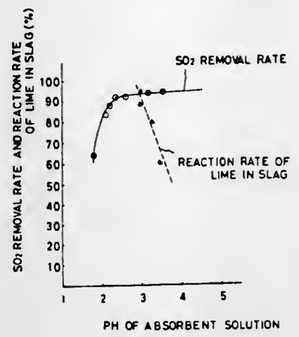
a. conveying substantially all the exhausted absorbing solution to the main column and regenerating the solution therein an in incomplete manner by means of externally supplied heat;.
b. conveying said solution to an expansion chamber and expanding said solution therein to thereby flash off steam;
c. conveying expanded solution (b) to said secondary column and treating said solution therein with the steam produced by said expansion (b) to thereby complete the regeneration of the solution in said secondary column;
d. extracting regenerated solution (c) from said secondary column and delivering it to the absorption stage;
e. discharging the steam issuing from the top of the secondary column, as well as from the top of the main column, together with the impurities desorbed.

4,073,864

METHOD OF DESULFURIZING EXHAUST EMISSION USING PULVERIZED SLAG AS ABSORBENT

Masumi Atsukawa; Hiroyuki Ushio; Haruo Kuwabara, and Kyoji Kubo, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 577,404, May 14, 1975, abandoned, which is a continuation of Ser. No. 308,434, Nov. 21, 1972, abandoned. This application Feb. 26, 1976, Ser. No. 661,499
Claims priority, application Japan, Nov. 21, 1971, 46-93978
Int. Cl.[2] C01B *17/00;* C01F *1/00*
U.S. Cl. 423—242 1 Claim



1. A method for desulfurizing sulfur dioxide-containing exhaust gases containing oxygen which comprises pulverizing slag from a blast furnace, converter or open hearth furnace, said slag being principally composed of $Ca_2Al_2SiO_7$, suspending the resulting minute particles in water, contacting the aqueous suspension with the exhaust gases while supplying the slag at a rate to maintain the pH of the suspension within the range of 1.5 to 4.0 to thereby remove the sulfur dioxide from the exhaust and then filtering the thus contacted suspension to recover the gypsum product from the slag formed by the absorption of the sulfur dioxide.

4,073,865

SILICA POLYMORPH AND PROCESS FOR PREPARING SAME

Edith Marie Flanigen, White Plains, and Robert Lyle Patton, Katonah, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sept. 27, 1976, Ser. No. 726,744
Int. Cl.[2] C01B *33/12*
U.S. Cl. 423—339 6 Claims

1. A synthetic crystalline silica polymorph, said silica polymorph after calcination in air for at least 1 hour at 600° C., having a mean refractive index of 1.39 ± 0.01, a specific gravity at 25° C. of 1.70 ± 0.05 g./cc., an adsorptive capacity for water vapor at 23° C and a water vapor pressure of 4.6 mm Hg of less than 1 weight percent, having an infrared absorption spectrum which exhibits a substantial absence of absorption in the region 3700 to 3100 cm^{-1} and having an X-ray powder diffraction pattern containing at least those d-spacings set forth in Table A, said X-ray diffraction pattern being further characterized by the absence of a reflection intermediate the reflections which correspond to the d-spacings, 3.82 ± 0.04° A and 3.71 ± 0.02A.

2. Process for preparing the crystalline silica polymorph of claim 1 which comprises providing a reaction mixture having a pH between 7 and 11, and which in terms of moles of oxides contains from 150 to 1500 moles H_2O, from 13 to 50 moles of reactive SiO_2, from 0 to 20 moles M_2O where M represents an alkali metal, each of the aforesaid reactants being present per mole of Q_2O where Q represents a quaternary cation having the formula $(R_4X)^+$, in which each R represents hydrogen or alkyl group containing from 2 to 6 carbon atoms, and X represents phosphorus or nitrogen, said reaction mixture also containing from 2 to 12 moles of fluoride ion per mole of Q_2O heating the reaction mixture thus provided at a temperature of from 100° to 250° C. until a crystalline precursor is formed, isolating said crystalline precursor and calcining same at a temperature of from 400° to 1000° C. until the said crystalline silica polymorph is formed.

4,073,866

PROCESS FOR CONVERTING NITROGEN DIOXIDE INTO NITROGEN MONOXIDE

Naoomi Yamaki; Natsuko Futsuhara; Kazue Masuda, all of Kawaguchi, and Koji Tsuchimoto, Ichikawa, all of Japan, assignors to Agency of Industrial Science and Technology of Japan, Tokyo, Japan

Filed Oct. 18, 1976, Ser. No. 733,162
Claims priority, application Japan, Nov. 15, 1975, 50-137572
Int. Cl.[2] C01B *21/24*
U.S. Cl. 423—405 5 Claims

1. A process for selectively and quantitatively reducing nitrogen dioxide in a gas to nitrogen monoxide which comprises bringing a gas containing nitrogen dioxide into contact at a temperature within the range of 50°–400° C with a carbide of a metal selected from the group consisting of chromium, molybdenum, tungsten, vanadium, titanium, tantalum, silicon and boron or a composite carbide of said metals.

4,073,867

PROCESS FOR THE PRODUCTION OF CRYSTALLINE ZEOLITIC MOLECULAR SIEVES OF TYPE A

Wolfgang Roebke, Altenstadt; Dieter Kneitel, and Erfried Parr, both of Rodenbach, all of Germany, assignors to Dentsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt and Henkel u. Cie GmbH, Dusseldorf-Holthausen, both of, Germany

Filed Mar. 30, 1976, Ser. No. 671,950
Claims priority, application Germany, Apr. 18, 1975, 2517218
Int. Cl.[2] C01B *33/28*
U.S. Cl. 423—429 10 Claims

1. A process for producing a crystalline zeolitic molecular sieve of Type A with the composition

$1.0 \pm 0.2\ Na_2/nO : Al_2O_3 : 1.85 \pm 0.5\ SiO_2 . y\ H_2O$

where y has a value up to 6 having particles with at least 99.5 weight % below 30μ diameter, as well as at least 90 weight % under 10μ and with 50 weight % below 6.5μ and having the particle spectrum

Fraction (μ)	Portion (weight %)
<5	25–35
<10	90–93
<15	91–97
<20	93–98

comprising hydrothermally crystallizing a sodium aluminate silicate by pouring together while stirring an aqueous sodium silicate solution and a first aqueous sodium aluminate liquor containing 1 to 100 g Al_2O_3/l and 10 to 200 g Na_2O/l, allowing the synthesis premixture formed having the molar ratios

SiO_2/Al_2O_3	3.4 to 50:1
Na_2O/SiO_2	0.2 to 20:1
H_2O /Na_2O	4 to 300:1

to solidify to a gel, adding to this gel a second and more highly concentrated aqueous sodium aluminate liquor containing up to 200 g Al_2O_3/l and up to 250 g Na_2O/l at a temperature between 10° and 100° C while stirring, allowing the thus obtained synthesis mixture to crystallize at a temperature between 20° and 175° C within 15 minutes.

4,073,868

CARBON BISULFIDE PRODUCTION

Morton Meadow, Trenton, and Sidney Berkowitz, Highland Park, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 355,991, April 30, 1973, Pat. No. 3,927,185. This application Sept. 19, 1975, Ser. No. 615,002
The portion of the term of this patent subsequent to Dec. 16, 1992, has been disclaimed.
Int. Cl.² C01B *31/26*
U.S. Cl. 423—443 **9 Claims**

1. Process for producing carbon bisulfide by the reaction of sulfur and a hydrocarbon in gaseous state in which a stream of higher hydrocarbon gas comprising a higher hydrocarbon having at least 3 carbon atoms is introduced into a stream of sulfur vapor in a reactor to form a hot reaction mixture whereby to react on-catalytically said sulfur and hydrocarbon to form carbon bisulfide in said reactor, said reactor having solid walls, wherein the improvement comprises moving said reaction mixture vertically from the zone of introduction of said hydrocarbon stream, the flow conditions and mixing conditions of the sulfur stream and hydrocarbon stream being such that the hydrocarbon stream becomes substantially completely mixed with sulfur vapor before the hydrocarbon comes into contact with a solid surface in the reaction zone, so that a non-catalytic reaction occurs between substantially all the higher hydrocarbon and sulfur prior to such contact.

9. Process for producing carbon bisulfide by the reaction of sulfur and a hydrocarbon in gaseous state, wherein the improvement comprises feeding to a reaction zone a stream of sulfur vapor and a stream of hydrocarbon gas comprising a higher hydrocarbon having at least 3 carbon atoms countercurrent to impinge said streams on each other in said reaction zone at a temperature at which the reaction said sulfur and said hydrocarbon to form carbon bisulfide occurs, and in which said reaction zone is at a pressure of at least 3.5 atmospheres, said hydrocarbon stream being directed substantially head-on at said sulfur vapor stream, said sulfur vapor stream is passed downstream through a tube within which a stream of said hydrocarbon is directed substantially axially of said tube and the resulting mixture passes through said tube downstream of the point at which said hydrocarbon stream comes into contact with the sulfur, the temperature of the walls of said tube is below about 750° C, the flow conditions and mixing conditions of the sulfur stream and hydrocarbon stream being such that the hydrocarbon stream becomes substantially completely mixed with sulfur vapor before the hydrocarbon comes into contact with a solid surface in the reaction zone, so that a noncatalytic reaction occurs between substantially all the higher hydrocarbon and sulfur prior to such contact.

4,073,869

INTERNAL CHEMICAL MODIFICATION OF CARBON FIBERS TO YIELD A PRODUCT OF REDUCED ELECTRICAL CONDUCTIVITY

Ilmar L. Kalnin, Millington, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed June 5, 1975, Ser. No. 584,098
Int. Cl.² D01F *9/12*; D06B *19/00*; C08K *3/04*
U.S. Cl. 423—447.1 **23 Claims**

1. An improved process for the internal chemical modification of a carbonaceous fibrous material comprising at least 90 percent carbon by weight comprising:

(a) contacting said fibrous material for about 5 to 120 minutes with a strong acid medium consisting essentially of nitric acid at a temperature of about 60° to 95° C. wherein the mole ratio of nitric acid to sulfuric acid present in said medium ranges between about 1 to 0 and 1 to 8 and the concentration of water in said acid medium ranges from 0 to 35 mole percent based upon the total mole concentration of said acids and said water, and

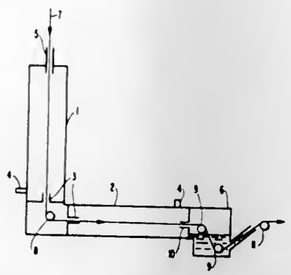
(b) removing excess acid adhering to the resulting carbonaceous fibrous material to yield a fibrous product containing about 3 to 30 percent bound oxygen by weight which exhibits a substantially reduced electrical conductivity by at least 40 percent when compared to that of the carbonaceous fibrous material prior to said contact and a single filament tenacity of at least 200,000 psi.

4,073,870

PROCESS FOR PRODUCING CARBON FIBERS

Yasuo Saji; Hideo Kurioka, both of Mishima; Kozo Tanaka, Numazu, and Hiroyasu Ogawa, Shizuoka, all of Japan, assignors to Toho Beslon Co., Ltd., Tokyo, Japan

Filed Apr. 1, 1976, Ser. No. 672,824
Claims priority, application Japan, Apr. 2, 1975, 50-39912
Int. Cl.² D01F *9/12*
U.S. Cl. 423—447.6 **10 Claims**



1. A process for producing carbon fibers which comprises feeding an inert gas into each of a vertical furnace maintained at about 500° C to about 1,000° C and a transverse furnace maintained at about 800° to about 2,000° C connected thereto so that the inert gas flows from the transverse furnace toward the bottom and then the top of the vertical furnace, and feeding preoxidized organic polymer fibers from the top of the vertical furnace to pass the fibers countercurrent to the inert gas flow through the two furnaces to thereby carbonize the fibers and obtain said carbon fibers, wherein:

during the entire process within the vertical and transverse furnace the advancing direction of the fibers treated is countercurrent to the direction in which the inert gas flows;

volatile components are generated in high amounts at the upper portion of the vertical furnace and there is substantially no generation of volatile components in the transverse furnace; and

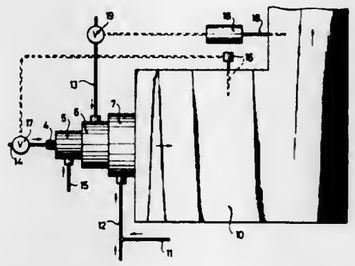
the feeding of the preoxidized fibers and the discharging of the inert gas containing the volatile components are carried out through the same slit whose temperature is maintained at about 200° to 400° C.

4,073,871

JOINT COMBUSTION OF OFF-GASES AND LIQUID RESIDUES CONTAINING CHLORINATED HYDROCARBONS WITH HYDROCHLORIC ACID RECOVERY

Wolfgang Optiz, Hurth-Alstadten, and Hans Hennen, Hurth, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 15, 1977, Ser. No. 777,718
Claims priority, application Germany, Mar. 19, 1976, 2611671
Int. Cl.² C01B *7/08*
U.S. Cl. 423—481 **9 Claims**



1. A process for the joint combustion of off-gases and liquid residues containing chlorinated hydrocarbons, which comprises forming a mist comprising a mixture of off-gases and atomised liquid residues, the latter being atomised by means of at least one of air or steam, and directing this mist into a preheated combustion chamber lined with refractory bricks, the said mixture being introduced into the combustion chamber jointly with combustion air through a burner having four feed pipes arranged coaxially with respect to each other and terminating in conically tapered outlets, the three outer feed pipes defining three separate and coaxial annular zones around the innermost feed pipe; the quantity of liquid residue fed in and burned being sufficient to maintain in the combustion chamber a predetermined maximum temperature which is not above the range 1200° to 1800° C, and which is compatible with the refractory properties of the brick lining of the combustion chamber; withdrawing the resulting hot combustion gases from the combustion chamber, quenching these combustion gases with water, and recovering hydrochloric acid from the aqueous solution resulting from the quenching of the combustion gases.

4,073,872

PROCESS FOR PRODUCING A PRODUCT CONTAINING ALUMINUM AND CHLORINE

Edward Max Adolf Willhoft, 6 Rosebery Road, Langley Vale, Epsom Downs, Surrey, England

Filed Apr. 27, 1976, Ser. No. 680,860
Int. Cl.² C01F *7/56, 7/60, 7/00*
U.S. Cl. 423—496 **3 Claims**

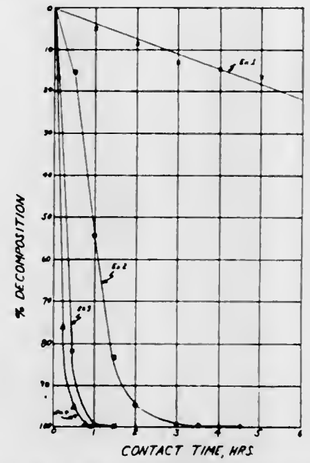
1. In a process for preparing a product containing aluminum and chlorine by chlorinating a mixture of an aluminum-containing mineral and carbon and recovering aluminum chloride, the improvement wherein a dried paper sludge, said dried paper sludge containing a carbonizable organic material in the form of organic fibres in intimate association with an aluminum-containing mineral selected from the group consisting of an oxide of aluminum and an aluminosilicate in finely divided form, is heated to a temperature of 500° to 1000° C to carbonize the organic fibers, the solid residue from the carbonization step is chlorinated, and a product containing aluminum and chlorine is recovered.

4,073,873

CATALYTIC DECOMPOSITION OF HYPOCHLORITE

Donald Lee Caldwell, Lake Jackson, and Raymond John Fuchs, Jr., Richwood, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 29, 1976, Ser. No. 671,532
Int. Cl.² C01D *3/04*; C01B *13/02, 7/08, 9/02*
U.S. Cl. 423—499 **9 Claims**



1. In a process of catalytically decomposing hypochlorites into oxygen and chloride, wherein said hypochlorites are of the group consisting of hypochlorous acid and metal salts of hypochlorous acid, and are in aqueous solution at a pH of not less than about 5.0 said process comprising contacting the hypochlorites with an oxide of cobalt as the catalyst, the improvement which comprises using single-metal spinel Co_3O_4 as the catalyst.

4,073,874

RECOVERY OF CHLORINE FROM IRON CHLORIDE

Seitaro Fukushima, Omiya, Japan, assignor to Mitsubishi Kinzoku K.K., Tokyo, Japan

Continuation-in-part of Ser. No. 574,043, May 2, 1975, abandoned, which is a continuation of Ser. No. 463,838, April 24, 1974, abandoned. This application Dec. 17, 1975, Ser. No. 641,583
Claims priority, application Japan, Apr. 28, 1973, 48-48941
Int. Cl.² C01B *7/03, 7/02*; C01G *49/06*
U.S. Cl. 423—500 **10 Claims**

1. In the process for the recovery of chlorine by causing an oxidizing gas selected from the group consisting of oxygen and a gas containing molecular oxygen and as the predominant constituent to react with an iron chloride gas selected from the group consisting of iron chloride in the vapor state and a gas containing iron chloride as the predominant constituent within an oxidation furnace, the improvement according to which the initial meeting of the iron chloride gas and the oxidizing gas is

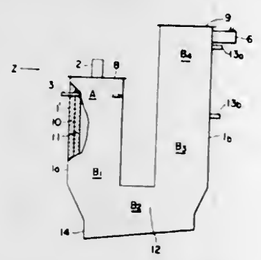
caused to occur in an unobstructed spaced within the oxidation furnace, and the oxidizing gas is introduced into the furnace in a direction and at a velocity such that turbulent flow induced by collision of said two gases will not reach the furnace walls, said improvement being achieved by conducting the reaction in an oxidation furnace which comprises:

a closed furnace structure of the vertical cylindrical type having a diameter of D (m) comprising a top end wall, a side wall and a bottom extraction port for withdrawing the product iron oxide,

an iron chloride conduit for injecting the iron chloride gas having a diameter of d (m) and being mounted at the central part of said top end wall coaxially with the furnace structure,

a plurality of oxygen nozzles for injecting the oxidizing gas said nozzles having a radius of $v_0(m)$ and being disposed radially and inwardly on said side wall at equiangular intervals from each other, the tips of the oxygen nozzles being directed to a point on the axis of the furnace structure, and

an exhaust pipe for discharging product gases out of the oxidation furnace said pipe being disposed at a position on the side wall close to the lower end of the side wall, wherein d and D is determined to satisfy the equation



$$d/D = 0.1 \text{ to } 0.25 \quad (1);$$

the iron chloride gas being injected into the oxidation furnace downwardly along the axis of the oxidation furnace at a velocity U (m/sec) satisfying the equation

$$Re = Ud/\nu = (2.1 \text{ to } 8.9) \times 10^4 \quad (2)$$

wherein Re denotes the Reynolds number of the iron chloride gas passing through the iron chloride conduit, ν is the kinematic viscosity of the iron chloride gas; and

the oxidizing gas being injected into the oxidation furnace through the oxygen nozzles at a substantially equal velocity Uo (m/sec) satisfying the formulas

$$0.1 \leqq Uc/U \leqq 6 \quad (3)$$

and

$$Uo = (DUc)/(24.8\nu_o) \quad (4)$$

wherein Uc (m/sec) denotes the velocity of the free turbulence of the oxidizing gas at the central axis of the furnace, whereby deposition of Fe_2O_3 on the furnace walls is minimized.

4,073,875

OXIDATION OF MAGNESIUM CHLORIDE

Max Hans Feilchenfeld, Jerusalem, Israel, assignor to Yissum Research Development Co. of the Hebrew Univ., Jerusalem and Israel Chemicals Ltd., Tel-Aviv, both of, Israel

Filed June 18, 1976, Ser. No. 697,540
Claims priority, application Israel, July 4, 1975, 47643
Int. Cl.[2] C01B *7/03;* C01F *5/02*
U.S. Cl. 423—504 8 Claims

1. In a process for the production of chlorine and magnesium oxide by oxidation of magnesium chloride with a gas comprising oxygen the improvement consisting at elevated temperatures of 750°-900° C in performing an exothermic reaction of magnesium chloride in a molten state in the form of a thin film on a support consisting of substantially anhydrous particulate magnesium oxide, said reaction being carried out with substantially anhydrous gas comprising oxygen.

4,073,876

PREPARATION OF GLYCOL ESTERS

Vijai P. Gupta, Freehold, N.J., assignor to Halcon International, Inc., New York, N.Y.

Filed July 1, 1976, Ser. No. 701,464
Int. Cl.[2] C07C *67/05;* C01B *19/00*
U.S. Cl. 423—508 3 Claims

1. A process for recovering tellurium values and removing contaminating metal components from a high-boiling tellurium-containing fraction obtained from the liquid reaction product produced in the manufacture of glycol esters by the molecular oxygen oxidation of an olefin in the presence of a carboxylic acid and a tellurium catalyst and containing contaminating metals in addition to the tellurium values, said high-boiling fraction comprising the highest boiling fraction produced by distillation of said liquid reaction product to recover the glycol esters therefrom, which comprises treating at least part of said fraction with water and/or an aqueous alkaline solution to produce an aqueous phase containing said contaminating metals and a precipitate containing substantially all of the tellurium values present in said fraction, and separating said precipitate from said aqueous phase.

4,073,877

MANUFACTURE OF TITANIUM DIOXIDE PIGMENT SEED FROM A TITANIUM SULFATE SOLUTION

Edgar Klein, Odenthal; Reinhard Kracke, Opladen; Walter Nespital, Odenthal, all of Germany, and Rüdiger Paul, deceased, late of Leverkusen, Germany, assignors to Kronos Titan G.m.b.H., Leverkusen, Germany

Filed May 27, 1975, Ser. No. 581,217
Claims priority, application Germany, July 26, 1974, 2435955
Int. Cl.[2] C01G *23/06*
U.S. Cl. 423—616 6 Claims

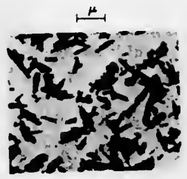
1. In a process for preparing nuclei for use in the manufacture of titanium dioxide pigment by hydrolysis of a titanium sulfate solution wherein the nuclei is formed by mixing a titanium sulfate solution with an alkaline-reacting substance followed by curing the mix at elevated temperature, the improvement comprising the steps of: first adding titanium sulfate solution to water at temperatures between room temperature and 80° C. and in amount to form a dilute, aqueous sulfate solution having a maximum TiO_2 concentration of about 5 gpl, admixing an alkaline-reacting solution with said dilute aqueous solution in an amount to form an acid mixture having a pH from 2.5 to 3.0, thereafter adding additional titanium sulfate solution and additional alkaline-reacting solution to said acid mixture, said additional titanium sulfate solution and said additional alkaline-reacting solution being added simultaneously at temperatures between 50° C. and 80° C., at rates sufficient to maintain the pH of the resulting mixture substantially constant within the range of from 2.5 to 3.0, and in amounts to achieve TiO_2 concentration of from 10 to 100 gpl TiO_2, and thereafter curing the concentrated mixture.

4,073,878

METHOD FOR PRODUCING YELLOW HYDRATED FERRIC OXIDE

Tatsukiyo Otsuki, 9-25, Saiwaicho, and Sinya Takata, 401, Nishikawahara, both of Okayama, Japan

Filed Sept. 9, 1975, Ser. No. 611,642
Int. Cl.[2] C01G *49/02*
U.S. Cl. 423—633 7 Claims



1. A method for producing yellow hydrated ferric oxide which comprises

(a) forming a mixed solution containing ammonium salt and ferrous salt, wherein the ammonium ion concentration of the solution is at least 30 g/l,

(b) adding ammonia to partially neutralize the solution and oxidizing the solution with air to obtain a seed liquid, the temperature of the solution being maintained within a range of from 25° - 40° C,

(c) adding continuously a ferrous salt solution to the seed liquid,

(d) neutralizing the resulting solution with ammonia to maintain the pH of the solution in the range of 4.0 - 6.5 and oxidizing the solution with air to form yellow hydrated ferric oxide, the neutralizing and oxidizing being conducted simultaneously while maintaining the solution at a temperature within a range of from 45° - 60° C, and

(e) recovering the resulting yellow hydrated ferric oxide.

4,073,879

BROMINATED PERFLUOROCARBON RADIOPAQUE AGENTS

David M. Long, Jr., El Cajon, Calif., assignor to University of Illinois Foundation, Urbana, Ill.

Continuation-in-part of Ser. No. 500,463, Aug. 26, 1974, Pat. No. 3,975,512, which is a continuation of Ser. No. 100,408, Dec. 21, 1970, abandoned. This application Aug. 16, 1976, Ser. No. 714,392
The portion of the term of this patent subsequent to Aug. 17, 1993, has been disclaimed.
Int. Cl.[2] A61K *29/02*
U.S. Cl. 424—5 13 Claims

1. In a process for radiologically examining a part of the body of an animal, the improvement comprising contacting said body part with an effective amount of a radiopaque agent comprising a dibrominated aliphatic perfluorocarbon or a brominated cyclic perfluorocarbon.

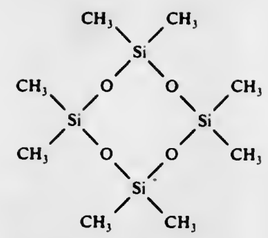
4,073,880

ANTIPERSPIRANT SOLUTION CONTAINING A SUBSTANTIALLY VOLATILE POLYDIMETHYL SILOXANE LIQUID

Morton Pader, Teaneck, and William Netzbandt, Dumont, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Filed Aug. 15, 1975, Ser. No. 605,376
Int. Cl.[2] A61K *7/34, 7/38*
U.S. Cl. 424—66 12 Claims

1. An antiperspirant solution suitable for pump spray or roll-on application consisting essentially of an alcohol soluble aluminum chlorhydroxide complex; a sufficient amount of a polydimethyl siloxane of the structural formula



to substantially reduce the tackiness of said complex during drying; and a sufficient amount of alcohol to result in said solution; said composition being characterized by having substantially reduced tackiness and giving a preception of quick drying when applied from a pump spray or a roll-on applicator.

4,073,881

CONDITIONING THE HAIR WITH A COMPOSITION CONTAINING A LIQUID POLYMER OF AN α-OLEFIN

Makoto Imai, Tokyo; Teruo Horiuchi, Sayama, and Ichiro Kashiwa, Kokubunji, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1976, Ser. No. 663,735
Claims priority, application Japan, Mar. 20, 1975, 50-33625
Int. Cl.[2] A61K *7/08*
U.S. Cl. 424—70 11 Claims

1. The method of conditioning hair for improving the lustre, combability and feel thereof which comprises the step of applying to hair an effective amount of the hair conditioner composition which comprises (A) from 1 to 40 weight percent of a liquid polymer having an average of from 24 to 60 carbon atoms and a viscosity of from 18 to 200 centistokes at 37.8° C, said liquid polymer having been prepared by cationic polymerization of an α-olefin having from 6 to 14 carbon atoms, in the presence of a Lewis acid catalyst consisting essentially of (a) an aluminum halide of the formula AlX_3 wherein X is halogen and (b) an etherified, esterified or etherified-esterified polyhydric alcohol or ketone, followed by removal of the catalyst and substances having less than 20 carbon atoms, (B) from 0.5 to 25 weight percent of a surface active agent effective for homogeneously emulsifying or dispersing component (A), said surface active agent being selected from the group consisting of anionic organic surfactants, nonionic organic surfactants, cationic organic surfactants and mixtures thereof, with the proviso that the composition does not contain both an anionic organic surfactant and a cationic organic surfactant, and (C) from 20 to 95 weight percent of water.

4,073,882

5-METHYL-3-M-BUTYL-OCTAHYDROINDOLIZINE AS AN ATTRACTANT FOR ANTS

Fridolin J. Ritter, Waddinxveen, Netherlands, assignor to Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek Ten Behoeve Van Nijverheid Handel en Verkeer, The Hague, Netherlands

Continuation of Ser. No. 459,358, April 9, 1974, abandoned. This application Jan. 5, 1976, Ser. No. 646,611
Claims priority, application United Kingdom, Apr. 19, 1973, 18990/73
Int. Cl.[2] A01N *17/14;* C07D *211/06*
U.S. Cl. 424—84 4 Claims

1. A process for attracting Pharaoh's ants, *Monomorium pharaonis* L, which comprises applying the compound 5-methyl-3-n-butyl-octahydroindolizine to a location frequented by the ants in an amount effective to attract the ants.

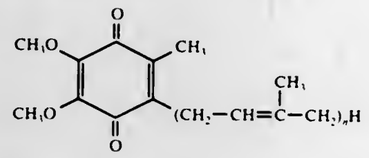
4,073,883

METHOD FOR TREATMENT OF IMPAIRED HEARING

Koichi Yasuda; Yusuke Ikeda, and Yukiaki Nishida, all of Fukuoka, Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Mar. 2, 1977, Ser. No. 773,671
Claims priority, application Japan, Mar. 5, 1976, 51-23165
Int. Cl.² A61K *31/12, 37/48*
U.S. Cl. 424—94 7 Claims

1. A method for treating partially impaired hearing which comprises administering to a human suffering from partially impaired hearing a therapeutically effective amount of Coenzyme Q having the formula:



wherein *n* is an integer from 7 to 10.

4,073,884

PROMOTION OF FEED EFFICIENCY

Frank Joseph Hartdegen, and Kamal Mohammad Abdo, both of Columbia, Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 726,632, Sept. 27, 1976, abandoned. This application Dec. 9, 1976, Ser. No. 749,001
Int. Cl.² A61K *37/48*
U.S. Cl. 424—94 7 Claims

1. A method of increasing the feed efficiency of pigs, chickens and turkeys comprising administering an effective amount of an enzyme fraction obtained by culturing *Streptomyces griseus* strain NRRL 5747 in a fermentation medium to obtain a fraction having the following characteristics:

(a) 1 g. of the enzymatic fraction represents about 500 units, 1 unit being that amount of enzyme fraction which when dissolved in 1 ml. of water reduces the viscosity of 1 ml. of prepared gastric mucin by 50% in 2 hours at 39° C.;

(b) said fraction is insoluble in acidic acetone;

(c) centrifuged broth from the fermentation medium contains 0.3–1.0 units of enzyme fraction/mg. broth;

(d) storage of the dry enzyme fraction at 109° F. for 28 weeks or at 122° F. for 8 weeks results in less than 10% activity decrease.

4,073,885

ANODYNIN, AN ENDOGENOUS OPIATE ANALGESIC FROM HUMAN BLOOD, AND PROCESS FOR RECOVERING SAME

Candace B. Pert; Agu Pert, both of Bethesda, Md., and John F. Tallman, Washington, D.C., assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Sept. 10, 1976, Ser. No. 722,207
Int. Cl.² A61K *35/14, 37/00*
U.S. Cl. 424—101 3 Claims

1. A method of recovering and purifying from human plasma an endogenous composition called anodynin having morphine agonist properties, which comprises acidifying said plasma to a pH of about 3.0 and heating said plasma, adjusting the pH to about 9.0 and recovering a precipitate, extracting said precipitate into butanol to recover anodynin from said butanol extract and reducing to dryness and subsequently purifying said anodynin by centrifuging and ion exchange column separation.

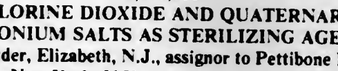
4,073,886

BLOOD FRACTIONATION PROCESS USING BLOCK COPOLYMERS OF ETHYLENE OXIDE AND POLYOXYPROPYLENE

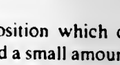
Walter C. Kehm, Scarsdale, N.Y., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jan. 30, 1973, Ser. No. 327,892
Int. Cl.² A61K *37/02;* C07G *7/00*
U.S. Cl. 260—112 B 7 Claims

1. A process for fractionating blood serum and plasma comprising selective precipitation of said material by admixing with a precipitating amount from about 1% to about 35% on a weight per volume basis of a compound of the formula



wherein *a* and *c* are integers such that the hydrophile portion represented by (CH_2CH_2O) constitutes at least about 50% of the molecule and *b* is an integer such that the hydrophobic portion represented by



has a molecular weight of at least about 950.

4,073,887

COMPOSITION FOR TREATING INGROWN TOENAILS

Ellis J. McLean, Sr., Moultrie, Ga., assignor to Edward Price McLean, Sr., Moultrie, Ga.

Continuation-in-part of Ser. No. 331,094, Feb. 9, 1973, abandoned. This application Aug. 7, 1974, Ser. No. 495,531
Int. Cl.² A61K *33/26*
U.S. Cl. 424—147 5 Claims

1. A process for treating unguis incarnatus comprising the steps of:

(a) applying to the nail and the skin area adjacent thereto of a person suffering from unguis incarnatus, a topical composition consisting essentially of ferric subsulfate solution;

(b) maintaining said ferric subsulfate in contact with the affected onyx and skin area adjacent thereto for several hours; and

(c) repeating steps (a) and (b) at least once daily for several days until the symptoms of said unguis incarnatus are substantially alleviated.

4,073,888

CHLORINE DIOXIDE AND QUATERNARY AMMONIUM SALTS AS STERILIZING AGENTS

Martin Snyder, Elizabeth, N.J., assignor to Pettibone Laboratories, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 480,335, June 18, 1974, abandoned, which is a continuation-in-part of Ser. No. 244,856, April 17, 1972, abandoned. This application Feb. 24, 1975, Ser. No. 552,517
Int. Cl.² A01N *9/02, 9/20, 11/00*
U.S. Cl. 424—149 9 Claims

1. A sporicidal composition which comprises from 1.0 to 6.0% chlorine dioxide and a small amount but effective amount of about 0.2% up to about 2.0% of a quaternary ammonium salt selected from the group consisting of octyl-decyl dimethyl ammonium chloride, didecyl dimethyl ammonium chloride, didodecyl dimethyl ammonium chloride, and octyl-dodecyl dimethyl ammonium chloride.

4,073,889

METHOD FOR PREVENTING AEROBIC DECOMPOSITION PROCESSES IN FERMENTATED FODDER

Theodor Beck, Munich, and Friedrich Gross, Grub, both of Germany, assignors to Plate Kofasil Gesellschaft mit beschrankter Haftung, Bonn, Germany

Filed Feb. 18, 1976, Ser. No. 659,094
Claims priority, application Germany, Feb. 19, 1975, 2507067
Int. Cl.² A01N *13/00*
U.S. Cl. 424—164 5 Claims

1. A method of preventing aerobic decomposition processes in fermented fodder, wherein benzoic acid and its salts, sodium or calcium formate and alkali salts of sulphurous acid are added either individually or in admixture to the fodder during storage or to the silage after removal from storage, in such quantity that the fermented fodder contains in synergistic combination from 300 to 600 ppm of benzoic acid, from 1000 to 2500 ppm of sodium or calcium formate and from 100 to 250 ppm of salts of sulphurous acid.

4,073,890

NOVEL POLYPEPTIDES

Masahiko Fujino, Takarazuka; Mitsuhiro Wakimasu; Shigehisa Taketomi, both of Suita, and Eiichiro Ishikawa, Nishinomiya, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 560,092, March 19, 1975, Pat. No. 4,001,199. This application Sept. 23, 1976, Ser. No. 726,052
Claims priority, application Japan, Mar. 26, 1974, 49-34161; Jan. 24, 1975, 50-10878
The portion of the term of this patent subsequent to Jan. 4, 1994, has been disclaimed.
Int. Cl.² A61K *37/00;* C07C *103/52*
U.S. Cl. 424—177 21 Claims

1. A composition for the treatment of diabetes or hyperchlolesteremia which comprises a medicinally effective amount of an active ingredient of the formula



(I)

wherein R_1 is hydrogen, or a basic or neutral amino acid residue having not more than 10 carbon atoms, R_2 is a neutral amino acid residue having not more than 10 carbon atoms and R_3 is NH_2, Tyr-NH_2, a residue of Tyr¹-peptide consisting of 2 to 5 amino acid residues, each of the amino acid residues having 2 to 10 carbon atoms, or R_3 is a residue of an amide of the Tyr¹-peptide, provided that when R_1 is hydrogen, R_2 is Pro and that when any of the amino acid residues constituting the compound of the formula (I) is an optical isomer, the amino acid residue is in L-configuration, in admixture with a pharmaceutically effective carrier therefor.

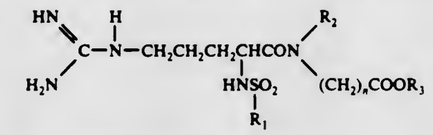
4,073,891

N^2-ARYLSULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Shosuke Okamoto, 15-11, Asahigaoka 3-chome, Tarumi, Kobe, Hyogo, Japan; Akiko Hijikata, Kobe, Japan; Ryoji Kikumoto, Machida, Japan; Yoshikuno Tamao, Yokohama, Japan; Kazuo Ohkubo, Machida, Japan; Toharu Tezuka, Yokohama, Japan, and Shinji Tonomura, Tokyo, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo and Shosuke Okamoto, both of Japan

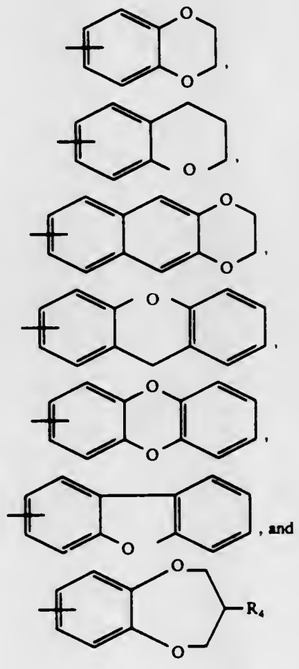
Continuation-in-part of Ser. No. 669,743, March 24, 1976, which is a continuation-in-part of Ser. No. 671,568, March 29, 1976, which is a continuation-in-part of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,667
Claims priority, application Japan, Nov. 8, 1974, 49-128774; Nov. 8, 1974, 49-128775; Nov. 29, 1974, 49-136695; Nov. 29, 1974, 49-136697; Feb. 25, 1975, 50-023268; Feb. 26, 1975, 50-023635
The portion of the term of this patent subsequent to Jan. 24, 1995, has been disclaimed.
Int. Cl.² A61K *37/00;* C07C *103/52*
U.S. Cl. 424—177 4 Claims

1. N^2-arylsulfonyl-L-argininamides having the formula (1):



(1)

and the pharmaceutically acceptable salts thereof, wherein R_1 is selected from the group consisting of naphthyl, 5,6,7,8-tetrahydronaphthyl, naphthyl substituted with at least one substituent selected from the group consisting of halo, nitro, cyano, hydroxy and C_1–C_{10} alkyl phenyl, phenyl substituted with at least one substituent selected from the group consisting of halo, nitro, cyano, hydroxy, and C_1–C_{10} alkyl, C_1–C_{10} alkoxy and C_2–C_{20} dialkylamino, C_7–C_{12} aralkyl,



wherein R_4 is hydrogen, C_1–C_{10} alkyl or C_1–C_{10} alkoxy; R_2 is selected from the group consisting of C_2–C_{10} alkyl, C_3–C_{10} alkenyl, C_3–C_{10} alkynyl, C_2–C_{10} alkoxyalkyl, C_2–C_{10} alkylthioalkyl, C_2–C_{10} alkylsulfinylalkyl, C_1–C_{10} hydroxyalkyl, C_2–C_{10} carboxyalkyl, C_3–C_{10} alkoxycarbonylalkyl, C_1–C_{10} haloalkyl, C_7–C_{15} aralkyl, C_8–C_{15} α-carboxyaralkyl, C_3–C_{10} cycloalkyl and C_4–C_{10} cycloalkylalkyl; R_3 is selected from the group consisting of C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–C_{12} aralkyl and 5-indanyl; and *n* is an integer of 1, 2 or 3.

4,073,892

N^2-ALKOXYNAPHTHYLSULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Shosuke Okamoto, 15-11, Asahigaoka 3-chome, Tarumi, Kobe, Hyogo, Japan; Akiko Hijikata, Kobe, Japan; Ryoji Kikumoto, Machida, Japan; Yoshikuno Tamao, Yokohama, Japan; Kazuo Ohkubo, Machida, Japan; Tohru Tezuka, Yokohama, Japan, and Shinji Tonomura, Tokyo, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo and Shosuke Okamoto, both of Japan

Continuation-in-part of Ser. No. 638,985, Dec. 9, 1975, which is a continuation-in-part of Ser. No. 671,436, March 29, 1976, which is a continuation-in-part of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,738

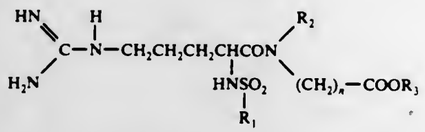
Claims priority, application Japan, Nov. 8, 1974, 49-128774; Nov. 8, 1974, 49-128775; Nov. 29, 1974, 49-136695; Nov. 29, 1974, 49-136697; Feb. 25, 1975, 50-023268; Feb. 26, 1975, 50-023635

The portion of the term of this patent subsequent to Oct. 25, 1994, has been disclaimed.

Int. Cl.[2] **A61K** *37/00;* **C07C** *103/52*

U.S. Cl. 424—177 **10 Claims**

1. N^2-alkoxynaphthylsulfonyl-L-argininamides having the formula:



and the pharmaceutically acceptable salts thereof, wherein R_1 is naphthyl substituted with at least one C_1–C_5 alkoxy; R_2 is selected from the group consisting of C_2–C_{10} alkyl, C_3–C_{10} alkenyl, C_3–C_{10} alkynyl, C_2–C_{10} alkoxyalkyl, C_8–C_{15} α-carboxyaralkyl, C_2–C_{10} alkylsulfinylalkyl, C_1–C_{10} hydroxyalkyl, C_2–C_{10} carboxyalkyl, C_3–C_{10} alkoxycarbonylalkyl and C_1–C_{10} haloalkyl; R_3 is selected from the group consisting of hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–C_{12} aralkyl and 5-indanyl; and *n* is an integer of 1, 2 or 3.

4,073,893

O-ALKYL-O-[4-LEPIDIN(6)YL]-(THIONO)(THIOL) PHOSPHORIC (PHOSPHONIC) ACID ESTERS AND ARTHROPODICIDAL COMPOSITIONS THEREOF

Christa Fest, Wuppertal; Ingeborg Hammann, Cologne, and Bernhard Homeyer, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

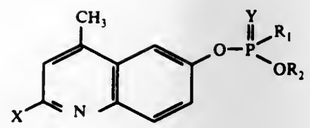
Filed Feb. 6, 1976, Ser. No. 656,036

Claims priority, application Germany, Feb. 25, 1975, 2508078

Int. Cl.[2] **C07D** *9/60;* **A61K** *31/675*

U.S. Cl. 424—200 **10 Claims**

1. An O-alkyl O-[4-lepidin(6)yl]-(thiono)(thiol)-phosphoric(-phosphonic) acid ester of the formula



in which

R_1 is alkyl or alkoxy, each with 1 to 6 carbon atoms, phenyl or n-propylmercapto,

R_2 is alkyl with 1 to 6 carbon atoms,

X is chlorine or hydrogen, and

Y is oxygen or sulfur.

10. The method according to claim 9, in which said compound is

methyl O-ethyl O-[4-lepidin(6)yl]-thionophosphonic acid ester,

ethyl O-ethyl O-[4-lepidin(6)yl]-thionophosphonic acid ester,

O-ethyl S-n-propyl O-[4-lepidin(6)yl]-thionophosphoric acid ester,

O-ethyl S-n-propyl O-[2-chloro-4-lepidin(6)yl]-thionophosphoric acid ester or

O,O-diethyl O-[4-lepidin(6)yl]-thionophosphoric acid ester.

4,073,894

OXADIAZOLIDINE SUBSTITUTED PHOSPHORUS COMPOUNDS

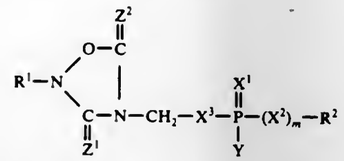
Leonard J. Stach, Riverside, and Robert N. Wilke, Chicago, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 656,493, Feb. 23, 1976, abandoned. This application Nov. 17, 1976, Ser. No. 742,970

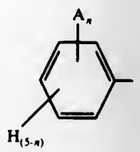
Int. Cl.[2] **C07D** *271/06;* **A01N** *9/36*

U.S. Cl. 424—200 **10 Claims**

1. A new compound of the formula



wherein R^1 and R^2 are independently selected from the group consisting of lower alkyl and



wherein A is selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio and halogen and *n* is an integer from 0 to 2; X^1, X^2, X^3, Z^1 and Z^2 are independently selected from the group consisting of oxygen and sulfur; *m* is the integer 0 or 1; and Y is selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio, amino, lower alkylamino and di (lower) alkylamino.

10. A method of controlling insects which comprises contacting said insects with an insecticidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to insects, a compound of claim 1.

4,073,895

ISOPROPYLAMINO PYRIMIDINE ORTHOPHOSPHATE

André Esanu, Paris, France, assignor to Societe d'Etudes de Produits Chimiques, Paris, France

Filed Feb. 16, 1977, Ser. No. 769,403

Claims priority, application United Kingdom, Feb. 18, 1976, 06430/76

Int. Cl.[2] **A61K** *31/505;* **C07D** *239/42*

U.S. Cl. 424—200 **2 Claims**

1. The compound 2-isopropylamino pyrimidine orthophosphate.

2. A therapeutic composition of matter presenting a favourable action in the field of the nerve regeneration comprising an effective amount of 2-isopropylamino pyrimidine orthophosphate together with an appropriate carrier.

4,073,896

INSECTICIDE FROM DIMETHYLMUCONIC ACID

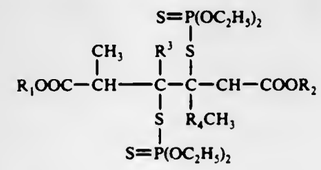
Richard D. Cassar, West Chester, Pa., assignor to Sun Ventures, Inc., Radnor, Pa.

Division of Ser. No. 586,101, June 11, 1975. This application Sept. 20, 1976, Ser. No. 724,837

Int. Cl.[2] **A01N** *9/36;* **C07F** *9/02*

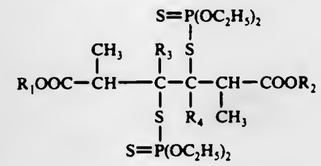
U.S. Cl. 424—205 **7 Claims**

1. A compound having the formula



wherein R_1 and R_2 are methyl, or ethyl, and may be the same or different, or one of R_1 and R_2 may be hydrogen, and R_3 and R_4 are methyl or hydrogen, and may be the same or different.

4. An insecticidal composition comprising a minor amount of an insecticidal compound having the formula



wherein R_1 and R_2 are methyl, or ethyl, and may be the same or different, or one of R_1 and R_2 may be hydrogen, and R_3 and R_4 are methyl or hydrogen, and may be the same or different, and a major amount of a suitable carrier.

4,073,897

TREATMENT OF ARTHRITIS AND ALLIED CONDITIONS WITH XENYLSALATE

Arthur Karler, Berkeley, Calif., assignor to Diagnostic Data, Inc., Mountain View, Calif.

Filed Nov. 15, 1976, Ser. No. 741,547

Int. Cl.[2] **A61K** *31/60*

U.S. Cl. 424—230 **4 Claims**

1. The method of treating arthritis and related conditions comprising administering systemically to an arthritic patient an effective amount of xenylsalate.

4,073,898

COMPOSITION FOR REDUCING THE OILY APPEARANCE OF THE HAIR AND SKIN

Claude Bouillon, Eaubonne, and Claudine Berrebi, Paris, both of France, assignors to L'Oreal, Paris, France

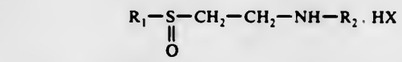
Filed Dec. 31, 1975, Ser. No. 645,658

Claims priority, application France, Dec. 31, 1974, 74 43406

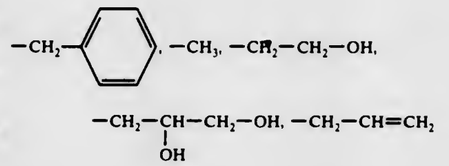
Int. Cl.[2] **A61K** *31/615, 31/205;* **C07C** *147/14*

U.S. Cl. 424—233 **17 Claims**

1. A composition for treating oily hair or skin to reduce the oily appearance thereof comprising in an appropriate vehicle 0.1 to 10% by weight of an active compound having the formula:



wherein R_1 represents a member selected from the group consisting of:



wherein

R_3 is lower alkyl containing 1-3 carbon atoms;

R_2 is hydrogen and

HX represents an organic acid selected from the group consisting of tartaric acid, malic acid, glutamic acid, salicylic acid, fumaric acid and 5-amino-3-thia hexanedioic acid.

4,073,899

METHOD OF TERMINATING PREGNANCY

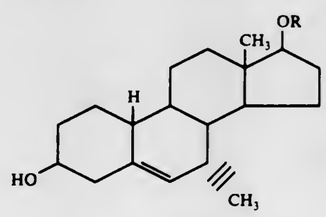
Joyce F. Grunwell, Hamilton, and John O. Johnston, Cincinnati, both of Ohio, assignors to Richardson-Merrell, Inc., Wilton, Conn.

Division of Ser. No. 506,255, Sept. 16, 1974, abandoned. This application Feb. 27, 1976, Ser. No. 661,967

Int. Cl.[2] **A61K** *31/565;* **C07J** *1/00*

U.S. Cl. 424—238 **9 Claims**

1. A method of terminating pregnancy in higher female primates which comprises administering to said primates a therapeutic amount of a 7α-methyl-estr-5-ene-3β,17β-diol having the formula



wherein R is selected from the group consisting of hydrogen and acyl having from 1 to 12 carbon atoms; administering said diol on or about 21 days following the onset of the last menstrual bleeding for a period of from 1 to 14 days or until menstrual bleeding again commences, whichever first occurs.

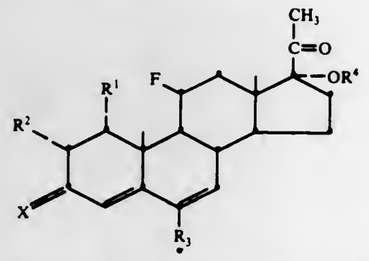
4,073,900

11β-FLUOROPREGNENES

Helmut Hofmeister; Henry Laureat; Rudolf Wiechert; Klaus Annen, and Hermann Steinbeck, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

Filed Oct. 19, 1976, Ser. No. 734,012
Claims priority, application Germany, Oct. 22, 1975, 2547687
Int. Cl.² C07J *7/00*
U.S. Cl. 424—243 **14 Claims**

1. An 11β-fluoropregnene of the formula



wherein R_1 and R_2 each are a hydrogen atom or collectively methylene or a carbon-carbon bond; R_3 is a hydrogen, fluorine or chlorine atom; X is an oxygen atom or H,OR_4, and R_4 is a hydrogen atom or the acyl radical of a hydrocarbon carboxylic acid of 1-11 carbon atoms.

13. A method of contraception which comprises administering daily orally to a fertile female a contraceptively effective amount of a compound of claim 1.

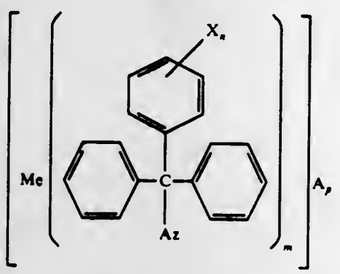
4,073,901

METAL COMPLEXES OF N-TRITYL-AZOLES FOR COMBATTING FUNGI

Karl Heinz Buchel, Wuppertal; Paul-Ernst Frohberger, and Helmut Kaspers, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 14, 1976, Ser. No. 649,161
Claims priority, application Germany, Jan. 24, 1975, 2502932
Int. Cl.² A61K *31/555;* C07F *1/08, 3/06*
U.S. Cl. 424—245 **10 Claims**

1. A metal complex of an N-tritylazole of the formula



in which

Me is copper or zinc

X is halogen, nitro, cyano, hydroxyl, alkyl with up to 6 carbon atoms, akloxy with 1 or 2 carbon atoms, alkylthio with 1 or 2 carbon atoms, alkoxycarbonyl with a total of up to 5 carbon atoms, haloalkyl with 1 or 2 carbon atoms and up to 5 fluorine or chlorine atoms, or alkylsulfonyl with 1 or 2 carbon atoms,

Az is an imidazolyl radical or a 1,2,4-triazolyl radical,

A is a chloride, bromide, iodide, nitrate, sulfate or phosphate anion,

n is 0, 1, 2, 3 or 4,

m is 1, 2, 3 or 4, and

p is 1, 2, 3, 4, 5 or 6.

8. A fungicidal composition containing as active ingredient a fungicidally effective amount of a complex according to claim 1 in admixture with a diluent.

9. A method of combatting fungus pests which comprises applying to the pests or a habitat thereof a fungicidally effective amount of a complex according to claim 1.

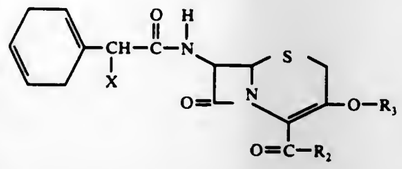
4,073,902

O-SUBSTITUTED 7β-AMINO-3-CEPHEM-3-OL-4-CARBOXYLIC ACID COMPOUNDS

Riccardo Scartazzini, Allschwil, and Hans Bickel, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 373,818, June 26, 1973, abandoned. This application Feb. 13, 1976, Ser. No. 657,908
Claims priority, application Switzerland, June 29, 1972, 9788/72; Aug. 17, 1972, 12195/72; Dec. 22, 1972, 18722/72; Feb. 23, 1973, 2655/73
Int. Cl.² A61K *31/38;* C07D *501/16, 501/60*
U.S. Cl. 424—246 **18 Claims**

1. An O-substituted 7β-amino-3-cepham-3-ol-carboxylic acid compound of the formula



(IA)

wherein X represents amino, R_2 represents hydroxyl or a group R_2' which together with the carbonyl grouping —C(=O)— forms a protected carboxyl group, and R_3 is lower alkyl, lower alkenyl, phenyl-lower alkyl, lower alkanoyl or lower alkoxycarbonyl, or pharmaceutically acceptable salts thereof.

5. A compound according to claim 1, which is the 7β-[D-α-amino-α-(1,4-cyclohexadienyl)-acetylamino]-3-methoxy-3-cephem-4-carboxylic acid, a salt or a hydrate thereof.

15. The antimicrobial pharmaceutical composition which comprises a therapeutically effective amount of a pharmacologically active compound of claim 1, together with a pharmaceutically usable excipient.

17. The method of treating infections caused by microorganisms which comprises administering the pharmaceutical composition of claim 15.

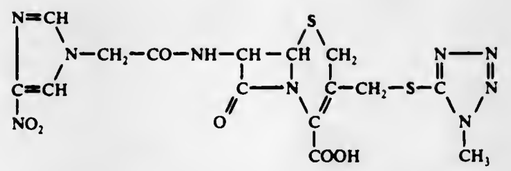
4,073,903

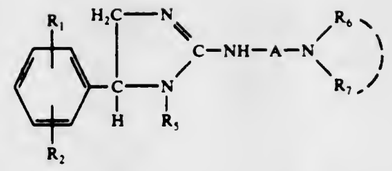
3-[5'(1-METHYLTETRAZOLYLTHIOMETHYL)]-7-[2(3"-NITROIMIDAZOLYL)ACETYL AMINO]CEPHALOSPORANIC ACID, SALTS, AND ITS PHARMACEUTICAL COMPOSITION

Silvia Zanin Tricerri, Carimate (Como), and Lino Chiarani, Milan, both of Italy, assignors to Pierrel S.p.A., Milan, Italy

Filed Sept. 27, 1976, Ser. No. 726,833
Claims priority, application United Kingdom, Oct. 1, 1975, 40063/75
Int. Cl.² A61K *31/545;* C07D *501/36*
U.S. Cl. 424—246 **5 Claims**

1. A cephalosporin compound of the formula





or non-toxic, pharmaceutically acceptable salts thereof.

5. A pharmaceutical composition comprising the antibacterial compound of claim 1 and a pharmaceutical carrier or excipient.

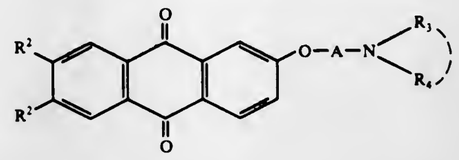
4,073,904

BIS-BASIC ETHERS OF 2,6,-AND 2,7-DIHYDROXY-ANTHRAQUINONES

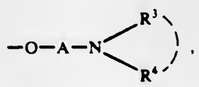
Robert W. Fleming; Arthur D. Sill, and Francis W. Sweet, all of Cincinnati, Ohio, assignors to Richardson-Merrell, Inc., Wilton, Conn.

Division of Ser. No. 394,584, Sept. 5, 1973, Pat. No. 3,974,186, which is a continuation of Ser. No. 37,312, May 14, 1970, abandoned. This application Jan. 26, 1976, Ser. No. 652,345
Int. Cl.² C07D *401/10, 403/10, 413/10;* A61K *31/445*
U.S. Cl. 424—248.58 **6 Claims**

1. A compound selected from a base of the formula



or a pharmaceutically acceptable acid addition salt of said base, wherein one R^2 is a hydrogen atom and the other R^2 is the radical



A is a straight chain alkylene group having 2 or 3 carbon atoms and R^3 and R^4 taken together with the nitrogen atoms to which they are attached is pyrrolidino, piperidino or morpholino.

6. A pharmaceutical preparation for administration to a host for resisting as well as suppressing viral infections comprising a pharmaceutical carrier and as the active ingredient an antivirally effective quantity of a compound of claim 1.

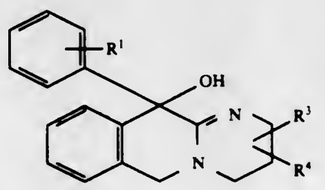
4,073,905

2-AMINO-4-PHENYL-2-IMIDAZOLINES AND SALTS THEREOF

Werner Kummer; Herbert Köppe; Helmut Stähle, all of Ingelheim am Rhein, and Walter Haarmann, Biberach an der Riss, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

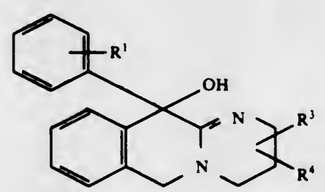
Continuation-in-part of Ser. No. 379,750, July 16, 1973. This application Mar. 9, 1977, Ser. No. 775,736
Claims priority, application Germany, July 19, 1972, 2235314; July 19, 1971, 2235328
Int. Cl.² C07D *403/12, 413/12;* A61K *31/495, 31/535*
U.S. Cl. 424—248.56 **8 Claims**

1. A compound of the formula



and a pharmaceutically acceptable acid addition salt thereof; wherein R^1 represents hydrogen, hydroxyl, lower alkyl, lower alkoxy, trifluoromethyl, or halogen; and R^3 and R^4 each represents hydrogen or lower alkyl; said lower alkoxy or lower alkyl groups having up to six carbon atoms, with the proviso that R^3 and R^4 cannot be groups which give rise to steric hindrance.

7. An anti-ulcer composition containing an effective amount of a pyrimido[1,2-b]isoquinoline selected from the group consisting of a base of the formula



and a pharmaceutically acceptable acid addition salt thereof; wherein R^1 represents hydrogen, hydroxyl, lower alkyl, lower alkoxy, trifluoromethyl, or halogen; and R^3 and R^4 each represents hydrogen or lower alkyl; said lower alkoxy or lower alkyl groups having up to six carbon atoms, with the proviso and R^3 and R^4 cannot be groups which give rise to steric hindrance, and a pharmaceutically acceptable carrier.

4,073,907

STABILIZED AMINOPHYLLINE SOLUTION AND PROCESS THEREFOR

David Thaddeus Guzek, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed June 1, 1976, Ser. No. 691,269
Int. Cl.² A61K *31/52*
U.S. Cl. 424—253 **7 Claims**

1. A method of stabilizing and preventing undesired crystal growth in an aqueous aminophylline solution for contact with a container system tending to promote crystal growth comprising: forming a solution of aminophylline, water, and disodium edetate, said disodium edetate present in the amount of about 0.01 to about 1.0% by weight based on the total solution weight, admixing ethylenediamine to effect a pH in the resulting solution of about 8.6 to about 9.0, said water prior to mixing with said aminophylline and disodium edetate being substantially free of carbon dioxide and excluding substantially all carbon dioxide from said solution by means of inert gas protection, said disodium edetate chelating any metal ion being present in said solution to form a soluble material.

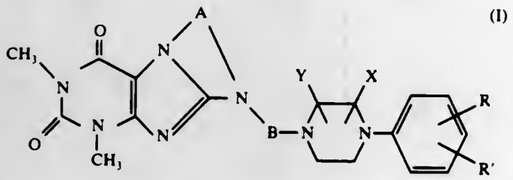
4,073,908

8-AMINO-THEOPHYLLINE DERIVATIVES AND APPLICATIONS THEREOF

Jean Raymond Quelet, Paris, France, assignor to Laboratoire le Brun S.A., Paris, France

Filed Mar. 10, 1976, Ser. No. 665,567
Claims priority, application France, Mar. 12, 1975, 75 07675
Int. Cl.² A61K *31/52*; C07D *473/08*
U.S. Cl. 424—253 **6 Claims**

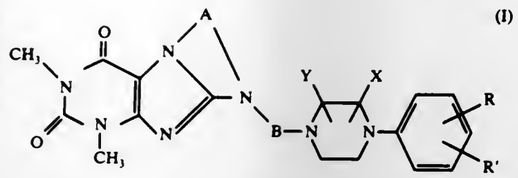
1. A compound selected from the group consisting of the 8-amino-theophylline derivatives having the formula:



(I)

in which A is a member selected from the group consisting of straight- and branched-chain alkylene radicals having 2–4 carbon atoms in the alkylene portion; B is a member selected from the group consisting of straight- and branched-chain alkylene radicals having 2–6 carbon atoms in the alkylene portion; X and Y are members individually selected from the group consisting of hydrogen, straight-chain alkyl having 1–6 carbon atoms and phenoxy-alkylene having 1–6 carbon atoms in the alkylene moiety; R is a member selected from the group consisting of halogen, straight-chain alkyl having 1–6 carbon atoms, alkoxy having 1–6 carbon atoms and trifluoromethyl; and R′ is a member selected from the group consisting of hydrogen, halogen, straight-chain alkyl having 1–6 carbon atoms, alkoxy having 1–6 carbon atoms and trifluoromethyl; and their therapeutically acceptable acid addition salts.

5. A therapeutic composition having a sedative and anti-aggressive psychotropic activity consisting essentially of a therapeutically effective amount of a compound selected from the group consisting of 8-aminotheophylline derivatives having the formula:



(I)

in which A is a member selected from the group consisting of straight- and branched-chain alkylene radicals having 2–4 carbon atoms in the alkylene portion; B is a member selected from the group consisting of straight- and branched-chain alkylene radicals having 2–6 carbon atoms in the alkylene portion; X and Y are members individually selected from the group consisting of hydrogen, straight-chain alkyl having 1–6 carbon atoms and phenoxy-alkylene having 1–6 carbon atoms in the alkylene moiety; R is a member selected from the group consisting of halogen, straight-chain alkyl having 1–6 carbon atoms, alkoxy having 1–6 carbon atoms and trifluoromethyl; and R′ is a member selected from the group consisting of hydrogen, halogen, straight-chain alkyl having 1–6 carbon atoms, alkoxy having 1–6 carbon atoms and trifluoromethyl; and their therapeutically acceptable acid addition salts, together with a therapeutically acceptable vehicle.

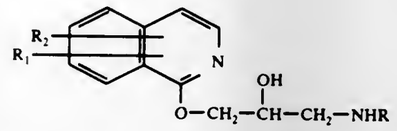
4,073,909

ISOQUINOLINE COMPOUNDS

Franz Troxler, and Erik Wiskott, both of Bottmingen, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 511,690, Oct. 3, 1974, abandoned. This application Mar. 8, 1976, Ser. No. 664,968
Claims priority, application Switzerland, Mar. 26, 1975, 3876/75; Oct. 8, 1973, 14307/73
Int. Cl.² A61K *31/47*; C07D *217/04, 215/14, 217/12*
U.S. Cl. 424—258 **52 Claims**

1. A compound of formula I,



I

wherein

R is lower alkyl or cycloalkyl of 3 to 7 carbon atoms; cycloalkyl of 3 to 7 carbon atoms substituted by alkyl of 1 to 4 carbon atoms; α-dialkylpropinyl or α-dialkylallyl of 5 to 9 carbon atoms, hydroxyalkyl of 2 to 7 carbon atoms, the hydroxy group thereof being separated by at least two carbon atoms from the nitrogen atom to which R is bound; phenethyl; phenethyl substituted by halogen, alkyl or alkoxy of 1 to 4 carbon atoms; ot adamantyl,

R_1 is hydrogen, halogen, alkyl or alkoxy of 1 to 4 carbon atoms, trifluoromethyl in the 5, 6 or 7 position, or a nitro or A—NH— group in the 4 or 5 position, wherein A is formyl or alkanoyl of 2 to 4 carbon atoms, and

R_2 is hydrogen, or, when R_1 is alkyl of 1 to 4 carbon atoms, also alkyl of 1 to 4 carbon atoms, or, when R_1 is alkoxy of 1 to 4 carbon atoms, also alkoxy of 1 to 4 carbon atoms, with the general proviso that the 8 position of the isoquinoline ring is unsubstituted, and any halogen substituent which may present in the 3 or 4 position is other than fluorine,

or a pharmaceutically acceptable acid addition salt thereof.

2. A method of treating hyperglycemia induced by stress in animals, which comprises administering to an animal in need of such treatment a therapeutically effective amount of a compound of claim 1.

4,073,910

METHOD FOR TREATMENT OF DIABETES

Hidetoshi Kawashima, Miyoshi; Shinzaburo Ohtake, Tokyo; Toru Fujimori, Kamakura; Isao Ohkawa, Hanno, and Tetsuya Tajima, Nagareyama, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Nov. 26, 1975, Ser. No. 635,448
Int. Cl.² A61K *31/455*
U.S. Cl. 424—266 **6 Claims**

1. A method for treatment of diabetes comprising administering, a therapeutically effective amount of Vitamine E nicotinate to a human suffering from diabetes.

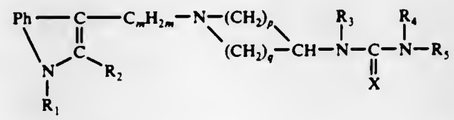
4,073,911

INDOLYLALKYLPIPERIDINES

Charles Ferdinand Huebner, Chatham, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 556,600, March 10, 1975. This application Feb. 2, 1976, Ser. No. 654,254
Int. Cl.² A61K *31/445*; C07D *401/14*
U.S. Cl. 424—267 **9 Claims**

1. A compound of the formula



wherein Ph is unsubstituted 1,2-phenylene or 1,2-phenylene substituted by one or two identical or different members selected from lower alkyl, hydroxy, mercapto, lower alkoxy, lower alkylenedioxy, benzyloxy, lower alkylmercapto, halogeno, trifluoromethyl, nitro and amino; each of R_1 and R_2 is hydrogen or lower alkyl; $(R_3 + R_4)$ is lower alkylene separating both nitrogens by 2 carbon atoms; R_5 is hydrogen, lower alkyl or phenyl unsubstituted or substituted in the positions 3 to 6 by one or two identical or different members selected from lower alkyl, hydroxy, mercapto, lower alkoxy, lower alkylenedioxy, benzyloxy, lower alkylmercapto, halogeno, trifluoromethyl, nitro and amino; X is oxygen, sulfur, imino or lower alkylimino; m is an integer from 1 to 7; each of p and q is an integer from 1 to 3, but $(p + q) = 4$; or a therapeutically acceptable acid addition salt thereof.

9. A method for reducing the blood pressure in mammals, which comprises administering to them enterally or parenterally an effective amount of a compound claimed in claim 1.

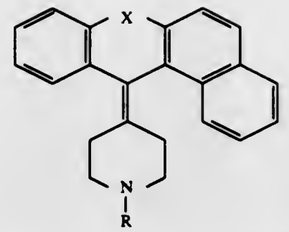
4,073,912

PIPERIDYLIDENE DERIVATIVES OF BENZO-FUSED XANTHENES, THIOXANTHENES AND DIBENZOXEPINS AND ANTIPSYCHOTIC USE THEREOF

Carl Kaiser, Haddon Heights, N.J., and John Joseph Lafferty, Levittown, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Oct. 12, 1976, Ser. No. 731,254
Int. Cl.² C07D *405/04, 409/04*; A61K *31/445*
U.S. Cl. 424—267 **12 Claims**

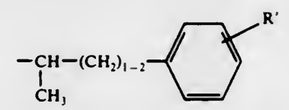
1. A chemical compound of the formula:



or a pharmaceutically acceptable acid addition salt thereof in which:

X is oxygen, sulfur or methyleneoxy; and

R is hydrogen, lower alkyl or alkenyl of from 1 to 5 carbon atoms, straight or branched chain, cycloalkylalkyl having 4 to 8 carbon atoms, hydroxyalkyl having from 2 to 4 carbon atoms, acyloxyethyl of from 2 to 7 carbon atoms or



R′ is hydrogen, benzyloxy, hydroxy, methoxy or 3,4-methylenedioxy.

9. A method of producing antipsychotic activity essentially free of extrapyramidal symptoms which comprises administering internally to an animal host in need of such activity a therapeutically effective amount of the compound of claim 1 or a nontoxic pharmaceutically acceptable acid addition salt thereof.

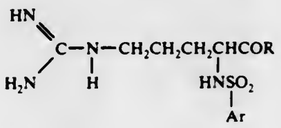
4,073,913

N^2-ARYLSULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Shosuke Okamoto, 15-1i, Asahigaoka 3-chome, Tarumi, Kobe, Hyogo, Japan; Akiko Hijikata, Kobe, Japan; Ryoji Kikumoto, Machida, Japan; Yoshikuni Tamao, Yokohama, Japan; Kazuo Ohkubo, Machida, Japan; Tohru Tezuka, Yokohama, Japan, and Shinji Tonomura, Tokyo, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo and Shosuke Okamoto, both of Japan

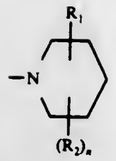
Continuation-in-part of Ser. No. 653,217, Jan. 28, 1976, and Ser. No. 713,486, Aug. 11, 1976, and Ser. No. 703,704, July 8, 1976, and Ser. No. 671,568, March 29, 1976, which is a division of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,668
Claims priority, application Japan, Nov. 8, 1974, 49-128774; Nov. 8, 1974, 49-128775; Nov. 29, 1974, 49-136695; Nov. 29, 1974, 49-136697; Feb. 25, 1975, 50-23268; Feb. 26, 1975, 50-23635; Mar. 5, 1975, 50-26768; Mar. 11, 1975, 50-29357; Mar. 11, 1975, 50-29358
The portion of the term of this patent subsequent to Feb. 14, 1995, has been disclaimed.
Int. Cl.² A61K *31/445*; C07D *211/60*
U.S. Cl. 424—267 **5 Claims**

1. An N^2-arylsulfonyl-L-argininamide having the formula (I):



(I)

or a pharmaceutically acceptable salt thereof, wherein R is



wherein R_1 is $-COOR_3$ wherein R_3 is hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–C_{12} aralkyl or 5-indanyl; each R_2 independently is hydrogen, C_1–C_{10} alkyl, phenyl, C_1–C_5 alkoxy, C_2–C_6 alkoxycarbonyl or carboxy; *n* is an integer of 1 to 4, R_1 is substituted into the piperidine ring at the 2 or 3-position; and R_2 is substituted into the piperidine ring at the 2, 3, 4, 5 or 6-position; and Ar is 5, 6, 7, 8-tetrahydronaphthyl or naphthyl each of which is optionally substituted with at least one substituent selected from the group consisting of halo, hydroxy, nitro, cyano and C_1–C_{10} alkyl.

5. A method of inhibiting activity and suppressing activation of thrombin in vivo which comprises administering to a mammal a pharmaceutical effective amount of a compound of claim 1.

4,073,914

N^2-NAPHTHALENESULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Ryoji Kikumoto, Machida; Yoshikuni Tamao, Yokohama; Kazuo Ohkubo, Machida; Tohru Tezuka, Yokohama; Shinji Tonomura, Tokyo; Sbosuke Okamoto, and Akiko Hijikata, both of Kobe, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo and Sbosuke Okamoto, Hyogo, both of Japan

Continuation-in-part of Ser. No. 671,568, March 29, 1976, which is a division of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Aug. 11, 1976, Ser. No. 713,486

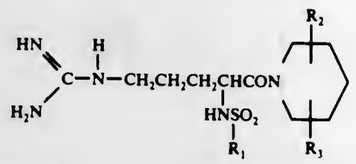
Claims priority, application Japan, Nov. 8, 1974, 49-128774; Nov. 8, 1974, 49-128775; Nov. 29, 1974, 49-136695; Nov. 29, 1974, 49-136697; Feb. 25, 1975, 50-23268; Feb. 26, 1975, 50-23635; Mar. 5, 1975, 50-26768; Mar. 11, 1975, 50-29357; Mar. 11, 1975, 50-29358

The portion of the term of this patent subsequent to Apr. 19, 1994, has been disclaimed.

Int. Cl.² A61K *31/445*; C07D *211/60, 211/62*

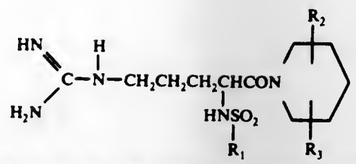
U.S. Cl. 424—267 **10 Claims**

1. An N^2-naphthalenesulfonyl-L-argininamide having the formula



and the pharmaceutically acceptable salts thereof, wherein R_1 is selected from the group consisting of naphthyl, 5,6,7,8-tetrahydronaphthyl and naphthyl substituted with at least one substituent selected from the group consisting of halo, nitro, cyano, hydroxy and C_1–C_{10} alkyl; R_2 is hydrogen or C_1–C_{10} alkyl; R_3 is $-COOR_4$ wherein R_4 is selected from the group consisting of C_1–C_{10} alkyl, C_6–C_{10} aryl and C_7–C_{12} aralkyl; R_2 can be substituted at the 2, 3, 4, 5 or 6-position; and R_3 is substituted at the 2 or 3-position.

10. A method for inhibiting activity and suppressing activation of thrombin in vivo, which comprises administering to a patient a pharmaceutically effective amount of an N^2-naphthalenesulfonyl-L-argininamide having the formula:



or the pharmaceutically acceptable salt thereof, wherein R_1 is selected from the group consisting of naphthyl, 5,6,7,8-tetrahydronaphthyl and naphthyl substitute with at least one substituent selected from the group consisting of halo, nitro, cyano, hydroxy and C_1–C_{10} alkyl; R_2 is hydrogen or C_1–C_{10} alkyl; R_3 is $-COOR_4$ wherein R_4 is selected from the group consisting of C_1–C_{10} alkyl, C_6–C_{10} aryl and C_7–C_{12} aralkyl; R_2 can be substituted at the 2, 3, 4, 5 or 6-position; and R_3 is substituted at the 2 or 3-position.

4,073,915

TREATING ASTHMA

Ulrich Martin, Birsfelden, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 686,172, May 13, 1976, abandoned. This application Mar. 3, 1977, Ser. No. 773,906

Claims priority, application Switzerland, May 20, 1975, 6475/75

Int. Cl.² A61K *31/445*

U.S. Cl. 424—267 **11 Claims**

1. A method of preventing or treating allergic asthma, exercise-induced asthma and allergic gastro-intestinal disorders which comprises administering to an animal in need of such treatment an effective amount of the compound 4-(1-methyl-4-piperidylidene)-4H-benzo[5,4]cyclohepta[1,2-b]thiophen-10(9H)-one.

4,073,916

N^2-NAPHTHALENESULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Shosuke Okamoto, 15-1i, Asahigaoka 3-chome, Tarumi, Kobe, Hyogo, Japan; Akiko Hijikata, Kobe, Japan; Ryoji Kikumoto, Machida, Japan; Yoshikuni Tamao, Yokohama, Japan; Kazuo Ohkubo, Machida, Japan; Tohru Tezuka, Yokohama, Japan, and Shinji Tonomura, Tokyo, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo and Shosuke Okamoto, both of Japan

Continuation-in-part of Ser. No. 713,486, Aug. 11, 1976, which is a continuation-in-part of Ser. No. 671,568, March 29, 1976, Pat. No. 4,049,645, which is a continuation-in-part of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,719

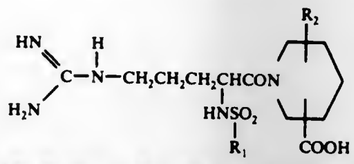
Claims priority, application Japan, Nov. 8, 1974, 49-128774: Nov. 8, 1974, 49-128775; Nov. 29, 1974, 49-136695; Nov. 29, 1974, 49-136697; Feb. 25, 1975, 50-023268; Feb. 26, 1975, 50-023635; Mar. 5, 1975, 50-026768; Mar. 5, 1975, 50-029357; Mar. 5, 1975, 50-029358

The portion of the term of this patent subsequent to Feb. 14, 1995, has been disclaimed.

Int. Cl.² A61K *31/445*; C07D *211/60*

U.S. Cl. 424—267 **17 Claims**

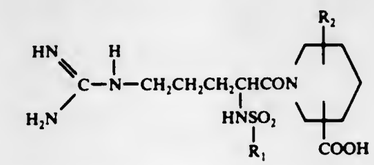
1. An N^2-naphthalenesulfonyl-L-argininamides having the formula



and the pharmaceutically acceptable salts thereof, wherein R_1 is selected from the group consisting of naphthyl, 5,6,7,8-tetrahydronaphthyl and naphthyl substituted with at least one

substituent selected from the group consisting of halo, nitro, cyano, hydroxy, C_1–C_{10} alkyl and C_2–C_{20} dialkylamino; R_2 is hydrogen or C_1–C_{10} alkyl; R_2 can be substituted at the 2, 3, 4, 5 or 6-position; and COOH is substituted at the 2 or 3-position.

17. A method for inhibiting activity and suppressing activation of thrombin in vivo, which comprises administering to a mammal a pharmaceutically effective amount of an N^2-naphthalenesulfonyl-L-argininamide having the formula:



or the pharmaceutically acceptable salt thereof, wherein R_1 is selected from the group consisting of naphthyl, 5,6,7,8-tetrahydronaphthyl and naphthyl substituted with at least one substituent selected from the group consisting of halo, nitro, cyano, hydroxy, C_1–C_{10} alkyl and C_2–C_{20} dialkylamino; R_2 is hydrogen or C_1–C_{10} alkyl; R_2 can be substituted at the 2, 3, 4, 5 or 6 - position; and COOH is substituted at the 2 or 3 position.

4,073,917

LOCAL ANESTHETICS TERTIARY AMINOALKOXYPHENYL ETHERS

Rune Verner Sandberg, Jarna, and Sven Bengt Arvid Åkerman, Sodertalje, both of Sweden, assignors to Astra Lakemedel Aktiebolag, Sodertalje, Sweden

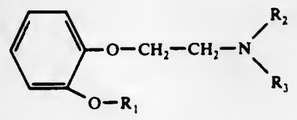
Filed Dec. 18, 1975, Ser. No. 641,984

Claims priority, application Sweden, Dec. 20, 1974, 7416143

Int. Cl.² A61K *31/445*; C07C *91/28*; C07D *295/08*

U.S. Cl. 424—267 **21 Claims**

1. A compound of the formula



and pharmaceutically acceptable acid addition salts thereof, in which formula R_1 represents an alkyl group selected from the group consisting of n-propyl, n-butyl and i-butyl, R_2 and R_3 are the same and are selected from the group consisting of ethyl and i-propyl.

15. A method for producing local anesthesia, the method comprising administration to mammals, including humans, of a therapeutically effective amount of a compound according to claim 1.

4,073,918

PHENOXYALKYLCARBOXYLIC ACID AMIDES OF SUBSTITUTED THIAZOLIDINECARBOXYLIC ACIDS AND THEIR UTILIZATION IN MEDICAMENTS

Gunter Metz, Blaubeuren, and Manfred Specker, Ehigen, Donau, both of Germany, assignors to Ludwig Merckle KG, Blaubeuren, Germany

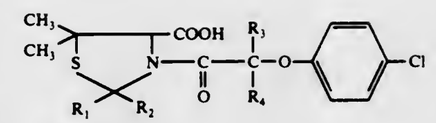
Filed Sept. 25, 1975, Ser. No. 616,890

Claims priority, application Germany, Sept. 26, 1974, 2446100

Int. Cl.² A61K *31/425*; C07D *277/06*

U.S. Cl. 424—270 **6 Claims**

1. A compound selected from the group consisting of phenoxyalkylcarboxylic acid amides of thiazolidinecarboxylic acid having the formula (I)

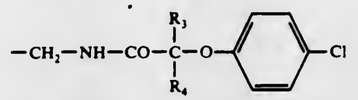


wherein

R_1 is selected from the group consisting of a hydrogen atom and a methyl group,

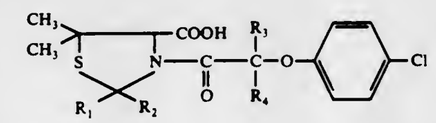
R_3 and R_4 are selected from the group consisting of a hydrogen atom and a methyl group,

R_2 is selected from the group consisting of a hydrogen atom, a methyl group and a group having the formula (II)



wherein R_3 and R_4 are as defined above, and the pharmaceutically acceptable salts thereof.

5. A pharmaceutical hypocholoesteremic composition comprising, as active ingredient, a hypocholesteremic compound selected from the group consisting of phenoxyalkylcarboxylic acid amides of thiazolidinecarboxylic acid having the formula (I)

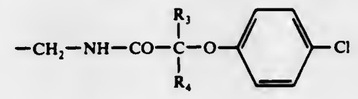


wherein

R_1 is selected from the group consisting of a hydrogen atom and a methyl group,

R_3 and R_4 are selected from the group consisting of a hydrogen atom and a methyl group,

R_2 is selected from the group consisting of a hydrogen atom, a methyl group and a group having the formula (II)



wherein R_3 and R_4 are as defined above, and the pharmaceutically acceptable salts thereof, in unit dosage forms for administering from 300–1500 mg/day, and a pharmaceutically acceptable carrier.

4,073,919

HYPOLIPEMIANT COMPOSITIONS AND METHODS

André Poittevin, Vaires-sur-Marne, and Vesperto Torelli, Maisons-Alfort, both of France, assignors to Roussel Uclaf, Paris, France

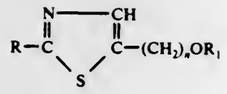
Filed Feb. 2, 1976, Ser. No. 654,629

Claims priority, application France, Feb. 14, 1975, 75 04627; Dec. 12, 1975, 75 38062

Int. Cl.² A61K *31/425*

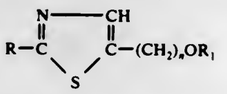
U.S. Cl. 424—270 **6 Claims**

1. A hypolipemiant composition comprising an hypolipemiantly effective amount of at least one compound selected from the group consisting of a thiazole of the formula



wherein R is alkyl of 1 to 5 carbon atoms, *n* is an integer of 3,5 or 7 and R_1 is selected from the group consisting of hydrogen and acyl of an alkanoic acid of 2 to 6carbon atoms and their non-toxic, pharmaceutically acceptable acid addition salts and a pharmaceutical carrier.

3. A method of inducing hypolipemic activity in warm-blooded animals comprising administering to warm-blooded animals an hypolipemically effective amount of at least one compound selected from the group consisting of the formula



wherein R is alkyl of 1 to 5 carbon atoms, *n* is an integer of 3,5 or 7 R_1 is selected from the group consisting of hydrogen and acyl of an alkanoic acid of 2 to 6 carbon atoms and their non-toxic, pharmaceutically acceptable acid addition salts.

4,073,920

VETERINARY COMPOSITION FOR THE TREATMENT OF MAMMARY DISORDER IN ANIMALS

John Sidney Dowrick, Littlehampton, Great Britain, assignor to Beecham Group Limited, Great Britain

Filed Aug. 9, 1976, Ser. No. 712,890

Claims priority, application United Kingdom, Aug. 14, 1975, 33847/75

Int. Cl.² A61K *31/43, 47/00*

U.S. Cl. 424—271 **20 Claims**

1. A veterinary composition for intramammary administration to animals for the treatment of mammary disorders in animals comprising a suspension of an effective amount of a semi-synthetic penicillin in an oily vehicle, which oily vehicle comprises triglycerides, or propylene glycol di-esters, of fatty acids containing 8-10 carbon atoms.

4,073,921

SUBSTITUTED ARYLCYANOALKYL AND DIARYLCYANOALKYLIMIDAZOLES AND FUNGICAL COMPOSITIONS AND METHODS UTILIZING THEM

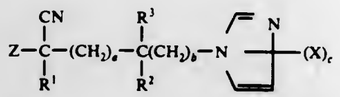
George A. Miller, Maple Glen; Hak-Foon Chan, Doylestown, and Harold E. Carley, Chalfont, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 557,546, March 12, 1975, abandoned. This application Jan. 7, 1976, Ser. No. 647,039

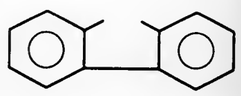
Int. Cl.² A01N *9/22*; C07D *233/56*

U.S. Cl. 424—273 R **13 Claims**

1. A compound of the formula



wherein Z is phenyl or phenyl substituted with up to three substituents independently selected from the group consisting of fluoro, chloro, bromo, iodo, nitro, cyano, methoxy, ethoxy, methyl, ethyl and trihalomethyl; R^1 is hydrogen, (C_1–C_{20}) alkyl, (C_3–C_8) cycloalkyl, (C_5–C_8) cycloalkenyl, (C_3–C_6) alkenyl, (C_3–C_6) alkynyl, phenyl, benzyl or phenethyl or phenyl, benzyl or phenethyl substituted with up to three substituents independently selected from the group consisting of fluoro, chloro, bromo, iodo, nitro, cyano, methoxy, ethoxy, methyl, ethyl and trihalomethyl; R^2 and R^3 are independently hydrogen, (C_1–C_{20}) alkyl, phenyl, benzyl or phenethyl or phenyl, benzyl or phenethyl substituted with up to three substituents independently selected from the group consisting of fluoro, chloro, bromo, iodo, nitro, cyano, methoxy, ethoxy, methyl, ethyl and trihalomethyl or R^2 and R^3 when taken together can form (C_4–C_8) cycloalkyl; R^1 and Z when taken together form the group



a is 0 to 5; *b* is 0 to 5; X is halogen; *c* is 0 to 2 and the agronomically acceptable acid addition salts thereof.

11. A method for controlling phytopathogenic fungi which comprises applying a fungicidally effective amount of a compound according to claim 1 to a plant, to plant seeds or to the plant habitat.

13. A fungicidal composition for controlling phytopathogenic fungi which comprises an agronomically acceptable carrier and, as the active ingredient a fungicidally effective amount of a compound of claim 1.

4,073,922

TREATMENT OF RHEUMATOID ARTHRITIS AND RELATED DISEASES

Roger Wyburn-Mason, Richmond Hill, England, assignor to John R. A. Simoons, Summit, N.J.

Filed June 29, 1976, Ser. No. 700,914

Claims priority, application Japan, Jan. 1, 1976, 51-684

Int. Cl.² A61K *31/415*

U.S. Cl. 424—273 R **5 Claims**

1. A method for producing remission in patients suffering from active rheumatoid arthritis which comprises administering to such a patient a bis-phenyl (2-halophenyl)-1-imidazolylmethane wherein the halo substituent is selected from the group consisting of chlorine, bromine and iodine.

4,073,923

FUNGICIDALLY EFFECTIVE IMIDAZOLES AND USE THEREOF AGAINST FUNGAL PESTS

Sugavanam Balasubramanyan, Wokingham; Margaret Claire Shephard, Maidenhead, and Patrick Jelf Crowley, Crowthorne, all of England, assignors to Imperial Chemical Industries Limited, London, England

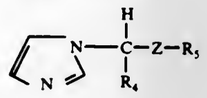
Filed Aug. 26, 1976, Ser. No. 718,206

Claims priority, application United Kingdom, Sept. 10, 1975, 37244/75

Int. Cl.² C07D *233/60*; A01N *9/22*

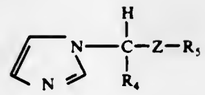
U.S. Cl. 424—273 R **9 Claims**

1. A compound of the formula (I):



wherein R_4 is ethyl or propyl, R_5 is hydroxy, $C_{1\text{-}14}$ alkoxy, phenylamino, benzyloxy or benzyloxy substituted with halogen and Z is C═O, or a fungicidal salt of said compound.

7. A method of combating fungal diseases in a plant, said method consisting essentially of the step of applying to the plant, or to the locus of the plant, a fungicidally effective amount of a compound of the formula:



wherein R_4 is $C_{1\text{-}3}$ alkyl, R_5 is hydroxy, $C_{1\text{-}14}$ alkoxy, phenylamino, benzyloxy or benzyloxy substituted with halogen and Z is C═O, or a fungicidal salts of said compound.

4,073,924

HYDANTOIN DERIVATIVES AND BROAD SPECTRUM BACTERICIDAL/FUNGICIDAL COMPOSITIONS THEREOF

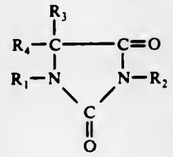
Norman O. V. Sonntag, Montoursville, Pa., assignor to Glyco Chemicals, Inc., Greenwich, Conn.

Filed Oct. 4, 1976, Ser. No. 729,344

Int. Cl.² A61K *31/415*; C07D *233/72*

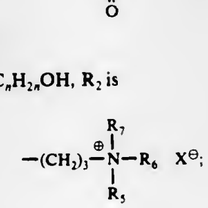
U.S. Cl. 424—273 R **14 Claims**

1. A hydantoin derivative having the formula:



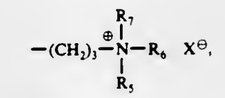
wherein:

when R_1 is $-C_nH_{2n}OH$, R_2 is



and

when R_1 is



R_2 is $-C_nH_{2n}OH$;

R_3 and R_4, which may be the same or different, are selected from the group consisting of hydrogen, alkyl of 1 to 6 carbons, phenyl or taken together R_3 and R_4 may be a cycloaliphatic group of 4 or 5 carbon atoms;

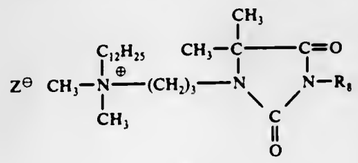
R_5, R_6 and R_7, which may be the same or different, are a group selected from the group consisting of benzyl or $-C_pH_{2p+1}$;

X is a physiologically accepted anion;

n is an integer from 1 to 4; and

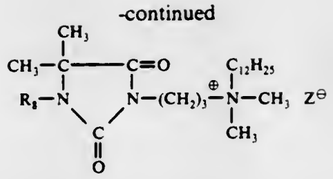
p is an integer from 1 to 24.

6. A compound according to claim 1 having the formula:



or

-continued



wherein:

R_8 is $-C_nH_{2n}OH$, Z is a physiologically acceptable anion and n is as defined.

9. A broad spectrum fungicidal and bactericidal compositon containing as an active ingredient a fungicidally and bactericidally effective amount of a compound according to claim 6, and a carrier for the active ingredient comprising an inert solid diluent or an inert liquid diluent.

4,073,925

FUNGICIDALLY EFFECTIVE IMIDAZOLES AND USE THEREOF AGAINST FUNGAL PESTS

Sugavanam Balasubramanyan, Wokingham, and Margaret Claire Shephard, Maidenhead, both of England, assignors to Imperial Chemical Industries Limited, London, England

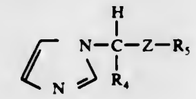
Filed Aug. 26, 1976, Ser. No. 718,205

Claims priority, application United Kingdom, Dec. 12, 1975, 51039/75; Jan. 8, 1976, 671/76

Int. Cl.² C07D *233/60*; A01N *9/22*

U.S. Cl. 424—273 R **8 Claims**

1. A compound of the formula:



wherein R_4 is alkenyl or alkynyl each of up to 8 carbon atoms or aralkyl of up to 8 carbon atoms, said aralkyl being optionally substituted with halogen, alkyl of up to 8 carbon atoms, nitro, trifluoromethyl, cyano, methoxy or methylenedioxy, R_5 is cycloalkyl or branched chain alkyl of up to 8 carbon atoms, and Z is C = O, or a fungicidal salt of such compound.

7. A method of combating fungal diseases in a plant, said method consisting essentially of the step of applying to the plant, or to the locus of the plant, a fungicidally effective amount of a compound or salt as claimed in claim 1.

4,073,926

MONO-QUATERNARY AMMONIUM SALTS OF HYDANTOIN AND COMPOSITIONS THEREOF

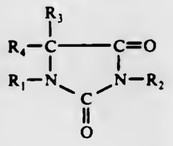
Norman O. V. Sonntag, Montoursville, and John Douglas Freilich, S. Williamsport, both of Pa., assignors to Glyco Chemicals, Inc., Greenwich, Conn.

Filed Oct. 4, 1976, Ser. No. 729,343

Int. Cl.² A61K *31/415*; C07D *233/72*

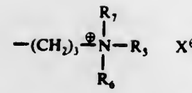
U.S. Cl. 424—273 R **13 Claims**

1. A hydantoin derivative having the formula:



wherein:

one of R_1 and R_2 is hydrogen or alkyl of 1 to 6 carbon atoms and the other is



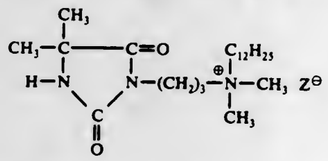
R_3 and R_4, which may be the same or different, are selected from the group consisting of hydrogen, alkyl of 1 to 6 carbons, phenyl or taken together R_3 and R_4 may be a cycloaliphatic group of 4 or 5 carbon atoms;

R_5, R_6 and R_7, which may be the same or different, are a group selected from the group consisting of benzyl or $-C_pH_{2p+1}$;

X is a physiologically acceptable anion;

p is an integer from 1 to 24.

6. A compound according to Claim 1 having the formula:



wherein Z is a physiologically acceptable anion.

8. A broad spectrum fungicidal and bactericidal composition containing as an active ingredient a fungicidally and bactericidally effective amount of a compound according to claim 6, and a carrier for the active ingredient comprising an inert solid diluent or an inert liquid diluent.

4,073,927

DI-QUATERNARY AMMONIUM SALTS OF HYDANTOIN AND COMPOSITIONS THEREOF

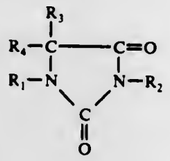
John Douglas Freilich, S. Williamsport, Pa., assignor to Glyco Chemicals, Inc., Greenwich, Conn.

Filed Oct. 4, 1976, Ser. No. 729,342

Int. Cl.² A61K *31/415;* **C07D** *233/72*

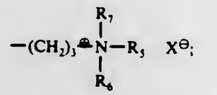
U.S. Cl. 424—273 R **16 Claims**

1. A hydatoin derivative having the formula:



wherein:

R_1 and R_2, which may be the same or different, are



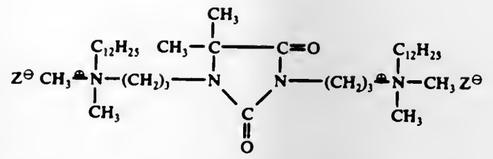
R_3 and R_4, which may be the same or different, are selected from the group consisting of hydrogen, alkyl of 1 to 6 carbons, phenyl or taken together R_3 and R_4 may be a cycloaliphatic group of 4 or 5 carbon atoms;

R_5, R_6 and R_7, which may be the same or different, are a group selected from the group consisting of benzyl or $-C_pH_{2p+1}$;

X is a physiologically acceptable anion;

p is an integer from 1 to 24.

9. A compound according to claim 1 having the formula:



wherein Z is a physiologically acceptable anion.

11. A broad spectrum fungicidal and bactericidal composition containing as an active ingredient a fungicidally and bactericidally effective amount of a compound according to claim 9, and a carrier for the active ingredient comprising an inert solid diluent or an inert liquid diluent.

4,073,928

THERAPEUTIC TREATMENT FOR VIRAL REGIONAL ILEITIS INFECTION

James B. Mercer, 13109 W. 95th St., Lenexa, Kans. 66215

Continuation-in-part of Ser. No. 514,798, Oct. 15, 1974, Pat. No. 3,952,103. This application Feb. 9, 1976, Ser. No. 656,336

Int. Cl.² A61K *31/415*

U.S. Cl. 424—273 R **4 Claims**

1. A method for treating a human host having viral regional ileitis infection comprising:

a. repeatedly orally administering anti-viral regional ileitis infection effective amounts of a pharmaceutical composition which contains, as an active ingredient, 1-(βhydroxyethyl)-2-methyl-5-nitromidazole to a human host in need of said treatment.

4,073,929

3-(2-SUBSTITUTED BENZIMIDAZOLYL) ALANINES

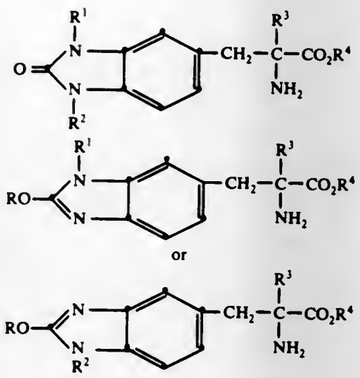
Patrick S. Callery, Cockeysville; Jeremy Wright, Baltimore, and Nicolas Zenker, Lutherville, all of Md., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 13, 1976, Ser. No. 657,829

Int. Cl.² A61K *31/415;* **C07D** *235/26*

U.S. Cl. 424—273 R **10 Claims**

1. A compound of the formula



wherein each of R, R^1, R^2, R^3 and R^4 is hydrogen or alkyl of from 1 to about 3 carbon atoms, and the pharmaceutically acceptable carboxylic salts and pharmaceutically acceptable acid-addition salts thereof.

9. A method for the treatment of hypertension in a mammalian species which comprises administering to a hypertensive subject an effective amount of a compound of claim 1.

4,073,930

CARBAMOYLOXIMES AND OXIMES AND INSECTICIDAL AND MITICIDAL COMPOSITIONS AND METHODS EMPLOYING THEM

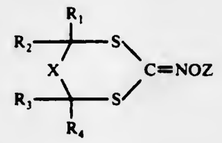
Arthur Peter Kurtz, Jr., Charleston, and Themistocles D. J. D'Silva, South Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed June 1, 1976, Ser. No. 691,374

Int. Cl.² A61K *31/385, 31/40, 31/445, 31/535*

U.S. Cl. 424—277 **43 Claims**

1. A compound of the formula:

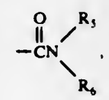


wherein:

X is sulfur, sulfinyl or sulfonyl;

R_1, R_2, R_3 and R_4 are individually hydrogen or alkyl;

Z is hydrogen or



wherein:

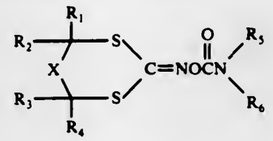
R_5 is hydrogen, alkyl or cycloalkyl; and R_6 is:

A. phenyl either unsubstituted or substituted with one or more fluoro, chloro, bromo, nitro alkyl, cyano, trihalomethyl or alkoxy substituents; or

B. When R_5 is other than hydrogen, R_6 may also be alkylsulfenyl, cycloalkylsulfenyl, alkylthiosulfenyl, cycloalkylthiosulfenyl, naphthylsulfenyl, naphthylthiosulfenyl, trihalomethanesulfenyl, perhaloethanesulfenyl, dialkylaminosulfenyl, piperidylsulfenyl, pyrrolidylsulfenyl, morpholinosulfenyl, alkanoyl, haloalkanoyl or substituted or unsubstituted phenylsulfenyl or phenylthiosulfenyl wherein the permissible substituents are one or more fluoro, chloro, bromo, nitro, cyano, trihalomethyl, alkoxy or alkyl substituents;

with the proviso that no one R_1, R_2, R_3, R_4, R_5 and R_6 substituent individually includes more than six aliphatic carbons.

18. An insecticidal and miticidal composition comprising an acceptable carrier and an insecticidally or miticidally effective amount of a compound of the formula:



wherein:

X is sulfur, sulfinyl or sulfonyl;

R_1, R_2, R_3 and R_4 are individually hydrogen or alkyl;

R_5 is hydrogen, cycloalkyl or alkyl;

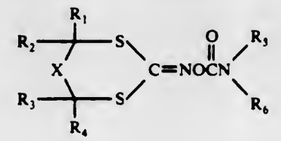
R_6 is:

A phenyl either unsubstituted or substituted with one or more chloro, bromo, fluoro, nitro, cyano, alkoxy, trihalomethyl or alkyl substituents; or

B. when R_5 is other than hydrogen R_6 may also be alkylsulfenyl, cycloalkylsulfenyl, cycloalkylthiosulfenyl, alkylthiosulfenyl, naphthylsulfenyl, naphthylthiosulfenyl, trihalomethanesulfenyl, perhaloethanesulfenyl, dialkylaminosulfenyl, iperidylsulfenyl, pyrrolidylsulfenyl, morpholinosulfenyl, alkanoyl haloalkanoyl or substituted or unsubstituted phenylsulfenyl or phenylthiosulfenyl wherein the permissible substituents are one or more chloro, fluoro, bromo, nitro, cyano, alkoxy, trihalomethyl or alkyl in any combination;

with the proviso that any one R_1, R_2, R_3, R_4, R_5 and R_6 substituent individually may not include more than six aliphatic carbons.

31. A method of controlling insects and mites which comprises subjecting them to an insecticidally or miticidally effective amount of a compound of the formula:



wherein:

X is sulfur, sulfinyl, or sulfonyl;

R_1, R_2, R_3 and R_4 are individually hydrogen or alkyl;

R_5 is hydrogen, cycloalkyl or alkyl;

R_6 is:

A. phenyl either unsubstituted or substituted with one or more chloro, bromo, fluoro, nitro, cyano, alkoxy, trihalomethyl or alkyl substituents; or

B. when R_5 is other than hydrogen R_6 may also be alkylsulfenyl, cycloalkylsulfenyl, cycloalkylthiosulfenyl, alkylthiosulfenyl, naphthylsulfenyl, naphthylthiosulfenyl, trihalomethanesulfenyl, perhaloethanesulfenyl, dialkylaminosulfenyl, piperidylsulfenyl, pyrrolidylsulfenyl, morpholinosulfenyl, haloalkanoyl alkanoyl or substituted or unsubstituted phenylsulfenyl or phenylthiosulfenyl wherein the permissible substituents are one or more chloro, fluoro, bromo, nitro, cyano, alkoxy trihalomethyl or alkyl in any combination;

with the proviso that any one R_1, R_2, R_3, R_4, R_5 and R_6 substituent may not individually include more than six aliphatic carbons.

4,073,931

NITROGLYCERINE INCLUSION COMPOUNDS WITH CYCLODEXTRIN AND COMPOSITION CONTAINING SAME

Eiichiro Akito, Omiya; Yoshiyuki Nakajima, Chiba, and Masayoshi Horioka, Fukuoka, all of Japan, assignors to Teijin Limited, Osaka and Nippon Kayaku Kabushiki Kaisha, Tokyo, both of, Japan

Filed Mar. 25, 1975, Ser. No. 561,884

Claims priority, application Japan, Mar. 27, 1974, 49-34176

Int. Cl.² A61K *9/20;* **C08B** *37/16*

U.S. Cl. 424—298 **5 Claims**

1. An inclusion compound of nitroglycerine in cyclodextrin.

4,073,932

METHOD OF CONTROLLING INSECTS USING 1,3-DIOXIN-4-ONES

Ernst Beriger, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

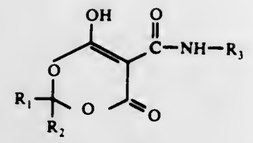
Filed Jan. 10, 1977, Ser. No. 757,810

Claims priority, application Switzerland, Jan. 14, 1976, 397/76; July 22, 1976, 9391/76; Dec. 14, 1976, 15701/76

Int. Cl.² A01N *9/28*

U.S. Cl. 424—279 **8 Claims**

1. A method of killing insects which comprises applying to said insects or the locus thereof an insecticidally effective amount of a compound of the formula



wherein

R_1 and R_2 are each methyl or together are tetramethylene or pentamethylene and R_3 is phenyl, 3-chlorophenyl, 4-chlorophenyl, 3,4-dichlorophenyl or 4-fluorophenyl.

4,073,933

NOVEL BICYCLOHEPTENE DERIVATIVES

Hiromi Shimomura, Nishinomiya; Akihiko Sugie, Takarazuka; Junki Katsube, Toyonaka, and Hisao Yamamoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

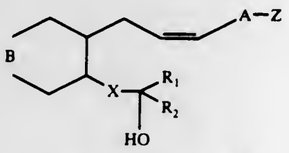
Filed June 17, 1976, Ser. No. 697,152

Claims priority, application Japan, June 27, 1975, 50-80292; July 1, 1975, 50-81635; July 1, 1975, 50-81636

Int. Cl.[2] **C07C** *177/00, 61/38, 69/74*

U.S. Cl. 424—299 **7 Claims**

1. A compound of the formula



wherein A is C_2-C_4 alkylene, B and X are each ethylene or vinylene, R_1 is hydrogen C_1-C_8 alkyl, C_4-C_8 alkyloxyalkyl, C_5-C_7 cycloalkyl, C_5-C_8 cycloalkylalkyl, R_2 is hydrogen or C_1-C_4 alkyl and Z is carboxyl or its non-toxic salt, or C_2-C_5 alkoxycarbonyl carbamoyl.

4,073,934

NOVEL ACETYLENIC PROSTAGLANDIN ANALOGS

Werner Skuballa; Bernd Radüchel; Helmut Vorbrueggen; Walter Elger; Olaf Loge, and Eckehard Schillinger, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

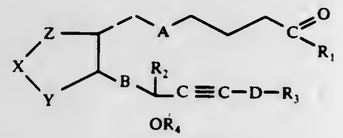
Filed Apr. 16, 1976, Ser. No. 677,861

Claims priority, application Germany, Apr. 18, 1975, 2517771

Int. Cl.[2] **C07C** *177/00;* **A61K** *31/215, 31/19*

U.S. Cl. 424—305 **82 Claims**

1. A (5Z, 13E) prostaglandin compound of the formula



wherein R_1 is $-OR_5$ or $-O-CH_2-U-V$, R_5 being a hydrogen atom, alkyl of 1-10 carbon atoms, phenyl, 1-naphthyl or 2-naphthyl, each of which can be substituted by up to 3 of halogen, phenyl, alkyl of 1-4 carbon atoms, chloromethyl, fluoromethyl, trifluoromethyl, carboxy, alkoxy and hydroxy or a heterocyclic ring of 5 or 6 ring members whose heteroatom is N, O or S, U being a direct bond, carbonyl or carbonyloxy, and V being phenyl substituted by one or more of phenyl, alkoxy of 1-2 carbon atoms, and halogen;

R_2 is hydrogen or alkyl of 1-5 carbon atoms;

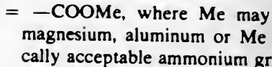
R_3 is alkyl or cycloalkyl of up to 10 carbon atoms;

A is cis-CH=CH—; B is trans-CH=CH;

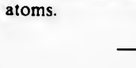
D is a direct bond, oxygen, or sulfur;

Z is carbonyl or >CH ▬ OR_4 wherein OR_4 is in the α- or β-position and R_4 is H, tetrahydropyranyl, tetrahydrofuranyl, α-ethoxyethyl, trimethylsilyl, and tri-p-xylysilyl, alkanoyl of up to 7 carbon atoms or benzoyl; and

X Y is



when Z is >CH OR_4—, or



or —CH=CH—, when Z is carbonyl;

and, when R_1 is hydroxy, physiologically acceptable salts thereof with bases.

4,073,935

SUBSTITUTED PROPANOL-(2)-DERIVATIVES AND THEIR NICOTINIC ACID ESTERS, AND PROCESS FOR THEIR PREPARATION, AND THE USE THEREOF AS HYPOLIPEMIC DRUGS

Helmut Grill, Vaterstetten; Rainer Hans Zschocke, Munich; Josef Wagner, Grunwald; Gernot Hofrichter, Vaterstetten, all of Germany, and P. Stefan Janiak, Basel, Switzerland, assignors to Klinge Pharma GmbH & Co., Germany

Filed Dec. 18, 1975, Ser. No. 641,982

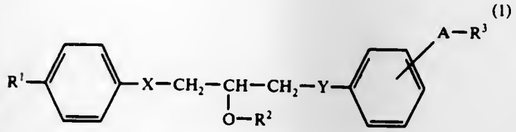
Claims priority, application Germany, Dec. 20, 1974, 2460689

Int. Cl.[2] **A61K** *31/235;* **C07C** *65/14, 69/76*

U.S. Cl. 424—308 **27 Claims**

1. A disubstituted propanol-(2) derivative of the general formula:

(1)



or its therapeutically acceptable salt, where X and Y stand for —O—;

R^1 = —Cl, or $-C(CH_3)_3$;

R^2 = —H;

A = a valence bond, or a vinylene group, or an ethylene group;

R^3 = —COOH, or

= —COOMe, where Me may be sodium, potassium, magnesium, aluminum or Me represents a therapeutically acceptable ammonium group, or

= —COOR‴, where R‴ is a straight or branched, saturated or unsaturated alkyl radical having 1 to 3 carbon atoms.

4,073,936

HYPOLIPIDEMIC ALLENE CARBOXYLIC ESTERS

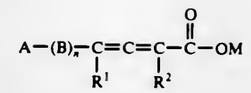
Eugene E. Galantay, Liestal, Switzerland, and Faizulla G. Kathawala, West Orange, N.J., assignors to Sandoz, Inc., East Hanover, N.J.

Division of Ser. No. 605,040, Aug. 15, 1975, Pat. No. 4,011,339. This application Nov. 17, 1976, Ser. No. 742,555

Int. Cl.[2] **A61K** *31/235;* **C07C** *149/40*

U.S. Cl. 424—308 **38 Claims**

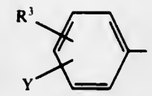
1. A compound of the formula



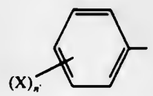
wherein

n is 0 or 1;

A is



wherein Y is a hydrogen atom, alkyl having from 1 to 4 carbon atoms, alkoxy having from 1 to 24 carbon atoms, alkylthio having from 1 to 24 carbon atoms, halo having an atomic weight of from about 19 to 36, cyclohexyl, phenoxy or substituted or unsubstituted phenyl of the formula



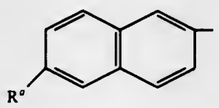
wherein X is a hydrogen atom, halo having an atomic weight of from about 19 to 36, alkoxy having from 1 to 4 carbon atoms or alkyl having from 1 to 4 carbon atoms; and

n' is 1 or 2;

each of R^1 and R^2, independently, is a hydrogen atom or alkyl having from 1 to 4 carbon atoms;

R^3 is a hydrogen atom, halo having an atomic weight of from about 19 to 36, or alkyl having from 1 to 4 carbon atoms; and

when *n* is 0, then A may also be



wherein R^a is a hydrogen atom, halo having an atomic weight of from about 19 to 36, alkyl having from 1 to 4 carbon atoms, alkoxy having from 1 to 4 carbon atoms, alkylthio having from 1 to 24 carbon atoms, or difluoromethoxy;

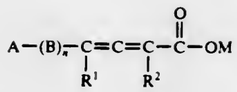
B is



wherein each of R^4 and R^5 is, independently, alkyl having from 1 to 3 carbon atoms; and

M is alkyl having from 1 to 3 carbon atoms provided that when *n* is 0, then Y and R^3 are not both hydrogen atoms.

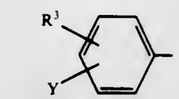
34. A pharmaceutical composition, useful as a hypolipidemic agent, comprising a non-toxic pharmaceutically acceptable solid carrier and as active ingredient from about 12.5 to 1000 milligrams of a compound of the formula



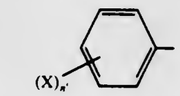
wherein

n is 0 or 1;

A is



wherein Y is a hydrogen atom, alkyl having from 1 to 4 carbon atoms, alkoxy having from 1 to 24 carbon atoms, alkylthio having from 1 to 24 carbon atoms, halo having an atomic weight of from about 19 to 36, cyclohexyl, phenoxy or substituted or unsubstituted phenyl of the formula



wherein X is a hydrogen atom, halo having an atomic weight of from about 19 to 36, alkoxy having from 1 to 4 carbon atoms or alkyl having from 1 to 4 carbon atoms;

n' is 1 or 2;

each of R^1 and R^2, independently, is a hydrogen atom or alkyl having from 1 to 4 carbon atoms;

R^3 is a hydrogen atom, halo having an atomic weight of from about 19 to 36, or alkyl having from 1 to 4 carbon atoms, and

when *n* is 0 then A may also be

wherein R^a is a hydrogen atom, halo having an atomic weight of from about 19 to 36, alkyl having from 1 to 4 carbon atoms, alkoxy having from 1 to 4 carbon atoms, alkylthio having from 1 to 4 carbon atoms, or difluoromethoxy;

B is



wherein each of R^4 and R^5 is, independently, alkyl having from 1 to 3 carbon atoms; and

M is alkyl having from 1 to 3 carbon atoms.

4,073,937

PREVENTIVE TREATMENT FOR OTITIS EXTERNAE

Jon Stephen Van Cleave, 812 SW. Lally St., Des Moines, Iowa 50315

Filed Aug. 12, 1976, Ser. No. 713,633

Int. Cl.[2] **A61K** *31/23, 31/16, 33/22, 31/19*

U.S. Cl. 424—312 **7 Claims**

1. A method of preventive treatment for swimmer's ear, and of combatting the uncomfortable feeling of water filling the ear, said method comprising,

applying to the skin surface of the external auditory canal prior to water contact with said skin surface, a pharmaceutically safe, liquid, non-ionic, substantially water insoluble, aqueous surface tension reducing agent the amount of said surface tension reducing agent being sufficient to substantially coat said skin surface

said aqueous surface tension reducing agent having a viscosity such that the agent can be conveniently administered as ear drops, but yet is not so thin that it will easily run out of the external auditory canal.

4,073,938

19,20-BIS-NOR-PROSTENOIC ACIDS AS HYPOLIPEMIC COMPOUNDS

Umberto Valcavi, Milan, Italy, assignor to Istituto Biochimico Italiano di Loredana Lorenzini S.a.s. and Dr. Madaus & Co., both of Milan, Italy

Filed July 30, 1975, Ser. No. 600,200
Claims priority, application Italy, Aug. 7, 1974, 26111/74
Int. Cl.[2] C07C *177/00*; A61K *31/215*
U.S. Cl. 424—317 **5 Claims**

1. 9-hydroxy-19,20-bis-nor-prostanoic acid sodium salt.

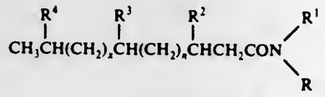
4,073,939

CONTROL OF NEMATODES AND OTHER HELMINTHS EMPLOYING CERTAIN AMIDES

Malcolm J. Thompson, Baltimore; Julius Feldmesser, and William E. Robbins, both of Silver Spring, all of Md., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 631,259, Nov. 12, 1975, Pat. No. 4,036,987. This application Mar. 7, 1977, Ser. No. 775,228
Int. Cl.[2] A01N *9/20*
U.S. Cl. 424—320 **7 Claims**

1. A method of controlling nematodes comprising exposing said nemotodes to a lethally effective amount of a compound selected from the group consisting of compounds of the formula.



wherein R and R^1 are selected from group consisting of H, CH_3, and C_2H_5, and when x and n are each a number 3, each of R^2, R^3, and R^4 are selected individually from the group consisting of H and CH_3, and when x and n are not each a number 3 and the total of x and n is a number from 3 to 26, R^2, R^3, and R^4 are hydrogen.

4,073,940

METHOD FOR TREATING CARDIAC ARHYTHMIA BY ADMINISTRATION OF BASIC ARYLOXYACETAMIDE

Laurent Porte, Sanary-sur-Mer, France, assignor to Centre Europeen de Recherches Pharmacologiques C.E.R.P.H.A., Val-de-Marne, France

Filed Oct. 28, 1976, Ser. No. 736,522
Int. Cl.[2] A61K *31/165*
U.S. Cl. 424—324 **3 Claims**

1. A method for treating a patient for cardiac arhythmia which comprises administering to the said patient N-(2,5-diethoxy phenyl)-N-(2-diethylamino ethyl)-4-butoxy phenoxy acetamide, or a pharmaceutically acceptable acid addition salt thereof, the mode of administration being oral or intravenous and the daily dosage being from 20 mg to about 500 mg of active ingredient.

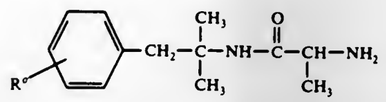
4,073,941

ARALKYL AMIDES HAVING ANTIDEPRESSIVE ACTIVITY

Ulf Henrik Anders Lindberg; Svante Bertil Ross, both of Sodertalje; Seth Olov Thorberg, Jarna, and Sven Ove Ögren, Sodertalje, all of Sweden, assignors to Astra Lakemedel Aktiebolag, Sodertalje, Sweden

Filed Aug. 30, 1976, Ser. No. 718,570
Claims priority, application Sweden, Sept. 4, 1975, 75098137
Int. Cl.[2] A61K *31/165*; C07C *103/10, 103/32*
U.S. Cl. 424—324 **15 Claims**

1. A compound of the general formula



(I)

or a pharmaceutically acceptable acid addition salt thereof, in which formula the group R^o is selected from the group consisting of hydrogen, chlorine, bromine, methyl, trifluoromethyl and methoxy.

11. A method for the treatment of depressive disorders related to neuronal uptake of 5-hydroxytryptamine, the method comprising administration to a host in need of such treatment of a therapeutically effective amount of a compound as claimed in claim 1.

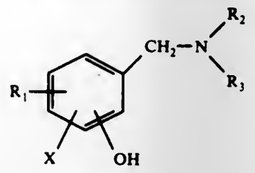
4,073,942

HALO-SUBSTITUTED HYDROXYBENZYL-AMINES AS SECRETOLYTIC AGENTS

Johannes Keck; Sigfrid Püschmann; Gerd Krüger, all of Biberach an der Riss; Klaus-Reinhold Noll, Warthausen-Oberhofen; Matyas Leitold, Biberach an der Riss, and Helmut Pieper, Mettenberg, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Continuation-in-part of Ser. No. 408,071, Oct. 19, 1973, abandoned, and Ser. No. 561,223, March 24, 1975, abandoned. This application Nov. 25, 1975, Ser. No. 635,220
Claims priority, application Germany, Oct. 23, 1972, 2251891; Apr. 26, 1973, 2320967; Sept. 17, 1973, 2346743; Apr. 3, 1974, 2416143
Int. Cl.[2] A61K *31/135*; C07C *87/29*
U.S. Cl. 424—330 **2 Claims**

1. A secretolytic pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective secretolytic amount of a compound of the formula



wherein

X is chlorine or bromine;

R_1 is hydrogen, chlorine or bromine;

R_2 is isopropyl; tert.butyl; tert.pentyl; mono-, di or trihydroxy-substituted branched alkyl of 3 to 5 carbon atoms; cyclohexyl; or hydroxycyclohexyl; and

R_3 is alkyl of 1 to 4 carbon atoms or, when R_2 is other than cyclohexyl, also hydrogen;

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4,073,943

METHOD OF ENHANCING THE ADMINISTRATION OF PHARMALOGICALLY ACTIVE AGENTS

Karl Arvid Johannes Wretlind, Stockholm; Stellan Ljungberg, Lidingo; Ivan Hakansson, Huddinge, and Bengt Magnus Ajaxon, Uppsala, all of Sweden, assignors to Apoteksvarucentralen Vitrum AB, Stockholm, Sweden

Continuation-in-part of Ser. No. 504,880, Sept. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 88,474, Nov. 10, 1970, abandoned, which is a continuation-in-part of Ser. No. 754,738, Aug. 22, 1968, abandoned. This application Mar. 12, 1976, Ser. No. 666,264
Int. Cl.[2] A61K *47/00*
U.S. Cl. 424—358 **1 Claim**

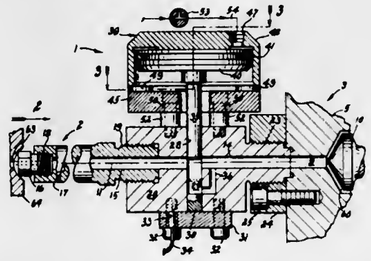
1. A carrier system for use in enhancing parenteral administration of a pharmacologically active, oil-soluable agent, comprising a stable, oil-in-water emulsion containing a pharmacologically inert lipoid as a hydrophobic phase dispersed in a hydrophilic phase, said lipoid being dispersed in the emulsion as finely divided particles having a mean particle size less than 1 micron to achieve rapid onset of an acceptable therapeutic effect, said carrier system being used with an effective dose of said pharmacologically active, oil-soluble agent predominantly dissolved in said lipoid at a fraction ratio thereto in the hydrophobic phase, said therapeutic effect being attributable to said effective dose of the active agent.

4,073,944

NOZZLE SHUT-OFF VALVE

James Earl Dawson, Lebanon, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed July 6, 1976, Ser. No. 702,481
Int. Cl.[2] B29F *1/03*
U.S. Cl. 425—146 **12 Claims**



1. A nozzle shut-off device for use in combination with and at a location between the nozzle and the plastication injection unit of a plastic injection molding machine, the nozzle having therethrough a substantially straight first passageway that is substantially coaxial with the exit passage from said plastication injection unit, said nozzle communicating with a mold cavity, which shut-off device comprises:

a body member for fixedly securing to and interposing between such nozzle and such injection unit and having therethrough a shut-off passageway that is substantially straight;

a lateral bore in said body intersecting said shut-off passageway, defining a pilot chamber on one side of said shut-off passageway and defining on the opposite side of said shut-off passageway a bore section in which the hereinafter said plunger is reciprocably supported;

a laterally extending plunger reciprocably mounted in said bore and of a cross-section to substantially completely block the following: said shut-off passageway when placed laterally thereacross, said lateral bore, and said pilot chamber, and having a length sufficient when advanced laterally fully to extend across said shut-off passageway into said pilot chamber thereby to block said shut-off passageway; and when fully withdrawn to substantially unblock said shut-off passage;

a pilot passage extending within said body between said pilot chamber and said shut-off passageway at a location that is upstream of the intersection of said bore with said shut-off passageway to establish communication between said upstream location and a region in said pilot chamber that is under the end of said plunger when the plunger is advanced into said pilot chamber sufficient to block said shut-off passageway.

4,073,945

FODDER FOR COWS

Heidrun Bertram, Hanau; Rudolf Fahnenstich, Mombris; Heribert Offermanns, and Herbert Tanner, both of Hanau, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Filed May 18, 1976, Ser. No. 687,503
Claims priority, application Germany, June 14, 1975, 2526750
Int. Cl.[2] A23K *1/00*
U.S. Cl. 426—2 **17 Claims**

1. The calcium salts of mono and bis hydroxymethyl derivatives of lysine.

4,073,946

PROCESS OF FEEDING LARVAL MARINE ANIMALS

Robert G. Bayless, Yellow Springs, Ohio, assignor to Capsulated Systems, Incorporated, Yellow Springs, Ohio

Division of Ser. No. 344,904, March 26, 1973, Pat. No. 3,922,373. This application Mar. 17, 1975, Ser. No. 558,835
Int. Cl.[2] A23K *1/18*
U.S. Cl. 426—2 **3 Claims**

1. The process of feeding larval marine animals, comprising the step of adding to the aqueous support system of the larval marine animals water-stable, substantially homogeneous, microglobules of hydrophilic, polymeric, cross-linked, film-forming material, having oil-insoluble nutrient material dispersed therein, and having a diameter of about 1 to 1000 microns.

4,073,947

PREPARATION OF A BEER-TYPE BEVERAGE

Paul R. Witt, Jr., Muscatine, Iowa, assignor to Grain Processing Corporation, Muscatine, Iowa

Continuation-in-part of Ser. No. 584,659, June 6, 1975, abandoned. This application Feb. 1, 1977, Ser. No. 764,567
Int. Cl.[2] C12C *9/00, 11/04*; C12G *3/00*
U.S. Cl. 426—13 **6 Claims**

1. A process for producing a non-distilled starch-based beer-type alcoholic beverage which comprises:

(a) subjecting liquefied starch derived from a source other than malt to hydrolysis with beta-amylase to produce a starch hydrolyzate containing fermentable carbohydrates and to produce a starch hydrolyzate having a dextrose equivalent value of from about 35 to 65 and a monosaccharide content of not more than about 10% by weight of carbohydrate content:

(b) preparing an aqueous liquid wort containing the said starch hydrolyzate in an amount from about 10 to 24% based on water content, a microbial, vegetable or animal protein hydrolyzate in an amount to provide about 0.10 to 0.50 milligram soluble nitrogen per milliliter having up to about 50% of the total as water soluble protein and up to 25% of the water soluble nitrogen as free alpha-amino nitrogen, a source of ammonium ions in an amount to provide about 0.10 to 0.50 milligram of nitrogen per milliliter, and a potassium phosphate salt in an amount to provide about 200 to 600 parts potassium per million and about 100 to 400 parts phosphorus per million, the maximum amount of malt in said liquid wort not exceeding about 2.5% by weight of starch;

(c) inoculating the liquid wort of step (b) with yeast; and

(d) fermenting for a period of not more than 8 days at a

temperature of from about 12 to 40° C. the liquid mass resulting from step (c) to produce a non-distilled starch-based beer-type alcoholic beverage.

4,073,948

PROCESS FOR PRODUCING MODIFIED PROTEIN

Keith L. Chandler, Algonquin; Roy G. Hyldon, Crystal Lake; Surinder Kumar, Buffalo Grove, and John P. O'Mahony, Crystal Lake, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed May 13, 1976, Ser. No. 685,734
Int. Cl.² A23J *3/00*
U.S. Cl. 426—44 **15 Claims**

1. A process for producing a modified plant protein having thermoplastic and forming properties similar to casein and caseinate slats, said process comprising:

a. making an aqueous slurry of a carbohydrate containing plant protein material containing at least about 30 percent by weight protein, said slurry having a solids content of from about 3 percent to about 18 percent by weight;

b. fermenting the slurry with a carbon dioxide generating yeast in a closed vessel to generate carbon dioxide, said fermentation being conducted at a temperature of from 33° F. to 90° F. for from 4 hours to 96 hours, and said yeast comprising a member selected from the group of yeast *Saccharomyces cerevisiae* and *Saccharomyces carlsbergensis;*

c. adding an alkali metal hydroxide or ammonium hydroxide to the slurry in amount sufficient to form a carbonate and to make a first pH adjustment of the carbonate containing slurry to a pH within the range from of about 7.0 to about 10.5;

d. heating the aqueous slurry to react the carbonate with the protein;

e. making a second pH adjustment to the slurry to produce a pH in the range of from 6.0 to 8.0 by addition thereto of an edible acid or edible alkali;

f. admixing the slurry with from about 0.3 percent to about 2.0 percent by weight peroxide per pound of protein in the slurry;

g. heating the slurry under a vacuum to a temperature within the range of from 60° F. to 150° F. to remove steam volatile flavor substances; and

h. drying the slurry until the moisture content thereof is less than 15 percent by weight.

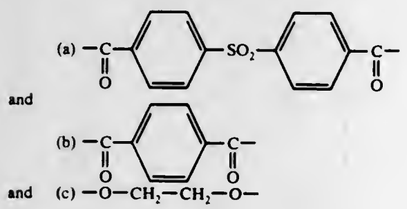
4,073,949

TEREPHTHALIC ACID/P,P-SULFONYLDIBENZOIC ACID/ETHYLENE GLYCOL/NEOPENTYL GLYCOL POLYESTER COMPOSITIONS AND CONTAINERS MADE THEREFROM

Santos W. Go, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 643,282, Dec. 22, 1975. This application Jan. 17, 1977, Ser. No. 759,973
Int. Cl.² B65D *81/00*
U.S. Cl. 426—106 **6 Claims**

1. In a method of packaging a product comprising placing said product in a polymeric polyester container, the improvement wherein said polyester container is a container of a polyester, the repeating units of said polyester consisting essentially of



and

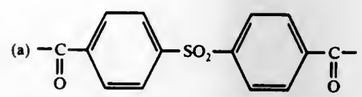
and (c) $-O-CH_2-CH_2-O-$

-continued

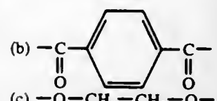
and (d) $-O-CH_2-C(CH_3)_2-CH_2-O-$,

said polyester having an oxygen permeability of less than 15 cc·mil/100 in.²·day·atm. and a glass transition temperature in excess of 72° C., said (a) and (b) units and said (c) and (d) units respectively being the units formed by reactively combining polyester forming precursors thereof in an amount of at least one mole of the precursors of said (c) and (d) units per mole of precursors of said (a) and (b) units and wherein the precursors of said units in forming said polyester by said reactive combining are in a molar ratio of said (b) unit precursor to said (a) unit precursor of about 90:10 to about 40:60 and a molar ratio of said (c) unit precursor to said (d) unit precursor of about 80:20.

2. In a package comprising a polyester container and foodstuffs or medicines enclosed in said container, the improvement wherein said polyester container is a container formed of polyester, the repeating units of said polyester consisting essentially of



and



and (c) $-O-CH_2-CH_2-O-$

and (d) $-O-CH_2-C(CH_3)_2-CH_2-O-$,

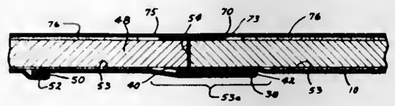
said polyester having an oxygen permeability of less than 15 cc·mil/100 in.²·day·atm. and a glass transition temperature in excess of 72° C., said (a) and (b) units and said (c) and (d) units respectively being the units formed by reactively combining polyester forming precursors thereof in an amount of at least one mole of the precursors of said (c) and (d) units per mole of precursors of said (a) and (b) units and wherein the precursors of said units in forming said polyester by said reactive combining are in a molar ratio of said (b) unit precursor to said (a) unit precursor of about 90:10 to about 40:60 and a molar ratio of said (c) unit precursor to said (d) unit precursor of about 80:20.

4,073,950

EASY OPENING SPIRALLY WOUND DOUGH CAN

Eldon D. Hansen, and Douglas A. Edmonson, both of Minneapolis, Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed June 25, 1975, Ser. No. 590,366
Int. Cl.² B65D *85/36, 17/24*
U.S. Cl. 426—128 **15 Claims**



1. A dough container comprising a spirally wound body wall member formed from a paper base strip having its edges lying adjacent one another to define a spirally extending butt joint which produces a line of weakness along the length of the can, a liner formed from flexible sheet material adjacent to the interior of the body wall member, a label formed from flexible sheet material in strip form bonded to the exterior surface of the body member, the liner and label both extending spirally with respect to the axis of the can, the marginal edges of the label being offset circumferentially with respect to the butt joint between the adjacent edges of the spirally wound body member, the liner having an expandable helically extending pleat comprising at least three overlapping layers of material,

the side edges of the helical pleat comprising at least two parallel helically extending marginal lines substantially in alignment with and underlying the butt joint in the body stock and including means whereby when the label is removed the line of weakness in the container defined by the butt joint separates and the helical pleat expands thereby allowing the contents of the container under pressure to press the liner outwardly between the separated edges of the butt joint and cause the can to partially open as the side edges of the butt joint move apart owing to the outward expansion of the helical pleat and the liner ruptures along one or more of the fold lines of the helical pleat and the contents of the package can then be removed throughout substantially the entire length of the container between the torn edges of the liner.

4,073,951

AGGLOMERATION METHOD

Ralph G. Sargeant, 408 W. Windsor St., Lakeland, Fla. 33803

Continuation-in-part of Ser. No. 461,964, April 18, 1974, abandoned. This application Aug. 25, 1976, Ser. No. 717,662
Int. Cl.² A23L *2/22;* A21D *6/00*
U.S. Cl. 426—237 **15 Claims**

1. The method for agglomerating a finely divided particulate solid material which is capable of agglomerating by inter-particle adherence when the surfaces of the particles are moistened but which, though having a free native moisture content of at least 0.5% by weight, is dry in the sense of being free-flowing and having insufficient surface moisture to exhibit inter-particle adherence, comprising

introducing said particulate material into an agglomeration zone;

agitating the particulate material in the agglomeration zone to effect random particle-to-particle contact adequate to cause agglomeration when the particles have adequate surface moisture;

subjecting the particulate material, while being so agitated in the agglomeration zone, to electromagnetic radiation to heat the free native moisture within each particle, without substantial direct heating of the particle itself, and thereby causing free moisture from within the particle to appear in liquid state at the surface of the particle,

continuance of agitation then causing agglomeration to occur by inter-particle adherence though no moisture extraneous to the particulate material has been introduced into the agglomeration zone; and

recovering the agglomerated material as a product which contains less moisture than when introduced into the agglomeration zone and which does not require drying.

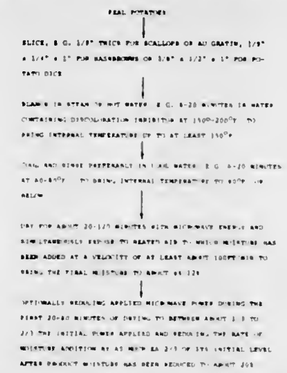
4,073,952

METHOD OF MAKING DEHYDRATED POTATO

Charles N. Standing, and Hamilton A. Olabode, both of Minneapolis, Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed Aug. 2, 1976, Ser. No. 710,990
Int. Cl.² A23B *7/02, 7/06*
U.S. Cl. 426—242 **9 Claims**

1. A process for dehydrating potato pieces from the tuber of the potato *Solanum tuberosum* to form substantially oil free dried potatoes with the tissue cells together in the same relative relationship as during life, said process comprising peeling the potatoes, subdividing them into pieces having a thickness between about 1/16 and ¼inch, blanching the potatoes in steam or water for sufficient time to bring the internal temperature up to at least about 150° F. but without causing the complete cooking of the potatoes, cooling and rinsing the potatoes to bring the internal temperature thereof to about 80° F. or below, drying the potatoes with microwave energy and simultaneously exposing the potatoes in heated air at 75° F or above to which moisture has been added to bring the initial relative humidity to at least 83%, said heated air having motion relative to said potatoes and being supplied in sufficient quantity to bring the final moisture content of the potato to 12% or less



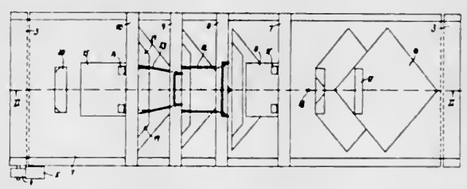
and maintaining the potatoes in an oil free condition throughout the process.

4,073,953

METHOD FOR THE PRODUCTION OF ROLLED FOODS PRODUCTS

Erik Trostmann, Birkerod, and Ove Albertsen, Lyngby, both of Denmark, assignors to A/S Daloon, Nyborg, Denmark

Division of Ser. No. 588,319, June 19, 1975. This application Nov. 23, 1976, Ser. No. 744,270
Claims priority, application Denmark, June 24, 1974, 3381/74
Int. Cl.² A23P *1/00;* A21D *6/00*
U.S. Cl. 426—297 **7 Claims**



1. A method for producing rolled food products comprising the steps of

forming a flat edible wrap having a front portion and a rear portion and two opposite side portions,

depositing a filler centrally on the flat wrap,

successively folding the front portion and the opposite side portions of the wrap onto the filler substance by generating a pressure differential across the portions successively pressure above said portions being less that the pressure below said portions, and

rolling the folded wrap with its filler substance toward and onto a rear portion of the wrap thereby completing the enclosure of the filler.

4,073,954

METHOD OF REMOVING TANNINS AND REDUCING CLOUDING IN DRINKS

Christian Hermann Mobius, 23 Sudetenstr., Geisenheim, Germany (6222)

Filed Feb. 3, 1976, Ser. No. 654,920
Int. Cl.² C12H *1/04*
U.S. Cl. 426—330.3 **10 Claims**

1. A method of removing tannins from liquid fruit drinks, vegetable drinks, and fermented liquids of vegetable and fruit origin which comprises contacting the liquid with at least one highly dispersed polymer insoluble in the liquid and for a time sufficient to absorb the tannins and reduce clouding in the

liquid, the polymer being obtained by condensing a monomer selected from the group consisting of polyamino compounds, polyhydroxy compounds and mixtures thereof, with formaldehyde, said polymer being further characterized as having a specific surface area of at least $20m^2/g$ and a positive zeta potential in a solution having a pH of from 3 to 5, and subsequently separating the polymer from the contacted liquid.

4,073,955

APPARATUS AND METHOD FOR AGING LIQUOR

Edward Koppelman, Encino, Calif., assignor to Koppelman & Goodman Enterprises, Encino, Calif.

Filed Oct. 7, 1976, Ser. No. 730,618
Int. Cl.² C12G *3/00*; C12H *1/22*
U.S. Cl. 426—422 18 Claims

1. An apparatus for aging distilled alcoholic spirits comprising means defining a liquid-tight container adapted to be filled with the liquor to be aged, a manifold assembly mounted in said container and adapted to be at least partially submerged in the liquor, said manifold assembly comprising a framework incorporating a manifold including a plurality of substantially liquid-tight wooden conduits supported on said framework and having the interior channels thereof disposed in interconnected communication, at least a portion of the exterior surfaces of said wooden conduits provided with a charred coating thereover adapted to be disposed in contact with the liquor to be aged, a vapor recovery system connected to said manifold for receiving the vapors entering into said manifold assembly and effecting a recovery thereof, and means for producing relative movement between the liquor in said container and the char coating on said wooden conduits.

14. A process for aging distilled alcoholic spirits which comprises the steps of introducing liquor to be aged into a liquid-tight container, submerging in the liquor a manifold assembly including a plurality of substantially liquid-tight wooden conduits provided with charred exterior coatings and having interconnected interior channels, relatively moving the liquor in the container and the char coating on the wooden conduits, extracting and recovering the vapors entering the interior channels of said wooden conduits and continuing the aging treatment for a period of time sufficient to effect an improvement in the flavor of the distilled alcoholic spirits.

4,073,956

FOAM TEXTURIZATION OF FUNGAL MYCELIAL FIBERS

Richard Alan Yates, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 21, 1976, Ser. No. 734,630
Int. Cl.² A23B *1/00*
U.S. Cl. 426—470 9 Claims

1. A process comprising foaming an aqueous suspension of a fibrous proteinaceous hyphal fungal mass which contains from 10 to 35 weight percent solids, wherein the ribonucleic acid content of the fungal mass has been reduced to below 4 weight percent, and wherein at least 10% of the hyphae forming the fibrous proteinaceous hyphal mass are longer than about 0.5 mm to a density of from 2 to 8 milliliters of gas per gram of dry weight fungal mass to form a foamed slurry, filtering the foamed slurry to reduce the moisture content thereof to form a filtered foam, and drying the filtered foam to reduce the moisture content thereof to below 5 weight percent.

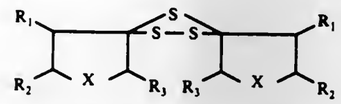
4,073,957

SPIRO-1,2,4-TRITHIOLAN CONTAINING FLAVORING AGENTS AND METHOD OF USE

Steven van den Bosch, Woudenberg, Netherlands, assignor to P.F.W. Beheer B.V., Amersfoot, Netherlands

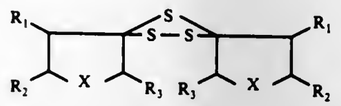
Filed May 12, 1976, Ser. No. 685,878
Claims priority, application United Kingdom, July 12, 1975, 29365/75
Int. Cl.² A23L *1/226, 1/231, 1/235*; C07D *341/00*
U.S. Cl. 426—535 20 Claims

1. A chemical compound having the structural formula



wherein X is selected from the class consisting of O, S, and $—CH_2—$, and R_1, R_2, and R_3 are hydrogen or alkyl groups having 1 to 3 carbon atoms.

16. A method of imparting flavor to or enhancing the flavor of a foodstuff which comprises incorporating therein an effective amount of a chemical compound having the formula



wherein X is selected from the class consisting of O, S, and $—CH_2—$, and R_1, R_2, and R_3 are hydrogen or an alkyl radical having 1 to 3 carbon atoms.

4,073,958

RICE FLAVORED SNACK FOOD

Shunji Abe, 1-banchi Oaza Tsuchikawa, Ojiya, Niigata, Japan

Filed Apr. 28, 1976, Ser. No. 681,203
Int. Cl.² A21D *10/00*
U.S. Cl. 426—559 19 Claims

1. A process for preparing a snack food which comprises:
a. homogeneously mixing finely divided corn material selected from the group consisting of waxy corn starch and waxy grits with a sufficent amount of finely divided rice bran having a particle size in the range of 100 to 300 mesh to impart a rice flavor and water,
b. kneading the mixture with steam for about 10 minutes at a pressure of 0.3 to 0.7 kg/cm^2 to produce a dough cake,
c. further kneading said dough cake in the absence of steam,
d. shaping said dough cake,
e. cooling said shaped dough cake,
f. drying said cooled dough cake for about 2 to 5 hours at about 40 to 50° C,
g. swelling said dried dough cake by baking or frying in oil at 150 to 300° C for 2 to 8 minutes, and
h. seasoning said swelled dough cake.

4,073,959

GUM CONFECTIONS CONTAINING POTATO STARCH

Harry Walter Durand, Muscatine, Iowa, assignor to Grain Processing Corporation, Muscatine, Iowa

Continuation-in-part of Ser. No. 639,381, Dec. 10, 1975, abandoned. This application Nov. 24, 1976, Ser. No. 744,501
Int. Cl.² A23G *3/00*
U.S. Cl. 426—578 2 Claims

1. In a continuous process for making a quick setting gum confection containing a starch gelling agent wherein the gum confection gels in a period of not substantially more than 2 hours, the improvement which consists in employing as the starch gelling agent potato starch having a Buel fluidity of about 20 to 70.

4,073,960

MEAT AND MILK PRODUCTS FROM RUMINANTS

Trevor William Scott, Kellyville, and Geoffrey Dean Loftus Hills, Beaumaris, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Division of Ser. No. 359,732, May 14, 1973, Pat. No. 3,925,560, which is a continuation-in-part of Ser. No. 100,332, Dec. 21, 1970, abandoned. This application Sept. 25, 1975, Ser. No. 616,882
Int. Cl.² A23C *9/00*; A23K *1/16*
U.S. Cl. 426—580 6 Claims

1. Improved nutritional products selected from ruminant milk and meat products whereby the unsaturated lipid content of body and milk fat of ruminant animals is increased, comprising:
feeding said ruminant animals a composite feed supplement material made of unsaturated dietary lipid which is assimilable by said ruminant animals and encapsulated by a reaction product of a dietary protein and an aldehyde which is substantially insoluble at a pH greater than about 5 and substantially soluble at a pH less than about 4 thereby not degradable in the rumen but subject to degradation in the abomasum and lower gut;
said unsaturated dietary lipid encapsulated within said reaction product being in the form of discrete globules having a size less than about 0.1 millimeter;
said feed supplement being fed in an effective amount to substantially increase the unsaturated lipid content of body and milk fat of said ruminant animals; and
allowing said feed supplement to be ingested by said ruminant animals and to pass through the rumen and become digested in the abomasum and lower gut of said ruminant animals to produce said improved nutritional products.

4,073,961

BOUILLON BASE

Rupert Josef Gasser, Zumikon, and Lienhard Bodo Huster, Winterthur, both of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle, S.A., Lausanne, Switzerland

Filed Aug. 13, 1976, Ser. No. 714,118
Claims priority, application Switzerland, Aug. 26, 1975, 11032/75
Int. Cl.² A23J *1/18*; A23L *1/28*
U.S. Cl. 426—589 7 Claims

1. A process for the production of a starting material for the preparation of bouillons from a yeast protein degradation product, which comprises diluting a yeast autolysate with at least the same quantity by weight of water, precipitating substantially insoluble salts, including alkaline-earth metal phosphates present therein, by heating the diluted autolysate which has a pH-value of from 7 to 8.5 at a temperature sufficient to cause said precipitating, separating solid fractions from the autolysate obtained by said prior heating step so that only a solution is left, subjecting the residual solution thus obtained to a steam stripping operation to purify the product of bitter flavor characteristics, concentrating the treated solution by evaporation to a dry matter content of from 50% to 80% by weight, mixing an effective amount up to 8% fats, an effective amount up to 5% of a monosaccharide, and an effective amount up to 2% of a nucleotide with the concentrated solution obtained, reacting the mixture obtained by heating the mixture having a pH-value of from 5.8 to 6.8 at a temperature sufficient to cause a reaction and drying said reacted mixture.

4,073,962

PROCESS FOR THE PRODUCTION OF A PROTEIN PRODUCT

James M. Spata, St. Louis, Mo., and Roger L. Diel, Dupo, Ill., assignors to Ralston Purina Company, St. Louis, Mo.

Filed June 1, 1976, Ser. No. 691,654
Int. Cl.² A23J *3/00*
U.S. Cl. 426—646 8 Claims

1. A method of preparing a protein food product having an arrangement of helically aligned protein layers comprising:
a. freezing an aqueous slurry of a protein material having a solids content of at least about 5% by weight by helically conveying said slurry through a freezing zone to form ice crystal layers which mold the protein material of the slurry into layers in the form of a helix, and
b. heat setting the protein layers into a substantially insoluble form by heating the frozen slurry to a temperature sufficiently high to allow the protein layers to set and lower than a temperature at which the protein will degrade thereby melting the ice crystal layers to form the protein food product.

4,073,963

STABLE, HOMOGENEOUS BUTTERED TABLE SYRUPS

Elmer E. Daggy, Tenafly, N.J., assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Dec. 27, 1976, Ser. No. 754,707
Int. Cl.² A23L *1/09*
U.S. Cl. 426—658 51 Claims

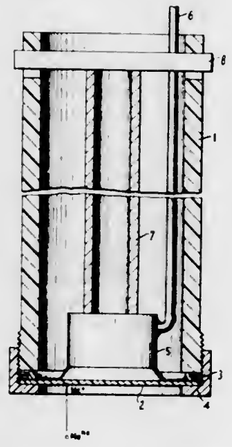
1. An emulsion system for a homogeneous, stable buttered table syrup having a sugar solids content of at least 65% Brix, said emulsion system consisting essentially of at least 0.1% by weight sodium stearoyl-2-lactylate; at least 0.2% by weight sorbitan monostearate; and, at least 1.6% by weight anhydrous butter oil or anhydrous butter fat.

4,073,964

PROCESS FOR CONTROLLING METAL THICKNESS, AND DEPOSITION AND DEGRADATION RATES

Gunther Herrmann, Nuremburg-Ebensee, Germany, assignor to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Mar. 3, 1975, Ser. No. 555,030
Claims priority, application Germany, Mar. 5, 1974, 2410927
Int. Cl.² G01N *23/203*
U.S. Cl. 427—10 26 Claims



1. A process for measuring metal layer thickness on an article during the formation or the degradation of said metal layer in a bath solution by means of a method selected from electroless, chemical, electrochemical and electrophoretic methods,

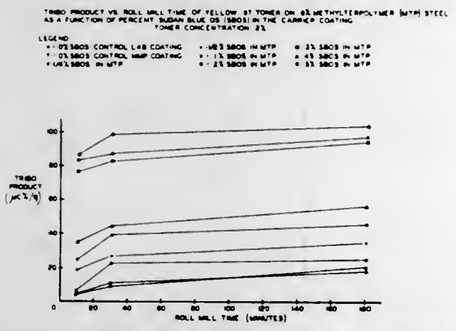
said process comprising mounting a test sample in an aperture in a liquid-tight casing in such a way that a part of said test sample faces outwards and is adapted to contact with a bath liquid when immersed therein and a second part faces the interior of said casing, immersing said test sample in a bath solution to be tested, and determining the radiation scattering capacity of a corresponding metallic layer deposited on or removed from said test sample while said test sample is present in said bath solution during the formation or degradation of said metal layer.

4,073,965

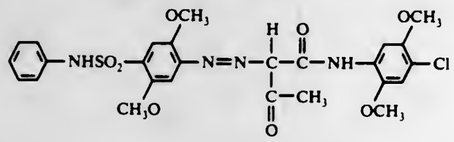
YELLOW DEVELOPER EMPLOYING A COATED CARRIER AND IMAGING PROCESS USING SAME

Joseph Mammino, Penfield, and Franklin Jossel, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sept. 29, 1975, Ser. No. 617,764
Int. Cl.² G03G *9/10, 13/01*
U.S. Cl. 427—22 **14 Claims**



8. An electrostatographic imaging process comprising establishing an electrostatic latent image on a surface and contacting said surface with an electrostatographic developer comprising toner particles and coated carrier particles, said toner particles comprising a resin and a colorant satisfying the formula:



and said coated carrier comprises a carrier core particle material overcoated with a composition comprising a resin and a copper tetra-4-(octadecylsulfonomido) phthalocyanine colorant to develop said latent image.

4,073,966

METHOD FOR APPLYING LUBRICATING MATERIALS TO METALLIC SUBSTRATES

Addison B. Scholes, Muncie, Ind., and David L. Dollar, Greeneville, Tenn., assignors to Ball Corporation, Muncie, Ind.

Continuation of Ser. No. 570,346, April 22, 1975, abandoned, which is a continuation-in-part of Ser. No. 382,980, July 26, 1973, abandoned. This application Dec. 17, 1976, Ser. No. 751,691
Int. Cl.² B05D *1/06, 5/08, 7/14*
U.S. Cl. 427—26 **20 Claims**

1. A method of coating a surface of a metallic substrate to form a lubricious coating thereon, comprising:

forming a plurality of finely divided particles of lubricant, said particles having a diameter to weight ratio such that they will remain suspended in a substantially quiescent atmosphere;

physically transporting said suspended particles from the location of particle formation to the general location of said metallic substrate;

confining said suspended and transported particles in a non-electrically conductive housing adjacent the metallic substrate to be coated in a substantially quiescent atmosphere;

electrically charging said particles while so confined to the degree necessary to enable them to repel one another while they are suspended; and

electrostatically depositing said particles on the metal surface while said particles are in a repelling relationship with respect to one another by establishing an attracting electrical field between said confined charged particles and said metallic substrate whereby said particles are deposited on the substrate in a laterally displaced relationship with respect to one another.

4,073,967

METHOD FOR RENDERING SUBSTRATES RESISTANT TO ABRASION

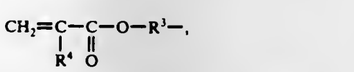
Timothy C. Sandvig, Woodville, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 513,116, Oct. 8, 1974, abandoned. This application Oct. 4, 1976, Ser. No. 728,951
Int. Cl.² B05D *3/06*
U.S. Cl. 427—44 **48 Claims**

1. A method for rendering a surface of a substrate resistant to abrasion comprising the steps of:

a. applying to said substrate, wherein said substrate is selected from metals and organic polymeric materials, a surface-coating of a composition comprising

i. a reactive silane of the formula $R'Si-R^2_{4-n}$, wherein R^1 is selected from the group consisting of $CH_2=CH-$, an alkyl group of from 2 to 10 carbon atoms containing an epoxy group, an alkyl ether epoxide group containing up t365- 10 carbon atoms, and



wherein R^3 is an alkylene group having from 1 to 8 carbon atoms, and R^4 is hydrogen or an alkyl radical having from 1 to 8 carbon atoms; R^2 is an alkoxy or acetoxy group; n is a positive integer of 1 to 3; and (ii) a metal ester of the formula $M—OR)_x$, wherein M is selected from the group consisting of titanium, aluminum, and zirconium; R is an alkyl radical having from 1 to 8 carbon atoms, and x is equal to the number of valence bonds of M; and

b. curing said composition so as to form an insoluble abrasion-resistant coating which is firmly bonded to the substrate.

4,073,968

METHOD FOR DESENSITIZATION OF A COLOR DEVELOPER

Akio Miyamoto; Hiroharu Matsukawa, and Teruo Kobayashi, all of Fujimiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 27, 1976, Ser. No. 736,048
Claims priority, application Japan, Oct. 27, 1975, 50-129098; Nov. 12, 1975, 50-136033; Nov. 18, 1975, 50-138419
Int. Cl.² B41M *3/12, 5/12*
U.S. Cl. 427—54 **11 Claims**

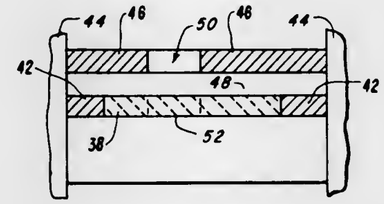
1. A method for desensitization of a color developer sheet to form a color by reaction with a color former which comprises coating a photocurable composition on the color developer and then irradiating the coated color developer with light to cure the photocurable composition prior to color formation.

4,073,969

METHOD OF FABRICATING A PHOTOCONDUCTIVE DETECTOR OF INCREASED RESPONSIVITY

Billy H. Breazeale, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 553,346, Feb. 26, 1975, Pat. No. 3,963,925. This application Jan. 15, 1976, Ser. No. 649,189
Int. Cl.² B05D *5/12*
U.S. Cl. 427—75 **6 Claims**



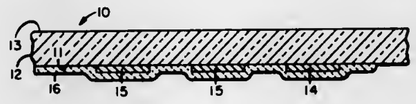
1. A method of fabricating a photoconductive detector of increased responsivity from a slab of N-type, intrinsic bulk semiconductor material having a positive and negative contact spaced one from the other formed thereon and defining a photoconductive detector active area therebetween comprising the step of shielding part of the detector active area with a material limiting photon exposure of said active area to retain a reduced detector active area sufficiently spaced from the negative contact to permit negligible loss in responsivity due to recombination of the photogenerated hole carriers at the negative contact.

4,073,970

METHOD OF MAKING ELECTRIC HEATING UNIT

Richard E. Allen, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 623,419, Oct. 17, 1975. This application May 4, 1976, Ser. No. 683,005
Int. Cl.² H05B *3/16*
U.S. Cl. 427—96 **1 Claim**



1. The method of making an electrical resistance cooking or heating unit which comprises;

I. providing a flat and relatively smooth thin plate of a glassy material and selecting a portion thereof as a heating portion;

II. silk screening onto one surface of said selected heating portion of said plate a sinuous strip of a liquid mixture comprising an organic platinum paint mixed with an organic gold paint;

III. baking and firing said plate to burn away the organic material of said strip and form a fired platinum/gold alloy strip which is adhered to said plate and integral therewith;

IV. silk screening over said sinuous strip a slurry of a frit of a glassy material completely covering such strip, such frit having a composition, by weight, of about 20 parts of ZnO, about 25 parts of Al_2O_3, about 55 parts of SiO_2 and about 2 parts of Cs_2O; and

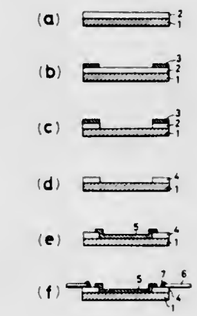
V. firing said plate and frit to provide a porous and partially sintered overglaze over said sinuous strip and part of the portion of said one surface to which such strip is adhered.

4,073,971

PROCESS OF MANUFACTURING TERMINALS OF A HEAT-PROOF METALLIC THIN FILM RESISTOR

Nobuo Yasujima, 1-4, Noda, Kawagoe,, Saitama; Juichiro Arai, 1-5-3 Kaganchara,, Chiba-Matsudo; Natsuo Itokawa, 23 Kamitotsuka,, Fujioka, Gunma, and Katsumoto Okino, 125 Kuroda,, Mamba, Tano, Gunma, all of Japan

Continuation of Ser. No. 491,940, July 25, 1974, abandoned. This application June 2, 1976, Ser. No. 692,229
Claims priority, application Japan, July 31, 1973, 48-85436; July 10, 1974, 49-78849
Int. Cl.² B05D *5/12*; H01B *1/02*; H01C *17/28*
U.S. Cl. 427—103 **8 Claims**



1. A process of manufacturing terminals of a resistor consisting essentially of the steps:

(a) depositing a resistive metallic thin film heat proof between 300° and 800° C onto a substrate,

(b) chemical plating a metallic layer selected from the group consisting of nickel, cobalt and nickel-cobalt alloy onto terminal portions of said resistor of said resistive metallic thin film to make metallic terminal layers, and

(c) heat treating the resultant resistor at a temperature between 300° and 800° C in a non-oxidation atmosphere whereby said terminal layers which contact with said resistive metallic thin film reduce contact resistance therebetween to substantially zero and thereby produce an electrical current noise of the resultant resistor below −20(db).

7. A process of manufacturing terminals of a resistor consisting essentially of the steps:

(a) depositing a resistive metallic thin film heat proof between 300° and 800° C onto a substrate,

(b) chemical plating a metallic layer selected from the group consisting of nickel, cobalt and nickel-cobalt alloy onto said resistive metallic thin film,

(c) coating a resistive coating material onto the metallic layer,

(d) removing the resistive coating material except terminal portions of said resistor to expose said metallic layer,

(e) etching the exposed metallic layer to expose the resistive metallic thin film,

(f) removing the resistive coating material which has been coated onto said terminal portions of the resistor to expose the metallic layer which acts as terminal layers of said resistor, and

(g) heat treating the resultant resistor at a temperature between 300° and 800° C in an oxidation atmosphere whereby said terminal layers which contact with said resistive metallic thin film reduce contact resistance therebetween to substantially zero and thereby produce an electrical current noise of the resultant resistor below −20(db).

4,073,972

SURFACE PROTECTION FOR POROUS MATERIALS

Heinz Nestler, Niederkassel-Ranzel, and Leo Hans Plankl, Recklinghausen, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Cologne, Germany

Continuation of Ser. No. 354,606, April 26, 1973, abandoned.
This application July 22, 1976, Ser. No. 707,930
Claims priority, application Germany, Apr. 26, 1972, 2220378
Int. Cl.[2] B05D *3/12, 1/36, 3/10*
U.S. Cl. 427—136 13 Claims

1. In a process for improving the water-repellancy of a porous surface of an object normally having an inorganic oxidic or hydroxyl containing surface which surface is neutral or acidic to phenolphthalein in which the surface is impregnated with a solution consisting essentially of an alkyltrialkoxysilane wherein the alkyl group has 1 to 6 carbon atoms and the alkoxy group has 1 to 8 carbon atoms dissolved in a C_2–C_4 alkanol, the improvement which comprises contacting the porous surface with a basic substance selected from the group consisting of limestone, calcareous marl, an alkali metal carbonate, an alkaline earth metal carbonate, alkali silicates, oxides of alkaline earth metals, hydroxides of alkaline earth metals, oxides of zinc, hydroxides of aluminum and sodium aluminate in the form of a 0.1 to 10% by weight solution or slurry before or during the impregnation, the basic substance being applied to the neutral or acidic to phenolphthalein surface in an amount between 0.5 and 50 gms/m^2.

4,073,973

CAVITY-FILLING WITH A POLY(ESTER-AMIDE) HOT MELT ADHESIVE COMPOSITION

Joseph G. Martins, Ludlow, and Donald D. Donermeyer, Springfield, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 2, 1976, Ser. No. 654,679
Int. Cl.[2] C08K *3/08*
U.S. Cl. 427—142 10 Claims

1. In a method of filling a cavity in a substrate which comprises applying excess adhesive compositions as a hot melt into the cavity, cooling the adhesive composition below its crystallization temperature, and sanding the adhesive composition to provide a surface even with the surrounding substrate, the improvement wherein the adhesive composition comprises:

a. from about 70 to about 30 parts by weight of a poly(ester-amide) block copolymer melting in the range of about 155° C. to about 225° C. having from about 30 to about 70 percent by weight of crystalline polyester segments derived from at least one aliphatic or alicyclic diol having 2 to 10 carbon atoms and at least one alicyclic or aromatic dicarboxylic acid having from 8 to 20 carbon atoms, and from about 70 to about 30 percent by weight of amorphous polyamide segments derived from an aliphatic polycarboxylic acid containing at least 40 weight percent of a C_{18} to C_{54} polycarboxylic acid and an aliphatic or alicyclic primary diamine containing 2 to 10 carbon atoms; and

b. from about 30 to about 70 parts by weight of a speroidal metal powder selected from the group consisting of aluminum, iron, mild steel, stainless steel and zinc of particle size in the range of about 0.2 to about 150 microns.

4,073,974

COATING CONTINUOUS FILAMENTS

Robert Vincent Albarino, Summit, and Sergio Torza, Madison, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 31, 1975, Ser. No. 600,280
Int. Cl.[2] B05D *1/18, 7/20*
U.S. Cl. 427—163 8 Claims

1. A method for coating a continuous fiber comprising:

passing the fiber into and out of a fluid filled container through upper and lower constricted openings with the fluid level of the coating within the container maintained between the upper and lower openings, while maintaining a reduced pressure within the container by evacuating the space above the coating fluid, the lower constricted opening restricting the flow of coating fluid from the container and the upper constricted opening allowing entry of the continuous fiber into the container while combining with the fiber to produce a partial pressure seal.

6. A method for coating a continuous fiber comprising:

passing the fiber in a vertical downward direction sequentially through a first container, through a constriction joining the first container with a second container, through the second container, and through a constricted opening in the second container, while maintaining a positive pressure within the second container and coating fluid within the first container, the positive pressure combining with the constriction between the containers and the fiber to restrict the flow of coating fluid between the containers and the constricted opening in the second container combining with the fiber to produce a partial pressure seal in the second container.

4,073,975

PROCESS FOR FLATTING GLOSSY SURFACES OF URETHANE POLYMERS

Mervin R. Buckwalter, Lancaster, and Edgar W. Knaub, Willow Street, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Sept. 17, 1976, Ser. No. 716,985
Int. Cl.[2] D06C *29/00;* B05D *5/00*
U.S. Cl. 427—170 7 Claims



1. A process for delustering a glossy polyurethane surface comprising:

(a) applying to a carrier member a coating of a solution of a curable polyurethane-forming composition in a diluent consisting of a solvent for said polyurethane-forming composition;

(b) treating the coated carrier member with vaporous water at a temperature of 70° to 200° F., said carrier member at a temperature of 60° to 150° F. and below the dew point of said vaporous water whereby a thin film of liquid water is deposited on the surface of said coatings;

(c) partially curing said coating having said thin film of water deposited thereon to a tack-free state; and

(d) completing the cure of said polyurethane-forming composition.

4,073,976

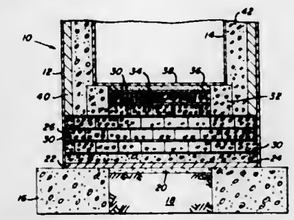
METHOD FOR CAPPING CELLULAR GLASS BLOCKS FOR THE LOAD BEARING INSULATION OF LIQUEFIED GAS STORAGE TANKS

Stanley J. Dudzinski, Trafford, Pa., assignor to Pittsburgh Corning Corporation, Pittsburgh, Pa.

Division of Ser. No. 547,754, Feb. 6, 1975, Pat. No. 3,952,469.
This application Nov. 3, 1975, Ser. No. 628,144
Int. Cl.[2] B65D *25/18;* B05D *1/12, 7/22*
U.S. Cl. 427—181 15 Claims

1. A method for capping cellular glass blocks for use as load bearing insulation of liquefied gas storage tanks consisting essentially of,

applying a layer of irreversably compressible inorganic particulate material to the surface of a layer formed from a plurality of cellular glass blocks each having a cut face forming a plurality of open hemispherical cells thereon, said plurality of cellular glass blocks forming a layer of said load bearing insulation,



penetrating said plurality of open hemispherical cells with said layer of inorganic particulate material to completely fill said open cells, and

compressing said layer of inorganic particulate material to form a substantially planar surface of said inorganic particulate material having a preselected thickness on said cellular glass block cut faces.

4,073,977

STABILIZATION OF PYROPHORIC METAL POWDERS WITH ALKYLENE OXIDE POLYMERS

Eberhard Koester, Frankenthal; Gerd Wunsch, Speyer; Eduard Schoenafinger, Ludwigshafen, and Hans Henning Schneehage, Mutterstadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed June 1, 1976, Ser. No. 691,227
Claims priority, application Germany, Aug. 7, 1975, 2535277
Int. Cl.[2] B05D *7/00;* C04B *31/40*
U.S. Cl. 427—216 9 Claims

1. A method of stabilizing a pyrophoric metal powder having particle sizes of from 50 to 2000A which comprises treating the metal powder with from 0.5 to 6g of gaseous alkylene oxide per gram of metal powder to form a polymer coating on the metal particles.

4,073,978

IMMERSION-TREATING TUBULAR ELEMENTS

William B. M. Womack; Ralph Emory Starnes, Jr., both of Carrollton, Ga.; John Charles Headrick, Oceola, Ark., and Ronald Ray Martin, Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

Filed Nov. 12, 1976, Ser. No. 741,529
Int. Cl.[2] B05D *1/18, 1/38, 3/12*
U.S. Cl. 427—235 33 Claims

1. A method of continually treating the interior and exterior surfaces of tubular elements, comprising the steps of:

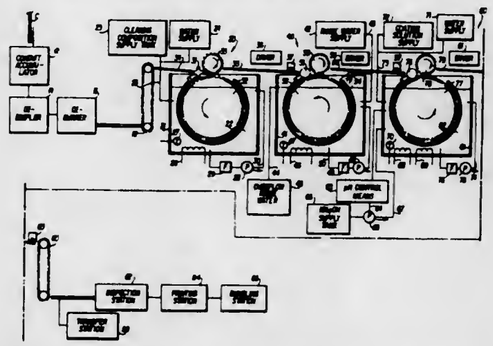
providing a first bath containing a cleaning agent, a second bath containing a rinsing agent, and a third bath containing a coating agent comprising an aqueous solution of a corrosion inhibitor and a film-forming polymer;

supplying a plurality of tubular elements comprising galvanized conduits of discrete length;

conveying said tubular elements in spaced, substantially parallel relation to each other about a first arcuate path through each bath in a first rotational direction for a predetermined immersion time;

conveying the tubular elements emerging from each bath about a second arcuate path disposed above each bath in a second rotational direction opposite to said first rotational direction; and

simultaneously inclining said tubular elements in said second arcuate path, the inclination of said tubular elements and the path traveled by said tubular elements about said second arcuate path being effective to drain excess agent from said tubular elements and into the bath associated



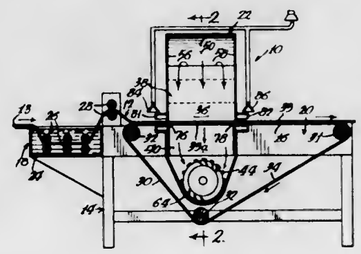
with said excess agent to thereby minimize the carry over of said agents between successive baths.

4,073,979

METHOD OF APPLYING MODIFYING INGREDIENTS TO OPEN-CELLED POLYURETHANE MATERIAL

Winslow L. Pettingell, Lombard, Ill., assignor to Foam Cutting Engineers, Inc., Addison, Ill.

Filed June 17, 1976, Ser. No. 697,065
Int. Cl.[2] B05D *5/00, 3/12*
U.S. Cl. 427—244 11 Claims



1. The method of applying a modifying ingredient to a mass of open-celled polyurethane foam, said method comprising the consecutive steps of:

applying an excess of a liquid solution or dispersion of said modifying ingredient to the mass of foam, said liquid being inert with respect to said foam;

squeezing the mass to remove most of said excess;

thereafter passing heated gaseous material entirely through the mass containing the remainder of said liquid solution or dispersion to rapidly raise the temperature of the entire mass, the temperature of said gaseous material being in the range of 350° F. to 500° F., said temperature being at least as high as the vaporization temperature of the liquid under the ambient condition of operation, the gaseous material being inert with respect to the polyurethane, the modifying ingredient and the liquid, and the period of exposure of the mass to the gaseous material being insufficient to allow charring of the foam, whereby the liquid is vaporized and the modifying ingredient is effectively simultaneously incorporated into the foam in a very short time;

and permitting the mass to cool.

4,073,980

CHEMICALLY TREATED CARRIER PARTICLES FOR USE IN ELECTROPHOTOGRAPHY

Virgil W. Westdale, Chagrin Falls, Ohio, and John Novotny, San Jose, Calif., assignors to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Sept. 29, 1976, Ser. No. 728,461
Int. Cl.² B32B 15/02, 19/00
U.S. Cl. 428—404 8 Claims

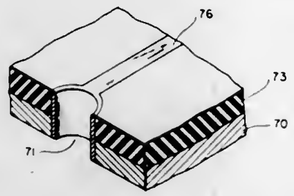
1. A carrier for use in electrophotographic development of latent electrostatic images capable of inducing an electrostatic charge in a toner mixed therewith with comprises a member selected from the group consisting of metallic particles and siliceous particles to the surface of which is adhered a mixture of a metallic sulfide selected from the group consisting of molybdenum disulfide, tungsten disulfide and titanium disulfide and a member selected from the group consisting of perfluorinated and substantially perfluorinated carboxylic acids containing from 3 to 18 carbon atoms and salts, esters and amides thereof, said sulfide and acid being present in a ratio by weight of sulfide to acid of about 0.2:1 to 5:1.

4,073,981

METHOD OF SELECTIVELY DEPOSITING METAL ON A SURFACE

William James Baron, Franklin Township, Somerset County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Mar. 11, 1977, Ser. No. 776,814
Int. Cl.² B05D 3/10, 5/12
U.S. Cl. 427—259 17 Claims



1. A method of selectively depositing a metal on a surface of a substrate capable of retaining thereon a colloidal activating metal species for electroless metal deposition, which comprises:

(a) selectively coating the substrate surface by coating a portion thereof with a copolymer coat of maleic anhydride and a vinyl monomer, said coat being selectively incapable of retaining thereon said colloidal activating metal species, to delineate an uncoated surface pattern capable of retaining the colloidal activating metal species thereon; and thereafter

(b) treating said selectively coated surface with a sol comprising said colloidal activating metal species to deposit said colloidal activating metal species only on said uncoated surface pattern.

4,073,982

NEWSPRINT COUPON SEPARATOR

Friedrich J. Weck, 1339 S. Seventh Ave., Hacienda Heights, Calif. 91745; James Hunkins, 13001 Aclare Place, Cerritos, Calif. 90701, and Samuel J. Rinsler, 712 N. Kings Road, Los Angeles, Calif. 90069

Filed July 18, 1975, Ser. No. 596,999
Int. Cl.² B05D 3/10; B41M 7/00; B32B 29/06
U.S. Cl. 427—270 7 Claims

1. A method of printing paper, integral portions of which are readily hand-detachable from the remainder of the paper along predetermined boundaries, which method comprises:

supplying to a printing press a paper-weakening composition comprising a pigment and a vehicle including substantially non-corrosive humectant, water and a wetting agent;

passing a web of paper through the printing press;

repetitively demarking discrete portions of the paper from surrounding portions thereof with said composition while maintaining the integrity of the web across resulting lines of demarcation; and

removing the paper from the press and forming an assembly of the same with other paper in layered relation;

said composition being sufficiently dried prior to the foregoing assembly step to prevent smearing of the pigment upon assembly, yet maintaining a moistened condition along the lines of demarcation following the assembly step so that the paper may subsequently be easily and preferentially torn along the lines of demarcation.

4,073,983

METHOD AND COMPOSITION FOR DECREASING WATER RESISTANCE TO MOVEMENT

Jon Stephen Van Cleave, Des Moines, Iowa, assignor to United Chemical Corporation, Des Moines, Iowa

Filed Apr. 25, 1975, Ser. No. 571,610
Int. Cl.² B05D 1/02
U.S. Cl. 427—421 15 Claims

1. A method of decreasing water resistance to movement by decreasing the surface tension and the contact angle between an object moving in water, and the water, thereby allowing the object to move at an increased speed with the same applied moving force or at the usual speed with less applied moving force, said method comprising, applying to the surface of the object, a coating consisting essentially of a non-ionic surface active agent or mixtures thereof selected from the group consisting of sorbitan fatty acid esters, polyoxyethylene sorbitol esters, polyoxyethylene alcohol ethers, polyoxyethylene mannitol dioleate esters, and sorbitan monoleate polyoxyethylene esters of mixed fatty and resin acids, which is water insoluble, said agent having an HLB of from about 7 to about 9, and moving said object through water thereby providing a solid liquid interface.

4,073,984

METHOD FOR IMPARTING A LUSTROUS TOP SURFACE TO ARTIFICIAL LEATHER

Kenji Okabe, Osaka, Japan, assignor to Toyo Cloth Co., Ltd., Osaka, Japan

Filed Apr. 19, 1976, Ser. No. 678,178
Claims priority, application Japan, Oct. 3, 1975, 50-119641
Int. Cl.² B05D 3/12, 7/04
U.S. Cl. 427—444 7 Claims

1. A process for imparting lustre to the top surface of an artificial leather comprising a laminate of a substrate, a cellular foam thermoplastic resin and a top coating of a thermoplastic resin having a softening point lower than that of said cellular foam, which process comprises:

contacting the surface of said top coating with a smooth surface at a temperature of 10°–40° C below the softening point thereof for about 3–40 seconds while avoiding static friction between the top coating and said smooth surfact at a pressure insufficient to rupture the cells of said foam to substantially increase the degree of lustre of said top coating.

4,073,985

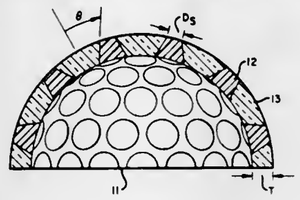
COMPOSITE DOME

Anthony San Miguel, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 14, 1976, Ser. No. 705,223
Int. Cl.² F42B 15/02
U.S. Cl. 428—35 9 Claims

1. A transparent shell, having a concave and convex surface, for protecting energy responsive instrumentation in a missile, said shell comprising:

a plurality of discrete, wedge-shaped, transparent optical elements having their smaller ends flush with said concave surface and their larger ends flush with said convex surface, said elements arranged adjacently so as to have interstices therebetween to form a dome; and



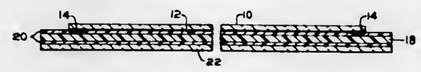
a continuous high temperature resistant polymer matrix positioned in the interstices between said discrete, wedge-shaped, transparent optical elements, and rigidly holding said discrete, wedge-shaped, transparent optical elements in place.

4,073,986

LAMINATED GLAZING UNIT WITH COMPOSITE INTERLAYER

Leroy D. Keslar, Natrona Heights, and James E. Vensel, New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 14, 1975, Ser. No. 577,248
Int. Cl.² B32B 17/10, 27/40, 27/42
U.S. Cl. 428—38 14 Claims



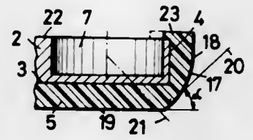
1. A laminated glazing unit comprising an outer sheet of transparent rigid material, an inner sheet of transparent rigid material, at least one of said sheets being a glass sheet likely to be damaged by cold chipping in service, an interlayer having a plasticized polyvinyl butyral surface integral with said glass sheet, and a continuous layer of transparent polyurethane disposed between said glass sheet and said plasticized polyvinyl butyral interlayer and integral therewith throughout substantially the entire extend common to said glass sheet and said interlayer.

4,073,987

MULTI-LAYER FRONT PLATE FOR FURNITURE AND METHOD OF MAKING SAME

Dietrich Mergner, Magstadt, and Heinz Stege, Stuttgart, both of Germany, assignors to Bauknecht Gesellschaft mit beschrankter Haftung Elektrotechnische Fabriken, Stuttgart, Germany

Filed Oct. 7, 1975, Ser. No. 620,390
Claims priority, application Germany, Oct. 8, 1974, 2447873
Int. Cl.² B32B 3/26
U.S. Cl. 428—81 9 Claims



1. A multi-layer front door plate for furniture, especially for kitchen cabinet doors, which includes in combination: a core plate of pressed chip material having a front side and a smooth rear side both coated with a synthetic resin and having plate defining edges, and a coat of soft integral foamed synthetic material arranged only on said resin coated front side and surrounding said plate defining edges to preclude all sharpness thereof and comprising a transitioned rounded section where said front side merges with said edges also covered with said coat of soft integral foamed synthetic material, the rear side except for edges being free of foamed synthetic material so that only the synthetic resin coats the rear side.

4,073,988

SUEDE-LIKE ARTIFICIAL LEATHERS AND A METHOD FOR MANUFACTURING SAME

Takeshi Nishida, Ibaragi; Masao Morioka, Sabae; Tetsuro Ohta, Joyo, and Yukio Yamakawa, Hofu, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Division of Ser. No. 546,873, Feb. 4, 1975, abandoned. This application Nov. 29, 1976, Ser. No. 745,851
Claims priority, application Japan, Feb. 8, 1974, 49-16429; Dec. 18, 1974, 49-146170
Int. Cl.² B32B 33/00; D02G 3/00; D06C 11/00
U.S. Cl. 428—91 11 Claims



1. An artificial leather having a suede-like texture, consisting of a shrunk fabric selected from the group consisting of pile woven fabrics, raised woven fabrics, pile knitted fabrics and raised knitted fabrics, said fabric consisting of a substrate having napped piles projecting therefrom and uniformly distributed over the entire surface of the substrate at a high nap density, said piles having a length of 0.5 to 4.0 mm, said piles consisting essentially of fibrillated composite filaments consisting of synthetic polymers having mutually low adhesive affinity to each other, said fibrillated composite filaments having been obtained by filbrillating composite filaments which in transverse cross-section consist of at least three integral layers (A) of one polymer wherein said layers diverge from each other substantially radially in the outward direction and extend to the perimeter of the filament and the spaces between said layers are filled with either segments (B) of another polymer or concave segments (B') of said another polymer the concavities of which are filled with segments (C) of a different polymer, wherein all of the polymers extend to the perimeter of the filament, so that the polymers are separated from each other, said fabric having been shrunk from 10 to 40% of its original area and then having been impregnated with from 3 to 40 percent by weight, based on the weight of said fabric, of a substantially microporous synthetic polymer, the piles having been buffed after impregnation with said polymer to transform same to napped piles consisting of uniformly dispersed separate very fine fibrils of (A) and (B) or (A), (B') and (C) having a nap fibril denier of from 0.05 to 1 denier and a nap fibril length of from 0.2 to 3.0 mm.

4,073,989

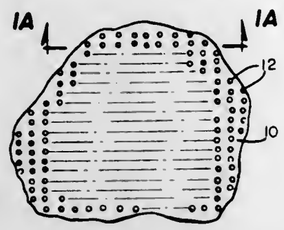
CONTINUOUS CHANNEL ELECTRON BEAM MULTIPLIER

Eugene Wainer, Shaker Heights, Ohio, assignor to Horizons Incorporated, Cleveland, Ohio

Filed Jan. 17, 1964, Ser. No. 338,363
Int. Cl.² B32B 3/04
U.S. Cl. 428—131 6 Claims

1. A fully virified ceramic element comprising a thin wafer having at least one aperture extending through said wafer, and perpendicular to the major surfaces of said wafer, the composition of said wafer consisting essentially of between 10 and 50

mole percent of at least one oxide selected from the group consisting of the oxides of Cs, Rb, K, Be, Mg, Ca, Ba, Sr, Ce, La, Yt and Zn, and between 90 and 40 mole percent of oxide of



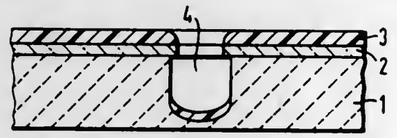
a metal selected from the group consisting of titanium, tin and niobium and between 0.5 and 3 mole percent of an oxide forming compound of at least one element selected from the group consisting of Ag, Au, Pd, Mo, W, and Sb.

4,073,990

APPARATUS FOR ADJUSTING A SEMICONDUCTOR WAFER BY ELECTRON BEAM ILLUMINATION

Hans Friedrich, Poering, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 7, 1976, Ser. No. 684,081
Claims priority, application Germany, May 9, 1975, 2520743
Int. Cl.² H01L *21/306;* B44C *1/22;* C03C *15/00, 25/06*
U.S. Cl. 428—138 **5 Claims**



1. Apparatus for the adjustment of a semiconductor wafer by electron beam illumination whereby the position of the semiconductor wafer is established by detecting signals corresponding to the electron beam illumination, comprising:

a. a semicondcutor wafer having a first layer thereon;

b. an adjustment mark provided in the semiconductor wafer as a recess which extends through an aperture in the first layer and into the semiconductor wafer, the width of said recess being not greater than its depth; and

c. an electron sensitive lacquer layer arranged on the first layer whereby the depth of said recess in relation to its width functions as a cage for capturing a large proportion of secondary and back-scattered electrons to permit more precise alignment.

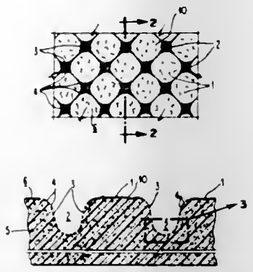
4,073,991

PERFORATED, EMBOSSED FILM TO FOAM LAMINATES HAVING GOOD ACOUSTICAL PROPERTIES AND THE PROCESS FOR FORMING SAID

Bruce E. Focht, Trainer, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Continuation of Ser. No. 476,216, June 4, 1974, abandoned. This application Oct. 18, 1976, Ser. No. 733,277
Int. Cl.² B32B *3/24, 3/30;* E04B *1/84*
U.S. Cl. 428—138 **5 Claims**

1. An acoustical film-to-foam laminate comprising an open cell foam having a deformable film, said foam having a surface embossed with a non-random, predetermined pattern having crowns, sidewalls and valleys, the deformable film being adhesively attached to the embossed surface of the foam, conforming to the pattern on the embossed surface and having perforations through the film predominately in the sidewalls and



valleys of the pattern, said valleys having a depth of at least 1/160 of an inch.

4,073,992

PRINTING ON A POLYOLEFIN SUBSTRATE

Frank Lerman, Cincinnati, and Raymond C. Bartsch, Wyoming, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 311,180, Dec. 1, 1972, abandoned, and a continuation-in-part of Ser. No. 23,044, March 26, 1970, abandoned. This application Nov. 15, 1974, Ser. No. 524,176
Int. Cl.² B41M *5/26*
U.S. Cl. 428—207 **10 Claims**

1. A method of forming an image on a polyolefinic substrate which comprises applying a dry fusible powder consisting of a pigment, an olefin polymer or copolymer and up to 10% of a silica flow additive in a predetermined pattern on the surface of said polyolefin substrate, fusing the powder particles to each other and to the substrate surface by maintaining the substrate at a temperature of about 115° to 140° C., and adherently bonding the pigmented powder to the substrate by cooling the pattern bearing substrate to effect solidification of the powder.

9. An article having an image thereon comprising a non-pretreated polyolefin substrate and adherently bonded thereto in a predetermined pattern, a pigmented, fused powder consisting of a pigment, an olefin polymer or copolymer and up to 10% of a silica flow additive.

4,073,993

HYDROPHILIC FINISHING PROCESS FOR HYDROPHOBIC FIBERS

John C. Lark, St. Charles, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 560,503, March 20, 1975, abandoned. This application Dec. 20, 1976, Ser. No. 752,518
Int. Cl.² B05D *3/02;* B32B *27/06, 27/34, 27/36*
U.S. Cl. 428—261 **14 Claims**

1. A process for treating textiles and textile fibers with a partial ester having at least one retained unreacted acid group on the molecule after the esterification to impart a durable hydrophilic antistatic antisoiling finish which comprises the steps of (1) providing a water soluble reaction product consisting essentially of a polyethylene glycol of an average molecular weight of 100 to 6000 and an aromatic polycarboxylic acid compound selected from the group consisting of trimellitic anhydride, trimellitic acid, pyromellitic dianhydride, pyromellitic acid, phthalic anhydride and phthalic acid wherein the compound is capable of forming a four to six membered cyclic acid anhydride ring, wherein the mole ratios are within the range of 1:1 to 1:2, glycol to acid, the reaction temperature of said glycol and said acid being in the range of from about 130° to 175° C, the said partial esters being characterized by acid numbers within the range of 17 through 286 when said ester is a monoester and 4 through 95 when said ester is a diester, (2) coating, and (3) curing said reaction product on said textile and textile fibers, the said textiles being selected from the group of textiles and textile fibers consisting of polyesters, polyamides and polyester-polyamide blends.

4,073,994

ACID MODIFIED POLYVINYL ACETATE TEXTILE SIZES

James C. Baatz, West Springfield, and Donald D. Donermeyer, Springfield, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 14, 1977, Ser. No. 777,381
Int. Cl.² B05D *3/02*
U.S. Cl. 428—265 **12 Claims**

1. A textile sizing solution which comprises a vinyl acetate interpolymer and a water dispersible polymer selected from the group consisting of polyvinyl alcohol and starch wherein the interpolymer comprises from about 64.5 to about 95.0 weight percent of vinyl acetate, from about 4.0 to about 9.5 weight percent of acrylic acid, from about 0.2 to about 1 weight percent of 2-acrylamido-2-methylpropanesulfonic acid and from about 0 to about 25 weight percent of an ethylenically unsaturated monomer selected from the group consisting of alkyl acrylates, dialkyl maleates and dialkyl fumarates wherein the alkyl groups contain from 1 to 8 carbon atoms and wherein the weight ratio of the interpolymer to the water dispersible polymer is in the range of about 95:5 to about 5:95.

4,073,995

ACID MODIFIED POLYVINYL ACETATE TEXTILE SIZES

James C. Baatz, West Springfield, and Donald D. Donermeyer, Springfield, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 14, 1977, Ser. No. 777,380
Int. Cl.² B32B *27/00*
U.S. Cl. 428—265 **22 Claims**

1. A textile sizing solution which comprises an interpolymer comprising from about 64.5 to about 95.8 weight percent of vinyl acetate, from about 4.0 to about 9.5 weight percent of acrylic acid, from about 0.2 to about 1 weight percent of 2-acrylamido-2-methylpropanesulfonic acid and from about 0 to about 25 weight percent of an ethylenically unsaturated monomer selected from the group consisting of alkyl acrylates, dialkyl maleates and dialkyl fumarates wherein the alkyl groups contain from 1 to 8 carbon atoms.

4,073,996

FABRIC TREATING ARTICLES AND PROCESSES

William Thomas Bedenk, Springfield Township, Hamilton County, and Paul Joseph Sagel, Green Township, Hamilton County, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 24, 1976, Ser. No. 660,951
Int. Cl.² D06M *11/00;* B05D *3/12*
U.S. Cl. 428—274 **19 Claims**

1. An article of manufacture especially adapted for conditioning fabrics in an automatic clothes dryer, comprising:

(a) an effective amount of a smectite clay/organic fabric conditioning agent mixture wherein the weight ratio of organic fabric conditioning agent to smectite clay is from about 200:1 to about 1:1 and wherein the organic fabric conditioning agent is cationic; and

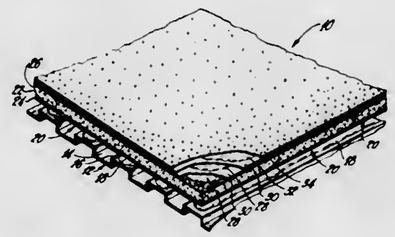
(b) a dispensing means which provides for release of said mixture within an automatic clothes dryer.

4,073,997

COMPOSITE PANEL

David O. Richards, Newark; Isaac P. Jones, Granville; Homer W. Duffee, Newark, and Charles E. Nutter, Hebron, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 530,110, Dec. 6, 1974, abandoned, which is a division of Ser. No. 263,746, June 9, 1972, Pat. No. 3,874,980. This application Sept. 17, 1976, Ser. No. 724,129
Int. Cl.² B32B *17/10*
U.S. Cl. 428—285 **13 Claims**



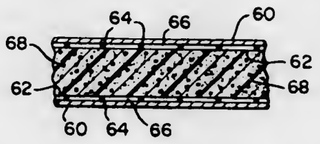
1. A roof insulating system comprising a roof deck; an adhesive layer on said roof deck; roof insulation on said layer, said roof insulation comprising a slab of expanded organic polymeric material having two major, substantially planar, substantially parallel surfaces and a peripheral edge of predetermined shape, said slab having a thickness from about one-half inch to about four inches, a thin mat of substantially randomly-disposed glass fibers on the upper major surface of said slab with the mat disposed substantially uniformly over said entire major surface, said fibers being held together by a binder, the polymeric material at the upper edge of said slab at least partially penetrating interstices among the fibers of said mat in a manner to be functionally integral therewith, and a layer of glass fibers affixed to the lower major surface of said slab, the polymeric material at the lower surface of said slab at least partially penetrating interstices among the fibers of the latter layer in a manner to be functionally integral therewith; a second adhesive layer on the upper surface of said mat; and a mat of fibers impregnated with asphalt on top of said second layer.

4,073,998

SCRIM/FOIL LAMINATE

Terence James O'Connor, St. Catharine's, Canada, assignor to Bay Mills Limited, St. Catharine, Canada

Filed Jan. 24, 1977, Ser. No. 762,210
Int. Cl.² B32B *3/26*
U.S. Cl. 428—310 **19 Claims**



1. A laminate providing a high strength, low flammability, moisture vapor barrier, especially adapted for use in polyurethane foam construction panels comprising

a metal foil;

an adhesive tie-coat coating one surface of said foil, said tie-coat comprising an organic adhesive compound having a high hydroxyl functionality, low organic acid functionality, low flammability, and which is thermoplastic at temperatures above about 200° F.; and

a scrim attached to said foil by the tie-coat, said scrim being made of yarns which are non-flammable and dimensionally stable.

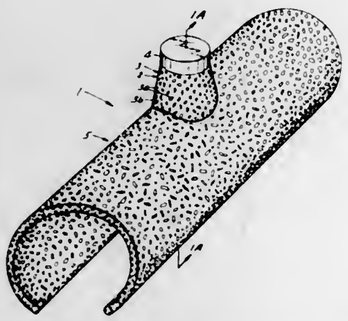
4. A construction panel comprising at least one laminate as defined in claim 1 having applied to the tie-coated surface a polyurethane foam, said polyurethane foam being prepared from a hydroxyl containing material and an isocyanate material comprising an isocyanate or isocyanurate, said isocyanate material and the hydroxyl groups of said organic adhesive compound having been reacted to chemically bond the foam and compound and thereby bonding the foam to said foil.

4,073,999

POROUS CERAMIC OR METALLIC COATINGS AND ARTICLES

Thomas Toplica Bryan, Mahtomedi Village, and Arthur William Pluim, Jr., Stillwater, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 9, 1975, Ser. No. 576,110
Int. Cl.² A61F *1/00*; B01J *21/00*
U.S. Cl. 428—311 **20 Claims**



1. A method for preparing coated substrates comprising:
(A) contacting a substrate selected from the class consisting of a ceramic substrate and metallic substrate with a composition to provide a coating of said composition on at least a portion of said substrate, said composition comprising:
(1) 25 to 80 percent by weight of a material selected from the class consisting of ceramic powder and powdered metal wherein the number average of the longest dimension of the particles of the material is from about 0.1 to about 300 microns;
(2) 2.0 to 12 percent by weight of a binder capable of adhering said material particles; and
(3) 18 to 73 percent by weight solvent;
(B) rapidly volatilizing at least a portion of said solvent of said composition on said substrate to form volatilized solvent bubbles within said composition which escape from said composition and thereby form porosity within said composition and
(C) sintering said coated substrate to form a coated substrate with a porous coating, said pores of said porous coating being from about 4 to about 350 microns in diameter.

4,074,000

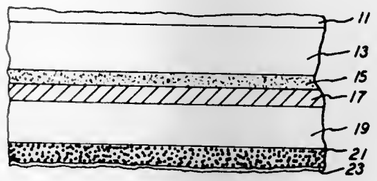
PRESSURE SENSITIVE ADHESIVE DRAFTING FILMS FOR USE IN ELECTROSTATOGRAPHIC COPIERS

Roy H. Hankee, Penfield, and Alp T. Akman, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 27, 1976, Ser. No. 736,034
Int. Cl.² B32B *5/16, 19/02, 27/08*
U.S. Cl. 428—323 **14 Claims**

1. A layered, pressure sensitive, self-adhesive drafting film suitable for imaging in electrostatographic copiers which comprises from the top downward:
a. a matte coating capable of receiving a holding graphic information;
b. a layer of an organic resinous material as support for the matte coating;
c. a pressure sensitive adhesive;
d. a silicone release coating;
e. a layer of an organic resinous material as release liner; and
f. a back coating which is a layer of an organic binder material having dispersed therein:
i. a particulate material of particle size ranging from 3 to 20 microns in the longest dimension; and
ii. a water insoluble antistatic agent of a type and in an amount sufficient to cause the film to have a surface resistivity in the range of from 10^9 to 10^{14} ohms/sq.

14. A multi-layered pressure sensitive drafting film suitable for imaging in electrostatographic copiers which comprises from the top down:



a. a matte film capable of receiving and holding graphic information;
b. a layer of organic resinous material;
c. a layer of pressure sensitive adhesive;
d. a release coating;
e. a layer of an organic resinous material as release liner;
f. a back coating comprising an organic binder material having dispersed therein a particulate material of particle size ranging from 3 to 20 microns in the longest dimension; and
g. a thin (0.01 mil to 0.06 mil) layer of an anti-static agent of a type which causes the film to have a surface resistivity in the range of from 10^9 to 10^{14} ohms/sq.

4,074,001

FIXING ROLL FOR ELECTROPHOTOGRAPHY

Kiyoshi Imai; Nobuyuki Hasebe, both of Annaka; Tomiaki Asami, Numazu; Setsuo Soga, Mitaka; Ichiro Fukushima, and Yasuo Asahina, both of Tokyo, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd. and Ricoh Company, Ltd., both of Tokyo, Japan

Filed June 23, 1976, Ser. No. 698,897
Claims priority, application Japan, June 24, 1975, 50-76848
Int. Cl.² B32B *15/08*; G03G *13/20*
U.S. Cl. 428—329 **7 Claims**

1. A fixing roll for electrophotography having a surface layer with a thickness of at least 1 mm composed of a cured room-temperature vulcanizing silicone rubber composition comprising
A. 100 parts by weight of a mixture consisting of
a. from 80 to 40% by weight of a diorganopolysiloxane terminated at both chain ends with diorganohydroxysilyl groups directly bonded to the terminal silicon atoms, having a viscosity of from 100 to 500,000 centistokes at 25° C and
b. from 20 to 60% by weight of a diorganopolysiloxane terminated at both chain ends with trialkylsilyl groups, having a viscosity of from 5 to 200 centistokes at 25° C,
B. from 0.5 to 10 parts by weight of an alkoxysilane represented by the general formula

$$R_a^1Si(OR^2)_{4-a}$$

where R^1 and R^2 are saturated or unsaturated monovalent hydrocarbon groups and a is 0 or 1, or a partial hydrolysis-condensate of the alkoxysilane,

C. from 0.1 to 5 parts by weight of a metal salt of an organic acid,
D. from 10 to 80 parts by weight of powdery calcium carbonate with an average particle diameter of not exceeding 10 μm,
E. from 10 to 80 parts by weight of powdery iron oxide with an average particlediameter of not exceeding 10 μm, and
F. from 10 to 80 parts by weight of powdery titanium dioxide with an average particle diameter of not exceeding 10 μm.

4,074,002

MAGNETIC RECORDING MEDIA HAVING A LOW COEFFICIENT OF FRICTION

Joachim Hack, Ludwigshafen; Dieter Schaefer, Lindenberg, and Herbert Motz, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Mar. 8, 1976, Ser. No. 664,644
Claims priority, application Germany, Mar. 21, 1975, 2512450
Int. Cl.² H01F *10/02*
U.S. Cl. 428—331 **3 Claims**

1. A magnetic recording medium comprising a flexible base and, applied thereto, at least one firmly adhering magnetic layer, at least the uppermost magnetic layer consisting essentially of finely divided magnetic particles and non-magnetic particles in an organic binder mixture, wherein the non-magnetic particles used are particles of precipitated silica having a mean primary particle diameter of from 0.02 to 0.1μ, a mean secondary particle diameter of from 2 to 4μ, a pH of from 5 to 8, a loss of weight on drying from about 2 to 5% and a loss of weight on ignition of from about 4 to 6%.

4,074,003

THERMOGRAPHIC STENCIL SHEET, ASSEMBLY AND METHOD OF MAKING AN IMAGED STENCIL SHEET

Margery L. Schick, Mount Prospect, and Bror E. Anderson, Arlington Heights, both of Ill., assignors to Weber Marking Systems, Inc., Arlington Heights, Ill.

Continuation of Ser. No. 521,033, Nov. 5, 1974, abandoned. This application May 11, 1976, Ser. No. 685,324
Int. Cl.² B41N *1/24*
U.S. Cl. 428—341 **13 Claims**

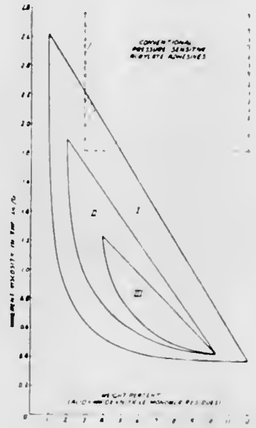
1. An assembly for making an imaged stencil sheet and adapted to provide a visual index of the degree of imaging, said assembly comprising a thermographic stencil sheet, and a receiving sheet arranged for surface contact with said stencil sheet, said stencil sheet comprising:
an ink-pervious fibrous tissue base sheet having a weight of about 4½ to 12 lbs. per 2000 sq. ft., and
at least two layers of a heat-flowable composition providing an ink-impervious coating on the base sheet,
a first one of said layers being adapted for imaging contact with an original and said first layer being essentially colorless, and
a second one of said layers being adapted for surface contact with said receiving sheet whereby said composition when rendered flowable by heat upon imaging transfers to the receiving sheet in the pattern of ink-transmitting image openings formed in the stencil sheet,
said second layer containing pigment or dye coloring material in an amount sufficient to provide a visible index of the degree of imaging on said receiving sheet but insufficient to increase substantially the infrared absorptivity of the stencil sheet, said coloring material being present in a maximum amount of about 0.07 lb. per 3,000 sq. ft.

4,074,004

PRESSURE-SENSITIVE ADHESIVE TAPE EMPLOYING MOISTURE RESISTANT ACRYLATE-BASE COPOLYMER ADHESIVE

George F. Bateson, Roseville; Francis W. Brown, West St. Paul, and Steven M. Heilmann, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 2, 1976, Ser. No. 702,347
Int. Cl.² C09J *7/02*
U.S. Cl. 428—355 **15 Claims**



1. In a sheet material comprising a sheet backing and a normally tacky and pressure-sensitive acrylate-based copolymer firmly bonded to at least one face thereof,
the improvement which comprises said pressure-sensitive copolymer having an inherent viscosity in tetrahydrofuran of at least about 0.4 dl/g at 25° C. and being a polymer of 100 parts by weight of homopolymerizable ethylenically unsaturated monomers consisting essentially of
(1) from about 88 to about 99 parts by weight of monomers consisting of
(a) 85–100 weight percent acrylic acid ester of at least one non-tertiary alkyl alcohol the molecules of said alcohol containing 1–14 carbon atoms, the average being about 5–12 carbon atoms, and
(b) correspondingly 15–0 weight percent of at least one monomer selected from the group consisting of vinyl acetate, styrene, vinyl ethers and alkyl methacrylates, and
(2) correspondingly from about 12 to about 1 part by weight of conjugated vinyl monomers selected from at least one of the classes listed below, said monomers being selected in types and amounts to impart tacky and pressure-sensitive adhesive properties to said copolymer:
(a) at least one carboxylic acid selected from the group consisting of acrylic acid, methacrylic acid and itaconic acid,
(b) at least one amide containing 3–4 carbon atoms, and
(c) at least one nitrile containing 3–4 carbon atoms,
no more than 10 parts by weight of either class (a) or class (c) monomers and no more than 7 parts by weight of class (b) monomers being employed,
said polymer falling beneath the line $y = (14 - x/5)$, where y = inherent viscosity in deciliters per gram as measured in tetrahydrofuran at 25° C. and x = the total weight percent of the vinyl monomers in "(2)" above, the copolymer having a wet shear strength of at least about 2 lbs/in²,
whereby said sheet material applied to dry fabrics remains

firmly bonded thereto upon being thereafter exposed to moisture for extended periods of time.

4,074,005
FLOCK TREATMENT

Ricky L. Moore, Atlanta, and Winston E. Hagborg, Columbus, both of Ga., assignors to West Point-Pepperell Inc., West Point, Ga.

Filed Feb. 20, 1976, Ser. No. 659,629
Int. Cl.[2] B05D *5/08, 7/02, 1/18*
U.S. Cl. 428—378 **22 Claims**

1. A method for the treatment of flock which comprises suspending the flock in water which contains a linear, saturated aliphatic monocarboxylic acid having at least 8 carbon atoms and a metal ion, in an amount sufficient to increase the flow of said flock, at least partially in the form of a salt of said acid and said metal, and separating and drying the flock.

4,074,006
POWDER COATABLE POLYESTER COMPOSITION AND ELECTRICAL CONDUCTOR COATED THEREWITH

Edith M. Boldebuck, Schenectady, and Bernard Gorowitz, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 16, 1976, Ser. No. 751,045
Int. Cl.[2] C08G *63/76*
U.S. Cl. 428—379 **18 Claims**

1. A curable resinous composition comprising

(I) a polyester resin consisting essentially of the reaction product of (a) from about 25 to 56 equivalent per cent of a material selected from the class consisting of isophthalic acid, terephthalic acid, lower dialkyl ester of isophthalic acid, lower dialkyl ester of terephthalic acid, and mixtures thereof, (b) from about 15 to 46 equivalent per cent of a diol, and (c) from about 13 to 44 equivalent per cent of a saturated aliphatic polyhydric alcohol having at least three hydroxyl groups, the sum of said equivalent percents being equal to 100 per cent, and

(II) an organic ester of ortho-titanic acid in an amount corresponding to from about 0.02 to about 0.045 part by weight of titanium per 100 parts by weight of said resin.

4,074,007
COATING COMPOSITION

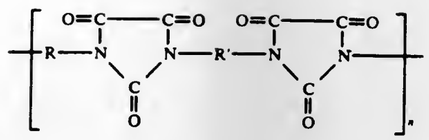
Gerhard Gebauer, Burgkirchen (Alz); Johannes Brandrup, Neu Isenburg; Kurt Kraft, Auringen, Taunus, and Franz Mayer, Burgkirchen (Alz), all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 560,295, March 20, 1975, abandoned. This application Mar. 23, 1977, Ser. No. 780,466
Claims priority, application Germany, Mar. 26, 1974, 2414389
Int. Cl.[2] B32B *27/04;* **C08J** *3/08;* **C08K** *5/00;* **C08L** *79/04*
U.S. Cl. 428—411 **15 Claims**

1. Coating composition for application as one-coat system which comprises

a. from 10 to 90 parts by weight of a low molecular weight polytetrafluorethylene having a melt viscosity of from 10^1 to 10^4 poises (measured at 380° C by means of the high pressure capillary viscometer), a specific surface of from 1 to 40 m^2/g (measured according to the BET method), and a mean particle diameter of from 0.1 to 50 microns;

b. from 90 to 10 parts by weight of a polymer containing triketo-imidazolidine rings and repeated units of the formula



where

R is a mono- to trinuclear, bi- to tetravalent aromatic radical, the aromatic radicals optionally being also quinones, and in polynuclear systems the aromatic radicals optionally being linked by aliphatic radicals or hetero atoms, furthermore the aromatic radicals optionally being mono- or polysubstituted by alkyl, cycloalkyl, alkoxy, aryl or monovalent functional radicals,

R′ is as defined for R or an aliphatic or cycloaliphatic hydrocarbon radical,

n is an integer of from 1 to 70, and

c. an aprotic organic solvent having a surface tension of more than 30 dyn/cm, in an amount by weight of from 0.43 to 100 times that of component b); up to 80% of the amount by weight of this aprotic solvent having a surface tension of more than 30 dyn/cm optionally being replaced by another organic solvent not meeting at least one of the two cited requirements, but necessarily having a boiling point at least 10° C lower than the boiling point of the aprotic solvent.

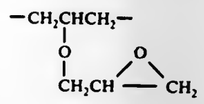
12. A process for the coating of surfaces, wherein the coating composition as claimed in claim 1 is used.

4,074,008
EPOXIDE RESINS

George Edward Green, Cambridge, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 3, 1976, Ser. No. 711,325
Claims priority, application United Kingdom, Aug. 13, 1975, 33678/75
Int. Cl.[2] C08F *2/46;* **G03C** *1/68;* **C23F** *1/02;* **C08F** *4/00*
U.S. Cl. 428—418 **35 Claims**

1. Epoxide resins which polymerise on exposure to actinic radiation, having, per average molecule, at least two photopolymerisable groups and also at least two 1,2-epoxide groups, one or more such epoxide groups being contained in units of formula



I

4,074,009
DRIOGRAPHIC MASTER

James F. Sanders, Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 8, 1975, Ser. No. 638,454
Int. Cl.[2] B32B *27/06, 27/10;* **B41N** *1/12;* **G03F** *7/20*
U.S. Cl. 428—421 **6 Claims**

1. An article capable of providing a driographic printing plate which can be direct imaged, comprising a substrate having a coating on at least one surface thereof, said coating comprising a fused particulate binder compound characterized by high surface energy and easy wettability when exposed to printing ink having a solid, at less than 100° F, heat-softenable fluorinated compound uniformly dispersed therethrough in a manner such that the surface of said coating is oleo ink repellent when dry; said fluorinated compound containing at least one fluorinated aliphatic radical therein having at least one terminal perfluoromethyl group, said coating containing no

material serving to flow at ordinary image-marking temperatures to heal image-marked areas therein.

4,074,010
CERAMIC-PAINT COATINGS

Clifford J. Knight, Transfer, Pa., assignor to Lyle V. Anderson, Pittsburgh, Pa., a part interest

Continuation-in-part of Ser. No. 576,255, May 12, 1975, abandoned. This application Sept. 29, 1975, Ser. No. 617,249
Int. Cl.[2] B32B *27/00, 17/06, 9/04, 13/04*
U.S. Cl. 428—422 **24 Claims**

1. An article of manufacture comprising a substrate having thereon a first coat or layer of ceramic paint having a pH level of at least about 11 and including a vehicle with chemically-bound water and an aqueous colloidal suspension of silica and alumina having a particle size within the range of 5 to 10 millimicrons thus creating a reactive form of aluminum silicate due to said pH level to produce a paint-wet surface, said surface having partly embedded therein an effective number of particles of finely-divided substance stable at the temperature of intended use, said ceramic paint being cured after heating said substrate, ceramic paint and particles to 250°–750° F to release water including said chemically-bound water from the vehicle of said ceramic paint without fusing said ceramic paint.

4,074,011
TOPCOATED PHOSPHATED BOLTS, NUTS AND WASHERS

Akira Teramae, Yokohama; Koji Yamada, Tokyo, and Hironobu Kawasaki, Machida, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 569,755, April 21, 1975, abandoned. This application Aug. 27, 1976, Ser. No. 718,131
Claims priority, application Japan, Apr. 25, 1974, 49-46877
Int. Cl.[2] B32B *15/04;* **F16B** *27/00*
U.S. Cl. 428—422 **1 Claim**

1. A bolt, nut and washer having an adherent, corrosion resistant, lubricious and paintable coating applied on the surface thereof, said coating being composed of an under-coating layer of phosphate of metals having a weight of 0.1 to 50 g/m^2, and a top-coating layer of a weight of 0.1 to 50 g/m^2 and containing a paintable base-forming vehicle, a chromium compound present in an amount of 0.5 to 25% by weight of chromium based on the dried weight of the top coating, and a lubricity-imparting ingredient of one or more materials selected from the group consisting of metal salts of higher fatty acid in an amount from 1 to 20%, polyolefin compounds in an amount from 1 to 50%, and polyethylene tetrafluoride in an amount from 1 to 50%, these percents being % by weight based on the dried weight of the top coating.

4,074,012
FINE-METAL-PARTICLE-BASED MAGNETIC RECORDING MEDIUM OF IMPROVED ENVIRONMENTAL STABILITY

Duane G. Heikkinen, North St. Paul, Minn., and Thomas M. Kanten, Baldwin Township, St. Croix County, Wis., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 320,630, Jan. 2, 1973, abandoned. This application Aug. 29, 1975, Ser. No. 608,916
Int. Cl.[2] H01F *10/02*
U.S. Cl. 428—425 **10 Claims**

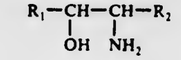
1. Magnetic recording medium comprising a magnetizable layer carried on a nonmagnetizable support, the magnetizable layer comprising (a) a nonmagnetizable organic polymeric binder material; (b) fine magnetizable particles that comprise at least 75 weight-percent metal, at least a majority of which is iron, cobalt, or nickel, uniformly and thoroughly dispersed in the binder material; and (c) an organic compound having a molecular weight of less than 500 and providing, per gram of particles, at least 0.0001 gram-equivalent of sterically unhindered aliphatic tertiay amine which is located in terminal groups on the organic compound, is not reacted with said binder material and has a pK_a of at least 8 when measured in an aqueous solution at 25° C, whereby the recording medium exhibits improved resistance to corrosion of said magnetizable particles.

4,074,013
CORRODIBLE IRON-CONTAINING SURFACES CARRYING CORROSION-INHIBITING COATING

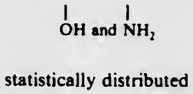
Karlheinz Koch, Haan; Gerhard Kolaczinski, Dusseldorf-Oberkassel; Wolfgang Rupilius, Dusseldorf, and Werner Stein, Erkrath-Unterbach, all of Germany, assignors to Henkel KGaA, Dusseldfdorf and Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, both of Germany

Filed May 5, 1976, Ser. No. 683,516
Claims priority, application Germany, May 7, 1975, 25202785
Int. Cl.[2] C23F *11/00;* **C09D** *5/08;* **B32B** *15/04*
U.S. Cl. 428—457 **9 Claims**

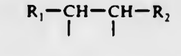
1. A shaped article having a surface of a corrodible iron-containing metal, said surface carrying a corrosion-inhibiting coating of a material selected from the group consisting of (A) mixtures of at least two amino-alkanols of the formula:



wherein R_1 and R_2 each represent $C_{1\text{-}21}$ alkyl; and wherein the sum of the carbon atoms in R_1 and R_2 is between 6 and 22; and (B) salts thereof, the vicinal

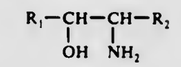


substituents being statistically distributed along the

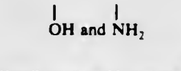


chain in accordance with known frequency of distribution curves.

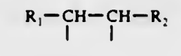
7. A process for inhibiting the tendency of a shaped article having a surface of a corrodible iron-containing metal to corrode when in contact with an aqueous medium, which comprises uniformly coating said surface with a corrosion-inhibiting material selected from the group consisting of (A) mixtures of at least two aminoalkanols of the formula:



wherein R_1 and R_2 each represent $C_{1\text{-}21}$ alkyl; and wherein the sum of the carbon atoms in R_1 and R_2 is between 6 and 22; and (B) salts thereof, the vicinal



substituents being distributed uniformly along the



chain.

4,074,014

ARTICLE INCLUDING ACRYLIC ADHESIVE BONDING VINYL COATINGS TO POLYMERIC SUBSTRATES

Carl H. Wollen, Comstock Park, Mich., assignor to Leon Chemical & Plastics, Division of U.S. Industries, Inc., Grand Rapids, Mich.

Continuation of Ser. No. 412,669, Nov. 5, 1973, abandoned. This application Jan. 6, 1976, Ser. No. 646,948
Int. Cl.[2] B32B *27/08*
U.S. Cl. 428—506 19 Claims

1. An article comprising a vinyl resin covering of a material suitable for molding onto a substrate and containing plasticizer consisting of substantially only phthalate esters; a polymeric substrate of a material forming a hard substrate surface to which said vinyl resin covering is adhered and an adhesive bonding said vinyl resin covering to said polymeric substrate, said adhesive comprising a mixture of from about 1 wt. percent to about 95 wt. percent phenolic resin solids and from about 5 wt. percent to about 99 wt. percent methacrylate resin solids, said methacrylate resin having a weight average molecular weight greater than about 400,000.

16. An article comprising a vinyl resin covering of a material suitable for molding onto a substrate and containing plasticizer consisting substantially only phthalate esters; a polymeric substrate of material forming a hard substrate surface to which said vinyl resin covering is adhered and an adhesive bonding said vinyl resin covering to said polymeric substrate, said adhesive comprising a mixture of from about 1 wt. percent to about 95 wt. percent phenolic resin solids and from about 5 wt. percent to about 99 wt. percent methacrylate resin solids, said methacrylate resin being a copolymer of methacrylate and normal or isobutyl acrylate wherein the methyl methacrylate comprises from about 40 to about 75 wt. percent of the copolymer and the normal or isobutyl acrylate comprises from about 20 to about 50 wt. percent of the copolymer, and said methacrylate resin having a weight average molecular weight greater than about 100,000.

4,074,015

PROCESS FOR THE PRODUCTION OF NONFLAMMABLE LAMINATED MATERIALS

Arnold Franz, and Siegfried Kopnick, both of Troisdorf, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Filed June 4, 1975, Ser. No. 583,766
Claims priority, application Germany, June 4, 1974, 2426862
Int. Cl.[2] B32B *27/10*
U.S. Cl. 428—526 10 Claims

1. In a process for the production of nonflammable laminated materials by the impregnation of cellulose-containing material with an impregnating solution containing a phenolic-resol resin solution, and at least one plasticizer, subsequently drying the thus-impregnated material under preliminary condensation of the resin, and thereafter curing superimposed layers of this impregnated and preliminarily condensed material with the use of heat and pressure, the improvement wherein there is used an impregnating solution containing:

a. 50 to 80% by weight of an ammonia alkaline-condensed aqueous phenol-resol resin with a solids content of 65–80% by weight and with following molecular weight distribution determined by gel chromatography (expressed in percent per unit area): dimers 20–26%; tri- and tetramers 6–12%; penta- and oligomers 24–36%;

b. hexamethylenetetramine in amounts of 1–15% by weight and

c. between 15 and 35% by weight of a phosphoric acid ester as the plasticizer, based on the weight of the impregnating solution.

4,074,016

MAGNETIC RECORD CARRIER

Gerhard Trippel, Sindelfingen, Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 9, 1976, Ser. No. 749,209
Claims priority, application Germany, Dec. 17, 1975, 2556755
Int. Cl.[2] B32B *15/00*
U.S. Cl. 428—626 14 Claims

1. A multi-layer magnetic record carrier, comprising:

a substrate;

a synthetic substance layer deposited onto said substrate;

a layer of getter metal vacuum deposited onto said synthetic substance layer; and

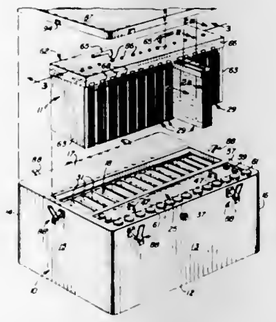
a layer of an undercoat metal vacuum deposited onto said getter metal layer, said undercoat metal layer being substantially thicker than said getter metal layer.

4,074,017

BATTERY FOR ELECTRIC POWERED VEHICLES

Lewis R. Kinsey, Phoenix, Ariz.

Filed Nov. 22, 1976, Ser. No. 743,537
Int. Cl.[2] H01M *2/06, 2/36*
U.S. Cl. 429—1 7 Claims



1. A storage battery of the wet cell type having a plurality of cells, each cell being provided with a group of plates having post members extending upwardly from each plate into the upper portion of the cells comprising:

a box-like battery case having partitions dividing the same into at least two compartments,

one of said compartments being open at the top of said battery case for the reception of said cells and the other of said compartments being closed at the top of said battery case and being used for the storage of an extra supply of electrolyte over that utilized in said one of said compartments,

a removable plate assembly for positioning in said one of said compartments,

said plate assembly comprising a supporting member arranged to receive in interlocking relationship a plurality of groups of plates detachably and spacedly arranged along said supporting member, said groups of plates being insulated one from the other when in a juxtapositioned arrangement, bus bars extending longitudinally of and within said plate assemblies for connecting together the post members of the plates of said groups of plates in positive and negative voltage orientation,

means for inter-connecting corresponding cells in said plate assembly and said other compartment for providing passageways for the free flow of electrolyte therebetween, and

a cover for said box-like battery case extending over at least one of said compartments,

said supporting member being spacedly grooved to receive in interlocking relationship in said grooves a plurality of groups of said plates spacedly arranged with one group of plates detachably positioned in each of said grooves,

each group of plates being a complete cell assembly removably mounted as a cell structure on said supporting member,

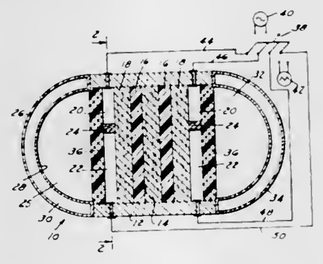
each cell assembly being provided with a projection which cooperates with its associated groove to restrict the insertion of each group of plates into one end only of the grooves.

4,074,018

SECONDARY FUEL CELL

Ronald J. Haas, San Jose, and Donald C. Briggs, Mountain View, both of Calif., assignors to Ford Aerospace & Communications Corporation, Dearborn, Mich.

Filed May 4, 1977, Ser. No. 793,906
Int. Cl.[2] H01M *4/86*
U.S. Cl. 429—21 1 Claim



1. A secondary fuel cell which comprises:

a housing;

an electrolyte retaining zone extending across a cross section of said housing;

an electrolyte in said electrolyte retaining zone;

a pair of gas impermeable, ion permeable reservoir zones, one such zone being located on each side of said electrolyte retaining zone and extending across the cross section of said housing;

a pair of electrode zones, one such zone being located on the side of each of said pair of gas impermeable, ion permeable reservoir zones not in contact with said electrolyte retaining zone, said pair of electrode zones each containing a pair of electrode structures, a first such electrode structure being more efficient in operation during charging of the fuel cell and a second of such electrode structures being more efficient in operation during discharge of the fuel cell;

an electrolyte retaining zone with electrolyte contained therein positioned between said first electrode zone and said second electrode zone of each of said pair of electrode zones;

structure means secured to said housing for defining gas containing zones for the fuel and the oxidant of the cell;

a pair of gas permeable but electrolyte impermeable zones extending across the cross section of said housing, one such zone being located between each one of said pair of electrode zones and its associated gas containing zone; and

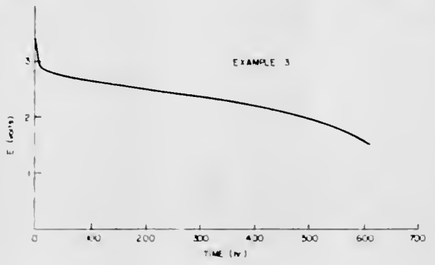
means for using during charging of the cell said electrode more efficient in charging and for using during discharge of said cell said electrode more efficient in discharging.

4,074,019

CELL HAVING FLUORINATED CARBON CATHODE AND SOLVATED ALKALI METAL SALT ELECTROLYTE

Paul A. Malachesky, Berkeley Heights, and Gerald H. Newman, Westfield, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Mar. 1, 1977, Ser. No. 773,283
Int. Cl.[2] H01M *10/44*
U.S. Cl. 429—50 13 Claims



1. A current producing cell comprising:

a. a cathode having a compound formed of fluorine and carbon;

b. an alkali metal-containing anode; and

c. a solid electrolyte consisting essentially of one or more solvated compounds of the formula:

$$ZMX_n$$

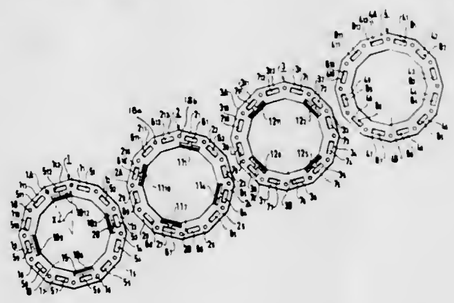
wherein Z is an alkali metal, wherein M is a metal selected from the group consisting of Zn, Cd, B, Al, Ga, In, Tl, Sn (stannous), P and As, wherein X is one or more halogens selected from the group consisting of chlorine, fluorine, bromine and iodine, and wherein n is a numerical value equal to one plus the valence of the metal M, said compounds having been solvated with one or more solvents selected from the group consisting of unsubstituted and inertly substituted monoethers and polyethers.

4,074,020

CROSS-FEED FUEL CELL BATTERY WITH FILTER PRESS TYPE STRUCTURE OF POLYGONAL CROSS-SECTION

Bernard Regnaut, Antony, France, assignor to Societe Generale de Constructions Electriques et Mecaniques "Alsthom et Cie", Paris, France

Filed Feb. 2, 1976, Ser. No. 654,694
Claims priority, application France, Feb. 6, 1975, 75.03663; Feb. 6, 1975, 75.03665
Int. Cl.[2] H01M *8/04*
U.S. Cl. 429—34 11 Claims



1. A fuel cell battery formed of an assembly similar to that of

a filter press comprising plate-like components in a repeating order of sequence embodying the elementary cell sequence of a cathode, a separator, an anode and a current collector, each of said components having substantially the same contour and being in the form of thin plates having an outer frame of an electrically insulating material surrounding a central active portion, the respective faces of the respective active portions of the cathode and anode components which face away from the separator component being respectively irrigated by the combustion supporting material and by the fuel, while the two faces of the separator component are irrigated by the electrolyte, said fuel cell battery being characterized by the improvement wherein:

the said frame of each of said components has a perimeter in the shape of a first regular polygon and an inner contour in the shape of a second regular polygon similar to and concentric with said first regular polygon and having sides parallel to those of said first regular polygon, so that said frame may be regarded as constituted of trapezoidal panels extending between two lines joining similarly oriented corners of the respective polygons;

each of said trapezoidal panels has at least one opening;

said openings of said panels of said frames together forming six sets of channels in which each set consists of at least one channel, of which one of said sets of channels is arranged for supply of combustion supporting material to the active portions of said cathode components, a second of said sets of channels is arranged for supply of electrolyte to both of the separator faces, a third set of said channels is arranged for supply of fuel to the active portions of the anode components, a fourth of said sets of channels is arranged for removal of used combustion supporting material, a fifth of said sets of channels is arranged for removal of the electrolyte and a sixth of said sets of channels is arranged to remove the reaction products of the fuel, and

said channels and their connections to the respective active portions of the respective components of said battery are so disposed that the average direction of flow of said electrolyte across said separator faces is at the same predetermined acute angle to the respective average directions of flow of said fuel and of said combustion supporting material across the active portions respectively of said anode and said cathode in the same cell.

4,074,021

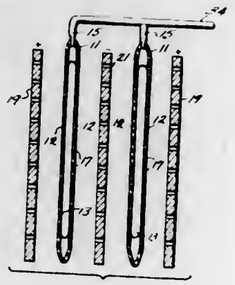
HIGH DISCHARGE BATTERY WITH DEPOLARIZED PLATES

Robert R. Aronson, West Bloomfield, Mich., assignor to Electric Fuel Propulsion Corporation, Detroit, Mich.

Continuation of Ser. No. 584,498, June 6, 1975, abandoned, which is a continuation-in-part of Ser. No. 385,324, Aug. 3, 1973, Pat. No. 3,928,080, which is a continuation of Ser. No. 26,218, April 7, 1970, abandoned. This application Oct. 19, 1976, Ser. No. 733,842

Int. Cl.² H01M *2/38*

U.S. Cl. 429—51 **17 Claims**



1. An improved rechargeable battery system for an electrically powered vehicle including a battery casing, a plurality of battery plates positioned in said casing in parallel spaced relationship with one another and an electrolyte positioned in said casing and covering said battery plates, the improvement comprising:

a plurality of envelope separators, each having a plurality of small openings therein for permitting the ingress and egress of said electrolyte with respect thereto and a tube communicating with a source of electrolyte, said envelope separators being positioned between and in substantially parallel spaced relationship with said battery plates, said envelope separators having a surface area extending over substantially the entire surface of said battery plates, and means for forcing said electrolyte from the inside of said envelope separators outwardly through said openings toward the surfaces of said battery plates, said electrolyte being in contact with substantially the entire area of said battery plates and flushing away waste products positioned proximate said battery plates and increasing the concentration of electrolyte at the surface of said battery plates, whereby the efficiency of said rechargeable battery system for an electrically powered vehicle is improved.

4,074,022

CASING OF AN ELECTRIC CELL

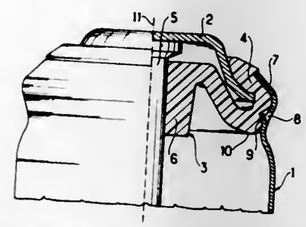
Guy Nadal, Poitiers, France, assignor to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville, France

Filed Nov. 9, 1976, Ser. No. 740,198

Claims priority, application France, Nov. 21, 1975, 75.35689

Int. Cl.² H01M *2/12*

U.S. Cl. 429—54 **5 Claims**



1. A casing of an electric cell, the casing including a metal wall whose inner surface is in close contact with an elastically deformable block which encloses a volume for active materials within the casing, the wall being provided with an orifice normally separated by said block from the enclosed volume of said casing and communicating with said enclosed volume by deformation of the block when the internal pressure reaches a determined value, wherein said orifice is in the form of a tongue cut in the metal wall and turned down towards the enclosed volume without being detached from the remainder of the wall.

4,074,023

PRIMARY DRY CELL WITH MASKED SEPARATOR

Lewis Frederick Urry, North Olmsted, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

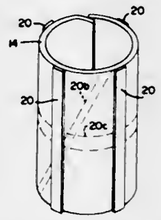
Filed Apr. 2, 1975, Ser. No. 564,490

Int. Cl.² H01M *2/12*

U.S. Cl. 429—56 **13 Claims**

1. A primary dry cell comprising a metal anode cup of magnesium having an open top end which is gas-tightly sealed by a closure including a vent and having a cathode mix therein comprising particles of a metal oxide depolarizer, finely divided conductive material and an electrolyte, separated from the side wall of said anode cup by an electrolyte-permeable separator, with a void space separating said closure and said cathode mix, and having at least one electrolyte-impermeable stripe lying adjacent said separator over a portion thereof between said anode cup and said separator and extending substantially the whole distance between the bottom of said anode cup and said void space for providing a gas venting passageway coincident to said impermeable stripe.

12. In a primary dry cell comprising a metal anode cup of magnesium having an open top end which is gas-tightly sealed by a closure and having a cathode mix therein comprising particles of a metal oxide depolarizer, finely-divided conductive material and an electrolyte, separated from the side wall of



said anode cup by an electrolyte-permeable separator, said separator being in contact with said anode cup, the improvement comprising wherein a circumferential stripe of an electrolyte-impermeable material is placed adjacent to said separator between said anode cup and said separator for masking off a portion of the side wall of the anode cup so as to maintain the structural integrity of the anode during consummation of the cell.

4,074,024

CATALYST CONTAINING CLOSURE PLUG FOR STORAGE BATTERY AND METHOD OF OPERATING STORAGE BATTERY

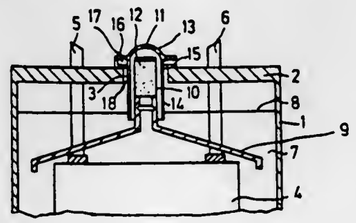
Harald Reber, Gerlingen, Germany, assignor to Robert Bosch GmbH, Gerlingen-Schillerhohe, Germany

Division of Ser. No. 666,585, March 15, 1976, which is a continuation of Ser. No. 532,866, Dec. 16, 1974, abandoned. This application Sept. 29, 1976, Ser. No. 727,937

Claims priority, application Germany, Feb. 22, 1974, 2408556

Int. Cl.² H01M *2/12*

U.S. Cl. 429—86 **4 Claims**



1. Closure plug for a storage battery comprising:

a body member adapted to fit into an opening of a battery and having means defining a chamber within the body which is adapted to extend below the liquid level of an electrolyte in a battery, said chamber having at least one opening below the liquid level of the electrolyte to permit a portion of the electrolyte to enter a portion of said chamber;

means defining an upper enclosure in said chamber of said body, said upper enclosure containing a catalyst for recombining evolved hydrogen and oxygen gases from said battery to form water vapor;

directing means in communication with said chamber and at least adjacent said chamber for directing said evolved oxygen and hydrogen gases to said upper enclosure;

a closed non-vented water vapor communication means at least partially defined by said chamber defining means and extending into said electrolyte, said communication means being at least partially located at the end of said body at a level below said upper enclosure to provide a closed conduit to conduct all of the water vapor from said upper enclosure to the portion of said body member which extends below said surface of said electrolyte to bring all of said water vapor into contact with said electrolyte in said chamber to condense said water vapor and intermix condensed with vapor with.

4,074,025

INDICATING DEVICE FOR STORAGE BATTERY

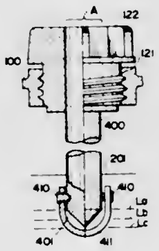
Shiro Miyagawa, Suita, Japan, assignor to Miyagawa Kasei Industry Co., Ltd., Osaka, Japan

Filed Mar. 17, 1977, Ser. No. 778,364

Claims priority, application Japan, Mar. 29, 1976, 51-38766[U]; Mar. 29, 1976, 51-38767[U]; Mar. 29, 1976, 51-38768[U]; Mar. 31, 1976, 51-40621[U]; July 23, 1976, 51-98893[U]; Jan. 6, 1977, 52-901[U]

Int. Cl.² H01M *1/06*

U.S. Cl. 429—91 **35 Claims**



1. An indicating device for a storage battery including an electrolytic vessel and an electrolyte contained therein, comprising,

means for transmitting light therethrough adapted to extend from outside said electrolytic vessel toward the interior of said electrolyte contained in said electrolytic vessel of said storage battery for allowing visual observation therethrough of the interior of said electrolyte; and

indicating means adapted to be disposed in said electrolyte in association with a range in which said indication means is visible through said light transmitting means;

said indicating means being rotatable around an axis which extends at right angles with respect to the extending direction of said light transmitting means;

the specifc gravity of said indicating means being correlated with the specific gravity of a battery electrolyte;

the center of buoyancy of said indicating means in said electrolyte being deviated from said axis of rotation, whereby said indicating means is rotated by the sinking and floating thereof caused in response to changes in the specific gravity of said electrolyte;

the manner of indication as viewed through said light transmitting means being changed in response to the rotation of said indicating means, thereby to indicate the condition of the specific gravity of said electrolyte.

4,074,026

SEALING OF ELECTROCHEMICAL DEVICES UTILIZING LIQUID SODIUM AND A SOLID CERAMIC ELECTROLYTE PERMEABLE TO SODIUM IONS

Roger John Bones, Abingdon, England, assignor to Chloride Silent Power Limited, London, England

Filed Feb. 4, 1977, Ser. No. 765,714

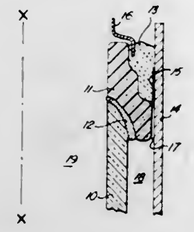
Claims priority, application United Kingdom, Feb. 9, 1976, 5030/76

Int. Cl.² H01M *10/38*

U.S. Cl. 429—104 **13 Claims**

1. In an electrochemical device having a sodium-containing region partially bounded by a sodium-ion permeable solid

ceramic electrolyte element and having the sodium-containing region sealed by a sodium-resistant glass seal joining the ceramic electrolyte element or a ceramic extension thereof to a metal member, the improvement which comprises providing a protective layer of film of niobium secured to said metal member in the region thereof exposed to the sodium in said sodium-containing region, and extending into said glass seal to protect at least the periphery of the interface between said glass seal and said metal member which is subjected to exposure to the sodium.

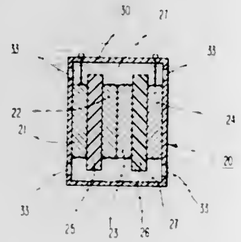


4,074,027

GENERATING DEVICE UTILIZING IRRADIATED COPPER ELECTRODE

Raymond F. Akers, 202 Summit Ave., Mantua, N.J. 08051, and Frank Malley, 112 Hughes Ave., Gloucester, N.J. 08030

Filed Mar. 4, 1977, Ser. No. 774,467
Int. Cl.² H01M *10/24*
U.S. Cl. 429—10 **23 Claims**



1. A generating device comprising:
a. a housing containing electrolyte;
b. a first electrode having a first predetermined surface area immersed in said electrolyte within said housing, said first electrode being of a first metallic composition and having been irradiated with electromagnetic energy in a range centered around about 1.378 A;
c. a second electrode having a second predetermined surface area immersed in said electrolyte within said housing, said second electrode being of a second metallic composition; and
d. output means connected to said electrodes for providing an electrical output on the outside of said housing.

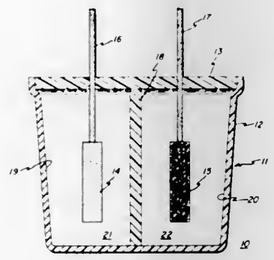
4,074,028

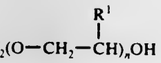
DENDRITE-INHIBITING ELECTROLYTIC SOLUTION AND RECHARGEABLE AQUEOUS ZINC-HALOGEN CELL CONTAINING THE SOLUTION

Fritz G. Will, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 9, 1977, Ser. No. 794,974
Int. Cl.² H01M *10/26*
U.S. Cl. 429—105 **10 Claims**

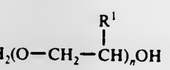
1. A dendrite-inhibiting elecrtrolytic solution comprising a solution containing a zinc compound, from 0.001 to 10 weight percent of a non-ionic surfactant additive having the formula:





where *m* is a number from 3 to 15, R is an alkyl radical having from 1 to 10 carbon atoms, R^1 is a member of a group consisting of hydrogen and methyl radical, *n* is a number for the group from 0 to 30, and the surfactant additive has a molecular weight range of approximately 550 - 1500, and an organic solubilizer in an amount from 5 to 50 weight percent of the solution.

6. A rechargeable aqueous zinc-halogen cell comprising a casing, a pair of spaced apart porous electrode substrates in the casing, an ion exchange membrane between the electrode substrates defining a positive and a negative electrode compartment, an electrolytic solution containing a zinc compound in both compartments, from 0.001 to 10 weight of the solution of a non-ionic surfactant additive in the negative compartment, the non-ionic surfactant additive having the formula:



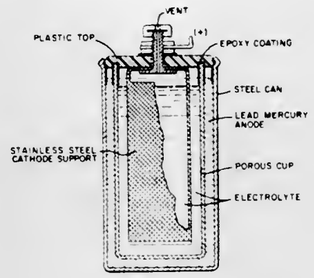
where *m* is a number from 3 to 15, R is an alkyl radical having from 1 to 10 carbon atoms, R^1 is a member of a group consisting of hydrogen and methyl radical, *n* is a number for the group from 0 to 30, and the surfactant additive has a molecular weight range of approximately 550 - 1500, and an organic solubilizer in an amount from 5 to 50 weight percent of the solution in the negative compartment.

4,074,029

RECHARGEABLE VOLTAIC CELL WITH LEAD MERCURY AMALGAM ANODE AND LEAD PEROXIDE CATHODE

Samuel Ruben, 52 Seacord Road, New Rochelle, N.Y. 10801

Filed June 3, 1976, Ser. No. 692,464
Int. Cl.² H01M *6/16*
U.S. Cl. 429—198 **5 Claims**



1. A rechargeable voltaic cell comprising an anode of lead mercury amalgam, an electrolyte of lead sulfamate and sulfamic acid and a cathodic reactant of lead peroxide.

4,074,030

PROCESS FOR PRODUCING NICKEL OXIDE CATHODIC REACTANT FOR PRIMARY CELLS

Samuel Ruben, 52 Seacord Road, New Rochelle, N.Y. 10801

Filed Nov. 19, 1976, Ser. No. 743,510
Int. Cl.² H01M *4/32*
U.S. Cl. 429—223 **5 Claims**

1. A process for producing a highly electrically conductive high coulombic capacity nickel oxide cathodic reactant for electric current producing cells which comprises making a metal screen the cathode in a molten nickel nitrate electrolyte, applying adequate electric current for a sufficient length of time to produce large nickel hydroxide dendrites on the exterior surface of said screen and extending outwardly therefrom, washing said dendrites and screen, connecting said dendrite bearing screen as the anode in an aqueous alkaline electrolyte, applying current thereto to convert the oxide dendrites on said screen to a friable hard dense higher oxide of nickel easily brushable off said screen, washing said screen and dendrites, and removing said dendrites from said screen base.

4,074,031

PROCESS FOR PREPARING ELECTRON BEAM RESISTS

Duane Edward Johnson, Los Gatos, and Lester Arlyn Pederson, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 8, 1976, Ser. No. 721,259
Int. Cl.² C08F *8/32*
U.S. Cl. 526—49 **5 Claims**

1. A process for preparing a positive electron beam resist comprising reacting a film which is a copolymer of from 75% to 50% methyl methacrylate and from 25% to 50% methacrylic acid with a tertiary amine.

4,074,032

MANUFACTURE OF HEAT-STABLE BROMINATED OLIGOMERS OF MONOVINYL-AROMATIC COMPOUNDS

Herbert Naarmann, Wattenheim; Klaus Penzien, Frankenthal, and Hermann Gausepohl, Mutterstadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed July 14, 1976, Ser. No. 705,278
Claims priority, application Germany, Aug. 22, 1975, 2537385
Int. Cl.² C08F *8/20, 8/22, 8/04*
U.S. Cl. 526—44 **5 Claims**

1. A process for the manufacture of heat-stable, brominated oligomers of monovinyl-aromatic compounds which comprises:
dissolving selectively hydrogenated oligomers of the monovinyl-aromatic compounds a halogenated solvents; reacting the hydrogenated oligomers with bromine in the presence of a Lewis acid catalyst at a temperature of from — 25° C to + 20° C while starting the reaction solution; washing the reaction solution with water to eliminate bromide ions; and thereafter isolating the brominated reaction product from the reaction solution.

4,074,033

CHEMICAL MILLING OF NEOPRENE RUBBER

Leon E. Wolinski, Cheektowaga; Richard G. Riebling, Hamburg, and John H. Edholm, Tonawanda, all of N.Y., assignors to Pratt & Lambert, Buffalo, N.Y.

Filed July 9, 1976, Ser. No. 703,796
Int. Cl.² C08F *8/06, 8/50*
U.S. Cl. 526—47 **4 Claims**

1. A process for improving the processability of a high molecular weight neoprene polymer which comprises treating a solution of said polymer in an organic solvent with an organic peroxide at room temperature in the presence of oxygen to reduce the molecular weight of said neoprene and lower the viscosity of said solution.

4,074,034

HARDENABLE COMPOSITION

Mitsuo Soga; Yuuzo Takase; Manabu Ishikawa; Masahiko Nakazawa, and Mutumi Nakayama, all of Tokyo, Japan, assignors to Asahi Denka Kogyo K.K., Tokyo, Japan

Filed Sept. 12, 1975, Ser. No. 612,860
Int. Cl.² C08F *8/08*
U.S. Cl. 526—56 **4 Claims**

1. A hardenable composition comprising as a film-forming component a final polymer prepared by reacting (A) a starting polymer prepared by cationic polymerization and consisting of 60 to 100 mole percent of 1,3-pentadiene units and zero to 40 mole percent of 1,3-butadiene units wherein from 50 to 90 molar percent of said units are in cis-1,2 and trans-1,2 configuration and the balance of said units are in 3,4, cis-1,4 and trans-1,4 configuration, said starting polymer having an average molecular weight of about 300 to 10000, with (B) an aqueous solution containing more than 30 up to about 90 weight percent of hydrogen peroxide wherein the amount of hydrogen peroxide is from 0.7 to 3.0 moles per unit mole of said starting polymer, and with (C) a carboxylic acid having the formula RCOOH, wherein R is hydrogen or alkyl having one to three carbon atoms, wherein the amount of said carboxylic acid is from 0.1 to 3.0 moles per unit mole of said starting polymer, the reaction being carried out at 30° to 100° C to obtain said final polymer having a molecular weight of 320 to 15000 and containing 12 to 25 percent of epoxy groups, from 4 to 20 percent of hydroxy groups and acyloxy groups, based on the double bonds contained in the starting polymer, and wherein the ratio of epoxy groups : hydroxy groups : acyloxy groups is 5 to 9 : 1 to 5 : 1 to 5 by equivalents.

4,074,035

HALOMETHYLATED AROMATIC INTERPOLYMERS

Kenneth W. Powers, Berkeley Heights, and Irving Kuntz, Linden, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Apr. 22, 1975, Ser. No. 570,352
Int. Cl.² C08F 4/14, 4/42, 212/00
U.S. Cl. 526—185 2 Claims

1. A continuous process for the preparation of gel-free interpolymers comprised of isobutylene and a mixture of from 0.5 to 5.0 mol % meta and para chloromethyl styrene which comprises:

(a) continuously feeding said monomers in the range of about 2 to about 20 parts by weight, about 80 to about 98 parts by weight of a solvent or mixture of solvents in which said monomers and said interpolymers are soluble and from about 0.001 to about 0.05 parts by weight of a catalyst selected from the group consisting of ethyl aluminum dichloride, ethyl aluminum sesquichloride, diethyl aluminum chloride, or boron trifluoride to a reaction zone maintained at a temperature in the range of about −120° C. to about −20° C. to form a reaction mixture;

(b) maintaining said reaction mixture in said reaction zone at said temperature for a time sufficient to convert at least one of said monomers to said interpolymer in an amount equal to or greater than about 85 percent; and

(c) recovering said interpolymer from the effluent reaction mixture leaving said reaction zone.

4,074,036

PRODUCTION OF LOW MOLECULAR WEIGHT POLYANHYDRIDES

Harold W. Tuller, Long Valley, and Ralph W. Nussbaum, West Orange, both of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Nov. 5, 1976, Ser. No. 739,215
Int. Cl.² C08F 4/12, 212/06, 220/08
U.S. Cl. 526—238 15 Claims

1. In a process for the production of a low molecular weight polyanhydride having a softening point within the range of 111° to 156° C., by the mass polymerization reaction of a maleic monomer and at least one vinyl monomer selected from the group consisting of styrene and alkyl-substituted styrenes at a temperature in the range of about 140° to 200° C., the improvement comprising employing an alkali metal bifluoride as catalyst for said reaction.

4,074,037

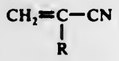
THERMOPLASTIC TERPOLYMERS OF ACRYLONITRILE, VINYL ESTERS AND INDENE

George S. Li, Aurora, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Feb. 28, 1977, Ser. No. 772,724
Int. Cl.² C08F 244/00
U.S. Cl. 526—280 8 Claims

1. The terpolymer composition resulting from the copolymerization of

A. from about 50 to 80% by weight of at least one nitrile having the structure



wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen,

B. from about 10 to 40% by weight of a vinyl ester having the structure $R_1COOCH=CH_2$ wherein R_1 is hydrogen or an alkyl group having from 1 to 5 carbon atoms, and

C. from about 10 to 20% by weight of at least one member selected from the group consisting of indene and coumarone,

wherein the given percentages of (A), (B) and (C) are based on the combined weight of (A) plus (B) plus (C).

4,074,038

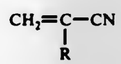
ACRYLONITRILE-STYRENE-INDENE INTERPOLYMERS

George S. Li, Aurora, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 23, 1976, Ser. No. 753,920
Int. Cl.² C08F 244/00
U.S. Cl. 526—280 8 Claims

1. A thermoplastic terpolymer composition resulting from the polymerization of

A. from about 25 to 50% by weight of at least one nitrile having the structure



wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen,

B. from about 30 to 70% by weight of a vinyl aromatic monomer selected from the group consisting of styrene, alpha-methyl styrene, the vinyl toluenes and the vinyl xylenes, and

C. from about 5 to 20% by weight of at least one member selected from the group consisting of indene and coumarone wherein the given percentages of (A), (B) and (C) are based on the combined weights of (A), (B) and (C).

4,074,039

HYDROPHILIC N,N-DIETHYL ACRYLAMIDE COPOLYMERS

Drahoslav Lim, Stanford, Calif.; Jindrich Kopecek, Prague, Czechoslovakia; Hedvika Bazilova nee Sverinova, Nymburk, Czechoslovakia, and Jiri Vacik, Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Continuation-in-part of Ser. No. 363,153, May 23, 1973, abandoned, which is a continuation-in-part of Ser. No. 124,567, March 15, 1971, abandoned. This application Feb. 12, 1976, Ser. No. 657,602
Claims priority, application Czechoslovakia, Mar. 26, 1970, 2020/70
Int. Cl.² C08F 220/54
U.S. Cl. 526—303 10 Claims

1. A hydrophilic gel for use in exposure to repeated or long term contact with live tissues or mucous membranes and consisting of marcomolecules obtained by polymerizing a mixture consisting of 43 to 0.1 parts by weight of a monomer selected from the group consisting of N-(2-hydroxypropyl) methacrylamide, N,N-dihydroxy ethylacrylamide, N-methyl methacrylamide, N-ethyl methacrylamide, acrylonitrile and methacrylonitrile, 52 to 99.5 parts by weight of N,N-diethyl acrylamide and 5 to 0.4 parts by weight of a crosslinking divinylic monomer selected from the group consisting of glycol dimethacrylate, diethylene glycol dimethacrylate, triethylene glycol dimethacrylate, methylene-bis-acrylamide and ethylene-bis- methacryl-amide in the presence of a free radical initiator.

4,074,040

MANUFACTURE OF ETHYLENE POLYMERS IN AN AUTOCLAVE REACTOR

Dieter Oeder, Weisenheim; Hans Gropper, Ludwigshafen, and Friedrich Urban, Limburgerhof, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Jan. 10, 1977, Ser. No. 758,208
Claims priority, application Germany, Mar. 18, 1976, 2611405
Int. Cl.² C08F 2/02, 10/02
U.S. Cl. 526—352 2 Claims

1. A process for the manufacture of an ethylene polymer by homopolymerization of ethylene or copolymerization of ethylene with one or more copolymerizable monomers by introducing the monomer(s) into a polymerization system in which pressures of from 500 to 5,000 bars and temperatures of from 100° to 300° C prevail, and removing a part of the heat of reaction generated by the polymerization by means of a cooling system located in the interior of the polymerization system but separate therefrom, wherein the monomer(s), under a pressure of from 500 to 5,000 bars, is passed continuously through the cooling system, the pressure of the monomer(s) in the cooling system differing by from 0 to 200 bars from that prevailing in the polymerization system and the temperature of the monomer(s) on entering the cooling system being at least 40° C lower than the temperature prevailing in the polymerization system.

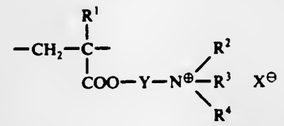
4,074,041

PROCESS FOR PREPARING SOLID WATER SOLUBLE POLYMERS

Takashi Nishikaji; Kenzo Watanabe, both of Sagamihara, and Shigeru Sawayama, Machida, all of Japan, assignors to Mitsubishi Chemical Industries Limited and Kyoritsu Yuki Co., Ltd., both of Tokyo, Japan

Filed Aug. 25, 1976, Ser. No. 717,742
Int. Cl.² C08F 6/12
U.S. Cl. 528—488 9 Claims

1. In a method of dehydrating an aqueous solution or jelly of a water soluble polymer which contains units of a quaternary ammonium salt of an alkylacrylate or a methacrylate having the formula:



wherein R^1 represents hydrogen or methyl; R^2, R^3, and R^4 represent C_1–C_4 lower alkyl or aralkyl having 1 to 4 carbon atoms in the alkyl moiety;

Y is alkylene or hydroxy substituted alkylene having 2 to 4 carbon atoms; and

X is halogen;

wherein said quaternary ammonium salt has been homopolymerized or copolymerized with a comonomer; the improvement which comprises adding from 2 to 50 wt. parts to 100 wt. parts of said water soluble polymer of a strong acid salt of a divalent metal selected from the group consisting of calcium, magnesium and barium to said aqueous solution or jelly.

4,074,042

PSEUDO-ISOCYTIDINE

Kyoichi Aloisius Watanabe; Chung Kwang Chu, both of Portchester, and Jack Jay Fox, White Plains, all of N.Y., assignors to Research Corporation, New York, N.Y.

Filed Aug. 7, 1975, Ser. No. 602,692
Int. Cl.² C07H 7/06
U.S. Cl. 536—1 15 Claims

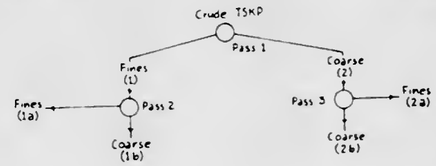
1. Pseudo-isocytidine and pharmaceutically acceptable acid addition salts thereof.

4,074,043

PURIFICATION OF TAMARIND GUM

Duane A. Jones, Minneapolis, Minn., and Wesley A. Jordan, Dallas, Tex., assignors to General Mills Chemicals, Inc., Minneapolis, Minn.

Filed Mar. 15, 1976, Ser. No. 666,994
Int. Cl.² C08B 37/00
U.S. Cl. 536—52 9 Claims



1. A process for purification of crude tamarind seed polysaccharide comprising finely grinding crude tamarind seed kernel powder to a particle size of less than 100 microns, said particle size having a gradation of particle size and air classifying said finely ground crude tamarind seed kernel powder into at least a first fine fraction having an increased protein content and a decreased polysaccharide content and a second coarse fraction having a reduced protein content and an increased polysaccharide content.

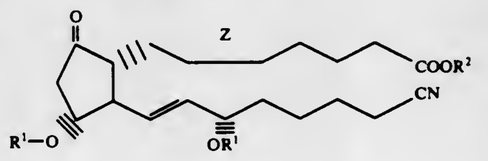
4,074,044

CYANOPROSTAGLANDINS

Hans-Jurgen E. Hess, and Thomas K. Schaaf, both of Old Lyme, Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 712,361, Aug. 6, 1976, Pat. No. 4,045,465. This application Apr. 25, 1977, Ser. No. 790,234
Int. Cl.² C07C 177/00; C07D 309/10
U.S. Cl. 542—402 3 Claims

1. A compound of the formula



wherein

R^1 is 2-tetrahydropyranyl;

R^2 is selected from the group consisting of hydrogen, alkyl having from one to four carbon atoms and 4-biphenylyl; and Z represents a single bond or a cis double bond.

4,074,045

2H-CYCLOPENTA[b]FURAN-2-ONES AND PROCESS FOR PREPARATION

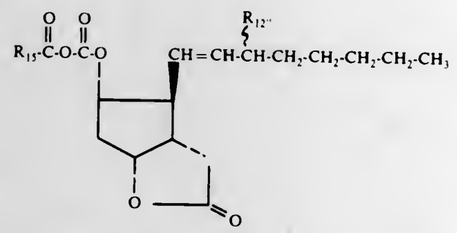
Frank Kienzle, Therwil, Switzerland, and Perry Rosen, North Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 381,322, July 20, 1973, abandoned, which is a continuation-in-part of Ser. No. 300,633, Nov. 25, 1972, abandoned. This application Sept. 10, 1975, Ser. No. 612,132

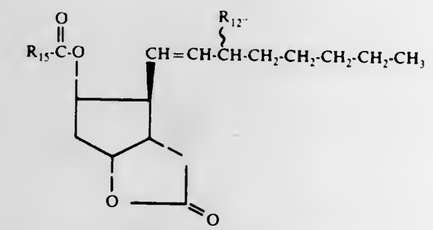
Int. Cl.[2] C07D *307/77*

U.S. Cl. 542—426 **3 Claims**

1. A composition of matter containing a compound of the formula:



or enantiomers or racemates thereof in admixture with a compound of the formula:



or enantiomers or racemates thereof,

wherein R_{15} taken together with its attached



is a radical derived from a conventional aromatic per-organic carboxylic acid by removal of the hydroxy of the per-carboxylic acid group; R_{12}'' is lower alkanoyloxy, benzoyloxy, benzyloxy, benzhydryloxy, tetrahydropyranyloxy, 4-methoxy-5,6-dihydro-2H-pyranyloxy, or trimethyl silyloxy.

4,074,046

PROCESS FOR AZOLES (RING CLOSURE OF NITRO COMPOUNDS)

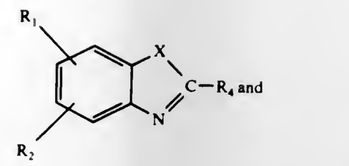
Arthur Gaudens Mohan, Branchburg Township, Somerset County, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 435,377, Jan. 21, 1974, abandoned, which is a continuation of Ser. No. 241,814, April 6, 1972, abandoned, which is a continuation of Ser. No. 846,282, July 30, 1969, abandoned. This application Oct. 14, 1976, Ser. No. 731,978

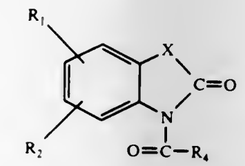
Int. Cl.[2] C07D *413/06, 263/54, 277/60*

U.S. Cl. 542—439 **6 Claims**

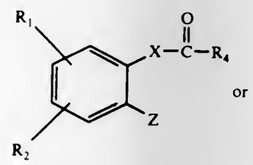
1. A process for preparing 2-substituted azoles having the formulas:



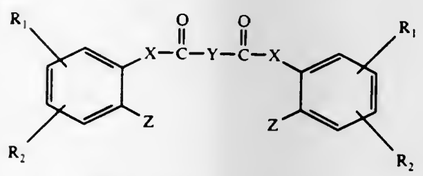
and N-acylazolinones having the formula:



which comprises reacting a nitrogenous compound of the formula:



or



wherein X is oxygen, or sulfur:

R_4 is selected from the group consisting of alkyl C_1-C_{15}, alkenyl C_2-C_4, aryl C_6-C_{10}, or aralkynyl C_8-C_{10};

R_1 and R_2 are independently hydrogen, alkyl C_1-C_4 and halo, or when taken together on adjacent carbon atoms, $-CH=CH-CH=CH-$;

Y is alkenylene; and

Z is nitro, azo, or azoxy; with carbon monoxide in the presence of a polar or non-polar solvent for the nitrogenous compound and a co-catalyst composition consisting essentially of about 10^{-5} to 0.5 gram-atom palladium or rhodium and about 5×10^{-4} to 0.15 mol of iron halide per mol of nitrogen atom, at a temperature of above 60° C. but below the decomposition temperature of said nitrogenous compound and a pressure of about 40 psig to 100,000 psig.

4,074,047

7[2-(AMINOCARBONYLALKOXYIMINO)ACETAMIDO] DERIVATIVES OF CEPHALOSPORIN

Michael W. Foxton, Chalfont, St. Giles; Gordon I. Gregory, Chalfont, St. Peter, and David M. Rogers, Ulverston, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

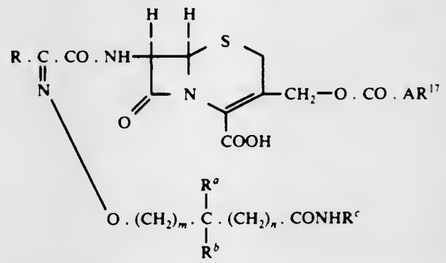
Filed June 9, 1976, Ser. No. 694,465

Claims priority, application United Kingdom, June 19, 1975, 26188/75

Int. Cl.[2] C07D *501/32, 501/34*

U.S. Cl. 544—30 **6 Claims**

1. A compound selected from the group consisting of a cephalosporin antibiotic of the formula



wherein R is phenyl, thienyl or furyl; R^a and R^b are each hydrogen, C_{1-4} alkyl, C_{2-4} alkenyl, C_{3-7} cycloalkyl, carboxy, C_{2-5} alkoxycarbonyl, aminocarbonyl, N-(C_1-C_4alkyl)aminocarbonyl or cyano, or R^a and R^b together with the carbon atom to which they are attached form a C_{3-7} cycloalkylidene or cycloalkenylidene group; R^c is hydrogen or C_{1-4} alkyl; m and n are each 0 or 1 such that the sum of m and n is 0 or 1; A is >O, >S or >NH; and R^{17} is hydrogen or C_{1-7} alkyl and a physiologically acceptable salt, metabolically labile ester or 1-oxide thereof.

4,074,048

PROCESS FOR THE PREPARATION OF 4-HYDROXY-2H-1,2-BENZOTHIAZINE-3-CARBOXAMIDE 1,1-DIOXIDES

Harold Zinnes, Rockaway; Neil A. Lindo, New Providence, and John Shavel, Jr., Mendham, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 10, 1976, Ser. No. 685,011

The portion of the term of this patent subsequent to May 18, 1993, has been disclaimed.

Int. Cl.[2] C07D *279/02, 417/12*

U.S. Cl. 544—49 **1 Claim**

1. 4-hydroxy-N-(2-pyridyl)-2H-1,2-benzothiazine-3-carboxamide 1,1-dioxide.

4,074,049

ANTITHROMBOTIC 1,3,4-THIADIAZOLE

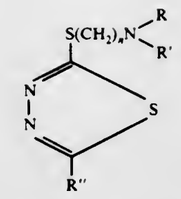
Louis E. Begin, and Joseph E. Dunbar, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 19, 1976, Ser. No. 743,200

Int. Cl.[2] C07D *413/4*

U.S. Cl. 544—82 **9 Claims**

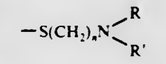
1. A compound of the formula



wherein n is the integer 2, 3, or 4;

R and R′ represent saturated aliphatic hydrocarbon moieties of from 1 to 4 carbon atoms or taken together with the nitrogen atom represent pyrrolidino, hexahydro-(1H)-azepinyl and morpholino;

and R″ represents amino or a moiety having the formula



wherein n, R, and R′ are the same as defined above or the pharmaceutically-acceptable non-toxic acid addition salts thereof.

4,074,050

DIPHENYL-1,3-BENZOXAZINE-2-ONES

Minoru Ozutsumi; Yoshihide Miyazawa, and Masahiko Yamaguchi, all of Tokyo, Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

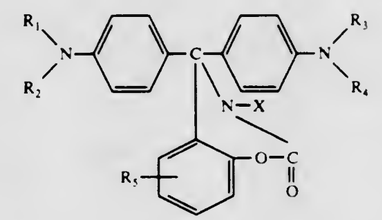
Division of Ser. No. 594,173, July 8, 1975. This application Mar. 16, 1977, Ser. No. 778,280

Claims priority, application Japan, July 8, 1974, 49-77348

Int. Cl.[2] C07D *265/28*

U.S. Cl. 544—92 **4 Claims**

1. A triphenylmethane compound represented by the formula (Ia);



(Ia)

wherein R_1 and R_3, which may be the same or different, each represents, a lower alkyl group having 1 to 4 carbon atoms, a benzyl group or a phenyl group, in which the aromatic nucleus of the benzyl and phenyl groups may be substituted with a lower alkyl group having 1 to 4 carbon atoms, a lower alkoxy group having 1 to 4 carbon atoms or a di-lower alkylamino group having 1 to 4 carbon atoms in each of the alkyl moieties thereof; R_2 and R_4, which may be the same or different, each represents a hydrogen atom, a lower alkyl group having 1 to 4 carbon atoms, a benzyl group or a phenyl group in which the aromatic nucleus of the benzyl and phenyl groups may be substituted with a halogen atom or a di-lower alkylamino group having 1 to 4 carbon atoms in each of the alkyl moieties thereof; R_5 represents a hydrogen atom, a lower alkyl group having 1 to 4 carbon atoms, a lower alkoxy group having 1 to 4 carbon atoms, a halogen atom, a di-lower alkylamino group having 1 to 4 carbon atoms in each of the alkyl moieties thereof, a dibenzylamino group, an N-lower alkyl-N-benzyl group having 1 to 4 carbon atoms in the alkyl moiety thereof or an N-lower alkyl-N-phenylamino group having 1 to 4 carbon atoms in the alkyl moiety thereof, in which the aromatic nucleus of the benzyl and phenyl groups may be substituted

with a halogen atom, a lower alkyl group having 1 to 4 carbon atoms, or a lower alkoxy group having 1 to 4 carbon atoms; and X represents a lower alkyl group having 1 to 4 carbon atoms, a lower alkenyl group having 2 to 4 carbon atoms, a cyclohexyl group, an aralkyl group having 1 to 4 carbon atoms in the alkyl moiety thereof or an aryl group, in which the aromatic nucleus of said aralkyl and aryl groups may be substituted with a lower alkyl group having 1 to 4 carbon atoms, a lower alkoxy group having 1 to 4 carbon atoms, a di-lower alkylamino group having 1 to 4 carbon atoms in each of the alkyl moieties thereof, a halogen atom, a nitro group, and when the aralkyl group is a benzyl group, the aromatic nucleus thereof may also be substituted with an N-lower alkyl-N-phenyl group having 1 to 4 carbon atoms in the N-lower alkyl moiety thereof.

4,074,051

3-PYRAZOLIDINONE DERIVATIVES

John Stevens, Harlow, England, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 206,168, Dec. 8, 1971, abandoned, which is a continuation of Ser. No. 853,941, Aug. 8, 1969, abandoned. This application Nov. 29, 1973, Ser. No. 420,292

Int. Cl.[2] C07D *231/08*

U.S. Cl. 544—140 **5 Claims**

1. 4-Morpholinomethyl-1-phenylpyrazolidin-3-one.

4,074,052

PROCESS FOR PREPARATION OF ISOCYANURIC ACID TRIESTERS

Susumu Handa, Wakayama; Yoshiaki Tanaka, Osaka; Atsushi Nishihata, Wakayama; Sadashi Ueda, Wakayama; Yoshiaki Inamoto, Wakayama; Fumio Tanimoto, Kyoto, and Hisao Kitano, Osaka, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

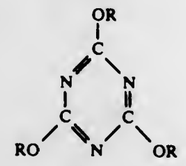
Filed Dec. 9, 1976, Ser. No. 749,053

Claims priority, application Japan, Jan. 19, 1976, 51-4828

Int. Cl.[2] C07D *251/34*

U.S. Cl. 544—221 **13 Claims**

1. A process of preparing an isocyanuric acid triester, which comprises the steps of heating at a temperature of from 50° to 200° C, a solution of a cyanuric acid triester having the formula



wherein R is alkyl, alkenyl, alkynyl or aralkyl, dissolved in a solvent comprising a liquid polar organic substance having a dielectric constant of at least 15 which is free of active hydrogen atoms and contains a nitrogen or sulfur atom in the molecule and has a boiling point not higher than 260° C, to effect a liquid phase isomerization of said cyanuric acid triester to the corresponding isocyanuric acid triester; and recovering said isocyanuric acid triester from the reaction mixture.

4,074,053

ALDEHYDES OF 2-HYDROXY-NAPHTHALENE-3-CARBOXYLIC ACID ARYLIDES

Klaus Hunger, Kelkheim, Taunus, and Theodor Papenfuhs, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

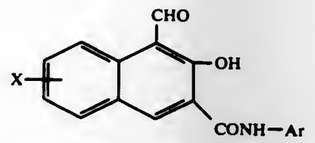
Division of Ser. No. 489,538, July 18, 1974, Pat. No. 3,947,516. This application Mar. 26, 1976, Ser. No. 670,997

Claims priority, application Germany, July 20, 1973, 2337023

Int. Cl.[2] C07D *235/26*

U.S. Cl. 548—305 **2 Claims**

1. An aldehyde of a 2-hydroxynaphthalene-3-carboxylic acid arylide of the formula



wherein X is hydrogen, chlorine or bromine and Ar is benzimidazolonyl or chlorobenzimidazolonyl, the amide nitrogen being connected to a ring carbon of the benzo-moiety of said benzimidazolonyl or chlorobenzimidazolonyl.

4,074,054

IMIDAZOLES AND 2-ALKYL IMIDAZOLES AND METHOD FOR THEIR MANUFACTURE

Yani Christidis, Paris, and Dominique Depernet, Stains, both of France, assignors to Nobel Hoechst Chimie, Puteaux, France

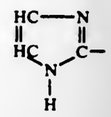
Filed Mar. 31, 1976, Ser. No. 672,493

Claims priority, application France, Apr. 3, 1975, 75 10510

Int. Cl.[2] C07D *233/58*

U.S. Cl. 548—335 **5 Claims**

1. In the process of manufacturing an imidazole of the structural formula:



wherein R represents hydrogen or alkyl from 1 to 17 carbon atoms, by condensing glyoxal with an alkanal of 1–18 carbon atoms and ammonia, the improvement comprising effecting said condensation at a pH from 6 to 8 in an aqueous alcoholic medium, said glyoxal being in its bisulphitic combination form and said ammonia being provided as an ammonium salt selected from the group consisting of ammonium carbonate, ammonium bicarbonate, and the ammonium salt resulting from the reaction of ammonia with sodium hydrogen sulfite.

4,074,055

PROCESS FOR PREPARING UNSATURATED IMIDAZOLINES

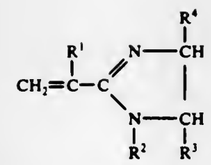
Hans Peter Panzer, Stamford; Michael Niall Desmond O'Connor, Norwalk, and Louis J. Baccei, Farmington, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 467,331, May 6, 1974, Pat. No. 4,006,247. This application Nov. 8, 1976, Ser. No. 740,161

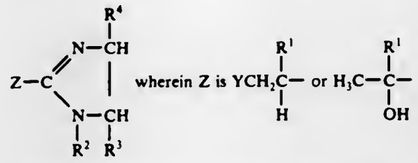
Int. Cl.[2] C07D *233/06*

U.S. Cl. 548—347 **16 Claims**

1. A method for the production of a compound having the formula



wherein R^1 is hydrogen or methyl and R^2, R^3 and R^4 are, individually, hydrogen, alkyl (C_1–C_4), aryl (C_6–C_{10}), aralkyl (C_7–C_{11}) or alkaryl (C_7–C_{11}) which comprises heating to a temperature ranging from about 275° C to about 500° C, under subatmospheric pressure, a starting compound having the formula



Y being hydroxyl or RO, wherein R is alkyl (C_1–C_{10}), aryl (C_6–C_{10}) or aralkyl (C_7–C_{11}) and R^1, R^2, R^3 and R^4 are as described above, in the presence of heterogeneous vapor phase catalyst and up to about 30%, by weight, based on the weight of said starting compound, of water, and recovering the resultant compound.

4,074,056

3-ALKYL-2-(6-CARBOXYHEXYL) CYCLOPENTANONES AND ESTERS AND SALTS THEREOF

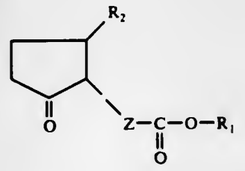
Robert Eugene Schaub, Upper Saddle River, N.J.; Karel Francis Bernady, Suffern, N.Y., and Martin Joseph Weiss, Oradell, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 240,814, April 3, 1972, Pat. No. 4,018,811, which is a continuation-in-part of Ser. No. 225,680, Feb. 11, 1972, abandoned, which is a continuation-in-part of Ser. No. 95,910, Dec. 7, 1970, abandoned. This application Jan. 4, 1977, Ser. No. 756,667

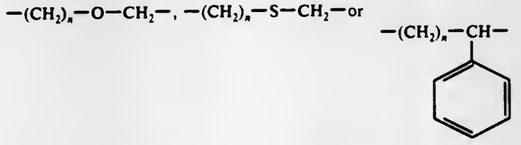
Int. Cl.[2] C07C *177/00*

U.S. Cl. 560—51 **10 Claims**

1. A compound selected from the group consisting of those of the formula:



wherein R_1 is hydrogen or alkyl having up to four carbon atoms; R_2 is a straight chain alkyl group having from one to ten carbon atoms, inclusive; and Z is a divalent radical of the formulae:



wherein n is an integer from three to five, inclusive; the stereoisomers thereof; and the cationic salts thereof when R_1 is hydrogen.

4,074,057

2-HALOPROPIONIC ACID AND ITS DERIVATIVES

Yutaka Kawamatsu, Kyoto; Takahiro Saraie, Osaka; Eiko Imamiya, Tondabayashi, and Yukihiko Hamuro, Hyogo, all of Japan, assignors to Takeda Chemical Co., Ltd., Japan

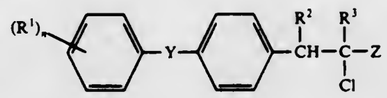
Continuation-in-part of Ser. No. 531,747, Dec. 11, 1974, abandoned. This application Sept. 30, 1976, Ser. No. 728,193

Claims priority, application Japan, Dec. 12, 1973, 48-139199; Apr. 19, 1974, 49-44634; May 22, 1974, 49-58116; Oct. 9, 1974, 49-116559

Int. Cl.[2] C07C *69/76*

U.S. Cl. 560—55 **30 Claims**

1. A compound of the formula:



wherein R^1 represents hydrogen, lower alkyl having 1 to 5 carbon atoms, halogen, hydroxyl, lower alkoxy having 1 to 4 carbon atoms or trifluoromethyl; R^2 and R^3 are the same or different and each represents hydrogen or lower alkyl having 1 to 5 carbon atoms; Y represents alkylenoxy having 1 to 6 carbon atoms or alkylenedioxy having 1 to 6 carbon atoms; Z represents a carboxyl group or group convertible to a carboxyl group which is an aminocarbonyl group, an alkoxycarbonyl group having 2 to 5 carbon atoms, a mono- or di-alkylaminocarbonyl group having 2 to 9 carbon atoms or mono- or di-arylaminocarbonyl group having 7 to 16 carbon atoms and $n = 1$ or 2.

4,074,058

ANTIMICROBIAL ESTERS OF ALIPHATIC DIOLS

August V. Bailey; Gordon J. Boudreaux; Gene Sumrell, all of New Orleans, and Arthur F. Novak, Baton Rouge, all of La., assignors to The United States of America, as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 667,055, March 15, 1976, Pat. No. 4,024,164. This application Feb. 15, 1977, Ser. No. 768,805

Int. Cl.[2] C07C *69/76, 69/78*

U.S. Cl. 560—105 **2 Claims**

1. 4-Benzoxy-2-butenyl trimethylacetate.
2. 4-Benzoxy-2-butenyl hydrocinnamate.

4,074,059

SUBSTITUTED-1-PHENOL-4-SULFONAMIDES

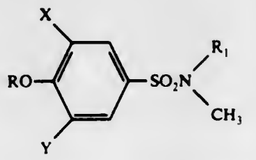
Milon Walker Bullock, Hopewell, and Bryant Leonidas Walworth, Pennington, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 19, 1972, Ser. No. 219,123

Int. Cl.[2] C07D *143/78*

U.S. Cl. 560—135 **7 Claims**

1. A compound of the formula



wherein X and Y are each selected from the group Br and Cl; R is H or —CO—NH—CH_3; and R_1 is H or CH_3.

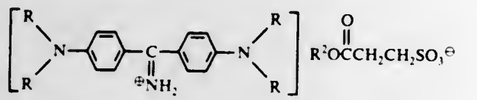
4,074,060

AURAMINE SALTS

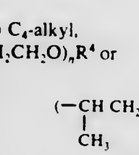
Manfred Eisert, Ludwigshafen, and Karl Schmeidl, Frankenthal, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Jan. 2, 1976, Ser. No. 646,242
Claims priority, application Germany, Jan. 24, 1975, 2502838
Int. Cl.² C07C *143/12*; C09D *11/02*
U.S. Cl. 560—149 4 Claims

1. A water soluble compound of the formula



in which
R is C_1—to C_4-alkyl,
R^2 is $-(CH_2CH_2O)_nR^4$ or



n is 1, 2 or 3 and
R^4 is hydrogen or C_1— to C_4-alkyl.

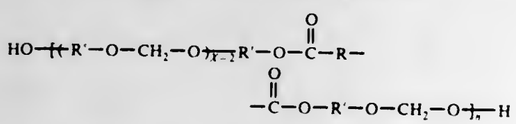
4,074,061

UNSATURATED POLYESTER CONTAINING FORMAL LINKAGES

Harry Robert Musser, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 26, 1976, Ser. No. 735,856
Int. Cl.² C07C *69/60*
U.S. Cl. 560—193 5 Claims

1. A polyester having a molecular weight in the range of 1,000 to 3,000 comprised of the following structure



X is a positive number from 2 to 10,
n is a sufficient number of repeating units to achieve the required molecular weight,
R is the divalent radical remaining after removal of the terminal carboxyl groups from an α,β-ethylenically unsaturated dicarboxylic acid, and
R′ is the divalent radical remaining after removal of the terminal hydroxyl groups from an aliphatic or cycloaliphatic glycol selected from the group consisting of 1,6-hexanediol, 1,7-heptanediol, 1,8-octanediol, 1,10-decanediol, 2,2,4-trimethyl-1,6-hexanediol, 1,4-cyclohexanediol, 1,2-cyclohexanedimethanol, 1,3-cyclohexanedimethanol, 1,4-cyclohexanedimethanol, 2,2,4,4-tetramethyl-1,3-cyclobutanediol.

4,074,062

PROCESS FOR PRODUCING UNSATURATED CARBOXYLIC ACID ESTERS

Fumiki Murakami, Otake; Soichi Teshima, Yamaguchi, and Toshihiko Yokoyama, Otake, all of Japan, assignors to Mitsubishi Rayon Company, Limited, Tokyo, Japan

Filed July 7, 1976, Ser. No. 703,263
Claims priority, application Japan, Aug. 21, 1975, 50-101436; Aug. 21, 1975, 50-101437; Mar. 12, 1976, 51-26834
Int. Cl.² C07C *69/54*
U.S. Cl. 560—217 17 Claims

1. An ester exchange process which comprises:
preparing an ester of unsaturated carboxylic acid by reacting a lower alkyl ester of an unsaturated, 3–4 carbon atom carboxylic acid with an alcohol different than the alcohol fragment of said lower alkyl ester over a catalyst selected from the group consisting of
1. metallic barium, barium compounds or mixtures thereof;
2. metallic thallium, thallium compounds or mixtures thereof;
3. metallic molybdenum, molybdenum compounds or mixtures thereof, and mixtures thereof by an ester exchange reaction.

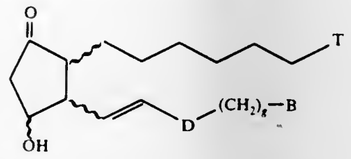
4,074,063

BICYCLOALKYL DERIVATIVES OF PROSTAGLANDINS

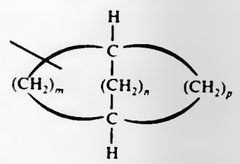
Warren Dexter Woessner; Charles John Sih; Harold Clinton Kluender; Henry Clifford Arndt, and William Gerard Biddlecom, all of Madison, Wis., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Feb. 11, 1976, Ser. No. 657,221
Int. Cl.² C07C *177/00*
U.S. Cl. 560—121 9 Claims

1. A compound having the formula



wherein
g is an integer having a value of from 0 to 10;
D is a R-hydroxymethylene or S-hydroxymethylene radical;
T is an alkoxycarbonyl having from 1 to 3 carbon atoms inclusive in the alkyl chain or carboxyl radical or pharmacologically acceptable nontoxic carboxy salts; and
B is a bicycloalkyl radical of the formula



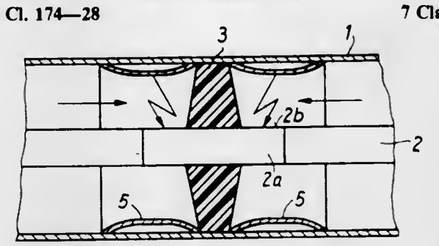
where m and p are integers having a value of from 1 to 4; n is an integer having a value of from 0 to 4 such that n is not 1 when m and p are both 2; and the sum of m, n and p is greater than or equal to 3 and where the point of attachment of the alkyl chain $(CH_2)_g$ to the bicycloalkyl radical is in the $(CH_2)_m$ bridge or bridgehead position.

4,074,064

ENCAPSULATED, GAS-INSULATED HIGH-VOLTAGE APPARATUS HAVING INCREASED RESISTANCE TO ARC ACTIVITY

Kurt Müller; Friedrich Richter, and Heinz-Helmut Schramm, all of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 19, 1974, Ser. No. 525,228
Claims priority, application Germany, Nov. 29, 1973, 2360071
Int. Cl.² H01B *9/04*
U.S. Cl. 174—28 7 Claims



1. In a gas-insulated, high-voltage apparatus wherein arcs can develop, the apparatus including: a metal enclosure; at least one electrical conductor made of aluminum or an alloy thereof; and an insulator for holding said conductor in spaced relation to said metal enclosure; and, wherein the improvement comprises: a metal member arranged at said conductor at locations thereof subject to the greatest arc activity, said metal member having a surface of electrically conductive, arc-resistant material facing said metal enclosure, said material having a reaction enthalpy less than the reaction enthalpy required to cause a chemical reaction of the material of said conductor with the gas under the action of an arc forming during the operation of the apparatus.

4,074,065

INSULATED WIRE SPLICE

Harry Vincent Leaf, Marshfield, and Francis J. Cassidy, Brockton, both of Mass., assignors to Ark-Les Switch Corporation, Watertown, Mass.

Continuation-in-part of Ser. No. 600,208, July 30, 1975, Pat. No. 3,999,273. This application Mar. 22, 1976, Ser. No. 669,155
Int. Cl.² H01R *5/10*
U.S. Cl. 174—87 3 Claims



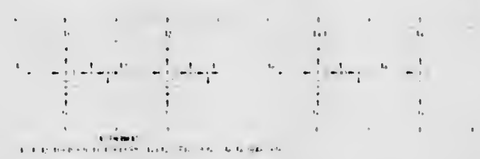
1. A post-insulated wire splice including
a conductive connector and an insulating member surrounding said connector,
said connector including a ferrule crimped around at least two wires, said ferrule having a generally smoothly curvd exterior surface and having outer and inner ends defined with respect to said wires, said wires extending externally beyond said ferrule inner end and being terminated adjacent said ferrule outer end,
said connector having a separation portion extending beyond said ferrule outer end, including an exterior surface continuous with a portion of said ferrule exterior surface and a sheared edge remote from said ferrule,
said separation portion being deformed from a shape coincident with a portion of the projection of said ferrule exterior surface to displace said sheared edge inwardly of said projection of said ferrule exterior surface toward said wires,
said insulating member comprising a generally tubular sleeve of insulating plastic material,
said insulating member fitting closely around said connector, and said connector sheared edge being spaced inwardly from said insulating member.

4,074,066

MESSAGE VERIFICATION AND TRANSMISSION ERROR DETECTION BY BLOCK CHAINING

William Friedrich Ehrsam, Hurley; Carl H. W. Meyer, Kingston; John Lynn Smith, and Walter Leonard Tuchman, both of Woodstock, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 26, 1976, Ser. No. 680,404
Int. Cl.² H04L *9/02*
U.S. Cl. 178—22 12 Claims



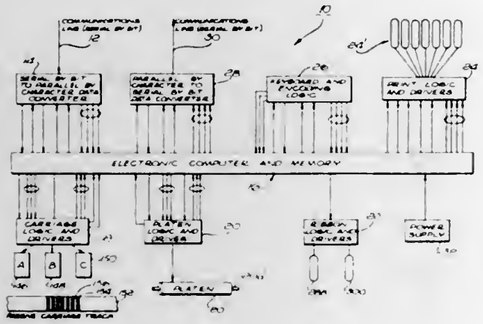
1. A system for the transmission of an input message consisting of successive input blocks of clear data bits from a sending station to a receiving station, comprising:
first cryptographic apparatus included in said sending station,
means applying said input message to said first cryptographic apparatus,
said first cryptographic apparatus operative in successive single cipher function operations for ciphering successive input blocks of clear data bits of said input message under control of successive input sets of cipher key bits to provide an output message consisting of successive output blocks of ciphered data bits corresponding to said successive input blocks of clear data bits for transmission to said receiving station,
means included in said first cryptographic apparatus providing one of said inputs for each succeeding single cipher function operation of said first cryptographic apparatus as a function of at least the preceding input block of clear data bits and the preceding output block of ciphered data bits of each preceding single cipher function operation so that each succeeding output block of ciphered data bits is effectively chained to all preceding single cipher function operations of said first cryptographic apparatus,
second cryptographic apparatus included in said receiving station receiving said output message transmmitted from said sending station as an input message consisting of successive input blocks of ciphered data bits and operative in successive single cipher function operations for deciphering successive input blocks of ciphered data bits under control of successive input sets of cipher key bits to provide a deciphered message consisting of successive output blocks of clear data bits corresponding to said successive input blocks of clear data bits of said input message of said sending station, and
means included in said second cryptographic apparatus providing one of said inputs for each succeeding single cipher function operation of said second cryptographic apparatus as a function of at least the preceding input block of ciphered data bits and the preceding deciphered output block of clear data bits of each preceding single cipher function operation so that each succeeding deciphered output block of clear data bits is effectively chained to all preceding single cipher function operations of said second cryptographic apparatus.

4,074,067

DIGITAL PRINTOUT ARRANGEMENT WITH MAGNETIC FIELD CARRIAGE DRIVE

Arthur Speckhard, 1617 Granvia Altamira, Palos Verdes Estates, Calif. 90274

Filed June 25, 1976, Ser. No. 699,623
Int. Cl.[2] B41J 5/30; H04L 15/00
U.S. Cl. 178—23 R 18 Claims



1. In a printout arrangement for providing a predetermined printout on a medium in response to a known first coded information signal, the improvement comprising, in combination:

a platen means for incremental, digital rotational movement adjacent said medium to move said medium in first directions;

platen drive means operatively connected to said platen means for selectively moving said platen in response to a platen control signal;

carriage means adjacent said medium for digital incremental reciprocating motion in second directions different from said first directions;

carriage drive means operatively connected to said carriage means for driving said carriage in said second directions in response to a carriage drive signal, and said carriage drive means comprising means for providing magnetic forces for interaction between said carriage drive means and said carriage to provide said digital incremental reciprocating motion thereof, and said carriage means being free of mechanical interconnection to said carriage drive means;

a print head means mounted on said carriage means for movement therewith, for printing predetermined sequential patterns on the medium;

print head control means operatively connected to said print head for controlling said predetermined sequential patterns of printing in response to a print control signal;

ribbon means mounted for digital, incremental movement intermediate said print head and said medium;

ribbon drive means operatively connected to said ribbon for selectively moving said ribbon in response to a ribbon control signal;

data converter means for receiving said first coded informaton signal and converting said first coded information signal to a second coded information signal different from said first coded information signal;

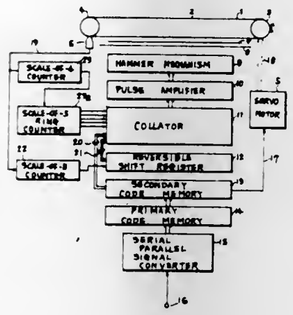
microprocessor means for receiving said second coded information signal and generating said platen control signal, said carriage control signal, said print control signal and said ribbon control signal in response to said second coded information signal in an interrelated predetermined timed sequence to provide said sequential patterns of printing in predetermined locations on said medium.

4,074,068

FLYING PRINTING SYSTEM USING TYPE BELT

Tasaku Wada, and Satoru Nakabo, both of Tokyo, Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Aug. 13, 1976, Ser. No. 714,276
Claims priority, application Japan, Aug. 15, 1975, 50-99361
Int. Cl.[2] B41J 1/00; H04L 15/34
U.S. Cl. 178—23 R 4 Claims



1. A flying printing system comprising:

a type belt having thereon types at a type pitch M different from a predetermined print pitch N, the respective numbers d_1 and d_2 of said print pitches N and said type pitches M per unit length being an integral of said print pitch and being determined under a condition: $M=N\cdot d_1/d_2$, said types being arranged such that respective telegraph codes of the successively arranged types successively change in binary numbers;

drive means coupled to said type belt to drive said type belt at a travelling speed in a travelling direction;

print means including type hammers disposed opposite said type belt and arranged at a pitch corresponding to said print pitch N;

sense means coupled to said drive means to develop type clock pulses indicative of the travelling timing of said type belt;

first count-down means coupled to said sense means for counting down said type clock pusles to one-d_1th to develop first counted down pulses;

second count-down means coupled to said sense means for counting down said type clock pulses to one $_2$th to develop second counted down pulses;

first shift register means coupled to said second count-down means for developing type corresponding codes successively indicative of telegraph codes of said types on said type belt in synchronism with the traveling of said types on said type belt;

input terminal means receptive of input telegraph codes of serial signal configuration;

signal conversion means connected to said input terminal means for converting said input telegraph codes of serial signal configuration to parallel signal configuration;

primary code memory means connected to said signal conversion means for temporarily storing said converted telegraph codes of parallel signal configuration;

secondary code memory means operatively coupled to said primary code memory means for temporarily storing said converted telegraph codes of parallel signal configuration except function codes;

second shift register means coupled to said first count-down means and said secondary code memory for developing address codes to read out the telegraph codes of parallel signal configuration from the secondary code memory means;

collator means coupled to said first shift register and said secondary code memory for successively comparing each of said read out telegraph codes from the secondary code memory with all of said type corresponding codes at the intervals d_1/d_2 times the time intervals of said type clock pulses; and

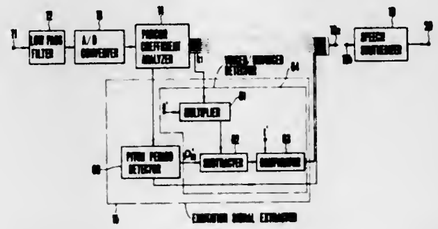
means connected to said collator means and said print means for driving a corresponding one of said type hammers when compared codes coincide with each other at the collator means.

4,074,069

METHOD AND APPARATUS FOR JUDGING VOICED AND UNVOICED CONDITIONS OF SPEECH SIGNAL

Yoichi Tokura, Kodaira, and Shinichiro Hashimoto, Koganei, both of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Japan

Filed June 1, 1976, Ser. No. 691,780
Claims priority, application Japan, June 18, 1975, 50-73063; July 15, 1975, 50-86277
Int. Cl.[2] G10L 1/00
U.S. Cl. 179—1 SC 24 Claims



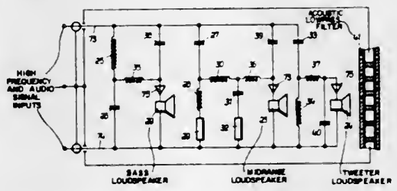
1. A method of judging voiced and unvoiced conditions of a speech signal, comprising the steps of determining a ratio $\phi(\tau s)/\phi(o)$ between the value $\phi(o)$ of the autocorrelation function of a speech signal at a zero delay time, and the value $\phi(\tau s)$ of the autocorrelation function at a delay time τs of a sampling period, and combining said ratio with a parameter extracted from the speech signal by correlation technique and representing the degree of the periodicity of the speech signal thereby judging that the speech signal is in a voiced condition or an unvoiced condition.

4,074,070

SUPERSONIC SIGNAL LINEARIZES LOUDSPEAKER OPERATION

Harry Gaus, Kronberg, Taunus, Germany, assignor to Braun A.G., Frankfurt, Germany

Filed Sept. 29, 1975, Ser. No. 617,825
Claims priority, application Germany, Oct. 2, 1974, 2446982
Int. Cl.[2] H04R 3/04, 3/14
U.S. Cl. 179—1 D 11 Claims



1. A process for minimizing audio distortions in electrodynamic loudspeaker apparatus having first, second, and third loudspeaker systems each having a driving system including a diaphragm connected to a coil moving in response to electrical signals, which comprises:

superimposing a high frequency oscillation signal on a low frequency audio signal coupled to said movable coils;

vibrating said diaphragms in response to said high frequency oscillation signal and said low frequency audio signal; and

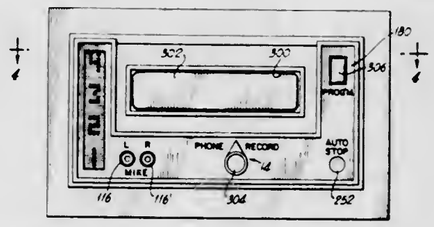
providing minimum damping of said high frequency signal coupled to said driving system of said first and second loudspeaker systems, and an increase in damping for signals at frequencies above an auditory frequency range coupled to said driving system of said third loudspeaker system.

4,074,071

AUTOMATIC TELEPHONE ANSWERING DEVICE WITH PAIRED TRANSDUCERS

Robert Shragal, Bellwood, Ill., assignor to Wells-Gardner Electronics Corporation, Chicago, Ill.

Filed Apr. 2, 1976, Ser. No. 672,864
Int. Cl.[2] H04M 1/64; G11B 21/08
U.S. Cl. 179—6 R 21 Claims



1. A telephone answering device comprising:

first and second transducers movably affixed within said telephone answering device;

means for transporting a single closed loop record medium having multiple pairs of recording tracks across each of said first and second transducers; and

means electrically coupled to said first and second transducers for rendering said first transducer operative to play back signals recorded on one of the tracks of one of said pairs and for simultaneously rendering said second transducer operative to record signals on the other track of said one pair, wherein said device further includes means mechanically coupled to said first and second transducers for simultaneously realigning said transducers with different pairs of said tracks, said realigning means being operative to realign said transducers with a different pair of said tracks upon the recording of one telephone call.

12. The method of automatically answering a telephone comprising the steps of:

recording multiple answering messages on one half of the tracks of a multiple track record medium;

playing back one of the answering messages into the telephone line upon receipt of an incoming telephone call;

recording the incoming telephone call on another track of the same record medium associated with the played back answering message; and

playing back a second one of the answering messages from a second track into the telephone line upon receipt of a subsequent telephone call.

4,074,072

MULTIPROCESSOR CONTROL OF A PARTITIONED SWITCHING NETWORK BY CONTROL COMMUNICATION THROUGH THE NETWORK

Carl Christensen, Berkeley Heights; Arthur Dickson Hause, Watchung, and Henry Stanton McDonald, Summit, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 24, 1976, Ser. No. 689,510
Int. Cl.[2] H04Q 11/04
U.S. Cl. 179—15 AQ 23 Claims

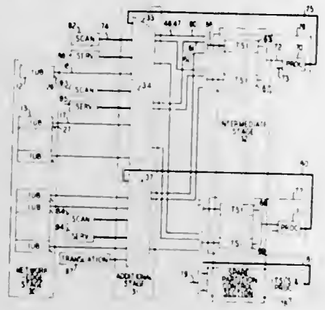
1. In a switching network for selectively establishing interconnections between signal communication ports at the edge of the network,

a plurality of stages in said network, one of said stages being divided into plural signal path switching blocks,

a plurality of signal processors equal in number to the number of said blocks of said one stage, and

means for coupling each of said processors to a different corresponding block of said one stage for controlling through said coupling means call path coupling both through that block and through a predetermined portion of each of the other stages of said network coupled between such block and an edge of said network.

5. The network in accordance with claim 1 in which said network is a time division multiplex switching network with



reconfigurable call path interconnections in plural time slots of recurring time frames, and said one stage is an intermediate stage and includes

at least one time slot interchanging means in each of said intermediate stage blocks,

means for coupling said interchanging means to be controlled from said processor which is coupled to such block, and

means for coupling signals between the last mentioned processor and said plurality of stages through said interchanging means.

4,074,073

PILOT RECEIVER MEMORY UNIT IN A CARRIER FREQUENCY SYSTEM

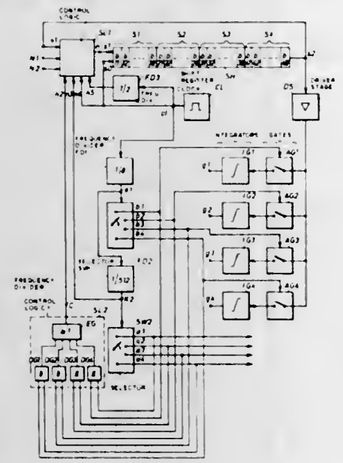
Arne Eidsmo, Tyreso, and Bengt Gustav Löfmark, Skarholmen, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Mar. 19, 1976, Ser. No. 668,429

Claims priority, application Sweden, Apr. 4, 1975, 7503881

Int. Cl.² H04J *1/16*

U.S. Cl. 179—15 BP **4 Claims**



1. In the receiver section of a carrier frequency system utilizing pilot signals for space-divided frequency groups having a receiver with receiver paths for each of the groups, a regulating unit in each of the receiver paths, and a memory unit, the receiver delivering determination signals for each of said groups to the memory unit in dependence on the value of the pilot signal associated with the group, the determination signals indicating the level of the pilot signal of the group in relation to a nominal level in order to determine a value to be stored in the memory unit, and the value being supplied as a control value to the regulating unit in the receiver path of the group, the improvement comprising:

a multi-section digital shift register with a section being provided for each of the space-divided group, the binary value stored in each section representing a control value for a specific group,

first control logic means for either changing at least one binary value to its complementary value or maintaining the binary value unchanged in dependence on the determination signals upon receipt of an activating signal,

clock means for circulating the contents of the shift register sections via said first control logic means for effecting the change or no change of the binary value in a shift register section,

controllable converter means provided for each of the space-divided groups in order to transmit the contents of each of said shift register sections in analog form to the regulating units of the groups,

first timing means controlled by said clock means for controlling said controllable converter means to a conducting state in synchronism with the emission of the contents of the corresponding shift register section,

second timing means controlled by said clock means for delivering control pulses to the receiving path of each space-divided group in order to feed the associated group pilot signal to the receiver, and

second control logic means for transmitting an activating signal to said first control logic means during the emission of the binary contents of a certain shift register section simultaneously with the control pulse from said second timing means which belongs to the frequency group associated with said certain shift register section.

4,074,074

TIME DIVISION DIGITAL TRANSMISSION SYSTEM

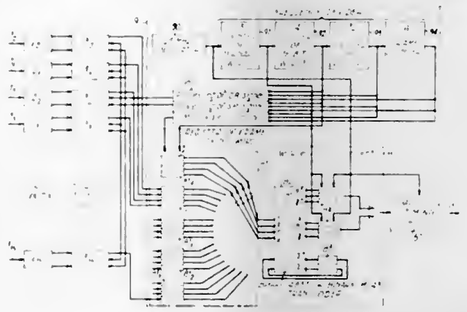
Patrick E. Boutmy, and Jean G. Walraet, both of Lannion, France, assignors to Societe Anonyme de Telecommunications, Paris Cedex, France

Filed Apr. 15, 1977, Ser. No. 788,040

Claims priority, application France, Apr. 23, 1976, 76 12129

Int. Cl.² H04J *3/04*

U.S. Cl. 179—15 BW **7 Claims**



1. A time-division digital transmission system comprising transmitting and recieving stations and transmission lines interconnecting said respective stations using a binary code in said stations and a multi-level code in said transmission lines in which a number of component digital channels having a low flow rate are multiplexed into a single resultant channel having a high flow rate, said multi-level code being such that a number N of bits in said binary code in the transmitting and receiving stations corresponds to a smaller number N' of digits of the multi-level code whereby a predetermined flow rate in said stations corresponds to a smaller flow rate in said transmission lines which is equal to N'/N times said predetermined flow rate in said stations, said time-division digital transmission system comprising:

1. each of said transmitting stations having:
   a. means for placing in parallel the bits of a number of said component digital channels equal to an integral multiple k of N at the rate of one bit per component digital channel so as to form parallel words of kN bits;
   b. means for multiplexing the bits of said parallel kN-bit words into k parallel words of N bits;
   c. means for converting said parallel N-bit words from said binary code used in said stations into parallel words of N' digits in said multi-level code used in said transmission lines; and
   d. the multiplexing and code conversion being practically simultaneous without producing a binary multiplex signal which is serialized; and
2. each of said receiving stations having:
   a. means for distributing the bits of said parallel words of kN bits at the rate of one bit on each of the kN component digital channels;
   b. means for converting said parallel N'-digital words into parallel N-bit words of said binary code used in said stations;
   c. means for forming parallel words of kN bits out of the number of k of N-bit words supplied by converting means in said receiving part; and
   d. means for multiplexing said parallel kN-bit words into kN bits at the rate of one bit per component digital channel.

4,074,075

CIRCUIT FOR DEMODULATING A STEREO SIGNAL

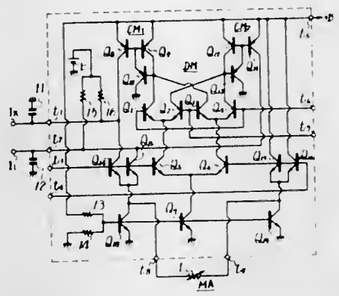
Mitsuo Ohsawa, Fujisawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 28, 1976, Ser. No. 736,306

Claims priority, application Japan, Oct. 30, 1975, 50-130917

Int. Cl.² H04H *5/00*

U.S. Cl. 179—15 BT **8 Claims**



1. A stereo demodulating circuit for demodulating a composite stereo signal to produce signals representing information contained in individual channels of the composite stereo signal, comprising:

switching means supplied with said composite stereo signal including a main-channel (L+R) signal, a sub-channel (L−R) signal modulated onto a sub-carrier, and a sub-carrier switching signal, said switching means producing oppositely phased sub-channel signals (L−R) and −(L−R), respectively;

first and second current generating means coupled to said switching means for producing first and second currents proportional to said oppositely phased sub-channel signals (L−R) and −(L−R), respectively;

an amplifier supplied with said composite stereo signal for amplifying said main-channel (L+R) signal, said amplifier including a first pair of transistors connected as differential amplifier type switching circuits to first and second current sources, respectively, and a second pair of transistors connected as differential amplifier type switching circuits to said first and second current sources, respectively;

channel separation control means interconnected between said first and second current sources for adjustably varying the currents flowing through said first and second pairs of transistors;

first and second output terminals for producing individual channel information signals L and R, respectively; and

means for supplying said first current produced by said first current generating means and a current flowing through said first pair of transistors to said first output terminal, and for supplying said second current produced by said second current generating means and a current flowing through said second pair of transistors to said second output terminal.

4,074,076

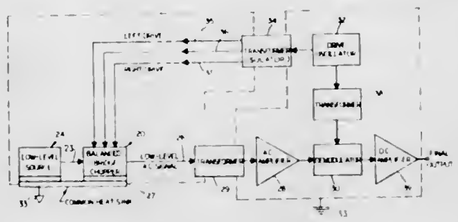
CHOPPER-MULTIPLEXER SYSTEM FOR MEASUREMENT OF REMOTE LOW-LEVEL SIGNALS

Donald R. Zrudsky, Sylvania, Ohio, assignor to The University of Toledo, Toledo, Ohio

Division of Ser. No. 546,700, Feb. 3, 1975, Pat. No. 3,995,174, which is a continuation-in-part of Ser. No. 445,929, Feb. 26, 1974, abandoned. This application Sept. 7, 1976, Ser. No. 720,552

Int. Cl.² H04J *3/04*

U.S. Cl. 179—15 BL **9 Claims**



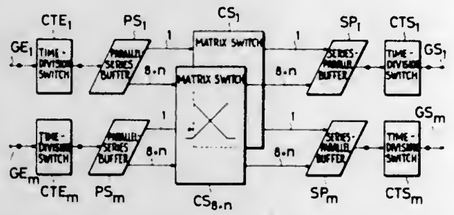
1. A system comprising, in combination, a reference grounded receiver, a plurality of remote low-level signal sources each adjacent a local ground, a plurality of balance bridge chopper means, one located adjacent and connected to each remote source for modulating at a predetermined frequency the low-level signals from such source when such chopper means is driven by a signal having such frequency, transmission line means for connecting the modulated low-level signal outputs from said chopper means in parallel to said receiver, and means for selectively driving at such predetermined frequency one of said chopper means at a time whereby only the low-level signal from the source connected to the driven chopper means is modulated and applied to said receiver.

4,074,077

TST EXCHANGE WITH SERIES-MODE SPACE SWITCHING STAGE

Pierre Charransol; Jacques Haari, and Claude Athenes, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 10, 1976, Ser. No. 684,964
Claims priority, application France, May 13, 1975, 75 14875
Int. Cl.² H04J *3/00*
U.S. Cl. 179—15 AT **4 Claims**



1. A time-division exchange for switching binary words of k bits from a plurality of incoming parallel-mode P C M junctions to a plurality of output parallel-mode P C M junctions, said exchange comprising:

first time-division switching means connected to said incoming P C M junctions for delivering said binary words in parallel-mode;

parallel-series conversion means comprising a first memory for successively receiving said binary words from said first time-division switching means, a second memory for simultaneously delivering said binary words in series mode on respectively k+n pluralities of input connections, and means for interchanging said first and second memories when said first memory is filled and said second memory is empty;

matrix switching means connected to said $k+n$ pluralities of input connections for delivering said binary words in series mode on $k+n$ pluralities of output connections; said matrix switching means being divided into $k+n$ independant distinct elements, each of said elements being connected respectively to one of said pluralities of input connections and to one of said pluralities of output connections and presenting to said binary words a plurality of paths between said input connections and said output connections;

series-parallel conversion means comprising a third memory for simultaneously receiving said binary words from said $k+n$ pluralities of output connections, a fourth memory for successively delivering said binary words in parallel-mode, and means for interchanging said third and fourth memories when said third memory is filled and said fourth memory is empty; and

second time-division switching means connected to said series-parallel conversion means for delivering said binary words to said plurality of output parallel-mode P C M junctions.

4,074,078

TELEPHONE PRIVACY DEVICE

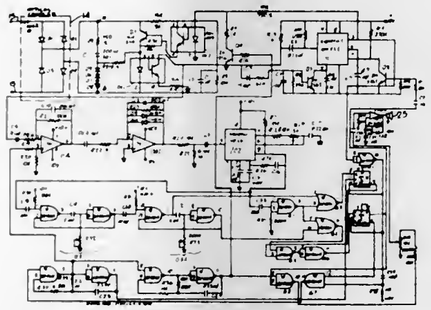
Bernard L. Jansen, Denver, Colo., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Mar. 17, 1975, Ser. No. 558,726
Int. Cl.² H04M *1/64*
U.S. Cl. 179—84 C **2 Claims**

1. A privacy circuit adaptable for installation to the incoming lines of a called telephone connected through a conventional telephone exchange which signals an incoming call only if the calling party generates an audible recognition signal through the mouthpiece of the calling telephone, said device inhibiting the sounding of the conventional bell of the attached called telephone for all incoming calls, without requiring detachment of the circuity of said bell,

said privacy circuit comprising a first circuit connected to the incoming lines of the called telephone, said first circuit including electronic means to sense and to inhibit an incoming ringing signal and prevent ringing of the attached bell of the called telephone,

said electronic means of said first circuit including electronic circuit means to immediately reduce the voltage across the incoming called telephone line so as to simulate the answering of the called telephone, upon sensing an incoming ringing signal and before the bell of the called telephone can be actuated by the ringing signal, with said reduction of voltage across the line of the called telephone causing the central telephone exchange to discontinue the ringing signal prior to actuation of the attached bell of the called telephone, and



a timer circuit which holds said first circuit in the sensed condition for a pre-set period of time after the first circuit inhibits the ringing signal,

a first oscillator circuit at the called telephone which sends a signal recognizable as an audible tone to the receiver of the calling telephone,

a recognition circuit at the called telephone which is responsive to the receipt of said tone signal generated by the calling party having a specific frequency and specific time duration, for energizing a second oscillator circuit to generate an audible signal through an attached first loudspeaker at the called telephone, said second oscillator circuit controlled by the said timer to remain operative for a pre-set period,

said first circuit, when de-energized by the said timer circuit acting to clear the incoming telephone line of the called telephone so that the caller is disconnected from the called line.

4,074,079

COIN TELEPHONE ANTIFRAUD SYSTEM

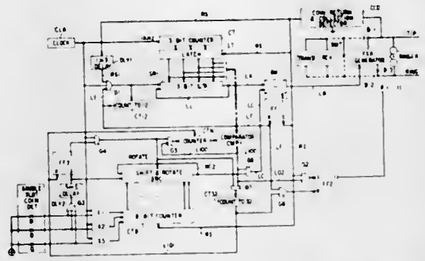
Edward Myron Prell, St. Charles, and Barry William Rogers, Geneva, both of Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 2, 1976, Ser. No. 692,208
Int. Cl.² H04M *17/00*
U.S. Cl. 179—6.3 R **11 Claims**

1. In a coin station,

choosing means for choosing one of a plurality of coding algorithms,

transmitting means for transmitting the identity of the chosen algorithm to the serving telephone office, and



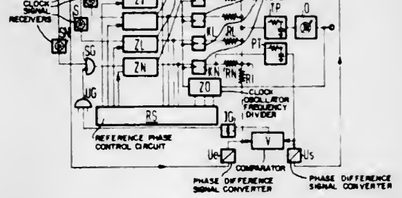
coding means for coding coin deposit information in accordance with said chosen algorithm.

4,074,080

METHOD AND SWITCHING ARRANGEMENT FOR SYNCHRONIZING OSCILLATORS OF A DIGITAL TELECOMMUNICATION NETWORK

Alexander Dragotinov, Munich, and Harro Lothar Hartmann, Braunschweig, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed May 28, 1976, Ser. No. 691,137
Claims priority, application Germany, May 28, 1975, 2523734
Int. Cl.² H04L *7/00*
U.S. Cl. 178—69.1 **8 Claims**



1. A method of synchronizing clock oscillators in the network nodes of a first digital communication network utilizing at least one clock oscillator in a second digital communication network, comprising the steps of:

comparing, in each network node, the phases of first line clock pulse trains on incoming lines to that network node from other network nodes in said first network with clock pulse trains issuing from a clock oscillator in the network node and producing first phase difference signals having a value proportional to the phase difference between said first line clock pulse trains and said clock oscillator pulse trains,

receiving second line clock pulse trains from at least one network node of said second network,

comparing the phases of said second line clock pulse trains and said clock oscillator pulse trains in the network node and producing a second phase difference signal having a value proportional to the result of the comparison,

receiving from another network node in said first network a third phase difference signal produced in the other network node in like manner as said second phase difference signal,

generating a comparison output signal whenever the value of said second phase difference signal exceeds the value of said third phase difference signal,

suppressing a number of pulses in said second line clock pulse train in proportion to the value of said compression output signal and sufficient to reduce the value of said second phase difference signal to be equal to or less than said third phase difference signal,

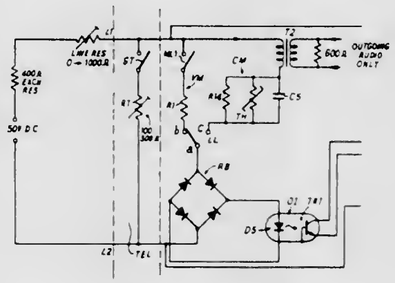
producing a control signal which is one of the sum or average of said first and second phase difference signals and regulating the frequency of said clock oscillator responsive to the value of said control signal.

4,074,081

APPARATUS FOR DETECTING THE LEVEL OF DIRECT CURRENT OR VOLTAGE ON A TELEPHONE LINE

Arthur James Humm, Farnborough, England, assignor to Ansafone Limited, London, England

Filed Apr. 8, 1976, Ser. No. 674,945
Claims priority, application United Kingdom, Apr. 10, 1975, 14882/75
Int. Cl.² H04M *1/00*
U.S. Cl. 179—84 R **16 Claims**



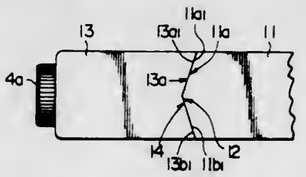
1. An apparatus for detecting the level of a direct current or voltage on a telephone line having two conductors, comprising optical isolator means wherein a first semiconductor device is adapted to emit electromagnetic radiation whose intensity represents the level of current flowing through the device and a second semiconductor device is arranged to receive radiation emitted from the first device and to generate a current whose level represents the intensity of the radiation, means for connecting the first device in the isolator means between the two conductors of the telephone line, and means for sensing only the direct current flowing through the second device in the isolator means and generating an output signal representative of the level of that direct current, and hence representative of the level of the direct current or voltage on the line.

4,074,082

COUPLING DEVICE BETWEEN TAPE RECORDER AND ATTACHMENT

Masanobu Sato, Hachioji, and Shiro Kondo, Tama, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 27, 1976, Ser. No. 690,529
Claims priority, application Japan, June 5, 1975, 50-76107[U]
Int. Cl.² G11B *31/00*
U.S. Cl. 179—100.11 **6 Claims**



1. A coupling device between a tape recorder and an attachment therefore comprising a mating surface on the tape recorder on which a plurality of electrical connecting terminals

are provided for connecting an electrical circuit of an tape recorder with the electrical circuit of the attachment, a mating surface on the attachment adapted to be detachably coupled with a mating surface on the tape recorder, the mating surface on the attachment being provided with a plurality of electrical connecting terminals which are located thereon in a manner corresponding to the position of a plurality of terminals provided on the mating surface of the tape recorder, said pair of mating surfaces comprising respective, abutting whole edges of the tape recorder and the attachment, said mating surfaces each having a common ridge that runs along the length of the respective mating surfaces, wherein said mating surfaces have a pair of inclined surfaces in obtuse angle around their common ridge, respectively; in a manner of complementing with each other, to form a projecting engaging portion and a recessed engaging portion on the respective mating surfaces.

4,074,083

STEREOPHONIC SOUND SYSTEM PARTICULARLY USEFUL IN A CINEMA AUDITORIUM

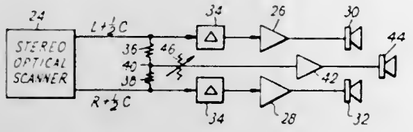
Robert Abraham Berkovitz, Lexington, Mass., and Kenneth James Gundry, London, England, assignors to Dolby Laboratories, Inc., San Francisco, Calif.

Filed Aug. 11, 1975, Ser. No. 603,670

Claims priority, application United Kingdom, Aug. 29, 1974, 37897/74

Int. Cl.² G11B *7/00*

U.S. Cl. 179—100.1 TD **6 Claims**



1. A stereophonic sound reproducing system comprising two inputs for left and right channel signals, left and right amplifying channels and loudspeakers connected to the respective inputs, means for summing the signals from the two inputs, and a center amplifying channel and loudspeakers connected to receive the summed signals, wherein each of the left and right amplifying channels includes sufficient delay to establish a precedence effect for the center channel loudspeaker, and the level of sound provided by the center channel loudspeaker is sufficiently less than that provided by the left and right channel loudspeakers for the latter to establish a stereo image when the left and right channel signals differ.

4,074,084

METHOD AND APPARATUS FOR RECEIVING SOUND INTENDED FOR STEREOPHONIC REPRODUCTION

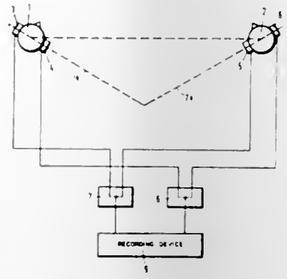
Johannes Cornelis Maria van den Berg, Kleibroek 14, Castricum, Netherlands

Filed Nov. 5, 1975, Ser. No. 629,049

Int. Cl.² G11B *23/18;* **H04R** *5/00*

U.S. Cl. 179—100.1 TD **5 Claims**

1. A method for receiving sound intended for stereophonic reproduction, in which sound is received by means of a plurality of spaced apart microphones and each signal from said microphones is recorded on a respective recording medium or on different parts of a single recording medium, or signals from said microphones are used for immediate re-transmission, characterized in that the reception is performed by means of at least two spaced apart microphone pairs of the dummy heads type, said microphone pairs being coupled to each other so that signals collected by microphones located on similar sides of



said dummy heads are essentially added to each other and are substantially recorded or used for immediate re-transmission.

4,074,085

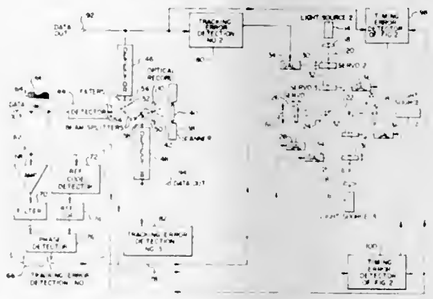
MULTIPLE BEAM OPTICAL RECORD PLAYBACK APPARATUS FOR SIMULTANEOUS SCAN OF PLURAL DATA TRACKS

James T. Russell, Richland, Wash., assignor to Eli S. Jacobs, New York, N.Y.

Filed Mar. 31, 1976, Ser. No. 672,458

Int. Cl.² G11B *7/00*

U.S. Cl. 179—100.3 B **17 Claims**



1. A multiple beam optical record playback apparatus comprising:
- an optical record having at least two optical data tracks recorded thereon each including a plurality of optical data spots;
- beam forming means for producing at least two light beams;
- scanning means for scanning each of said two light beams along a different one of said two data tracks to modulate said light beams by moving them across the optical data spots thereon;
- first detector means for detecting the modulated first light beam and producing a corresponding first electrical output signal;
- second detector means for detecting the modulated second light beam and producing a corresponding second electrical output signal;
- first optical servo means connected to the output of the first detector, for deflecting both of said two light beams laterally to said two data tracks; and
- second optical servo means connected to the output of the second detector for adjusting the lateral spacing between said two light beams.

4,074,086

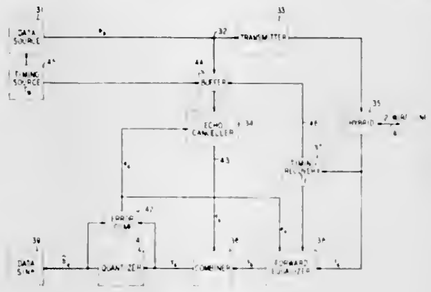
JOINT ADAPTIVE ECHO CANCELLER AND EQUALIZER FOR TWO-WIRE FULL-DUPLEX DATA TRANSMISSION

David Duncan Falconer, Linkoping, Sweden, and Stephen Brant Weinstein, Holmdel, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 7, 1976, Ser. No. 720,999

Int. Cl.² H04B *3/24*

U.S. Cl. 179—170.2 **10 Claims**



1. A joint echo cancellation and forward equalization arrangement for a digital data transmission system having both a transmitter section and a receiver section for simultaneous two-way signaling a full bandwidth over a common signal path comprising at each such terminal,
- a first adjustable signal processor in said receiver section for producing an output signal compensated for intersymbol interference inherent in signals traversing said common signal path to and from a remote terminal,
- a second adjustable signal processor for compensating for echoes of signals being transmitted by said transmitter section which have leaked into said receiver section having an output connected to a data source in said transmitter section and an output connected in sutractive relationship with the output signal from said first signal processor,
- combining means in said receiver section providing said subtractive relationship, and
- means responsive to the error difference between quantized and actual outputs of said combining means in said receiver section for generating a joint error control signal for said first and second signal processors.

4,074,087

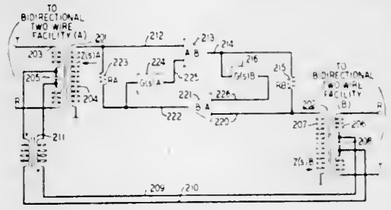
BIDIRECTIONAL VOICE FREQUENCY REPEATER

Roy Baxter Blake, Jr., Jamestown; James deGoulard Gwatkin, III; Judy Pat Magee, both of Greensboro, and Glendon Russell Porter, Greensboro, all of N.C., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 16, 1976, Ser. No. 714,306

Int. Cl.² H04B *3/20, 1/58, 3/36*

U.S. Cl. 179—170.2 **17 Claims**



1. A signal transmission network which comprises:
- transformer means having a primary and a secondary, said primary being adapted to couple the transmission network to a 2-wire transmission facility and said secondary having first and second terminals, said first terminal being connected to a reference potential;
- amplifier means having first and second inputs and an output and being arranged to amplify outgoing signals, said first input being connected in circuit with said second terminal of said transformer means secondary;
- means connected in circuit relationship with said second terminal of said transformer means secondary for supplying incoming signals to said transmission network; and
- means connected in circuit between said incoming signal supplying means and said second input of said amplifier means and having a prescribed complex transfer characteristic for generating a signal which is substantially a replica of an error signal developed across said transformer means secondary in response to said incoming signals because of complex impedance components of the 2-wire transmission facility when connected to said transformer means primary, wherein said replica signal and said error signal are algebraically combined by said amplifier means substantially to effect cancellation of said error signal so that unwanted portions of said incoming signals are substantially eliminated from the outgoing signals from said amplifier means.

4,074,088

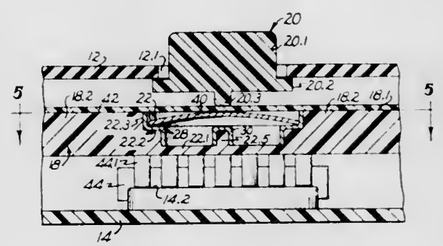
KEYBOARD APPARATUS AND METHOD OF MAKING

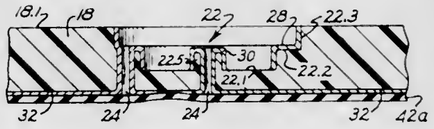
Laurence J. Keough, Walpole, and Bruce D. Butts, North Easton, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 21, 1974, Ser. No. 471,943

Int. Cl.² H01H *13/70, 9/00;* **H05K** *1/16*

U.S. Cl. 200—5 A **14 Claims**





12. A switch arrangement comprising:
- a molded plastic board with a pattern of recesses molded into one surface and a hole extending through the board in the central region of each recess;
- a pattern of conductive material on said board, said pattern comprising through-plating in each said hole, a patch of said material placed centrally in the bottom of said recess and connected to said through-plating, and a portion around the periphery of said recess in its bottom and extending up the wall and over the lip of the recess; and
- a dome in each recess, the rim of said dome being in contact with said peripheral portion, and the peak of said dome being poised above said central patch when undeflected, and being deflectable into contact with said patch.

13. A keyboard apparatus comprising a dielectric card having a plurality of recesses in one card side, first electrically conductive contacts disposed in respective card recesses, complementary electrically conductive contacts disposed in re-

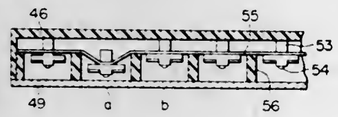
spective card recesses in spaced relation to the first contacts within said recesses, a selected pattern of circuit path means on said card connected to said contacts, and a plurality of electrically conductive elements each having a dished configuration movable with snap-action to an inverted dished configuration in response to pressure applied thereto, said snap-acting elements being disposed in an open circuit position in said respective card recesses in engagement with one of said contacts in said recesses and spaced from another of said contacts in said recesses, said respective snap-acting elements being adapted to be pressed toward said inverted dished configuration to additionally engage another of said contacts in said recesses for closing a circuit.

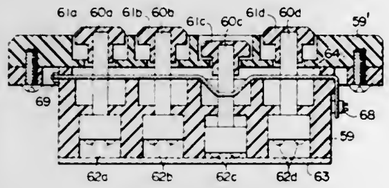
4,074,089

MULTIPLE PUSH-SWITCH APPARATUS HAVING FLEXIBLE ELEMENT PREVENTING SIMULTANEOUS ACTUATOR DEPRESSION

Itaru Mitsugi, Kadoma, and Toshio Hayakawa, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 24, 1976, Ser. No. 689,076
Claims priority, application Japan, May 28, 1975, 50-64487; June 10, 1975, 50-79268[U]; Mar. 17, 1976, 51-32469[U]
Int. Cl.² H01H *9/26*
U.S. Cl. 200—5 E **8 Claims**





1. A multiple push-switch apparatus comprising a plurality of operation bodies each supported for translation with respect to a housing along a longitudinal axis,

a plurality of bistable inversion mechanisms each having a resilient body which translates the associated operation body in one direction along said axis, each of said bistable inversion mechanisms being inverted by the resilient force of said resilient body when the operation body associated with the bistable inversion mechanism is depressed in the opposite direction along said axis to oppose the resilient force of said resilient body,

a plurality of switching mechanisms each closing when the associated bistable inversion mechanism is inverted, and

an elongated flexible element loosely attached to said operation bodies, both ends of said flexible element being fixed such that said element is strained with a predetermined amount of slackness, wherein,

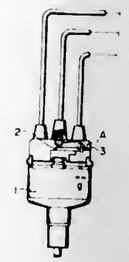
when any one of said operation bodies is depressed the bistable inversion mechanism associated with said depressed operation body is inverted and another bistable inversion mechanism, which was in its inverted state before depression of said one of said operation bodies, is restored as said flexible member is strained by the depression of said one operation body.

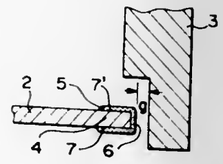
4,074,090

DISTRIBUTOR ROTOR ELECTRODE HAVING SILICON COATING FOR SUPPRESSING PEAKS OF CAPACITY DISCHARGE CURRENT

Minoru Hayashi, Toyota; Mineo Ogino, Aichi; Toshihiko Kobayashi, Toyoake, and Masaki Noda, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed May 7, 1976, Ser. No. 684,361
Int. Cl.² H01H *19/00, 1/02*
U.S. Cl. 200—19 DR **4 Claims**





1. In a distributor having a rotor brush with a discharge electrode portion adapted to rotate in association with a driving rotory shaft of an internal combustion engine and side terminals arranged adjacent to a locus of rotation of the rotor brush with a discharge gap provided therebetween, the improvement comprising a noise wave suppressing ion-plating formed silicon coating disposed on the surface of the discharge electrode portion of the rotor brush to suppress the peaks of capacity discharge current.

4,074,091

INTERLOCKING OPERATING MECHANISM FOR ENCLOSED SWITCHGEAR HAVING DEFEATER INTERLOCK

John F. Bischof, Richfield, and Ronald J. Fritsch, Sussex, both of Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Apr. 12, 1976, Ser. No. 676,332
Int. Cl.² H01H *9/20*
U.S. Cl. 200—50 A **24 Claims**

1. An operating mechanism for switchgear mounted in an enclosure having an openable door with an opening therein and a catch rigidly mounted thereon and immobile with respect thereto, said operating mechanism comprising:

a frame;

means mounting said frame in said enclosure;

an operating handle movably supported on said frame for movement between designated positions and extending through said opening in said door when said door is closed, said handle being operatively connected to said switchgear;

a latch movably supported on said frame for movement in a single plane and cooperable with said catch to prevent opening of said door when said handle is in a first of said designated positions, and cooperable with said handle to prevent movement of said handle to said first of said designated positions when said door is open.

15. An operating mechanism for switchgear mounted in an

enclosure having an openable door with an opening therein and a catch thereon, said operating mechanism comprising:

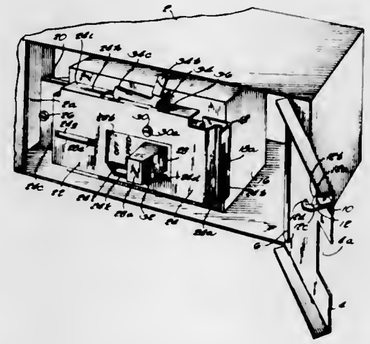
a frame;

means mounting said frame in said enclosure;

an operating handle movably supported on said frame for movement between designated positions and extending through said opening in said door when said door is closed, said handle being operatively connected to said switchgear;

a latch pivotally mounted to said frame and cooperable with said catch to prevent opening of said door when said handle is in a first of said designated positions, and cooperable with said handle to prevent movement of said handle to said first of said designated positions when said door is open, said latch being also cooperable with said catch to permit movement of said handle between any of said designated positions when said door is closed; and

means biasing said latch in one direction of pivoting thereof; said latch being normally biased to a first angular position in the path of movement of said handle when said door is



open to provide a stop against movement of said handle to said first designated position;

said catch holding said latch in a second angular position against the bias of said biasing means and out of the path of movement of said handle when said door is closed to permit movement of said handle between any of said designated positions;

said latch lying in the path of movement of said catch when said handle is in said first designated position to provide a stop against opening of said door;

said handle holding said latch in a third angular position against the bias of said biasing means and out of the path of movement of said catch when said handle is in a second of said designated positions to permit opening of said door;

said latch having a trunk portion cooperable with said handle and an arm portion cooperable with said catch, the path of movement of said handle intersecting the pivotal arc of said trunk porton, and the path of movement of said catch intersecting the pivotal arc of said arm portion.

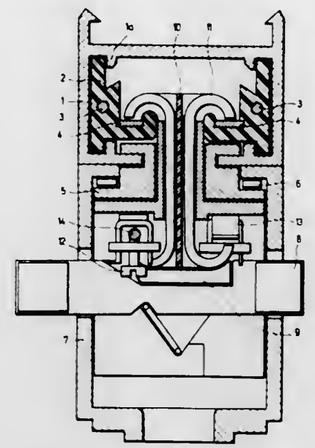
4,074,092

SAFETY POWER TRACK SYSTEM

Laszlo Csenky, Budapest, Hungary, assignor to Szarvasi Vas-Femipari Szovetkezet, Szarvas, Hungary

Filed Jan. 12, 1976, Ser. No. 648,364
Claims priority, application Hungary, July 16, 1975, 2818
Int. Cl.² H01R *19/50, 19/52*
U.S. Cl. 200—51.07 **4 Claims**

1. A safety power track system for carrying light fixtures, including a light source, comprising a generally U-shaped supporting rail, the limbs of which have inwardly bent ends, an internal insulating lining fitted in the rail and having at least a first current conductor embedded therein, earthing means connected to the bent ends of the limbs of the rail, and at least a second current conductor mounted in or on an externally substantially inaccessible portion of the lining that faces inwardly of the rail, a transversely mounted, reciprocally movable push-button switch having "on" and "off" positions and being formed with an oblique groove, a presser cam being guided for movement in said groove, at least two contactors engaged by the cam in the "on" position, conductor springs for



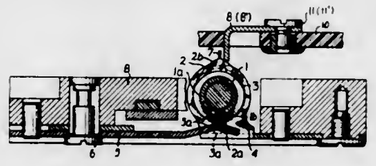
making contact with said cam, a conductive fixing screw for establishing contact of said springs and said cam, and a third conductor disposed in the interior of the adaptor and connected to one of the contactors, wherein each of said contactors is a generally C-shaped body, the contactors being arranged back-to-back, and insulating means for surrounding, as well as mutually separating said contactors.

4,074,093

SWITCHING MECHANISM IN AN ELECTRONIC WATCH

Yukio Ikehata, Matsudo; Masataka Ikenishi, Soka; Shozo Kushida, Narashino, and Tadahiro Kikuchi, Tokyo, all of Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Sept. 19, 1975, Ser. No. 614,958
Claims priority, application Japan, Sept. 24, 1974, 49-109814
Int. Cl.² H01H *3/32*; G04C *3/00*
U.S. Cl. 200—52 R **2 Claims**



1. A switching mechanism in an electronic timepiece comprising:

a. a rod mounted for axial rotation and having a peripheral notch extending peripherally thereof for a certain angular interval;

b. mounting means mounting said rod for axial rotation;

c. a first cam mounted for rotation on said rod and having a projection opposite the peripheral notch of said rod for engaging therewith to rotate with said rod and having dimensions less than said peripheral notch to allow said first cam to rotate on said rod relative thereto, and having an eccentric peripheral portion;

d. a resilient spring-like member having a free end positioned to bear against the periphery of said first cam as said first cam rotates upon rotation of said rod, said eccentric pe-

ripheral portion engaging said free end as said first cam is rotated relative thereto and bending said spring-like member and the bent spring-like member bearing against said eccentric peripheral portion to accelerate said first cam relative to said rod as said eccentric peripheral portion rotates past the free end of said spring-like member;

e. a second cam mounted for rotating concurrently with said first cam and having a peripheral projection; and

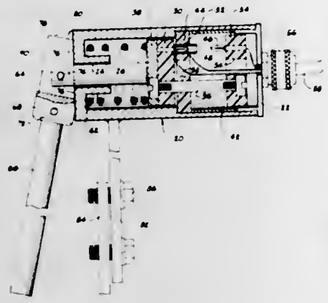
f. contact switch means defining a contact switch operated by the peripheral projection of said second cam, said contact switch means being positioned relative to said second cam to be engaged and operated by the peripheral projection of said second cam as said first cam is accelerated relative to said rod whereby operation of said contact switch is for an interval determined by the acceleration of said first cam to a rate of rotation greater than the rate of rotation of said rod.

4,074,094

ELECTRIC SWITCH STRUCTURE INCORPORATING TRIP ROD FOR SENSING CABLE DERAILMENT AND THE LIKE

Bruno Lubbe, 3695 Warren Way, Reno, Nev. 89502

Filed Feb. 10, 1976, Ser. No. 656,806
Int. Cl.² H01H 3/16; B61B 12/06
U.S. Cl. 200—61.13 **8 Claims**



1. An electric switch structure including a housing, a disc set, means supporting the disc set within the housing, the disc set including electrical contacts, the disc set being moveable from a first position in which the electric contacts on two of the discs within the set are engaged to a second position in which said contacts are disengaged, a trip rod, means connecting the trip rod to the disc set to move the disc set from the first to the second position upon movement of the trip rod from a first to a second position, the connecting means including a shaft having a portion extending through an opening in the housing, a yolk connected to the trip rod, the yolk being positioned about and pivotally connected to the portion of the shaft external to the housing, the yolk of the trip rod including two faces which may be caused selectively to bear against the exterior surface of the housing, one face positioning the trip rod in a first, extended position, the other face positioning the trip rod in a second, deflected position.

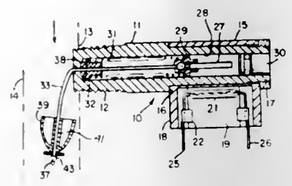
4,074,095

FLOW OPERABLE SWITCH DEVICE

Robert F. Romanowski, Rochester, N.Y., assignor to Qualitrol Corporation, Fairport, N.Y.

Filed Sept. 10, 1976, Ser. No. 722,010
Int. Cl.² H01H 35/40
U.S. Cl. 200—81.9 M **5 Claims**

1. A fluid flow operable switch device comprising a housing, a reed switch mounted to the housing having a pair of contacts at least one of which is magnetically attractible, a magnet movable in an elongated bore of the housing into and out of a zone of effective magnetic flux influence upon the contacts of the switch, a spring biasing the magnet into the zone, a string connected to the magnet and projecting externally of the housing, and a pull element connected to the projecting end of the



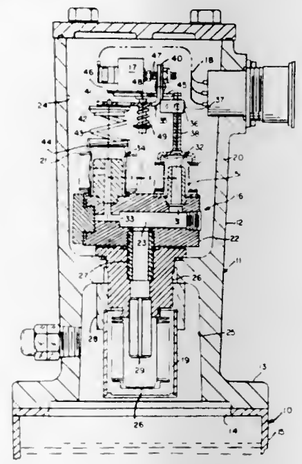
string responsive to a predetermined fluid flow applied to it in a direction away from the housing to draw the magnet out of said zone.

4,074,096

BELLOWS CONTROLLED SUDDEN PRESSURE RISE RELAY

Robert F. Romanowski, Rochester, N.Y., assignor to Qualitrol Corporation, Fairport, N.Y.

Filed Oct. 6, 1976, Ser. No. 730,200
Int. Cl.² H01H 35/32
U.S. Cl. 200—83 D **5 Claims**



1. A fluid bellows controlled pressure relay comprising a housing having a lower open end adapted to be mounted over a complementary opening in a pressure developing tank, a bellows support block mounted in the housing, a pressure sensing bellows mounted to an underside of the block having a bottom end adapted to be subjected to pressures applied through said lower open end, a second vertically extending bellows mounted to an upper surface of the block, a third bellows mounted to the upper surface of the block in spaced parallel relation to the second bellows, the interiors of the several bellows being connected in communication with a common channel in the block, the channel and connected bellows defining a closed hydraulic circuit filled with fluid, a switch having a push-pin switch contact in an electrical alarm circuit, a bracket pivoted intermediately of its ends to a stationary support and supported in a balanced condition at its ends upon the second and third bellows, a switch actuating element carried by the bracket disposed in the balanced condition of the bracket in ineffective abutting relation to the push-pin switch contact, the second bellows having an orifice communicating its interior with the common channel, and the third bellows having a relatively larger port communicating its interior with the common channel, the sensing bellows being

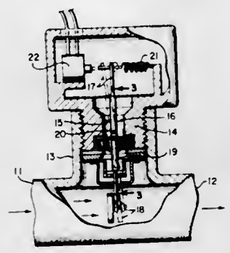
contractible upon sensing pressure variations applied through said lower open end to force fluid from the channel to the orifice and larger port respectively of the second and third bellows, the second bellows having a larger diameter area subject to pressures from the channel fluid entering the orifice than the third bellows has subject to pressure from the channel at the larger port, the second and third bellows being responsive to normal pressure changes from the channel in such manner as to maintain the bracket in neutral position whereby the switch actuating element will not actuate the push-pin switch contact, and the second and third bellows being responsive to sudden pressure changes from the channel in such manner that the bracket is caused to swing about its pivot to cause the switch actuating element to actuate the push-pin switch contact.

4,074,097

FLUID RESPONSIVE SEALED PIVOT ARM MEANS

Harold D. Hutchinson, 26734 W. Latigo Shore Drive, and William C. Gregge, 6902 S. Fernhill Drive, both of Malibu, Calif. 90265

Filed Oct. 18, 1976, Ser. No. 733,475
Int. Cl.² H01H 35/40
U.S. Cl. 200—81.9 R **4 Claims**



1. A fluid response sealed pivot arm means inserted in a fluid chamber portion and responsive to fluid movements in said chamber to physically rock and thereby transmit the movement to the exterior of the chamber, said sealed pivot arm means including, in combination:

a. body means communicating with said portion of the fluid chamber and including a bore of given diameter having an increased diameter portion at the end of said bore opening into said fluid chamber;

b. an elongated arm means passing through said bore so that an outer end is exterior of the chamber, an inner end is within the chamber, and a central portion is in said bore;

c. a pivot pin passing transversely across said bore and into said central portion of said arm means for pivoting the arm means for rocking movement, the central portion of the arm means having a diameter less than said given diameter to define within the inside wall of said bore an annulus;

d. a rolling diaphragm having its outer periphery terminating in an annular bead received in said increased diameter portion, the inner portion of said diaphragm being secured to said arm means, the annular portion of the diaphragm between its inner portion and outer periphery folding to define an annular rolling portion filling said annulus between the inner wall of said bore and the outer wall of said central portion of said arm means so that rocking movement of said arm means can be accommodated by said rolling portion of said diaphragm while said diaphragm provides a fluid tight seal between the fluid chamber and exterior;

e. a washer assembly overlying said annular bead and secured to said body means to retain the annular bead in said increased diameter portion of said bore; and,

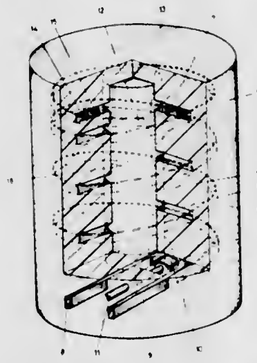
f. a flexible boot and filter combination secured to said washer assembly loosely surrounding said inner portion of said arm means for excluding particles in the fluid from passing into said annulus beneath the rolling portion of said diaphragm.

4,074,098

ELECTRIC ARC EXTINCTION APPARATUS

Albert Pullen, Bergenthelm, Netherlands, assignor to Hazemeijer B.V., Hengelo, Netherlands

Filed Mar. 26, 1976, Ser. No. 670,672
Int. Cl.² H01H 33/16
U.S. Cl. 200—144 R **13 Claims**



1. An electric arc extinguishing apparatus, comprising:

an arc initiation mechanism including two electrodes for initiation of an electric arc therebetween;

two conductors each respectively connected to one of said electrodes for conducting the electric arc at high velocity under the influence of a magnetic field generated by the supply current of the arc, whereby electric impedance is connected in series with said arc;

an annular contact gap between the ends of both said conductors; and

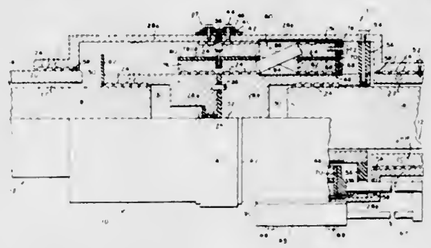
an arc resistant electrically insulating material including a winding channel, said two conductors being located in said winding channel such that the adjacent succeeding turns of said conductors are separated by the insulating walls of said channel, said annular contact gap maintaining the rotation of the arc caused by the wound conductors until said arc is extinguished, said winding channel emerging at one end thereof into an annular channel in said body containing said annular contact gap.

4,074,099

COAXIAL, POLARITY-REVERSING SWITCH

Donald B. Steen, Bowie, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 27, 1976, Ser. No. 754,282
Int. Cl.² H01H 3/24, 15/06
U.S. Cl. 200—153 S **11 Claims**



1. A coaxial line switch comprising:

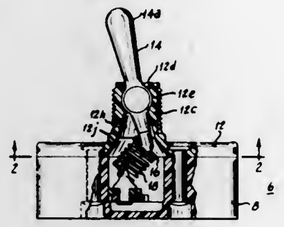
a cylindrical switch body member;
means for connecting the switch to the outer conductor of the coaxial line;
means for connecting the switch to the inner conductor of the coaxial line;
means coaxially mounted within said body member for selectively connecting, disconnecting and interconnecting the conductors of the coaxial line to control the flow of current through each of the conductors.

4,074,100

ELASTIC TOGGLE SWITCH LEVER MOUNTING

Harold W. Hults, New Berlin, and John A. Sweasel, Jr., Milwaukee, both of Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed June 14, 1976, Ser. No. 696,112
Int. Cl.² H01H *3/04*
U.S. Cl. 200—339 **1 Claim**



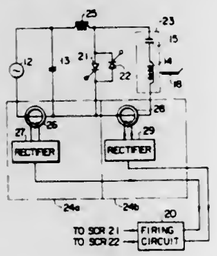
1. In an electric switch of the toggle lever type wherein a toggle lever having an enlarged intermediate pivot portion can be press fitted past a constriction in the aperture of a bushing formed of elastic material by deformation of the latter and is then seated and retained in a pivot socket in said bushing upon elastic restoration of said constriction to its former shape, the improvement comprising, providing the bushing pivot socket with spaced semi-spherical wall portions and parallel flat wall portions which merge at their opposite ends with said semi-spherical wall portions, and providing said toggle lever with a pivot portion which has surfaces that are complemental in form to and in juxtaposition with said semi-spherical and flat wall portions of said bushing pivot socket when seated therein.

4,074,101

INDUCTION HEATING APPARATUS USING A PAIR OF INVERSELY PARALLEL CONNECTED GATE-CONTROLLED SWITCHING DEVICES

Mitsuyuki Kiuchi; Keizo Amagami; Takumi Mizukawa, and Hideyuki Kominami, all of Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Feb. 11, 1976, Ser. No. 657,307
Claims priority, application Japan, Feb. 14, 1975, 50-19251
Int. Cl.² H05B *5/04*
U.S. Cl. 219—10.49 R **23 Claims**



1. An induction heating apparatus comprising, a pair of input terminals connectable in use to a source of low frequency alternating voltage, at least a pair of first and second gate-controlled unidirectional conducting devices inversely parallel connected to the input terminals, means sensitive to the polarity of said alternating voltage for generating an output indicative of the polarity of the alternating voltage, means for gating on said first and second gate-controlled unidirectional conducting devices in succession at a high frequency in a given order in response to the output from said polarity sensitive means indicating one polarity of the alternating voltage and in succession at the high frequency in a reversed order in response to the output from said polarity sensitive means indicating the opposite polarity of the alternating voltage, and high-frequency commutating circuit means including an induction heating coil and a capacitor in series thereto responsive to a current produced when one of the gate-controlled conducting devices is gated on for producing in succession a commutating current that flows through said commutating circuit means and the subsequently gated-on gate-controlled conducting device in the opposite direction.

20. An induction heating apparatus comprising:
a first pair of inversely parallel connected first and second gate-controlled switching devices, a second pair of inversely parallel-connected third and fourth gate-controlled switching devices, the first and second pairs being connected in use in series to a source of low frequency alternating voltage, and wherein the first and third switching devices are poled in the same direction of conduction and the second and fourth switching devices are poled in the opposite direction of conduction;
means sensitive to the polarity of said alternating voltage for generating an output indicative of the polarity of the alternating voltage;
means for gating on said first, second, third and fourth switching devices in succession in a given order in response to the output from said polarity sensitive means indicating one of the polarity of the alternating voltage and in a reversed order in response to the output from said polarity sensitive means indicating the opposite polarity of the alternating voltage; and
high frequency commutating circuit means including an induction heating coil and a commutating capacitor in series thereto responsive to a current produced when one of the gate-controlled switching devices is gated on for producing in succession a commutating current that flows through said commutating circuit means and a subsequently gated-on switching device.

4,074,102

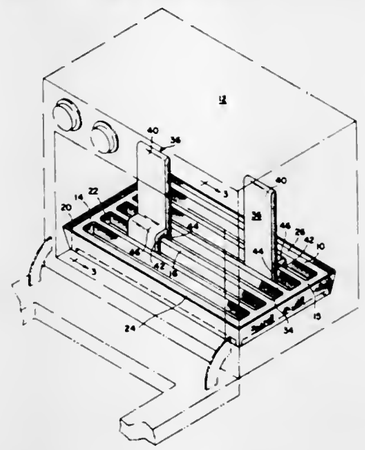
MICROWAVE OVEN RACK

Donald Asen, 114 Cornell Ave., Bala Cynwyd, Pa. 19004

Filed Mar. 10, 1976, Ser. No. 665,721
Int. Cl.² H05B *9/06*
U.S. Cl. 219—10.55 E **29 Claims**

1. In an oven rack for use in holding food in a microwave oven, the combination of
a non-metallic base,
said base comprising means to support a plurality of food holding means; and

a plurality of non-metallic food holding means adjustably carried by the base to hold the food,



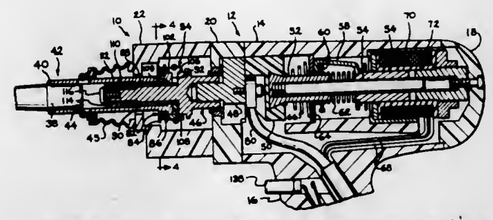
at least some of said food holding means comprising a food contacting arm which projects above the base to support food to be cooked in a desired position.

4,074,103

APPARATUS FOR WELDING STUDS TO WORKPIECES

Thomas E. Shoup, Amherst, and Steve Spisak, Elyria, both of Ohio, assignors to TRW Inc., Cleveland, Ohio

Filed Jan. 12, 1976, Ser. No. 648,052
Int. Cl.² B23K *11/04*
U.S. Cl. 219—98 **5 Claims**



1. Apparatus for welding a stud to a workpiece having an electrically-resistant coating thereon, said apparatus comprising a welding tool having chuck means extending outwardly therefrom for holding a weldable stud, means for moving said chuck means toward and away from the workpiece, means connected to said chuck means for rotating said chuck means, electrically-conducting means positioned adjacent portions of said chuck means and said moving means and in contact with both, said electrically-conducting means being generally radially segmented, means engagable with the segments for urging them radially inwardly, and resilient means for urging said chuck means and said moving means toward one another.

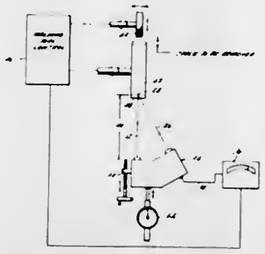
4,074,104

OPTO-ELECTRONIC POSITION SENSING METHOD

Emmet M. Fulkerson, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 534,552, Dec. 19, 1974, abandoned. This application Apr. 29, 1976, Ser. No. 681,737
Int. Cl.² B23K *9/00*
U.S. Cl. 219—121 LM **3 Claims**

1. A method for removing a predetermined depth of material from a workpiece target capable of at least partially reflecting light in a scattered manner, through the application of a material removal tool, wherein a narrow incident beam is directed along an incident beam axis onto the target, scattered light from the incident beam reflected from the target is collected from a position other than on the incident beam axis along a reflected light axis which intersects the incident beam axis at an axis intersection, the scattered light being focused on a photosensitive means which provides an output signal including a portion which is a function of displacement of the focused light from a reference of the photosensitive means representing the axis intersection, the improvement comprising the steps of:



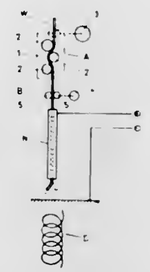
positioning the axis intersection within the workpiece beneath the target at a predetermined distance which is related to the amount of material to be removed by the material removal tool; and then
operating the tool to remove material from the workpiece until the focused light approaches a preselected position in respect to the reference of the photosensitive means as a function of the approach of the incident beam to the axis intersection.

4,074,105

ARC WELDING METHOD AND ARC WELDING APPARATUS

Setsuzi Minehisa, Itami; Tatuo Inui, Osaka, and Hitoshi Fukuda, Shiki, all of Japan, assignors to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japan

Filed Nov. 21, 1975, Ser. No. 634,190
Claims priority, application Japan, Nov. 22, 1974, 49-135770; Apr. 11, 1975, 50-44425
Int. Cl.² B23K *9/12*
U.S. Cl. 219—137.8 **5 Claims**



1. An electric arc welding method, in which molten metal is deposited along a welding line, comprising the steps of:
(a) feeding a welding wire, which has been arranged in a substantially straight line, into a plastic deforming zone which is continuously rotated through a range of 360°;
(b) causing said wire supplied to said zone to be first plastically deformed from its substantially straight line shape, and then plastically reformed back into said substantially straight line shape, whereby the welding wire supplied to said zone is simultaneously spirally deformed and reformed and also subjected to a unidirectional continuous rotary circular motion through a 360° range;
(c) feeding the welding wire after it leaves the plastic de-

forming zone to an elongated nonconsumable welding nozzle positioned at the welding line;

(d) causing the welding wire to leave the tip of the welding nozzle so that it is at an angle with respect to the central axis of said nozzle and also is rotating through a range of 360°;

(e) simultaneously causing the welding nozzle to move from one end of the welding line to the other end thereof, whereby the path traversed by the bent and rotating end of the welding wire as it leaves the welding nozzle along the welding line is that of a helix wholly contained in a single plane thus achievng full agitation of the weld metal by periodic remelting a portion of the welding line to produce a dense weld.

4,074,106

METHOD FOR THE AUTOMATIC MANUFACTURE OF PRESSURIZED OR LIQUEFIED GAS TANKS

Paul Nee, Dange-Saint-Romain, France, assignor to Roger Pelleray, France

Division of Ser. No. 457,216, April 1, 1974, Pat. No. 3,943,615. This application Dec. 31, 1975, Ser. No. 645,662
Claims priority, application France, Apr. 9, 1973, 73.12705
Int. Cl.² B23K *9/12*
U.S. Cl. 219—137 R **3 Claims**



1. In a method for manufacturing pressurized or liquefied gas tanks or containers which comprise two substantially cylindrical parts closed at one end and open at the other end, the free edges of the cylindrical parts substantially defining the cross-section of the tanks or containers and said two parts being welded to each other, the improvement comprising the following steps:

cutting two metal blanks simultaneously from a single metal sheet;

stamping said blanks simultaneously at two separate stations so as to form said two substantially cylindrical parts; and

assembling said two substantially cylindrical parts by welding the cylindrical parts together along the free edges of the said open ends of said cylindrical parts.

4,074,107

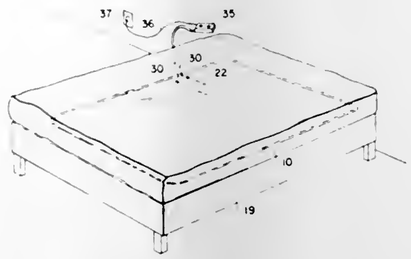
COMFORT QUILT

Margurita L. Moss, N. Miami Beach, Fla., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Oct. 19, 1976, Ser. No. 733,808
Int. Cl.² H05B *1/00*
U.S. Cl. 219—212 **1 Claim**

1. A quilt, shaped to fit about the top surface, sides and bottom edges of a mattress to which the quilt may be attached, such that the quilt may be directly attached to a said mattress, so as to serve as an electrically heatably waterproof mattress cover; upon which a user may rest,

said quilt formed of a top surface of insulated fabric in which an electrical heating element is embedded, together with a



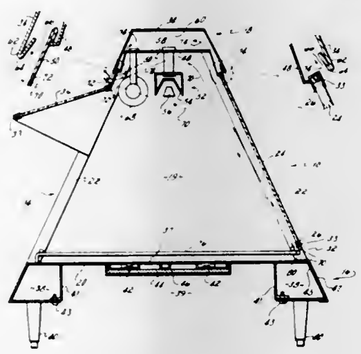
cover of waterproof plastic sheeting bonded to the exterior surface of said fabric.

4,074,108

COUNTERTOP DISPLAY WARMER

James D. King, Dayton, Ohio, assignor to Henny Penny Corporation, Eaton, Ohio

Filed Sept. 13, 1976, Ser. No. 722,474
Int. Cl.² H05B *1/00*
U.S. Cl. 219—214 **10 Claims**



1. A countertop display warmer comprising:

transparent front and sides and an open rear,

a base member having a concave outer bottom surface providing a first air space below said warmer,

a ceiling member defining with said base member, said front, and said sides, a warmer chamber,

a canopy mounted over said ceiling member defining a second air space therebetween,

first heating means disposed in said first air space for heating said base member,

second heating means in spaced relation to said ceiling for heating said warmer chamber,

an opening along the lower edge of said front and the upper edge of said rear providing a generally upwardly and rearwardly directed ventilation path through said warmer chamber, and
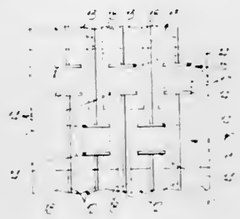
an opening along the lower edge of said canopy providing a second ventilation path through said second air space.

4,074,109

THERMAL PRINT BAR

David Robbin Baraff; Robert James Boynton, Ottawa, and Frederick Caldwell Livermore, Kanata, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed July 15, 1977, Ser. No. 815,794
Int. Cl.² H05B *1/00*
U.S. Cl. 219—216 **10 Claims**



1. A thermal print bar comprising:

a substrate of electrically insulating material;

a continuous bar of electrically resistive material on a surface of said substrate;

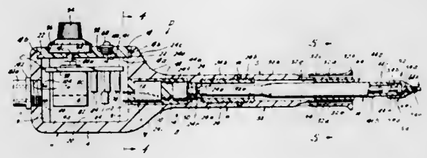
electrical conductor patterns extending beneath said bar to define two rows of print elements extending along the bar, the print elements of one row offset relative to the print elements of the other row, in the direction of the longitudinal axis of the bar.

4,074,110

HAND HELD ELECTRIC HEATING DEVICE

Philip E. Slaughter, 4552 Elm St., Bellaire, Tex. 77401

Filed Dec. 2, 1975, Ser. No. 637,080
Int. Cl.² H05B *1/02*; B23K *3/04*; H05B *3/06*
U.S. Cl. 219—240 **14 Claims**



1. An electrically powered heating device adapted to be held in the hand of a user, comprising:

elongated electrical heating means for providing localized heating over various selected heating ranges for a variety of applications, said elongated electrical heating means comprising;

an elongated substantially rigid tubular sheath;

an electric heating element in said sheath;

terminal means at one end of said sheath; and,

collet means at the other end of said sheath for removably receiving and holding a heating tip in a heat exchange relation to said electric heating element;

an elongated sleeve means of thermally insulative material disposed in spaced relation about and covering a major portion of said heating means for gripping by the user and for thermally insulating the user's hand from said heating means, said collet means being spaced from one end of said sleeve means;

a body member formed having an enlarged housing portion and a reduced neck portion, said neck portion releasably engaging said terminal means of said heating means, said neck portion having a first end and a second end, said first end formed with said enlarged housing portion providing a thermal barrier between said heating means and said enlarged housing portion, said second end adapted to releasably engage the other end of said sleeve means;

an electronic control circuit coupled to said heating means for selectively controlling a heating temperature of said heating means over various selected heating ranges; and

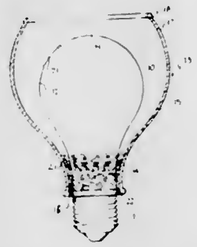
said enlarged housing portion formed with a cavity therein for housing said electronic control circuit.

4,074,111

VAPORIZING ATTACHMENT FOR LIGHT BULBS

William George Hunter, 704 Kingsmere Cresc. SW., Calgary, Canada

Filed Jan. 27, 1977, Ser. No. 762,864
Int. Cl.² F22B *1/28*; A61L *3/00*
U.S. Cl. 219—275 **2 Claims**



1. An article of manufacture comprising in combination a vaporizing shroud and an electric light bulb, said electric light bulb including an envelope and a metal screw threaded base secured to one end of the envelope, said shroud including an open lower, relatively small, reservoir end portion and an open upper, relatively large, evaporating portion, means to detachably secure said shroud by the lower end thereof around the portion of said envelope adjacent said metal base whereby said shroud is sealably secured to said envelope and extends upwardly therefrom in spaced relationship, said lower end portion forming an annular reservoir around said light bulb, said upper end portion forming an evaporating chamber above said reservoir and means to sealably secure said shroud to said light bulb, said last mentioned means including epoxy resin adhesive between said lower small end of said shroud and the associated portion of said envelope above said metal base and a flexible elastomeric O ring surrounding said associated portion of said envelope and within said epoxy resin and being in wedging contact with the inner surface of said lower small end of said shroud thereby sealing said lower small end to said envelope.

4,074,112

SWITCH ASSEMBLY HAVING MOVABLE CONTACT FACE CONFIGURATION FOR PENETRATING FROST OR ICE LAYER ON ADJACENT CONTACT SURFACE

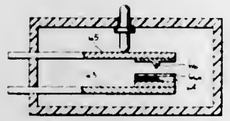
Arthur J. Runft, Mequon, Wis., assignor to Kelley Co., Inc., Milwaukee, Wis.

Division of Ser. No. 428,923, Dec. 27, 1973, Pat. No. 3,922,814. This application Nov. 5, 1975, Ser. No. 629,057
Int. Cl.² H01H *1/12, 9/00*
U.S. Cl. 200—279 **4 Claims**

1. An automatic door operator having a control circuit connected to an electrically controlled motor means for controlling door movement in a freezing environment wherein frost forms on the surfaces within the environment, comprising a control switch adapted to be connected in said control circuit and having a pair of opposed electrical contacts, said contacts having opposed contact faces and said contacts solely moving on a line essentially perpendicular to said contact faces for opening and closing an electrical conductive path therebetween in response to the movement directly toward and away from each other on the line through said contacts, a first of said contacts having the contact face formed with a pimple and the other of said contacts having the contact face with a plurality

of serrations defining a series of sharp contact peaks, said pimple defining a penetrating means to disrupt frost on said





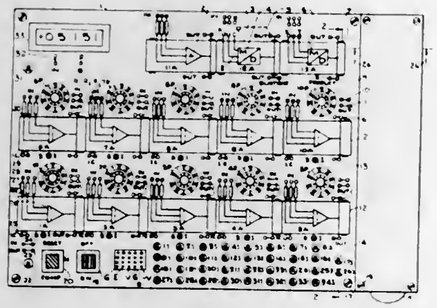
serrations of the other of said contacts and permit said pimple to move into conductive engagement with said second contact.

4,074,113

PUNCHED-CARD PROGRAMMABLE ANALOG COMPUTER

Edwin Zenith Gabriel, 318-B South St., Eatontown, N.J. 07724

Filed Jan. 19, 1976, Ser. No. 650,255
Int. Cl.[2] G06G *7/06, 7/48;* **G09B** *23/02*
U.S. Cl. 235—419 **6 Claims**



1. A computer comprising a panel including a plurality of computing modules, each comprising a summing amplifier circuit and integrator circuit, and means for connecting the output of one computing module to the input of another computing module and a punched-card means for interconnecting said modules in a preselected manner to solve a predetermined mathematical differential equation and wherein said panel further includes a plurality of coefficient potentiometers, on/-off switches and jacks, means for interconnecting selected components for forming an analog model of a physical system;

voltage responsive indicator means;

mode control switching means for

a. "reset" position and means for setting said integrator circuit to their initial values,

b. "compute" position and means for setting said integrator circuits to allow an applied voltage to appear at said integrator circuit output,

c. "hole" position and means for removing the input voltage to said integrator circuits;

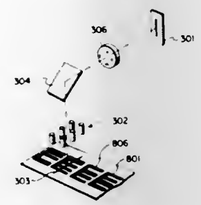
whereby a user of said computer can connect desired computing circuits to model and simulate dynamic physical systems whose output response can be observed on said voltage responsive indicating means.

4,074,114

BAR CODE AND METHOD AND APPARATUS FOR INTERPRETING THE SAME

Bruce W. Dobras, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Mar. 12, 1976, Ser. No. 666,569
Int. Cl.[2] G06K *7/10;* **G08C** *9/06;* **G06K** *9/00, 10/06*
U.S. Cl. 235—463 **29 Claims**



1. An apparatus for reading and interpreting a bar-encoded record bearing a group of substantially parallel, scannable bars having distinctive light reflective characteristics and whose widths represent encoded data, said apparatus comprising:

light responsive means including a linear series of photodetectors arranged along a single straight line for generating a signal whose amplitude fluctuations reflect the spatial variations of the incident light intensity along said series of photodetectors;

means for simultaneously projecting an image of the record onto said series of photodetectors, said record image being along a line generally perpendicular to said group of bars; and

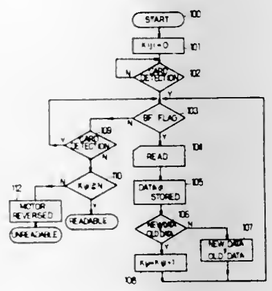
decoding means attached to said light responsive means for decoding the amplitude fluctuations of said signal into data.

4,074,115

METHOD AND APPARATUS TO READ-IN BAR-CODED INFORMATION

Akio Sugiura, Nagoya, and Tadao Nojiri, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 15, 1976, Ser. No. 742,121
Claims priority, application Japan, Nov. 19, 1975, 50-139424; Sept. 14, 1976, 51-110209
Int. Cl.[2] G06K *7/10;* **G08C** *9/06*
U.S. Cl. 235—462 **11 Claims**



1. A method to read-in bar-coded information provided on a surface of an object in bar codes having a plurality of bar symbols of at least two kinds of bar width comprising the steps of:

placing said object to read-in said bar-coded information,

sensing said bar-coded information along a line on the surface of said object,

converting said bar-coded information to a group of electrical signals,

storing said group of electrical signals,

comparing said group of electrical signals with a previously stored group of electrical signals to discriminate a coincidence between said two groups of electrical signals,

counting to accumulate said coincidence,

sensing said bar-coded information along a line which is different from the previous line on the surface of said object,

repeating the same steps of converting, storing, comparing, counting and sensing as above until said object has been carried out of all lines along which said sensing is made, and,

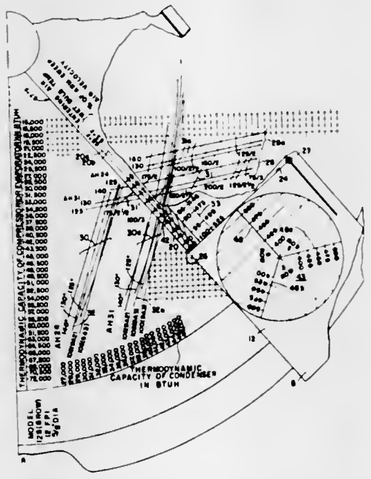
providing a discrimination signal when the number of coincidence times does not reach a predetermined value.

4,074,116

SELECTOR

William M. Ell, 5513 Trent Court, Apt. 261, Alexandria, Va. 22311

Filed Oct. 14, 1976, Ser. No. 732,277
Int. Cl.[2] G06C *27/00, 1/02*
U.S. Cl. 235—83 **7 Claims**



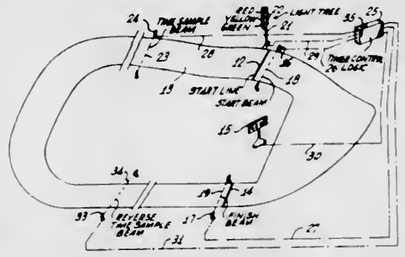
1. In a selector for choosing components for thermodynamic systems such as air conditioning systems, in which said components include a compressor, a condenser, an expansion valve and an evaporator said selector comprising a planar base, an arcuate chart on said base, a pivot on said base, said pivot establishing a point of origin for said chart, a half line on said base extending from said point of origin, indicia on said half line expressing thermodynamic capacities expressed in B.T.U.H. from a minimum near said point of origin to a maximum at a position remote from said point of origin required by said system, said halfline dividing said chart into at least a first and a second quadrant, at least one set of curves (**28**) on said first quadrant representing thermodynamic information necessary for selection of a compressor, at least one second set of curves (**30**) on said first quadrant representing information necessary for selection of a condenser suitable for use with the selected compressor, a first pivoted arm extending from said point of origin as a pivot across said first quadrant said arm including a datum point (**26**) and a first scale expressed in units of temperature extending from said datum point decreasing toward said point of origin, said scale reading 39° F at said datum point, a second scale on said first pivoted arm referring to a correction factor of 1.0 at said datum point and diminishing to 0.0 at said point of origin, a movable pointer (**24**) on said first pivoted arm to be positioned along said first pivoted arm to indicate on said scales on said arm temperatures and correction factors determined in connection with the selection of said compressor by use of said scales and pointer; the improvement including at least one scale on said first pivoted arm extending radially outwardly from said datum point expressed in units of air velocity reading 525fpm at the datum point (**26**), to a velocity of 400cfm radially outwardly thereof, and a second pivoted arm extending from a pivot at said point of origin to overlie said second quadrant, said second pivoted arm being provided with a plurality of scales extending there along; a scale reading in square feet of area of an evaporator; C.F.M. of air that is necessary for an evaporator of that area at 525fpm and a correction factor of 1.0; and at least one scale denoting dimensions of standard evaporators, and a plurality of radial lines lying near the edge of said chart each said radial line indicating an evaporator by catalogue number and other pertinent data, whereby, after a compressor has been selected, a complementary evaporator may be selected by catalogue number.

4,074,117

TIMING SYSTEM

Jack Z. DeLorean, Bloomfield Hills, and David C. Bacon, East Detroit, both of Mich., assignors to Grand Prix of America, Inc., Birmingham, Mich.

Continuation of Ser. No. 458,175, April 5, 1974, abandoned. This application Apr. 26, 1976, Ser. No. 680,415
Int. Cl.[2] G04F *10/00*
U.S. Cl. 235—92 T **23 Claims**



1. Apparatus for sequentially starting and timing a plurality of participants traversing a designated course, said apparatus comprising:

sensing means for detecting the presence of participants at selected positions in the course;

timing means responsive to signals from said sensing means for determining for each participant a sample time measured over a selected portion of the course and a total time over the complete course;

control means for automatically starting the participants over the course at spaced time intervals derived from the respective sample times of immediately preceding participants, said control means including means for generating a control signal after a delay time derived from the sample time determined by said timing means, and means responsive to the control means for signaling a participant to start; and

display means connected to said timing means, for automatically displaying the total time for each participant completing the course.

4,074,118

CALCULATOR CONSTRUCTION

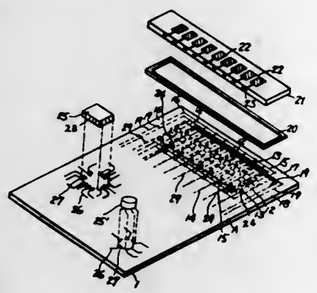
Isamu Washizuka, Kyoto; Shintaro Hashimoto, Shiki, and Saburo Katsui, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 403,857, Oct. 5, 1973, abandoned. This application May 12, 1975, Ser. No. 576,834

Claims priority, application Japan, Oct. 6, 1972, 47-100996; Apr. 24, 1973, 48-46929

Int. Cl.[2] G06F *7/38*

U.S. Cl. 364—712 **14 Claims**



1. An electronic calculator comprising:

a pair of substantially planar dielectric substrates constructed and arranged to define a cavity therebetween, one of said substrates being larger than the other in the provision of an extension of said one substrate beyond said cavity;

a liquid crystal display unit, a liquid crystal composition being contained in said cavity, said liquid crystal display unit including electrode means formed on said dielectric substrates;

semiconductor circuit means including at least a computation function circuit having an input and an output, said semiconductor circuit means being directly mounted on said extension of said one substrate, said computation function circuit output being coupled to said electrode means of said display unit; and

keyboard switch means for feeding data into said calculator having stationary switch contacts directly formed on said extension of said one substrate, said stationary switch contacts being electrically coupled to the input of said computation function circuit.

4,074,119

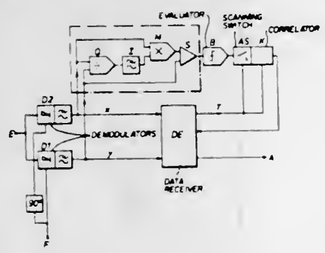
CODE WORD DETERMINATION

Wolfgang Steinert, Backnang, Germany, and Bo Ekström, Stockholm, Sweden, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed June 8, 1976, Ser. No. 693,911

Int. Cl.[2] G06G *7/12*; H04L *7/00*

U.S. Cl. 364—807 **2 Claims**



2. In a receiver of a transmission system operating with multiple phase modulation or multiple phase difference modulation transmission and coherent demodulation reception and in which a unique word is transmitted only as signals in two phases which are 180° apart and the received signals are divided during demodulation into two orthogonal voltage components representing the amplitude and relative phase angle of a received signal, the improvement comprising a circuit for producing a single value whose algebraic sign is determinative of the two-phase signal and including: divider means connected to receive the two orthogonal components of the received signals for producing a quotient signal representing the ratio of the amplitudes of such components; multiplier means connected to receive the quotient signal from said divider means and one of the orthogonal components for producing a product signal representing the product of its received signals; and summing means connected to receive the product signal from said multiplier means and the other one of the orthogonal components for producing a sum signal representing the sum of its received signals and constituting the single value.

4,074,120

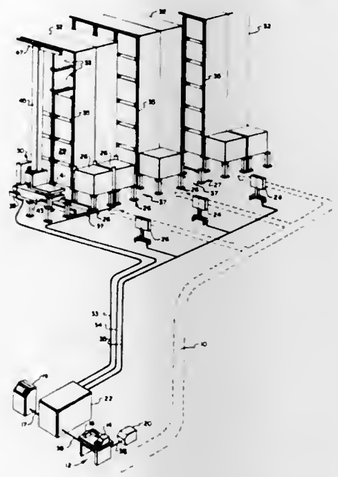
AUTOMATED MATERIALS STORAGE SYSTEM AND METHOD

James Kenneth Allred; Arlyn G. Liddell, both of Salt Lake City; Edward Barney Quinn, Bountiful, and Francis Bischoff Black, Sandy, all of Utah, assignors to Kenway Incorporated, Bountiful, Utah

Filed Mar. 2, 1976, Ser. No. 663,177

Int. Cl.[2] B65G *47/00*; G06K *7/10*

U.S. Cl. 235—419 **20 Claims**



1. A method of automatically addressing and handling goods in a high-rise storage system utilizing an electronically controlled storage and retrieval (S/R) machine, a central processing unit (CPU), a storage operator station and a storage aisle console, comprising the steps of:

establishing in the CPU memory a part number file of all goods acceptable for storage;

establishing in the CPU memory a storage inventory file of all goods actually stored in the high-rise storage system;

establishing in the CPU memory a transaction file of all goods in transit to or from the high-rise storage system;

providing a plurality of transaction code numbers which can only be associated with a load of goods at the storage operator station;

examining the load of goods to be stored and entering a description of the goods into the CPU at the storage operator station;

verifying the descriptive information entered into the CPU by electronically comparing the descriptive information with the part number file of acceptable goods to determine if the description of the goods is found in the part number file;

electronically associating a transaction code number with the description of the load only if the description is found in the part number file and thereafter electronically storing the description in the transaction file at an address identifiable by the transaction code number;

physically associating the transaction code number with the load in a machine-readable form so as to eliminate further human interpretation of the goods to the CPU;

printing an identification label bearing the descriptive information and associating the printed label with the load of goods;

removing the labeled goods to a pick up station of the high-rise storage system;

reading the transaction code number into the aisle console so as to identify the description of the goods to the CPU without human interpretation thereof; and

transferring the goods to the S/R machine from the pickup station and storing the goods in a CPU-selected location.

4,074,121

PHOTOFLASH LAMP UNIT

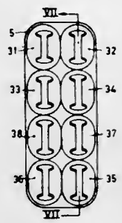
Henricus P. Jagers, and Rudolf Sanders, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 1, 1976, Ser. No. 701,636

Claims priority, application Netherlands, July 2, 1975, 7507855

Int. Cl.[2] G03B *15/02*

U.S. Cl. 362—13 **5 Claims**



1. A flashlamp unit comprising: a generally planar supporting member; a plurality of photoflash lamps secured to said supporting member, each lamp being elongated and having a longitudinal axis, each said longitudinal axis being disposed parallel to said generally planar supporting member; and a reflector disposed between said supporting member and said plurality of lamps, said reflector surface proximate to each lamp being (a) generally concave on a side facing said plurality of lamps (b) having an elongated aperture therein, and (c) having at least one elastically deformable lug abutting said elongated aperture, said lug being bendable elastically away from the contiguous surface, said lug in the bent position enlarging said elongated aperture.

4,074,122

FLUORESCENT LANTERN

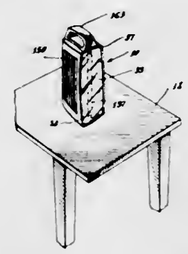
Arthur H. Moore, Fairfield, Conn., assignor to The Bridgeport Metal Goods Manufacturing Company, Bridgeport, Conn.

Filed Feb. 2, 1976, Ser. No. 654,156

Int. Cl.[2] F21L *7/00*

U.S. Cl. 362—200 **7 Claims**

1. A fluorescent lantern comprising a single piece chassis, said chassis having a unitary reflector section and a compartment section integral with said reflector section, battery means disposed in said compartment section, a fluorescent lamp supported by said reflector section so as to direct its light outwardly from said chassis, and means for electrically connecting said fluorescent lamp to said battery means, wherein said unitary reflector section is comprised of a concave rectangular reflector, said concave reflector defining a lens opening, a sealing rim integral with said concave reflector being peripherally disposed around said lens opening, said concave reflector also having a pair of integral sockets located at opposite ends of said concave reflector, said sockets being aligned on the apex of said concave reflector facing said lens opening, and wherein said compartment section is rectangular and longitudinally aligned with said reflector section, said compartment section being integral with said concave reflector opposite said sockets and said lens opening, and wherein said compartment



section is comprised of a pair of sidewalls connected together at each end by a pair of integral end portions, each of said sidewalls also having an integral perpendicular divider wall extending almost to the opposite sidewall, each of said divider walls being disposed equidistant to but on opposite sides of the midpoint of said compartment section, said divider walls thereby defining with a portion of said sidewalls a switching mechanism compartment between themselves, and each divider wall also defining a battery compartment with a portion of said sidewalls and said end portion closest to said divider wall.

4,074,123

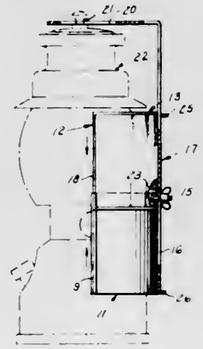
COMBINATION REFLECTOR AND LIGHT SHIELD

Lawrence H. Wissinger, 337 Montgomery Ave., Springfield, Ohio 45506

Filed June 23, 1976, Ser. No. 698,866

Int. Cl.[2] F21V *7/00*

U.S. Cl. 362—319 **1 Claim**



1. A combination reflector and light shield for a lantern, comprising a threaded bolt fastener which receives a wing nut, said bolt fastener being removably received through the said reflector, the said light shield, and said light shield is translucent, so as to be alternately used with said reflector which is opaque, the said combination of said light shield and said reflector being semi-cylindrical in configuration and slidably engaging each other, and said reflector has an elongated slot which receives said bolt fastener, and said light shield has, secured fixedly thereto, a metal plate on its concave portion, which receives said bolt fastener and a lip with an opening, is

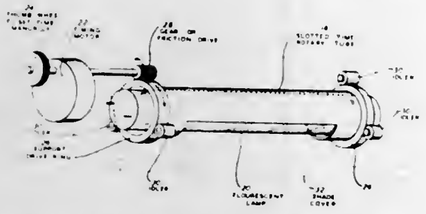
fixedly secured on a peripheral edge of both said light shield and said reflector for receiving a bracket for a lantern.

4,074,124

ILLUMINATION APPARATUS FOR SIMULATING NIGHT, DAWN AND MORNING, MID-DAY AND AFTERNOON AND DUSK NATURAL LIGHT CONDITIONS

Charles J. Maute, 66 Ball Road, Mountain Lakes, N.J. 07046, and Anthony V. Ianetti, 4 Trojan Ave., Parsippany, N.J. 07054

Filed Sept. 22, 1976, Ser. No. 725,441
Int. Cl.² F21V *11/18*
U.S. Cl. 362—217 **3 Claims**



1. Illumination apparatus for simultating night, dawn and morning, mid-day and afternoon and dusk natural light conditions, comprising:

means for providing a source of artificial light; and

shutter means including a pair of shutters operatively associated with said source of artificial light for totally concealing said source of artificial light during a first predetermined amount of time to simulate said night condition, for gradually exposing increasingly larger portions of said source of artifical light during a second predetermined amount of time to simulate said dawn and morning conditions, for constantly exposing a predetermined portion of said source of artificial light during a third predetermined amount of time to simulate said mid-day condition, and for gradually concealing increasingly larger portions of said source of artificial light during a fourth predetermined amount of time to simulate said afternoon and dusk conditions, and

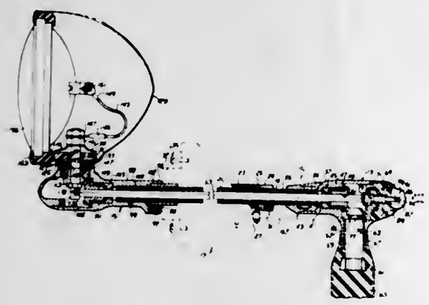
one of said shutters mounted fixedly and the other of said shutters mounted rotatably through 360°.

4,074,125

SPOT LIGHT ASSEMBLY

Robert A. Casalou, Birmingham, Mich., assignor to Robert A. Casalou, Inc., Southfield, Mich.

Filed Nov. 5, 1975, Ser. No. 629,005
Int. Cl.² F21M *3/18*
U.S. Cl. 362—271 **2 Claims**



1. In a spot light assembly including a support tube journalled and retained upon a frame, having a handle assembly secured over one end of said tube, a head assembly secured over the other end of said tube and mounting a spot light, rotation of the handle assembly in a vertical plane effecting a corresponding angular adjustment of the spot light in a vertical plane, a rotatable drive shaft within said tube with its ends extending respectively into said handle assembly and head assembly, an upright stud mounted in said head assembly, said handle asembly including a handle rotatable in a horizontal plane, and intermeshing gear means on said handle, on end portions of said drive shaft and on said stud, and connected to said spot light, whereby rotation of said handle in a horizontal plane effects corresponding rotation of the spot light in a horizontal plane; the improvement comprising:

said drive shaft at one end being in brush contact with said stud;

a lead wire interconnecting said stud and spot light; and

a normally opened switch in said handle assembly connected to an electric power source, and including a spring-biased retracted contact spaced from the other end of said drive shaft;

said handle assembly including an open-ended housing receiving one end of said support tube; said intermeshing gear means including a pair of bevel gears journalled on said housing in insulated relation; and a plastic handle journalled upon and depending from said housing and connected to one of said bevel gears;

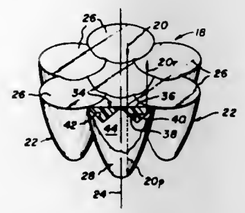
the connection of said handle to one of said bevel gears including an axial shaft on said gear at one end secured within said handle for rotation in unison, there being an annular groove in said shaft; a plastic switch-holding cap mounted over one end of said housing and secured thereto; and a bifurcated tongue on said cap extending into said shaft groove and anchoring said handle upon said housing.

4,074,126

LIGHTING PANEL

Thomas W. Dey, Rochester, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation-in-part of Ser. No. 480,343, June 18, 1974, abandoned. This application Nov. 17, 1975, Ser. No. 632,611
Int. Cl.² F21V *5/00*
U.S. Cl. 362—297 **10 Claims**



1. A luminaire assembly for providing controlled light distribution, comprising:

a light source for emitting light;

reflector means receiving substantially all the light emitted from the light source for directing substantially all such received light as locally unidirectional light to a reflector aperture; and

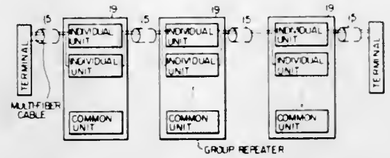
a lighting control panel disposed across the reflector aperture and having a plurality of light modifying elements, each element being disposed in said lighting control panel to receive the locally unidirectional light from said reflector means and having first interface surface means for providing total internal reflection of substantially all the received locally unidirectional light and second interface surface means for refracting substantially all the totally internally reflected light upon leaving the elements into a control range.

4,074,127

OPTICAL PCM GROUP TRANSMISSION REPEATING SYSTEM

Yukou Mochida; Tadao Ogawa, both of Kawasaki, and Kazuo Yamaguchi, Hiratsuka, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 24, 1976, Ser. No. 717,273
Claims priority, application Japan, Aug. 26, 1975, 50-102524
Int. Cl.² H04B *9/00*
U.S. Cl. 250—199 **12 Claims**



1. A light PCM group transmission repeating system for transmitting PCM information by means of a plurality of optical fiber groups each of which is composed of a plurality of optical fibers comprising: group repeaters provided for each optical fiber group, each group repeater having a plurality of individual means for regenerating the PCM information as transmitted through a plurality of said optical fibers, each group repeater having additional means commonly connected to said individual means for simultaneous control thereof;

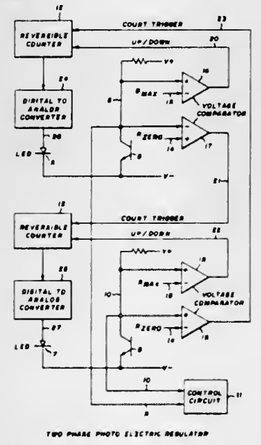
each of said individual means for each group repeater including an individual opto-electric converter circuit, an amplifier, an equalizer and an electro-optic converter circuit for each of a plurality of said optical fibers, and said commonly connected additional means for simultaneous control of said individual means including at least one of the following circuits, an automatic gain control circuit, a light element control circuit, a power supply circuit, a timing circuit, and a supervisory circuit.

4,074,128

PHOTOELECTRIC SIGNAL GENERATING CIRCUITS

Samuel C. Harris, Jr., Waynesboro, and William A. Hanger, Churchville, both of Va., assignors to General Electric Company, Waynesboro, Va.

Continuation of Ser. No. 683,418, May 5, 1976, abandoned. This application Apr. 22, 1977, Ser. No. 789,854
Int. Cl.² G01J *1/32*
U.S. Cl. 250—205 **10 Claims**



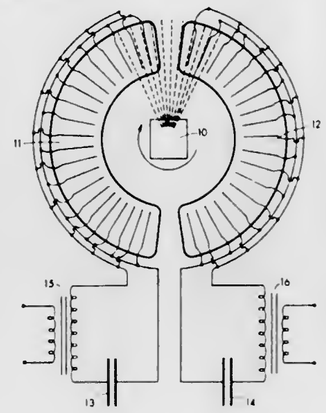
1. An arrangement wherein a shaft encoder comprises a first and second source of light, and means are provided for pulsing said sources of light with light opaque and light transparent segments provided on a rotating disc and representative of the angular position of the shaft, means for regulating the light intensity of said sources comprising a first and second sensor for sensing the light interrupted by said disc at separate predetermined points to provide a respective one of a pair of signals, wherein the amplitudes of said pair of signals are phase displaced by 90° as light passed by the disc changes recurrently through a cycle of maximum to minimum to maximum intensity as the shaft and disc rotate, a respective reversible counter and a respective digital to analog converter associated with each of said first and second light sources, a source of a first and second reference signal for each sensor, means for comparing the voltage developed by each sensor with one of said first and one of said second reference signals to provide first and second control signals respectively, means responsive to the first control signal associated with one sensor to change the count of the reversible counter associated with the second sensor by a predetermined count, means responsive to the second control signal associated with said second sensor to control the direction of said predetermined count, each of said digital to analog converters responsive to the count of the reversible couner associated therewith to provide an analog signal, each source of light responsive to its associated analog signal to vary its light intensity to regulate the amplitude of the light pulses with respect to said given reference levels.

4,074,129

ELECTRIC GENERATION BY LIGHT-VARIABLE CAPACITANCE

Louis R. O'Hare, 1041 Ponderosa Apt. 2, Fort Collins, Colo. 80521

Filed Mar. 22, 1976, Ser. No. 669,384
Int. Cl.² H01J *39/12*
U.S. Cl. 250—212 **4 Claims**



1. An improvement in the method of generating electricity from radiant energy by the use light variable capacitors in a variable capacitance electric generator comprising:

concentrating light energy by reflecting surfaces focusing on a rotable mirror in a vacuum chamber,

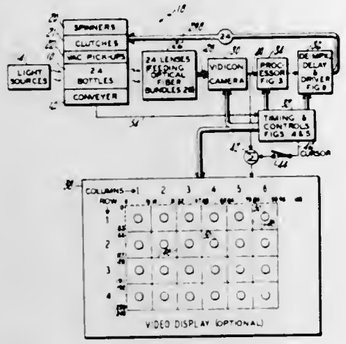
rotating the mirror to rotate the beam of light only upon successive separate light-variable capacitors of separate light-variable capacitance generators, thereby preventing electric interactions between light-variable capacitors,

realizing and utilizing separate electric power outputs, one output from each of the separate generators.

4,074,130
LABELED CONTAINER ORIENTATION PROCESSOR

Leonard A. Messman, Brookfield Center; Harold C. Wooding, Jr., Trumbull, and Glenn C. Waehner, Riverside, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 31, 1975, Ser. No. 645,725
Int. Cl.² B65G 47/24
U.S. Cl. 250—223 R **7 Claims**



1. Apparatus for sensing the rotary orientation of a plurality of illuminated, labeled containers, each rotating at a respective station, comprising:

a plurality of light responsive means, one for each station, each providing intensity signal manifestations of light intensity of respective areas through which successive portions of the peripheral surface of the related container pass as the container rotates at the corresponding station;

sampling means responsive to said light responsive means for sampling said intensity signal manifestations and providing brightness-indicating signals representative of the sampled intensity of said intensity signal manifestation being in excess of a given magnitude;

memory means responsive to said sampling means for storing said brightness-indicating signals in groups, each group including brightness-indicating signals relating to all of the containers within a given time period, and for reading out the stored brightness-indication signals in sets, each set including brightness-indicating signals relating to one of said containers stored during said time period and a plurality of similar, contiguous, preceding time periods;

stop means responsive to said memory means for testing each set of signals read out of said memory means for compliance with a desired pattern and for providing a stop signal related to the orientation of the container when a set of signals conforms to the desired pattern; and

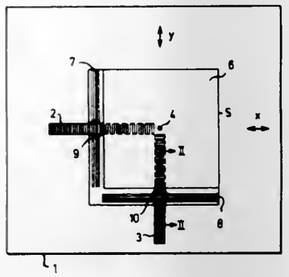
a plurality of delay means, one for each of said stations, each responsive to said stop means to provide an output signal after a pre-established delay from the time of generating said stop signal in response to the testing of a corresponding one of said sets of signals, said pre-established time delay being related to the relative position of the related one of said light responsive means and the desired rotary orientation of the container thereat.

4,074,131
APPARATUS FOR MEASURING OR SETTING TWO-DIMENSIONAL POSITION COORDINATES

Reiner Schwebel, Aalen, Germany, assignor to Carl Zeiss-Stiftung, Oberkochen, Germany

Filed May 3, 1976, Ser. No. 682,504
Claims priority, application Germany, May 15, 1975, 2521618
Int. Cl.² H01J 3/14
U.S. Cl. 250—237 G **15 Claims**

1. A device for measuring or setting two-dimensional position coordinates of an object, comprising a movable object-bearing slide and a support for said slide, means coacting between said slide and said support for limiting their relative displacement to non-rotational displacement in essentially a single plane, two elongate measurement grids fixedly disposed on said support at right angles to each other and parallel to said plane, the point of intersection of the alignments of said grids coinciding with a measurement mark and each of said grids cooperating with a separate reading index carried directly by said object-bearing slide, the reading index for each coordinate

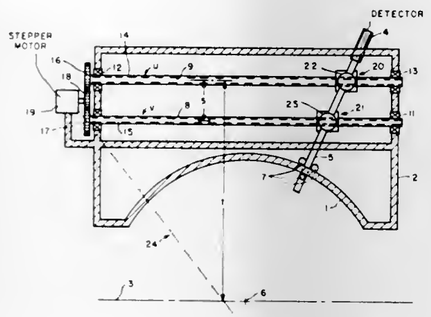


direction being an elongate scanning grid of an effective length which is substantially the measurement length of the other coordinate direction, each of said grids comprising only a single set of parallel lines which are oriented parallel to one or the other of orthogonally related components of the non-rotational displacement, and a photoelectric sensor associated with each scanning grid for detecting position with respect to the associated measurement grid, whereby each sensor may provide a digit-countable output signal indicative of the component of displacement scanned thereby.

4,074,132
AUTOMATIC SINGLE CRYSTAL DIFFRACTOMETER

Joshua Ladell, Monsey, N.Y., and Gerald Kennedy Pitcher, Old Lyme, Conn., assignors to North American Philips Corporation, New York, N.Y.

Filed Aug. 24, 1976, Ser. No. 717,372
Int. Cl.² G01N 23/20
U.S. Cl. 250—277 R **6 Claims**

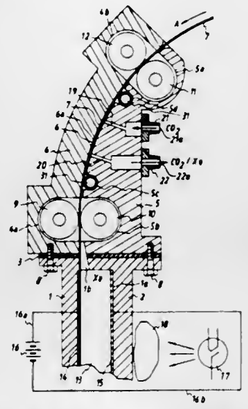


1. In a diffractometer for the acquisition of crystallographic data from a single crystal including means to rotatably mount the crystal in the path of a beam of x-rays, an arc mounted on a frame for rotation about a horizontal axis, a detector moveable along said arc, and means to constrain the movement of the crystal and the detector so that the detector is sequentially positioned along a line of the reciprocal lattice of the crystal, the improvement wherein means are provided to constrain translation of the detector on the arc while the arc itself rotates about the horizontal axis said constraining means being a double lead screw arrangement to which the detector is coupled.

4,074,133
IONOGRAPHY IMAGING CHAMBER

Jürgen Müller; Alfred Rheude, and Manfred Schmidt, all of Munich, Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Sept. 7, 1976, Ser. No. 720,577
Claims priority, application Germany, Sept. 11, 1975, 2540404
Int. Cl.² G03B 41/16
U.S. Cl. 250—315 A **14 Claims**

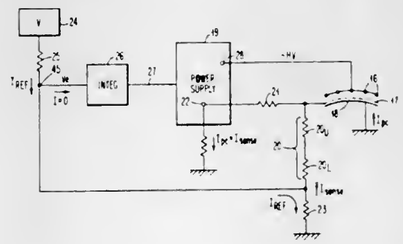


1. In an X-ray apparatus, a combination comprising an ionography imaging chamber defining an interelectrode gap and having a channel for introduction of insulating charge-receiving media into and for withdrawal of such media from said gap; a source of high Z gas; means for conveying compressed high Z gas from said source into said gap and vice versa; a source of compressed buffer gas which is readily separable from said high Z gas; means for admitting compressed buffer gas from the respective source into at least one first portion of said channel whereby the buffer gas flows in said channel toward and away from said gap and the buffer gas flowing toward said gap mixes with high Z gas which normally fills at least a portion of said channel intermediate said gap and said first portion of said channel; and means for evacuating the mixture of buffer gas and high Z gas from at least one second portion of said channel intermediate said gap and said first portion of said channel, said evacuating means comprising a device for maintaining the gases in said second portion of said channel at a pressure which is less than the pressure of buffer gas in said first portion of said channel.

4,074,134
OPERATING POINT REGULATION FOR A CORONA DISCHARGE DEVICE

Howard John Roalson, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 13, 1976, Ser. No. 676,586
Int. Cl.² H01T 19/04
U.S. Cl. 250—324 **4 Claims**



1. A control circuit for a corona discharge device utilized to produce a uniform charge on an electrophotographic imaging member comprising:

a direct current power source having a high voltage terminal and a common terminal;

a corona generating device having a plurality of corona emission wires and a screen member between said corona wires and said imaging member;

means for connecting said high voltage terminal to said corona wire to produce corona emission;

means for connecting a first resisitor between said screen electrode and said common terminal of said power source to produce a predetermined screen current;

means for connecting said screen electrode to a summing point over a circuit path including a sense resistor to produce a sense current;

a direct current power source for producing a reference current and circuit means to couple this reference current to said summing point;

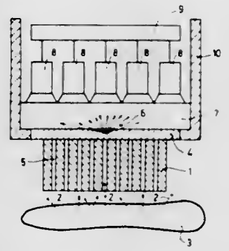
circuit means for connecting a summing resisitor from said summing point to a reference potential to produce an error voltage proportional to the difference between said sense current and said reference current; and

means responsive to said error voltage to adjust the high voltage output inversely with the variation of the sense current.

4,074,135
GAMMA CAMERA IN WHICH ONLY THE THREE LARGEST SIGNALS ARE USED FOR POSITION DETERMINATION

Petrus Franciscus Stevens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 17, 1975, Ser. No. 623,394
Claims priority, application Netherlands, Oct. 21, 1974, 7413741
Int. Cl.² G01T 1/20
U.S. Cl. 250—366 **5 Claims**



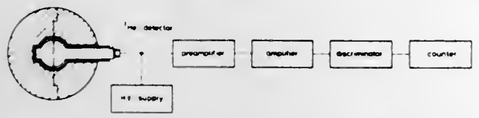
1. A scintillation camera comprising a scintillation crystal, a matrix of detectors viewing overlapping areas of said crystal, an output signal being associated with each detector, means for comparing the amplitudes of said output signals and for selecting a predetermined number thereof having the greatest amplitude, and computing circuitry for computing the position of a scintillation produced in said crystal from the selected predetermined number of output signals, thereby to improve spatial resolution by using for position calculation only the information contribution from a predetermined number of detectors situated nearest to the scintillation.

4,074,136

APPARATUS FOR DETERMINING THE DOSE EQUIVALENT OF NEUTRONS

Max Heinzelmann; Fritz Rohloff, and Hans Schüren, all of Julich, Germany, assignors to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

Continuation-in-part of Ser. No. 617,397, Sept. 29, 1975, abandoned. This application Feb. 8, 1977, Ser. No. 766,773
Claims priority, application Germany, Oct. 8, 1974, 2447817
Int. Cl.[2] G01T *3/00*
U.S. Cl. 250—392 5 Claims



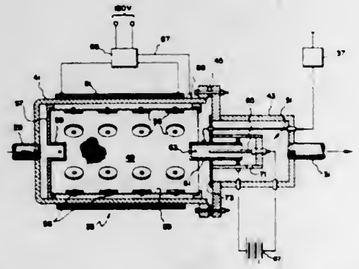
1. An apparatus for obtaining an indication of the dose equivalent independent of the energy of the neutrons and dose rate equivalent of neutrons without registering any thermal neutrons, which includes in combination: a detector operable to absorb neutrons and to emit voltage pulses, a mantle surrounding said detector having only a single moderator layer for moderating purposes and for absorbing neutrons, amplifying means following and in series with said detector for amplifying the voltage pulses emitted by said detector, a voltage discriminator arranged to receive the amplified voltage pulses, recording means following and arranged in series with said voltage discriminator for registering the time average number of the voltage pulses emitted by said voltage discriminator withholding voltage impulses while said detector for neutrons with energies up to at least 10^6 eV emits voltage pulses the height of which depends both on the energy freed by the nuclear processes initiated by the absorbed neutrons and on the kinetic energy of the absorbed neutrons, and while the number of the voltage pulses with a height located within the range of the energies freed in the nuclear processes is at a maximum, said voltage discriminator having the height of the voltage threshold located above the height of the voltage of the by far greatest number of the voltage pulses distributed about said maximum, that part of said mantle which faces said detector comprising a cadmium layer having a thickness of from 0.1 to 2 millimeters to preclude thermal neutrons.

4,074,137

HEATED ION CHAMBER DETECTOR FOR A DYNAMOELECTRIC MACHINE

Chester C. Carson, Ballston Spa; Sterling C. Barton, and Federico S. Echeverria, both of Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sept. 2, 1976, Ser. No. 719,838
Int. Cl.[2] G01T *1/18*
U.S. Cl. 250—380 2 Claims



1. An improved apparatus of the type used for detecting the presence of pyrolysates in a gaseous carrier, said gaseous carrier being a coolant gas sample from a gas cooled dynamoelectric machine wherein certain machine parts are coated with selected materials which will decompose at an elevated temperature to produce said pyrolysates indicative of localized overheating of dynamoelectric machine parts; said apparatus comprising an outer shell including a gas mixing and ionizing section and a detector section, said detector section receiving said ionized gas sample from said gas mixing and ionizing section, said detector section including spaced electrodes having an applied voltage between which current flow occurs by means of the ionized gas to produce a variable signal the magnitude, of which, is proportional to the current flow; wherein the improvement comprises:

heater means applied to the gas mixing and ionizing section, said heater means providing a temperature range of from approximately 150° C to 250° C within the gas mixing and ionizing section whereby oil mist particles from the dynamoelectric machine may be gasified without affecting pyrolysates in the gaseous carrier; and,

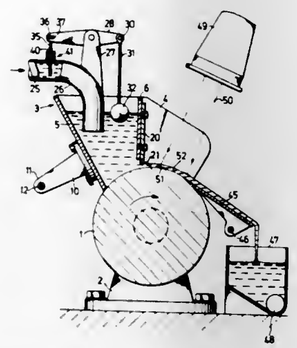
a radiation source within said gas mixing and ionizing section comprising a plurality of discrete radioactive ceramic elements supported along the axial length of said gas mixing and ionizing section.

4,074,138

APPARATUS FOR TREATING LIQUID SLUDGE MATERIAL

Ernst Bosshard, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Feb. 25, 1975, Ser. No. 552,936
Claims priority, application Switzerland, Dec. 23, 1974, 17238/74
Int. Cl.[2] G01N *21/24, 21/26, 23/10, 23/20*
U.S. Cl. 250—435 10 Claims



1. In an apparatus for treating sludge with electron beam radiation, the combination of

a rotatably driven drum for conveying the sludge to be treated;

means including a hopper of sludge for applying the sludge onto said drum in a thin layer and a metering plate near the vertex of said drum constituting a wall of said hopper for determining the thickness of the layer of sludge on said drum; and

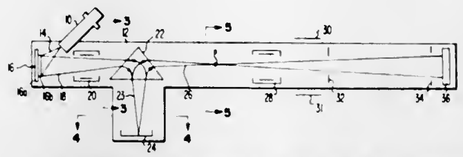
an electron beam generator for directing an electron beam radially onto said drum to define an irradiation zone on the sludge carried past said electron beam on said drum and to swing said beam back and forth along a generatrix of said drum.

4,074,139

APPARATUS AND METHOD FOR MASKLESS ION IMPLANTATION

Jacques Isaac Pankove, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,685
Int. Cl.[2] H01J *37/30;* H01L *21/72, 21/265*
U.S. Cl. 250—492 A 7 Claims



1. A method of implanting a dopant material into a substrate of semiconductive material in a preselected pattern without utilizing a mask, said method comprising the steps of:

forming a source template having at least one dopant material formed thereon in said preselected pattern;

sputtering ions of said dopant material from said template by ion bombardment from a primary ion source;

filtering said ions of said dopant material from ions of other materials by means of an ionic filter; and

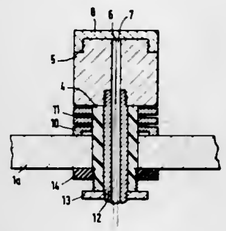
implanting said ions of said dopant material into said substrate in the pattern of said source template.

4,074,140

ARRANGEMENT FOR MEASURING TEMPERATURES OF WORKPIECES TO BE TREATED BY GLOW DISCHARGE

Bernd Edenhofer, Cologne, Germany, assignor to Ionit Anstalt Bernhard Berghaus, Vaduz, Liechtenstein

Filed Feb. 16, 1977, Ser. No. 769,164
Claims priority, application Germany, Feb. 18, 1976, 2606453
Int. Cl.[2] G21K *5/08*
U.S. Cl. 250—492 R 10 Claims



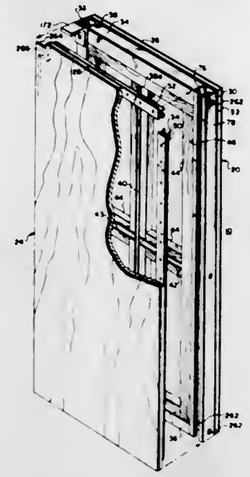
1. In an arrangement for measuring temperatures of workpieces to be treated by glow discharge a combination comprising a container for receiving a treating gas or gas mixture and a charge of one or more workpieces to be treated; means for establishing an electrical potential gradient between said container and the workpiece so as to produce a glow discharge field; and means electrically-insulated in relation to said container and having the same potential than the workpiece(s) for indicating the temperature of the workpiece(s), including heat sensing means having a thermal sensor element mounted within the testpiece in heat-conducting relationship therewith and operative for generating a signal in dependence upon the temperature detected, and means for conducting the detected signal from said sensor element towards the exterior of said container, said conducting means being located remote from said glow discharge field to thereby prevent undesirable interference between said field and the detected signal.

4,074,141

PREFABRICATED X-RADIATION PROTECTION PANELS

Frank E. Bryant, 28 Honeybear Lane, Romeoville, Ill. 60441

Filed Apr. 23, 1976, Ser. No. 679,836
Int. Cl.[2] G21F *3/04*
U.S. Cl. 250—517 9 Claims



1. A shielded wall panel assembly comprising:

a rectangular frame including a pair of vertical side channel members and a pair of horizontal top and bottom channel members secured together with their bight portions facing toward one side and with their open sides defining an elongated slot facing toward the other side;

an outside finish panel with an inner lead sheath secured to the bight portions of said channel members;

an inside finish panel having a snap-on fastening member extending along and contiguous to each of the edges of the inner side thereof;

said fastening members each defining a pair of spaced flanges adapted to snap-fit within the respective open sides of said channel members;

the outer legs of said channel members on opposite sides of said frame being substantially contiguous to the edges of said panels; and

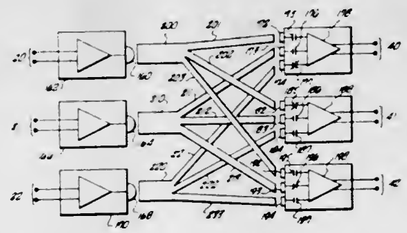
means for securing said outer legs of said channel members to an adjacent structure.

4,074,142

OPTICAL CROSS-POINT SWITCH

Albert S. Jackson, 1335 Crestview, Seal Beach, Calif. 90740

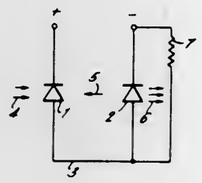
Filed Sept. 10, 1975, Ser. No. 612,255
Int. Cl.[2] G02B *27/00*
U.S. Cl. 250—551 20 Claims



1. In an optical cross-point switch, the combination which comprises:

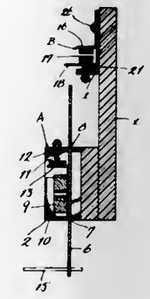
a plurality of separate input circuits;
a plurality of separate output circuits;
an optical matrix connected between the input and output circuits, the matrix including a first set of light emitting units associated with the input circuits and a second set of light sensor units associaed with the output circuits, one of the first and second sets having a number of *n* units, where *n* equals an integer, and the other set having a number of arrays of units with each array having a number of *n* units, one unit in each array of the other set being individually associated with one unit of said one set, each unit of the first set being coupled to a separate input or output circuit and each array of the second set being coupled to a separate input or output circuit, each light emitting unit being arranged to convert an electrical signal into a light signal, each light sensor unit being arranged to convert a light signal into an electrical signal;
means for transmitting light signals between each unit of said one set and the associated unit in each array of the other set so that each input circuit may be selectively coupled to any desired output circuit; and
means for selectively enabling one unit of each array to thereby connect selected input circuits to selected output circuits.

4,074,143
OPTOELECTRONIC DEVICE WITH OPTICAL FEEDBACK
George Hedley Storm Rokos, Hitchen, England, assignor to Xerox Corporation, Stamford, Conn.
Filed Mar. 15, 1976, Ser. No. 666,981
Claims priority, application United Kingdom, Oct. 24, 1975, 43925/75
Int. Cl.² G01J *1/32*; H01L *9/00*
U.S. Cl. 250—552 **4 Claims**



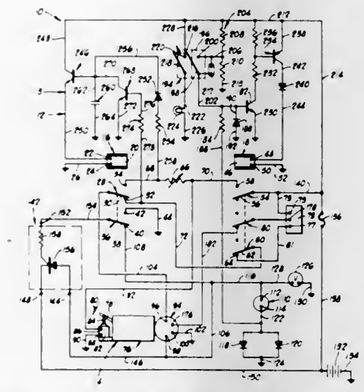
1. A optoelectric device comprising:
a light emitting device,
a light sensitive device coupled directly in series with said light emitting device,
first means for applying a voltage across said series connected devices, said voltage having a polarity such that said light sensitive device is reverse biased and said light emitting device is forward biased, said reverse bias of said light sensitive device causing said light sensitive device to be current blocking and preventing current flow through said light emitting device,
light from an external light source being transmitted to said light sensitive device, causing said light sensitive device to conduct whereby current is permitted to flow through said light emitting device which emits light in response to said current flow,
said light emitting device being so disposed in relationship to said light sensitive device such that a portion of the light emitted by said light emitting device is incident upon said light sensitive device to provide positive feedback whereby said light sensitive device permits additional current flow which provides for more light output from said light emitting device.

4,074,144
SWITCH DEVICE
Mitsuji Kawai, No. 26, 1-chome, Kaname-cho, Toshima, Tokyo, Japan
Filed May 13, 1976, Ser. No. 686,019
Int. Cl.² B60K *33/00*
U.S. Cl. 307—10 R **10 Claims**



1. A switch device comprising:
two switch mechanisms connected in series in an electric circuit extending between a member to be operated and a power source;
one of said two switch mechanisms including a stationary contact and a movable member having a movable contact, said movable contact being adapted to engage and disengage from said stationary contact;
a magnet attracted to or a spring applied against said movable member;
said movable member being in releasable engagement with a slidable member connected to a vehicle accelerator by means of said magnet or spring; and
the other switch mechanism including a stationary contact and a movable contact for engaging and disengaging from said stationary contact of said other switch mechanism by the slidable movement of said slidable member.

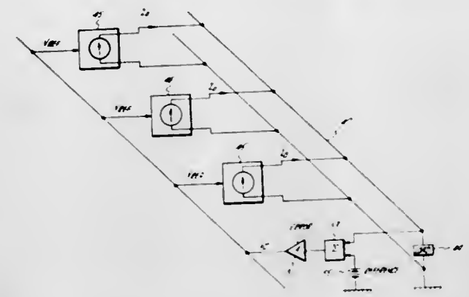
4,074,145
ELECTRIC POWER GENERATING APPARATUS
Perry D. Laffoon, 21 Janice, Yukon, Okla. 73099, and Robert L. Boettcher, 7225 Norman Road, Oklahoma City, Okla. 73132
Filed Apr. 18, 1977, Ser. No. 788,524
Int. Cl.² H02J *3/00*
U.S. Cl. 307—10 R **14 Claims**



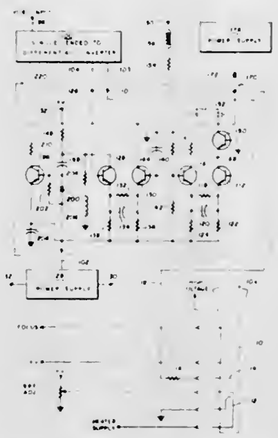
1. An electric power generating apparatus comprising:
an outlet for connection to an electrical load;
an alternator, having an input terminal for receiving a field current, the alternator having an output terminal connected to the outlet for providing a voltage signal thereto in a driven condition of the alternator;
an auxiliary power unit, mechanically coupled to the alternator, for driving the alternator, the auxiliary power unit comprising a throttle positionable in a first position wherein the auxiliary power unit drives the alternator at a relatively low speed and positionable in a second position wherein the auxiliary power unit drives the alternator at a higher speed;
a solenoid, connected to the throttle of the auxiliary power unit and alternatively positioning the throttle in the first and second positions, the solenoid having an input terminal and a ground terminal, the input terminal receiving an actuating current and the ground terminal connected to a system ground;
a battery connected to the input terminal of the alternator and to the input terminal of the solenoid, the battery providing the field current to the alternator and providing the actuating current to the solenoid; and
a switching assembly, interposed between the battery and the input terminals of the alternator and the solenoid, comprising:
a voltage regulator having an input terminal connected to the battery and an outlet terminal;
a voltage regulation conduit;
a variable resistor; and
a switching circuit comprising:
a first relay having a first relay first contact assembly connected to the input terminal of the alternator, the resistor and the voltage regulation conduit, the first relay first contact assembly connecting the voltage regulation conduit to the input terminal of the alternator in a deactuated state of the first relay and connecting the resistor to the input terminal of the alternator in an actuated state of the first relay;
a second relay, comprising:
a second relay first contact assembly connected to the battery, the resistor, and the input terminal of the solenoid, the second relay first contact assembly connecting the battery to the resistor and to the input terminal of the solenoid in an actuated state of the second relay; and
a second relay second contact assembly connected to the output terminal of the alternator and to the voltage regulator conduit, the second relay second contact assembly connecting the output terminal of the alternator to the voltage regulation conduit in a deactuated state of the second relay; and
relay actuation means for alternatively placing the first and second relays in a deactuated state and placing the first and second relays in an actuated state.

4,074,146
LOAD SHARING MODULAR POWER SUPPLY SYSTEM
Carlos Ernesto Buonavita, South Pasadena, Calif., assignor to Burroughs Corporation, Detroit, Mich.
Division of Ser. No. 593,070, July 3, 1975, Pat. No. 4,032,830.
This application Mar. 1, 1976, Ser. No. 662,636
Int. Cl.² H02J *1/04*
U.S. Cl. 307—60 **4 Claims**

1. A modular power supply system for connection to a power bus supplying a load, said modular power supply system comprising:
a first power supply module connected to said bus which includes current feedback means for maintaining a constant current output, the level of said current output being adjustable in response to a first settable reference voltage level; and
at least a second power supply module connected to said power bus and including current feedback means for maintaining a constant current output, the level of said current output being adjustable in response to a second settable reference voltage level;
means for monitoring the voltage across said load and developing an error signal indicating a departure of the voltage across said load from a desired level; amd
a common voltage reference source means outputting a single voltage for supplying said first and second settable reference voltage levels and for responding to said error signal to adjust said common voltage reference to compensate for said departure.



4,074,147
SWITCHING AMPLIFIERS
Carlo Infante, Dallas, Tex., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 3, 1976, Ser. No. 747,161
Int. Cl.² H03K *1/02*
U.S. Cl. 307—230 **20 Claims**



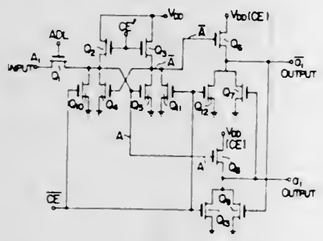
1. A switching amplifier providing output pulses at a first voltage level and connected to a power supply at a second voltage level greater than the first level, comprising:
input means responsive to a switching signal and connected to the power supply for generating a first output current,
a differentiator coupled to said input means and to the power supply and responsive to the switching signal for generating a second output current,
a summing junction for adding the first and second output currents, and
clamping means connected to said summing junction for limiting the amplitude of the output pulses to the first voltage level.

4,074,148

ADDRESS BUFFER CIRCUIT IN SEMICONDUCTOR MEMORY

Takashi Sato, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Filed June 3, 1976, Ser. No. 692,367
Claims priority, application Japan, June 4, 1975, 50-66565
Int. Cl.[2] H03K *3/286, 3/353*
U.S. Cl. 307—279 **7 Claims**



1. An address buffer circuit for a semiconductor memory circuit comprising:

a dynamic flip-flop circuit operated by an operating voltage and including first and second inverters and voltage-driven load means series-connected to the respective inverters, an input node of each inverter being cross-coupled with an output node of the other inverter, said flip-flop circuit receiving an input signal at the input node of said second inverter and providing mutually opposite output signals at the output nodes of said first and second inverters respectively upon application of a driving pulse signal to said load means to couple said inverters to the operating voltage,

an output circuit including first and second drivers connected to receive the output signals of the flip-flop circuit respectively from the output nodes of said second and first inverters and providing mutually opposite pulse outputs of the buffer circuit, and

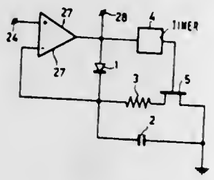
driving pulse generating means coupled to control terminals of said load means for generating a driving pulse signal existing for a period between the occurrence of a control signal of the memory circuit and that of a pulse output at said output circuit and driving said load means in conduction thereby.

4,074,149

PEAK DETECTING WITH CONSTANT FRACTIONAL OFFSET

Geert Jan Naaijer, Limeil-Brevannes, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 8, 1974, Ser. No. 522,116
Claims priority, application France, Nov. 9, 1973, 73 39857; Nov. 9, 1973, 73 39858; Nov. 22, 1973, 73 41594
Int. Cl.[2] H03K *5/153;* **G01R** *19/04*
U.S. Cl. 307—351 **4 Claims**



1. A peak detector for detecting peaks of various amplitudes comprising:

difference determining means having first and second inputs and an output;

means for applying an input signal, having signal peaks at successive times and of arbitrary amplitude, to the first input of said difference determining means;

analog storage means, comprising a capacitor having one terminal connected to said second input of said difference determining means for storing an analog reference level derived from the most recent signal peak of said input signal;

charging means connected to the output of said difference determining means and responsive to a latter signal peak having an amplitude greater than the reference level of said analog storage means and operative for charging said capacitor;

timing means having an input connected to the output of said difference determining means, and an output, said timing means being responsive to the trailing edge of a signal peak received on its input for generating a signal of predetermined duration of its output; and

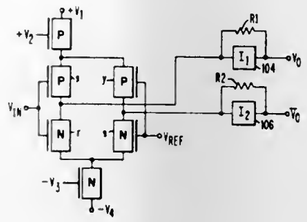
discharging means having a control input connected to the output of said timing means for partially discharging said capacitor by a predetermined fraction upon termination of an input signal peak for determining said analog reference as a fraction of the most recent signal peak.

4,074,150

MOS INTERCHIP RECEIVER DIFFERENTIAL AMPLIFIERS EMPLOYING RESISTOR SHUNT CMOS AMPLIFIERS

Frederick Buckley, III, Vestal; Malcom Kenneth Creamer, Jr., Endicott, and Gerald Aberdeen Miller, Owego, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 534,950, Dec. 20, 1974, Pat. No. 3,986,041.
This application June 30, 1976, Ser. No. 701,385
Int. Cl.[2] H03K *5/20, 17/04, 17/60, 19/08*
U.S. Cl. 307—362 **6 Claims**



1. A high performance digital signal receiver circuit comprising:

an FET differential amplifier having a first input connected to a source signal, a second input connected to a reference voltage, and a differential amplifier output node characterized by a large source capacitance;

a negative feedback amplifier in shunt feedback configuration having its input terminal connected to said differential amplifier output node for providing a low impedance path for current around said capacitance and whose output constitutes the output terminal for said receiver circuit;

said feedback amplifier comprising:

a first P-channel FET device having a source connected to a relatively high supply voltage and a drain connected to said amplifier output terminal and to the drain of a first N-channel FET device having its source connected to a relatively low supply voltage;

said first P-channel FET device having a gate electrode connected to said amplifier input terminal and said first N-channel FET device having a gate electrode connected to said amplifier input terminal;

a resistor connected between said amplifier input and output terminals;

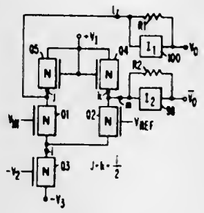
whereby a high speed digital signal receiver is formed.

4,074,151

MOS INTERCHIP RECEIVER DIFFERENTIAL AMPLIFIERS EMPLOYING CMOS AMPLIFIERS HAVING PARALLEL CONNECTED CMOS TRANSISTORS AS FEEDBACK SHUNT IMPEDANCE PATHS

Frederick Buckley, III, Vestal; Gerald Aberdeen Miller, Owego, and Vincent Anthony Scotto, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 534,945, Dec. 20, 1974, Pat. No. 3,986,043.
This application June 30, 1976, Ser. No. 701,377
Int. Cl.[2] H03K *5/20, 17/04, 17/60, 19/08*
U.S. Cl. 307—362 **6 Claims**



1. A high performance digital signal receiver circuit, comprising:

an FET differential amplifier having a first input connected to an input signal source, a second input connected to a reference voltage, and a differential amplifier output node characterized by a large source capacitance;

a negative feedback amplifier in shunt feedback configuration having its input terminal connected to said differential amplifier output node for providing a low impedance path for current around said capacitance and whose output constitutes the output terminal for said receiver circuit;

said feedback amplifier further comprising:

a first P-channel FET device having a source connected to a relatively high supply voltage and a drain connected to said amplifier output terminal and to the drain of a first n-channel FET device having its source connected to a relatively low supply voltage;

said first P-channel FET device having a gate electrode connected to said amplifier input terminal and said first N-channel FET device having a gate electrode connected to said amplifier input terminal;

a second N-channel FET device and a second P-channel FET device mutually connected in parallel between said amplifier input and output terminals, with the gate of said second N-channel FET device connected to said relatively high supply voltage and the gate of said second P-channel FET device connected to said relatively low supply voltage;

whereby a high speed digital signal receiver is formed.

4,074,152

ULTRASONIC WAVE GENERATOR

Kiyokazu Asai, and Akihiro Takeuchi, both of Nagoya, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan

Filed Sept. 30, 1975, Ser. No. 620,059
Claims priority, application Japan, Dec. 28, 1974, 49-3508
Int. Cl.[2] H01L *41/04*
U.S. Cl. 310—334 **13 Claims**

1. An ultrasonic wave generator comprising:

an ultrasonic wave oscillator;

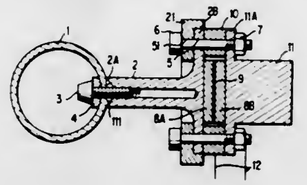
an ultrasonic wave transducer, connected to said ultrasonic wave oscillator, for transforming an electrical oscillation from said oscillator into a mechanical vibration;

a mechanical vibration amplifying member, having one end thereof integrally secured to one end of said ultrasonic wave transducer, for amplifying the amplitude of said mechanical vibration transmitted from said ultrasonic wave transducer;

an ultrasonic vibratory member of a hollow cylindrical body which is open at both ends thereof, which has a side circular wall having a predetermined length between said ends and a constant predetermined wall thickness in the axial direction thereof, and which has its outer circumferential surface integrally connected to the other end of said mechanical vibration amplifying member, with the longitudinal axis thereof being disposed perpendicularly to the longitudinal axis of said mechanical vibration amplifying member; and

an increased thickness portion which projects from said circumferential surface of said ultrasonic vibratory member and/or from a side wall portion of said mechanical vibration amplifying member at the connecting portion of said ultrasonic vibratory member and said mechanical vibration amplifying member, and which is integrally formed upon said ultrasonic vibratory member and said mechanical vibration amplifying member in such a manner that the cross-sectional area of said connecting portion of said ultrasonic vibratory member and said mechanical vibration amplifying member gradually changes,

whereby the mechanical strength of said connecting portion between said ultrasonic vibratory member and said mechanical vibration amplifying member is increased so as to prevent fatigue failure and cracking within said connecting portion, and the positive trnasmission of ultrasonic waves from said mechanical vibration amplifying member to said ultrasonic vibratory member is insured so as to



generate ultrasonic waves from said ultrasonic vibratory member in a stable manner for a long period of time;

said mechanical vibration amplifying member and said vibratory member form two separate members;

said vibratory member of said hollow cylindrical body having a predetermined wall thickness and being integrally secured to the other end of said mechanical vibration amplifying member upon its outer circumferential surface; and

said increased thickness portion is a rib structure provided on at least one of the joint portions of said vibratory member and said mechanical vibration amplifying member along a side wall surface thereof,

whereby said vibratory member is integrally coupled to said mechanical vibration amplifying member through means of said rib structure, and the mechanical strength of said joint portion between said ultrasonic vibratory member and mechanical vibration amplifying member is increased;

said rib structure of said increased thickness portion is integrally formed upon said joint portion of said vibratory member and said mechanical-vibration amplifying member along said outer circumferential surface of said vibratory member in a direction parallel with the longitudinal axis of said vibratory member;

said ultrasonic vibratory member comprises a hollow cylinder provided with said rib structure which has a triangular columnar projection configuration, is integral with the cylindrical wall of said vibratory member, and extends in a direction parallel with the longitudinal axis of said cylindrical body over the entire axial length thereof.

4,074,153

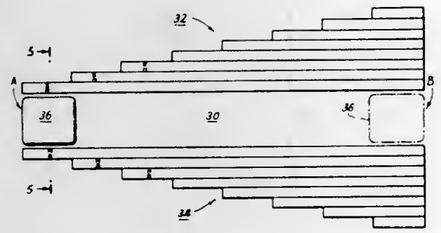
MAGNETIC PROPULSION DEVICE

Daniel Baker, deceased, late of New York, N.Y., by Esther Claire Fuhrer, and Alan W. Borst, 60 E. 42nd St., New York, N.Y. 10017

Division of Ser. No. 218,746, Jan. 18, 1972, abandoned. This application Aug. 26, 1975, Ser. No. 604,463

Int. Cl.[2] H02H *41/00*

U.S. Cl. 310—12 **5 Claims**



1. A magnetic propulsion device comprising a magnetized propulsion wall composed of a plurality of individual magnets extending continuously from the beginning to the end thereof, each magnet being permanently magnetized through its thickness, a second propulsion wall spaced from said first wall having the same length, linear or radial arcuate, as said first wall and transversely substantially the same beginning and end terminal points, whereby the space defined by said propulsion walls is adapted to receive a magnetized element which is propelled therethrough from the beginning to the end thereof due to the interaction of the magnetic fields produced by said element and said walls.

4,074,154

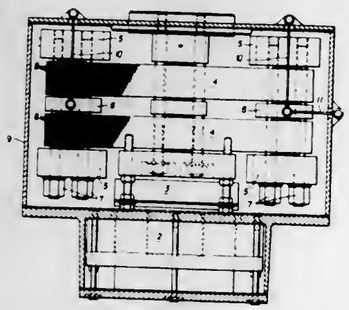
ELECTROMAGNETIC VIBRATOR WITH IMPROVED SPRING MOUNTS

Konrad Kuschel, Vienna, Austria, assignor to IFE Gesellschaft mbH, Vienna, Austria

Filed May 27, 1976, Ser. No. 690,570

Int. Cl.[2] H02K *33/02*

U.S. Cl. 310—29 **26 Claims**



1. An electromagnetic drive, comprising a first vibratory member which includes an armature; a second vibratory member which includes at least one electromagnet arranged for cooperation with said armature; spring means having spaced end portions and arranged to couple said first and second vibratory members; first connecting means connecting said first vibratory member with said spring means; and second connecting means connecting said second vibratory member with said spring means, at least one of said second connecting means and said second vibratory member being arranged to compensate for at least the predominant part of the changes in spacing between said end portion which occur in response to deflection of said spring means, and said second connecting means being arranged for substantially moment-free transmission of forces from said spring means to said second vibratory member, said second connecting means comprising bar-like members provided in the regions of said end portions, said bar-like members being resistant to bending in longitudinal direction of said spring means and in the direction of vibration of said spring means, and said bar-like members having a low resistance to torsion about an axis extending normal to the vibrational plane.

4,074,155

INTERNALLY AIR COOLED EXCITER-CURRENT LEAD-THROUGH BOLT INTERCONNECTING ROTOR SHAFT-ENCLOSED LEAD-IN CONDUCTOR BAR AND TERMINAL CONDUCTOR BAR LEADING TO ROTOR WINDING

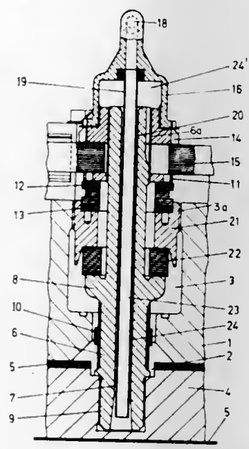
Werner Haditsch, Nussbaumen; Hansruedi Rutz, Wettingen, and Ernst Toplak, Windisch, all of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Dec. 30, 1975, Ser. No. 645,322

Claims priority, application Switzerland, Jan. 16, 1975, 524/75

Int. Cl.[2] H02K *9/00*

U.S. Cl. 310—59 **4 Claims**



1. The combination with a rotor shaft of a dynamo-electric machine including a longitudinal bore containing an insulated exciter-current lead-in conductor bar and a radial bore extending from said longitudinal bore to the surface of the shaft, of a radially extending exciter-current lead-through bolt mounted in and extending through said radial bore, means securing the radially inner end of said bolt in said lead-in conductor bar, means securing the radially outer part to a terminal conductor bar leading to an exciter winding located on said rotor, and means for cooling said bolt comprising a ventilating tube disposed within a longitudinal bore extending through said bolt, said tube being smaller than the bolt bore to establish a gap between said tube and the wall of the bore, and a ventilating hood mounting the outer end of said ventilating tube and which is mounted atop the radially outer end of said bolt in the ambient air, said hood including a first port extending through the wall thereof placing said gap in communication with the ambient air and a second port placing the outer end of said ventilating tube in communication with the amient air, said ports establishing an air inlet and air outlet respectively thereby to establish a circulating flow path for ambient cooling air in one radial direction through said gap and in the opposite direction through said ventilating tube.

4,074,156

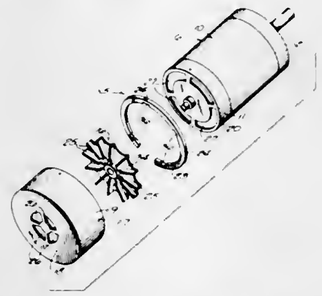
AIR COOLING MEANS FOR DYNAMOELECTRIC MACHINE

John C. Widstrand, Cedarburg, and Dennis J. Jurek, Grafton, both of Wis., assignors to Leeson Electric Corporation, Grafton, Wis.

Filed Apr. 19, 1976, Ser. No. 678,301

Int. Cl.[2] H02K *9/06*

U.S. Cl. 310—62 **4 Claims**



1. A dynamoelectric machine having a wound stator, a frame that encloses the stator and comprises front and rear end members, said frame being substantially imperforate except for axially opening apertures in said end members that provide for circulation of cooling air into and out of the interior of the frame, a rotor having a shaft journaled in bearings in said end members, a cooling fan constrained to rotate with said shaft and located forwardly adjacent to the front end members, and a fan enclosure comprising an apertured front wall forwardly adjacent to the fan and a substantially imperforate circumferential side wall extending rearwardly from said front wall in concentric surrounding relation to the fan, said side wall having a rear portion which is larger in diameter than the frame and which is disposed radially opposite a front portion of the frame all around the same, said machine being characterized by:

air barrier means extending radially across the space between said rear portion of the side wall and said front portion of the frame and circumferentially around at least most of the frame,

said air barrier means cooperating with the frame and with the side wall of said fan enclosure to define an annular plenum chamber in the radially outer portion of said fan enclosure from which pressurized air is mainly constrained to flow into the interior of the frame, and thus through the entire length thereof, by way of said apertures in the end members, while no more than a minor portion of air from said plenum chamber is directed across the exterior of the frame, said air barrier means comprising

an arcuate strip, curved to closely embrace said front portion of the frame and having a radial thickness to extend substantially entirely across the space between said side wall and said front portion of the frame, said strip being secured in said space by fastening means that also secure the fan enclosure to the frame.

4,074,157

PERMANENT MAGNET A.C. SIGNAL GENERATOR

Melvin A. Lace, Prospect Heights, Ill., assignor to Synchro-Start Products, Inc., Del.

Filed Oct. 4, 1976, Ser. No. 729,272

Int. Cl.[2] H02K *3/50*

U.S. Cl. 310—67 R **12 Claims**

1. The sub-fractional A.C. signal generator comprising:

an annular coil support of insulator material of U-shaped cross-sectional configuration having a plurality of integral alignment bosses on each side wall;

an electrical coil wound upon the coil support;

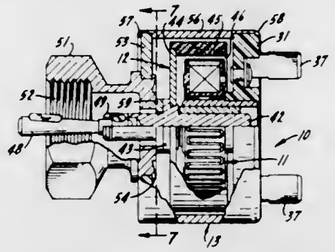
a pair of annular, magnetically permeable stator members of C-shaped cross-sectional configuration, each stator member having a plurality of alignment apertures fitted onto the alignment bosses on one side wall of the coil support to afford a stator sub-assembly, each stator member having a multiplicity of individual pole pieces interleaved one-for-one with the pole pieces of the other stator member around the outer periphery of the stator sub-assembly;

an insulator barrier member;

a cylindrical stator support having a sleeve bearing mounted co-axially therein;

the insulator barrier and the stator sub-assembly being mounted on opposite ends of the stator support to afford a stator assembly;

a drive shaft;



a cylindrical permanent magnet magnetized to afford a multiplicity of magnetic poles, corresponding to the total number of pole pieces on the stator members, facing a central axial opening having a diameter slightly larger than the outer diameter of the stator members;

magnet mounting means mounting one end of the magnet onto the shaft for rotation therewith, to afford a rotor assembly;

the rotor assembly and stator assembly being joined in a generator by sliding the two assemblies together with the rotor shaft journalled in the stator bearing and the magnet encompassing the stator members but spaced therefrom by a small, uniform radial air gap; and

a housing encompassing both assemblies and maintaining the two assemblies in axial alignment.

4,074,158

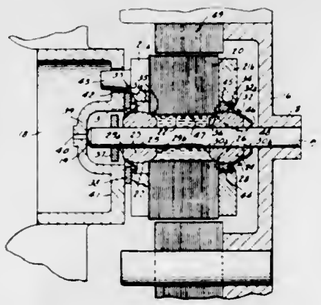
ELECTRIC MOTOR ASSEMBLY

James D. Cole, 1651 S. San Luis, Green Valley, Ariz. 85614

Filed May 14, 1976, Ser. No. 686,309

Int. Cl.[2] H02K *5/00*

U.S. Cl. 310—90 **13 Claims**



1. An electric motor assembly comprising:

(a) a stator assembly having a stator winding and an adjacent air gap aperture, and a support member on said stator assembly at one end of said air gap aperture;

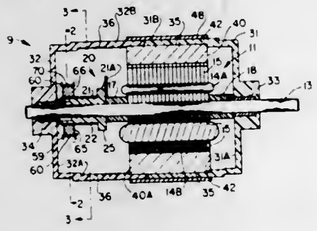
(b) a rotor shaft non-rotatably mounted to said support member and aligned in said air gap aperture;
(c) a rotor assembly having laminations and a central aperture in the laminations, first and second self-aligning bearing means positioned in said central aperture, each bearing means having a curved surface seated at one end against a seating portion formed on the laminations at an end of said central aperture and retained at the other end by a retaining spring abutting a curved surface of the bearing means, said first and second bearing means rotatably engaging said rotor shaft.

4,074,159

DYNAMO-ELECTRIC MACHINE

Russell O. Robison, 103 Plymouth East Road, Plymouth, Ohio 44865

Filed Apr. 16, 1976, Ser. No. 677,758
Int. Cl.² H02K *21/28*
U.S. Cl. 310—154 **7 Claims**



1. In a dynamo-electric machine having housing means, a rotor within the housing, the rotor housing laminations and coil means carried by and rotatable with the rotor, and a cylindrical permanent magnet within the housing and radially outwardly of the laminations and coin means in functional cooperation with the said laminations and coil means, the improvement of said housing means comprising a first and a second shell-like housing having facing open ends and axially aligned cylindrical walls abutted together at said open ends to enclose said rotor, said housings being of plastic material having integral ribs formed on the inner surfaces of said cylindrical walls and extending longitudinally of the housings, said ribs being deformed by said cylindrical permanent magnet pressed axially into said housings through the respective open ends thereof to provide a close frictional fit between the outer cylindrical wall of the permanent magnet and the inner cylindrical walls of both said housings and to provide that said first and second housings are axially aligned, and held assembled together to enclose the rotor, by said permanent magnet inter-engaged by said frictional fit between the permanent magnet and both said housings.

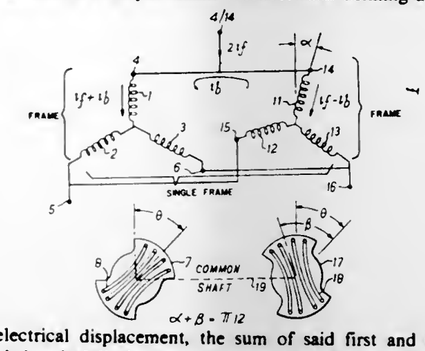
4,074,160

ROTARY ELECTRIC MACHINES

Alexander Richard William Broadway, Bristol, England, assignor to National Research Development Corporation, London, England

Filed July 25, 1975, Ser. No. 598,945
Claims priority, application United Kingdom, Dec. 22, 1972, 59401/72
Int. Cl.² H02K *3/00*
U.S. Cl. 310—184 **14 Claims**

1. An alternating-current, burshless, stator-controlled electric motor, for asynchronous operation, comprising first and second machine elements, the first machine element comprising a first wound stator and a first rotor, said second machine element comprising a second wound stator and a second rotor, both said first and second rotors having rotor asymmetry in two axes electrically at right-angles, said first and second wound stators being connected together electrically in parallel and coupled together mechanically with an electrical displacement therebetween defining a first electrical displacement, said first and second rotors being coupled together mechanically with an electrical displacement therebetween defining a second electrical displacement, the sum of said first and said second electrical displacements being substantially $\pi/2$ radians so that currents corresponding to backward field components are in antiphase in said first and said second wound stators.

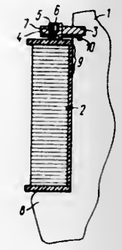


4,074,161

POLE ASSEMBLY OF A DYNAMOELECTRIC MACHINE

Vasily Mikhailovich Minichev, Kubinskaya ulitsa, 64, kv. 8; Evgeny Moiseevich Simis, 7 Sovetskaya ulitsa, 15/19, kv. 1, and Vladimir Konstantinovich Judin, Kuznetsovskaya ulitsa, 10, korpus 3, kv. 55, all of Leningrad, U.S.S.R.

Filed Mar. 18, 1976, Ser. No. 668,187
Int. Cl.² H02K *3/46*
U.S. Cl. 310—194 **5 Claims**



1. A pole assembly of a dynamoelectric machine, comprising:
a core having slots and a shoulder;
an induction coil received about said core, the coil having a first and a second bearing surface, the second bearing surface abutting against said shoulder of said core;
abutment strips inserted in said slots, said strips having threaded openings;
lock washers retaining said abutment strips in the respective slots; and
tightening bolts threadedly received in said threaded openings, said bolts having their ends abutting against said first bearing surface of said coil.

4,074,162

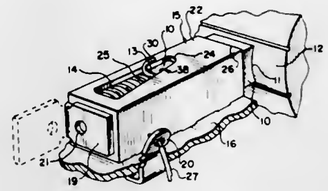
BRUSH SPRING ASSEMBLY

Joseph F. Parzych, New Britain, Conn., assignor to Dynamics Corporation of America, Greenwich, Conn.

Filed June 24, 1976, Ser. No. 699,482
Int. Cl.² H01R *39/40*
U.S. Cl. 310—245 **3 Claims**

1. In an electric motor having a commutator brush assembly comprising:
an elongated brush housing having a longitudinal slot in one rectangular side wall, said slot having a longitudinal side edge inclined as a cam to the longitudinal center line of said side wall;
brush means slidably received in said housing;

a coiled brush spring having an end coil portion to engage the brush and a hook portion extending laterally from the side edge and overlapping the end of the coil and opening towards the brush; and



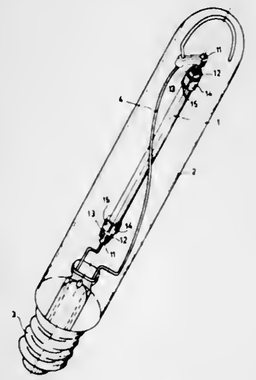
means interconnecting one side of the hook and the end coil and disposed to engage said inclined edge for it to move the hook progressively into coincidence with the end of said slot as it progresses along said edge with brush wear.

4,074,163

DISCHARGE LAMP WITH HEAT SHIELD

Bart van der Leeuw, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 29, 1976, Ser. No. 653,432
Claims priority, application Netherlands, Mar. 19, 1975, 7503243
Int. Cl.² H01S *61/52*
U.S. Cl. 313—13 **3 Claims**



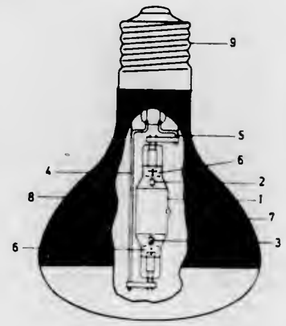
1. A discharge lamp which comprises an elongated discharge tube, first and second electrodes disposed at opposite ends of said discharge tube, a heat shield, and means carrying said heat shield in electrical insulated relation with respect to said first and second electrodes; said means for carrying including a bimetallic element which positions said heat shield in either a first position in proximate relation to said discharge tube substantially at the coldest spot of said tube or a second position in further spaced relation with respect to said discharge tube, said heat shield being normally in said first position following a period in which said lamp is in a steady state off condition and normally in said second position after steady state operation of said lamp.

4,074,164

SUN LAMP

Helmut Leyendecker, Taufkirchen, Germany, assignor to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH, Munich, Germany

Filed Mar. 24, 1977, Ser. No. 780,980
Claims priority, application Germany, Apr. 15, 1976, 2616893
Int. Cl.² H01J *61/34, 61/40, 61/20*
U.S. Cl. 313—25 **10 Claims**



1. A sun lamp comprising an arc tube integrally mounted within a surrounding ultraviolet transmissive envelope, said arc tube comprises a halogen metal vapor discharge lamp containing mercury and (i) at least one rare earth metal halide or (ii) iron halide; said ultraviolet light transmissive envelope comprising glass having a spectral transmission factor of approximately zero at 280 nm, of about 30% at 300 nm, and maximum transmittance being attained at above 350 nm, said sun lamp transmitting radiation having a ratio of UV-A to UV-B substantially the same as sunlight with the radiation in the UV-C region being so small as to be harmless.

4,074,165

DECORATIVE LIGHT SOURCE INCLUDING A DISCHARGE LAMP AND RESISTOR WITHIN AN OUTER ENVELOPE

Hideo Moriyama, Tokyo, Japan, assignor to Moriyama Sangyo Kabushiki Kaisha, Tokyo, Japan

Filed May 7, 1976, Ser. No. 684,253
Claims priority, application Japan, May 23, 1975, 50-62384; Oct. 17, 1975, 50-125045
Int. Cl.² H01J *61/34, 61/35, 61/40, 61/56*
U.S. Cl. 313—112 **20 Claims**



1. An illuminating device used for decorating purposes which comprises:
a base for electrical and mechanical connection to a socket;
a discharge bulb;
a discharge control element for said discharge bulb;
supporting wires to support said discharge bulb and said discharge control element;
a flame-shaped member mounted over said discharge bulb; and

a light transmitting envelope separately comprised of a lower neck part, one end of which is adapted to be received in said base, and an upper enveloping part being attached to the other end of said lower neck part, for covering said discharge bulb, said discharge control element and said supporting wires therewithin.

4,074,166

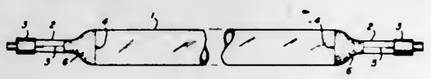
ULTRAVIOLET EMITTING ARC DISCHARGE LAMP

Edward A. Webb, Reading; Nikolaos Barakitis, Haverhill, and Keith Pigott, West Peabody, all of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Nov. 19, 1976, Ser. No. 743,265

Int. Cl.² H01J *61/12*

U.S. Cl. 313—185 **3 Claims**



1. An ultraviolet-emitting highly loaded arc discharge lamp having an arc length greater than 36 inches containing an arc tube fill of mercury, inert gas and niobium, the inert gas pressure being between about 8–10 torr, the amount of niobium being adequate to stabilize the arc.

4,074,167

HALOGEN INCANDESCENT LAMP

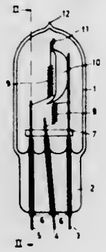
Cornelis Pieter van den Broek, and Johannes Maria Josephus van Lieshout, both of Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Nov. 16, 1976, Ser. No. 742,343

Claims priority, application Netherlands, Nov. 18, 1975, 7513429

Int. Cl.² H01J *5/50*

U.S. Cl. 313—222 **5 Claims**



1. A halogen incandescent lamp which comprises: a lamp vessel of a high-melting-point transparent material which is resistant to halogen, at least three molybdonum internal current conductors disposed in said vessel, at least two tungsten filaments stretched between said internal current conductors, said lamp vessel comprising a vacuum-tight seal having a plurality of current leadthrough conductors incorporated therein which are each in electrical contact with one of said internal current conductors, a plurality of external current conductors extending outside said lamp vessel, each of said external current conductors being connected to one of said leadthrough conductors, said lamp vessel being filled with a halogen-containing inert gas, said lamp vessel consisting of an alkali-alumino-borosilicate glass having a coefficient of expansion of $31 - 37 \times 10^{-7}$° C^{-1} at 0°–300° C, said internal current conductors being a molybdenum wire having a minimum diameter of 400 microns, a glass bead of the kind of glass from which the material of the lamp vessel is selected being disposed in surrounding vacuum tight relationship to at least the part of each of said molybdenum wires which extend in said vacuum-tight seal of said lamp, the ratio between the diameter of the molybdenum wires and the wall thickness of the glass bead being larger than 2 and the angles at which the glass of the lamp vessel contacts the glass of the bead, measured through glass, being at most 90°.

4,074,168

HALOGEN INCANDESCENT LAMP WHOSE FILLER GAS COMPRISES BROMINE, CHLORINE AND HYDROGEN

Germain Remi T'Jampens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 1, 1974, Ser. No. 511,056

Claims priority, application Netherlands, Oct. 10, 1973, 7313906

Int. Cl.² H01K *1/50*

U.S. Cl. 313—222 **3 Claims**

1. A halogen incandescent lamp having a transparent sealed envelope, a filament supported therein, and means for supplying electric power to said filament, wherein said envelope contains carbon, hydrogen, bromine and chlorine and a gas selected from the group consisting of the rare gases and nitrogen, the ratio between said carbon, hydrogen, bromine and chlorine in gram atoms being between 1:1:1:2 and 1:1.8:1.8:0.4, and the ratio between hydrogen and bromine differing by less than 10% from 1.

4,074,169

MAGNETRON WITH HARMONIC FREQUENCY OUTPUT SUPPRESSION

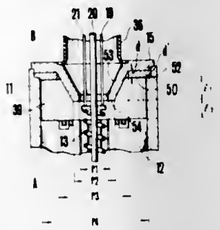
Akikazu Harada, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 12, 1976, Ser. No. 713,859

Claims priority, application Japan, Sept. 19, 1975, 50-112687

Int. Cl.² H01J *25/587*

U.S. Cl. 315—39.75 **8 Claims**



1. In a magnetron of the class comprising an anode cylinder, vanes extending toward the axis of said anode cylinder from the inner wall thereof, and a cathode structure positioned along the axis of said anode cylinder, wherein end spaces are defined at both ends of said anode cylinder, the improvement which comprises a non-magnetic axially symmetric annular member disposed in at least one of said end spaces for causing said one end space to resonate to an unwanted frequency other than the fundamental wave frequency thereby preventing unwanted electro-magnetic wave from leaking to the outside of said magnetron.

4,074,170

VOLTAGE REGULATOR WITH THERMAL OVERLOAD PROTECTION

Jean M. Orban, Santa Monica, Calif., assignor to Vivitar Corporation, Santa Monica, Calif.

Filed June 21, 1976, Ser. No. 697,869

Int. Cl.² H05B *41/34;* **H02H** *3/06, 5/04*

U.S. Cl. 315—120 **15 Claims**

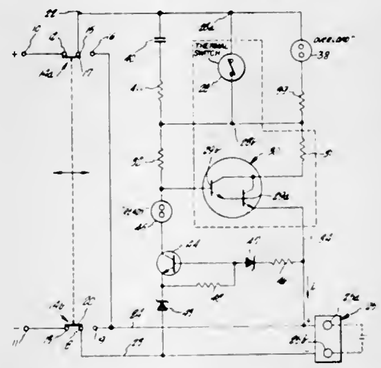
1. A voltage regulator for charging the main capacitor of an electronic flash unit and for preventing the application of energy to the flash unit when the time average electrical

charge applied to the flash unit reaches a potentially damaging level for the flash unit, comprising

a pair of input terminals adapted to be connected to a dc voltage source,

a pair of output terminals adapted to be connected to an electronic flash unit for supplying charging energy to the main capacitor thereof,

circuit means connecting said input terminals with said output terminals, said circuit means including semiconductor feedback regulator circuit means and a thermal switch means connected in series between one of said



input terminals and one of said output terminals, said regulator circuit means including at least one current carrying series component in thermal contact with said thermal switch means for sensing accumulated heat to thereby provide time integration of current supplied through said regulator circuit means and to cause said thermal switch means to open if a predetermined amount of energy is applied to an electronic flash unit connected with said output terminals.

9. A voltage regulator as in claim 1 including

overload indicator means connected in parallel with said thermal switch means.

4,074,171

ELECTRONIC FLASH DEVICE

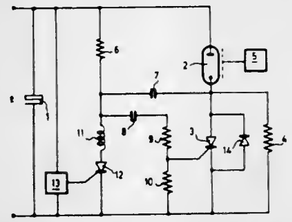
Frederick Arthur Woodworth, Romiley, England, and Ernst-Guenther Zobel, Watten Terrace, Singapore, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 29, 1974, Ser. No. 492,417

Claims priority, application Germany, Aug. 23, 1973, 2339094

Int. Cl.² H05B *37/00*

U.S. Cl. 315—241 P **13 Claims**



1. An electronic flash device comprising, a pair of voltage supply terminals, an electronic flash tube, a first capacitor connected across said supply terminals, a thyristor, means connecting the series arrangement of the flash tube and the thyristor across the electrodes of the first capacitor, means including said thyristor for initiating a flash of light in said flash tube, a flash duration limiter comprising a series arrangement of a second capacitor and an electronic switch connected in shunt with the thyristor, said flash duration limiter normally producing a light spike in the flash tube upon operation of the electronic switch, and means for inhibiting said light spike comprising a rectifier connected in shunt with the thyristor with its pass direction opposite to that of the thyristor.

4,074,172

DISCHARGE LAMP OPERATING CIRCUIT

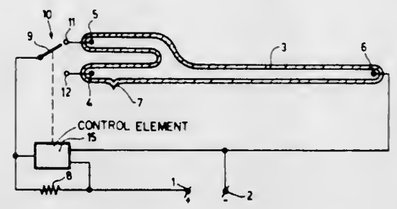
Gustaaf Adolf Wesselink; Hendrik Roelofs, and Gijsbert Johannes Ponsen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 3, 1976, Ser. No. 663,488

Claims priority, application Netherlands, Apr. 1, 1975, 7503824

Int. Cl.² H05B *41/36*

U.S. Cl. 315—307 **9 Claims**



1. A device having a lamp which is provided with a metal vapor discharge tube having an elongated discharge tube having first end and a second bifurcated end having first and second legs; first, second, and third electrodes; said first electrode being disposed in said first leg, said second electrode being disposed in said second leg and said third leg being disposed in said first end; a reservoir of metal of the type which has a vapor which in the operating condition of the lamp participates in the discharge; a switch; means automatically operating said switch responsive to the magnitude of the lamp current; said discharge tube being operated substantially ballastless, said switch being connected to a source of electrical power and having a first position in which the first electrode is switched off and the second electrode of the discharge tube is switched on and a second position in which the first electrode is switched on and the second electrode is switched off, means positioning said switch in said second position of said switch at relatively low lamp current values, said reservoir being so disposed that the coldest spot of the discharge tube is present in said reservoir in the operating condition of the lamp.

4,074,173

ELECTRIC MACHINE

Johannes Hendrikus Hubertus Janssen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 28, 1976, Ser. No. 653,084

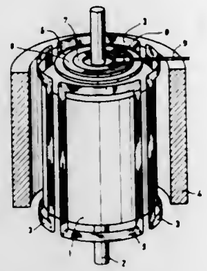
Claims priority, application Netherlands, Mar. 14, 1975, 7503046

Int. Cl.² H02K *29/00*

U.S. Cl. 318—138 **12 Claims**

1. An electric machine including an electronic commutator comprising, a magnetic rotor, a plurality of stator coils disposed in flux-coupling relation to said rotor, switching means for selectively applying electric current to the stator coils as a function of the rotor position, a member coupled to the rotor to rotate in synchronism therewith and comprising a plurality of magnetically coded tracks disposed thereon, and a plurality of

magnetosensitive elements individually arranged in magnetic coupling relationship with said magnetically coded tracks for



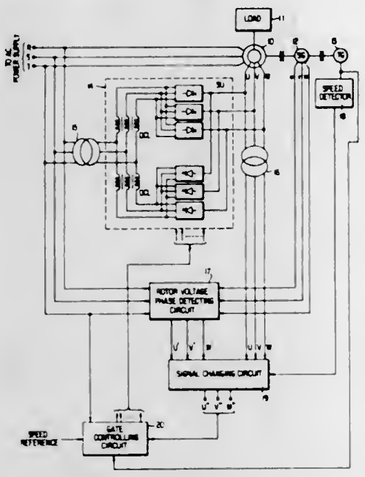
selectively operating said switching means as determined by the rotor position.

4,074,174

CONTROLLING APPARATUS FOR ASYNCHRONOUS MOTORS WITH WOUND ROTOR

Katutaro Kuge, Mizuhomachi, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Jan. 28, 1976, Ser. No. 653,197
Claims priority, application Japan, Jan. 31, 1975, 50-14390[U]
Int. Cl.² H02P *1/26*
U.S. Cl. 318—197 **11 Claims**



1. A controlling apparatus for a supersynchronous Scherbius apparatus to enable wound rotor type induction motors to have a smooth speed control below and above the synchronous speed comprises

first detecting means for detecting a signal corresponding to the rotating magnetic field of the induction motor,

second detecting means for detecting a signal corresponding to the position of the rotor,

calculating means for generating a signal corresponding to the phase of the secondary voltage in accordance with the signals of the first and the second detecting means,

power converting means for reversibly converting the power of a secondary winding of the induction motor to the power of an A.C. power supply, and

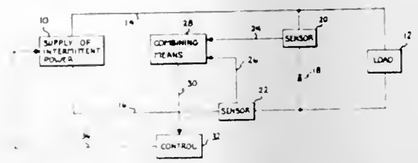
power controlling means for controlling the power converting means in accordance with the signal of the calculating means.

4,074,175

INDUCTIVE LOAD CURRENT MEASURING CIRCUIT

Norman E. Born, and Edwin E. Kolatorowicz, both of Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed Apr. 15, 1976, Ser. No. 677,195
Int. Cl.² H02P *5/00*
U.S. Cl. 318—332 **18 Claims**



1. A circuit for generating an output signal proportional to the average current of an inductive load intermittently supplied power from a source comprising:

(a) means to provide a free-wheeling path through which load current may flow during periods when said source is not connected to said load;

(b) first means to produce a first signal which is a function only of the current in said free-wheeling path;

(c) second means to produce a second signal which is a function only of the current supplied to said load from said source; and,

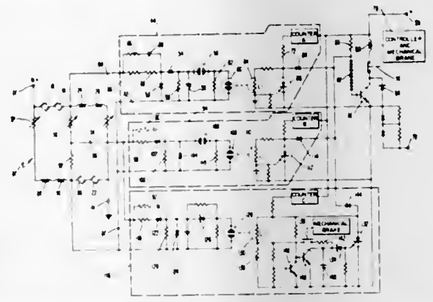
(d) means to combine said first and second signals to provide said output signal proportional to the average load current.

4,074,176

MOTOR PROTECTOR

Harry G. Parke, Brooklyn, and Harry W. Tomsky, Bronx, both of N.Y., assignors to Marine Electric Corporation, Brooklyn, N.Y.

Filed June 7, 1976, Ser. No. 693,483
Int. Cl.² H02P *3/26*
U.S. Cl. 313—371 **27 Claims**



1. Apparatus for preventing damage to an electric motor during dynamic braking comprising:

sensing means for electrically detecting dynamic brake voltage of the electric motor;

means responsive to said detected dynamic brake voltage for generating an output whenever said voltage exceeds a predetermined value; and

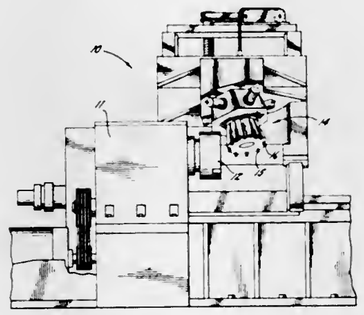
means responsive to the output of said voltage responsive means for interrupting dynamic braking and substituting mechanical braking therefor whereby damage to the motor by excessive dynamic braking voltages may be prevented.

4,074,177

METHODS AND APPARATUS FOR AUTOMATIC MOVEMENT OF A MEMBER TO PRECISELY INDEXED POSITIONS DESPITE SIGNAL DRIFT OR OFFSET

Eugene A. Olig, Fond du Lac, Wis., assignor to Giddings & Lewis, Inc., Fond du Lac, Wis.

Filed July 17, 1975, Ser. No. 596,586
Int. Cl.² G05B *19/28*
U.S. Cl. 318—602 **11 Claims**



1. In a system for selectively moving a member along a path to various ones of a plurality of predetermined index positions, in response to respective index position command signals, for precise lock-up, the combination comprising

means for releasably locate-locking said member in any one of said index positions when the member is within a given proximity (B) of that one position,

means energizable when said locking means are released for moving said member along said path,

means for producing a position command signal (TCC) which from time to time is changed to represent different ones of the predetermined index positions by different predetermined respective values thereof,

means for sensing the position of said member and producing a feedback signal (TAC) nominally representing the member's actual position along the path, but said signal being subject to drift and inaccuracy,

means operative only when said member is locked in an index position for producing and storing a correction signal (TOC) representing the difference (TAC − TCC) between said feedback signal and the predetermined value for the command signal then obtaining, and

means responsive to said command, feedback and correction signals for (a) releasing said locking means, (b) and energizing said moving means when the algebraic sum (TCC − TAC + TOC) of such three signals is in absolute magnitude greater than an amount corresponding to said given proximity (B).

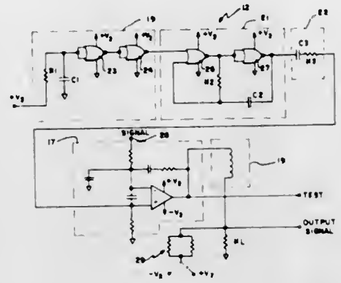
4,074,178

TIME LIMITED DIGITAL OSCILLATOR

Gerald Shelton Bower, Paso Robles, Calif., assignor to Systron-Donner Corporation, Concord, Calif.

Filed Dec. 29, 1975, Ser. No. 644,758
Int. Cl.² G05B *11/01*
U.S. Cl. 318—631 **10 Claims**

1. A digital oscillator responsive to application of a DC power signal for exciting an electrical device, comprising a gating circuit coupled to receive the DC power signal and providing an output responsive thereto, means coupled to said gating circuit for changing the output therefrom at the end of a predetermined time period after application of the DC power signal, an astable multi-vibrator for receiving the output from said gating circuit, said astable multi-vibrator providing a series of unipolar signal pulses during said predetermined time period, and means for converting said series of unipolar signal pulses to a series of bipolar signal pulses and for coupling said series of bipolar signal pulses to the electrical device, whereby



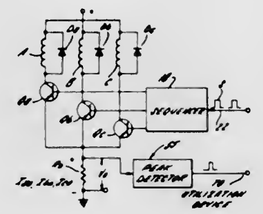
the electrical device is driven bidirectionally by said bipolar signal pulses during said predetermined time period.

4,074,179

POSITION DETECTION METHODS AND APPARATUS FOR STEPPING MOTORS

Benjamin C. Kuo; John R. Frus, both of Champaign, and Gurdial Singh, Urbana, all of Ill., assignors to Warner Electric Brake & Clutch Company, Rockford, Ill.

Filed June 16, 1975, Ser. No. 587,107
Int. Cl.² H02K *37/00*
U.S. Cl. 318—696 **55 Claims**



1. The method of confirming that a plural phase stepping motor will reach an equilibrium position corresponding to steady excitation of a phase which has been turned on, said method comprising the steps of (a) sensing the current which flows through a phase, (b) detecting a change in the sign of the slope of said current with respect to time, and (c) producing an output signal in response to said detecting.

4,074,180

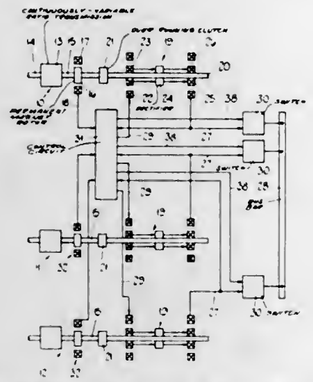
ELECTRIC CURRENT GENERATOR ARRANGEMENTS

Raymond Sharpe, Mirfield, and Kenneth Darnbrough, Bingley, both of England, assignors to Lucas Industries Limited, Great Britain

Filed Feb. 18, 1976, Ser. No. 659,169
Claims priority, application United Kingdom, Feb. 25, 1975, 7754/75
Int. Cl.² H02H *7/06*; H02P *9/00*; H02J *1/00*
U.S. Cl. 322—29 **8 Claims**

1. An electric current generator arrangement comprising a continuously-variable-ratio transmission device having input and output shafts, an electric alternator having a rotor drivingly connected to said output shaft, an electrical generator having a first winding excitable by a voltage derived from the alternating output from said alternator and a second winding from which an output current of said generator can be derived, and an over-running clutch connecting said output shaft and the rotor of said generator so that the speed of said output shaft

may be less than that of siad rotor, and means responsive to the frequency of an electrical output from said alternator for pro-



viding an indication of the speed of the output shaft of said transmission.

4,074,181

VOLTAGE REGULATORS OF A TYPE USING A COMMON-BASE TRANSISTOR AMPLIFIER IN THE COLLECTOR-TO-BASE FEEDBACK OF THE REGULATOR TRANSISTOR

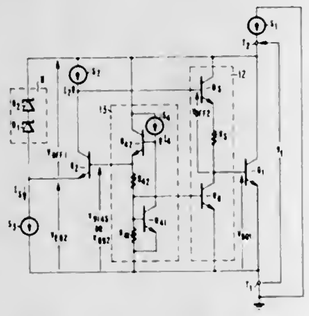
Brian Crowle, Ashford, England, assignor to RCA Corporation, New York, N.Y.

Filed Dec. 2, 1976, Ser. No. 746,887

Claims priority, application United Kingdom, Dec. 4, 1975, 49864/75

Int. Cl.² G05F *1/64*

U.S. Cl. 323—8 **21 Claims**



1. A voltage regulator for regulating the voltage applied between its first and second terminals from a source of operating current, said voltage regulator comprising in addition to said first and second terminals the following:

first and second transistors of a first conductivity type, each having base and emitter and collector electrodes;

means connecting said first transistor as a shunt regulator for controlling the potential appearing between said first and said second terminals, which means includes

first direct current conductive means that is between the emitter electrode of said first transistor and said first terminal, and includes

means directly responsive to the collector current of said first transistor for reducing the potential at said second terminal; as referred to the potential at said first terminal; and

a direct-coupled degenerative collector-to-base feedback connection of said first transistor wherein said second transistor is included in common-base amplifier configuration, said feedback connection including for connecting said second transistor in said common-base amplifier configuration:

potential offsetting means for applying a first offset potential between said second terminal and the emitter electrode of said second transistor,

second direct current conductive means that is between the emitter electrode of said second transistor and said first terminal,

means for applying a bias potential between said first terminal and the base electrode of said second transistor;

means direct coupling the collector electrode of said second transistor to the base electrode of said first transistor, and

third direct current conductive means that is between said second terminal and the collector electrode of said second transistor.

4,074,182

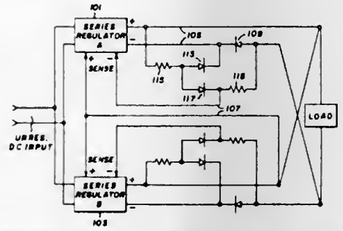
POWER SUPPLY SYSTEM WITH PARALLEL REGULATORS AND KEEP-ALIVE CIRCUITRY

Richard C. Weischedel, Camillus, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Dec. 1, 1976, Ser. No. 746,398

Int. Cl.² G05F *1/56, 1/58*

U.S. Cl. 323—25 **9 Claims**



1. A redundant DC power supply system comprising:

(a) a plurality of voltage regulators having a combined power rating in excess of the anticipated load by an amount at least equal to the power rating of at least one of the regulators, each of said regulators having an input for connection to a power source, an output for connection to a load, and control means including a voltage control input for controlling the regulator output to the load;

(b) supply and load conductor means for connecting said regulators in parallel with each other between a source of unregulated input voltage and a common load;

(c) unidirectional current flow means interposed in one of said load conductor means between each of said regulators and said common load for permitting current flow to the load from at least the one of said regulators having the highest output voltage and preventing current flow from the load to any other of said regulators;

(d) keep-alive circuit means associated with at least one of said regulators including first diode and first resistance means connected in series relation with each other across said conductor means between said one regulator and said load with the point of connection to the one of said load conductor means having interposed therein said unidirectional current flow means being on the regulator side thereof, and second diode and second resistance means connected in series relation with each other with said second diode means being connected to the point of connection of said first diode and resistance means and said second resistance means being connected to said one load conductor means on the load side of said unidirectional current flow means, whereby current may flow from said load through said second diode means when the regulator output voltage is lower than the load voltage by a predetermined amount; and

(e) means responsive to current flow in said second diode means for applying to the voltage control input of said one regulator a control signal effective to cause that regulator to maintain an output voltage of predetermined magnitude relative to its rated output.

4,074,183

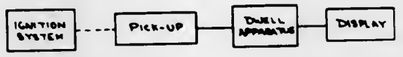
APPARATUS FOR MEASURING THE DWELL OF AN AUTOMOTIVE IGNITION SYSTEM

Zoltan Voross, Chicago, Ill., assignor to Sun Electric Corporation, Chicago, Ill.

Continuation of Ser. No. 587,520, June 16, 1975, abandoned. This application Mar. 31, 1976, Ser. No. 672,484

Int. Cl.² F02P *17/00*

U.S. Cl. 324—16 R **19 Claims**



12. An apparatus for measuring the dwell of an ignition system producing a primary ignition signal, said primary ignition signal having peak and a dwell period, comprising, in combination:

storage means for storing a voltage;

controllably conductive means, operable in a first state and a second state, for charging said storage means in said first state and discharging said storage means in said second state, said controllably conductive means defining a voltage threshold, said controllably conductive means being responsive to said primary ignition signal and operable in said first state whenever said primary ignition signal is substantially within said voltage threshold or 0 volts;

comparator means for comparing said voltage to a comparison voltage, said comparator means being operable in a first comparator state to produce a first output signal and operable in a second comparator state to produce a second output signal;

means for setting said comparison voltage in said first and second comparator states, whereby said comparator means switches to said first comparator state a predetermined time after initiation of said dwell period and switches to said second comparator state in response to said peak;

detector means for detecting a voltage crossing between said first output signal and said second output signal of said comparator means, said detector means producing an output signal in response to said voltage crossings; and

delay means for delaying transmission of said second output signal to said detector means for substantially said predetermined time whenever said comparator means switches from said first comparator state to said second comparator state.

4,074,184

NONCONDUCTIVE VAPOR/SOLID OR LIQUID FRACTION DETERMINATION

Ronald L. Dechene, Boxford; Frank G. Grimaldi, and Robert E. Newton, both of Tewksbury, all of Mass., assignors to Auburn International, Inc., Danvers, Mass.

Continuation-in-part of Ser. No. 719,196, Aug. 31, 1976, and Ser. No. 722,168, Sept. 10, 1976. This application Feb. 22, 1977, Ser. No. 770,821

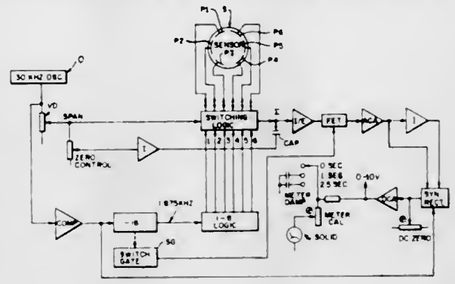
Int. Cl.² G01N *27/42*

U.S. Cl. 324—30 R **9 Claims**

1. Method of measuring phase fractions in mixed flow media of dielectric material, comprising the steps of

applying a cyclic series of relatively displaced voltage fields across the flow in distributed, spatially overlapping, time sequenced, fashion, each with a field of said series being established in tapered form between a relatively narrow input electrode opposing a relatively broad receiving electrode,

summing capacitive currents so produced across the flow by such fields and affected by the flowing medium dielectric constant to produce a signal correlatable with phase fraction of the flow with direction dependent variations averaged out.



4,074,185

METHOD AND APPARATUS FOR MEASURING THE POSITION OF A MAGNETIC ROD

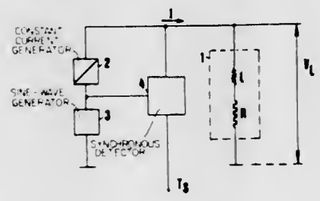
Regis Dardenne, Roselies, Belgium, assignor to ACEC, Ateliers de Constructions Electriques de Charleroi, Charleroi, Belgium

Filed July 30, 1976, Ser. No. 710,106

Claims priority, application Belgium, July 31, 1975, 158795

Int. Cl.² G01R *33/00*

U.S. Cl. 324—208 **4 Claims**



1. A method of measuring a position of a magnetic rod moving along a longitudinal axis of an induction coil, comprising the steps of:

a. feeding the induction coil by means of a constant current AC supply,

b. measuring a resulting voltage appearing across the terminals of the induction coil,

c. measuring a reactive component of said voltage, said reactive component being representative of the position occupied by the magnetic rod in the coil,

d. said reactive component measuring step comprising the step of vectorially multiplying, in phase, the coil supply current with the coil voltage, which is in quadrature with the current, so as to obtain the reactive component value of said voltage.

4,074,186

CONDUCTIVITY MEASURING INSTRUMENT HAVING LINEARIZATION MEANS AND A DIGITAL READ-OUT

John J. Flaherty, Grove Village, Ill., assignor to Magnaflux Corporation, Chicago, Ill.

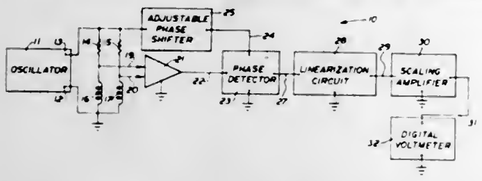
Filed Sept. 19, 1975, Ser. No. 614,877

Int. Cl.² G01R *33/12*

U.S. Cl. 324—222 **7 Claims**

1. In an eddy current instrument for measuring conductivity over a wide range of conductivity values, a test coil circuit including test coil means arranged to be placed in proximity to a part under test, an AC signal source coupled to said test coil circuit for applying thereto an AC signal of a certain frequency, said test coil circuit being operative to develop an AC output signal having an amplitude and a phase shift relative to

said applied AC signal both varying as functions of the conductivity of the part under test, means coupled to said AC signal source for supplying a reference AC signal having a certain phase relation to said applied AC signal, a detector circuit responsive to said AC output signal from said test coil circuit and said reference AC signal for developing an analog signal, said detector circuit and said certain phase relation of said reference AC signal to said applied AC signal being such that the amplitude of said analog signal developed by said detector circuit changes as a non-linear function of conductivity of the part under test while changing progressively and continuously in one direction in response to changes in conductivity of the part under test from one end to the other of said wide range of conductivity values to thereby be a single-valued non-linear function of conductivity, a linearization circuit responsive to said analog signal from said detector circuit for developing an analog output signal varying as a linear function of the conductivity of the part under test, and digital read-out means responsive to said analog output signal of said linearization circuit to provide a digital indication of the conductivity of the part under test.

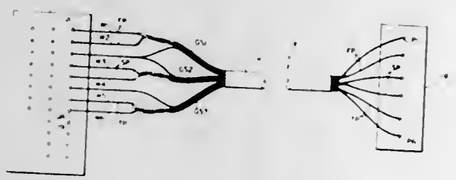


4,074,187

CABLE TESTER FOR MULTI-PAIR SHIELDED CABLES

David H. Miller, 59 Lancaster Road, Arlington Heights, Mass. 02174, and Peter M. Mena, 4 Creeper Hill Road, North Grafton, Mass. 01536

Filed Nov. 30, 1976, Ser. No. 746,071
Int. Cl.² G01R *31/02*
U.S. Cl. 324—51 **9 Claims**



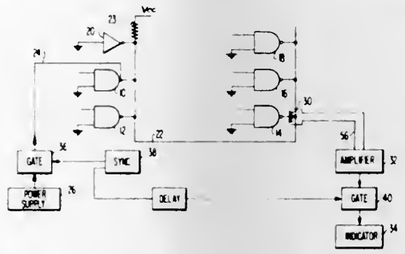
9. Apparatus for testing for shorts, polarity and continuity in a pair of shielded wires from a first termination connected to a first end of said pair of shielded wires to a second termination connected to said second end of said pair of shielded wires, said first termination having first, second and third terminals which should be connected respectively to the first wire, second wire and grounding shield of said pair of shielded wires, said second termination having first and second terminals which should be connected respectively to the first wire and second wire of said pair of shielded wires, said apparatus comprising: a first module and a second module, the first module comprising a battery having positive and negative terminals, a termination having first second and third terminals, adapted to be connected to first, second and third terminals respectively in said first termination, first and second light emitting diodes each having their anodes connected to the positive terminal of the battery, third and fourth light emitting diodes each having their cathodes connected to the negative terminal of the battery and switch means adapted in a first position to connect the first terminal of the termination to the positive terminal of the battery and the anode of the second and third light emitting diodes to the second terminal of the termination and in a second position to connect the first terminal of the termination to the cathode of the first light emitting diode and the second terminal of the termination to the cathode of the fourth light emitting diode, and means connecting the negative terminal of the battery to the third terminal of the termination, said first light emitting diode providing a visual indication of a short between the grounding shield and one of the wires when the switching means is in said second position, said third light emitting diode providing a visual indication of continuity between the pair of wires when said switching means is in a first position and said fourth light emitting diode providing a visual indication of shorts between the two wires when said switching means is in a first position, the second module comprising a termination having first and second terminals adapted to be connected respectively to first and second terminals in said second termination and a pair of light emitting diodes connected in parallel and reversed across said terminals for providing a visual indication of polarity when said switch means is in a first positon.

4,074,188

LOW IMPEDANCE FAULT DETECTION SYSTEM AND METHOD

Roger M. Boatman, and Melvin R. Hall, both of Titusville, Fla., assignors to Testline Instruments, Inc., Titusville, Fla.

Filed Aug. 1, 1975, Ser. No. 601,172
Int. Cl.² G01R *31/08, 31/28*
U.S. Cl. 324—52 **23 Claims**



5. A system for isolating a low impedance fault which causes sinking of electric current through a current carrying element on a printed circuit board comprising:

a hand manipulatable probe carrying an inductor element at a location on the probe so as to permit the positioning of the inductor element adjacent the current carrying element on the printed circuit board, the inductor element producing an electrical signal as a function of the first derivative of the magnetic field associated with varying current flow in the current carrying element on the printed circuit board;

means for generating a time synchronization signal in approximate time coincidence with expected variations in current flow in the current carrying element on the printed circuit board;

means for manually selecting an amplitude reference value; and

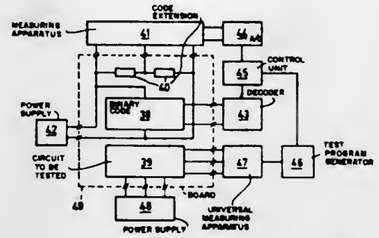
circuit means connected to receive said electrical signal produced by said inductor element and to indicate the presence of excursions of said electrical signal only in excess of said selected amplitude reference value and in time coincidence with said synchronization signal whereby false indications in response to spurious signals are generally avoided.

4,074,189

CARRIER WITH CODE

Arie Anthonie Harms, and Johan Gerrit Wark, both of Rijswijk, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 315,304, Dec. 14, 1972, abandoned, which is a continuation of Ser. No. 128,091, March 25, 1971, abandoned. This application July 10, 1974, Ser. No. 487,019
Int. Cl.² G01R *15/12*
U.S. Cl. 324—73 R **2 Claims**



1. In a system for the treatment of electronic devices or elements wherein a particular treatment program is selectable upon the occurrence of a particular coded address, said system including at least one carrier of the type such as a printed circuit board, the improvement comprising:

a pair of input terminals located on said carrier; a plurality of galvanic contacts being disposed on said carrier; means for connecting a first of said terminals to a predetermined number of said galvanic contacts; means for connecting the second terminal to a predetermined number of galvanic contacts which are not connected to said first terminal, each of said terminals being identified with a digital logical value, one of said terminals being associated with a logical "1" and the other terminal being associated with a logical "0", said arrangement of galvanic contacts being ordered in accordance with a predetermined pattern so that a predetermined digital coded number corresponds to said ordered arrangement of galvanic contacts; a further galvanic contact being disposed on said carrier;

an electrical impedance element being connected between said further galvanic contact and one of said input terminals, said impedance element forming an analog code element for extending said binary coded arrangement of galvanic contacts, sensing means responsive to said digital coded arrangement of galvanic contacts and said analog code element for providing an address for selecting a corresponding treatment program of said treatment system.

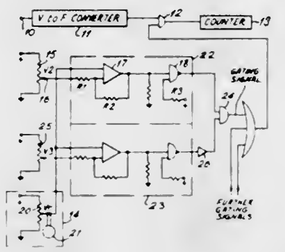
4,074,190

SIGNAL MEASURING APPARATUS

Walter Bunting, Little Chalfont, England, assignor to National Research Development Corporation, London, England

Filed Feb. 5, 1976, Ser. No. 655,376
Int. Cl.² G01R *23/16*
U.S. Cl. 324—77 A **3 Claims**

1. Signal measuring apparatus for measuring selected pairs of a time varying signal comprising measuring means for measuring the integral with respect to time of parts of a time varying signal gated to said measuring means, a ramp voltage generator, a plurality of pairs of generators of dc voltages of adjustable magnitudes, a comparator circuit associated with each dc voltage generator for providing a switching signal when the output of the ramp generator is equal to the value of the voltage provided by its associated dc voltage generator, gating means for gating a signal to be measured to said measuring means when a switching signal is provided from one of the dc voltage generators to a pair and for blocking such signal when a switching signal is provided from the other dc voltage generator of a pair.

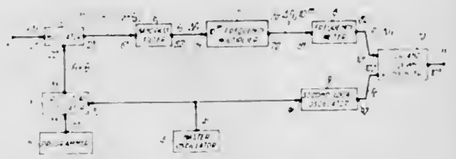


4,074,191

FREQUENCY MEASURING DEVICE FOR TELECOMMUNICATION SYSTEMS

Jacques M. Jules, 1, Allee de Bellevue, Maintenon, France (28130)

Filed Dec. 30, 1976, Ser. No. 755,945
Claims priority, application France, Dec. 30, 1975, 75 40113
Int. Cl.² G01R *23/14*
U.S. Cl. 324—79 R **4 Claims**



1. A device for measuring a positive or negative difference Δf between the actual value $(f+\Delta f)$ and the nominal value f of at least one frequency carried by way of a telecommunication line, comprising:

a first local oscillator controlled by a master oscillator and producing a frequency value $(f+f_o)$, f_o being a constant predetermined frequency value which may be added to or subtracted from the frequency f;

a balanced modulator, one input of which is connected to the said line and the other input of which is connected to the output of the first local oscillator, the said modulator then producing, among its modulation products, the frequency term:

$$(f+f_o) - (f+\Delta f) = f_o - \Delta f;$$

a bandpass filter connected to the output of the modulator, the band limits of the said bandpass filter being determined so that the said filter transmits only the said term $(f_o-\Delta f)$;

a second local oscillator controlled by the said master oscillator and producing a frequency of value f_o, and

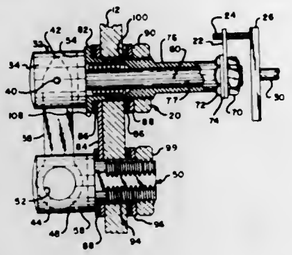
means for measuring the algebraic difference between the frequency produced by the said second local oscillator and the frequency transmitted by the filter, the said difference being equal to the value of the difference Δf.

4,074,192

KEYLESS UNIDIRECTIONAL RESET FOR CUMULATIVE DEMAND REGISTER

David Gerald Hart, Clemson, S.C., assignor to Sangamo Electric Company, Springfield, Ill.

Filed May 27, 1976, Ser. No. 690,726
Int. Cl.[2] G01R *11/02; G05G 5/16; G06C 15/42*
U.S. Cl. 324—103 R 5 Claims



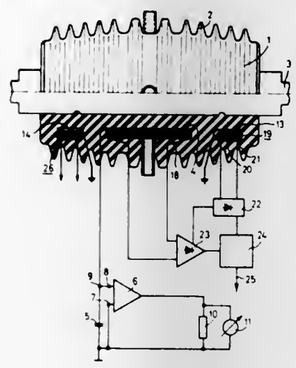
1. A reset mechanism mountable in and through an aperture in the cover of an electric watt hour meter, said meter having a crank-operated cumulative demand register comprising:
an elongated, tubular bushing member;
a shaft member having a head end and a shank member extending through and rotatably supported by said bushing member;
said bushing member having a radial flange and an intermediate shank portion extendable through said aperture in said cover;
means engageable with said shank portion of said bushing member and the inside of said cover to secure said bushing member within said aperture with said flange member against the outside of said cover member;
said bushing member having a counterbore defining an annular space extending from its flanged end and encompassing a portion of said shank member of said shaft;
said flange having a radial slot in its outer surface communicating with said annular space;
a radial slot in the head end of said shaft;
a link member pivotally mounted at one end in said slot of said head end for rotation thereabout through an angle of less than 180°;
a locking post carried by said cover and spaced from said shaft member;
a radial slot in the locking post oriented to be in the plane of the radial slot of said head member in one position thereof and adapted to receive the other end of said link member in a locked position;
a coil spring around the portion of said shank member of said shaft having its convolutions within said annular space with a bight end of said coil spring extending into said radial slot in said flange member;
said convolutions of said spring being in bearing contact with said shank member within said annular space whereby said shaft member is rotatable in an angular direction opening said convolutions about said shank member and is prevented from rotation in the opposite direction;
resilient means at the extended end of said shank member retaining said head end in axially thrust relationship with said flange of said bushing member and retaining the bight end of said coil spring in said radial slot; and
an operating lever on the inner end of said shank member for operable engagement with said crank-operated cumulative demand register whereby in the unlocked position said link member is pivotable from the slot of said locking post to an angular position with the axis of said shaft member to serve as a lever to rotate said shaft and said operating lever in said angular direction to a point of re-registry with said slot in said locking post.

4,074,193

COMBINED CURRENT AND VOLTAGE MEASURING APPARATUS

Werner Kohler, Bentfeld, Holstein, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 14, 1974, Ser. No. 523,851
Claims priority, application Germany, Dec. 20, 1973, 2363933
Int. Cl.[2] G01R *1/20, 19/00*
U.S. Cl. 324—126 7 Claims



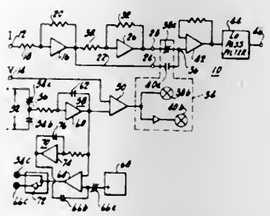
1. A combined current and voltage measuring apparatus for measuring voltage and current on a rod-like primary conductor for conducting current at an upper potential comprising: a capacitive voltage divider having upper and lower potential capacitors and extending between the upper potential and a lower potential; a body of cast resin disposed in surrounding relation to the primary conductor; a cylindrical electrode embedded in said body so as to cause the primary conductor to extend through said electrode in spaced relation to the same, said electrode and the primary conductor conjointly defining said upper potential capacitor of said voltage divider and the portion of cast resin of said body between said electrode and the primary conductor constituting the dielectric of said upper potential capacitor; and, a coreless winding carried by said body of cast resin for sensing the current in the primary conductor, said winding being arranged in surrounding relation to said cylindrical electrode so as to cause said cylindrical electrode to equalize the potential stress on said cast resin body between the primary conductor and said coreless winding.

4,074,194

WATT METER PROVIDING ELECTRICAL SIGNAL PROPORTIONAL TO POWER

Alan W. Wilkerson, 410 Madero, Thiensville, Wis. 53092

Filed Feb. 28, 1977, Ser. No. 773,070
Int. Cl.[2] G01R *7/00*
U.S. Cl. 324—142 10 Claims



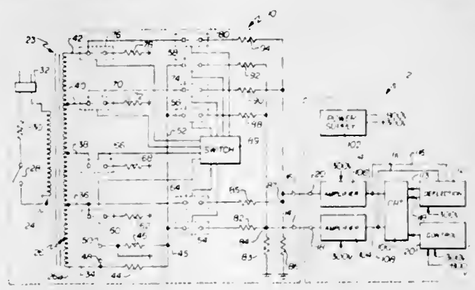
1. A watt meter circuit for receiving input signals proportional to the voltage across, and the current through, an electrical element at input terminals and for providing an electrical signal indicative of power at an output terminal, said circuit comprising:
signal forming means coupled to a first of said input terminals for receiving the input signal applied thereto and for providing a pair of signals corresponding to the input signal, said signals being equal to each other in magnitude but opposite to each other in polarity;
switch means having make-break elements actuatable by a signal responsive operator means and receiving said pair of signals for alternately providing said signals to a signal terminal to form a signal wave having portions of alternating opposite polarity in a variable duty cycle;
means connected to said switch means and to the output terminal of said watt meter for providing the electrical signal indicative of power from the signal obtained at said signal terminal;
signal generating means generating a cyclical wave, having half cycles alternating in polarity, said wave being formed of linear partial wave portions and having equal positive and negative peaks; and
comparator means having one input connected to said signal generating means and the other input connected to a second input terminal and having an output connected to said operator means of said switch means for controlling the operation of said make-break elements of said switch means and the duty cycle of said cyclical wave in accordance with the relative magnitude of said input signal and said cyclical wave.

4,074,195

SEMICONDUCTOR TESTER

Bill Hunt, 6408-139th SE, Snohomish, Wash. 98290

Filed Feb. 16, 1977, Ser. No. 769,110
Int. Cl.[2] G01R *31/22*
U.S. Cl. 324—158 D 15 Claims



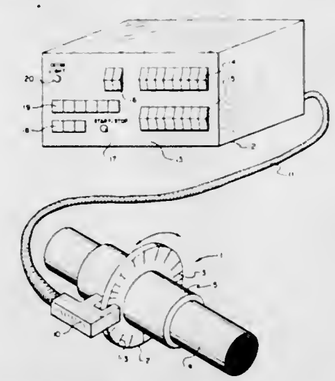
1. An improved semiconductor junction tester, comprising:
a. visual indicator means having two input connections;
b. signal generating means having first, second and third output lines, and producing a first known AC voltage between said first and second output lines, and producing a second known AC voltage between said first and third output lines, at least the AC voltage provided between said first and second output lines being variable;
c. first impedance means connected between the first output line of said signal generating means and ground;
d. means adapted to be connected across a junction to be tested, said adapted means in turn being connected to the tester in such a manner that said junction is in parallel electrically with said first impedance means and such that, in tester operation, an AC test signal is provided across said junction;
e. second impedance means connectable between the second output line of said signal generating means and ground, such that said second impedance means, when so connected, is in parallel electrically with said first impedance means;
f. third impedance means connectable between the third output line of said signal generating means and ground, such that said third impedance means, when so connected, is in parallel electrically with said first impedance means; and
g. means for selectively connecting and disconnecting said third impedance means to the third output line of said signal generating means, wherein, in operation of the tester, a first output signal is developed between said first impedance means and ground for application to one input connection of said indicator means and a second signal output is developed between said second impedance means and ground for application to the other input connection of said indicator means, and wherein said signal generating means is so configured and arranged, and has such an impedance between its first, second and third output lines, and wherein said second and third impedances have such values that (1) in a first operating condition of the tester, wherein said third impedance means is connected, and the AC voltage between the first and second output lines is at a level which is less than the AC voltage between the first and third output lines, an impedance is presented to said junction which is substantially lower than the effective impedance of the circuit in which said junction is connected, and (2) in a second operating condition of the tester, wherein said third impedance means is disconnected, the amplitude of the voltage between the first and second output lines may be increased to a level sufficient to fire said junction and sufficient impedance is presented to said junction to limit the current therethrough to a safe level, whereby a pattern is produced on said visual indicator means which is indicative of the forward and reverse characteristics of said junction.

4,074,196

SPEEDOMETER AND ODOMETER APPARATUS

Douglas G. Webster, 14450 Black Walnut Court, Saratoga, Calif. 95070

Filed Aug. 2, 1976, Ser. No. 710,566
Int. Cl.[2] G01P *3/48*
U.S. Cl. 324—166 21 Claims



1. A speedometer and odometer apparatus comprising:
means for generating pulses as a function of the distance a vehicle is moved;
means for calibrating the number of pulses generated by the pulse-generating means, said calibrating means comprising counter means coupled to the pulse-generating means for counting pulses received from the pulse-generating means;
circuit means including switch means for setting a calibrating number in the apparatus;
comparing means coupled to said counter means and said circuit means for comparing the contents of said counter means and said calibrating number, and generating a control signal when a predetermined relationship exists between said counter contents and said calibrating number;
gate means forming an output of said calibrating means coupled to said pulse-generating means for gating therethrough pulses received from said pulse-generating means to said output of said calibrating means; and

means responsive to the control signal generated by said comparing means when said predetermined relationship exists for inhibiting said gate means during the time of receipt of a predetermined number of said pulses from said pulse-generating means so that less than the total number of pulses generated by said pulse-generating means is gated through said gate means for providing said calibrating of the number of pulses received from said pulse-generating means; and

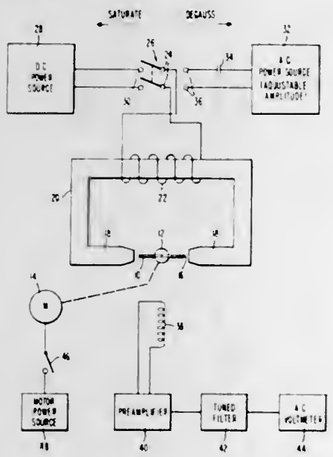
means coupled to the output of said calibrating means for indicating said distance.

4,074,197

SYSTEM FOR ROTATING SMALL PERMANENT MAGNETS WHILE ADJUSTING AND SIMULTANEOUSLY SENSING THE MAGNETIC MOMENTS THEREOF

Clifford John Bader, West Chester, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Aug. 25, 1976, Ser. No. 717,648
Int. Cl.[2] G01R *33/12*
U.S. Cl. 324—205 **9 Claims**



1. A system for adjusting the magnetic moment of a bar magnet comprising in combination:

a yoke having a pair of pole pieces separated from each other by an air gap, a winding disposed on said yoke;

a DC power source and an AC power source, means for selectively coupling the last mentioned sources to said winding, spindle means situated within said air gap for rotatably mounting said magnet, drive means coupled to said spindle means to rotate the latter;

the energization of said winding by said DC power source generating a saturating magnetic field in said air gap, said magnet being initially stationary with its extremities aligned with said field and being driven to a saturated state;

the removal of said saturating magnetic field and the subsequent energization of said winding by said AC power source generating a degaussing field of increasing strength in said air gap, said magnet being rotated in a plane parallel to said degaussing field by said drive means and having its moment reduced from said saturated state to a desired level;

a pickup coil positioned in proximity to said rotating magnet and having its axis oriented orthogonally to said degaussing field, the rotation of said magnet causing a voltage to be induced in said coil which is proportional to the magnet flux and to its moment, the flux change resulting in said induced voltage occurring substantially during the rotational interval when said magnet is least influenced by said degaussing field;

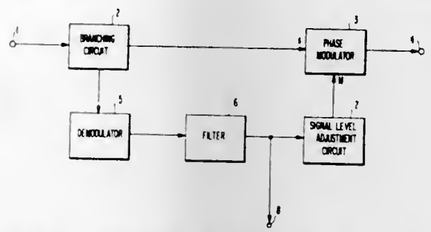
amplifier means coupled to said coil, filter means coupled to the output of said amplifier means, and means coupled to the output of said filter means for indicating the amplitude thereof simultaneously with said increasing degaussing field strength, said amplitude being proportional to the magnet moment.

4,074,198

SYSTEM FOR SUPPRESSING SIDEBAND COMPONENTS OF ANGLE-MODULATED WAVE

Tadashi Furuya, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed May 13, 1976, Ser. No. 686,202
Claims priority, application Japan, May 16, 1975, 50-58045
Int. Cl.[2] H04B *1/60*
U.S. Cl. 325—3 **3 Claims**



1. A system for suppressing a predetermined part of the sideband components of an angle-modulated wave in a frequency-division multiplex system, comprising:

means for branching said angle-modulated wave into two angle-modulated waves,

a phase modulator connected to said means for branching to receive one of said two angle-modulated waves as a signal input, and

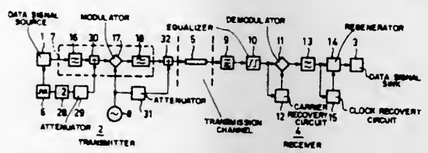
means for demodulating the other of said two angle-modulated waves to baseband and supplying the demodulated wave as the first output of the system and also supplying the demodulated wave as the inversely modulating signal input to said phase modulator, said phase modulator providing a second output of the system which is a wave that can be reused for transmission of other sideband components.

4,074,199

VESTIGIAL-SIDEBAND TRANSMISSION SYSTEM FOR SYNCHRONOUS DATA SIGNALS

Frank de Jager, Eindhoven, Netherlands, and Juan Jose Martony, Montevideo, Uruguay, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 613,184, Sept. 15, 1975, abandoned. This application Nov. 16, 1976, Ser. No. 742,341
Claims priority, application Netherlands, Sept. 16, 1974, 7412226
Int. Cl.[2] H04B *1/68*
U.S. Cl. 325—50 **9 Claims**



1. Vestigial-sideband transmission system for transmission of synchronous data signals from a transmitter to a receiver via a transmission channel of restricted bandwidth, comprising

a transmitter including a data signal source, a clock signal source connected to said data signal source for synchronizing said data signal source, a carrier source, and a filtering and modulating circuit connected to the data signal source and to the carrier source for generating a vestigial-sideband amplitude-modulated channel signal comprising

a shift register having an input connected to the output of said data signal source, and an output;

a frequency multiplier connected to the output of said clock signal source for determining the shift frequency of said shift register;

a weighting circuit having an input connected to said output of said shift register, and an output for producing a baseband signal with a predetermined frequency spectrum; and

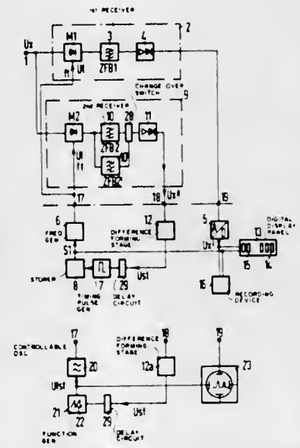
filtering and modulating means connected to said output of said weighting circuit for producing a modulated signal.

4,074,200

CIRCUIT ARRANGEMENT FOR SELECTIVE FREQUENCY ANALYSIS OF THE AMPLITUDES OF ONE OR MORE SIGNALS

Karl Buchta, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Nov. 15, 1976, Ser. No. 741,849
Claims priority, application Germany, Dec. 10, 1975, 2555602
Int. Cl.[2] H04B *1/36*
U.S. Cl. 325—335 **9 Claims**



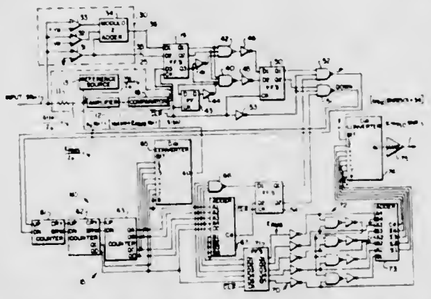
1. A circuit arrangement for frequency-selective analysis of the amplitudes of one or more signals in which a first selective receiver automatically scans through a given frequency band, and the scanning speed of its frequency settings is controlled by means of a control signal value which is dependent upon the amplitude difference of signal voltages received consecutively in time, comprising a second selective receiver which has its frequency setting changed in synchronism with the first receiver and with a constant frequency spacing maintained between the instantaneous tuning frequencies of said first and second receivers and the tuning frequency of said second receiver leading the tuning frequency of said first receiver and an analysis device receiving the output of said second receiver for determining the amplitude difference of signal voltages received consecutively in time and deriving the said control signal value and supplying it to said first and second receivers.

4,074,201

SIGNAL ANALYZER WITH NOISE ESTIMATION AND SIGNAL TO NOISE READOUT

Thomas J. Lennon, Burlington, Mass., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed July 26, 1976, Ser. No. 708,369
Int. Cl.[2] H04B *17/00*
U.S. Cl. 325—363 **15 Claims**



1. Signal analyzing apparatus for producing an estimated noise signal which is an average of differences between a received signal corrupted by additive noise and a reference signal which is equal to the received signal without additive noise, said apparatus including in combination

an input connection for receiving a received signal corrupted by additive noise,

reference signal means for producing a fixed reference signal equal to the received signal without additive noise;

estimated noise signal means for accumulating data and for producing an estimated noise signal determined by the accumulated data contained therein, and

analyzing means coupled to said input connection, said signal means, and said estimated noise signal means for producing a first indication if the received signal is greater than the algebraic sum of the reference signal and the estimated noise signal and for producing a second indication if the received signal is less than the algebraic sum of the reference signal and the estimated noise signal;

said estimated noise signal means being operable in response to a first indication from said analyzing means to alter the accumulated data contained in the estimated noise signal means in a manner tending to cause an increase in the estimated noise signal produced, and being operable in response to a second indication from said analyzing means to alter the accumulated data contained in the estimated noise signal means in a manner tending to cause a decrease in the estimated noise signal produced.

4,074,202

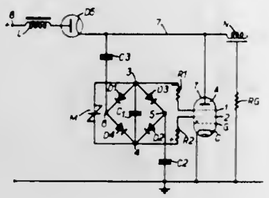
BIASING CIRCUIT FOR THYRATRON

Graham John Scoles, Chelmsford, England, assignor to English Electric Valve Co., Ltd., Essex, England

Filed Oct. 26, 1976, Ser. No. 735,540
Claims priority, application United Kingdom, Oct. 28, 1975, 44515/75
Int. Cl.[2] H01J *17/44*
U.S. Cl. 328—258 **17 Claims**

1. A multi-gap thyratron arrangement comprising a thyratron having at least one gradient-grid pair consisting of two

adjacent electrodes between the cathode and anode of said thyratron and means for constantly biassing that electrode of



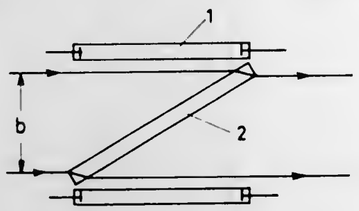
said gradient-grid pair which is nearer the anode negatively with respect to the other electrode of said gradient-grid pair.

4,074,203

ELLIPTICAL BEAM AMPLIFYING SYSTEM

John Leonard Hughes, 34 Nungara Place, Aranda, A.C.I., Australia (2614)

Filed May 14, 1976, Ser. No. 686,542
Claims priority, application Australia, May 15, 1975, 1609/75
Int. Cl.² H01S *3/00*
U.S. Cl. 330—4.3 **8 Claims**



1. A laser amplifier system for amplifying laser beams of elliptical cross-section comprising one or more amplifying disc segments of circular cross-section whose effective diameter is much greater than its thickness and equal to the major axis of the laser beam cross-section, the said segment of circular cross-section being orientated at an angle to the minor axis of the elliptical beam cross-section given by the cosecant of the ratio of minor to major axes of the elliptical beam cross-section and symmetric about the axis of propogation of the laser beam.

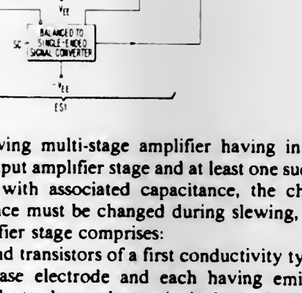
4,074,204

EQUALIZING AMPLIFIER

Gregory W. Broburg, White Bear Lake, and Allen C. Clark, Minneapolis, both of Minn., assignors to Van Alstine Audio Systems, Inc., Burnsville, Minn.

Filed Nov. 22, 1976, Ser. No. 743,977
Int. Cl.² H03F *1/36*
U.S. Cl. 330—109 **7 Claims**

1. A frequency contouring amplifier comprising:
a first amplifying means having an input connected to receive the signal and having an output, said first amplifying means increasing the entire spectrum of the signal;
a first passive filter network connected to the output of said first amplifying means so as to attenuate the portion of the signal above 2122 Hertz;
a second amplifying means having an input connected to the output of said amplifying means and having an output, said second amplifying means increasing the entire spectrum of the signal received from said first amplifying means as attenuated by said first filter network;



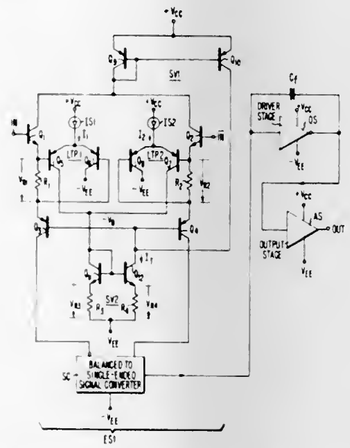
a second passive filter network connected to the output of said second amplifying means so as to attenuate the portion of the signal from 50 to 500 Hertz; and
at least one third amplifying means connected to the output of the second amplifying means to produce a low impedance frequency contoured output signal, said third amplifying means increasing the entire spectrum of the signal received from said second amplifying means as attenuated by said second passive filter network.

4,074,205

INPUT STAGE FOR FAST-SLEWING AMPLIFIER

Thomas Joseph Robe, Union, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 9, 1977, Ser. No. 775,863
Int. Cl.² H03F *3/45*
U.S. Cl. 330—257 **21 Claims**



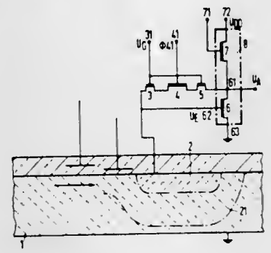
1. A fast-slewing multi-stage amplifier having in cascade connection an input amplifier stage and at least one succeeding amplifier stage with associated capacitance, the charge on which capacitance must be changed during slewing, wherein said input amplifier stage comprises:
first and second transistors of a first conductivity type, each having a base electrode and each having emitter and collector electrodes and a principal conduction path therebetween;
means for applying first and second input potentials to the emitter electrode of said first transistor and to the emitter electrode of said second transistor, respectively, said input potentials having respective quiescent levels;
means for applying collector potentials to said first and said second transistors for conditioning them to operate in the normal transistor mode, including means for applying the collector current variations of said first transistor to the amplifier stage in said cascade connection immediately succeeding said input amplifier stage;
means for applying quiescent base potentials to said first and second transistors that differ respectively from the quiescent levels of the input potentials applied to their respective emitter electrodes so as to cause quiescent conduction of said first and second transistors;
a first resistor connected to sense the flow of current through the principal conduction path of said first transistor for developing a potential drop across said first resistor proportional to the current it senses, which potential drop has a quiescent value dependent upon the level of quiescent conduction of said first transistor; and
first slew-rate improvement means, responsive to decrease in the potential drop across said first resistor from its quiescent value, for increasing the difference between the potential applied to the base electrode of said second transistor and the quiescent level of the input potential applied to the emitter electrode of said second transistor, thereby to increase the flow of current through the principal conduction path of said second transistor.

4,074,206

LINEAR OUTPUT AMPLIFIER FOR CHARGE-COUPLED DEVICES

Karlheinrich Horninger, Eglharting, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 14, 1977, Ser. No. 759,352
Claims priority, application Germany, Jan. 23, 1976, 2602520
Int. Cl.² H03F *3/16*
U.S. Cl. 330—269 **4 Claims**



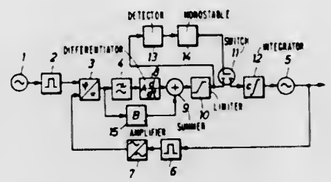
1. A linear output amplifier for a CCD arrangement comprising an FET switching transistor and a load element, connected in series to one another, the connection point being the output terminal of said amplifier, the gate terminal of said switching transistor being the input of the amplifier, said input of said amplifier being connected to said CCD arrangement, and between the output and the input of said amplifier is provided a second FET, by which the input to said amplifier can be electrically connected to the output of said amplifier, said load element being a third field effect transistor whose load resistance can be varied by connecting a voltage to the gate terminal thereof, wherein in order to prevent input-couplings of control pulses of said second transistor, a fourth FET is connected between said second transistor and said input of said amplifier, a fifth FET is connected between the said second transistor and said input of said amplifier, and the gate terminals of said second and fifth transistors being connected to a voltage source.

4,074,207

INTERFERENCE RESISTANT PHASE-LOCKED LOOP

Gunnar Stefan Forsberg, Stockholm, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Dec. 13, 1976, Ser. No. 749,875
Claims priority, application Sweden, Dec. 30, 1975, 7514797
Int. Cl.² H03B *3/04*
U.S. Cl. 331—1 A **5 Claims**



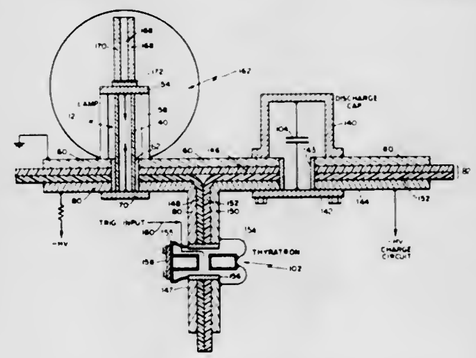
1. In an interference resistant phase-locked loop, particularly for carrier frequency generation in Frequency Division Multiplex telecommunication systems of the type having a voltage controlled oscillator provided with a control input and a signal output, a phase discriminator with two inputs and one output to which inputs are fed a reference signal and a feedback signal respectively, the feedback signal being derived from the output signal of the oscillator, and a low pass filter for filtering of the phase difference representing output signal from said discriminator, the improvement comprising a transmission path arranged to connect the output of the low pass filter with the control input of the oscillator, said transmission path comprising a series connection of
a differentiating circuit for the differentiation of the output signal from the low pass filter, a limiter which limits the output signal from the differentiating circuit at two levels symmetrically arranged on both sides of a zero level, and
an integrating circuit having an output which produces a control voltage for said oscillator.

4,074,208

STABILIZED REPETITIVELY PULSED FLASHLAMPS

Michael E. Mack, Manchester, and Donna B. C. Northam, Malden, both of Mass., assignors to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed Sept. 17, 1975, Ser. No. 614,223
Int. Cl.² H01S *3/092*
U.S. Cl. 331—94.5 P **13 Claims**



1. A stabilized pulse operated flashlamp laser comprising:
first and second electrodes;
an enclosure for said first and second electrodes and containing an atmosphere of a predetermined gas;
means for flowing said gas through said enclosure;
means for imparting a motion to said gas in flowing through

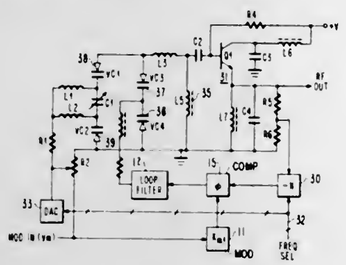
said enclosure which comprises a circulation around an axis between said first and second electrodes;
means for initiating breakdown of the gas between said electrodes;
means for maintaining breakdown of the gas between said first and second electrodes as a stabilized continuous discharge;
means for repetitively augmenting the current of said discharge to provide an augmented output of radiant energy from said discharge;
a conduit containing a flowing laser medium and having a window for the application of excitation radiation to said flowing laser medium;
means for directing radiation pulses from said flashlamp to the flowing laser medium in said conduit; and
means for defining a laser beam from said laser medium as a result of lasing action of said medium in response to each pulse of excitation radiation from the discharge between said first and second electrodes;
the continuous discharge between said first and second electrodes producing insufficient energy to generate lasing of said laser medium whereas the level of radiant energy from said flashlamp during each pulse of discharge is sufficient to provide substantial lasing of said medium.

4,074,209

WIDE RANGE FREQUENCY MODULATION OF NARROW LOOP BANDWIDTH PHASE-LOCKED OSCILLATORS

Morris Lysobey, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 13, 1976, Ser. No. 749,981
Int. Cl.[2] H03C *3/22*
U.S. Cl. 332—19 **3 Claims**



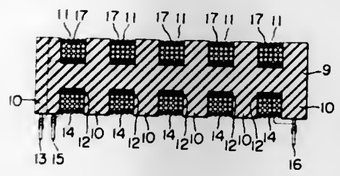
1. In a circuit for producing a frequency-modulated output signal, including reference modulator means responsive to a modulating signal for producing a reference signal and phase-locked loop means having voltage-controlled-oscillator means responsive to a control signal for producing said output signal, phase discriminator means responsive to said output signal and to said reference signal for producing an error signal proportional to the difference in phase between said output signal and said reference signal, the improvement comprising:
VCO modulator means reponsive to the modulating signal for producing a correction signal, the VCO modulator means including means for amplifying said modulating signal by a factor proportional to the ratio of the sensitivity of said reference modulator means to the sensitivity of said voltage-controlled-oscillator; and
combining means responsive to the error signal and said correction signal for supplying said control signal to said voltage-controlled-oscillator means.

4,074,210

DISTRIBUTION TYPE DELAY LINE

Hiroshi Otake, Katano; Saburo Koresawa, Hirakata, and Kozo Hashimoto, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Aug. 4, 1976, Ser. No. 711,648
Claims priority, application Japan, Aug. 20, 1975, 50-101376; Aug. 20, 1975, 50-101377; Aug. 20, 1975, 50-101378; Aug. 20, 1975, 50-101387
Int. Cl.[2] H03H *7/30, 7/34;* H01F *5/02, 5/14*
U.S. Cl. 333—29 **4 Claims**



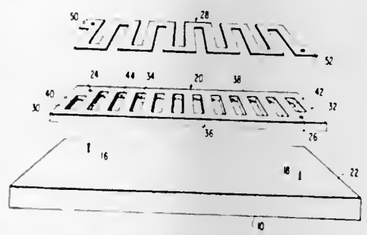
1. A distributed type delay line comprising
a bobbin made of insulating material and provided with a plurality of coaxial longitudinally spaced flanges defining a plurality of transverse slots therebetween,
a signal winding in each slot of said insulated bobbin, said signal windings being series-connected,
a grounding electrode winding wound between the core of said bobbin and each of said signal windings, and
a shielding winding wound on each of said signal windings,
each of said grounding electrode and shielding windings being wound so as to cancel the flux developed by the other winding and only one end of each of said grounding electrode and shielding windings being connected to grounding terminal, to reduce the series inductance between said grounding terminal and said grounding and shielding windings.

4,074,211

DIELECTRIC SUBSTRATE FOR SLOW-WAVE STRUCTURE

Calvin Dwight Bates, Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 7, 1976, Ser. No. 721,136
Int. Cl.[2] H01P *3/08;* H01J *23/24, 9/00*
U.S. Cl. 333—31 R **10 Claims**



1. In a meander line slow-wave circuit device consisting of a planar assembly including a conductive ground plane, a dielectric substrate contiguous with said ground plane and a serpentine meander line conductor having connecting transverse and longitudual segments disposed on a portion of the upper surface of said substrate, the improvement comprising:
an integral unitary ladder shaped planar dielectric substrate having a plurality of spaced transverse vane segments intersecting a pair of opposing continuous longitudinal vane segments, portions of said longitudinal vane segments between transverse vane segments being exposed when said meander line conductor is disposed thereon, and including a plurality of slot-like openings in the dielectric substrate between adjacent transverse segments of said conductor disposed on said transverse vane segments, the complete lower surface of said intersecting longitudinal and transverse vane segments of said substrate being in continuous direct contact with said ground plane.

4,074,212

MULTISECTION FILTER USING INFLECTED AMPLITUDE CHANGE FUNCTION TO SHARPEN ITS BAND-EDGE RESPONSES

Richard Wesley Hamming, Monterey, Calif., and James Frederick Kaiser, Summit, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 16, 1976, Ser. No. 751,125
Int. Cl.[2] H03H *7/10*
U.S. Cl. 333—70 T **17 Claims**



1. In combination,
a plurality of filter sections of predetermined frequency response characteristics,
means for connecting said sections in a tandem signal path to sharpen the transitional portion of said characteristics between each stopband and any adjacent passband thereof, and
said connecting means includes means for interconnecting said sections so that a plot of the amplitude change function of overall tandem transfer function amplitude versus the transfer function amplitude of one section of the combined sections is described by

$$H_T = H_S^{n+1}(f) \sum_{k=0}^{M} \frac{(n+k)!}{n!\,k!} [1 - H_1]^k$$

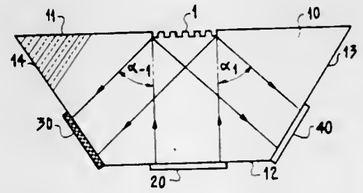
where H_T is the transfer function amplitude as a function of frequency of said interconnected sections, H_S is the transfer function amplitude as a function of frequency of one of said sections, n and m are the orders of tangency of the polynomial plot at ordinates of 0 and 1, respectively, the plot passing through the (0,0) and (1,1) coordinates, and the set n and m having positive integer set values other than the sets ($n=0$, $m=1$), (n 1, $m=0$), and ($n=m=0$).

4,074,213

ELASTIC BULK WAVE FREQUENCY FILTER

Bernard Epsztein, and Gérard Kantorowicz, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 30, 1976, Ser. No. 746,127
Claims priority, application France, Dec. 5, 1975, 75 37317
Int. Cl.[2] H03H *9/26, 9/30, 9/32;* H01L *41/04*
U.S. Cl. 333—71 **9 Claims**



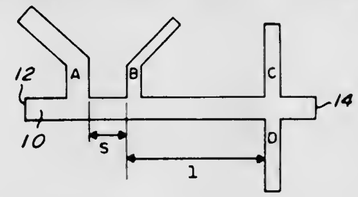
1. A frequency filter for filtering a signal having a plurality of frequency components, comprising an elastic body having two parallel surfaces, the first of said surfaces bearing an input transducer to which said signal to be filtered is applied, said input transducer accordingly, in said body, generating a beam of elastic bulk waves corresponding to said signal, the second of said surfaces bearing a grating of parallel obstacles with diffracts said components of said beam in a plurality of diffracted beams, each having a direction which is governed by the frequency of said components, said obstacles having a shape and being arranged in such a way as to concentrate substantially all the energy in said diffracted beams, said body having a third surface which is inclined relative to said two parallel surfaces, an output transducer being applied on said third surface for intercepting one of said diffracted beams, said third surface being parallel to the wave planes of said intercepted diffracted beam for the central frequency of said signal to be filtered.

4,074,214

MICROWAVE FILTER

Ronald Albert Aichholzer, Chicago, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sept. 20, 1976, Ser. No. 724,501
Int. Cl.[2] H01P *1/20, 7/00;* H04B *1/26;* H01P *3/08*
U.S. Cl. 333—73 S **10 Claims**



1. A transmission line filter for passing signals having frequencies within a passband centered about a first predetermined frequency and attenuating signals having frequencies within a stopband centered about a second predetermined frequency, the filter comprising:
a central transmission line having an input terminal and an output terminal for receiving signals at its input terminal and passing the same to said output terminal; and
first, second and third stubs, each stub of predetermined dimension and coupled to the transmission line at a predetermined location such that
a. the first and second stubs resonate with the third stub at the first predetermined frequency,
b. at least one of the first and third stubs attenuates transmission line signals having frequencies within the stopband, and
c. the third stub attenuates transmission line signals at a flyback frequency, which flyback frequency is created within the stopband by an interreaction between the stubs.

4,074,215

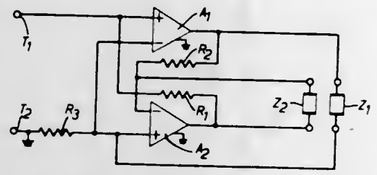
STABLE GYRATOR NETWORK FOR SIMULARITY INDUCTANCE

John Mortimer Rollett, London, England, assignor to Post Office, London, England

Filed Oct. 5, 1976, Ser. No. 729,716
Claims priority, application United Kingdom, Oct. 7, 1975, 40985/75
Int. Cl.[2] H03H *7/44, 11/00*
U.S. Cl. 333—80 R **6 Claims**

1. An electrical impedance network including first and second differential d.c. amplifiers each having an inverting input and a non-inverting input and an output, an input port comprising a first input terminal and a second input terminal, a first alternative load output port and a second alternative load output port, the non-inverting input of the first amplifier being connected directly to the first input terminal and, by way of a first resistive impedance, to the output of the second amplifier, the inverting input of the second amplifier being connected by way of a second resistive impedance to the output of the first

amplifier, the non-inverting input of the second amplifier being connected by way of a third resistive impedance to the second input terminal, the first alternative load output port being formed between the non-inverting input of the second amplifier and the output of the first amplifier, and the second alternative load output port being formed between the inverting input terminal of the second output amplifier and the output terminal

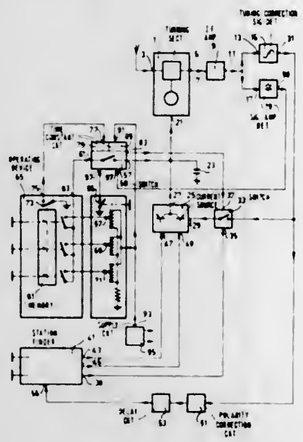


of the second amplifier, and in which the non-inverting input terminal of the second amplifier is directly connected to the inverting input of the first amplifier so that, with a resistive impedance connected in one of said alternative load output ports the network presents at its input port an impedance which is proportional to the inverse of an output load connected across the other alternative load output port.

4,074,216
RECEIVER TUNING CIRCUIT

Arnoldus Garskamp, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 549,063, Feb. 11, 1975, abandoned.
This application Sept. 24, 1976, Ser. No. 726,267
Claims priority, application Netherlands, Feb. 27, 1974, 7402624
Int. Cl.² H03H 5/12; H03J 3/06, 5/04
U.S. Cl. 334—15
5 Claims

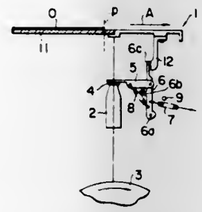


1. A receiver tuning circuit comprising a tuning section having a tuning input, a capacitor means coupled to said tuning input for applying a tuning voltage thereto, a controllable current source coupled to said capacitor, a tuning correction signal detector means coupled between said tuning section and said current source for applying an automatic tuning correction signal to said capacitor means through said current source, and means for immediately tuning said tuning section to a selected frequency independently of the previous voltage on said capacitor comprising a first switch coupled to said capacitor and an operating device means for controlling said switch for an operating period, said operating device including a memory means for storing the last adjusted state of said operating device, at least one potentiometer and a generator means for effecting that a signal from said potentiometer is applied to said capacitor through said switch upon operation of said operating device, and said first switch including a first time constant circuit means coupled to said generator for maintaining said switch in an on position for a selected period of time independent of said operating period.

4,074,217
CLEANING UNIT FOR AN OPTICAL SYSTEM IN A COPYING MACHINE

Nobuyuki Yanagawa, Chigasaki, Japan, assignor to Ricoh Company, Ltd., Japan

Filed May 20, 1976, Ser. No. 688,333
Claims priority, application Japan, May 21, 1975, 50-68648[U]
Int. Cl.² G03B 27/52, 27/00
U.S. Cl. 355—30
8 Claims



6. In a cleaning unit for an optical system in a copying machine comprising means movable in reciprocal motion along a predetermined path for scanning an original to be copied through said optical system, the improvement comprising

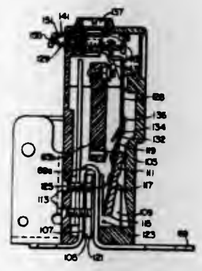
a. a mechanical wiper means arranged to be automatically brought into light pressing contact with at least one face to be cleaned of said optical system when said movable means arrives at a position corresponding to one of the extremities of said path, and

b. means for moving said wiper means relative to and along said face while maintaining the light pressing contact thereon until said wiper means stands aside off said faces when said movable means departs from said position for scanning.

4,074,218
CIRCUIT BREAKER

John G. Salvati, Patterson Township, Beaver County, and Paul Skalka, Beaver, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 7, 1976, Ser. No. 684,140
Int. Cl.² H01H 9/00
U.S. Cl. 335—176
4 Claims



1. A circuit breaker responsive to abnormal currents in the conductors of an electrical distribution system and for actuating a circuit interrupter to open upon the occurrence of predetermined operating conditions, comprising a circuit breaker mechanism having separable contacts adapted to be connected as part of the distribution system, the circuit breaker mechanism also comprising a releasable member movable from a latched position to effect opening of the contacts, a latch lever movable between latched and unlatched positions of the releasable member and being biased in the latched position, a stationary magnetic structure for each conductor of the distribution system and comprising a coil and core assembly and an armature, a trip bar movable to unlatch the latch lever and being biased in the latched position, lever means associated with each stationary magnetic structure for moving the trip bar to the unlatched position, the lever means comprising the armature and being movable in response to abnormal currents in at least one of the conductors, the armature being positioned at a constant distance from said assembly, tension means for varying tension on the lever means and comprising adjustable spring means operatively connected to the lever means so that the force required to attract the armature to said assembly is adjustable without varying the distance between the armature and said assembly, the tension means also comprising a manually rotatable cam and a cam follower, and the cam follower being operatively connected to the spring means for increasing and decreasing tension on the spring means in response to rotation of the cam.

4,074,219
MOUNTING MEANS FOR A CIRCUIT BREAKER

Svein T. Nordberg, and Donald R. Shaner, both of El Paso, Tex., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Mar. 24, 1976, Ser. No. 669,999
Int. Cl.² H01H 85/02
U.S. Cl. 337—186
10 Claims



1. Mounting means for mounting a circuit breaker having an envelope with a pair of electrical conductors extending from a base of said envelope in a holder having an electrically insulative body with a conductive first contact carried by the base of said body and a conductive first retaining means carried by said body comprising:

conductive second retaining means circumscribing at least a portion of said envelope and bonded thereto for engaging said first retaining means to retain said circuit breaker in said holder;

means for electrically connecting one of said pair of electrical conductors to said second retaining means;

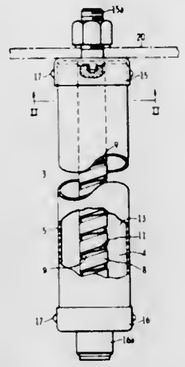
a conductive second contact electrically connected to the other one of said pair of electrical conductors; and

electrically insulative spacing means molded between said base of said envelope and said second contact for fixedly spacing said second retaining means from said second contact a predetermined distance, said spacing means encompassing said pair of conductors for holding said conductors in a spaced relationship, said predetermined distance ensuring contact between said first and second contacts when said first and second retaining means are engaged.

4,074,220
FUSE STRUCTURE HAVING IMPROVED GRANULAR FILLER MATERIAL

James N. Santilli, Bloomington, Ind., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 515,949, Oct. 18, 1974, abandoned.
This application Sept. 14, 1976, Ser. No. 723,255
Int. Cl.² H01H 85/18
U.S. Cl. 337—276
9 Claims

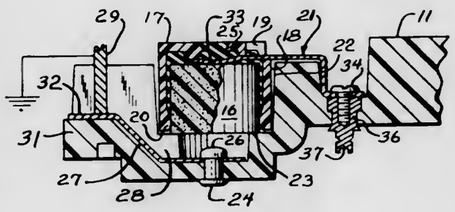


1. A fuse structure comprising, in combination, a fuse holder supporting a pair of spaced fuse terminals and defining an enclosed volume, one or more fuse elements electrically connected to said spaced fuse terminals and passing through said enclosed volume, a granular filling material for said enclosed volume to assist in deionizing the arc established during fusing of the fuse structure, said granular filling material comprising sand and admixed water.

4,074,221
EPOXY BONDED SILICON CARBIDE LIGHTING-PROTECTION VALVE

James W. Milligan, West Lafayette, Ind., assignor to Duncan Electric Company, Inc., Lafayette, Ind.

Filed Sept. 30, 1976, Ser. No. 728,315
Int. Cl.² H01C 7/10
U.S. Cl. 338—21
2 Claims



1. A lightning protection valve pressure molded from silicon carbide powder with the particles thereof coated with a resin binder and interstices between the coated particles largely filled with aluminum oxide to prevent internal tracking; the valve including opposed terminal faces and the sides of the valve between the faces being substantially free of tracking characteristics.

4,074,222
PLANAR HEATING ELEMENT

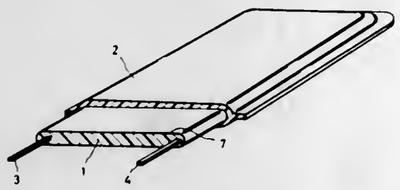
Shin Kiyokawa; Shokichi Sakaguchi, and Toru Takeuchi, all of 139, Kamihikona, Misato, Saitama, Japan

Division of Ser. No. 562,046, March 26, 1975. This application Aug. 1, 1975, Ser. No. 601,178

Claims priority, application Japan, Mar. 29, 1974, 49-35373; Mar. 29, 1974, 49-35374

Int. Cl.² H01C *3/06*

U.S. Cl. 338—212 **1 Claim**



1. A planar heating element comprising a thin flat body formed from an insulating thermoplastic resin and electrically conductive powder wherein the electrically conductive powder is formed in a layer within the thermoplastic resin in the neighborhood of the entire surface of the body and lead wires within said body, said lead wires being positioned near the surface of the body such that the lead wires are electrically connected to said layer of electrically conductive powder; said planar heating element being produced by a method comprising uniformly melt-admixing and insulating thermoplastic resin with an electrically conductive powder wherein said electrically conductive powder is present in an amount less than 40% by weight of the thermoplastic resin, extruding the melted mixture to form said planar heating element, applying wires lengthwise into the extruded body, stretching or drafting the extruded body in the softening state and immediately continuously rapidly cooling the extruded body at a temperature of less than 20° C. whereby said electrically conductive powder is in a higher concentration near the surface of the element.

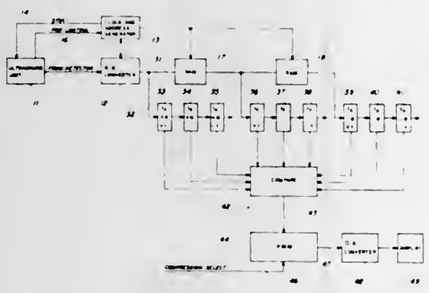
4,074,223
PEAK DETECTOR FOR RESOLUTION ENHANCEMENT OF ULTRASONIC VISUALIZATION SYSTEMS

Reginald C. Eggleton, and Warren L. Williamson, both of Indianapolis, Ind., assignors to Indianapolis Center for Advanced Research, Indianapolis, Ind.

Filed Aug. 3, 1976, Ser. No. 711,359

Int. Cl.² G01S *9/66*

U.S. Cl. 340—1 R **11 Claims**



1. A peak detector system for ultrasonic visualization arrangements comprising:
   a. first means for dividing received ultrasonic energy into resolution elements;
   b. second means for creating for each resolution element a plural bit word which encodes the value of the received ultrasonic energy in the resolution element;
   c. third means for storing said plural bit words; and
   d. fourth means connected to said third means for comparing said plural bit words and producing at its output a signal indicative of peak points determined by said fourth means for comparing.

4,074,224
ACOUSTIC WAVE TRANSDUCER WITH AUTOMATIC COMPENSATION OF THE STATIC PRESSURE VARIATIONS

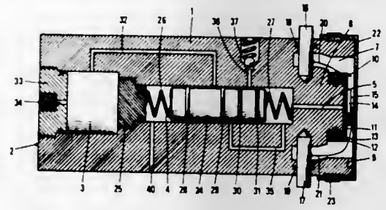
Jean Laurent, Morainvilliers, France, assignor to Institut Francais du Petrole, France

Filed Oct. 18, 1976, Ser. No. 733,052

Claims priority, application France, Oct. 27, 1975, 75 32993

Int. Cl.² H04B *13/00*

U.S. Cl. 340—8 PC **14 Claims**



1. An acoustic wave transducer drive comprising a sensitive element disposed in a rigid body provided with at least one wall transparent to acoustic waves, the sensitive element having a first face subjected through said transparent wall to the pressure prevailing in an external medium and a second face in front of an inner cavity of said body, automatic regulation means for establishing communication between the inner cavity and the external medium or a source of fluid at a pressure permanently higher than that of the external medium, depending on whether the internal pressure in said cavity is either greater or smaller than the pressure prevailing in the external medium, said regulating means comprising a member movable in said inner cavity and delimiting with the inner surface thereof several compartments respectively communicating, when the pressure difference is lower than a certain threshold value, directly with the external medium, directly with the source of pressurized fluid, with the portion of the cavity in front of the second face of the sensitive element and with the external medium through a valve which may open toward the outside of the rigid body, said compartments being separated from one another.

4,074,225
EMERGENCY DETECTION ALARM AND EVACUATION SYSTEM

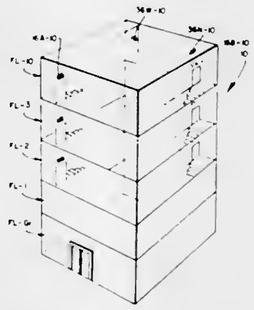
Joseph L. Vandeweghe, Englewood, N.J., assignor to Engleway Corporation, Englewood, N.J.

Filed May 9, 1975, Ser. No. 576,034

Int. Cl.² G08B *21/00*

U.S. Cl. 340—237 R **7 Claims**

1. An emergency detection and evacuation system for a building having a plurality of stories comprising, a plurality of detectors spatially distributed on each of said stories operative to detect an emergency condition; a plurality of emergency signalling units respectively located adjacent emergency exits; and a control panel comprising a plurality of indicators respectively connected to said emergency condition detectors an a plurality of signalling switches respectively connected to said signalling units for selectively actuating and deactuating said signalling units in response to said detectors; said signalling units being respectively operative in response to the actuation of respectively associated switches to emit coded audible signals with each of said emitted audible signals being uniquely coded to distinguish each of said coded audible signals from all other of said coded audible signals, said detectors operative to respectively actuate the corresponding panel indicators upon the occurrence of an emergency condition in the vicinity of a detector and means for manually actuating and deactuating selected signalling units in response to the observation by an operator of the actuation and non-actuation of particular panel indicators on said control panel.



4,074,226
BRAKE MALFUNCTION WARNING AND INDICATING SYSTEM FOR AUTOMOBILES

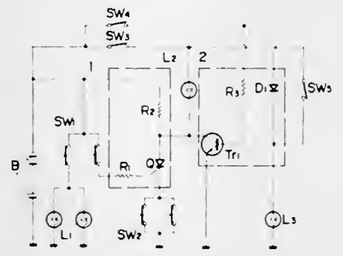
Nobuhiro Takeda; Masaichi Hattori; Minoru Kondo, all of Nagoya, and Tatsuo Kato, Inazawa, all of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Japan

Continuation of Ser. No. 597,995, July 22, 1975, abandoned, which is a continuation of Ser. No. 387,643, Aug. 13, 1973, abandoned. This application Mar. 4, 1976, Ser. No. 663,857

Claims priority, application Japan, Aug. 15, 1972, 47-81132; Aug. 25, 1972, 47-85061; July 25, 1973, 48-87313

Int. Cl.² G08B *21/00*; B60Q *1/00*

U.S. Cl. 340—52 B **1 Claim**



1. A brake malfunction warning and indicating system for use with a brake system of an automotive vehicle, said brake system having a brake pedal and working fluid under pressure therein, said warning and indicating system comprising a power source, a stop switch connected to said source adapted to close in response to the depression of the brake pedal, a stop lamp connected through said stop switch to the power source, a brake warning switch normally closed when the brake pedal is released, but adapted to open when the brake pedal is depressed and the pressure of the working fluid in the brake system is at a normal level and to remain closed in response to a possible malfunction of the brake system in terms of the working fluid when the brake pedal is depressed, a controlled rectifying element having an anode and cathode connected between said brake warning switch and an anode of said power source, and at its gate to said stop switch, an indicating means connected at one end to the anode of said controlled rectifying element and at the other end through an ignition switch to the anode of said power source, a starter switch connected to said power source, and a switching means turned ON when said starter switch is closed, rendering the indicating means conductive through said ignition switch.

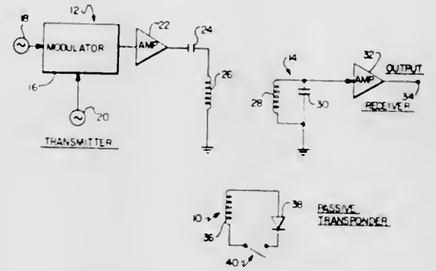
4,074,227
TIRE PRESSURE INDICATOR

Henry P. Kalmus, 3000 University Terrace, NW., Washington, D.C. 20016

Continuation-in-part of Ser. No. 524,285, Nov. 15, 1974, abandoned. This application May 5, 1976, Ser. No. 683,431

Int. Cl.² B60C *23/02*; G08B *19/00*

U.S. Cl. 340—58 **11 Claims**



1. A system for electro-magnetically monitoring the internal pressure of a tire having a plurality of possible states comprising:
   a. pressure sensor means for determining one of the said plurality of states of said tire;
   b. transmitter means for transmitting an interrogation signal composed of a carrier wave modulated at a predetermined modulating frequency and means tuned to said carrier frequency to remove all residual energy at the modulating frequency;
   c. transponder means, operable in response to said pressure sensor means, for passively detecting said interrogation signal and retransmitting an information signal at said modulating frequency as a function of the state of said sensor, said transponder means comprising a non-linear electrical element series coupled to an inductor;
   d. and receiver means comprising a parallel coupled inductor and capacitor tuned only to said modulating frequency for providing an output indicative of the tire pressure.

4,074,228
ERROR CORRECTION OF DIGITAL SIGNALS

Charles Maria Jonscher, London, England, assignor to Post Office, London, England

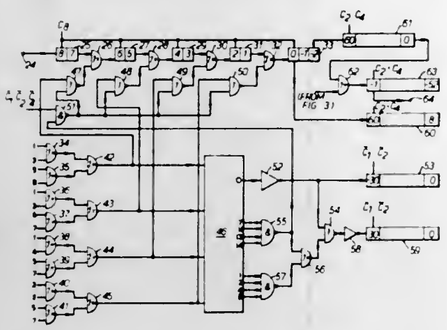
Filed Oct. 26, 1976, Ser. No. 735,443

Int. Cl.² G06F *11/12*

U.S. Cl. 340—146.1 AQ **25 Claims**

1. A method of correcting errors in a digital signal, the method comprising the steps of:
   receiving a digital signal comprising information bits, first error control bits corresponding to a first error control code, and second error control bits corresponding to a second error control code,
   decoding the first error control bits to determine the probability of error in the received signal,
   decoding the second error control bits,

using the error probability determined from the first error control bits to define a correction algorithm, and



correcting the information bits by performing on them the said correction algorithm using the decoded second error control bits.

4,074,229

METHOD FOR MONITORING THE SEQUENTIAL ORDER OF SUCCESSIVE CODE SIGNAL GROUPS

Gerhard Prey, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 26, 1976, Ser. No. 680,494
Claims priority, application Germany, Apr. 25, 1975, 2518588
Int. Cl.² G06F *11/10*; G11C *29/00*
U.S. Cl. 340—146.1 AG **4 Claims**

1. A method for monitoring for insuring the accurate and proper sequential order of successive code signal groups used in program controlled data processing apparatus, wherein each said code signal group includes at least two check characters, at least one of which is derived from the subsequent code signal group and wherein the accurate and proper sequential order is monitored by comparing the said check character with a further check character derived from the next code signal group, comprising the steps of:
   - deriving both said check characters from the successive code signal group,
   - monitoring the address sequence under the control of a first of said check characters,
   - monitoring the sequence of instructions using the second of said check characters and
   - comparing check characters derived directly from available indications to or from the next code signal group in sequence using separate checking apparatus.

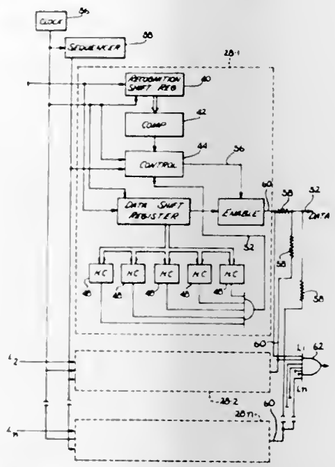
4,074,230

COMMUNICATION METHOD AND APPARATUS FOR PROVIDING AN ENHANCED SIGNAL FROM DIVERSE SIGNALS

Phineas J. Icenbice, Jr., Northridge, Calif., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed May 24, 1976, Ser. No. 689,331
Int. Cl.² G06F *11/08*; H04B *7/02*
U.S. Cl. 340—146.1 BE **15 Claims**

1. A method of communicating comprising the steps of:
   (a) providing a digital signal to be communicated;
   (b) formating the digital signal into a serial digital signal having a plurality of information bits, the digital signal being preceded by a predetermined recognition code, and containing an error detection code, the error detection code having a number of bits which is less than the number of information bits;
   (c) modulating and transmitting the digital signal;
   (d) receiving and demodulating a plurality of diverse signals each representing the transmitted signal, to provide a plurality of received digital signals;
   (e) interrogating the plurality of received digital signals for recognition of the predetermined recognition code;
   (f) interrogating the plurality of received information bits in the digital signals in conjunction with their error detection code; and



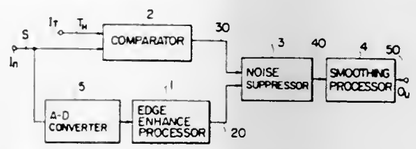
   (g) assembling a digital signal by selecting at least one received digital signal for which the recognition code was in fact recognized and which the respective error detection code indicates is accurate.

4,074,231

PATTERN PROCESSING SYSTEM

Shunichi Yajima; Shigeru Kakumoto, both of Kokubunji; Yoshiji Fujimoto, Hachioji, and Toshihiro Hananoi, Kanagawa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 9, 1976, Ser. No. 748,882
Claims priority, application Japan, Dec. 17, 1975, 50-149624
Int. Cl.² G06K *9/12*
U.S. Cl. 340—146.3 AG **5 Claims**



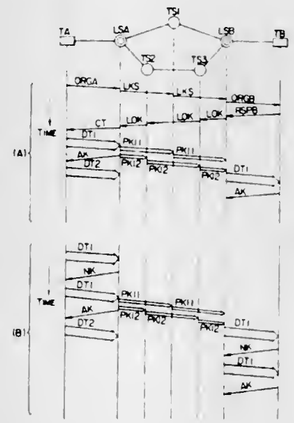
1. A pattern processing system comprising:
   - first processing means to subject a pattern input signal to a filtering processing of enhancing an edge of a pattern,
   - binary-coding means to binary-code said pattern input signal by a predetermined threshold value,
   - noise suppressing means to suppress noises by a nonlinear processing of outputs from said first processing means and said binary-coding means, and
   - second processing means to subject an output from said noise suppressing means to a filtering processing for performing a smoothing processing.

4,074,232

DATA SENDING AND RECEIVING SYSTEM FOR PACKET SWITCHING NETWORK

Koju Otomo; Takeshi Itoh, both of Musashino; Kazuyuki Hayashi, Yokohama; Hiroshi Omoto; Takayuki Yui, both of Tokyo, and Makoto Suzuki, Kawasaki, all of Japan, assignors to Hitachi, Ltd.; Nippon Telegraph and Telephone Public Corporation; Oki Electric Industry Co., Ltd.; Nippon Electric Company, Ltd. and Fujitsu Limited, all of Japan

Filed Mar. 2, 1976, Ser. No. 663,048
Claims priority, application Japan, Mar. 3, 1975, 50-25007
Int. Cl.² H04Q *9/00*
U.S. Cl. 340—147 R **3 Claims**



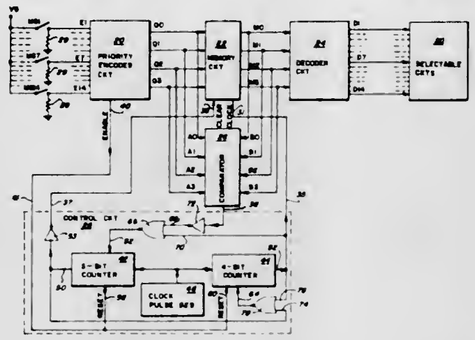
1. A packet switching system comprising a packet switching network having office-to-office channels for connecting between packet switching offices, and data communication channels for connecting between data communication sending and receiving terminals and said packet switching offices;
   - wherein a data communication is conducted by a single communication link established prior to the beginning of the data communication, from one of said data communication sending terminals to one of said data communication receiving terminals through one of said office-to-office channels in accordance with a character oriented transmission control procedure, said single communication link being disconnected in accordance with said character oriented transmission control procedure after said data communication;
   - and wherein, after the establishment of said single communication link for transmitting a data block from said sending terminal to said receiving terminal through said packet switching network, a checking answer is provided in accordance with said transmission control procedure, said checking answer associated with the data block being transmitted from said packet switching office connected by said data communication channel to said data communication sending terminal; and after the transmission of said data block to said data communication receiving terminal, a checking answer is transmitted from said data communication receiving terminal in accordance with said transmission control procedure, said checking answer associated with the data block being received by said packet switching office connected by said data communication channel to said data communication receiving terminal to inhibit the transmission of said checking answer into said packet switching network.

4,074,233

SELECTION SWITCH MEMORY CIRCUIT

Richard Slaughter Swain, Des Plaines, Ill., assignor to Norlin Music, Inc., Lincolnwood, Ill.

Filed June 30, 1976, Ser. No. 701,391
Int. Cl.² H04Q *9/00*
U.S. Cl. 340—147 LP **35 Claims**



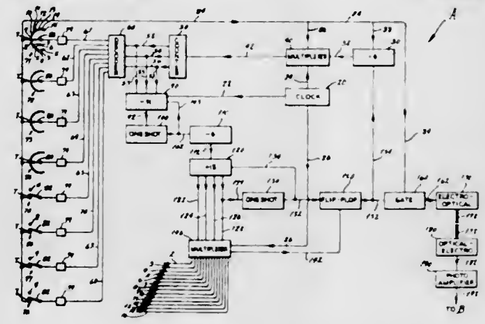
1. In a selection circuit having a plurality of actuateable swtiches and a plurality of selectable circuits associated therewith, a switching circuit for selectively activating said selectable circuits, comprising:
   - means for providing a code representative of any one of said switches in response to actuation thereof;
   - storage means for storing the provided code;
   - means for comparing the stored code with a subsequently provided code; and
   - means responsive to said comparing means for controlling activation of said selectable circuits, said controlling means deactivating an activated one of said selectable circuits in response to the provided code being the same as the stored code.

4,074,234

CONTROL SYSTEM FOR AN AERIAL DEVICE

Charles W. Fox, Clayton, Mo., assignor to McCabe-Powers Body Company, St. Louis, Mo.

Continuation of Ser. No. 463,903, April 25, 1974, abandoned, which is a division of Ser. No. 263,648, June 16, 1972, Pat. No. 3,820,070. This application Apr. 15, 1975, Ser. No. 568,174
Int. Cl.² H04Q *9/00*
U.S. Cl. 340—171 R **4 Claims**



1. In combination, encoder means comprising a plurality of individually controllable signal control means for effecting production of a plurality of pulse form control signals in a rapidly repeating sequence, said signals being characterized by a selected frequency for each individually controllable signal control means and each frequency signal having a selected pulse duration dependent upon actuation of the respective individually controllable signal control means, electrical-opti-

cal means for converting said control signals to light signals, a flexible light transmitting fiber adapted to transmit said differing control signals from said encoder means in a non-linear path to a location remote from said encoder means, optical-electro means and discriminator means provided at said remote location for receiving said differing control signals from said encoder means, said discriminator means including means for identifying each differing control signal as to frequency and pulse duration, and a plurality of output networks communicating with said discriminator means, each of said output networks being associated with one of said differing control signal frequencies and responsive to the pulse duration, said discriminator means further including means for directing an identification signal for each said control signal to its corresponding output network.

4,074,235

DATA STORAGE AND RETRIEVAL SYSTEMS

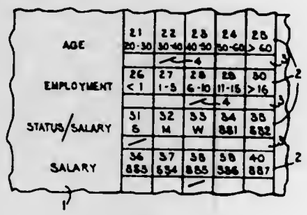
Roy Thomas, Ashford, England, assignor to International Computers Ltd., Stevenage, England

Filed Oct. 28, 1975, Ser. No. 626,495

Claims priority, application United Kingdom, Oct. 29, 1974, 46815/74

Int. Cl.² G06F *7/04*

U.S. Cl. 364—900 **7 Claims**



1. A process for retrieving, from a file of information items each identified by an index number, the index number of each item for which a desired value obtains for each of a predetermined number of retrieval criteria, the process comprising:

forming a magnetically recorded index tape separate from the file of information items by, for each information item, carrying out the steps of:

providing a criteria recorder having a plurality of recording positions each capable of recording only a single bit by being either set or unset, each recording position corresponding to a value of a retrieval criterion, and there being for each retrieval criterion a plurality of recording positions each corresponding to a different alternative value of that criterion,

entering the value of each retrieval criterion which obtains for the item by causing only each recording position which corresponds to such a value to be set and the remainder to be unset,

reading the settings of the recording positions to generate a string of binary electrical signals each representing the setting of a different recording position, and magnetically recording the said string serially on the said index tape together with the index number of the information item;

entering each retrieval-criterion value that it is desired should obtain for an item to be retrieved into an electronic register having plurality of binary stages each corresponding to a different retrieval-criterion value, by causing each stage which corresponds to a desired retrieval-condition value to be set, the remainder being unset;

reading the tape to obtain, for each information item, the said recorded string of binary electric signals and index number,

outputting the contents of the aid register as a plurality of binary electrical signals each representing the setting of a different one of the said stages;

comparing each binary signal of the said string with the binary signal representing the corresponding stage of the said register; and

displaying the index number of each item for which a predetermined number of signals representing set stages in the said register match the corresponding signals in the said string, thereby displaying the index number of each informtion item for which a desired value obtains for each of a predetermined number of retrieval criteria.

4,074,236

MEMORY DEVICE

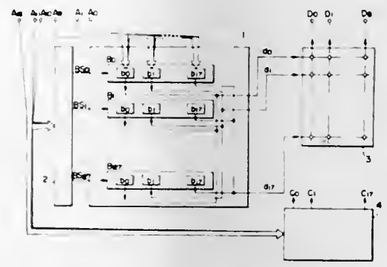
Akira Ishida, Tokyo, Japan, assignor to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Dec. 12, 1975, Ser. No. 640,227

Claims priority, application Japan, Dec. 16, 1974, 49-144243

Int. Cl.² G11C *13/00*

U.S. Cl. 365—200 **6 Claims**



1. A memory device comprising:

a memory portion composed of a plurality of major memory blocks, each composed of at least a predetermined number of minor memory blocks, the minor memory blocks being respectively composed of a plurality of memory cells for data storage and the major memory blocks being respectively given addresses corresponding thereto;

a control information registration portion for registering and storing information as to whether or not each of the minor memory blocks making up each of the major memory blocks includes a defective memory cell;

a block select portion for selecting one of the major memory blocks; and

an input/output control portion connected to data bus lines for reading out the control information registered and stored in the control information registration portion corresponding to the major memory block selected by the block select portion to select a predetermined number of minor memory blocks having no defective memory cell from the group of minor memory blocks making up the selected major block and to interconnect those selected to the bus lines to cause them to perform data inputting and outputting.

4,074,237

WORD LINE CLAMPING CIRCUIT AND DECODER

Dominic Patrick Spampinato, Ozone Park, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 8, 1976, Ser. No. 665,144

Int. Cl.² G11C *7/00*

U.S. Cl. 365—230 **7 Claims**

1. A word line clamping circuit comprising

a memory array word line,

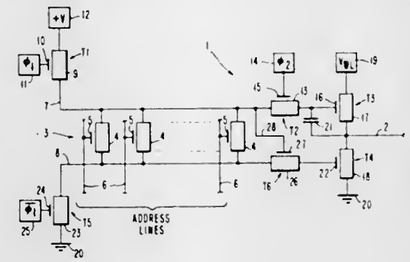
a decoder circuit adapted for operating in a selected and nonselected mode including a plurality of actuable field effect transistors,

means connected to said word line for applying word line potential to said word line when said word line is selected including a first field effect transistor having source, drain and gate electrodes and a bootstrap capacitor connected across the drain and gate electrodes thereof,

means connected to said decoder and said word line for clamping said word line to a reference potential when said word line is unselected including a second field effect transistor having source, drain and gate electrodes connected between said word line and said reference potential, third, fourth and fifth field effect transistors each having source, drain and gate electrodes and at least one of said plurality of actuable field effect transistors operable during a first interval for applying charge to said first and second field effect transistors rendering them operable, the source electrode of said fourth field effect transistor being connected to the gate electrode of said fifth field effect transistor,

means connected to said fourth field effect transistor and at least one of said plurality of field effect transistors for maintaining them operable during at least a portion of a second interval, and,

means connected to said fifth field effect transistor for rendering it inoperable during said second interval to trap charge on said gate of said second field effect transistor holding said last-mentioned transistor operable and maintaining reference potential on said word line.



4,074,238

SEMICONDUCTOR READ-ONLY MEMORY

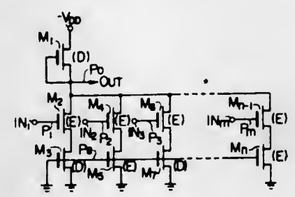
Kenzo Masuda, Tokorozawa, Japan, assignor to Hitachi, Ltd., Japan

Filed Mar. 12, 1976, Ser. No. 666,426

Claims priority, application Japan, Mar. 26, 1975, 50-35598

Int. Cl.² G11C *11/40, 13/00*

U.S. Cl. 365—104 **8 Claims**



1. A read-only memory comprising:

a first and a second line;

a plurality of information memory circuits connected in parallel with one another across said first and second lines, each said memory circuit comprising a pair of insulated-gate field effect transistors connected in series with each other across said first and second lines, one of said insulated-gate field effect transistors in each said information memory circuit in which information is to be written being of depletion mode, while the other said insulated-gate field effect transistor being of enhancement mode;

means for supplying electric power to said information memory circuits; and

means for reading out the information written in said information memory circuits.

4,074,239

MEMORY CELL WITH NONDESTRUCTIVE RECALL

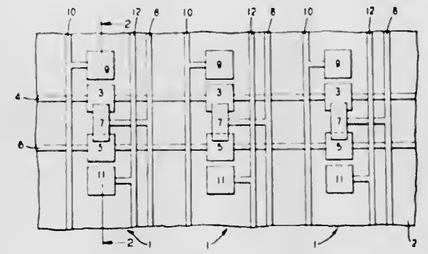
Roger T. Baker, Box 240, Mount Tabor, N.J. 07878

Continuation-in-part of Ser. No. 642,721, Dec. 22, 1975, Pat. No. 4,015,247, which is a continuation-in-part of Ser. No. 613,189, Dec. 14, 1976, Pat. No. 3,997,799. This application Mar. 25, 1976, Ser. No. 670,143

The portion of the term of this patent subsequent to Dec. 14, 1993, has been disclaimed.

Int. Cl.² G11C *7/00, 11/34*

U.S. Cl. 365—176 **14 Claims**



11. In the class of semiconductor random access memories wherein

a plurality of first electrodes and a semiconducting substrare are utilized to form a plurality of memory cells,

in each of said memory cells one of said first electrodes is utilized to form in said semiconducting substrate a first localized minimum potential energy region for one polarity of mobile charge carriers in said semiconducting substrate,

in each of said memory cells a one is represented by storing a relatively large number of mobile charge carriers of said polarity in the said first localized minimum potential energy region of that said memory cell,

in each of said memory cells a zero is represented by storing a relatively small number of mobile charge carriers of said polarity in the said first localized minimum potential energy region of that said memory cell,

the said memory cells are interconnected such that the said first electrode of each of the said memory cells is connected in common with the said first electrode on some of the other of the said memory cells,

a method of entering datum in any particular one of the said memory cells, comprising the steps of

to enter a one in said particular memory cell, applying a first potential between the said first electrode of the said particular memory cell and the said semiconducting substrate,

to enter a zero is said particular memory cell, applying a second potential between the said first electrode of the said particular memory cell and the said semiconducting substrate,

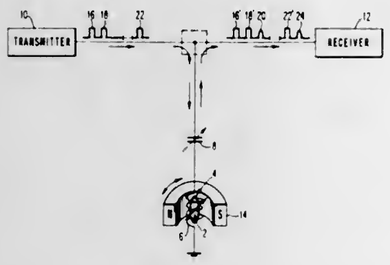
both said first potential and said second potential being a magnitude and polarity such that when either of these said potentials are applied between the said first electrode of one of the said memory cells and the said semiconducting substrate, a localized minimum potential energy region for said polarity of mobile charge carriers is formed in said semiconducting substrate, and

the localized minimum potential energy region so formed by so applying either said first potential or said second potential can be used to store the said relatively large number of mobile charge carriers of said polarity used to represent a one in one of said memory cells.

4,074,240
MAGNETOELASTIC STORAGE DEVICE

Robert Lee Melcher, Yorktown Heights, and Norman Steven Shiren, Ossining, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 20, 1976, Ser. No. 659,872
Int. Cl.[2] G11C 11/02
U.S. Cl. 365—192 10 Claims



1. A device for obtaining storage and readout of information comprising:

a powdered magnetoelastic material having a plurality of particles each with its own mechanical resonance frequency and each with its own original orientation,

a tuned electrically resonant circuit comprising a variable capacitor and a coil wherein said material is located within said coil for providing an oriented radiofrequency magnetic field within said material,

a d. c. magnet for applying a magnetic field to said powder at an angle to the field created by radiofrequency current through said coil,

means for applying a first r. f. pulse as an information-bearing pulse to said electrically resonant circuit for causing said particles of said powdered material to oscillate mechanically at said mechanical resonance frequencies,

means for applying a second r. f. pulse with peak power above a minimum power to said electrically resonant circuit to cause said mechanically oscillating particles to rotate to new orientations because said minimum power is exceeded, said second r. f. pulse serving to store the information-bearing pulse as said new orientations, and

means for applying a third r. f. pulse to said electrically resonant circuit so as to obtain a readout signal of said stored information.

4,074,241
RADIOSONDE CIRCUITRY FOR IMPEDANCE MEASUREMENT OF AN AL_2O_3 ABSOLUTE WATER VAPOR SENSOR

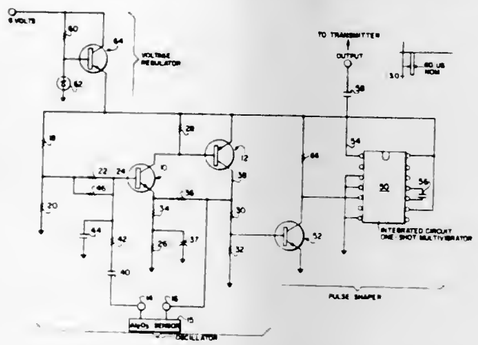
Paul Kranz, Harvard, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 24, 1974, Ser. No. 536,077
Int. Cl.[2] G08C 19/16, 17/00
U.S. Cl. 340—189 M 1 Claim

1. A circuit for measuring the impedance of an Al_2O_3 water vapor sensor used in a radiosonde telemetry system, which system has a transmitter, said circuit comprising:

oscillator means for producing a temperature stabilized cyclical output, said oscillator means having an Al_2O_3 water vapor sensor as a feedback frequency-control element, the frequency of said oscillator being independent of temperature effects, said oscillator means includes first and second transistors, the collector of said second transistor being connected through said sensor to the base of said first transistor, the collector of said first transistor being connected to the base of said second transistor;

pulse shaping means for receiving the output from said oscillator means and converting it to a pulse suitable for modulating the transmitter of said radiosonde, said pulse shaping means includes a buffering transistor, the base of said buffering transistor being connected to the collector of said second transistor, said pulse shaping means further includes a one-shot multivibrator integrated circuit connected to the collector output of said buffering transistor,



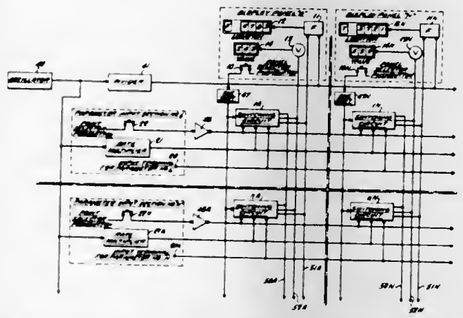
said one-shot multivibrator providing an output pulse for each cycle of said oscillator means; and

voltage regulator means for providing a relatively constant dc voltage input to said oscillator means and said pulse shaping means.

4,074,242
POINT SELECTION AND DISPLAY SYSTEM

Robert Mayer, Ardmore, Pa., assignor to Suntech, Inc., Wayne, Pa.

Filed Nov. 24, 1975, Ser. No. 634,691
Int. Cl.[2] H04Q 9/00
U.S. Cl. 340—213.1 7 Claims



1. A system for monitoring the value of a plurality of parameters at different locations in a process and for displaying at a central location the value of the process parameters selected, said monitoring system comprising:

(a) a plurality of input terminals, each input terminal receiving a signal related to the value of a particular process parameter, and each input terminal having associated therewith parameter selection means for allowing that input terminal to be selected to monitor its process parameter, and for producing a signal indicative of its selection;

(b) a plurality of display systems, each display system having means for displaying the value of a selected process parameter, and each display system having associated therewith display system selection means for allowing that display system to be selected to display the value of a selected parameter, and for producing a signal indicative of its selection;

(c) a matrix of switching circuits, each switching circuit coupling an input terminal with a display system, and each switching circuit comprising,

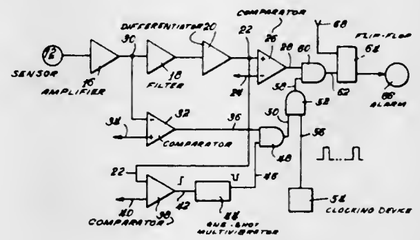
(i) means, responsive to a signal from the display system selection means associated with that switching circuit, for placing the switching circuit in a first enabled mode wherein an open circuit is produced between the input terminal and the displaying means, whereby all the switching circuits coupled to a particular display system are placed in a first enabled mode,

(ii) means, responsive to the switching circuit being placed in said first enabled mode and further responsive to a signal from the process parameter selection means associated with that switching circuit, for placing the switching circuit in a second mode wherein a closed circuit is produced between the input terminal and the displaying means, and the value of the selected process parameter is displayed by the displaying means of the selected display system.

4,074,243
ANTICIPATORY FLAMMABLE GAS DETECTION SYSTEM

John S. Bogen, Chicago, and Gary I. Robin, Niles, both of Ill., assignors to Erdco Engineering Corporation, Addison, Ill.

Filed June 18, 1976, Ser. No. 697,452
Int. Cl.[2] G08B 17/10
U.S. Cl. 340—237 R 9 Claims



1. A flammable gas detection system, comprising, in combination:

flammable gas sensing means for sensing the flammable gas concentration level of a mixture of flammable and non-flammable gas, said flammable gas sensing means including a transducer for effecting an indicating signal proportional to said flammable gas concentration level;

a differentiator for generating a rate of change signal in response to the rate of change of said flammable gas concentration level;

reference signal means for effecting a continually changing reference signal which varies as a function of time, said continually changing reference signal being proportional to a non-constant preselected reference rate of change of flammable gas concentration level which varies as a function of time;

comparator means for comparing the rate of change signal with the continually changing reference signal; and

control means operatively responsive to the comparing means for energizing an alarm signal when the rate of change of the flammable gas concentration level exceeds the non-constant preselected reference rate of change of said flammable gas concentration level.

4,074,244
AUDIBLE-VISUAL WARNING ALARM SYSTEM

Robert Bruce Balderson, 53 Pueblo Road, New Britain, Pa. 18901

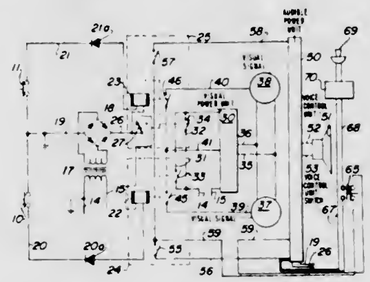
Filed July 18, 1975, Ser. No. 597,207
Int. Cl.[2] G08B 23/00
U.S. Cl. 340—244 R 8 Claims

1. A warning alarm system comprising

a pair of different visual signals, p1 audible signal means having a pair of different delivered signals corresponding respectively to each of the visual signals and having speaker means for delivery of said audible signals,

signal input means responsive to a plurality of conditions,

control means for said visual signals and said audible signal means responsive to one condition for maintaining said visual and audible signals in an inactive condition and to different predetermined conditions of warning for selectively simultaneously initiating one of said visual signals and delivery of a corresponding audible signal through said speaker means for one condition of warning and for selectively simultaneously initiating a different one of said



visual signals and delivery of a corresponding different audible signal through said speaker means,

said control means including members for providing a priority of one of said audible signals over the other,

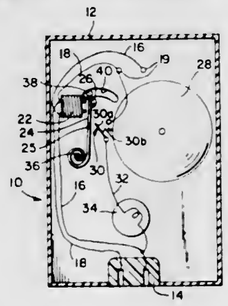
auxiliary voice input means including a microphone selectively connected to said speaker means,

said voice input means including members for cutting off audible alarm signals to said speaker means and connecting said microphone to said speaker means thereby overriding said audible signal means without overriding said visual signals.

4,074,245
POWER FAILURE ALARM

John P. Podany, 8299 Mitchell Road, Eden Prairie, Minn. 55343

Filed July 19, 1976, Ser. No. 706,259
Int. Cl.[2] G08B 21/00
U.S. Cl. 340—248 B 4 Claims



1. A power failure alarm device comprising:

a housing,

first electric circuit means in said housing for electrically connecting an electrical appliance in series to a power source,

an electromagnet connected to said first electric circuit means and energized by said first electric circuit means only when power is supplied to said first electric circuit means from said power source, and

an audible alarm in said housing, said audible alarm including

a gong mounted in said housing, and

a movable striker element normally restrained by said electromagnet in spaced relation to said gong, spring means mounted within said housing for moving said striker element in a direction away from said electromagnet and to strike said gong when said electromagnet is de-energized by an interruption of power supplied to said first electric circuit means from said power source, said gong being spaced from said electromagnet a distance sufficient to assure that said striker element will not be automatically attracted in a reverse direction back toward said electromagnet when said electromagnet is re-energized and a post mechanically connected to said striker element extending exteriorly of said housing in a slot therethrough,

a second electric circuit means in said housing in parallel to said first circuit means, said second circuit means including

a light and a switch closable by said means for moving said striker element when said striker element is being moved toward said gong,

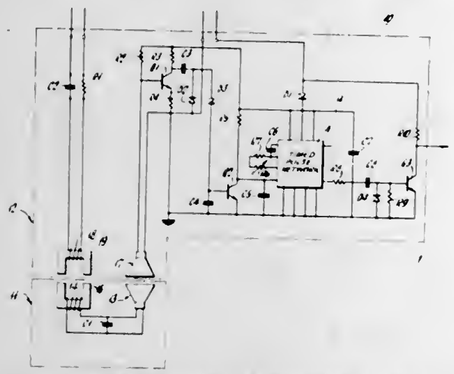
whereby upon a power failure occurring, said striker element is released by said electromagnet so that said spring means causes said striker element to strike said gong and to simultaneously close said switch so that said light is automatically actuated upon the restoration of power to said first electric circuit means from said power source, said striker element being returnable toward said electromagnet only by manually sliding said post in said slot towards said electromagnet, the actuation of said light indicating that power has been restored and that said post can be manually slid toward said electromagnet and that said striker element will then again be restrained by said electromagnet.

4,074,246

CONTACT SYSTEM FOR SENSING CLOSURES

Robert M. Conklin, Chappaqua, N.Y.; Charles J. Everett, Clinton, and Arthur T. Human, Norwalk, both of Conn., assignors to Holmes Protection, Inc., New York, N.Y.

Filed Feb. 17, 1976, Ser. No. 658,445
Int. Cl.² G08B *13/08*
U.S. Cl. 340—274 R **15 Claims**



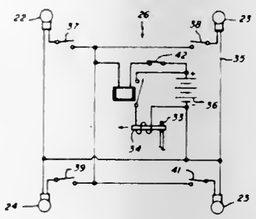
1. In combination with a closure member movable between a closed and open position relative to a stationary member, a system for sensing the position of said closure member relative to said stationary member comprising a first transducer having an electrical input signal and an output signal of predetermined type and mounted on one of said members, a second transducer having an input signal of said predetermined type and an electrical output, said first and second transducers being tightly coupled by said predetermined type signal output of said first transducer when said closure member is in closed position producing an output signal from said second transducer and being relatively uncoupled when said closure member is in open position producing a signal change, and means responsive to the output signal of said second transducer, said predetermined signal type comprising sound, said first transducer comprising an electro-mechanical transducer and said second transducer comprising a mechanical-electrical transducer operable in the sound frequency range, a first coil on said stationary member, means adapted to connect said first coil to a source of alternating current, and a second coil on said closure member electrically connected to said first transducer and magnetically coupled to said first coil when said closure member is in said closed position.

4,074,247

ATTACK DOG SECURITY SYSTEM

Ronald M. Carvalho, Box 175, Groton St., Dunstable, Mass. 01827

Filed Jan. 17, 1977, Ser. No. 760,094
Int. Cl.² G08B *13/00*
U.S. Cl. 340—276 **6 Claims**



1. In combination with a building having valuable furniture and furnishings and divided into at least two zones, or areas; an attack dog security system comprising:

an attack dog kennel, located within said building, said kennel having a normally latched door for confining an attack dog in said kennel and having electrically operated means for unlatching said door and releasing said dog from said kennel; and

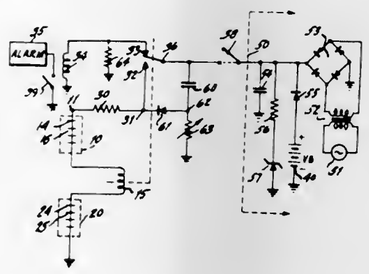
electric burglar alarm circuit means including a source of electricity, said electrically operated means; alarm means and sensing means, said circuit activating the alarm of said alarm means and activating said electrically operated door unlatching means upon sensing an intruder in said building.

4,074,248

DUAL OPERATING CONTROL CIRCUITS FOR INTRUSION DETECTION SYSTEMS

Roy Stockdale, Huntington, N.Y., assignor to Napco Security Systems, Inc., Copiaque, N.Y.

Filed Nov. 22, 1976, Ser. No. 743,539
Int. Cl.² G08B *13/08*
U.S. Cl. 340—276 **10 Claims**



1. An intrusion detection system comprising:

(a) a series loop including a plurality of intrusion sensing devices operative in a first closed position to indicate a secured condition and a second opened position to indicate an intrusion,

(b) control means adapted when energized to operate in a first position and in a second position when deenergized, said control means including a current activated actuator to operate said control means to said first position when a current flows through said actuator and means for coupling said actuator in series with said loop,

(c) an alarm coupled to said control means and responsive to said control means operative in said second position to indicate an alarm condition,

(d) means for providing a biasing current of a predetermined duration to said loop and hence, said actuator, in a first mode, to cause said actuator to operate said control means to said first position and

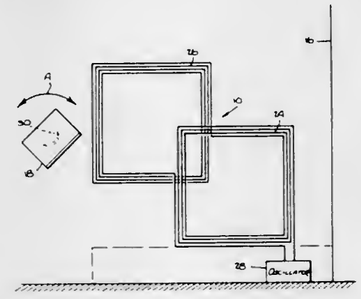
(e) means responsive to said control means operative in said first position for providing a second current to said loop, wherein if said loop is opened and closed during said predetermined duration, said means for providing a biasing current will again operate said actuator, and thereafter said actuator is biased by said means responsive to said control means.

4,074,249

MAGNETIC DETECTION MEANS

Arthur J. Minasy, Woodbury, N.Y., assignor to Knogo Corporation, Hicksville, N.Y.

Filed Feb. 4, 1977, Ser. No. 765,582
Int. Cl.² G08B *13/26*
U.S. Cl. 340—280 **11 Claims**



6. A target for a magnetic detection system of the type in which an alternating interrogating magnetic field is generated at an exit passageway and magnetic fields, which alternate at frequencies harmonically related to the interrogating field, are detected at said passageway, said target comprising an elongated strip of readily saturable magnetic material, said strip being curved along its length.

4,074,250

ALARM BOX WITH FINGERPRINT RECORDER

Stephen Robert Cooper, 246 Sunrise Hill Court, Norwalk, Conn. 06851

Filed Apr. 27, 1976, Ser. No. 680,845
Int. Cl.² G08B *29/00*
U.S. Cl. 340—304 **10 Claims**

1. A voice call alarm box comprising:

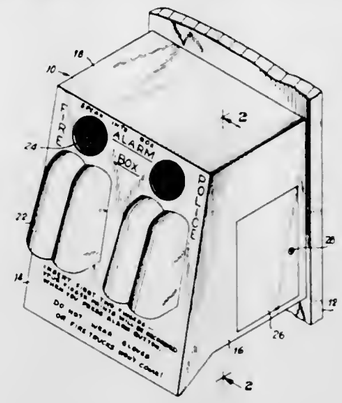
(a) a housing,

(b) circuit means contained within said housing for activation of an alarm at a remote location,

(c) switch means for selection activation of said circuit means,

(d) voice transmission means disposed within said housing for establishing oral communication between each successive operator of said alarm box and said remote location,

(e) means cooperating with said switch means for obtaining and preserving at least one fingerprint of said each successive operator, and



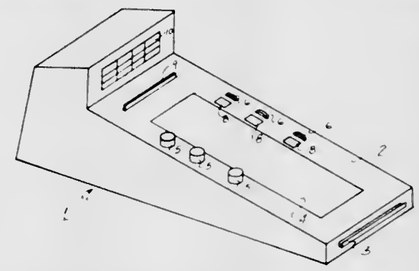
(f) means for transmitting a facsimile of said at least one fingerprint to said remote location.

4,074,251

APPOINTMENT REMINDERS

William G. Creely, 1400 E. Duschesne, Florissant, Mo. 63031

Filed May 3, 1976, Ser. No. 682,716
Int. Cl.² G08B *7/00*
U.S. Cl. 340—309.4 **1 Claim**



1. An appointment reminder comprising,

a cabinet means,

a plurality of message storage means mounted in said cabinet means, comprising a plurality of paper strips mounted upon a message tray,

a viewing window mounted in said cabinet means to permit viewing of said message storage means,

a plurality of time selection means operably mounted in said cabinet means and disposed proximate each message storage means, provided with a timer switch,

audio and visual indicating means operably mounted in said cabinet means,

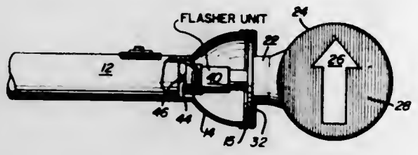
a plurality of message lighting means operably mounted in said cabinet means and disposed proximate each message,

electric power supply means operably mounted in said cabinet means,

a plurality of message activation switches operably mounted in said cabinet means, each of said message activation switches connected in series with a timer switch and also in series between said power supply and said message lights and said indicator means,

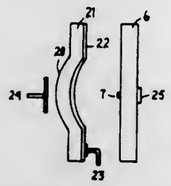
override means comprising a switch and conductor means operably mounted in said cabinet means and connected in series between said power supply and all message lights simultaneously to view stored messages simultaneously.

4,074,252
HAND SAFETY FLASHER
Herman F. Keller, Newton, Kans., assignor to Leon Nikkel; Kermit Nikkel, both of Canton and Lelus B. Brown, Newton, all of Kans., part interest to each
Filed May 20, 1976, Ser. No. 688,484
Int. Cl.[2] G08B *23/00*
U.S. Cl. 340—321 **7 Claims**



1. A hand safety flasher device, comprising, in combination:
a. a handle forming main body receptacle having a pair of spaced ends and arrangeable for receiving an electrical energizing cell, the receptacle being provided with an enlarged head portion at one of the ends thereof, the head portion having an opening therein for receiving the cell;
b. an on-off switch mounted on the receptacle and arranged for selectively closing and opening a circuit through the cell received in the receptacle; and
c. flasher means mounted on the enlarged head portion, and including a direction and warning indicating portion arranged extending away from the receptacle and a flasher unit extending into the receptacle and contacting a pole of the cell received in the receptacle, an electrical circuit being formed from the cell through the switch, flasher unit, and direction and warning indicating portion.

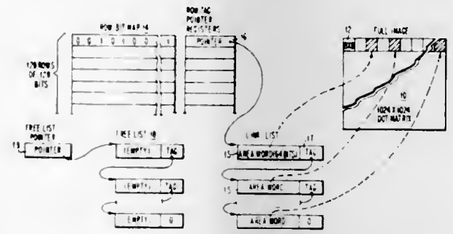
4,074,253
NOVEL BISTABLE LIGHT MODULATORS AND DISPLAY ELEMENT AND ARRAYS THEREFROM
Mark T. Nadir, Warren, N.J., assignor to Kenneth E. Macklin, White Plains, N.Y.
Filed Nov. 19, 1975, Ser. No. 633,494
Int. Cl.[2] G09F *9/32*
U.S. Cl. 340—324 M **11 Claims**



1. A bistable light modulator which comprises:
(a) a curved flexible membrane which is adapted to assume only either a stable concave or stable convex configuration and
(b) optical means positioned in accordance with one of the two stable states for enhancing the visibility of one of the two stable states.

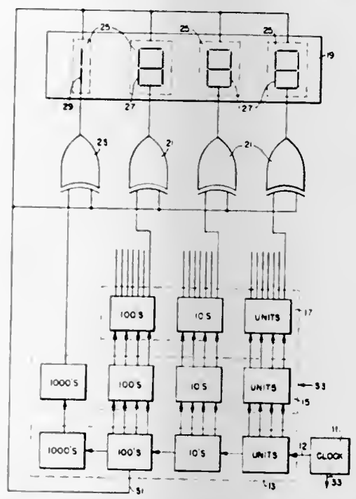
4,074,254
XY ADDRESSABLE AND UPDATEABLE COMPRESSED VIDEO REFRESH BUFFER FOR DIGITAL TV DISPLAY
Karl Arnold Belser, Campbell, and Philip Bradshaw Metz, Saratoga, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed July 22, 1976, Ser. No. 707,803
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—324 AD **4 Claims**

1. An apparatus for mapping compressed image information between a refresh buffer and an image display device by dividing the image into small subarrays such that only non-zero subarrays are represented in the refresh buffer,
said apparatus comprising: an area word memory for storing subarray information, each word containing dot matrix segments of a pictorial image;
row bit maps means for storing first manifestations designating active each subarray in which points are plotted and second manifestations designating inactive each subarray in which no points are plotted, said active subarrays being stored in said area word memory;
a row tag pointer memory for storing pointers associated



with each row of subarrays whose active subarray map is stored in said row bit map, each said pointer pointing to the first word location in said area word memory designating the first area word of a link list of chained area words corresponding to each active subarray in said designated row;
whereby said information stored in said area word memory can be updated to reflect changes in said image such that by updating said row bit map corresponding to changes in said area word list, subarrays can be entered or deleted from the map and the area word memory as their active/inactive status changes.

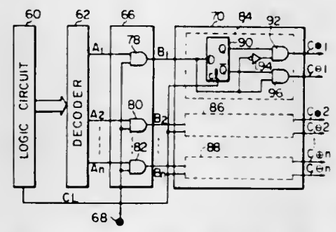
4,074,255
DISPLAY EXCITATION AND UPDATING CIRCUIT
Irwin Munt, Springfield, N.J., assignor to Sangamo Weston, Inc., Springfield, Ill.
Filed Apr. 12, 1976, Ser. No. 676,186
Int. Cl.[2] G02F *1/13;* **G06M** *3/06*
U.S. Cl. 340—336 **6 Claims**



1. An AC display excitation circuit for exciting the display of an electronic instrument having a multi-stage counter for accumulating pulses representative of a quantity of interest, portions of said display being bounded by pairs of electrode

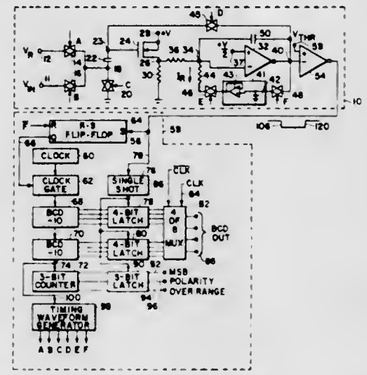
means and being selectively actuable by the application of an excitation voltage across said electrode means comprising:
clock means coupled to said counter at one stage thereof for continuously driving said counter while said display is operational;
register means;
means selectably operable for synchronously transferring the count in said counter to said register means;
means connecting the output of a stage of said counter to one of said pair of electrode means for applying thereto an AC potential having a frequency divided from said clock frequency by the stages of said counter between said output and said stage to which said clock means is coupled; and
selectably actuable display excitation means including means for connecting the output of said stage of said counter to the other of said electrode means for selectably applying thereto either said AC potential or its complement.

4,074,256
DRIVER CIRCUIT FOR DRIVING ELECTROCHROMIC DISPLAY DEVICE
Fukuo Sekiya, and Heihachiro Ebihara, both of Tokorozawa, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan
Filed Aug. 18, 1976, Ser. No. 715,523
Claims priority, application Japan, Aug. 20, 1975, 50-100231; Dec. 16, 1975, 50-149079
Int. Cl.[2] G06F *3/14;* **G09F** *9/32*
U.S. Cl. 340—336 **21 Claims**



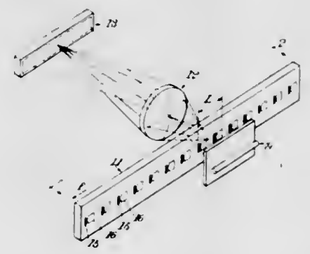
1. In an electrochromic display device includng a common electrode and a plurality of segment electrodes, a driver circuit having a power source and connected to a decoder adapted to provide display information signals, comprising:
a drive signal generator for generating coloring and bleaching signals in response to first and second changes in state of each of said display information signals;
a switching device composed of complementary MOSFETs connected between power source and said segment electrodes and responsive to said coloring and bleaching signals to cause an electric current from said power source to flow through said segment electrodes in directions to induce colored and bleached states, respectively;
means for applying a display erase signal; and
data control circuit coupled between said decoder and said drive signal generator to normally pass said display information signals to said drive signal generator, said data control circuit being responsive to said display erase signal to block said display information signals being applied to said drive signal generator, whereby said drive signal generator simultaneously generates a plurality of bleaching signals to cause said complementary MOSFETs of said switching device to apply an electric current from said power source simultaneously to all of said segment electrodes which have previously been in a colored state in a direction to induce bleached state for thereby automatically erasing displaying data.

4,074,257
AUTO-POLARITY DUAL RAMP ANALOG TO DIGITAL CONVERTER
Tim Warren Heary, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.
Filed June 30, 1975, Ser. No. 592,131
Int. Cl.[2] H03K *13/20*
U.S. Cl. 340—347 NT **12 Claims**



1. An analog-digital converter comprising:
a. input circuit means for receiving an unknown voltage to be digitized and a reference voltage,
b. an integrating means coupled to said input circuit means, said integrating means having an input and an output which is selectively coupled to said input means
c. memory means selectively coupled to said input circuit means and said integrating means and responsive thereto for storing a virtual reference voltage of opposite polarity to the reference voltage,
d. said integrating means being selectively responsive to the reference voltage, the virtual reference voltage, and the unknown voltage for integrating prior and during a predetermined time period and for integrating during a variable time period at a known rate, and
e. digital circuit means coupled to said integrating means and being selectively enabled during the predetermined and variable time periods for providing a digitized signal indicative of the unknown voltage.

4,074,258
DEVICE FOR READING DISPLACEMENTS OF A MOVABLE MEMBER
Alain Doré, Conflans Sainte-Honorine; Jean Picard, Versailles, and Jacques Rochereau, Montmagny, all of France, assignors to Societe d'Applications Generales d'Electricite et de Mecanique (SAGEM), France
Filed May 3, 1976, Ser. No. 682,347
Claims priority, application France, May 7, 1975, 75 14339
Int. Cl.[2] H03K *13/18*
U.S. Cl. 340—347 P **9 Claims**



1. A device for reading the position of a member movable

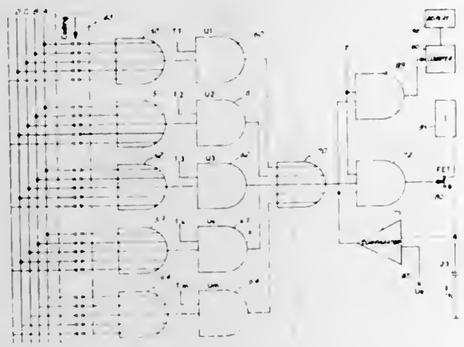
with respect to another, comprising a scale carried by a first one of the members and having coded references distributed at equal intervals along the direction of relative movement of said members, each said coded reference being distinct from all the others and identifying the serial number of the coded reference on said scale, and an optical system which forms, on a detector carried by the other member, an image of a portion of the scale which is situated at a predetermined location with respect to said other member, said portion having a length at least equal to one of said intervals plus the maximum length of one said coded reference in said direction, said detector comprising a linear matrix of photoelements which are regularly distributed along said direction and electronic means, operatively associated with said photoelements, for decoding that coded reference whose complete image is formed on the matrix as the most significant bits of a number indicating said position and for counting the number of the photoelements from one end of the matrix up to the photoelement on which the image of a predetermined location in said coded reference is formed so as to provide the least significant bits of the number indicating said position.

4,074,259

PROCESS FOR ANALOG/DIGITAL CONVERSION

Joachim Voss, Leisanstrasse 14, 8000 Munich 60, Germany

Filed Apr. 26, 1976, Ser. No. 680,162
Claims priority, application Germany, Apr. 28, 1975, 2518914
Int. Cl.² H03K *13/20*
U.S. Cl. 340—347 AD **8 Claims**



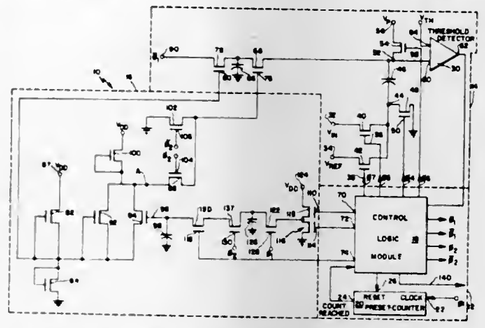
1. An analog-to-digital conversion system having a programmable response curve which comprises, in combination:
- a timing capacitor;
- an input circuit for receiving an analog input signal;
- means for generating a train of pulses for establishing successive time intervals T1 through T*m;*
- a source of digital signals for establishing, within each of said intervals, subintervals during which said timing capacitor is charged;
- a counter;
- means for generating *t* pulses per second for incrementing said counter such that said counter is incremented T1/*t* through T*M*/*t* times during each of said intervals T1 through T*m* respectively;
- means for interconnecting said digital signals and said train of pulses to produce a control signal;
- a constant current source;
- a field effect transistor connected to switch current from said source onto said timing capacitor in response to said control signal;
- a comparator for terminating the operation of said counter when the voltage across said capacitor exceeds a threshold level established by said analog input voltage; and
- output means for displaying the count present on said counter.

4,074,260

ANALOG-TO-DIGITAL CONVERTER

Walter J. Butler, Scotia, and Charles W. Eichelberger, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 24, 1976, Ser. No. 689,456
Int. Cl.² H03K *13/02*
U.S. Cl. 340—347 CC **10 Claims**



1. In a non-integrating, time-independent linear counting analog-to-digital converter of the type wherein an analog signal is coupled to a first terminal of a two-terminal charge storage means and having means coupled to a second terminal of said charge storage means for the metered transfer of a plurality of charge packets into and out of said charge storage means with a charge packet magnitude determined by the difference in magnitude between first and second voltages, and threshold means coupled to said second terminal of said storage means for providing an output signal when a threshold level is reached, the improvement comprising:
- a reference voltage source;
- switch means for connecting the first terminal of said storage means selectively to said analog signal and to said reference voltage source;
- means enabled only when said reference voltage source is connected to said first terminal for counting the number of charge packets transferred to said storage means;
- means connected to said counting means for providing a signal when a preset count is reached in said counting means; and
- means responsive to said signal and to said output signal for adjusting the magnitude of at least one of said first and second voltages to vary the amount of charge in each of said plurality of charge packets to cause said preset count to be reached simultaneously with said output signal.

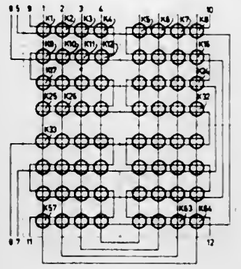
4,074,261

KEYBOARD CONTACT AND SIGNAL LINE ARRANGEMENT

Hendrik van der Gaag, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 1, 1975, Ser. No. 573,477
Claims priority, application Netherlands, May 6, 1974, 7406034
Int. Cl.² G06F *3/02*
U.S. Cl. 340—365 R **4 Claims**

1. A keyboard comprising a plurality of key elements, signal connection lines, a plurality of contact points for each of said key elements, each of said contact points including a drive contact point, wherein said contact points may be coupled to each other by means of an actuated key, said contact points of different ones of said key elements being selectively connected to each other by said signal connection lines for the transport of a drive contact signal, wherein for a predetermined number of correspondingly constructed key elements, said predetermined number being equal to the product, $n \times m \times p$, of three non-negative integers, there are provided $n + m + p$ signal connection lines, each signal connection line of a group of *n*, *m*, and *p* signal connections, respectively, being selectively connected to a corresponding contact point of at most $m \times p$, at most $n \times p$, and at most $m \times n$, key elements, respectively,



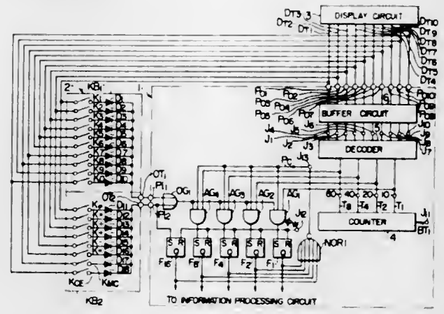
each key element being connected to a single signal connection line of each of the groups of *n*, *m* and *p* signal connections, wherein *n*, *m* and *p* are predetermined non-negative integers.

4,074,262

KEY INPUT CIRCUIT

Kosei Nomiya, Tokyo, and Shinkichi Hotta, Kodaira, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 27, 1976, Ser. No. 652,661
Claims priority, application Japan, Jan. 31, 1975, 50-12583
Int. Cl.² G06F *3/02*
U.S. Cl. 340—365 S **15 Claims**



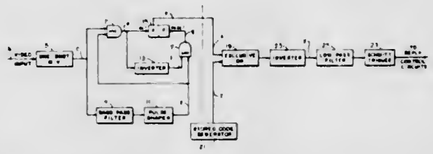
9. A key input circuit for coding a plurality of key information inputs to electrical signals for application to an information processing system, comprising:
- binary-coded N-ary counter means for producing N combinations of binary-coded signals by counting a first timing pulse signal applied to said counter means;
- decoder means for converting each one of said binary-coded signals from said binary-coded N-ary counter means into N second timing pulse signals;
- key switch circuit means having a plurality of input terminals connected to receive the respective outputs of said decoder means and at least one output terminal and including a plurality of key switches corresponding respectively to a plurality of key information inputs, one end of said key switches being connected with different ones of said input terminals of said key switch circuit means and the other ends of said key switches being connected with said one output terminal of said key switch circuit means, the number of said output terminals being smaller than that of said input terminals;
- gate circuit means having first input terminals connected to receive the outputs of said binary-coded N-ary counter means and second input terminals connected in common to receive one of said N second timing pulse signals associated with an operated one of said key switches; and
- means for connecting said output terminal of said key switch circuit means with said second input terminals of said gate circuit means.

4,074,263

CODE SIGNAL PROCESSING CIRCUITRY FOR IFF TRANSPONDER BEACON

Albert M. Sullivan, Jr., Ellicott City, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 27, 1969, Ser. No. 795,774
Int. Cl.² G01S *9/56*
U.S. Cl. 343—6.8 LC **4 Claims**



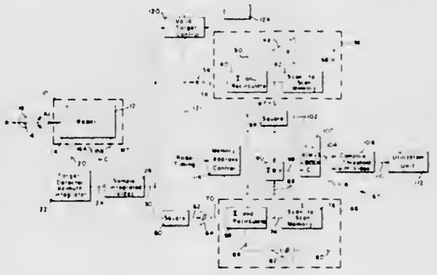
1. Transponder beacon circuitry for processing received binary coded signals, comprising a received radar video pulse train which is time modulated in accordance with a binary code, means to extract the binary code from said pulse train in two-level form, said means including a resonant filter tuned to the pulse repetition frequency of said radar video pulse train and a pulse shaper in cascade therewith and wherein said resonant filter is shock excited by said received video pulse train, whereby said pulse shaper produces an unmodulated video pulse train, and means for correlating said extracted binary code with a locally stored code which is run at a different bit rate than said extracted binary code.

4,074,264

ADAPTIVE THRESHOLD CLUTTER PROCESSOR

Richard D. Wilmont, Buena Park, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 7, 1976, Ser. No. 647,226
Int. Cl.² G01S *7/30, 9/02*
U.S. Cl. 343—17.1 R **10 Claims**



1. A target detector system responsive to a source of signals over a plurality of range intervals of a plurality of range sweeps comprising:
- mean level processor means coupled to said source of signals for providing mean values derived from time samples of scan to scan signals,
- standard deviation processor means coupled to said source of signals for providing standard deviation values derived from time samples of scan to scan signals; and
- combining means coupled to said mean level processor means and said standard deviation processor means for providing a target detection threshold.

4,074,265

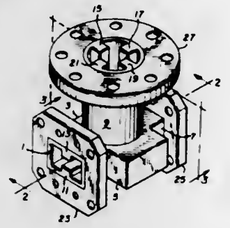
MICROWAVE POWER COMBINER

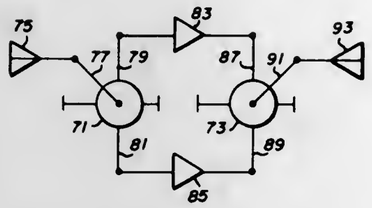
Richard Brownell True, Sunnyvale, Calif., assignor to Litton Systems, Inc., San Carlos, Calif.

Continuation-in-part of Ser. No. 504,456, Sept. 9, 1974, Pat. No. 3,986,188. This application Sept. 20, 1976, Ser. No. 724,930

Int. Cl.² G01S 7/38; H01P 5/12

U.S. Cl. 343—18 E **1 Claim**





1. An electronic countermeasures system operable at a frequency, *f*, of wavelength λ comprising a receiving antenna, a transmitting antenna, first and second microwave energy coupling turnstile junctions each of which comprises:

four double ridge waveguide means, said waveguide means arranged in the form of a cross centered about an axis with an end of each opening into a common central region;

fifth quadridge circular waveguide means extending along said axis located at the juncture of said formed cross oriented orthogonal to said four waveguide means, said fifth waveguide means having an end in communication with said common central region, and said waveguide means having the remaining end thereof open for passing microwave energy;

impedance matching means located in said common central region;

two opposed ones of said four double ridge waveguide means each having an opening at a respective remaining end for passing microwave energy and the remaining two opposed ones of said double ridge waveguide means having microwave energy reflecting termination means located therewithin spaced from said axis;

and wherein the distance, d_1, between said axis and said energy reflecting termination means of one of said two opposed waveguide means is approximately equal to the quantity $(2N+3)(\lambda/8)$; and wherein the distance, d_2, between said axis and said energy reflecting termination means of the remaining one of said two opposed waveguide means is approximately equal to the quantity $(2N+1)(\lambda/8)$, where N is an integer, including zero, and where λ equals one wavelength at the frequency *f*;

the effective distance between said reflecting termination means being equal to one-half wavelength, λ, at said frequency *f*;

means connecting the output of said receiving antenna to said fifth waveguide means of said first coupling turnstile junction;

means connecting the input of said transmitting antenna to the fifth waveguide means of said second coupling turnstile junction;

first signal processing means coupled between an end opening of one double ridge waveguide means of said first turnstile junction and the corresponding end opening of double ridge waveguide means of said second turnstile junction; and

second signal processing means coupled between the end opening of remaining double ridge waveguide means of said first turnstile junction and the corresponding end opening of double ridge waveguide means of said second turnstile junction.

4,074,266

SYSTEM FOR RECEIVING RADIO WAVES THROUGH SINGLE ANTENNA APPARATUS

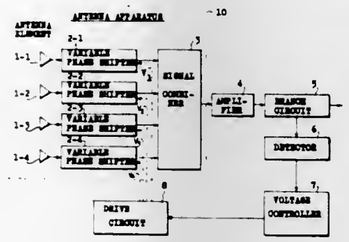
Hiroshi Yokoi, Machida, and Takayasu Shiokawa, Yokohama, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed June 4, 1976, Ser. No. 692,778

Claims priority, application Japan, June 9, 1975, 50-68639

Int. Cl.² H04B 7/10

U.S. Cl. 343—100 SA **6 Claims**



1. A system for receiving a direct wave simultaneously with reflected waves arriving from the same radio wave source comprising:

an antenna apparatus capable of deforming its directivity pattern;

first control means connected to said antenna apparatus for deforming by a very small amount, at intervals sufficiently shorter than that of fading peculiar to the paths of the direct wave and the reflected waves, the directivity pattern of said antenna apparatus at the arrival bearing of the reflected waves;

detection means connected to said antenna apparatus for detecting the resultant level of the direct wave and the reflected waves at said intervals to provide error voltages each indicative of the polarity of a difference between the directivity pattern of said antenna apparatus and an optimum pattern; and

second control means connected to said first control means and said detection means for controlling said first control means by a control voltage produced from said error voltages to deform the directivity pattern of said antenna apparatus, thereby increasing the resultant level of the direct wave and the reflected waves and substantially maintaining the maximum value of said resultant level.

4,074,267

DEVICE FOR NUMERICALLY DISPLAYING VOR BEARING

Sidney G. Knox, Oxnard, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 17, 1976, Ser. No. 686,976

Int. Cl.² G01S 1/50

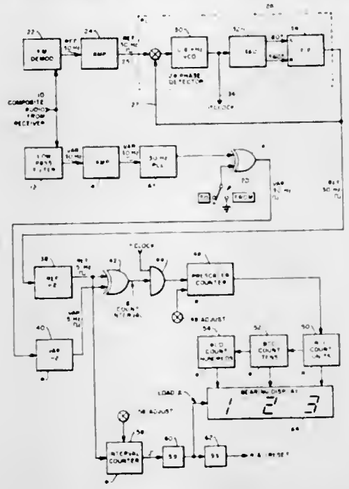
U.S. Cl. 343—106 R **12 Claims**

10. A device for numerically indicating bearing from a VOR bearing signal comprising:

a. means for detecting reference and variation signals from said VOR bearing signal;

b. means for frequency dividing said reference and variation signals;

c. an exclusive "OR" gate for comparing said reference and variation signals to produce a composite signal whenever



said reference and variation signals exist in opposing logic states; and

d. means for detecting duration of said composite signal to numerically indicate bearing.

4,074,268

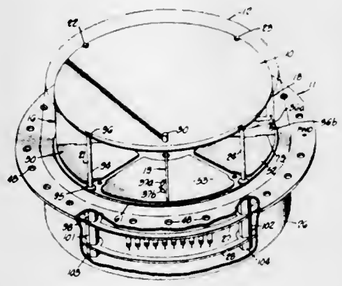
ELECTRONICALLY SCANNED ANTENNA

Roy H. Olson, Palos Verdes, Calif., assignor to Hoffman Electronics Corporation, El Monte, Calif.

Filed June 21, 1976, Ser. No. 697,868

Int. Cl.² G01S 1/50

U.S. Cl. 343—106 R **19 Claims**



1. An antenna for electronically generating a rotating radiation pattern comprising

conic means for radiating electro-magnetic energy,

baseplate means forming a ground plane, said conic means forming a conic monopole and being mounted above said ground plane,

a plurality of modulator fin means disposed between said baseplate means and said conic means for altering the pattern of radiation radiated by said conic means, said modulator fin means including controllable variable resistance means electrically connected to said conic means, and

electrical circuit means coupled with said controllable variable resistive means for causing a predetermined out-of-phase change in the resistance of said variable resistive means of at least two of said modulator fin means.

4,074,269

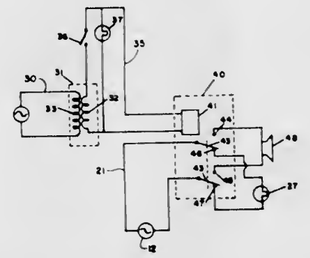
BURGLAR ALARM FOR USE WITH AN AUTOMATIC GARAGE DOOR OPENER

Justin Hartley, 17 Fox Meadow Lane, West Hartford, Conn. 06107

Filed June 16, 1976, Ser. No. 696,754

Int. Cl.² H04B 7/00

U.S. Cl. 343—225 **9 Claims**



1. A burglar alarm for use in combination with an automatic garage door opener comprising:

a housing,

an alarm generator within the housing.

means for energizing the alarm generator whereby the alarm generator is capable of being activated by a signal from the automatic garage door opener, and

means for communicating the signal from the automatic garage door opener to activate the energized alarm generator.

4,074,270

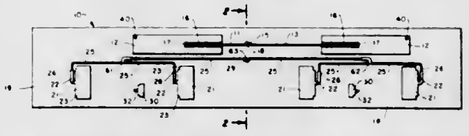
MULTIPLE FREQUENCY MICROSTRIP ANTENNA ASSEMBLY

Cyril M. Kalol, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 9, 1976, Ser. No. 712,994

Int. Cl.² H01Q 1/38

U.S. Cl. 343—700 MS **24 Claims**



1. A multiple electric microstrip antenna assembly, comprising:

a. a plurality of different electric microstrip antenna systems operating at different frequencies;

b. each of said microstrip antenna systems comprising at least one thin electrically conducting radiation element; each said radiation element being fed at a single feedpoint and being spaced apart from a thin ground plane conductor by a dielectric substrate;

c. each of said microstrip antenna systems sharing a common thin ground plane conductor and dielectric substrate;

d. at least one of said microstrip antenna systems having a plurality of radiation elements in array with a 90° phase difference between any interconnecting elements and groups of elements sharing a common junction for providing increased bandwidth and ease in tuning;

e. at least one tuning means included within the microstrip antenna substrate beneath each of the elements of at least one of said microstrip antenna systems for fine tuning of the antenna elements and operating to change the resonant frequency, the resonant input impedance and the effective length of said radiating elements;

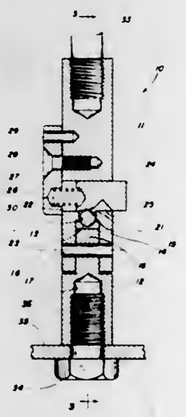
f. said 90° phase difference being provided between two interconnecting elements sharing a common junction in any of said plurality of microstrip antenna systems by means of the length of a first transmission line between said common junction and the feedpoint to one of said two interconnecting elements being one-quarter wavelength longer than a second transmission line between said common junction and the feedpoint to the other of said two elements; said additional one-quarter wavelength length of said first transmission line operating as an impedance inverter.

4,074,271

ADJUSTABLE ANTENNA HOLDING DEVICE

Kotoku Sakuma, Toride, Japan, assignor to American Electronics, Inc., Greenwood, Ind.

Filed July 23, 1976, Ser. No. 708,261
Claims priority, application Japan, Jan. 31, 1976, 51-10490[U]
Int. Cl.² H01Q *1/08*
U.S. Cl. 343—882 **22 Claims**



1. An antenna holding device which comprises:

a first member;

a second member hingedly attached to said first member to pivot about a rotational axis, said first member including a plurality of concavities formed on an arc of a circle having the rotational axis extending normal to the center therof, said second member including a first channel opening adjacent one of the concavities of said first member, and a second channel communicating with and extending other than parallel to the first channel;

a locking assembly including a locking member received within the first channel of said second member and movable therethrough to extend within one of the concavities of said first member, and further including a release member received within the second channel of said second member and abutting the locking member, said locking assembly having a locking condition in which the release member is in a first position and the locking member projects into one of the concavities of said first member, and a release condition in which the release member is in a second position and the locking member is withdrawn from the concavity of said first member to permit rotation of said second member relative said first member about the rotation axis;

said release member being movable in a direction between said first position and said second position; and

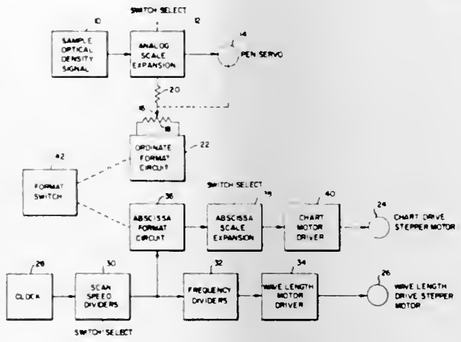
said direction being substantially parallel to said rotational axis.

4,074,272

SPECTROPHOTOMETER HAVING INDEPENDENTLY CONTROLLED CHART SCALE EXPANSION AND CHART FORMAT SELECTION

Allan S. Way; Thomas J. Glenn, both of Irvine; Howard J. Sloane, Fullerton, and Gerald T. Keahl, Newport Beach, all of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 443,631, Feb. 19, 1974, abandoned.
This application Feb. 9, 1976, Ser. No. 656,463
Int. Cl.² G01D *5/26, 9/38*
U.S. Cl. 346—33 A **2 Claims**



1. A spectrophotometer for measuring and recording an optical characteristic of a sample positioned in a radiant energy beam path comprising:

a first frequency responsive drive motor for driving a wavelength scanning mechanism in the radiant energy beam path to vary the wavelength output of the mechanism;

a chart recorder including a marker for recording on chart paper the optical characteristic of the sample as a function of the wavelength output of the mechanism to record a wavelength spectrum plot of the sample;

a second frequency responsive drive motor for driving the chart paper along an abscissa scale;

a third drive motor for driving the marker along an ordinate scale as a function of the optical characteristic of the sample;

means for synchronizing operation of the wavelength scanning mechanism and the chart recorder such that the position of the marker along the abscissa scale is a function of the wavelength output, the synchronizing means including a system clock having a pulse train output and means for coupling the clock output to the first and second frequency responsive motors for driving the same;

first variable frequency division means coupled between the output of the system clock and the first frequency responsive motor to vary the scanning speed of the wavelength scanning mechanism;

second variable frequency division means coupled between the system clock and the second frequency responsive motor for selecting one of several speeds at which the chart paper is driven relative to the marker along the abscissa scale and hence for selecting an abscissa scale expansion value;

third frequency division means independent of the second frequency division means and coupled between the system clock and the second frequency responsive motor, the third frequency division means having a plurality of preset operating conditions each establishing a different limit for the abscissa scale to define an abscissa scale format for the spectrophototmeter;

means for controlling the third drive motor and responsive to a signal indicative of the optical characteristic for establishing a predetermined fraction of the total range of optical characteristic values for recording over the entire

ordinate scale to define a condition of ordinate scale expansion for the spectrophotometer;

means independent of the controlling means for establishing preselected maximum limits on travel of the marker along the ordinate scale to define different ordinate scale formats for the spectrophotometer; and

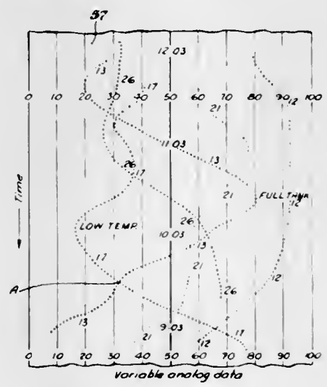
means for actuating the third variable frequency division means and the establishing means to select predetermined combinations of ordinate and abscissa formats independent from selection of values of ordinate and abscissa scale expansion by the controlling means and the second variable frequency division means.

4,074,273

SEQUENTIAL VALUE MULTI-POINT RECORDING DEVICE WITH UNIDIRECTIONAL SCAN

Wayne P. Dupree, and William F. Brown, Jr., both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 12, 1976, Ser. No. 731,239
Int. Cl.² G01D *9/38*
U.S. Cl. 346—34 **23 Claims**



1. In a process for recording variable analog data representative of physical parameters on a sheet material with a recording head which is moveable relative to said sheet material, comprising the step of retrieving and storing said variable analog data, tabulating said variable analog data in order of value, and marking said tabulated analog data on said sheet material, the improvement comprising the steps of driving said recording head in a unidirectional movement and in a continuous sweep over the sheet material, sequentially marking, as a function of time, said tabulated data at their value and representative of said physical parameters and in their order of magnitude on said sheet material, and continuously moving said sheet material, as a function of time, in a transverse direction relative to said recording head.

4,074,274

MULTIPOINT RECORDER

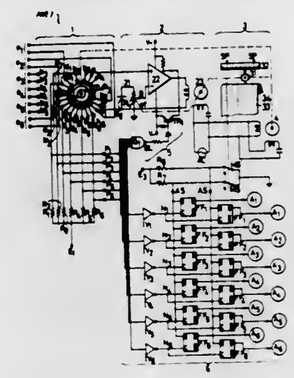
Hisaya Fujita; Nobuo Kaieda; Setsuo Sato, and Kenji Kawakami, all of Musashino, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan

Filed July 22, 1976, Ser. No. 707,819
Claims priority, application Japan, July 31, 1975, 50-93506
Int. Cl.² G01D *9/00;* H01H *19/58*
U.S. Cl. 346—34 **11 Claims**

1. In a multipoint recorder of the type including a selection mechanism having a plurality of fixed measuring point contacts and a plurality of moving contacts for sequentially selecting signals from a plurality of measuring points, a self-balancing circuit including a balancing motor for intermittently measuring said signals, and an indicating and recording mechanism operated in synchronism with the selection mechanism for indicating and recording the measurements supplied from the self-balancing circuit, the improvement including:

a plurality of fixed auxiliary contacts positioned with said fixed measuring contacts in an alternating pattern such that each fixed auxiliary contact is positioned between an adjacent pair of said measuring contacts;

said measuring and switching contacts being configured in such a manner that one of said movable contacts, upon moving from a first fixed measuring point contact to a second fixed measuring point contact, will simultaneously



contact said first measuring point contact and the next adjacent auxiliary contact, and subsequently simultaneously contact said next auxiliary contact and said second measuring contact; and

means in circuit with said fixed auxiliary contacts for locking said balancing motor while said movable contact is in contact with said auxiliary contacts,

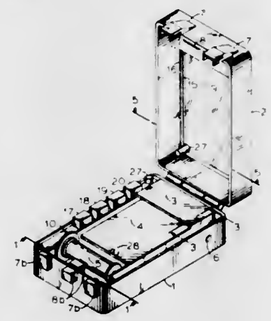
whereby said balancing motor is automatically locked while said movable contact switches from one said measuring contact to another.

4,074,275

STRIP CHART RECORDER

John C. Stires, III, Box 988, Rancho Santa Fe, Calif. 92067

Filed Feb. 4, 1977, Ser. No. 765,600
Int. Cl.² G01D *9/12*
U.S. Cl. 346—19 **3 Claims**



1. A case having a top with a door having a self-locking mechanism, a container in said case for holding a strip chart, a drive means in said case for advancing said chart, the drive means capable of being programmed for specific rates of movement versus time, a battery circuit for powering said drive means, a means for selecting the rate of chart movement, a transducer for sensing an environmental variable, a means for printing or writing the output from the transducer on said strip chart, a switch means for closing the battery circuit only when

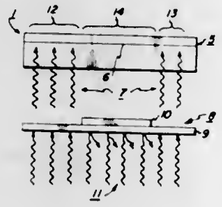
the door in the top of the case is closed, the case having a surface over which the chart moves, said surface having an identifying number or symbol which can be reproduced on the strip chart by applying pressure to that portion of the strip chart over said symbol or number, said strip chart having graphic means of identifying the time intervals recorded as they are related to the time interval programmed, said chart having several points to be marked for identifying which specific time interval has been selected.

4,074,276

MAGNETIC IMAGING SYSTEM USING HEAT

Werner E. L. Haas, and Eugene C. Faucz, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 26, 1976, Ser. No. 690,129
Int. Cl.² G03G *19/00*
U.S. Cl. 346—74.1 **16 Claims**



1. A magnetic imaging process, comprising: providing a magnetizable recording member comprising a substrate overcoated with a magnetic recording layer of magnetic particles dispersed in a binder; and exposing one of said substrate and said magnetic recording layer to light, thereby leaving said unexposed regions of said magnetic recording layer in said image configuration on the substrate in two locations at an energy level at about 0.05 to about 0.5 Joules per centimeter square for a period of time effective to at least weaken the binding force between said binder and said substrate to at least allow removal of said magnetic recording layer in regions thereof corresponding to exposed regions of said recording member upon contact of said magnetic recording layer with an adhesive member, thereby leaving said unexposed regions of said magnetic recording layer in said image configuration on the substrate in two locations.

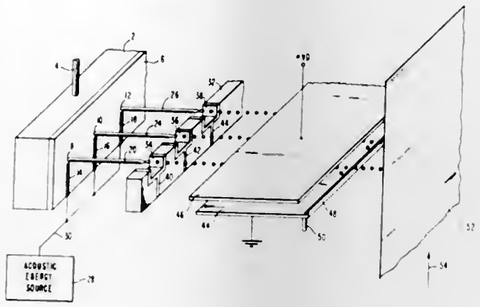
4,074,277

APPARATUS FOR ACOUSTICALLY SYNCHRONIZING DROP FORMATION IN AN INK JET ARRAY

Ramon Lane, Crompond, and Howard Hyman Taub, Mount Kisco, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 3, 1976, Ser. No. 738,423
Int. Cl.² G01D *15/18*
U.S. Cl. 346—75 **8 Claims**

1. In an ink jet system, the combination comprising:
an ink source;
means for emitting a plurality of streams of ink from said source;
a plurality of acoustic fibers, with a different one of said plurality of acoustic fibers being coupled to each of said plurality of streams at a position displaced from where each of said plurality of streams is emitted from said source; and
means for acoustically energizing each of said plurality of fibers for acoustically exciting each of said plurality of



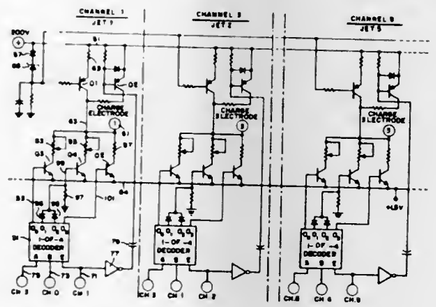
streams for synchronizing the droplet formation from one stream to the next.

4,074,278

COMPENSATION CIRCUIT FOR CHANNEL TO CHANNEL CROSSTALK

John A. Robertson, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Dec. 22, 1976, Ser. No. 753,614
Int. Cl.² G01D *15/18*
U.S. Cl. 346—75 **7 Claims**



1. A circuit for applying a potential to a charge electrode in an ink jet printer having multiple jets, to compensate for the charging effect of adjacent electrodes, comprising:
means for applying a catch potential or a print potential to the electrode for catch or print operations, respectively,
means for altering the print potential applied to the electrode when one of two adjacent electrodes is supplied with a catch potential, and
means for altering the print potential applied to the electrode when both of the adjacent electrodes are supplied with a catch potential, such that the charging effect of adjacent electrodes is compensated.

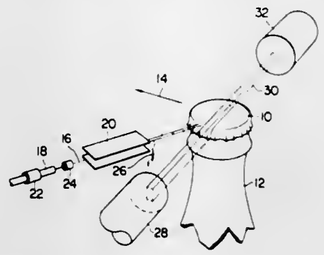
4,074,279

INK DROP WRITING APPARATUS

Takatoshi Ikeda, and Yoshio Ohuchi, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 15, 1976, Ser. No. 723,609
Claims priority, application Japan, Sept. 19, 1975, 50-112597
Int. Cl.² G01D *15/18*
U.S. Cl. 346—75 **10 Claims**

1. In an ink drop writing apparatus for writing information on a writing medium by selectively deflecting a stream of charged ink drops into said writing medium, the improvement comprising detection means for detecting the position of the writing medium in the deflecting direction of the stream of charged ink drops, and deflection control means for increasing and decreasing the amount of deflection of said stream of charged ink drops in accordance with the position detected by



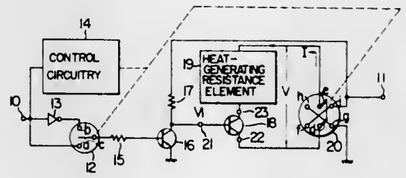
said detection means, whereby the ink drops can be printed at predetermined positions on the writing medium even when the position of the writing medium varies in the deflecting direction.

4,074,280

THERMAL RECORDING APPARATUS

Yasuyuki Kojima, Hitachi; Kiyohiko Tanno, Katsuta; Tetsuo Doi, Hitachi, and Kunio Ono, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 10, 1976, Ser. No. 740,680
Claims priority, application Japan, Nov. 15, 1975, 50-137633
Int. Cl.² G01D *15/10*
U.S. Cl. 346—76 R **7 Claims**



1. A thermal recording apparatus comprising:
a plurality of heat-generating resistance elements;
a driving circuitry adapted to supply drive current selectively to selected one(s) of said heat-generating resistance element(s) in response to signal representing information to be recorded;
a recording medium disposed in contact with said plurality of heat-generating resistance elements and adapted to be changed in color by said selected heat-generating resistance element(s);
means for moving said plurality of heat-generating resistance elements and said recording medium relative to each other; and
switching circuit means for inverting the direction of said drive current supplid to said selected heat-generating resistance element(s) in a predetermined manner.

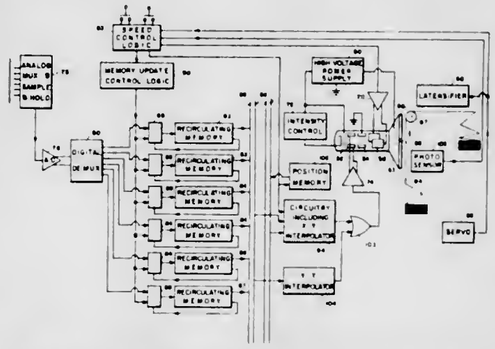
4,074,281

METHOD AND APPARTUS FOR MAKING HARD COPY RECORDS OF CURVES INCLUDING CURVES WHICH ARE MATHEMATICALLY DESCRIBED AS MULTI-FUNCTIONS FROM PERIODICALLY SAMPLED DATA POINTS

William T. Quarton, Englewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 26, 1976, Ser. No. 717,996
Int. Cl.² G06G *7/30*
U.S. Cl. 346—110 R **6 Claims**

1. Apparatus for making a hard copy record on a recording medium from a series of data points with a line scan recorder which records an area on the recording medium in a predetermined number of line scans, comprising in combination:
means for recording in a region on said medium with parallel line scans along one of two intersecting axes, a region between two adjacent line scan positions defining a finite band;
means for determining the distance between two data points along the one of said two intersecting axes;
means for determining the distance between said two data points along the other of said two axes;
means to divide said distance along said one axis into a predetermined number of increments;
means to divide said distance along said other axis into a predetermined number of increments;
means for determining the position of said medium relative to said recording means along said one axis;



means including said dividing means for determining interpolated values along said one axis between said data points;
means including said dividing means for determining interpolated values along said other axis between said data points;
means for determining the interpolated values along said one axis falling within said finite band;
means for determining the interpolated values along said other axis corresponding with the interpolated values along said one axis that are within said finite band; and
means responsive to said means for determining interpolated values along said other axis within said finite band for recording along said other axis a line whose length is a function of the interpolated values along said one axis falling within said finite band.

4,074,282

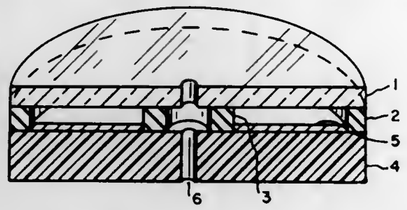
RADIATION-SENSITIVE RECORD WITH PROTECTED SENSITIVE SURFACE

Charles Balas, Jr., Spring Valley; David Yuan Kong Lou, Ossining, both of N.Y., and George Churchill Kenney, II, Stamford, Conn., assignors to North American Philips Corporation, New York, N.Y.

Filed May 13, 1976, Ser. No. 687,084
Int. Cl.² G01D *15/32*
U.S. Cl. 346—135 **19 Claims**

1. A radiation-sensitive record comprising a first disc-shaped member, a second disc-shaped member in coaxial confronted relationship with said first disc-shaped member and spaced therefrom, a pair of coaxial sealing rings of different sizes sealed between the confronting surfaces of said first and sec-

ond disc-shaped members coaxially therewith and forming an annular space therebetween, at least one of said disc-shaped



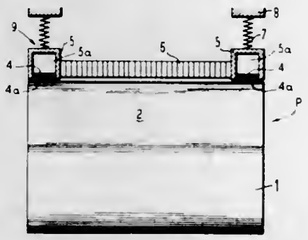
members being transparent, and a radiation-sensitive recording layer on one of said confronting disc surfaces.

4,074,283

NON-MECHANICAL PRINTER OPERATING IN ACCORDANCE WITH AN ELECTROGRAPHIC PROCESS

Wolfgang Fink, Glonn, and Peter Graf, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 29, 1976, Ser. No. 681,726
Claims priority, application Germany, May 5, 1975, 2519997
Int. Cl.[2] G01D *15/06*
U.S. Cl. 346—139 C **2 Claims**



1. A non-mechanical printer for use in an electrographic process comprising a horizontally disposed rotatable drum-shaped data carrier, an elongated horizontally disposed electrode comb located above said data carrier, and gas bearing means on said recording head for maintaining said recording head in predetermined spaced relation to said data carrier, said gas bearing means comprising a pair of housings connected respectively to the ends of said recording head and in overlying relation to said data carrier, said housings each having a pressurized gas inlet, a gas chamber and a porous bottom wall in registry with said data carrier and shaped to the contour thereof.

4,074,284

INK SUPPLY SYSTEM AND PRINT HEAD

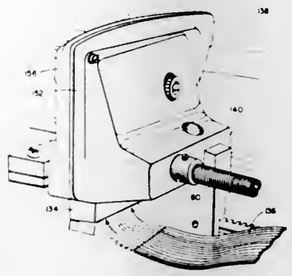
John L. Dexter, Mountain View; Edmond L. Kyser, Portola Valley; Charles S. Mitchell, Palo Alto, and Stephan B. Sears, Portola Valley, all of Calif., assignors to Silonics, Inc., Sunnyvale, Calif.

Filed June 7, 1976, Ser. No. 694,064
Int. Cl.[2] G01D *15/16*
U.S. Cl. 346—140 R **7 Claims**

1. An improved ink jet printer of the type having an ink supply, an asynchronous, volume displacement droplet ejection print head in fluid communication with the ink supply, the print head having at least one droplet ejecting nozzle and carriage means for effecting relative movement between the print head and a print receiving medium, wherein the improvement comprises:

first means for removably attaching the print head to the carriage means, including means for adjustably spacing the print head from the print receiving medium,

second means integral with the first means for removably connecting the print head to the ink supply, the second means including means for blocking the introduction of air into and the loss of ink from the print head upon its removal from the carriage means,



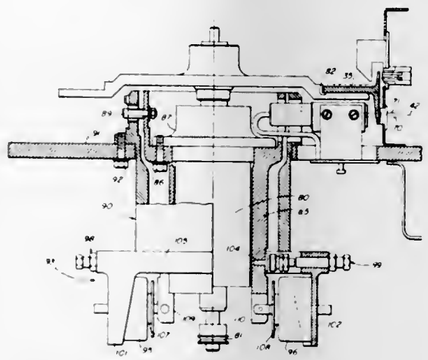
third means integral with the first and second means for providing a removable electrical interconnection with the print head, and wherein each print head includes preadjusted electrical signal conditioning means for adapating each print head to operate within predetermined system parameters when supplied with predetermined electrical signals through the third means.

4,074,285

PHOTOCOMPOSING MACHINE WITH MOVABLE CHARACTER STORAGE AND PRESENTATION APPARATUS

Raymond Francis Belanger, Lawrence, Mass., assignor to Graphic Systems, Inc., Hudson, N.H.

Filed June 4, 1976, Ser. No. 692,743
Int. Cl.[2] B41B *15/16*
U.S. Cl. 354—15 **11 Claims**



1. A character storage and retrieval apparatus for use in a phototypesetting machine or the like, for storing characters for selective presentation at a character display location, comprising,

a plurality of interchangeable discrete character carriers each said character carrier carrying a plurality of characters from one or more fonts arranged in rows along said character carriers permanently secured thereto and movably disposed for rotation in a closed path of motion along said rows when said photo-type setting machine is in operation, each of said carriers being dimensionally rigid in said closed path of motion, and said characters being selectively positionable in an unobstructed optical path within the boundaries of the dimensionally rigid carrier;

carrier mounting means;

releasable means for attaching each of said character carriers to said carrier mounting means, whereby said character storage apparatus is capable of carrying desired combinations of individually replaceable and dimensionally stable character fonts;

means for moving said carrier mounting means with each of said attached carriers across the direction of rotation and between a first row and another row whereby selected rows of characters for each of said discrete character carriers are selectively positioned in said unobstructed optical path,

said moving means consisting of

a gimbal assembly upon which said carrier mounting means is attached;

a plurality of bearings,

a gimbal housing wherein said gimbal assembly is attached to said gimbal housing by said bearings,

a plurality of solenoids,

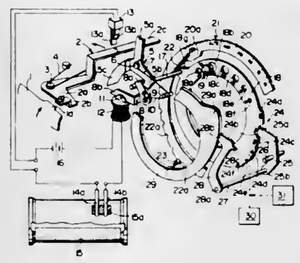
a yoke assembly to which solenoids are mounted, said yoke assembly being attached to said gimbal housing whereby upon actuation of said solenoids, said gimbal assembly is positioned so that the character row can be aligned in said unobstructed optical path.

4,074,286

AUTOMATIC EXPOSURE CONTROL DEVICE FOR A CAMERA INCLUDING AUTOMATIC FILM SPEED SETTING MEANS

Ryotaro Suzuki, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Oct. 28, 1976, Ser. No. 736,588
Claims priority, application Japan, Oct. 28, 1975, 50-129515; Oct. 28, 1975, 50-129516; Sept. 7, 1976, 50-107004
Int. Cl.[2] G03B *7/00*
U.S. Cl. 354—21 **24 Claims**



1. An automatic exposure control device for a camera provided with an automatic exposure control means including a photodetector to measure scene brightness and an exposure factor control means which controls an exposure factor such as shutter speed or diaphragm aperture in accordance with the scene brightness measured by said photodetector with reference to the film speed of a film loaded in the camera and further provided with a flash-matic means including a calculating means which gives an output to control the size of a diaphragm aperture taking into account such factors as the film speed of the film loaded in the camera, the distance of the object to be photographed and the guide number of flash light means used for illuminating the object to be photographed, said camera being adapted to be used with at least two kinds of film magazines, one being loaded with a film of special film speed and being provided with a conductor on an external surface thereof and the other being loaded with a film of normal film speed and not being provided with a conductor, wherein the improvement comprises:

a first switching means which is closed by said conductor on the film magazine loaded with a film of the special film speed,

a second switching means connected in series with the first switching means and opened in response to opening movement of a back cover of the camera,

an electromagnet connected with a power source in series with said first and second switching means so as to be energized when both the switching means are closed, and

a film speed setting means which is connected with said flash-matic means to give thereto a factor of film speed, and carries at least two light control apertures of different sizes selectively brought into alignment with said photodetector,

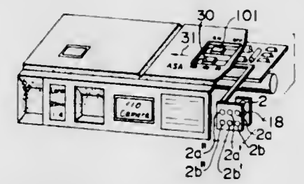
said film speed setting means being put into a state to set said special film speed in the flash-matic means when said electromagnet is energized.

4,074,287

FLASH AND CAMERA DEVICE

Hiroshi Iwata, and Tetsuo Yamaoka, both of Osaka, Japan, assignors to West Electric Co., Ltd., Osaka, Japan

Filed July 1, 1976, Ser. No. 701,981
Claims priority, application Japan, July 7, 1975, 50-83813
Int. Cl.[2] G03B *7/08, 7/18*
U.S. Cl. 354—31 **11 Claims**



7. A flash and camera device comprising:

an automatic exposure camera including a first light sensor for sensing the brightness of an object, a first control circuit operated in response to the output of said first light sensor, and means for controlling the exposure of said camera by said first control circuit;

an electronic flash device including firing means for emitting a predetermined amount of light toward said object, a second light sensor for sensing light reflected by said object as a result of light transmitted thereto by said electronic flash device, a second control circuit operated in response to the output of said second light sensor and stop means responsive to said second control circuit for causing the generation of light by said firing means to stop in the course of said generation;

operation threshold adjusting means for changing the operation thresholds of said first and second control circuit in a linked manner; and

selection means for switching said operation threshold adjusting means in association with the exposure of said automatic exposure camera or the amount of the light emitted by said electronic flash device.

4,074,288

TIME DELAY QUENCH STROBE WITH IMPROVED FILL-IN FLASH PERFORMANCE

Bruce K. Johnson, Andover, and George D. Whiteside, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 674,840, April 8, 1976. This application May 10, 1976, Ser. No. 684,902
Int. Cl.[2] G03B *7/16*
U.S. Cl. 354—33 **14 Claims**

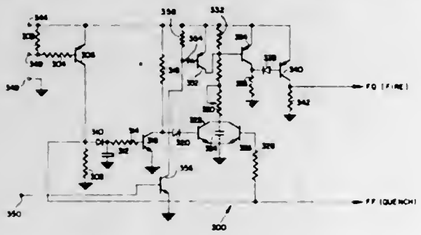
1. A photographic camera apparatus comprising:

a housing;

means for mounting an objective lens on said housing;

means associated with said housing for receiving a source of electrical energy;

a source of artificial illumination;
means within said housing for defining a film exposure plane;
a blade assembly mounted and arranged within said housing for displacement from an initial closed arrangement wherein said blade assembly precludes scene light from impinging on said exposure plane to a second arrangement wherein said blade assembly defines a maximum aperture through which scene light is permitted to impinge on said exposure plane and then to a final closed arrangement wherein said blade assembly again precludes scene light from impinging on said exposure plane, such a displacement of said blade assembly serving to define an exposure interval during which scene light is incident upon said film exposure plane;
scene light detecting means energizable by the source of electrical energy for providing an output signal in correspondence to the amount of scene light detected; and



means, at least in part energizable by the source of electrical energy, for initiating the displacement of said blade assembly from its said initial closed arrangement towards its second arrangement thereby commencing the exposure interval and for initiating the energization of the source of artificial illumination to effect the firing thereof subsequent to the initiating of the exposure interval, and then, responsive to said output signal of said scene light detecting means reaching a predetermined value indicative of a select film exposure value for effecting the displacement of said blade assembly into its said final closed arrangement and for initiating the deenergization of the source of artificial illumination to effect the termination of the firing thereof subsequent to the expiration of a select time delay, said last stated means further including means for varying said select time delay as a function of a varying characteristic of said output signal of said scene light detecting means prior to or simultaneous with the firing of said source of artificial illumination.

4,074,289

CAMERA EXPOSURE CONTROL SYSTEM ADAPTER TO ADJUST BOTH THE DIAPHRAGM AND THE SHUTTER

Tsukumo Nobusawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

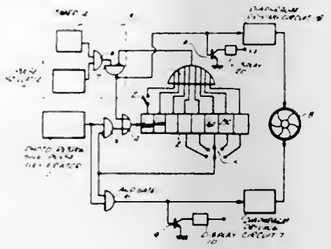
Filed July 14, 1975, Ser. No. 595,805

Claims priority, application Japan, July 17, 1974, 49-81211; Aug. 2, 1974, 49-88099; Oct. 3, 1974, 49-114014; Nov. 5, 1974, 49-126557

Int. Cl.² G03D *7/08*

U.S. Cl. 354—23 D **23 Claims**

1. In a camera having a shutter operated in an automatic manner for controlling exposure time, and having a diaphragm with an adjustable opening; a camera exposure control system for automatically changing the setting of the diaphragm opening from a manual presetting thereof, which comprises:
a photo-responsive pulse generator means for producing in serial-by-bit format a number of data pulses as a function of the light intensity of the object to be photographed and the manual presetting of the diaphragm opening;
register means for storing in parallel-by-bit format, a digital signal to identify one of a sequence of register means memory states;
means responsive to the serially produced data pulses for sequencing the register means through its memory states so that a first predetermined number of said data pulses are required to sequence the register means to a first predetermined one of said memory states and a second, larger predetermined number of said data pulses are required to sequence the register means to a second predetermined one of said memory states;
diaphragm driving circuit means, including an electrome-



chanical element, for adjusting the diaphragm opening in response to a drive control signal supplied thereto; and
drive control signal supplying means responsive to said digital signal for supplying the drive control signal to the diaphragm driving circuit means to cause it to adjust the diaphragm opening to an extent dependent upon the difference between the number of said serially produced data pulses and one of said predetermined number of data pulses.

4,074,290

APPARATUS FOR SYNCHRONIZING AN ELECTRONIC FLASH WITH A CAMERA

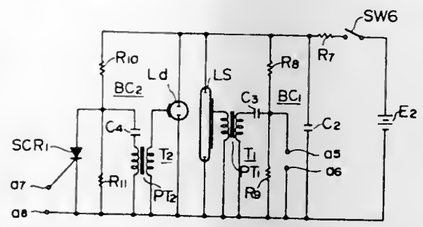
Soichiro Matsuzaki, Mitaka; Yoshihisa Maitani; Kunio Shimoyama, both of Hachioji, and Isao Kondo, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Division of Ser. No. 504,856, Sept. 11, 1974, Pat. No. 3,987,468. This application Nov. 14, 1975, Ser. No. 631,935

Claims priority, application Japan, July 2, 1974, 49-75693

Int. Cl.² G03B *7/16*

U.S. Cl. 354—34 **4 Claims**



1. An apparatus for synchronizing an electronic flash with a camera having a focal plane shutter provided with first and second blinds, said apparatus comprising:
a normally disabled photometric circuit having switch means for enabling said circuit to initiate a photometric operation in synchronism with initiation of an opening movement of the shutter first blind to subsequently produce a shutter closing signal at a time delay controlled by the amount of time required for the photometric value to reach a given amount of exposure;
a shutter control circuit having a control input, said shutter control circuit preventing the remaining blind from running to thereby keep the shutter open in the absence of a shutter control signal at said control input and for enabling the remaining blind to run and thereby close the shutter when a shutter closing signal is applied to said control input;
an electronic flash unit including means for initiating illumination thereof as soon as the first blind has completed running;
gate means for enabling the shutter closing signal to be coupled to the shutter control circuit only when the shutter first blind has moved to its fully open position;
means for interrupting the illumination of the electronic flash unit when the shutter closing signal is supplied from the photometric circuit as a result of photometry thereby a light reflected from an object being photographed, due to either natural light or flash light from the electronic flash unit or both.

4,074,291

SINGLE LENS REFLEX CAMERA WITH AUTOMATIC EXPOSURE CONTROL MECHANISM

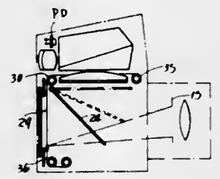
Hiroshi Ueda, Nara, and Akira Yoshizaki, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Japan

Filed June 24, 1976, Ser. No. 699,375

Claims priority, application Japan, July 7, 1975, 50-84811

Int. Cl.² G03B *7/08, 19/12*

U.S. Cl. 354—51 **5 Claims**



1. A single lens reflex camera comprising:
a mirror movable between a viewing position in which it projects into the optical path of the camera and a photographing position in which it is retracted from the optical path;
a focal plane shutter having first and second curtains which travel upon exposure in the same direction in which said mirror is retracted from said viewing position to said photographing position; and,
means for initiating the travel of said first curtain when said mirror is partially retracted from the optical path.

2. A single lens reflex camera having an automatic exposure control mechanism comprising:
a diaphragm aperture capable of being stopped down to a preset position;
means for initiating the stopping down operation of said diaphragm in response to a shutter release operation;
a mirror movable between a viewing position in which it projects into the optical path of the camera and a photographing position in which it is retracted from the optical path;
means for storing a signal indicative of light received through the lens of the camera after said diaphragm aperture has been stopped down;
means for driving said mirror from said viewing position to said photographing position after a signal has been stored in said storing means;
a focal plane shutter having first and second curtains which travel upon actuation of an exposure operation in the same direction in which said mirror is retracted from said viewing position to said photographing position;
means for initiating movement of said first curtain for causing exposure when said mirror is partially retracted from the optical path during the movement from said viewing position to said photographing position; and,
means for controlling the delayed time for initiating movement of said second curtain in dependence upon the signal stored in said storing means.

4,074,292

SYSTEM FOR INDICATING PHOTOGRAPHIC INFORMATION

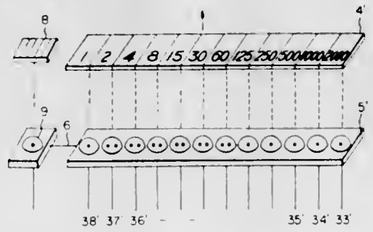
Soichi Nakamoto, Machida; Tadashi Ito; Fumio Ito, both of Yokohama, and Yasuo Isobe, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 437,621, Jan. 29, 1974, abandoned. This application Apr. 19, 1976, Ser. No. 678,033

Claims priority, application Japan, Feb. 6, 1973, 48-15014; Feb. 6, 1973, 48-15015

Int. Cl.² G03B *17/20, 7/00*

U.S. Cl. 354—53 **3 Claims**



1. A system for indicating shutter speeds of a camera comprising:
a plurality of segments each having a coded integer, which represents both a first shutter speed equal in seconds to the integer and a second shutter speed equal in seconds to the reciprocal of the integer;
a plurality of means each responsive to an indication signal for illuminating the coded integer of its associated one of said segments;
means for representing that the integer, when illuminated, is indicative of the associated first shutter speed; and
control circuitry including:
a plurality of means for producing the indication signals to activate said plurality of illuminating means, at least one of said plurality of illuminating means being activated selectively by two of said plurality of indication signal producing means; and
an additional circuit for activating said representing means, whereby the integer, when illuminated with said representing means, represents the associated first shutter speed, and, when illuminated without activating said representing means, represents the associated second shutter speed.

4,074,293

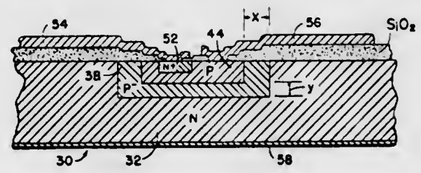
HIGH VOLTAGE PN JUNCTION AND SEMICONDUCTIVE DEVICES EMPLOYING SAME

Bernard L. Kravitz, Forest Hills, N.Y., assignor to Dionics, Inc., Westbury, N.Y.

Continuation-in-part of Ser. No. 175,124, Aug. 26, 1971, abandoned, and Ser. No. 259,763, June 5, 1972, abandoned. This application Nov. 15, 1973, Ser. No. 416,170

Int. Cl.² H01L *29/72*

U.S. Cl. 357—34 **25 Claims**



1. A PN junction extending to a major surface of a body of

semiconductive material in a diffused, planar semiconductive device of a first conductivity type comprising:

a first diffused zone of opposite conductivity type and forming said junction at its periphery;

a second diffused zone of opposite conductivity type entirely surrounded on said surface by said first zone;

said first zone having a concentration of opposite conductivity impurities of from two to four orders of magnitude less than said second zone and less than about 10^{16} atoms cc;

said body of semiconductive material containing less than about 10^{15} atoms/cc of first conductivity type impurities.

4,074,294

DATA RECORDING MEANS FOR PHOTOGRAPHIC CAMERA

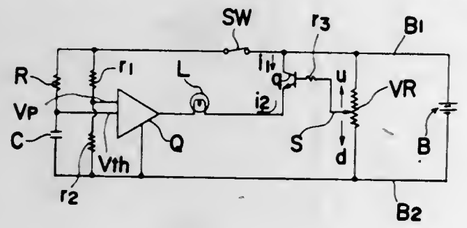
Susumu Fujita, Kobe, and Seijiro Kushibe, Nishinomiya, both of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sept. 15, 1976, Ser. No. 723,342

Claims priority, application Japan, Oct. 28, 1975, 50-130064; Jan. 26, 1976, 51-7375

Int. Cl.² G03B *17/24*

U.S. Cl. 354—106 **6 Claims**



1. In a data recording means employed in a camera to record data items on photgraphic film material located at an exposure station in said camera simultaneously with exposure of said film material to image-wise light reflected from an external scene upon actuation of a shutter means having associated therewith a shutter speed setting means externally actuable and movable to different settings to cause exposure action of said shutter means to be effected at different speeds and comprising a data carrier means movable by externally actuable means to bring successive items of data carried thereby to a projection position and a data projection system able to project the image of data items located at said projection position onto a specific portion of said film material and including a light source which with respect to said camera construction is located forward of said data carrier and which when actuated may illuminate data items located at said data projection position, said image of said data items being projectable by said projection system onto said film material only when said light source is actuated, and a light source actuation system for actuation of said light source during action of said camera shutter means, a data recording means wherein said light source actuation system comprises

a normally open power supply circuit which when closed supplies power to said light source, and includes a power source, a power supply adjustment circuit which at least includes an adjustable-setting element connected to, and movable to different settings simultaneously with, said shutter speed setting means, movement of said adjustable-setting element being proportional to that of said shutter speed setting means, and which causes said power to be supplied to said light source at a rate proportional to the shutter speed set by said shutter speed setting means, said power supply rate being made higher or lower as said set shutter speed is made higher or lower, and a timing circuit which stops said power supply after elapse of a set time from closure of said power supply circuit; and

a normally unactuated power supply circuit closure means which is actuated to close said power supply circuit during said exposure action effected by said shutter means.

4,074,295

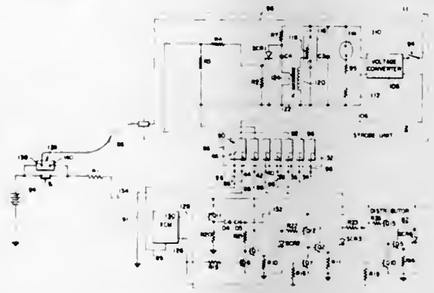
COMPACT ACCESSORY STROBE FOR CAMERAS WITH BATTERY ENCLOSED FILM PACK

Richard C. Kee, Chestnut Hill, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 23, 1976, Ser. No. 679,698

Int. Cl.² G03B *15/05*

U.S. Cl. 354—145 **9 Claims**



1. An electronic flash unit for use with a camera of the type having a flash socket assembly adapted for receipt of a conventional multiple flash bulb array together with an electrical receiving socket spaced apart from the flash socket for accommodating the connection of a conventional remote actuator button, said flash unit comprising:

a housing;

a storage capacitor;

means responsive to an applied, substantially steady stage, voltage for charging said capacitor;

circuit means responsive to an applied trigger signal for discharging said capacitor through said discharge tube to produce an illuminating flash of light;

a connector blade extending outward of said housing and adapted for receipt within the camera flash socket assembly, said connector blade having at least three spaced terminal elements thereon of which two terminal elements are arranged to receive an applied trigger signal from the camera and of which the third terminal element is arranged to receive one side of an applied, substantially steady state, voltage from the camera for charging said capacitor;

means for respectively electrically connecting said trigger signal receiving terminal elements to said means for discharging said capacitor and for electrically connecting said applied voltage receiving terminal element to said means for charging said capacitor;

a flexible electrical connecting member having a single conductive element therein extending outward of said housing and connecting to an electrical insertion jack adapted for receipt within the camera receiving socket to receive the other side of the applied, substantially steady state, voltage from the camera for charging said capacitor; and

means within said housing for electrically connecting said conductive element to said means for charging said capacitor.

4,074,296

FOLDING CAMERA

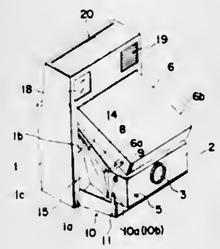
Tsuneaki Munakata, Tokyo, and Makoto Kuboshima, Sagamihara, both of Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

Filed Dec. 27, 1976, Ser. No. 754,805

Claims priority, application Japan, Dec. 27, 1975, 50-157228

Int. Cl.² G03B *17/04*

U.S. Cl. 354—187 **4 Claims**



1. Folding camera comprising at least

an exposure compartment comprising opaque wall portions and defining an exposure station whereat film material may be exposed;

a lens mount carrying at least a taking lens assembly able to focus image-wise light reflected from an external scene onto said film material, and having a first support shaft affixed to a first rear corner portion thereof and a second support shaft affixed to a second rear corner portion thereof;

a front opening defined in a forward portion of said camera;

a case which has one end pivotally supported in one end portion of said front opening, may be accommodated in said front opening, and may be moved to a first position in which said case extends forwardly from said front opening and to a second position in which said case is accommodated in said front opening;

linkage assemblies which connect opposite sides of said case to opposite ends of said second support shaft;

pivotal support assemblies which are provided in connection to opposite sides of said lens mount and each of which comprises a long, generally rectangular support plate whose outer end is in pivotal attachment to a side portion of said lens mount, and a guide rod which has one end in pivotal attachment to the inner end of said support plate and whose opposite end is in pivotal attachment to a portion of a side wall of said camera which is near to the rear wall of said camera and which in terms of top-to-bottom dimension of said camera is in a generally central portion of said side wall;

wall portions defining slots through which said support plates and said guide rods may move or be accommodated; and

side-folding opaque bellows element provided between said exposure station and said lens mount.

4,074,297

DUPLEX CUT FILM HOLDER

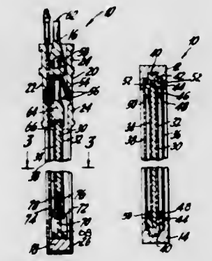
Morris Hoffman, 19 Grand Ave., Farmingdale, N.Y. 11735

Continuation-in-part of Ser. No. 493,074, July 30, 1974, abandoned. This application Nov. 15, 1976, Ser. No. 741,931

Int. Cl.² G03B *17/26*

U.S. Cl. 354—285 **4 Claims**

1. A photographic film sheet holder adapted for facilitated removable insertion therein of a sized photographic film sheet preparatory to photographic exposure of said film sheet, said holder comprising a pair of opposite side frames and an end frame cooperating to define a three-sided frame housing bounding a film-receiving compartment, a corresponding pair of opposite side frame inserts and an end frame insert having operative positions disposed in said three-sided frame housing, each of said inserts having film-holding lip extension means thereon projected into said film-receiving compartment about the periphery thereof for establishing holding contact with a film sheet inserted into said compartment, each of said lip extension means on each said opposite side insert having in the end adjacent said end insert a film-inserting slot formed therein of a selected length so as to facilitate the insertion of said film sheet therethrough into said compartment into an initial position of being slidably held beneath the length of said lip extension means extending beyond said film-inserting slot thereof, and a slidably disposed positioning member mounted in spanning relation across said three-sided frame housing open end movable from a clearance position through a film sheet positioning stroke into said compartment, whereby said positioning member establishes pushing contact against an end of said film sheet and urges same during said positioning stroke into an operative position in said compartment in which the peripheral edges of said film sheet are in engaged relation with said lip extension means of said opposite side and bottom inserts.



4,074,298

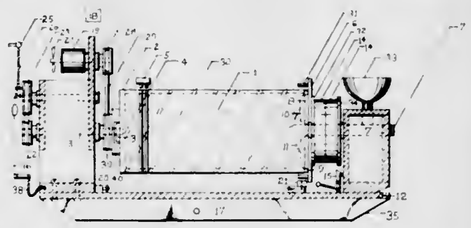
PHOTOGRAPHIC PROCESSING MACHINE

Neil B. Cartwright, 693 E. 16th St., Idaho Falls, Idaho 83401

Continuation of Ser. No. 436,459, Jan. 25, 1974, abandoned. This application June 30, 1975, Ser. No. 591,351

Int. Cl.² G03D *13/00*

U.S. Cl. 354—299 **2 Claims**



1. Apparatus for processing photographic sheet material, said apparatus comprising:

a tubular processing vessel having at least one open end,

means for rotatably supporting and rocking the tubular vessel,

means for mounting the sheet material in the interior of said vessel and for spacing the back of the sheet material from the inner surface of said vessel,

means for supplying processing solution to the interior of said vessel, and

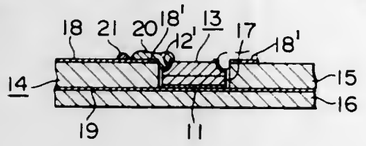
means for discharging the used processing solution from the vessel, wherein said discharging means includes a movable lid for closing the open end of the vessel in a fluid tight manner, resilient means for exerting pressure on the lid to maintain it in the closed position, means for tilting the vessel for draining the solution, and means for removing the pressure exerted by the resilient means on the lid to thereby allow the solution to be drained from the vessel.

4,074,299

LIGHT-EMITTING DIODE ELEMENT AND DEVICE

Masaaki Kusano, Yokohama; Shinzi Okuhara, Fujisawa, and Ichiro Ohhinata, Yokohama, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 1, 1975, Ser. No. 636,452
Claims priority, application Japan, Dec. 4, 1974, 49-138382
Int. Cl.[2] H01L *33/00, 23/48*
U.S. Cl. 357—17 8 Claims



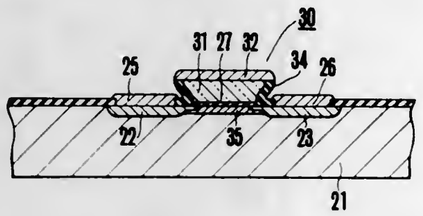
1. A light-emitting diode device comprising a light-emitting diode element comprising a rectangularly-shaped semiconductor wafer including a pair of a p-type semiconductor region and an n-type semiconductor region forming a pn junction, an inclined first electrode provided on a beveled area formed by removing a portion of at least one of the peripheral edges of the surface of one of said semiconductor regions in said semiconductor wafer, and a flat second electrode provided on the surface of the other said semiconductor region, and a substrate which comprises a rectangularly-shaped opening for receiving said light-emitting diode element therein, a first wiring conductor strip disposed to extend around the top end of said opening, and a second wiring conductor strip disposed to extend along the bottom end of said opening, said light-emitting diode element being received in said opening of said substrate in such a relation that said second electrode directly faces said second wiring conductor strip, and said first and second electrodes are electrically connected to said first and second wiring conductor strips respectively, said first electrode being electrically connected to said first wiring conductor strip by a bridge of low melting point metal.

4,074,300

INSULATED GATE TYPE FIELD EFFECT TRANSISTORS

Tetsushi Sakai, Tachikawa; Yutaka Sakakibara, Tokorozawa; Junichi Murota, Kodaira, and Tsutomu Wada, Higashi-Yamato, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Japan

Filed Feb. 13, 1976, Ser. No. 657,873
Claims priority, application Japan, Feb. 14, 1975, 50-17938
Int. Cl.[2] H01L *29/78*
U.S. Cl. 357—23 5 Claims



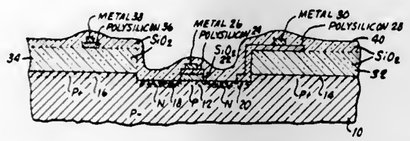
1. An insulated gate type field effect transistor comprising a semiconductor substrate; spaced-apart source and drain regions formed at one surface of said semiconductor substrate; a first insulating film overlying the surface of said substrate between said source and drain regions; a polycrystalline semiconductor gate layer disposed over said first insulating film and having a deliberately formed inverted frustum shape; the top surface of the inverted frustum being at a different level from the level of the source and drain regions and the outer peripheral edges of the projection of the top surface of the inverted frustum onto the substrate being substantially coextensive with the inner peripheral edges of the source and drain regions; source, drain and gate electrodes formed on said source region, said drain region and said polycrystalline semiconductor gate layer, respectively, and second insulating films formed over substantially the entire side surface of said polycrystalline semiconductor gate layer between said gate electrode and said source electrode and between said gate electrode and said drain electrode and extending to and covering the top surface areas of the substrate surrounding the gate layer, said last mentioned top surface areas being substantially defined by projecting the top peripheral surface of said inverted frustum gate layer down upon the top surface of the substrate whereby horizontal spacing between adjacent electrodes is essentially zero and parasitic capacitive coupling between the electrodes is minimized.

4,074,301

FIELD INVERSION CONTROL FOR N-CHANNEL DEVICE INTEGRATED CIRCUITS

John O. Paivinen, Newtown Square, and Walter D. Eisenhower, Audubon, both of Pa., assignors to MOS Technology, Inc., Norristown, Pa.

Division of Ser. No. 613,537, Sept. 15, 1975, Pat. No. 4,011,105.
This application Nov. 1, 1976, Ser. No. 737,547
Int. Cl.[2] H01L *29/78*
U.S. Cl. 357—23 8 Claims



1. An N-channel MOS integrated circuit structure comprising:

a single crystal semiconductor material substrate of P^--type bulk conductivity material having a laterally extending top flat surface;

said substrate being ion-implanted along said top surface with a P-type dopant to form a top, P^+-type field layer, the resistivity of said P^+-type field layer being substantially less than that of the underlying P^--type material;

selected portions of said P^+-type field layer being removed at locations which are laterally spaced from each other to leave a pattern of field layer areas, and the P^--type material which is exposed thereby and is laterally surrounded by said field areas being ion-implanted with a P-type dopant to form top, P-type layers, the resistivity of said P-type layers being intermediate that of the P^--type material and the material of the P^+-type field layer;

selected portions of at least some of said P-type layers being doped with N-type material to form N-channel MOS devices;

layers of material electrically inert as compared with said P^+-type material being disposed over the field areas; and

electrical interconnects extending over at least some of said layers of inert material and making electrical contact with at least some of said MOS devices.

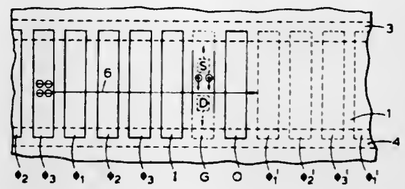
4,074,302

BULK CHANNEL CHARGE COUPLED SEMICONDUCTOR DEVICES

Robert J. Brewer, Carshalton, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 19, 1976, Ser. No. 688,008
Claims priority, application United Kingdom, June 26, 1975, 27093/75; Nov. 27, 1975, 48894/75
Int. Cl.[2] H01L *29/78, 29/04;* G11C *19/28*
U.S. Cl. 357—24 34 Claims

1. A semiconductor device comprising a semiconductor body having a semiconductor layer of one conductivity type, means for enabling the semiconductor layer to be locally fully depleted without avalanche multiplication in order to allow the movement of majority charge carriers representative of information via the interior of the layer to one or more storage sites in the layer, means for enabling the reading of information present at least in one storage site comprising an insulated gate field effect transistor structure having its channel region present at the surface of the semiconductor layer above said one



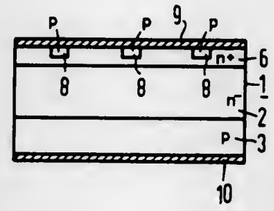
storage site and between source and drain regions of the opposite conductivity type, and means for enabling the temporary confinement of the quantity of majority charge carriers in said one storage site to the interior of the layer without mixing of the stored charge carriers in said one storage site and the mobile minority charge carriers in the transistor channel in order that the current flow in the transistor channel when the transistor gate electrode is maintained at ay given potential is dependent upon the quantity of charge in the said one storage site.

4,074,303

SEMICONDUCTOR RECTIFIER DEVICE

Hansjochen Benda, and Peter Huber, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 20, 1976, Ser. No. 650,626
Claims priority, application Germany, Feb. 13, 1975, 2506102
Int. Cl.[2] H01L *29/00*
U.S. Cl. 357—33 3 Claims



1. A semiconductor diode comprising an interior zone, a first exterior zone connected to the interior zone on one side and has the same conductivity type as said interior zone, said first exterior zone having a higher doping concentration than said interior zone, and with at least a second exterior zone connected to the other side of said interior zone, said second exterior zone being of opposite conductivity type of said interior zone, a first electrode mounted on said first exterior zone, a second electrode mounted on said second exterior zone, areas of opposite conductivity type formed in said first exterior zone and distributed across its surface, said areas having depths which are less than the depth of said first exterior zone, and said first electrode covering and in contact with said areas and said first exterior zone and said areas of opposite conductivity type having a doping concentration which is less than that of said first exterior zone and greater than that of said interior zone.

4,074,304

SEMICONDUCTOR DEVICE HAVING A MINIATURE JUNCTION AREA AND PROCESS FOR FABRICATING SAME

Hiroshi Shiba, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 618,419, Oct. 1, 1975, abandoned. This application Mar. 2, 1977, Ser. No. 773,658
Claims priority, application Japan, Oct. 4, 1974, 49-114408
Int. Cl.[2] H01L *29/04, 27/02, 29/34, 23/48*
U.S. Cl. 357—59 9 Claims



1. A semiconductor device comprising:

a semiconductor substrate having a first semiconductor region of one conductivity type and a second semiconductor region of the opposite conductivity type contained in said first semiconductor region with a p-n junction between said first and second semiconductor regions;

an insulating film on one main surface of said substrate and having an opening which exposes portions of the surface of said first semiconductor region and of the surface of said second semiconductor region;

a silicon thin film having a first segment covering said insulating film and a second segment in direct contact with the exposed surfaces of said first and second semiconductor regions, and a silicon oxide film produced by the selective oxidation of a portion of said silicon thin film and covering a portion of said p-n junction exposed in said opening of said insulating film;

portions of said first and second segments of said silicon thin film that are not selectively oxidized defining first and second electrode wiring paths which are mutually separated by said silicon oxide film, said first and second electrode wiring paths making ohmic contacts with said first and second semiconductor regions, respectively.

4,074,305

GaAs LAYERS AS CONTACTS TO THIN FILM SEMICONDUCTOR LAYERS

Wilbur Dexter Johnston, Jr., Holmdel, and Joseph Leo Shay, Marlboro, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 16, 1976, Ser. No. 742,519
Int. Cl.[2] H01L *23/48*
U.S. Cl. 357—67 9 Claims

9. A semiconductor device containing a p-type InP layer deposited on a conducting substrate, wherein the contact to the substrate is improved by a layer of p-type GaAs deposited between said substrate and said InP layer.

4,074,306

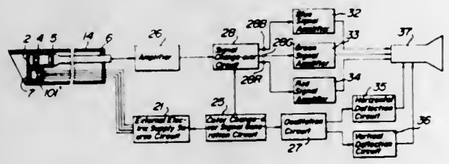
ENDOSCOPE UTILIZING COLOR TELEVISION AND FIBER OPTICS TECHNIQUES

Yoshikazu Kakinuma, Hachioji, and Tadashi Morokuma, Tokyo, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed July 23, 1976, Ser. No. 708,262
Int. Cl.[2] H04N *9/02*
U.S. Cl. 358—1 8 Claims

1. An endoscope for displaying a color picture image of an object to be viewed in a hollow cavity, comprising a sheath to be inserted into said hollow cavity and an exterior circuit arranged outside said sheath, said sheath including a self-scanning type solid state image pick-up device, a bundle of lead wires composed of a lead wire for supplying a signal for oper-

ating said image pick-up device from said exterior circuit and a lead wire for leading out a picture signal supplied from said image pick-up device toward said exterior circuit, and an illumination light transfer body comprised of flexible light-conducting fibers for transferring a light for illuminating said object to be viewed from said exterior circuit, said exterior circuit including a signal generator for operating said self-scanning type solid state image pick-up device, an amplifier for



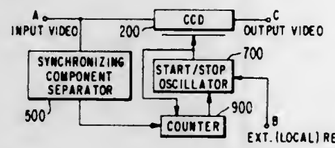
amplifying said picture signal supplied from said image pick-up device, a color picture tube for displaying a color picture image upon receipt of said picture image signal from said amplifier, a light source for emitting illumination light on said illumination light transfer body, means for decomposing light incident on said illumination flexible light-conducting fibers into three primary color lights and a signal change-over circuit for changing over a signal supplied to said picture tube by a synchronizing signal.

4,074,307

SIGNAL PROCESSOR USING CHARGE-COUPLED DEVICES

Robert Adams Dischert, Burlington; Robert Norman Hurst, Cherry Hill, and Arch Clinton Luther, Jr., Woodstown, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 14, 1975, Ser. No. 604,775
Int. Cl.² H04N *5/78*
U.S. Cl. 358—8 **5 Claims**



1. A time base corrector for removing time base errors from video signal information of a type including synchronizing pulses, comprising:

storage means including a predetermined number of sequentially arranged storage elements and having an input terminal to be coupled to a source of signals representative of said video signal information to be corrected and an output terminal for providing corrected signals representative of said video signal information, said storage means responsive to clock pulses for transferring said signals through successive storage elements from said input terminal to said output terminal;

a start/stop oscillator coupled to said storage means to apply clock pulses thereto;

timing signal means responsive to an external source of synchronizing signal components coupled to said start/stop oscillator for providing a first reference signal for starting the operation of said oscillator to provide clock pulses to said storage means;

a triggerable counter which, after being triggered on, stops said oscillator after the number of clock pulses necessary to transfer a signal from said input terminal to the last of said sequentially arranged storage elements; and

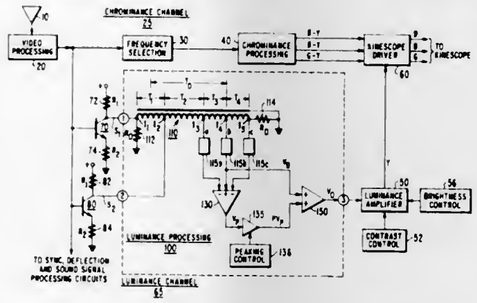
synchronizing pulse separator means coupled to receive said video signal to be corrected and to said counter for providing a second reference signal for starting said counter at a predetermined time during each active line period of said video signal, whereby the portion of said video signal occurring at said predetermined time is stored at the last of said sequentially arranged storage elements.

4,074,308

DELAY LINE NETWORK FOR PROCESSING A COMPOSITE ELECTRICAL SIGNAL

Walter Gold Gibson, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 28, 1976, Ser. No. 736,420
Int. Cl.² H04N *9/00, 5/14*
U.S. Cl. 358—38 **18 Claims**



1. Apparatus for processing a composite electrical signal, comprising:

a source of composite electrical signal;

wide bandwidth signal delaying means having at least respective end terminals and an intermediate terminal;

first means for coupling said composite signal to one of said end terminals of said signal delaying means;

second means for coupling said composite signal to said intermediate terminal of said signal delaying means, said one end terminal and said intermediate terminal being arranged to provide a signal time delay therebetween substantially equal to NT/2, where N is an odd integer and T is the reciprocal of a selected frequency at which it is desired to provide a predetermined amplitude response of said composite signal, so that a combined signal appearing at said intermediate terminal is representative of relatively delayed and undelayed composite signals and exhibits said predetermined amplitude response at said selected frequency; and

utilization means coupled to a remaining one of said end terminals for translating said combined signal.

4,074,309

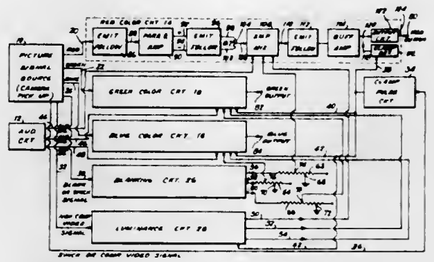
VIDEO EFFECTS APPARATUS AND METHOD

David Wynn-Smith, Borehamwood, England, assignor to Chroma-Flex, Inc., West Nyack, N.Y.

Filed Nov. 12, 1976, Ser. No. 741,360
Int. Cl.² H04N *9/535*
U.S. Cl. 358—82 **29 Claims**

22. A method for providing special video effects by the use of color video signals and supplemental television signals, said method comprising forming at least one of said video signals into inverted and non-inverted signals, selecting a signal level

between the inverted and non-inverted signals, and amplitude mixing the thusly selected signal with a further signal derived



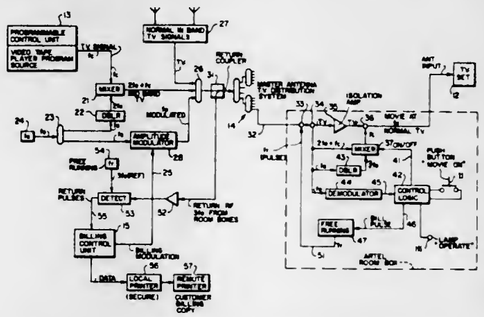
from at least one of said supplemental signals to produce an output signal.

4,074,310

SELECTIVE CCTV COMMUNICATING

Paul A. Hurney, Lexington, and John P. Curtis, Reading, both of Mass., assignors to Artel Manufacturing Corporation, Waltham, Mass.

Filed Nov. 26, 1975, Ser. No. 635,409
Int. Cl.² H04N *7/18*
U.S. Cl. 358—84 **4 Claims**



1. Selective communication apparatus comprising,

a source of a master oscillator signal of frequency f_o,

a source of a special signal modulated upon a carrier of frequency f_c,

signal processing means responsive to said master oscillator signal for providing a processed signal of predetermined frequency that is integrally related to that of said master oscillator signal,

mixing means responsive to said special signal and said processed signal for providing said special signal translated in frequency by an amount corresponding to the algebraic combination of said predetermined frequency and said frequency f_o,

a source of other signals in a frequency range embracing said frequency f_c outside the frequency range embracing the translated special signal,

means for combining said other signals, said translated special signal and a signal related to said master oscillator signal of said frequency f_o for providing a combined signal,

master distributing means for receiving said combined signal and providing it to a plurality of remote locations with each remote location having a remote unit and each remote unit comprising,

a remote unit output for coupling signals to a utilization device,

means for coupling all said other signals to said remote unit output,

means at said remote unit responsive to said translated special signal and said signal related to said master oscillator signal for selectively translating said special signal to the frequency range embracing said other signals for transmission to said remote unit output in response to a selection signal transmitted thereto over a path entirely at the location of said remote unit,

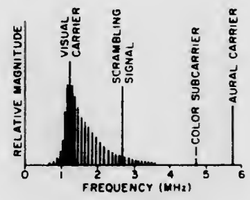
and means at said remote unit for providing said selection signal.

4,074,311

TELEVISION SECURITY SYSTEM

James L. Tanner, Reseda, and Bruno A. Rist, Northridge, both of Calif., assignors to Tanner Electronic Systems, Van Nuys, Calif.

Filed June 18, 1976, Ser. No. 697,507
Int. Cl.² H04N *1/44*
U.S. Cl. 358—118 **45 Claims**



27. A television security system comprising:

means for generating a television signal having a video carrier and an audio carrier;

scramble signal generating means for injecting at least one scramble signal between the video and audio carriers of said television signal, said at least one scramble signal having a frequency substantially between the limits of one-fourth and three-fourths of the frequency interval between said video carrier and said audio carrier, such that said television signal is scrambled thereby; and

transmitting means for transmitting said scrambled television signal for television reception.

4,074,312

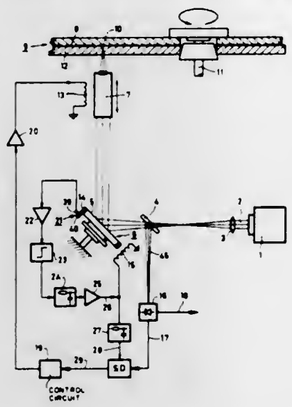
AUTOMATIC DITHERING OPTICAL FOCUSING SYSTEM USING AN OSCILLATING MIRROR IN THE PATH OF THE RADIATION BEAM

Gerard Eduard van Rosmalen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 1, 1976, Ser. No. 662,456
Claims priority, application Netherlands, Jan. 19, 1976, 7600479
Int. Cl.² G11B *11/00*
U.S. Cl. 358—128 **9 Claims**

1. An automatic focusing system for a disc player system comprising means for projecting a radiation beam onto a moving surface of a rotating disc that is optically encoded with information thereby modulating the radiation beam with said encoded information; radiation-sensitive means for converting the modulated beam from the disc into a focusing error signal and into an electrical output signal corresponding to said information; optical focusing means comprising lenses axially movable in the path of the radiation beam from the projecting means for focusing the radiation beam to a read spot in an imaginary focusing plane including said optically encoded moving surface of the disc in response to said focusing error signal; and an oscillating mirror in the path of the radiation beam from said projecting means between the projecting means and the disc and comprising a base having a reflecting

surface, and means for producing bending periodic oscillations in said reflecting surface, said oscillations having a component



in the direction of the radiation beam reflected from said reflecting surface of said oscillating mirror.

4,074,313

ELECTRON BEAM DISC RECORDER

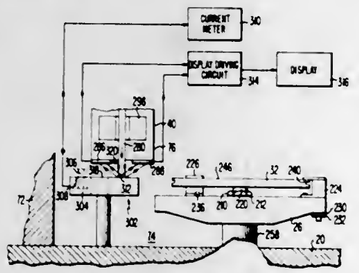
John Henry Reisner, Haddonfield; William Henry Morewood, Pennington, and George Herbert Needham Riddle, Princeton, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed June 30, 1976, Ser. No. 701,416

Claims priority, application United Kingdom, June 14, 1976, 24561/76

Int. Cl.² H04N *5/76*

U.S. Cl. 358—128 **7 Claims**



1. An apparatus for recording signals by directing a beam of energy toward a disc master; said beam of energy having characteristics representative of signals to be recorded; said disc master having characteristics responsive to said beam of energy; said apparatus comprising the combination of:

(1) a frame;

(2) a base plate secured to said frame;

(3) a non-translatable turntable;

(4) means secured to said base plate for rotatably supporting said non-translatable turntable;

(5) means coupled to said non-translatable turntable for causing rotational motion of said turntable;

(6) a cover plate mounted to said frame;

said cover plate defining a recording chamber, surrounding said turntable, in cooperation with said base plate;

(7) a carriage;

(8) bearing means secured to said cover plate for supporting a translational motion of said carriage relative to said cover plate;

(9) a translatable recorder column for providing a signal representative beam of energy;

said recorder column being secured to said carriage for translational motion therewith;

said carriage and said cover plate having openings through which a portion of said recorder column protrudes into said recording chamber;

said opening in said cover plate having dimensions which permit said translational motion of said recorder column;

said carriage bearing means being so oriented that said translational motion of said carriage results in a motion of said beam of energy along a path radially disposed with respect to the center of said turntable;

(10) means coupled to said carriage for causing said translational motion of said recorder column in correlation with said rotational motion of said turntable;

(11) beam set-up means including a non-translatable stage; said non-translatable set-up stage being fixedly mounted within said recording chamber adjacent the outside perimeter of said turntable; said non-translatable set-up stage having a reference surface which is responsive to said beam of energy; said translational motion causing means additionally serving to selectively position said translatable recorder column in alignment with said non-translatable set-up stage in order to permit directing of said beam of energy onto said reference surface of said non-translatable set-up stage for detecting pertinent characteristics of said beam of energy;

(12) means for releasably securing a disc master to said non-translatable turntable such that the recording surface of said disc master is disposed in registration with said reference surface of said non-translatable set-up stage;

(13) means for selectively evacuating said recording chamber; and

(14) means coupled between said translatable recorder column and said cover plate opening for preventing leakage of air into said recording chamber through said cover plate opening, when said recording chamber is evacuated.

4,074,314

APPARATUS FOR OPTICALLY READING A RECORD CARRIER AND CORRECTING FOCUS ERROR

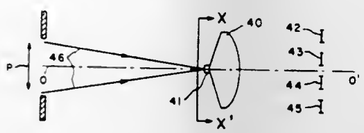
Christiaan Hendrik Frans Velzel, and Peter Ferdinand Greve, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 527,244, Nov. 26, 1974, Pat. No. 3,992,575. This application Aug. 27, 1976, Ser. No. 718,398

Claims priority, application Netherlands, Feb. 25, 1974, 7402504

Int. Cl.² H04N *5/76*; G11B *7/12*

U.S. Cl. 358—128 **1 Claim**



1. An apparatus for reading a record carrier on which information is stored in an optically readable structure, which apparatus includes a radiation source, an objective system for imaging the radiation source on the information structure of the record carrier, a radiation-sensitive detection sstem for converting the radiation which is supplied by the radiation source and modulated by the information structure into an electrical signal, said apparatus being provided with a focus error detection system, wherein the radiation source comprises at least two radiation sub-sources, which are offset relative to each other both in the direction of the optical axis of the objective system and in a direction transverse thereto, a separate detector in the detection system for each of the radiation sub-sources, a first element means for dividing a radiation beam

supplied by the radiation source into two separate sub-beams, a second element means for focussing the sub-beams in different planes, an optical assembly comprising an optical wedge and a field lens disposed in the path of the radiation passing said separate detectors, and at least three additional radiation-sensitive detectors disposed in the plane in which images of the exit pupil of the objective system are formed by the optical assembly, wherein the radiation - sensitive detection system detects small errors in focusing and the additional radiation - sensitive detectors derive correction signals for large focusing errors.

4,074,315

APPARATUS FOR REPRODUCING MULTIPLEX VIDEO DATA

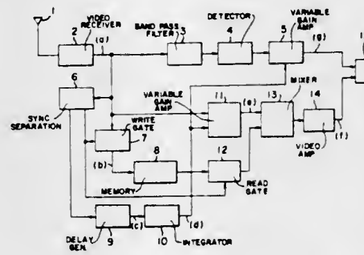
Hiroshi Kawamura; Yoshihisa Nishitani, and Katsumi Muta, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 27, 1976, Ser. No. 690,729

Claims priority, application Japan, June 6, 1975, 50-68196; Feb. 2, 1976, 51-10211; Feb. 2, 1976, 51-10212; Feb. 2, 1976, 51-10213

Int. Cl.² H04N *7/00*

U.S. Cl. 358—142 **5 Claims**



1. An apparatus for reproducing multiplex video data comprising:

receiver means for outputting composite video signals, said composite video signals including main video signals having a vertical blanking interval and symbol data multiplexed with the main video signals during the vertical blanking interval;

write-in gate means for selecting the symbol data from the composite video signals outputted by said receiver means;

memory means connected to said write-in gate means and responsive to to selecting of symbol data for recording the selected symbol data;

read-out gate means for reading out the symbol data recorded in said memory means; and

means for superposing the symbol data read out by said read-out gate means with the composite video signals outputted by said receiver means to produce a resultant signal for visual display, including means connected to said receiver means for controlling the amplitude of the main video signals in the composite video signals outputted by said receiver means and corresponding to the superposing background for the symbol data, and mixer means connected to said read-out gate means and said amplitude controlling means for multiplexing the symbol data read-out by said read-out gate means with the composite video signals having a main video signals amplitude controlled by said amplitude controlling means to produce a resultant signal for visual display.

4,074,316

ELECTRONIC SWITCHING SIGNAL GENERATOR FOR USE IN TELEVISION

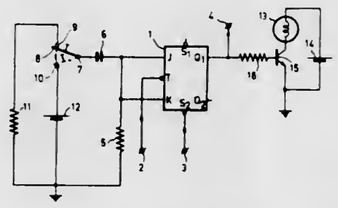
Robert Tiemeijer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 26, 1976, Ser. No. 708,600

Claims priority, application Netherlands, Apr. 8, 1975, 7509245

Int. Cl.² H04N *5/22*

U.S. Cl. 358—181 **5 Claims**



1. An electronic switching signal generator comprising a master slave flip-flop circuit including a trigger input means for receiving a switching signal occurring at a television field frequency and having a switching pulse edge occurring during field blanking intervals, and at least one condition input means; and a capacitor charging and discharging circuit coupled to said condition input means and including a monostable push-button switch, a voltage source coupled to said switch, a capacitor coupled to said switch and a pair of charge-discharge resistors coupled to said switch and said capacitor respectively.

4,074,317

MULTI-CHANNEL VIDEO DISPLAY APPARATUS USING SEQUENTIAL CIRCUIT

Hiroshi Kogo, Tokyo; Tokuji Kato, Chiba, and Takashi Uematsu, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Nov. 3, 1976, Ser. No. 738,575

Claims priority, application Japan, Nov. 5, 1975, 50-132113

Int. Cl.² H04N *5/22*

U.S. Cl. 358—181 **5 Claims**

1. Apparatus for displaying a plurality of channels of video information including vertical synchronization pulses on divided areas of the screen of a cathode ray tube with deflection means energized by horizontal and vertical sawtooth deflection potentials of such values that each video channel is reproduced on a selected one of the divided areas, comprising:

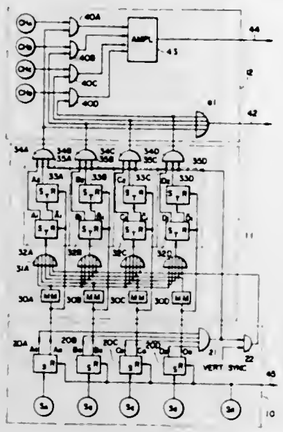
a channel selection circuit having a plurality of manually operated switches equal in number to said channels;

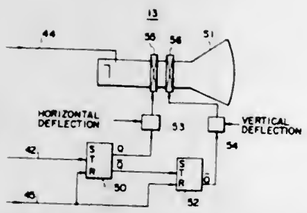
means for sequentially generating output pulses in each step with a vertical synchronization pulse contained in said video information in the same order of sequence as the operating sequence of said switches;

gate means responsive to said output pulses for passing said video information to said cathode ray tube; and

means responsive to said output pulses for generating a series of horizontal and vertical beam positioning DC potentials

for biasing said horizontal and vertical sawtooth deflection potentials, respectively, such that the video informa-





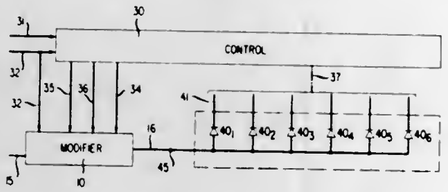
tion passed through said gate means is reproduced on corresponding one of the divided areas of the screen.

4,074,318

LED ARRAY IMAGING SYSTEM-SERIAL APPROACH

William John Kapes, Jr., Randolph Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 13, 1976, Ser. No. 750,113
Int. Cl.² H04N 5/66
U.S. Cl. 358—230 **9 Claims**



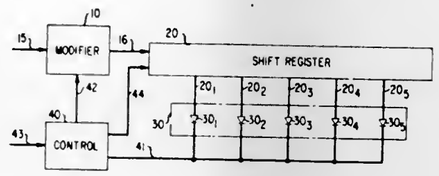
1. A facsimile system responsive to an input signal comprising:
- a plurality of energy sources, each having a first type terminal and a second type terminal;
- first means, connected to said first type terminal of each of said energy sources, for individually enabling said energy sources;
- second means, responsive to said input signal, for simultaneously applying said input signal to each of said second type terminal of said energy sources; and
- third means for controlling the time duration during which said second means applies said input signal to each of said second type terminals of said energy sources to effect a gray level control.

4,074,319

LIGHT EMITTING DIODE ARRAY IMAGING SYSTEM - PARALLEL APPROACH

Wilbur Harry Goldschmidt, Sparta; Hansjuergen Hermann Henning, Summit, and William John Kapes, Jr., Randolph Township, Morris County, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 13, 1976, Ser. No. 750,273
Int. Cl.² H04N 5/66
U.S. Cl. 358—230 **25 Claims**



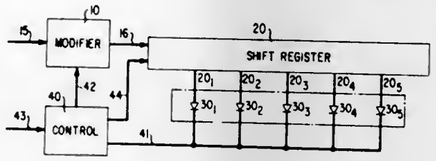
1. A facsimile system comprising:
- an array of pel energy sources, each having a first lead and a second lead;
- a memory having a first plurality of parallel outputs;
- first means for connecting said first leads of said energy sources to said first plurality of parallel outputs;
- second means for connecting said second leads of said energy sources to a third plurality of terminals; and
- third means for simultaneously activating the pel energy sources of said array which are connected to each terminal of said third plurality of terminals.

4,074,320

HIGH QUALITY LIGHT EMITTING DIODE ARRAY IMAGING SYSTEM

William John Kapes, Jr., Randolph Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 13, 1976, Ser. No. 750,275
Int. Cl.² H04N 5/66
U.S. Cl. 358—230 **4 Claims**



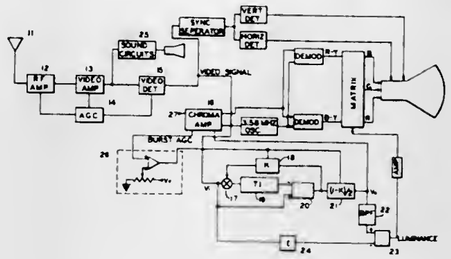
1. In a facsimile receiver responsive to input signals, including a plurality of energy sources for illuminating the picture elements of a pictorial field, the improvement comprising:
- means for storing a correction constant corresponding to each of said plurality of energy sources; and
- means for altering portions of said input signals destined for each of said energy sources in accordance with said correction constant corresponding to each of said energy sources wherein said correction constant corresponding to each of said plurality of energy sources relates multiplicatively to the energy output of each of said plurality of energy sources, and wherein said means for altering comprises a multiplier responsive to said input signals and to said correction constants.

4,074,321

CIRCUIT FOR SEPARATING CHROMA AND LUMINANCE INFORMATION IN A COMPOSITE VIDEO SIGNAL

William George Miller, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed Oct. 12, 1976, Ser. No. 731,190
Int. Cl.² H04N 9/00, 9/535
U.S. Cl. 358—31 **12 Claims**



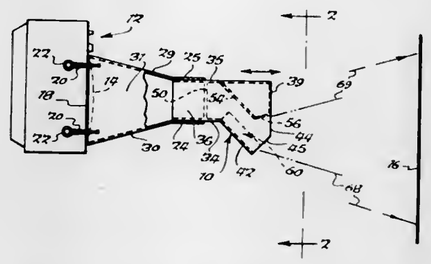
1. A comb filter of the type having a delay means, said delay means having an input terminal adaptively connected to a source of video signal and an output terminal for delivering a delayed video signal, means for combining said delayed video signal with said video signal to produce a filtered signal and means for supplying a portion of said filtered signal as a feedback signal from said means for combining to said delay means input terminal whereby said feedback signal is combined with said video signal, further comprising means for varying said feedback signal in response to the signal to noise ratio of said video signal.

4,074,322

TELEVISION PROJECTOR

Angelo M. Cammilleri, Williamsville, N.Y., assignor to Telejector Ltd., Cheektowaga, N.Y.

Filed Jan. 24, 1977, Ser. No. 761,950
Int. Cl.² H04N 5/74; G02B 5/136, 27/18
U.S. Cl. 358—237 **9 Claims**



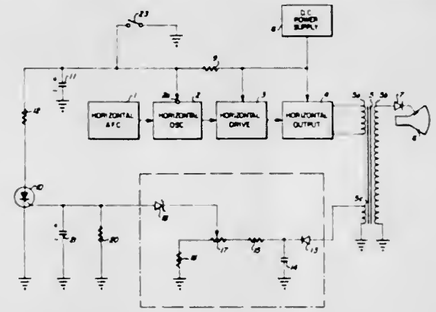
1. Apparatus for projecting an optical image from the screen of a television receiver onto a generally planar viewing medium spaced therefrom comprising:
- (a) an elongated housing having a longitudinal axis; an entrance opening at one end of said housing for receiving the optical image to be projected, and an exit opening adjacent the other end of said housing through which the image leaves for projecting onto the viewing medium, said housing adapted to be operatively associated with a television receiver with said entrance opening adjacent the screen of said receiver, said exit opening facing said viewing medium, and said housing longitudinal axis disposed in a plane generally perpendicular to the plane of the receiver screen;
- (b) a lens supported in said housing and disposed in a plane generally perpendicular to said housing longitudinal axis, the center of said lens being substantially coincident with said housing longitudinal axis, said lens receiving an optical image from said entrance opening and converting said image into an enlarged, inverted and reversed image; and
- (c) a mirror combination including two plane reflecting mirror elements joined along an edge of each mirror defining a straight intersection, said intersection being disposed in each plane of the reflecting surfaces of said mirrors, said intersection being disposed in a plane containing said housing longitudinal axis, the reflecting surfaces of said mirrors being disposed to define an included angle of 90°, said mirror combination being located optically between said lens and said housing exit opening with said reflecting surfaces being disposed to receive an image toward said opening, said mirror combination inverting the received image and projecting the image onto the viewing medium.

4,074,323

TELEVISION RECEIVER PROTECTION SYSTEM

Donald E. Griffey, Skokie, Ill., assignor to Matsushita Electric Industrial Co., Ltd., Franklin Park, Ill.

Filed Apr. 14, 1976, Ser. No. 677,074
Claims priority, application Japan, May 7, 1975, 50-54980
Int. Cl.² H04N 5/68
U.S. Cl. 358—243 **5 Claims**



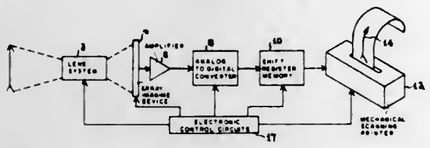
1. A protection system for a television receiver having a horizontal oscillator circuit, a horizontal flyback transformer, and a direct current power supply input terminal coupled with the horizontal oscillator circuit, said protection circuit including in combination:
- static latching switch means having a control terminal and coupled between the power supply input terminal and a point of reference potential;
- transient suppression circuit means coupled with the control terminal of said static latching switch means; and coupling circuit means including a voltage threshold sensing means direct current coupled between the flyback transformer and the control terminal means of said static latching switch means for rendering said switch means conductive in response to voltages from the flyback transformer which produce voltages in excess of the threshold voltage of said voltage threshold sensing means to terminate operation of the horizontal oscillator circuit by reducing the direct current power applied thereto.

4,074,324

INSTANT ELECTRONIC CAMERA

Jon S. Barrett, 715 Dona St., Sunnyvale, Calif. 94087

Filed July 14, 1975, Ser. No. 595,628
Int. Cl.² H04N *1/04*
U.S. Cl. 358—296 **4 Claims**



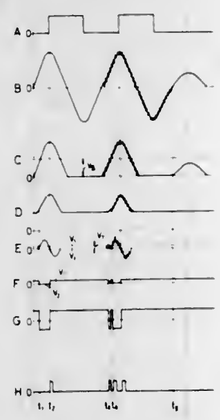
1. An instantaneous camera comprising a lens system; a solid state array imaging device having discrete light sensitive points whose accumulated charge is a function of the incident light; means for positioning said imaging device in predetermined relationship with said lens system; means for sensing charges at said points and generating in predetermined order a sequence of pulses whose amplitudes are a function of the respective instantaneous charges at said points; a printer responsive to said pulses and having means for direct production of visible marks; and means coupling said last-said means to said printer.

4,074,325

SYSTEM FOR SENSING THE PEAKS OF AN OUTPUT FROM A MAGNETIC HEAD

Yoshiaki Sakai, and Kuniki Murayama, both of Musashino, Japan, assignors to Teac Corporation, Tokyo, Japan

Filed Feb. 22, 1977, Ser. No. 770,785
Int. Cl.² G11B *5/09, 5/02*
U.S. Cl. 360—39 **6 Claims**



1. A system for sensing the peaks of an output produced by a magnetic head as the latter converts magnetic variations on a magnetic recording medium into electric variations, comprising in combination:

amplifier means for amplifying the output from said magnetic head;

half-wave rectifier means for effecting half-wave rectification of an output from said amplifier means;

differentiating circuit means connected directly to said half-wave rectifier means for differentiating an output therefrom;

comparator means for comparing an output from said differentiating circuit means with a reference voltage having first and second levels and for producing an output voltage having third and fourth levels, said output voltage from said comparator means changing from said third to said fourth level when the output from said differentiating circuit means crosses said first level of said reference voltage and changing from said fourth to said third level when the output from said differentiating circuit means subsequently crosses said second level of said reference voltage, said first and said second levels of said reference voltage having a sufficiently great differential therebetween to prevent said comparator means from responding to noise which may be contained in the output from said differentiating circuit means; and

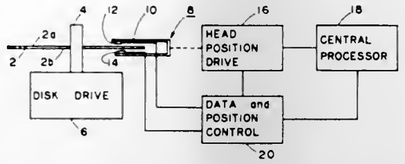
means connected to said comparator means for sensing the trailing edges of output pulses produced thereby.

4,074,326

PLURAL-TRACK RECORD DISK INITIALIZATION SYSTEM

Douglas A. Smith, Blairadam by Kelty, Scotland, assignor to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 527,896, Nov. 27, 1974, Pat. No. 4,030,130.
This application Feb. 17, 1977, Ser. No. 769,609
Claims priority, application United Kingdom, Mar. 15, 1974, 11610/74
Int. Cl.² G11B *5/02, 21/10*
U.S. Cl. 360—55 **2 Claims**



1. A method for recording an initial set of data tracks on a virgin plural-track record disk using a transducer head assembly which is comprised of: support means; a first transducer head carried by the support means and cooperable with a first face of a record disk; and a second transducer head carried by the support means and cooperable with the opposite face of the record disk, the second transducer head being fixed in a radially spaced relationship from the first head with respect to the disk, comprising the steps of:

recording a plurality of annular, spaced tracks on a first face of the record disk using said first transducer head, spacing said tracks twice the radial distance of the fixed relationship between said first and second transducer heads;

recording a plurality of annular, spaced tracks on the other face of the record disk using said second transducer head, by positioning said first transducer head exactly between pairs of adjacent tracks on said first face of the record disk during recording;

re-recording a plurality of tracks on said first face of the record disk by positioning said second transducer head exactly between pairs of adjacent tracks on said other face of the record disk, using said first transducer head for re-recording each track on said first face of the record disk; and

repeating the above steps for reducing the positional error between tracks, until said positional error is reduced to a predetermined amount.

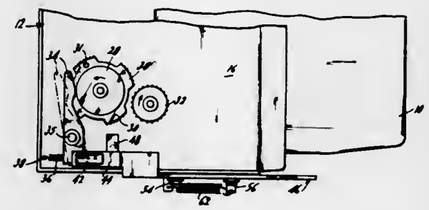
4,074,327

AUTOMATIC STOP SYSTEM FOR A TAPE RECORDER

Bernard Berger, New Rochelle, N.Y., assignor to Morse Electro Products Corporation, Brooklyn, N.Y.

Filed Jan. 21, 1976, Ser. No. 650,909
Int. Cl.² G11B *15/48, 21/08*
U.S. Cl. 360—74 **4 Claims**

1. In a tape player for a multi-channel tape including a tape head and means operative to move said multi-channel tape past said tape head, the combination comprising, switch means for coupling a source of power to said tape player, a deactivating member pivotably mounted on said tape player, means mounting said switch means for selective movement relative to the movement path of said deactivating member and control means including an indexing member operatively mounted in said tape player for movement at the end of each tape channel and a control member positioned on said indexing member for engagement with one end of said deactivating member, the



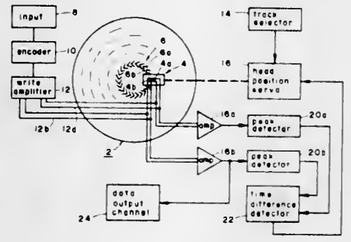
opposite end of said deactivating member being positioned for movement in response to the engagement of the deactivating member by said control member into engagement with said switch means for disconnecting the source power from said tape player.

4,074,328

METHOD AND APPARATUS FOR RECORDING AND REPRODUCING INFORMATION ON A PLURAL-TRACK RECORD DISK

John F. Hardwick, Glenrothes, Scotland, assignor to Burroughs Corporation, Detroit, Mich.

Filed June 24, 1976, Ser. No. 699,273
Claims priority, application United Kingdom, June 27, 1975, 27288/75
Int. Cl.² G11B *21/10, 5/56*
U.S. Cl. 360—77 **10 Claims**



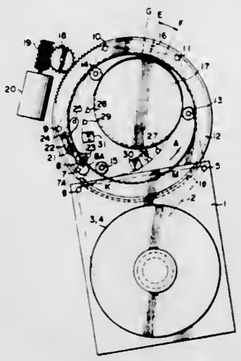
1. A transducer track-centering method utilizing a direct sensing of data position for reproducing retrievable informational data with respect to a selected one of a plurality of circular concentric tracks on a record disk, comprising: selecting a track on which the data is to be recorded; positioning with respect thereto transducer means including two recording-reproducing devices fixed at a predetermined angle to each other, the two devices being positioned at opposite sides of the center line of the selected track and at equal acute angles with respect thereto; utilizing both said recording-reproducing devices concurrently for recording said data so that the same data is recorded in two angular zones with respect to the center line of the selected track; utilizing both recording-reproducing devices concurrently for reading-out said so-recorded data from the angular zones of the selected track; outputting the data from one of the recording-reproducing devices to an output device; detecting any difference in the time that the outputted data is read-out from the one recording-reproducing device and the time that the same data is read-out from the other recording-reproducing device; producing an error signal corresponding to said time difference; and utilizing said error signal to move the transducer means in a substantially perpendicular direction with respect to the center line of the selected track in the direction tending to reduce the error signal to zero.

4,074,329

ROTARY HEAD TYPE MAGNETIC RECORDING AND REPRODUCING SYSTEM

Hideki Sakumoto, Katano, and Yoshiteru Namoto, Moriguchi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 17, 1976, Ser. No. 658,754
Claims priority, application Japan, Feb. 19, 1975, 50-21174; Feb. 19, 1975, 50-21176
Int. Cl.² G11B *5/08*; G03B *1/56, 1/04*; G11B *5/008*
U.S. Cl. 360—85 **4 Claims**



1. A rotary head type magnetic recording and reproducing system comprising:

a. a tape cassette having an opening formed in one end accommodating a supply reel and a take-up reel, both said reels being coaxially and rotatably mounted within said cassette and carrying a magnetic tape wound on them such that a tape portion extending along said opening is inclined with respect to said cassette from a level identical with that of one reel to a level identical with that of the other reel;

b. a cylinder including a rotary magnetic head assembly;

c. a rotary ring extending parallel to the reels in said cassette in the loaded state and surrounding said cylinder;

d. a drive means for rotating said rotary ring selectively in either forward or reverse direction; and

e. a first tape take-out post (7) mounted on said rotary ring, the top end of said first tape take-out post being lower in level than the lower edge of tape wound on the upper one of said reels within said cassette and also being higher than the upper edge of tape wound on the lower reel;

said rotary ring being rotated at the time of tape loading for introducing said first tape take-out post into the inner side of the tape at a position closer to the upper reel and then causing the first post to engage the tape at a position closer to the lower reel and withdraw the tape progressively out of the cassette, thereby to pass the tape around said cylinder over a peripheral portion thereof subtending a predetermined angle.

4,074,330

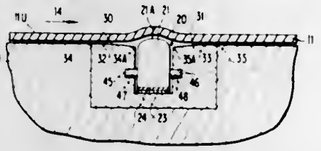
FLEXIBLE DISK STORAGE APPARATUS

David Gibbons Norton, Boulder, and Gary Thorup Wright, Longmont, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 30, 1976, Ser. No. 719,023
Int. Cl.² G11B *15/64, 5/60, 5/82*
U.S. Cl. 360—102 **14 Claims**

1. Magnetic recording apparatus having a rotatable flexible circular record disk disposed over a flat plate, characterized in that:

said flat plate has an elongated groove opening to said flexible record disk and having a substantial radial length;
a transducer movably disposed for radial displacements along said groove for transducing operations with respect to said flexible record disk and substantially closed to axial air flow and to radial air flow at each radial extremity thereof and extending to be juxtaposed to a circumferential edge of said flexible record disk; and
pull down means having up-stream and down-stream air bearing means extending from said flat plate toward said flexible record storage disk and being respectively dis-



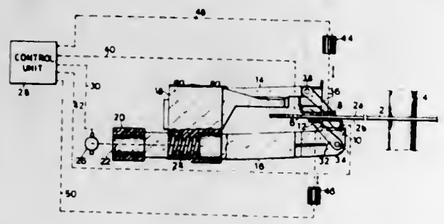
posed along said groove on opposite sides thereof for inducing a pull down force on said flexible record disk toward said transducer, each said air bearing means having a radially elongated convex surface raised from said flat plate toward said record disk each with a radially extending apex such that the circumferential extent of both air bearing means is greater between the apexes adjacent said groove than remote from said groove whereby disk motion over said air bearing means tends to remove air from said groove to generate a pull down action on said disk over said groove and between said apexes independent of transducer radial position.

4,074,331

MAGNETIC RECORDING HEAD STRUCTURE FOR RECORDING ON BOTH SIDES OF A RECORD MEMBER

James Michael O'Reilly, Tillicoultry, and Alexander Smith Murison, Kirkcaldy, both of Scotland, assignors to Burroughs Corporation, Detroit, Mich.

Filed Oct. 1, 1976, Ser. No. 728,804
Claims priority, application United Kingdom, Oct. 3, 1975, 40492/75
Int. Cl.² G11B *5/48*
U.S. Cl. 360—104 **3 Claims**



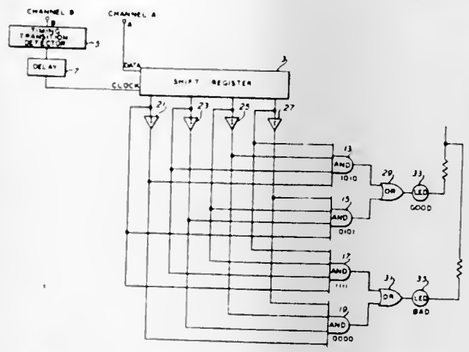
1. A magnetic recording head assembly for recording information on opposite surfaces of a flexible record member comprising:
a pair of magnetic recording heads, each said recording head having a recording face adapted to contact a surface of the record member, said recording faces being of substantially D-shape and having a magnetic core transducer means eccentrically disposed thereon adjacent to and parallel to the straight bar of the "D", each of said magnetic core transducer means comprising a read/write core having a non-magnetic gap and low friction non-magnetic material aligned with the read/write magnetic core and a pair of erase cores having non-magnetic gaps disposed on opposite sides of the low-friction non-magnetic material;
means for supporting and positioning one of said pair of magnetic recording heads adjacent to one of the surfaces of said flexible record member and the other of said pair of magnetic recording heads adjacent to the opposite surface of the record member with the straight bar portions of said recording heads being parallel to and in close proximity to each other on opposite sides of said flexible record member; and
a pair of pressure pads supported by said positioning and supporting means on opposite sides of the flexible record member, each of said pressure pads being in registry with an associated magnetic recording head located on the opposite side of the flexible record member, each of said pressure pads adapted to bias the flexible record member into cooperative relationship with its associated magnetic recording head, said pressure pads being positioned closely adjacent to the straight bar portion of the magnetic recording head that is located on the same side of the flexible record member whereby the D-shape of the magnetic recording heads enables the compact arrangement of a pair of magnetic recording heads and their associated pressure pads.

4,074,332

METHOD AND DIGITAL CIRCUIT FOR MEASURING SKEW OF MAGNETIC HEADS

Frank T. Innes, Chester, N.J., assignor to Litton Business Systems, Inc., Morris Plains, N.J.

Filed May 27, 1976, Ser. No. 690,710
Int. Cl.² G11B *5/43*
U.S. Cl. 360—137 **8 Claims**



1. A magnetic tape skew measuring circuit comprising:
a shift register means having at least two stages;
at least two AND cirucits, each coupled at its input to the output of said at least two stages of said shift register means;
an OR circuit means whose inputs are coupled to the output of only two of said AND circuits;
the outputs of each of said stages of said shift register means being coupled to each of said at least two AND circuits; and
first transmission means, coupled to the output of each stage of said shift register, for coupling the true and complement output signals from the second and first stages, respectively, to each of said AND circuits.

4,074,333

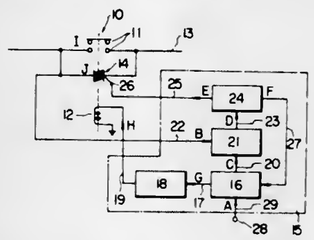
A.C. RELAY SYSTEM

Kanemichi Murakami; Yoshihiro Ishida, and Kazuo Okubo, all of Ise, Japan, assignors to Shinko Electric Company, Ltd., Tokyo, Japan

Filed July 15, 1976, Ser. No. 705,708
Int. Cl.² H01H *33/59*
U.S. Cl. 361—13 **2 Claims**

1. An A.C. relay system for making and breaking an A.C. power line, comprising in combination:

an electromagnetic relay having contacts for making and breaking the power line and a coil for opening and closing said contacts;
a bilateral gated semiconductor connected across said contacts; and
a control circuit for controlling said relay and semiconductor, said circuit comprising; a sequence control unit receptive of an energizing signal from an external source, a phase detector having inputs connected to said sequence control unit and to one of the terminals of said semiconductor, a semiconductor firing unit having an input connected to said phase detector and outputs connected to the gate of said semiconductor and to said sequence control unit, and a relay energizing unit having an input connected to said sequence control unit and an output connected to said coil of the relay, said sequence control unit



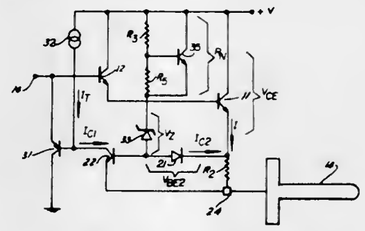
being adapted to be actuated by said energizing signal to energize said phase detector, said phase detector energizing said semiconductor firing unit so as to fire said semiconductor when the phase angle of a voltage on the power line is zero, said semiconductor firing unit simultaneously producing a signal to said sequence control unit for actuating said relay energizing unit thereby actuating said relay and turning off said semiconductor, and upon cessation of said energizing signal said sequence control unit deenergizing said relay energizing unit to open said contacts so that a load current of the power line is directed to pass through said semiconductor, said sequence control unit upon lapse of a suitable time interval de-energizing said semiconductor firing unit to interrupt the gate signal, and said semiconductor becoming turned off when the load current drops below a holding current for said semiconductor.

4,074,334

PROTECTIVE DEVICE FOR A POWER ELEMENT OF AN INTEGRATED CIRCUIT

Sebastiano D'Arrigo, Sedriano (Milan), and Giovanni Ghiringhelli, Segrate (Milan), both of Italy, assignors to SGS-ATES Componenti Elettronici S.p.A., Agrate Brianza (MI), Italy

Filed Sept. 17, 1976, Ser. No. 724,463
Claims priority, application Italy, Sept. 18, 1975, 27341/75
Int. Cl.² H02H *7/20*
U.S. Cl. 361—79 **6 Claims**



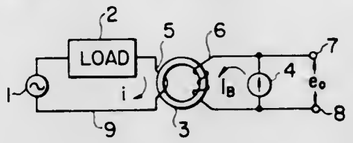
1. In integrated circuitry including a power element traversed by an output current and a protective device for confining the values of said output current and of an accompanying voltage drop across said power element to a predetermined area of a current/voltage diagram partly bounded by a generally exponential curve,
the improvement wherein said protective device comprises:
an output resistance in series with said power element;
a monitoring amplifier with input connections across said output resistance, said input connections including a unidirectionally conductive component with a generally logarithmic conduction characteristic connected to a junction of said power element with said output resistance;
a threshold circuit connected across an input of said power element and controlled by said monitoring amplifier for shunting out part of an incoming signal upon said values approaching said boundary; and
a voltage-sensing network connected in series with said component across said power element, said network including a series combination of electronic switch means and two-terminal breakdown means having a substantially current-independent voltage upon reaching a predetermined firing potential, said switch means significantly modifying the resistance of said network in a voltage range exceeding said firing potential.

4,074,335

DETECTING CIRCUIT

Kazuo Takasugi, Higashi-yamato, Japan, assignor to Hitachi, Ltd., Japan

Filed Jan. 21, 1976, Ser. No. 650,857
Claims priority, application Japan, Jan. 24, 1975, 50-9716
Int. Cl.² H02H *3/08, 5/04*
U.S. Cl. 361—87 **17 Claims**



1. A detecting circuit comprising:
at least one magnetic core having a rectangular magnetic characteristic;
at least one first winding means coupled magnetically to said magnetic core;
at least one second winding means coupled magnetically to said magnetic core;
first power supply means comprising an alternating current source connected to said first winding means, for applying a first current to be detected to said first winding means;
second power supply means comprising a direct current source connected to said second winding means, for applying a reference current to said second winding means;
means connected to said second winding means, for deriving at least one output signal from said second winding means; and
means connected to said first power supply means and said first winding means for changing the first current in response to a condition of an object.

4,074,336

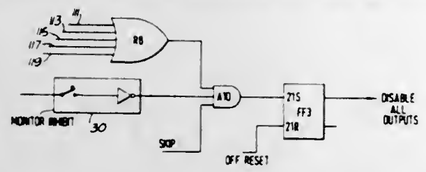
PROTECTION CIRCUITS FOR COMPUTER BASED CONTROL SYSTEMS

Geoffrey Clarke, Blunsdon, near Swindon, England, assignor to Square D Company, Park Ridge, Ill.

Filed June 23, 1976, Ser. No. 699,135
Claims priority, application United Kingdom, June 28, 1975, 27420/75
Int. Cl.² H02H *7/20*
U.S. Cl. 361—88 **5 Claims**

1. In a computer based control system, a protection circuit comprising first and second gating means responsive to input signals from the control system for generating output signals,

and disabling means responsive to the output signal from said first gating means for disabling the output of the control system, and input of the first gating means receiving an input signal at a predetermined time, or at the end of, a scan period of the control system, another input of said first gating means connected to the output of the second gating means, said second gating means having a number of inputs each connected to a respective part of the control system so that said second



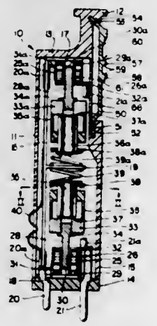
gating means passes its output signal to said first gating means on an occurrence of a fault at any one of said parts of the control system and said second gating means interrogates said number of inputs before an address of the control system takes place to determine that said parts of the control system are in the right state for causing said first gating means to activate, at said predetermined time, said disabling means for disabling all outputs of said control system.

4,074,337

PROTECTOR FOR TELECOMMUNICATION LINES

George Debortoli, and Detlef Zimmermann, both of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Oct. 27, 1976, Ser. No. 736,172
Int. Cl.² H02H *3/08, 3/22*
U.S. Cl. 361—124 **6 Claims**



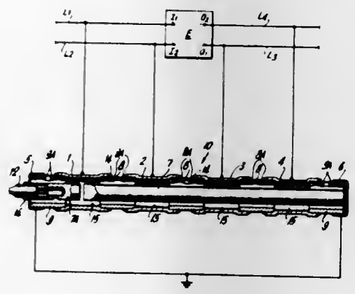
1. A protector for telecommunication lines, comprising:
an electrically insulating housing;
a metallic ground bar extending substantially the length of the housing, said ground bar including first and second end webs extending normal to the longitudinal axis of said housing, and a central web extending from the centre of the ground bar normal to said axis;
a first protection device extending between said centre web and said first end web and a second protection device extending between said centre web and said second end web;
each of said protection devices comprising an overcurrent device and an overvoltage device on a common axis parallel to said axis of said housing;
two pairs of pins extending from a base of said housing, each pair composed of an outside plant pin for connection to outside plant equipment and a central office pin for connection to central office equipment;
said overcurrent device in said first protection device connected between one pair of outside plant and central office pins, said overcurrent device in said second protection device connected between the other pair of outside plant and central office pins;
said overvoltage device in said first protection device connected between one of said outside plant pins and said ground bar and said overvoltage device in said second protection device connected between the other of said outside plant pins and said ground bar;
ground means connected to said ground bar for connection to a ground connector;
the arrangement such that actuation of an overcurrent device directly connects the related outside plant pin to said ground bar, and actuation of an overvoltage device directly connects the related outside pin to said ground bar.

4,074,338

MULTI-ELEMENT SURGE ARRESTER

Frank L. Simokat, Babylon, N.Y., assignor to TII Corporation, Lindenhurst, N.Y.

Filed Nov. 19, 1978, Ser. No. 743,298
Int. Cl.² H02H *9/06*
U.S. Cl. 361—129 **7 Claims**



1. A multi-element protector comprising:
1. a casing formed of an alternating succession of insulator elements and conductive elements sealably connected together to define an array of insulated generally annular electrodes,
2. an elongated electrode disposed within the interior of said elements to provide a common electrode for said annular electrodes and to define annular gaps therewith,
3. end caps connected to said array to cap said casing, at least one of said caps being electrically connected to said common electrode,
4. and at least said one end cap and each of said annular electrodes having means for connection to one of a plurality of equipment input and output terminals whereby a surge appearing across certain of said terminals causes ionization of the respective gap which triggers in turn ionization of the other gaps to minimize differential current flow between all of said terminals.

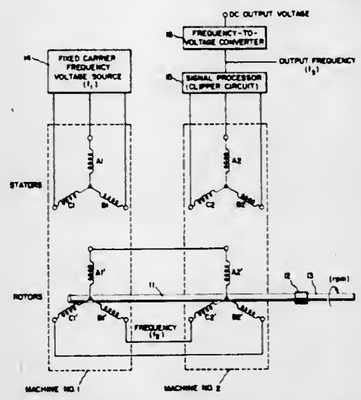
4,074,339

METHOD AND APPARATUS FOR MEASURING THE SPEED OF A ROTATING SHAFT

Fred G. Turnbull, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 6, 1976, Ser. No. 730,144
Int. Cl.² H02P *9/00*
U.S. Cl. 361—239 **10 Claims**

1. A system for generating an electrical signal indicative of the speed of a rotating shaft comprising
at least one electrical machine including at least one rotor having a pair of polyphase rotor windings coupled for rotation with the rotating shaft whose speed is to be measured, said polyphase rotor windings being connected together in parallel circuit relationship with the phase sequence of one rotor winding reversed as compared to the other rotor winding, said electrical machine further including at least one stator having a pair of polyphase stator windings,
source means for applying to one stator winding a fixed carrier frequency polyphase voltage to thereby induce into one rotor winding a second polyphase voltage having



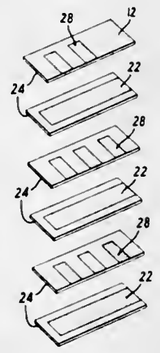
a second frequency representative of shaft speed and consequently induce into the other stator winding a third polyphase voltage having a third frequency also representative of shaft speed, and
output means for deriving from the third induced polyphase voltage an output signal with a frequency indicative of the speed of the rotating shaft and direction of rotation.

4,074,340

TRIMMABLE MONOLITHIC CAPACITORS

William Conrad Leigh, Monroe, Conn., assignor to Vitramon, Incorporated, Monroe, Conn.

Filed Oct. 18, 1976, Ser. No. 733,089
Int. Cl.² H01G *4/34*
U.S. Cl. 361—321 **15 Claims**



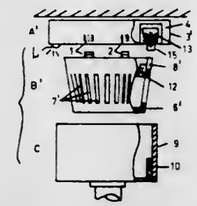
1. A multilayer monolithic ceramic capacitor comprising a dielectric material body having two major surfaces, a first side surface, a second side surface, a first end terminal and a second end terminal; at least two base electrodes each of which is in a plane substantially parallel to the major surfaces and each of which extends to and is coextensive with only the first end terminal there being no base electrodes extending to and in direct contact with the second end terminal; a conductive coating on the first end terminal which electrically interconnects each of the base electrodes extending to and coextensive with the first end terminal; and, at least one incremental electrode which extends, in a plane substantially parallel to the major surfaces, to, and is coextensive with, at least one side surface of the capacitor.

4,074,341

INTERLOCKED SEPARABLE FIRE SENSOR CONSTRUCTION

Werner Niederost, Schmerikon, and Bernhard Durrer, Stafa, both of Switzerland, assignors to Cerberus AG, Mannedorf, Switzerland

Continuation of Ser. No. 528,169, Nov. 29, 1974, abandoned.
This application May 24, 1976, Ser. No. 689,375
Claims priority, application Switzerland, Dec. 7, 1973, 17219/73
Int. Cl.² H02B *9/00*
U.S. Cl. 361—331 **12 Claims**



1. Interlocked, separable fire sensor construction having a socket element (A) adapted for mounting on a supoort including an outer socket housing (3), and a sensor element (B) including a sensor housing (6) and fire sensing and detection means located therein, removably secured to the socket element,
wherein the socket housing (3) is formed with a projecting portion (3″);
the sensor housing (6) fits telescopically within at least a portion of the projecting portion (3″) of the socket housing (3) while leaving a narrow gap between said housings; and
movable sensor element — socket housing interlock means (5, 15, 21; 8, 8′, 23) are provided comprising locking means (5, 15, 21) located on one of said elements (A) and matching engagement recess means (8, 8′, 23) formed on the other of said elements (B), said interlock means being located interiorly of the respective housing behind, and shielded by said projecting socket housing portion (3″) and, upon locking engagement of said elements, being accessible only through said narrow gap and being manually inaccessible, the locking means engaging in said recess means upon relative engaging movement of said elements and preventing disengaging movement of said elements upon engagement of said movable locking means in said recess means.

4,074,342

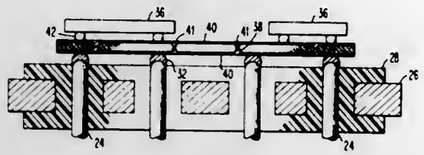
ELECTRICAL PACKAGE FOR LSI DEVICES AND ASSEMBLY PROCESS THEREFOR

James Joseph Honn, and Kenneth P. Stuby, both of Manassas, Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,967
Int. Cl.² H05K *1/04*
U.S. Cl. 361—411 **1 Claim**

1. An electrical package for large scale integrated devices comprising
a. a carrier having terminal members supported therein having circuits thereon,
b. a circuit transposer attached to the carrier terminal members with at least one semiconductor active element mounted on the transposer, the transposer being of the same material as the active element,
c. the carrier being a plastic substrate, having a greater

coefficient of thermal expansion than the active element, and uniformally encapsulating an imbedded metallic web having a coefficient of thermal expansion lower than the active element to make the overall coefficient of expansion of the carrier equal to the active element,



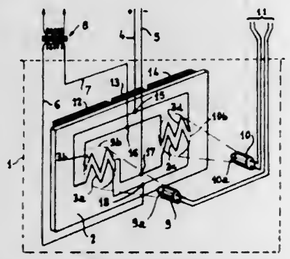
d. the coefficient of thermal expansion of the carrier, transposer and semiconductor active element being 3:3:3 when at operating temperature.

4,074,343

ELECTRIC CURRENT CHOPPER

Jacques Chaussy; Jean-Louis Bret; Adrien Berton, and Jacques Odin, all of Grenoble, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Oct. 20, 1976, Ser. No. 734,093
Claims priority, application France, Oct. 22, 1975, 75 32986
Int. Cl.² H02M *7/00*
U.S. Cl. 363—14 **10 Claims**



1. An electric current chopper for use with a cryostat, comprising resistance means having at least one superconductivity resistance component adapted to be maintained in the cryostat slightly below its superconductivity threshold and a controlled electroluminescent diode placed inside the cryostat for periodically emitting a light beam for heating the resistance component above its threshold.

4,074,344

HIGH POWER FACTOR AC TO DC CONVERTER CIRCUIT

Ira Jay Pitel, Williamsport, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Sept. 22, 1975, Ser. No. 615,503
Int. Cl.² H02M *1/14*
U.S. Cl. 363—44 **7 Claims**

1. A high power factor AC to DC converter circuit comprising:

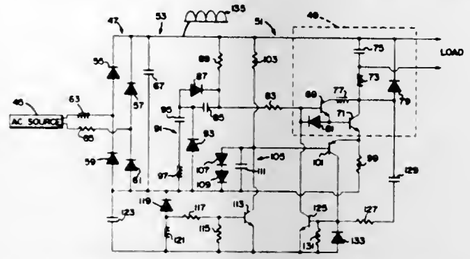
a load circuit;

switching regulator means for providing a DC potential, said switching regulator means including an oscillator circuit coupled to a control circuit with said oscillator circuit having an output circuit with a series connected inductor and capacitor, said capacitor coupled to said load circuit and said inductor coupled to a DC restorer connected to said oscillator circuit;

rectifier means for providing a full-wave rectified pulsating DC potential coupled to said switching regulator means;

a source of AC potential coupled to said rectifier means; and

a radio frequency current filter means connected in circuit with said rectifier means and switching regulator means, said filter means including a radio frequency responsive capacitor shunting said rectifier means a pulsating current



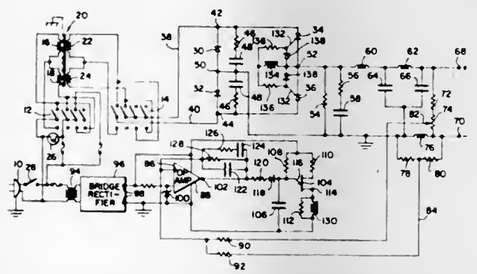
flow in phase with and of at least 50% duration of said potential available from said AC potential source a power factor of at least 90%.

4,074,345

ELECTRONIC POWER SUPPLY

Walter J. Ackermann, No. 6 Lounsbury Ave., Norwalk, Conn. 06851

Filed Nov. 2, 1976, Ser. No. 738,187
Int. Cl.² H02M *1/14*
U.S. Cl. 363—48 **2 Claims**



1. An electronic power supply comprising a full wave bridge rectifier having two adjacent legs thereof, utilizing a pair of silicone control rectifiers, said bridge rectifier having input and output terminals, a transformer having a pair of primary windings and a pair of secondary windings, first means to switch said primary windings in a series electrical circuit or a parallel circuit, second means to switch said secondary windings in a series electrical circuit or a parallel circuit independently operable of said first means, said secondary windings coupled to the input terminals of said bridge rectifier, a filter circuit including at least one series inductance and at least one shunt capacitance having input terminals and output terminals, said input terminals of said filter circuit coupled to said output terminals of said bridge rectifier, an amplifier, said amplifier having input terminals and output terminals, a voltage divider network, said voltage divider network coupled to said output terminals of said filter circuit, a pair of resistors, said pair of resistors coupled together in a series circuit in series with said input terminals of said filter circuit, said voltage divider network coupled to said input terminals of said amplifier, the juncture of said pair of resistors coupled to said input terminals of said amplifier, a uni-junction transistor, said uni-junction transistor having gate terminals and output terminals, said gate terminals of said uni-junction transistor coupled to said output terminals of said amplifier, a pulse transformer having a primary winding and a secondary winding, said primary winding of said pulse transformer coupled to said output terminals of said uni-junction transistor, said pair of silicone control rectifiers having

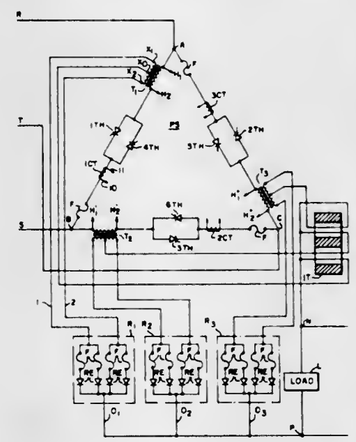
gate terminals, said secondary of said pulse transformer coupled to said gate terminals.

4,074,346

POWER SUPPLY PROTECTIVE CIRCUIT

John A. Riley, Williamsville, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 13, 1976, Ser. No. 685,825
Int. Cl.² H02M *1/18*
U.S. Cl. 363—50 **9 Claims**



1. A protective circuit for a power supply including an alternating current power source coupled to at least one bilateral controlled static power switch mounted in the primary of a transformer stage comprising:

means for detecting a voltage unbalance condition in said transformer primary for generating an error signal characteristic of said unbalance; and

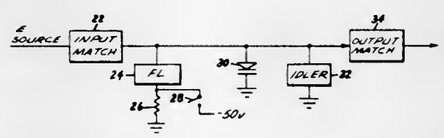
means operative in relation to said error signal for preventing damage to said power supply as a result from said unbalance; with said detecting means including means for integrating said unbalance condition over at least one cycle of said voltage alternating current power source.

4,074,347

VARACTOR FREQUENCY MULTIPLIER AND SWITCHING CIRCUIT

Roger D. Hall, Encino, Calif., assignor to The Bendix Corporation, North Hollywood, Calif.

Filed Sept. 17, 1976, Ser. No. 724,190
Int. Cl.² H02M *5/06*
U.S. Cl. 363—158 **9 Claims**



1. A frequency multiplying circuit including a varactor, a source of pulses of high frequency voltage of substantial power, filter means connected between said source and said varactor, an idler circuit connected to said varactor and band pass filter means connected to the output of said varactor, said varactor being self-biased such that it reaches a snap condition during which it generates harmonic frequencies:

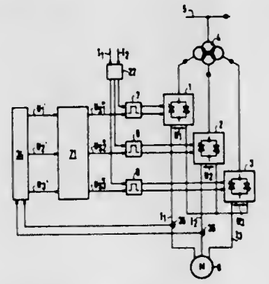
wherein the improvement comprises a drive circuit connected to said varactor including means supplying a negative-going gating pulse of voltage sufficient to bias said varactor to its off condition.

4,074,348

CIRCUIT ARRANGEMENT WITH A NUMBER OF CYCLOCONVERTERS, PARTICULARLY DIRECT CYCLOCONVERTERS IN Y-CONNECTION

Theodor Salzmann; Wolfgang Timpe, both of Erlangen, and Manfred Weibelzahl, Weiher, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 2, 1976, Ser. No. 663,131
Claims priority, application Germany, Mar. 3, 1975, 2509177
Int. Cl.² H02M *5/27*
U.S. Cl. 363—160 **3 Claims**



1. A circuit arrangement comprising:

an odd number *m* of Y-connected cycloconverters adapted to be connected to an AC network and to a symmetrical m-phase load without a direct connection between the Y-point of said cycloconverters and the Y-point of said load, said load having phase voltages of a predetermined periodic waveform and together forming a symmetrical system;

a number of control units for supplying control voltages to said cycloconverters such that each converter has an output voltage which is a periodic waveform comprised of a waveform corresponding to a predetermined one of said phase voltages and of a waveform of at least one harmonic of an odd order divisible by *m;*

a regulating device for generating *m* output voltages of periodic waveform;

and a converter stage for converting said output voltages and including means for supplying said converted output voltages to said control units, said converter stage converting said output voltages such that during each region from $\pi/3$ to $2\pi/3$ of a half wave of each particular output voltage that output voltage is reduced to $\sqrt{3}/2$ times its peak value and the other two output voltages are increased by an amount equal to the difference between said peak value and $\sqrt{3}/2$ times said peak value.

4,074,349

METHOD AND A SYSTEM OF NUMERICALLY CONTROLLING A CUTTING MACHINE

Masanobu Ueda, Suita, Japan, assignor to Dainichi Kinzoku Kogyo Co., Ltd., Amagasaki, Japan

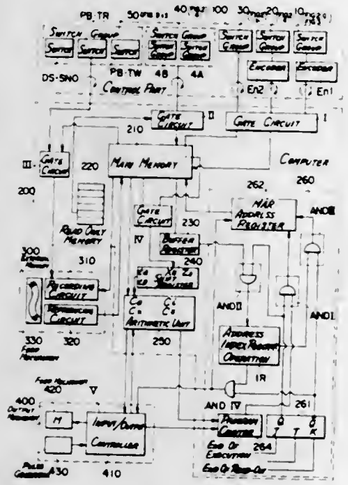
Filed Oct. 22, 1975, Ser. No. 624,993
Claims priority, application Japan, Apr. 9, 1975, 50-43636
Int. Cl.² G06F *15/46*
U.S. Cl. 364—107 **6 Claims**

1. A method for numerical control of the displacement of a working tool with respect to a rotated article according to a computer having a main memory capable of storing an executing program block and data; an executing part for executing arithmetic operation according to said executing program block; a read only memory storing plural executing program blocks therein; an input-output controller for controlling the transfer of signals to an external device; and a control unit for

controlling the introduction of the executing program block from the read only memory into the main memory, the read out of one instruction of the executing program block, the read out of the data of the main memory by said executing program block, the execution of arithmetic operation of the executing part, and the transfer of signals by the input-output controller; comprising

a. a step of first coding a data group concerning the limit displacing distances of said working tool in the radial and axial directions of said rotated article and storing thus coded signals with sequential codes in the main memory of said computer;

b. a step of second coding a data group for determining the distance of displacement of said working tool according to the mode of working and storing thus coded signals into the main memory of said computer, said data group at least containing, as reference data for coordinate values of work start point, data indicating the coordinate values of



position of the blades of said working tool with respect to the rotational center of said article at an end face thereof from which the working is to be started, said working tool being stopped at said position after a trail working on said rotated article;

c. a step of selecting one of said plural executing program blocks and introducing thus selected program block into said main memory of said computer;

d. a step of introducing, upon reception of a work start signal, said coded signals with sequential codes into the executing part of said computer according to the instruction signals of said executing program block stored in said main memory; and

e. a step of introducing pulse train signals proportional to the distance of displacement of said working tool into the executing part of said computer and controlling the displacement of said working tool by means of an output signal obtained from said computer.

4,074,350

SOFT-WIRED MACHINE TOOL CONTROL

Gerald V. Roch, Indianapolis, Ind., and James P. Wiles, Olean, N.Y., assignors to Hurco Manufacturing Company Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 558,213, March 14, 1976. This application Mar. 3, 1976, Ser. No. 663,538

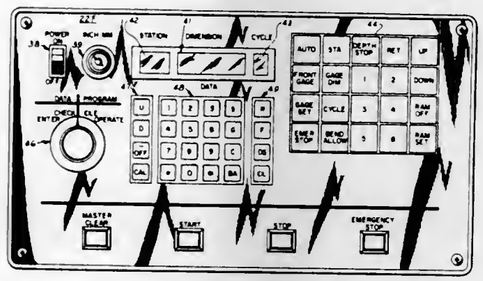
Int. Cl.² B21D *5/02*

U.S. Cl. 364—107 **10 Claims**

1. In positioning apparatus for machines, the improvement comprising:

a machine drive means, and a workpiece material locating gauge;

a controller having read-only memory means therein and random access memory means therein and a microprocessor therein and a numerical keyboard for sequential entry into said random access memory means of a group of gauge and machine drive position data numbers to identify gauge and machine drive position to be achieved, and additional keys for entry of instructions to said random



access memory means and microprocessor for processing said data numbers according to said instructions to produce output control signals in a desired sequence;

said controller supplying first control signals for controlling said gauge positioning and second control signals for controlling said machine drive, said controller being programmed to produce control signals to automatically drive said gauge and machine drive to positions in accordance with said position data in sequence according to said instructions.

4,074,351

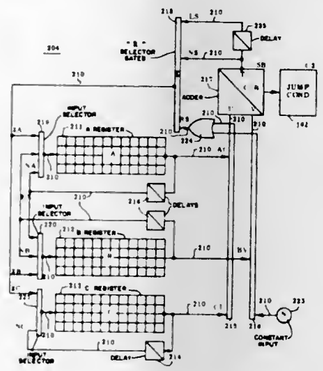
VARIABLE FUNCTION PROGRAMMED CALCULATOR

Gary W. Boone, Sunnyvale, Calif., and Michael J. Cochran, Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 529,251, Dec. 2, 1974, abandoned, which is a division of Ser. No. 420,999, Dec. 3, 1973, which is a continuation of Ser. No. 163,565, July 19, 1971, abandoned. This application Feb. 24, 1977, Ser. No. 771,498

Int. Cl.² G06F *15/04*

U.S. Cl. 364—200 **20 Claims**



1. A calculator system implemented in large-scale-integrated semiconductor means comprising:

(a) addressable storage means included in the semiconductor means for storing fixed program instructions to control the operation of the calculator system;

(b) a plurality of separate control means included in the semiconductor means coupled to said addressable storage means and responsive to said program instructions for

decoding the program instructions and generating control signals in accordance with said program instructions;

(c) data register means included in the semiconductor means for storing and shifting in parallel a plurality of multi-bit words of coded information;

(d) parallel arithmetic-logic means included in the semiconductor means coupled to said control means and to said data register means for performing parallel arithmetic and logic operations on said multi-bit words in accordance with said control signals to provide resulting answers;

(e) input means coupled to said data register means for inputting said coded information into said data register means; and

(f) output means for outputting said resulting answer.

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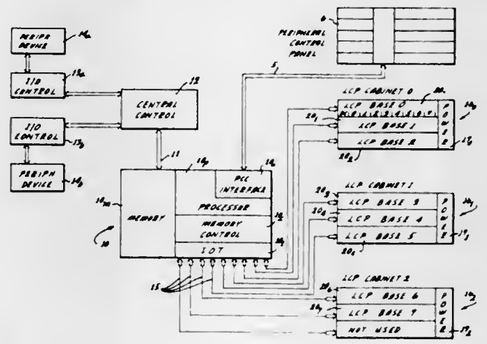
MODULAR BLOCK UNIT FOR INPUT-OUTPUT SUBSYSTEM

Darwen John Cook, Alhambra, and Donald Alexander Millers, II, San Clemente, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Sept. 30, 1976, Ser. No. 728,456

Int. Cl.² G06F *3/04*

U.S. Cl. 364—200 **11 Claims**



1. In a digital system for the transfer and control of digital information between a first main system which includes a processor with main memory having an I/O translator interface unit, and a plurality of remote peripheral terminal units, wherein each peripheral terminal unit is connected to the main system via a corresponding line control processor, and wherein groups of said line control processors at a given site are organized into Base Modules, a Base Module unit comprising:

(a) a plurality of line control processors, each of which has its own dedicated connection to a corresponding peripheral terminal unit and wherein each of said line control processors is adapted to handle the particular discipline required by its corresponding peripheral terminal unit,

each of said line control processors including a data buffer memory having sufficient memory space for storing at least one complete message block of information data and control data;

(b) a single backplane common to each of said plurality of line control processors within said Base Module, said backplane including transmission lines from each line control processor to a distribution-control means, said transmission lines being selectively activated by said distribution-control means;

(c) connection means for connecting of each said plurality of line control processors with a dedicated transmission line to its corresponding peripheral terminal so that each peripheral terminal has an unimpeded exclusive line connection to its corresponding line control processor;

(d) a distribution-control means including:

(d1) message level interface means including logic means to connect a data path having a standard transmission discipline to said I/O translator interface of said main system, said message level interface operating to transfer a stream of characters without interruption until a complete message block is transferred;

(d2) means to signal said main system if an addressed line control processor is busy;

(d3) means to signal said main system if an addressed line control processor is available, and to connect said addressed line control processor to said main system;

(d4) means, when a line control processor requests access, to connect said requesting line control processor to said main system, by activation of selected backplane transmission lines to said line control processor requesting access;

(d5) means for setting a local base priority value number for each line control processor within a given base module, and using said value number for determining priority of access when simultaneous requests for access occur between line control processors in the same Base Module.

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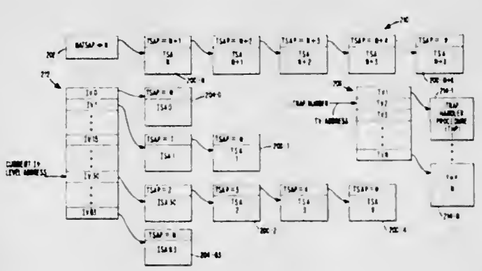
TRAP MECHANISM FOR A DATA PROCESSING SYSTEM

William E. Woods, Natick; Philip E. Stanley, Westboro; Kenneth J. Izbicki, Hudson, and Steven C. Ramsdell, Lowell, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed May 24, 1976, Ser. No. 689,014

Int. Cl.² G06F *9/20, 11/00*

U.S. Cl. 364—200 **13 Claims**



1. A trap mechanism in a data processing system which includes a central processing device, a memory device and a plurality of data processing devices, each of said devices coupled to a system bus for the transfer of data thereover, each of said devices having an interrupt level associated therewith, said interrupt levels indicating priorities for gaining access to said system bus, an interrupt level of a first priority will have precedence to said system bus over a said device having an interrupt level of a second priority, said mechanism further comprising:

A. a plurality of trap save areas, in said memory device each of said areas including a plurality of locations for storing information;

B. first means for linking said plurality of trap save areas with each other to form a pool of said trap save areas, said means for linking including pointer means in each of said areas for pointing to another of said areas so that a first said area points to a second said area and so that second said area points to a third said area until a next to last said area points to a last said area;

C. means for indicating the interrupt level specified by one of said devices which requires the processing of data and which requires the execution of a process in said system;

D. means, responsive to a predetermined condition in said system, for loading said locations in one of said areas with information from predetermined sources in said system;

E. means, responsive to said predetermined condition, for unlinking said one of said areas from said pool of said areas; and

F. second means, responsive to said predetermined condition, for linking said linked said one of said areas with said process associated with the device having the interrupt level indicated by said means for indicating.

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PROCESS CONTROL SYSTEM

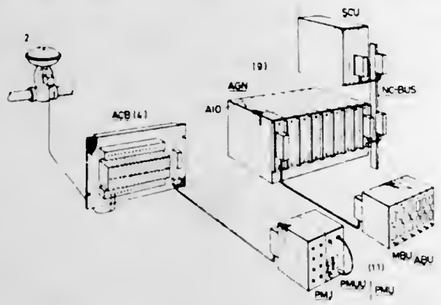
Mutsuaki Nakagawa; Yutaka Wakasa; Hisayuki Uchiike, and Susumu Nagata, all of Musashino, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan

Filed June 3, 1976, Ser. No. 692,329

Claims priority, application Japan, June 17, 1975, 50-73426

Int. Cl.[2] G06F *3/04*

U.S. Cl. 364—200 **6 Claims**



1. In a process control system of the type having a central station with a digital computer; said system including a plurality of field devices located remotely from said central station and including both field sensing devices for developing measurement signals reflecting process conditions such as temperature, and also field control devices responsive to control signals for affecting respective process variables such as fluid flow rate; and means interconnecting said field devices with said central station to provide said computer with data signals corresponding to said measurement signals, and to provide for sending to said field control devices control signals responsive to the digital output signals developed by said computer representing commands for said field control devices; said interconnecting means comprising:

(a) means at said central station responsive to said digital output signals for developing intermediate control signals of common format, each intermediate control signal serving to convey a command for a respective field control device;

(b) a plurality of signal converting units each assigned to a corresponding field control device and serving to transform the intermediate control signal for its assigned device to an analog control signal in the form of a variable current the magnitude of which represents the command for the respective field control device;

(c) a first plurality of analog signal transmission lines each connecting the output of a respective one of said converters to its corresponding field control device to provide for the actuation of that device in accordance with the magnitude of the corresponding analog control signal;

the system further including maintenance backup apparatus comprising:

(1) an analog signal generator located at said central station and operable to develop a manually-settable backup analog signal;

(2) a second plurality of analog signal transmission lines each assigned to a corresponding one of said field control devices;

(3) a selector unit for said analog signal generator including means for connecting said back-up analog signal to one end of any selected one of said second plurality of analog signal transmission lines assigned to a selected one of said field control devices; and

(4) switch means operable to interrupt the connection between the output of any said selected converter unit and the corresponding one of said first plurality of transmission lines, and to establish a connection between said corresponding one transmission line and the other end of said selected one of said second plurality of transmission lines, said settable backup analog signal thereby being transmitted from said analog signal generator to the particular field control device normally supplied with an analog control signal by said selected converter unit, whereby that selected converter unit can if necessary be removed for servicing while its assigned field control device is actuated by the analog backup signal from said signal generator.

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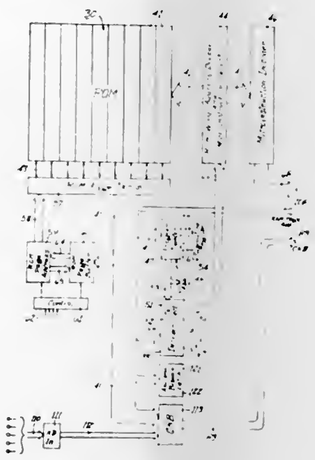
DIGITAL MICROPROCESSOR SYSTEM WITH SHARED DECODE

Graham S. Tubbs, Houston, Tex., assignor to Texas Instruments Incorporated. Dallas, Tex.

Filed Aug. 16, 1976, Ser. No. 714,721

Int. Cl.[2] G06F *9/00*

U.S. Cl. 364—200 **9 Claims**



1. An electronic digital processor system of the type having:

at least one logic unit having a plurality of command inputs, the logic unit executing functional operations in response to operation commands;

memory means for storing instruction words which define the operation of the logic unit and other parts of the system, and addressing means for accessing the memory means;

control means including a programmable logic array having first and second sections, said control means receiving instruction words from the addressable memory means and generating therefrom a plurality of operation commands, the operation commands being coupled to said command inputs;

timing means for generating timing signals for defining a machine cycle including a first interval during which an address is delivered to said addressing means and including a second interval during which an instruction word is delivered to the control means to generate operation commands; the improvement wherein:

the processor system includes a shared decoder having an input and first and second outputs, the first output being connected to the memory means and the second output being connected to said second section of said programmable logic array in said control means, whereby said decoder forms part of said addressing means during the first interval and forms said first section of said programmable logic array during the second interval.

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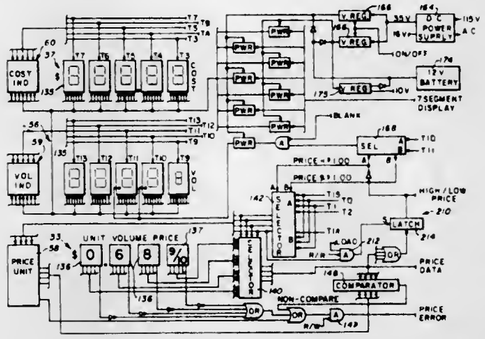
FLUID DELIVERY CONTROL AND REGISTRATION SYSTEM

Robert J. Schiller, Simsbury, and Theodore Charles Perrill, Vernon, both of Conn., assignors to Veeder Industries, Inc., Hartford, Conn.

Filed Sept. 7, 1976, Ser. No. 720,789

Int. Cl.[2] B67D *5/16*; G06F *15/56*

U.S. Cl. 364—465 **28 Claims**



1. A fluid delivery station control and registration system for selectively controlling the delivery of fluid at the delivery station and for accumulating and registering the cost and volume amounts of fluid delivered, comprising a BCD price selector for establishing a BCD unit volume price within a multiple place decimal price range having at least dollar, ten cent and cent places, pulses means for providing a relatively high and low frequency volume pulse trains having 1000 and 100 pulses per unit volume respectively with a volume pulse for approximately each predetermined decimal increment of fluid delivered, selector means for selecting the relatively high frequency pulse train when the established BCD unit volume price is at least 1 dollar and the relatively low frequency pulse train when the established BCD unit volume price is less than 1 dollar, electronic storage memory circuit means having an electronic storage memory for accumulating and storing the cost and volume amounts of fluid delivered, and storage memory control means for selectively resetting the storage memory and for operating the storage memory circuit means for accumulating and storing in the storage memory the cost and volume amounts of fluid delivered in accordance with the established BCD unit volume price and the number of volume pulses of the selected pulse train.

4,074,357

ANALOG CONTROL AND DIGITAL SYSTEM WITH INTEGRATED INTERFACE FOR ELECTRIC POWER AND OTHER PLANTS

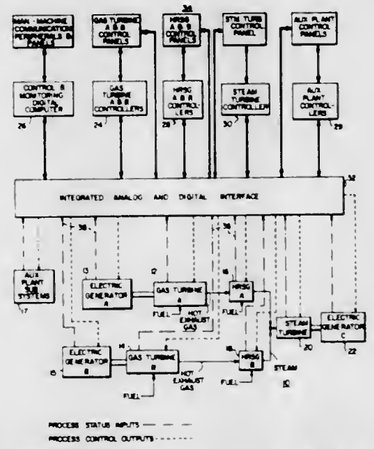
Rash B. Gupta, West Deer Township, Pittsburgh County, and David L. Armstrong, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 15, 1976, Ser. No. 705,631

Int. Cl.[2] F02C *9/02*

U.S. Cl. 364—494 **7 Claims**

1. An integrated digital/analog control system for an electric power or other industrial plant comprising an analog control system and a digital control system, said control systems having means for generating outputs which control the plant in response to input signals therefrom, a plurality of plant transducers and transmitters generating respective input analog signals for use in controlling the plant, respective circuit means for powering each of said analog transmitters and for generating buffered analog signals corresponding to the transmitted analog signals and being compatible with both said analog and digital control systems, an analog input information panel for terminating the buffered analog signals, means for coupling each of said buffered analog input signals from said analog



input information panel to one or both of said analog and digital control systems, a plurality of plant contacts generating respective input digital signals for use in controlling the plant, respective circuit means for conditioning each of said digital signals to a logic level compatible to said analog and digital control systems, a digital input information panel for terminating the digital input logic signals, and means for coupling each of said digital input logic signals from said digital input information panel to one or both of said analog and digital control systems.

4,074,358

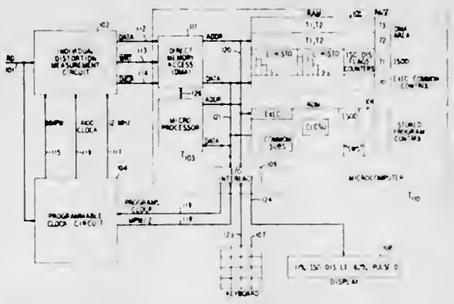
TEST SET FOR MEASURING JITTER DISTORTION OF DATA PULSES

Salvatore Caputo, Long Branch; Scott McDowell Fitch, Holmdel, both of N.J.; Cliff Andrew Harris, Albuquerque, N. Mex.; John Kuhar, Jr., Middletown, N.J.; Andrew Leo Pappas, Tinton Falls, N.J., and Wayne Redlich, Freehold, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 2, 1976, Ser. No. 746,809

Int. Cl.[2] G01R *29/02*; H04B *15/00*; G06F *15/20*

U.S. Cl. 364—514 **17 Claims**



1. A test set for measuring distortion of incoming pulses comprising means responsive to the incoming pulses for constructing a standard pulse, means for generating digital repre-

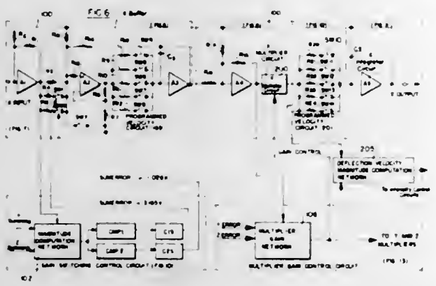
sentations of relative positions in time of the incoming pulses and the standard pulse, means for processing the digital representations of the relative time positions of each of a plurality of the incoming pulses and the standard pulse to obtain the quantity of distortion of the incoming pulse and means for compiling the number of times each distortion quantity is obtained.

4,074,359

VECTOR GENERATOR

Ralph D. Hasenbalg, Canoga Park, Calif., assignor to Vector General, Inc., Woodland Hills, Calif.

Filed Oct. 1, 1976, Ser. No. 728,544
Int. Cl.[2] G06G *7/22, 7/26;* H01J *29/70*
U.S. Cl. 364—521 **10 Claims**



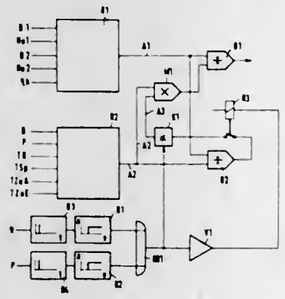
1. A system for generating a vector signal including: circuit means including a multiplier circuit; an integrator coupled to the output of said circuit means; a gain control circuit; means connecting said gain control circuit to said multiplier circuit to control the gain of the multiplier circuit to cause the multiplier circuit to generate a constant output so as to constitute a constant current source for said integrator for linear integration thereby; and a computing network for increasing the dynamic range of the system, said computing network generating an output representing the function (F-I)A; where F represents an end point, I represents the instantaneous value of the output of the system, and A is a value which changes as the output moves towards the end point F

4,074,360

FUEL AND FEEDWATER-MONITORING SYSTEM OF A ONCE-THROUGH STEAM GENERATOR

Lothar Stadie, Hochstadt, and Eberhard Wittchow, Erlangen, both of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed May 9, 1977, Ser. No. 795,023
Claims priority, application Germany, May 11, 1976, 2620734
Int. Cl.[2] G01L *03/26*
U.S. Cl. 364—551 **6 Claims**



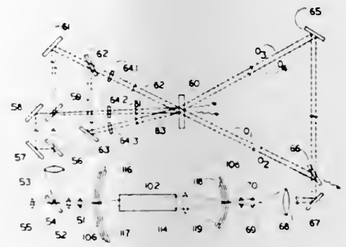
1. Monitoring system for a once-through steam generator for determining deviations between the amount of heat absorbed by the water and the steam of the generator and the amount of heat given off by a firing system for the generator during operating conditions that are not steady-state, as compared to steady-state operation, comprising a first computing circuit responsive to a signal corresponding at least to an amount of fuel for determining a value approximately proportional to the amount of heat given off by the fuel, a second computing circuit responsive to a signal corresponding at least to an amount of feedwater for determining a value approximately proportional to the amount of heat absorbed by the water and the steam, a comparison circuit having inputs connected to respective outputs of said first and second computing circuits, a correction circuit connected between the output of one of said computing circuits and the respective input of said comparison circuit, said correction circuit including a correction member having an output variable only during an operating condition of the steam generator that is not steady-state, said variable output having an effect upon the value of the output of said one computer circuit that is fed to the respective input of said comparison circuit so that, during steady-state operation of the steam generator, the values of the outputs of said computer circuits to the inputs of said comparison circuit are returned as values representing substantially equal amounts of heat for heat given up by the fired fuel and for heat absorbed by the water and the steam.

4,074,361

PARALLEL DATA PROCESSING SYSTEM

Richard G. Clow, 624 Black Canyon Stage, Phoenix, Ariz. 85020

Continuation-in-part of Ser. No. 543,173, Jan. 22, 1975, abandoned, which is a continuation of Ser. No. 398,332, Sept. 18, 1973, abandoned, which is a continuation of Ser. No. 117,784, Feb. 22, 1971, abandoned, which is a continuation of Ser. No. 720,262, April 10, 1968, abandoned. This application May 3, 1976, Ser. No. 682,731
Int. Cl.[2] G06G *9/00;* G03H *1/00;* H01S *3/101*
U.S. Cl. 364—713 **23 Claims**



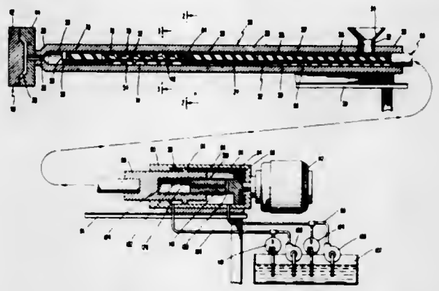
1. A data processor, comprising:
a multi-mode threshold laser, having at least 25 independent, traveling wave modes, all of substantially the same frequency;
a source of coherent optical radiation of the same frequency as said modes of the multi-mode threshold laser; and
a coherent optical computer, for diffracting coherent optical radiation derived from said source and using the diffracted coherent optical radiation to produce twenty-five distinct output beams which are substantially reversals of the beams emitted by said modes of the multi-mode threshold laser; placed adjacent to the multi-mode threshold laser with said output beams impinging on the multi-mode threshold laser; so that each beam of said output beams is injected into exactly one mode of said modes and the oscillation of said mode may be initiated by said output beam.

4,074,362

VENTED INJECTION MOLDING MACHINE

George A. Kruder, Marion, and Clyde S. Gudermuth, Jr., Mount Gilead, both of Ohio, assignors to HPM Corporation, Mount Gilead, Ohio

Filed Nov. 19, 1976, Ser. No. 743,489
Int. Cl.[2] B29B *1/06*
U.S. Cl. 366—82 **9 Claims**



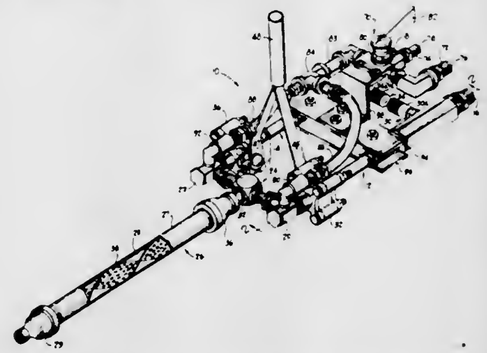
1. A vented injection molding machine operable to masticate, plasticate, and devolatilize synthetic resinous material while preparing the synthetic resinous material for injection into a mold cavity which shapes the material, said machine comprising:
base means;
barrel means cantilever mounted on the base means and having a longitudinal screw-receiving bore, a distal end, a feed opening communicating with the bore to admit synthetic resinous feed material, a discharge opening communicating with the bore at the distal end to deliver material to a mold, and a vent opening between the feed opening and the discharge opening to exhaust liberated gases;
a rotatable reciprocable screw positioned in the screw-receiving bore and including
a first stage having a protruding screw flight with a first pitch, communicating with the feed opening, and operable with the barrel means to receive, masticate and substantially complete plastication of synthetic resinous material,
protruding ring means downstream of the first stage, upstream of the vent opening, cooperating with the first stage to tolerate a variety of synthetic resinous materials, and operable to meter the flow of plasticated material from the first stage, and
a second stage having a protruding screw flight with an axially short pumping section at the downstream end, communicating with the vent opening and the discharge opening, having a second pitch that exceeds the first pitch so that the first stage and the ring means starve feed the second stage to reduce the tendency of material to bleed from the vent opening operable with the barrel means to devolatilize plasticated synthetic resinous material upstream of the short pumping section and to advance the plasticated devolatilized material through the short pumping section without substantial pressurization; and
operating means mounted on the base means, connected with the screw, operable to rotate the screw within the barrel means during plastication of the material, operable to retract the screw from the discharge opening during plastication, and operable to move the screw longitudinally toward the discharge opening while expelling accumulated material therethrough.

4,074,363

APPARATUS FOR GENERATING PLASTIC FOAM

John C. Croft, Barberton, Ohio, assignor to Ric-Wil, Incorporated, Brecksville, Ohio

Filed Sept. 17, 1976, Ser. No. 724,378
Int. Cl.[2] B01F *15/02*
U.S. Cl. 366—138 **1 Claim**



1. Gun-type apparatus for generating plastic foam comprising:
(a) a pair of conduits each connectible at one end to individual supplies of foam material,
(b) an adjustable flow control valve in each conduit,
(c) a manually actuated ball valve in each conduit downstream from each said flow control valve,
(d) adjacent operating handles extending from said ball valves,
(e) means for selectively connecting said handles together for joint actuation, said connecting means being operably disassociable from said handles to permit individual actuation thereof,
(f) a manifold connected to said conduits downstream from said ball valves,
(g) a tubular mixing head connected to said manifold,
(h) twisted perforated strip means extending lengthwise of said mixing head and dividing the interior of said into spiral mixing paths that communicate with each other along the length of said strip through its perforations,
(i) a pressurized air inlet,
(j) a solvent inlet,
(k) passageway means connecting said inlets to said conduits at locations downstream from said ball valves,
(l) selector valve means for selectively communicating each of said inlets to both of said conduits,
(m) check valve means in said passageway means enabling fluid flow from said inlet means to said passages, but preventing flow in the opposite direction, and
(n) frame means supporting and connecting all of the foregoing as a unitized assembly.

DESIGNS

FEBRUARY 14, 1978

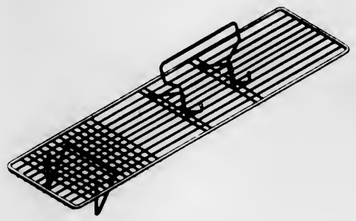
247,201
SPORT SHOE
Morris L. Krome, 9 Roland Mews, Baltimore, Md. 21210
Filed Apr. 23, 1976, Ser. No. 679,821
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310



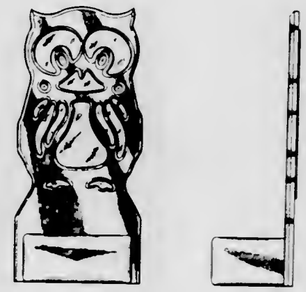
247,202
ATHLETIC HOSE
Henry P. Mueller, 800 Garfield St., Hobart, Ind. 46342
Filed Jan. 21, 1976, Ser. No. 651,057
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—330



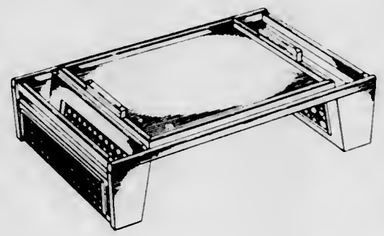
247,203
COMBINATION ACCESSORY TRAY AND BOOK SUPPORT FOR BATHTUBS OR THE LIKE
Gus Levin, 4515 N. Braeswood, Apt. 302B, Houston, Tex. 77035
Filed Feb. 12, 1976, Ser. No. 657,689
Term of patent 14 years
Int. Cl. D23—*02;* D6—*04*
U.S. Cl. D6—91



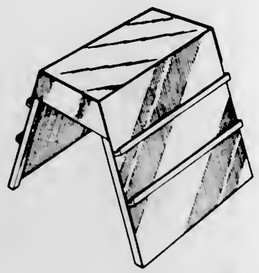
247,204
PLANTER
Gaye Lorraine Daugherty, 12643 Promenade, Dallas, Tex. 75238
Filed Jan. 27, 1977, Ser. No. 763,291
Term of patent 14 years
Int. Cl. D6—*04;* D11—*02*
U.S. Cl. D6—137



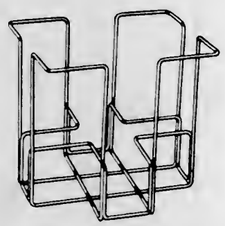
247,205
BED TRAY
Jose P. Mabugat, Cebu City, Philippines, assignor to Linrose Sales Corporation, Marina del Rey, Calif.
Filed Oct. 28, 1976, Ser. No. 736,384
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—138



247,206
READING RACK FOR CHILDREN
Douglas J. Hermann, and Lynda S. Hermann, both of 1430 Bruce Lane, Green Bay, Wis. 54303
Filed July 26, 1976, Ser. No. 708,412
Term of patent 7 years
Int. Cl. D6—*04*
U.S. Cl. D6—184



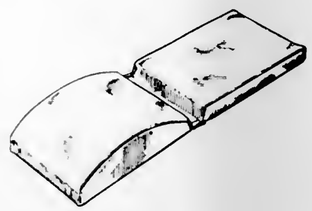
247,207
NEWSPAPER STORING AND BUNDLING DEVICE
James T. Moynihan, 25 Johnson St., Newington, Conn. 06111
Filed May 7, 1976, Ser. No. 684,172
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—184



247,208
COMBINED CABINET SOFFIT AND PLATE SUPPORT UNIT
Ronald D. Pearson, 22015-146th Ave. East, Graham, Wash. 98338
Filed Dec. 8, 1975, Ser. No. 638,369
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—191



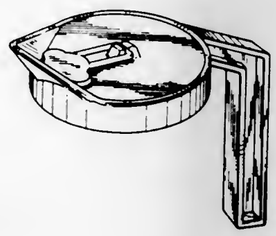
247,209
PATIENT POSITIONING CUSHION
James N. Woog, 11572 65th Place North, Maple Grove, Minn. 55369
Filed Nov. 17, 1975, Ser. No. 632,513
Term of patent 7 years
Int. Cl. D6—*09*
U.S. Cl. D6—201



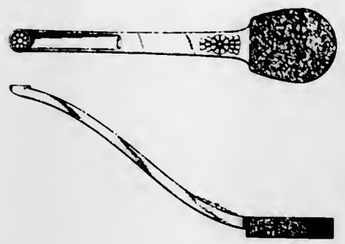
247,210
COMPOTE
Arthur L. Harshman, Dunkirk, Ind., and James I. Messmer, Detroit, Mich., assignors to Florists' Transworld Delivery Association
Filed May 17, 1976, Ser. No. 687,184
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—22



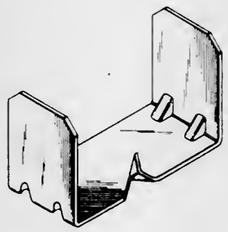
247,211
COMBINED COVER AND DISPENSER FOR A JAR OR THE LIKE
Sidney L. Young, Rte. 1, Delta, Utah 84624
Filed Dec. 8, 1975, Ser. No. 638,470
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—131



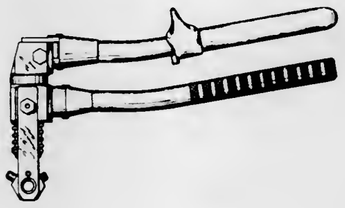
247,212
TOILET BOWL BRUSH
Robert J. Welch, West Chicago, Ill., assignor to Minnesota Mining and Manufacturing Co., St. Paul, Minn.
Filed Jan. 26, 1976, Ser. No. 652,489
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—179



247,213
CAN PUNCTURING TOOL OR SIMILAR ARTICLE
Alfred Nilsen, and James Stewart Calkins, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Filed Aug. 15, 1975, Ser. No. 605,116
The portion of the term of this patent subsequent to Sept. 6, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D8—18



247,214
RIVET GUN
Paul E. Wolf, Box 38C R.F.D., Pascoag, R.I. 02859
Filed Aug. 16, 1976, Ser. No. 716,121
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—51



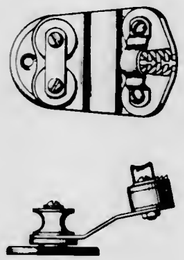
247,215
ROD FOR UNLOCKING AND LOCKING A VEHICLE DOOR
Murray R. Nassau, 9880 W. Bay Harbor Drive, Bay Harbor Island, Fla. 33154
Filed Dec. 20, 1976, Ser. No. 752,552
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—88



247,216
CABLE SUPPORT RACK
Lyle H. Mathews, P.O. Box 3697, Anaheim, Calif. 92803
Filed Aug. 23, 1976, Ser. No. 716,891
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—356



247,217
CAM CLEAT
Carl Alan Merry, Marion, Mass., assignor to Schaefer Marine Products, New Bedford, Mass.
Filed Jan. 27, 1977, Ser. No. 762,835
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—356



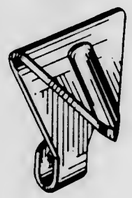
247,218
PORTABLE REEL FOR ELECTRIC EXTENSION CABLE
Robert N. Barber, 3705 N. Miller, Oklahoma City, Okla. 73112
Filed Oct. 12, 1976, Ser. No. 731,325
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—359



247,219
ONE PIECE WALL BRACKET WITH SLOTTED WALL PENETRATING PROJECTION
Richard M. Yensh, 1901 E. Missouri, Phoenix, Ariz. 85016
Filed Aug. 9, 1976, Ser. No. 712,527
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—371



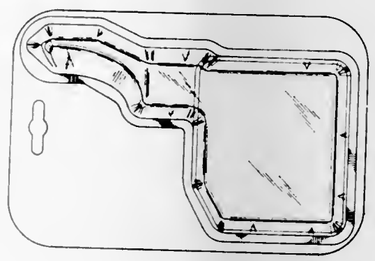
247,220
ONE PIECE WALL BRACKET WITH CORRUGATED WALL PENETRATING PROJECTION
Richard M. Yensh, 1901 E. Missouri, Phoenix, Ariz. 85016
Filed Aug. 9, 1976, Ser. No. 712,529
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—371



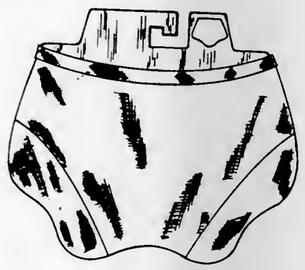
247,221
BOTTLE
Walter Landor, San Francisco, and Richard C. Young, San Rafael, both of Calif., assignors to S. C. Johnson & Son, Inc.
Filed July 16, 1976, Ser. No. 706,083
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—168



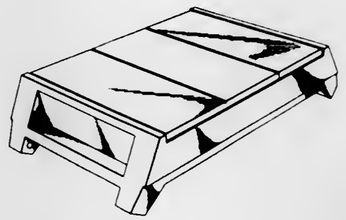
247,222
RIBBON CARTRIDGE PACKAGE
Anthony N. Paone, Syracuse, and William P. Montgomery, Cortland, both of N.Y., assignors to SCM Corporation, New York, N.Y.
Filed July 12, 1976, Ser. No. 704,265
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—192



247,223
PANTYHOSE PACKAGE
Barry G. Carroll, Burlington, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.
Filed Apr. 7, 1976, Ser. No. 674,746
Term of patent 14 years
Int. Cl. D9-03
U.S. Cl. D9—193



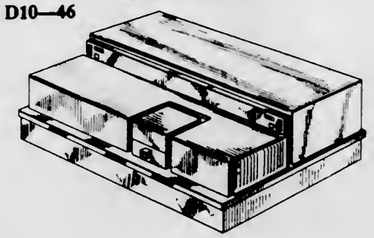
247,224
WRIST WATCH CASE
John Hunter Pemberton, Cambridge, England, assignor to Sinclair Radionics Limited, Huntingdon, England
Filed Oct. 3, 1975, Ser. No. 619,858
Claims priority, application United Kingdom, Apr. 9, 1975, 970574/75
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38

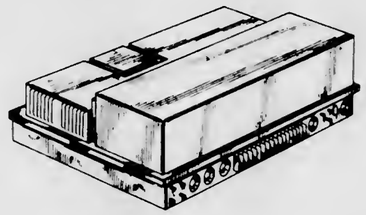


247,225
TOOTH-SHAPED SAND TIMER
Edward K. Beckwith, 303 La Marina, Santa Barbara, Calif. 93109
Filed May 24, 1976, Ser. No. 689,506
Term of patent 14 years
Int. Cl. D10—*03*
U.S. Cl. D10—44

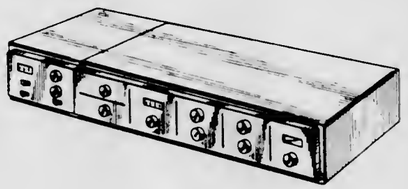


247,226
SPECTROPHOTOFLUOROMETER
James G. Bruni, Glendale; Stephen G. Hauser, Tarzana, both of Calif.; David Lynnwood Leesner, Baltimore, and James Herbert Macemon, Glen Burnie both of Md., assignors to Baxter Travenol Laboratories, Inc.
Filed May 24, 1976, Ser. No. 689,436
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D10—46





247,227
COMPONENT FOR A SPECTROPHOTOFLUOROMETER
James G. Bruni, Glendale; Stephen G. Hauser, Tarzana, both of Calif.; David Lynnwood Leesner, Baltimore, and James Herbert Macemon, Glen Burnie, both of Md., assignors to Baxter Travenol Laboratories, Inc.
Filed May 24, 1976, Ser. No. 689,437
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D10—46



247,228
JEWELRY FINDING
George Viveiros, P.O. Box L-188, New Bedford, Mass. 02745
Filed July 12, 1976, Ser. No. 704,237
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—1



247,229
PLAQUE
William B. Campbell, St. Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Apr. 7, 1976, Ser. No. 674,522
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—135



247,230
PLAQUE
William B. Campbell, St. Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Apr. 7, 1976, Ser. No. 674,525
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—137

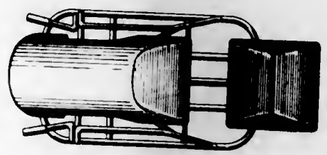


247,231
MOISTENER STATUETTE
Gorgonio M. Solidum, 56 Vesta St., San Francisco, Calif. 94124; Alan J. Jang, 2920 Octavia St., San Francisco, Calif. 94123, and Thomas Yee, 635 28th Ave., San Francisco, Calif. 94121
Filed May 13, 1976, Ser. No. 685,959
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—160

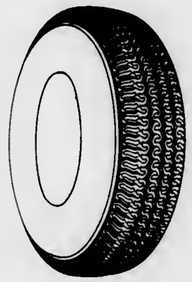


247,232
INVALID'S CHAIR
Robert D. Gunnell, 7768 Waterman Road, Vassar, Mich. 48768
Filed Feb. 25, 1976, Ser. No. 661,058
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D12—54

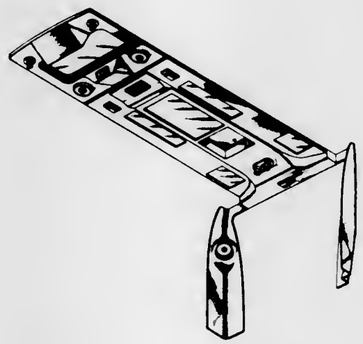




247,233
VEHICLE TIRE
Norio Iwata, No. 29-1, 2-chome, Onta-Cho, Higashi-Murayama, Tokyo, and Hiroshi Kojima, No. 19-5, 4-chome, Higashi-Toyota, Hino, Tokyo, both of Japan
Filed Feb. 3, 1977, Ser. No. 765,125
Claims priority, application Japan, Sept. 22, 1976, 51-37327
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—143



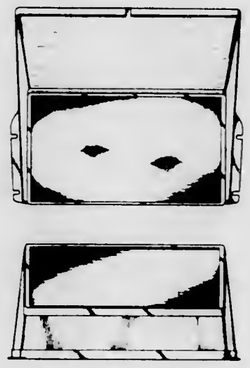
247,234
VAN OVERHEAD CONSOLE
Buster D. Stewart, 16123 Runnymede St., Van Nuys, Calif. 91406
Filed Feb. 9, 1976, Ser. No. 656,415
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155



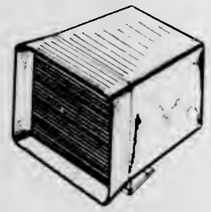
247,235
HAND-HELD MICROPHONE
Paul L. Cote, Windham, N.H., assignor to Gentex Corporation, New York, N.Y.
Filed Mar. 2, 1977, Ser. No. 773,660
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—12



247,236
LOUDSPEAKER
Robert E. Croup, Indianapolis, Ind., assignor to Acoustic Fiber Sound Systems, Inc.
Filed Feb. 9, 1976, Ser. No. 656,151
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—33

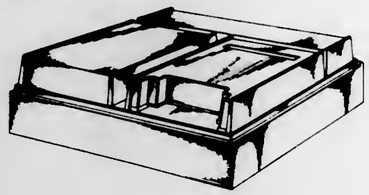


247,237
LOUDSPEAKER
Robert E. Croup, Carmel, Ind., assignor to Acoustic Fiber Sound Systems, Inc., Indianapolis, Ind.
Filed Jan. 29, 1976, Ser. No. 653,341
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—35

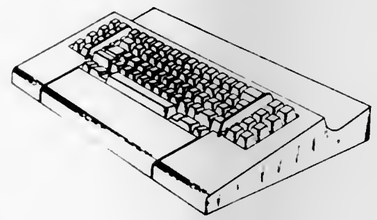




247,238
MODULARIZED HOUSING UNIT FOR ELECTRONIC APPARATUS OR THE LIKE
Helmut Eppich, West Vancouver, and Paul K. L. Dwillies, Delta, both of Canada, assignors to Ebco Industries, Ltd., Richmond, Canada
Filed May 13, 1976, Ser. No. 686,631
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—40



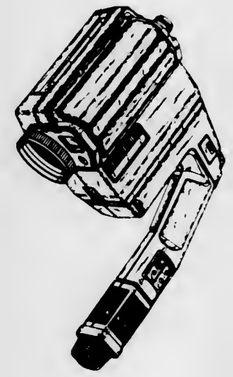
247,239
KEYBOARD
Charles Paul Baechtle, Lake Katrine, and John Van Dyke Stram, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Aug. 2, 1976, Ser. No. 710,831
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—40



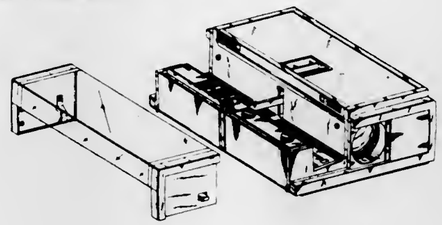
247,240
COMBINED RADIO RECEIVER AND PERPETUAL CALENDAR
Masami Ueda, 6-12 Saidaiji-kita 1-chome, Nara, Nara; Benito Mishiro, C7-403 Shirasagi-danchi 1771, Kansoka-cho, Sakai, Osaka; Toshio Igo, 3-304 Myoken-zaka 3-chome, Katano, Osaka, and Masanori Hamada, 216 Kotobuki-mansion, 1-95 Kyuhoen, Yao, Osaka, all of Japan
Filed Jan. 23, 1976, Ser. No. 651,955
Claims priority, application Japan, Oct. 22, 1975, 50-42485
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—72



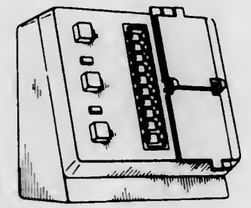
247,241
MOTION PICTURE CAMERA OR THE LIKE
David E. Hansen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Continuation-in-part of Ser. No. 685,490, May 11, 1976, abandoned. This application Aug. 6, 1976, Ser. No. 712,458
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—04



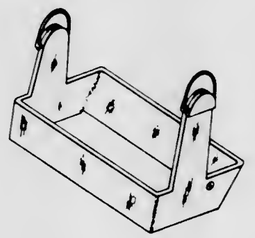
247,242
TRANSPARENCY PROJECTOR
Robert E. Bourke, Weston, Conn., assignor to GAF Corporation, New York, N.Y.
Filed June 11, 1976, Ser. No. 694,945
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D16—21



247,243
SORTER CONTROLLER
John A. Nelson, Pittsford, and Jacob W. Patla, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed May 3, 1976, Ser. No. 682,281
Term of patent 14 years
Int. Cl. D14—*02*; D18—*99*
U.S. Cl. D16—32



247,244
CAMERA CARRYING DEVICE
Harry E. Mazur, P.O. Box 4508, Palm Springs, Calif. 92262
Filed Aug. 16, 1976, Ser. No. 714,610
Term of patent 14 years
Int. Cl. D16—*05*; D3—*02*
U.S. Cl. D16—44



247,245
DUAL VIEWER ATTACHMENT FOR A MICROSCOPE
John T. Armbruster, Niagara Falls, N.Y., assignor to American Optical Corporation, Southbridge, Mass.
Filed Feb. 24, 1976, Ser. No. 660,968
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—83

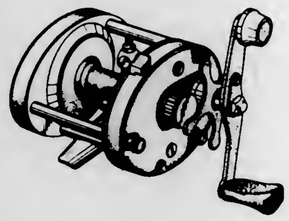




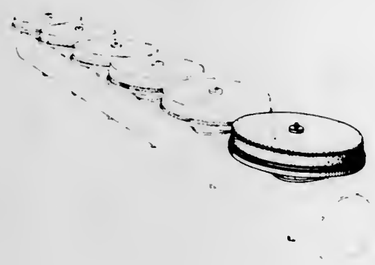
247,246
WRITING INSTRUMENT
Franco Verona, Turin, Italy, assignor to Aurora S.p.A., Turin, Italy
Filed June 28, 1976, Ser. No. 700,621
Claims priority, application Italy, Jan. 28, 1976, 52884/76
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—45



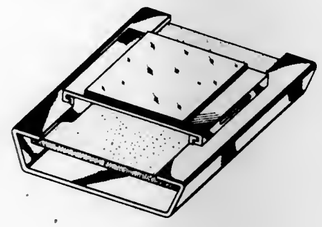
247,247
FISHING REEL
Kiyoshi Okada, Koganei, Japan, assignor to Daiwa Seiko, Inc., Higashikurume, Japan
Filed Aug. 27, 1976, Ser. No. 718,251
Claims priority, application Japan, July 8, 1976, 51-6382
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25



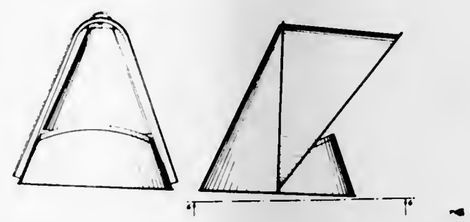
247,248
DIFFUSION PLATE FOR OXYGENATION TREATMENT OF SLUDGE OR THE LIKE
Jean Durot, Villepreux, France, assignor to Degremont S.A., Rueil-Malmaison, France
Filed Mar. 29, 1976, Ser. No. 671,692
Claims priority, application France, Sept. 29, 1975, 1262
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—1



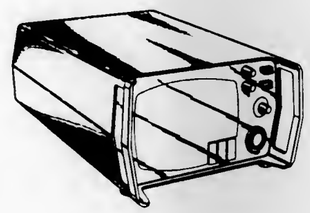
247,249
COMBINED HOLDER AND MOUNTING BRACKET FOR SOLID DEODORANT, PERFUME, INSECT REPELLANT OR THE LIKE
Georg Schimanski, Hagen, Germany, assignor to Globol-Werk GmbH, Neuburg, Germany
Division of Ser. No. 622,630, Oct. 15, 1975, Pat. No. Des. 242,145. This application Aug. 16, 1976, Ser. No. 714,366
Claims priority, application Germany, Apr. 21, 1975, MR 281
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150



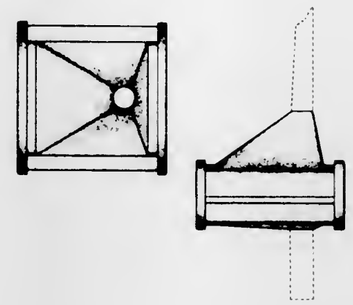
247,250
VENTILATOR HOOD
Lester L. Miller, 3117 De Salvo Road, Jacksonville, Fla. 32216
Filed Aug. 5, 1976, Ser. No. 712,169
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—153



247,251
PORTABLE PHYSIOLOGICAL MONITOR
Joseph D. Napoli, Billerica, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed Oct. 4, 1976, Ser. No. 729,616
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—17



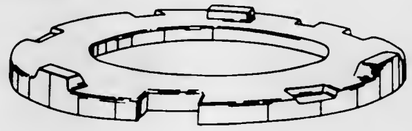
247,252
FILTER ASSEMBLY
David J. Rosenberg, Glen Cove, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.
Filed Feb. 12, 1976, Ser. No. 657,674
Term of patent 14 years
Int. Cl. D23—*99*; D24—*02, 99*
U.S. Cl. D24—52



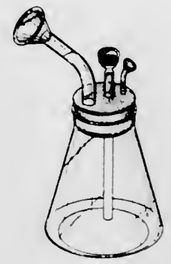
247,253
COMMUNICATIONS BOOTH
John H. Vargo, 110 Second St., Verplanck, N.Y. 10596
Filed July 28, 1976, Ser. No. 709,433
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—16



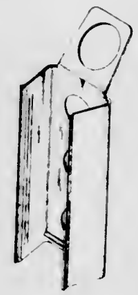
247,254
PRE-CAST CONCRETE UNIT FOR MANHOLES
Brian E. Brown, Burlington, and Alfred G. Hall, London, both of Canada, assignors to Moduloc Concrete Products (London) Ltd., Concorde, Canada
Filed Aug. 9, 1976, Ser. No. 712,824
Claims priority, application Canada, Feb. 9, 1976, 0902762
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—36



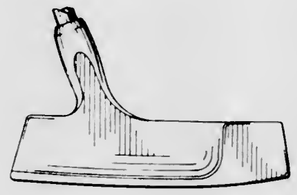
247,255
SMOKING PIPE
Charles W. Frost, 1778 A Spanish Trail, Columbia, S.C. 29210
Filed Dec. 2, 1975, Ser. No. 637,044
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—3



247,256
APPARATUS FOR CARRYING ARTICLES ON A TENNIS RACQUET
Ernest W. Kevin, 2728 60th SE., Mercer Island, Wash. 98040
Filed Nov. 10, 1975, Ser. No. 630,356
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 ST



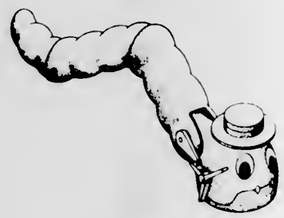
247,257
PUTTER
Roy L. Osborn, P.O. Box 23157, Phoenix, Ariz. 85063
Filed Jan. 12, 1976, Ser. No. 648,576
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GC



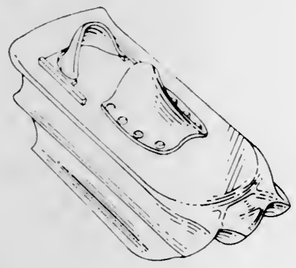
247,258
COMBINED FLOATING TOY AND FIGURES THEREFOR
Shinroku Nakao, Yokohama, Japan, assignor to Combi Co., Ltd., Tokyo, Japan
Filed Jan. 5, 1976, Ser. No. 646,700
Claims priority, application Japan, July 15, 1975, 50-29311; July 15, 1975, 50-29310; July 15, 1975, 50-29309
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 B



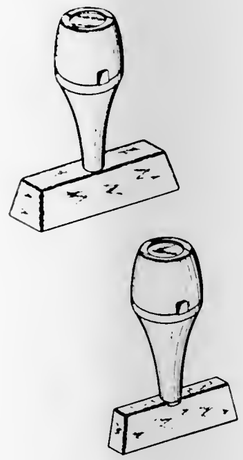
247,259
TOY MEASURING WORM
Hiroichi Yonezawa, Matsudo, Japan, assignor to Kabushiki Kaisha Yoneya Gangu
Filed Nov. 16, 1976, Ser. No. 742,350
Claims priority, application Japan, July 22, 1976, 51-28160
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 B



247,260
FOOT SKI
Gary Becker Jacobs, 4023 Guadalupe, Austin, Tex. 78751
Filed Sept. 13, 1976, Ser. No. 723,031
Term of patent 7 years
Int. Cl. D21—*02*
U.S. Cl. D34—40



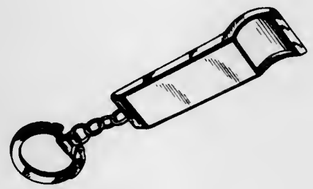
247,261
HAND STAMP
Franz Hörmann, Simoniusstrasse 21, 7988 Wangen Im Allgau, Germany
Filed Dec. 29, 1975, Ser. No. 645,127
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D64—10



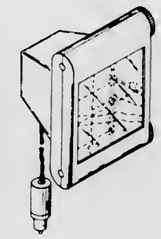
247,262
SHOULDER BAG
Thomas D. Tweedie, Monrovia, Calif., assignor to Samsonite Corporation, Denver, Colo.
Filed Dec. 16, 1975, Ser. No. 641,301
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 F



247,263
COMBINED KEY RING AND BOTTLE OPENER
Alberthus van Benthem, 8, Bergkampen, Vollenhoven, Netherlands
Filed Jan. 28, 1976, Ser. No. 653,372
Claims priority, application Benelux, Aug. 1, 1975, 50466-00
Term of patent 14 years
Int. Cl. D3—*01*; D7—*06*
U.S. Cl. D87—8.3



247,264
MAP VIEWER
John N. Smith, Willingboro, N.J., assignor to Interstate Travel Services, Inc., Willingboro, N.J.
Filed Feb. 9, 1976, Ser. No. 656,136
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D96—9



247,265
SIGN STAKE
Robert L. Ledebuhr, 205 E. Aldrich, Capac, Mich. 48014
Filed Sept. 29, 1976, Ser. No. 727,978
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 A



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 14TH DAY OF FEBRUARY, 1978

NOTE —Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Robins Company, Inc.: *See—*
Cale, Albert Duncan, Jr., 4,073,796, Cl. 260-326.330.

A-Lok Corporation: *See—*
Ditcher, John, 4,073,048, Cl. 29-450.000.

A/S Daloon: *See—*
Trostmann, Erik; and Albertsen, Ove, 4,073,953, Cl. 426-297.000.

A-T-O Inc.: *See—*
Heintz, Clifford E., 4,073,741, Cl. 252-187.00R.

AAGFA-Gevaert, A.G.: *See—*
Zangenfeind, Helmut; Burchardi, Jurgen; and Lederer, Josef, 4,073,588, Cl. 355-41.000.

Abbott Laboratories: *See—*
Guzek, David Thaddeus, 4,073,907, Cl. 424-253.000.

Abdo, Kamal Mohammad: *See—*
Hartdegen, Frank Joseph; and Abdo, Kamal Mohammad, 4,073,884, Cl. 424-94.000.

Abe, Shunji. Rice flavored snack food. 4,073,958, Cl. 426-559.000.

Abendschein, Frederic Henry; Ivey, John Saxon; Roberts, Richard W.; and Tothero, Dwight L., to Borg-Warner Corporation. Variable displacement compressor. 4,073,603, Cl. 417-222.000.

ACEC, Ateliers de Constructions Electriques de Charleroi: *See—*
Dardenne, Regis, 4,074,185, Cl. 324-208.000.

Ackermann, Walter J. Electronic power supply. 4,074,345, Cl. 363-48.000.

Adams, Jac, to Krey Packing Company. Biological process for scrubbing smokehouse smoke. 4,073,686, Cl. 195-2.000.

Adams-Russell Co., Inc.: *See—*
Patterson, William Luther, 4,073,381, Cl. 206-331.000.

Addressograph Multigraph Corporation: *See—*
Westdale, Virgil W.; and Novotny, John, 4,073,980, Cl. 428-404.000.

Adler, Franklin P., to Apex Railway Products Co. Closing means for a hatch cover. 4,073,239, Cl. 105-377.000.

Aeritalia S.p.A.: *See—*
Hapke, Donald W., 4,073,440, Cl. 239-265.290.

Aerojet-General Corporation: *See—*
Beichel, Rudi, 4,073,138, Cl. 60-245.000.

AFGA-Gevaert N.V.: *See—*
Florens, Raymond Leopold, 4,073,652, Cl. 96-101.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
Chaussy, Jacques; Bret, Jean-Louis; Berton, Adrien; and Odin, Jacques, 4,074,343, Cl. 363-14.000.

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Bullock, Milon Walker; and Walworth, Bryant Leonidas, 4,074,059, Cl. 560-135.000.
Mohan, Arthur Gaudens, 4,074,046, Cl. 542-439.000.

Panzer, Hans Peter; O'Connor, Michael Niall Desmond; and Baccei, Louis J , 4,074,055, Cl. 548-347.000
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American Medical Systems, Inc.: *See—*
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Androski, Edward C. Remote-controlled safety hook assembly. 4,073,531, Cl. 294-83.00R.
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Anhalt, John W.; Goodman, David S.; and Peterson, Carl W., to International Telephone and Telegraph Corporation. Electrical connector. 4,073,560, Cl. 339-99.00R.
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Dieck, Ronald L.; and Quinn, Edwin J., 4,073,824, Cl. 260-823.000.
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Aronson, Robert R., to Electric Fuel Propulsion Corporation. High discharge battery with depolarized plates. 4,074,021, Cl. 429-51.000.
Arrowood, Gordon W., to McKenney's, Inc. Internal back vent system. 4,073,018, Cl. 4-191.000.
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Barleon, Leopold; Dorner, Stefan; Goetzmann, Odo; and Kussmaul, Guenter, to Gesellschaft fuer Kernforschung. Nuclear reactor core catching apparatus. 4,073,682, Cl. 176-38.000.
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Bates, Charles F., II. Mechanism for converting predetermined alternate rotational movements to rectilinear movements. 4,073,167, Cl. 70-133.000.
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Holm, Robert E.; and Battershell, Robert D., 4,073,637, Cl. 71-94.000.
Batts, John H.; and Duester, Everett L., to John Thomas Batts, Inc Article suspension device. 4,073,457, Cl. 248-340.000.
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Mergner, Dietrich; and Stege, Heinz, 4,073,987, Cl. 428-81.000.
Baum, Werner, to Pei, Inc. Burners for flame jet drill. 4,073,351, Cl. 175-14.000.
Baumgartner, Werner; and Schnoeller, Manfred, to Siemens Aktiengesellschaft. Technique for making silicon U-shaped members 4,073,859, Cl. 264-322.000.
Baus, Heinz Georg. Lower guide member for adjacently suspended, slideable partitions for a wet chamber. 4,073,035, Cl. 16-96.00R.
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Dey, Thomas W., 4,074,126, Cl. 362-297.000.
Baxter Travenol Laboratories, Inc.: *See—*
Kehm, Walter C., 4,073,886, Cl. 260-112.00B.
Bay Mills Limited: *See—*
O'Connor, Terence James, 4,073,998, Cl. 428-310.000.
Bayer Aktiengesellschaft: *See—*
Buchel, Karl Heinz; Frohberger, Paul-Ernst; and Kaspers, Helmut, 4,073,901, Cl. 424-245.000.
Buysch, Hans-Josef; Oertel, Harald; and Roos, Ernst, 4,073,746, Cl. 252-404.000.
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Eimers, Erich; Margotte, Dieter; Schmid, Helmut; and Dhein, Rolf, 4,073,769, Cl. 260-45.80R.
Fest, Christa; Hammann, Ingeborg; and Homeyer, Bernhard, 4,073,893, Cl. 424-200.000.
Hemmerich, Heinz-Peter; Winter, Gerhard; Rosenkranz, Hans Jurgen; and Woditsch, Peter, 4,073,764, Cl. 260-37.00N.
Moretto, Hans-Heinrich; de Montigny, Armand; Thom, Karl-Friedrich; and Schliebs, Reinhard, 4,073,801, Cl. 260-448.20E.
Regel, Erik; Eue, Ludwig; and Schmidt, Robert R., 4,073,636, Cl. 71-92.000.
Schmidt, Manfred; Freitag, Dieter; Fries, Hermann; and Esch, Erich, 4,073,757, Cl. 260-19.00R.
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Baylis, Arthur: *See—*
Grundstrom, Robert Ronnie; and Baylis, Arthur, 4,073,165, Cl. 70-371.000.
Bayliss, John Patrick, to Girling Limited. Anti-skid vehicle braking system. 4,073,546. Cl. 303-115.000.
Bazilova nee Sverinova, Hedvika: *See—*
Lim, Drahoslav; Kopecek, Jindrich; Bazilova nee Sverinova, Hedvika; and Vacik, Jiri, 4,074,039, Cl. 526-303.000.
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Haditsch, Werner; Rutz, Hansruedi; and Toplak, Ernst, 4,074,155, Cl. 310-59.000.
Koch, Hans, 4,073,134, Cl. 60-39.290.

Beach, Bruce M. Pocket-size electronic device for playing chess. 4,073,067, Cl. 35-8.00R.
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Beck, Theodor; and Gross, Friedrich, to Plate Kofasil Gesellschaft mit beschrankter Haftung. Method for preventing aerobic decomposition processes in fermentated fodder. 4,073,889, Cl. 424-164.000.
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Way, Allan S.; Glenn, Thomas J.; Sloane, Howard J.; and Keahl, Gerald T., 4,074,272, Cl. 346-33.00A.
Bedenk, William Thomas; and Sagel, Paul Joseph, to Procter & Gamble Company, The. Fabric treating articles and processes. 4,073,996, Cl. 428-274.000.
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Dowrick, John Sidney, 4,073,920, Cl. 424-271.000.
Beekenkamp, Gerald, to Black and Decker Manufacturing Company, The. Portable workbench assembly. 4,073,484, Cl. 269-321.0CF.
Begin, Louis E.; and Dunbar, Joseph E., to Dow Chemical Company, The. Antithrombotic 1,3,4-thiadiazole. 4,074,049, Cl. 544-82.000.
Behr, Hans. Mixing and/or dispersing and spraying arrangement. 4,073,436, Cl. 239-8.000.
Beichel, Rudi, to Aerojet-General Corporation. Mixed mode rocket engine. 4,073,138, Cl. 60-245.000.
Belanger, Raymond Francis, to Graphic Systems, Inc. Photocomposing machine with movable character storage and presentation apparatus. 4,074,285, Cl. 354-15.000.
Belden Corporation: *See—*
Orlandi, John F.; and Rauch, John E., 4,073,127, Cl. 57-58.360.
Bell & Howell Company: *See—*
Scheib, Harold A., 4,073,589, Cl. 355-50.000.
Bell, Richard M. Sprocket mold. 4,073,463, Cl. 249-102.000.
Bell Telephone Laboratories, Incorporated: *See—*
Albarino, Robert Vincent; and Torza, Sergio, 4,073,974, Cl. 427-163.000.
Ballman, Albert Anthony; Brown, Harold; Martin, John Martin; and Tien, Ping King, 4,073,675, Cl. 156-600.000.
Blake, Roy Baxter, Jr.; Gwatkin, James deGoulard, III; Magee, Judy Pat; and Porter, Glendon Russell, 4,074,087, Cl. 179-170.200.
Caputo, Salvatore; Fitch, Scott McDowell; Harris, Cliff Andrew; Kuhar, John, Jr.; Pappas, Andrew Leo; and Redlich, Wayne, 4,074,358, Cl. 364-514.000.
Christensen, Carl; Hause, Arthur Dickson; and McDonald, Henry Stanton, 4,074,072, Cl. 179-15.0AQ.
Falconer, David Duncan; and Weinstein, Stephen Brant, 4,074,086, Cl. 179-170.200.
Goldschmidt, Wilbur Harry; Henning, Hansjuergen Hermann; and Kapes, William John, Jr., 4,074,319, Cl. 358-230.000.
Hamming, Richard Wesley; and Kaiser, James Frederick, 4,074,212, Cl. 333-70.00T.
Hartless, Ray Lawson; and Trozzolo, Anthony Marion, 4,073,771, Cl. 260-45.9NC.
Johnston, Wilbur Dexter, Jr.; and Shay, Joseph Leo, 4,074,305, Cl. 357-67.000.
Kapes, William John, Jr., 4,074,318, Cl. 358-230.000.
Kapes, William John, Jr., 4,074,320, Cl. 358-230.000.
Prell, Edward Myron; and Rogers, Barry William, 4,074,079, Cl. 179-6.30R.
Belser, Karl Arnold; and Metz, Philip Bradshaw, to International Business Machines Corporation. XY Addressable and updateable compressed video refresh buffer for digital TV display. 4,074,254, Cl. 340-324.0AD.
Belshaw Brothers, Inc.: *See—*
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Belshaw, Thomas E.: *See—*
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Slezinger, Isaak Isaevich; Babkin, Gennady Fedotovich; Gorlin, Samuil Matusovich; and Belyaeva, Regina Valentinovna, 4,073,188, Cl. 73-147.000.
Benda, David; and Reigel, Franklin G., to GTE Sylvania Incorporated. Cathode ray tube fabricating process. 4,073,558, Cl. 316-18.000.
Benda, Hansjochen; and Huber, Peter, to Siemens Aktiengesellschaft. Semiconductor rectifier device. 4,074,303, Cl. 357-33.000.
Bendix Corporation, The: *See—*
Hall, Roger D., 4,074,347, Cl. 363-158.000.
Benjamin, John Stanwood: *See—*
Volin, Timothy Earl; Benjamin, John Stanwood; Larson, Jay Michael; and Cairns, Robert Lacock, 4,073,648, Cl. 75-245.000.
Bennett, Richard Nelson, to National Instrument Company, Inc. High-speed filling machine. 4,073,322, Cl. 141-169.000.
Beny, Janos; Ryan, John W.; and Snyder, Edward, III, to Ideal Toy Corporation. Toy doll. 4,073,088, Cl. 46-265.000.
Berg, Gerhard; and Nordsiek, Karl-Heinz, to Chemische Werke Huels Aktiengesellschaft. Pulverulent, tackfree, pourable, filler-containing elastomer mixtures optionally containing plasticizer oil, as well as processes for their production and utilization. 4,073,755, Cl. 260-17.4BB.
Berger, Bernard, to Morse Electro Products Corporation. Automatic stop system for a tape recorder. 4,074,327, Cl. 360-74.000.
Berger, Rainer: *See—*
Wiest, Hubert; Berger, Rainer; and Lieb, Erwin, 4,073,779, Cl. 260-79.3MU.
Bergersen, Earl Olaf. Closely adapted orthodontic appliance. 4,073,061, Cl. 32-14.00B.
Berggren, Lloyd E. Apparatus for repressurizing tennis balls. 4,073,120, Cl. 53-79.000.
Beriger, Ernst, to Ciba-Geigy Corporation. Method of controlling insects using 1,3-dioxin-4-ones. 4,073,932, Cl. 424-279.000.
Berkovitz, Robert Abraham; and Gundry, Kenneth James, to Dolby Laboratories, Inc. Stereophonic sound system particularly useful in a cinema auditorium. 4,074,083, Cl. 179-100.1TD.
Berkowitz, Sidney: *See—*
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Bermudez, Eduardo. Fence structure. 4,073,478, Cl. 256-27.000.
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Bertram, Heidrun; Fahnenstich, Rudolf; Offermanns, Heribert; and Tanner, Herbert, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Fodder for cows. 4,073,945, Cl. 426-2.000.
Bethlehem Steel Corporation: *See—*
Steinbicker, Richard N.; and Rauch, Stewart E., 4,073,701, Cl. 204-54.00R.
Wieland, George E., Jr.; and Rudzki, Eugene M., 4,073,668, Cl. 148-113.000.
Biaggini, Benjamin F.; and Garin, Paul V., to Southern Pacific Transportation Company. Lift truck with attachment for carrying automobiles. 4,073,394, Cl. 214-145.00R.
Bickel, Hans: *See—*
Scartazzini, Riccardo; and Bickel, Hans, 4,073,902, Cl. 424-246.000.
Biddlecom, William Gerard: *See—*
Woessner, Warren Dexter; Sih, Charles John; Kluender, Harold Clinton; Arndt, Henry Clifford; and Biddlecom, William Gerard, 4,074,063, Cl. 560-121.000.
Bierlich, Johannes Harald. Ventilators. 4,073,224, Cl. 98-41.00R.
Bills, Marius W. Lock for sliding doors. 4,073,517, Cl. 292-60.000.
Bimba, Charles W. Fluid power motor with guard cylinder. 4,073,219, Cl. 92-128.000.
Birum, Gail H., to Monsanto Company. Hydrogen phosphonates and polymers containing them as flame retardants. 4,073,767, Cl. 260-45.80R.
Bischof, John F.; and Fritsch, Ronald J., to Cutler-Hammer, Inc. Interlocking operating mechanism for enclosed switchgear having defeater interlock. 4,074,091, Cl. 200-50.00A.
Black and Decker Manufacturing Company, The: *See—*
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Black, Francis Bischoff: *See—*
Allred, James Kenneth; Liddell, Arlyn G.; Quinn, Edward Barney; and Black, Francis Bischoff, 4,074,120, Cl. 235-419.000.
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Black, Sivalls & Bryson, Inc.: *See—*
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Blair, Calvin B. Round bale handler. 4,073,532, Cl. 294-107.000.
Blake, Roy Baxter, Jr.; Gwatkin, James deGoulard, III; Magee, Judy Pat; and Porter, Glendon Russell, to Bell Telephone Laboratories, Incorporated. Bidirectional voice frequency repeater. 4,074,087, Cl. 179-170.200.
Blakeley Engineering Limited: *See—*
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Blurton, Keith F.; and Stetter, Joseph R., to Energetics Science, Inc. Method and device for the detection and measurement of carbon monoxide in the presence of hydrogen. 4,073,698, Cl. 204-1.00T.
Boatman, Roger M.; and Hall, Melvin R., to Testline Instruments, Inc. Low impedance fault detection system and method. 4,074,188, Cl. 324-52.000.
BOC Limited: *See—*
Smith, Jack James, 4,073,483, Cl. 269-25.000.
Bodart, Detlef Eugen, to Merck Patent Gesellschaft mit beschrankter Haftung. Analytical determination of substances in solution. 4,073,623, Cl. 23-259.000.
Bodine, Albert G. Sonic large bore earth auger. 4,073,353, Cl. 175-56.000.
Boehm, Oscar: *See—*
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Boehringer Ingelheim GmbH: *See—*
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Boeing Company, The: *See—*
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Hicks, Harry Clark, Jr., 4,073,708, Cl. 204-106.000.
Logan, James H., 4,073,258, Cl. 115-12.00R.
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Bogen, John S.; and Robin, Gary I., to Erdco Engineering Corporation. Anticipatory flammable gas detection system. 4,074,243, Cl. 340-237.00R.
Boise Cascade Corporation: *See—*
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Bolanz, Gerrit M. Building construction system. 4,073,104, Cl. 52-125.000.
Boldebuck, Edith M., and Gorowitz, Bernard, to General Electric Company. Powder coatable polyester composition and electrical conductor coated therewith. 4,074,006, Cl. 428-379.000.
Bolli, Giuseppe. Drive mechanisms of spinning or twisting machines adapted for the formation of knop yarn. 4,073,125, Cl. 57-38.300.
Bollian, Erwin, to Doduco, Eugen Durrwachter. Method of and apparatus for manufacturing double contact rivets. 4,073,425, Cl. 228-116.000.
Bones, Roger John, to Chloride Silent Power Limited. Sealing of electrochemical devices utilizing liquid sodium and a solid ceramic electrolyte permeable to sodium ions. 4,074,026, Cl. 429-104.000.
Boone, Gary W.; and Cochran, Michael J., to Texas Instruments Incorporated. Variable function programmed calculator. 4,074,351, Cl. 364-200.000.
Borg-Warner Corporation: *See—*
Abendschein, Frederic Henry; Ivey, John Saxon; Roberts, Richard W.; and Tothero, Dwight L., 4,073,603, Cl. 417-222.000.
Born, Norman E.; and Kolatorowicz, Edwin E., to General Electric Company. Inductive load current measuring circuit. 4,074,175, Cl. 318-332.000.
Borom, Marcus P., to General Electric Company. Method for removing a magnesia doped alumina core material. 4,073,662, Cl. 134-2.000.
Borroughs Tool & Equipment Corporation: *See—*
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Bosshard, Ernst, to Sulzer Brothers Limited. Apparatus for treating liquid sludge material. 4,074,138, Cl. 250-435.000.
Boston, Jacquelin Vaughan. Coloring book for the blind. 4,073,070, Cl. 35-26.000.
Bosworth, Clive J.; Bridgstock, Neil E.; Stone, Raymond S.; and McLaughlin, William L., to British Steel Corporation. Apparatus for removing cross welds from metal tubes and marking the same. 4,073,260, Cl. 118-8.000.
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Bouhon, Pierre Hubert Marie Joseph, to Societe Anonyme des Ateliers Houget Duesberg Bosson. Open-end spinning device. 4,073,126, Cl. 57-58.950.
Bouillon, Claude; and Berrebi, Claudine, to L'Oreal. Composition for reducing the oily appearance of the hair and skin. 4,073,898, Cl. 424-233.000.
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Bower, Gerald Shelton, to Systron-Donner Corporation. Time limited digital oscillator. 4,074,178, Cl. 318-631.000.
Bowman, Richard C.; and Kay, Daniel J., to Hooker Chemicals & Plastics Corporation. Polyethylene emulsion containing resin binder compositions and processes. 4,073,761, Cl. 260-29.300.
Bowser, Robert E., to Simplimatic Engineering Co. Method and apparatus for tier forming on a row by row basis. 4,073,387, Cl. 214-6.00P.
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Brook, Greville Bertram; Bowyer, William Henry; and Desforges, Charles Desmond, 4,073,400, Cl. 220-63.00R.
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Brackmann, Warren A.; and Dilanni, Daniel, to Rothmans of Pall Mall Canada Limited. Method of producing polymeric material. 4,073,850, Cl. 264-93.000.
Bradley, William E.; and Gates, Geoffrey Steven, to American Medical Systems, Inc. Urethral profilometry catheter. 4,073,287, Cl. 128-2.00R.
Brady, Jack D.; and Graves, Kenny M., to Andersen 2000, Inc. Stationary drum filtration device and method. 4,073,631, Cl. 55-97.000.
Brandrup, Johannes: *See—*
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Breazeale, Billy H., to Texas Instruments Incorporated. Method of fabricating a photoconductive detector of increased responsivity. 4,073,969, Cl. 427-75.000.
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Brennan, Thomas M., to Pfizer Inc. 4-Pyridylformimidoylglycyl-D-phenylglycine. 4,073,780, Cl. 260-112.50R.
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Lawson, Robert, 4,073,619, Cl. 23-232.00R.
Marshall, Joseph W.; and Gibson, Keith C., 4,073,173, Cl. 72-250.000.
Broadway, Alexander Richard William, to National Research Development Corporation. Rotary electric machines. 4,074,160, Cl. 310-184.000.
Broburg, Gregory W.; and Clark, Allen C., to Van Alstine Audio Systems, Inc. Equalizing amplifier. 4,074,204, Cl. 330-109.000.
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Buda, Dennis; Broman, Rodney L.; and Waters, John R., 4,073,694, Cl. 195-103.700.
Brondyke, James R., to Maryland Cup Corporation. Dispensing carton for wrapped drinking straws. 4,073,404, Cl. 221-63.000.
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Brook, Greville Bertram; Bowyer, William Henry; and Desforges, Charles Desmond, to Fulmer Research Institute. Gas containers. 4,073,400, Cl. 220-63.00R.
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Brooks, John Langshaw; and Budziarek, Richard, to Imperial Chemical Industries Limited. Poly-carbonyloxyurethanes. 4,073,800, Cl. 260-404.500.
Brown, Amos J.; Belshaw, Thomas E.; Knull, Kenneth L.; and Wilke, Wilbur D., to Belshaw Brothers, Inc. Siphon pump. 4,073,305, Cl. 137-140.000.
Brown, C. Kepler, Jr.: *See—*
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Brown, Francis W.: *See—*
Bateson, George F.; Brown, Francis W.; and Heilmann, Steven M., 4,074,004, Cl. 428-355.000.
Brown, Glendon W.; Fine, Mary Jane; and Hill, Larry O., to Mead Corporation, The. Method for preparing wetproofed catalyst particles and particles produced thereby. 4,073,748, Cl. 252-428.000.
Brown, Harold: *See—*
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Brown, Lelus B.: *See—*
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Brown, R. Bernard, to United States of America, Navy. Laser total reflectometer. 4,073,590, Cl. 356-209.000.
Brown, Richard E., to Warner-Lambert Company. Indolobenzoxazepines. 4,073,789, Cl. 260-293.580.
Brown & Root, Inc.: *See—*
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Brown, Stanley J.; and Gorholt, Wilhelm, to General Atomic Company. Reactor core lateral restraint assembly. 4,073,685, Cl. 176-87.000.

Brown, William F., Jr.: *See—*
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Bryan, Thomas Toplica; and Pluim, Arthur William, Jr., to Minnesota Mining and Manufacturing Company. Porous ceramic or metallic coatings and articles. 4,073,999, Cl. 428-311.000.

Bryant, Frank E. Prefabricated X-radiation protection panels. 4,074,141, Cl. 250-517.000.

Buchel, Karl Heinz; Frohberger, Paul-Ernst; and Kaspers, Helmut, to Bayer Aktiengesellschaft. Metal complexes of N-trityl-azoles for combatting fungi. 4,073,901, Cl. 424-245.000.

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Buckwalter, Mervin R.; and Knaub, Edgar W., to Armstrong Cork Company. Process for flatting glossy surfaces of urethane polymers. 4,073,975, Cl. 427-170.000.

Buda, Dennis; Broman, Rodney L.; and Waters, John R., to Johnston Laboratories, Inc. Microbiological assay of aminoglycoside antibiotics. 4,073,694, Cl. 195-103.700.

Budziarek, Richard: *See—*
Brooks, John Langshaw; and Budziarek, Richard, 4,073,800, Cl. 260-404.500.

Buljan, Sergej Tomislav; and Stermer, Philip Eli, to GTE Sylvania Incorporated. High density high strength S13 N4 ceramics prepared by pressureless sintering of partly crystalline, partly amorphous S13 N4 powder. 4,073,845, Cl. 264-65.000.

Bull, Michael J.; and Searle, Robert J. G., to Shell Oil Company. Benzyl ethers. 4,073,812, Cl. 260-613.00R.

Bull, Rame; Denenberg, Byron A.; and Popovic, Djorde R., to MDA Scientific, Inc. Reader recorder for toxic gas concentration tapes. 4,073,621, Cl. 23-254.00E.

Bullock, Milon Walker; and Walworth, Bryant Leonidas, to American Cyanamid Company. Substituted-1-phenol-4-sulfonamides. 4,074,059, Cl. 560-135.000.

Bunting, Walter, to National Research Development Corporation. Signal measuring apparatus. 4,074,190, Cl. 324-77.00A.

Buonavita, Carlos Ernesto, to Burroughs Corporation. Load sharing modular power supply system. 4,074,146, Cl. 307-60.000.

Burchardi, Jurgen: *See—*
Zangenfeind, Helmut; Burchardi, Jurgen; and Lederer, Josef, 4,073,588, Cl. 355-41.000.

Burgess, Ronald R., to Tom McGuane Industries, Inc. Throttle control system. 4,073,272, Cl. 123-103.00B.

Burkholder, Theodore B.; Stalter, Robert J.; and Skotynsky, Paul N., to Goodyear Tire & Rubber Company, The. Method of zone pouring foam products. 4,073,839, Cl. 264-45.100.

Burkholder, Theodore B.: *See—*
Stalter, Robert J.; and Burkholder, Theodore B., 4,073,020, Cl. 5-355.000.

Burlington Industries, Inc.: *See—*
Crawford, William B.; and Solomon, Anthony T., 4,073,246, Cl. 112-121.110.

Burns, Timothy L.: *See—*
Whittington, Billy J.; Welsh, Alan B.; and Burns, Timothy L., 4,073,209, Cl. 84-1.240.

Burris, Michael V. Asphalt-gilsonite emulsion. 4,073,659, Cl. 106-277.000.

Burroughs Corporation: *See—*
Bader, Clifford John, 4,074,197, Cl. 324-205.000.
Buonavita, Carlos Ernesto, 4,074,146, Cl. 307-60.000.
Cook, Darwen John; and Millers, Donald Alexander, II, 4,074,352, Cl. 364-200.000.
Hardwick, John F., 4,074,328, Cl. 360-77.000.
O'Reilly, James Michael; and Murison, Alexander Smith, 4,074,331, Cl. 360-104.000.
Smith, Douglas A., 4,074,326, Cl. 360-55.000.

Burroughs Wellcome Co.: *See—*
Wood, Hamish Christopher Swan; and Stirling, Irene, 4,073,786, Cl. 260-251.500.

Burry, Arthur. Method of multi-material injection moulding. 4,073,854, Cl. 264-161.000.

Bury, Norman Albert, to Flexibox Limited. Flexible couplings. 4,073,161, Cl. 64-13.000.

Bustin, Leopold. Multi-way grab rail. 4,073,036, Cl. 16-110.00R.

Butler, Walter J.; and Eichelberger, Charles W., to General Electric Company. Analog-to-digital converter. 4,074,260, Cl. 340-347.0CC.

Butts, Bruce D.: *See—*
Keough, Laurence J.; and Butts, Bruce D., 4,074,088, Cl. 200-5.00A.

Buysch, Hans-Josef; Oertel, Harald; and Roos, Ernst, to Bayer Aktiengesellschaft. Mixtures of α,α'-bis-(2-hydroxy-3,5-dialkylphenyl)-p-and -m-diisopropylbenzenes, a process for the preparation thereof and the use thereof as stabilizers. 4,073,746, Cl. 252-404.000.

Buzga, Heinrich; Steprath, Werner; and Pause, Kurt, to Maschinenfabrik Buckau R. Wolf Aktiengesellschaft. Process for cleaning comminuted plastic material. 4,073,661, Cl. 134-1.000.

Byalko, Mikhail Vladimirovich; Kirko, Elena Viktorovna; Perlovsky, Rafael Shliomovich; and Ryzhnev, Vadim Jurievich. Pneumatic detector of gas and vapor contaminants in atmosphere of industrial buildings. 4,073,183, Cl. 73-23.000.

C. H. Heist Corporation: *See—*
Goodwin, Robert J., 4,073,026, Cl. 15-104.10R.

C. & J. Clark Ltd.: *See—*
Bailey, Frank Gordon; and Ralphs, George Trevor, 4,073,022, Cl. 12-135.00A.

Cabasso, Israel; Jagur-Grodzinski, Joseph; and Vofsi, David. Polymer alloys of phosphonylated polystyrene or polyphenylene oxide with cellulose ester, polystyrene, or unsaturated polyester. 4,073,754, Cl. 260-17.00R.

Cagle, Harlan R., to Sahlin International Inc. Vacuum producing device. 4,073,602, Cl. 417-185.000.

Cairns, Robert Lacock: *See—*
Volin, Timothy Earl; Benjamin, John Stanwood; Larson, Jay Michael; and Cairns, Robert Lacock, 4,073,648, Cl. 75-245.000.

Calderazzo, Franklin J.: *See—*
O'Brien, John G.; and Calderazzo, Franklin J., 4,073,391, Cl. 214-65.000.

Caldwell, Donald Lee; and Fuchs, Raymond John, Jr., to Dow Chemical Company, The. Catalytic decomposition of hypochlorite. 4,073,873, Cl. 423-499.000.

Cale, Albert Duncan, Jr., to A. H. Robins Company, Inc. N-(1-substituted-3-pyrrolidinyl)-1-naphthalene carboxamides. 4,073,796, Cl. 260-326.330.

Callery, Patrick S.; Wright, Jeremy; and Zenker, Nicolas, to Merck & Co., Inc. 3-(2-Substituted benzimidazolyl) alanines. 4,073,929, Cl. 424-273.00R.

Camirand, Wayne M.: *See—*
Popper, Karel; Camirand, Wayne M.; Williams, Gerald S.; and Mecchi, Edward P., 4,073,747, Cl. 252-412.000.

Cammilleri, Angelo M., to Telejector Ltd. Television projector. 4,074,322, Cl. 358-237.000.

Campeau, Leo. Wheel board undulating coaster. 4,073,500, Cl. 280-87.04R.

Canadian Patents and Development Limited: *See—*
Maginnes, Edward A.; Brooks, Eyrle E.; Haukeness, Maynard O.; and Green, George H., 4,073,089, Cl. 47-17.000.

Canon Kabushiki Kaisha: *See—*
Kitajima, Tadayuki, 4,073,584, Cl. 355-8.000.
Nakamoto, Soichi; Ito, Tadashi; Ito, Fumio; and Isobe, Yasuo, 4,074,292, Cl. 354-53.000.

Capsulated Systems, Incorporated: *See—*
Bayless, Robert G., 4,073,946, Cl. 426-2.000.

Caputo, Salvatore; Fitch, Scott McDowell; Harris, Cliff Andrew; Kuhar, John, Jr.; Pappas, Andrew Leo; and Redlich, Wayne, to Bell Telephone Laboratories, Incorporated. Test set for measuring jitter distortion of data pulses. 4,074,358, Cl. 364-514.000.

Carl Zeiss-Stiftung: *See—*
Schwebel, Reiner, 4,074,131, Cl. 250-237.00G.

Carley, Harold E.: *See—*
Miller, George A.; Chan, Hak-Foon; and Carley, Harold E., 4,073,921, Cl. 424-273.00R.

Carlisle, Richard S. Differential-pressure flotation cushion. 4,073,021, Cl. 5-365.000.

Carlsson, Eric; Gefvert, Karl Ivan; Hjalmarsson, Thomas; Kerff, Anton; Pejchal, Karel; and Wide, Lars, to Aktiebolaget IRO. Device for holding yarn bobbins. 4,073,450, Cl. 242-131.000.

Carnegie-Mellon University: *See—*
Shaw, Milton C.; and Hoshi, Tetsutaro, 4,073,214, Cl. 90-24.00D.

Caron, Ronald N.; and Shapiro, Stanley, to Olin Corporation. Processing for improved stress relaxation resistance in copper alloys exhibiting spinodal decomposition. 4,073,667, Cl. 148-12.70C.

Carson, Chester C.; Barton, Sterling C.; and Echeverria, Federico S., to General Electric Company. Heated ion chamber detector for a dynamoelectric machine. 4,074,137, Cl. 250-380.000.

Carter, Norman R., to Zetco Manufacturing Company, Incorporated. Semi-automatic lifting system. 4,073,388, Cl. 214-8.50A.

Cartwright, Neil B. Photographic processing machine. 4,074,298, Cl. 354-299.000.

Caruso, Jerome, to Litton Business Systems, Inc. Bonded chair construction. 4,073,539, Cl. 297-455.000.

Carvalho, Ronald M. Attack dog security system. 4,074,247, Cl. 340-276.000.

Casalou, Robert A., to Robert A. Casalou, Inc. Spot light assembly. 4,074,125, Cl. 362-271.000.

Cassar, Richard D., to Sun Ventures, Inc. Insecticide from dimethylmuconic acid. 4,073,896, Cl. 424-205.000.

Cassella Farbwerke Mainkur Aktiengesellschaft: *See—*
Heid, Christian; and Polster, Johannes, 4,073,616, Cl. 8-34.000.

Cassidy, Francis J.: *See—*
Leaf, Harry Vincent; and Cassidy, Francis J., 4,074,065, Cl. 174-87.000.

Cassidy, Raymond T., to National Blank Book Company, Inc. Mag card storage device. 4,073,553, Cl. 312-184.000.

Caterpillar Tractor Co.: *See—*
Gianessi, Albert, 4,073,524, Cl. 292-341.120.
Goloff, Alexander, 4,073,221, Cl. 92-221.000.

Heitzman, Gary N.; and Shook, Norma G., 4,073,591, Cl. 403-24.000.
Lohbauer, Kenneth R., 4,073,141, Cl. 60-421.000.

Cav Limited: *See—*
Nicolls, Wilfrid Edward Walter, 4,073,276, Cl. 123-139.00E.

Cawley, William H.: *See—*
Rowe, Edward A., Jr.; and Cawley, William H., 4,073,066, Cl. 34-73.000.

Cefilac: *See—*
Perret, Claude, 4,073,160, Cl. 64-9.00R.

Celanese Corporation: *See—*
Kalnin, Ilmar L., 4,073,869, Cl. 423-447.100.

Celeste, Lawrence S. Shelf protector. 4,073,384, Cl. 211-134.000.

Celotex Corporation, The: *See—*
Barnhart, David A.; and Loftin, Gordy E., 4,073,597, Cl. 415-201.000.

Cenaruzza, Ignacio: *See—*
Arnold, Franz; Boehm, Oscar; and Cenaruzza, Ignacio, 4,073,197, Cl. 74-110.000.

Centralny Osrodek Badawczo-Rozwojowy Maszyn Wlokienniczych: *See—*
Ostrowski, Jerzy; Sierputowski, Piotr; Turkowski, Lukasz; Jablkiewicz, Jerzy; Pacholski, Jan; and Jedryka, Tadeusz, 4,073,128, Cl. 57-58.890.
Ostrowski, Jerzy; Sierputowski, Piotr; Turkowski, Lukasz; Jablkiewicz, Jerzy; Pacholski, Jan; and Jedryka, Tadeusz, 4,073,129, Cl. 57-58.890.

Centre de Recherche d'Architecture d'Urbanisme et de Construction Rauc: *See—*
Oudot, Pierre Armand; and Petroff, Leon, 4,073,113, Cl. 52-710.000.

Centre de Recherches Metallurgiques Centrum Voor Research in de Metallurgie: *See—*
Etienne, Arlette Therese, 4,073,332, Cl. 164-4.000

Centre Europeen de Recherches Pharmacologiques C.E.R.P.H.A.: *See—*
Porte, Laurent, 4,073,940, Cl. 424-324.000.

Centronics Data Computer Corporation: *See—*
Prager, Jay, 4,073,371, Cl. 197-157.000.

Cepkauskas, Martin D., to Combustion Engineering, Inc. Releasable extension shaft coupling. 4,073,684, Cl. 176-86.00R.

Cerberus AG: *See—*
Niederost, Werner; and Durrer, Bernhard, 4,074,341, Cl. 361-331.000.

Cerefice, Steven A.; and Fields, Ellis K., to Standard Oil Company (Indiana). 7,8 Diacyl bicyclo[2.2.2]bis(2,3-dicarboximide) compounds. 4,073,794, Cl. 260-326.00C.

Ceskoslovenska akademie ved: *See—*
Lim, Drahoslav; Kopecek, Jindrich; Bazilova nee Sverinova, Hedvika; and Vacik, Jiri, 4,074,039, Cl. 526-303.000.

Champion International Corporation: *See—*
Nelson, Iver L., 4,073,119, Cl. 53-76.000.

Chan, Hak-Foon: *See—*
Miller, George A.; Chan, Hak-Foon; and Carley, Harold E., 4,073,921, Cl. 424-273.00R.

Chandler, Keith L.; Hyldon, Roy G.; Kumar, Surinder; and O'Mahony, John P., to Quaker Oats Company, The. Process for producing modified protein. 4,073,948, Cl. 426-44.000.

Chapin and Bangs Company, The: *See—*
DeNomme, George L., 4,073,386, Cl. 214-1.00F.

Chapman, Samuel L. Blood sampling syringe. 4,073,288, Cl. 128-2.00F.

Chapurlat, Robert, to Rhone-Poulenc, S.A. Anisotropic phenolic polyether membrane. 4,073,724, Cl. 210-23.00H.

Charransol, Pierre; Hauri, Jacques; and Athenes, Claude, to Thomson-CSF. TST exchange with series-mode space switching stage. 4,074,077, Cl. 179-15.0AT.

Chasey, Henry G., to Koppers Company, Inc. Articulated disc valve. 4,073,472, Cl. 251-229.000.

Chaussy, Jacques; Bret, Jean-Louis; Berton, Adrien; and Odin, Jacques, to Agence Nationale de Valorisation de la Recherche (ANVAR). Electric current chopper. 4,074,343, Cl. 363-14.000.

Chemetron Corporation: *See—*
Hansen, Arne; and Troup, George, 4,073,464, Cl. 251-26.000.

Chemische Werke Huels Aktiengesellschaft: *See—*
Berg, Gerhard; and Nordsiek, Karl-Heinz, 4,073,755, Cl. 260-17.4BB.

Chen, Chun-Pa. Construction for a water hammer type pump. 4,073,604, Cl. 417-226.000.

Chestnov, Robert E., to Jaclyn, Inc. Method of forming a design and an accessory article. 4,073,853, Cl. 264-132.000.

Chevron Research Company: *See—*
Collman, James P., 4,073,778, Cl. 260-78.00L.

Chiarani, Lino: *See—*
Zumin Tricerri, Silvia; and Chiarani, Lino, 4,073,903, Cl. 424-246.000.

Chicago Dryer Company: *See—*
Kober, Kasimir, 4,073,486, Cl. 270-69.000.

Chicago Rawhide Manufacturing Co.: *See—*
Jackowski, Ronald A., 4,073,540, Cl. 301-108.00A.

Chloride Silent Power Limited: *See—*
Bones, Roger John, 4,074,026, Cl. 429-104.000.

Chono, Masazumi: *See—*
Doi, Tsunesuke; Komoto, Hiroshi; Chono, Masazumi; Inoue, Akira; Saito, Kazuaki; and Shinozuka, Isao, 4,073,618, Cl. 21-2.70R.

Chou, Eng J.: *See—*
Okamoto, Yoshiyuki; Wang, Joseph Y.; and Chou, Eng J., 4,073,726, Cl. 210-45.000.

Christ, Alfred; Lehmann, Rolf; and Miller, Helmut, to Escher Wyss Limited. Hydrostatic supporting device. 4,073,549, Cl. 308-9.000.

Christensen, Carl; Hause, Arthur Dickson; and McDonald, Henry Stanton, to Bell Telephone Laboratories, Incorporated. Multiprocessor control of a partitioned switching network by control communication through the network. 4,074,072, Cl. 179-15.0AQ.

Christensen, Inc.: *See—*
Rowley, David S.; Walker, Bruce H.; Fielder, Coy M.; and Rohde, Heino J., 4,073,354, Cl. 175-329.000.

Christidis, Yani; and Depernet, Dominique, to Nobel Hoechst Chimie. Imidazoles and 2-alkyl imidazoles and method for their manufacture. 4,074,054, Cl. 548-335.000.

Christy, Charles A. Positive displacement vane type rotary pump. 4,073,608, Cl. 418-241.000.

Christy, Ronald I., to Hughes Aircraft Company. Bearing retainer. 4,073,552, Cl. 308-201.000.

Chroma-Flex, Inc.: *See—*
Wynn-Smith, David, 4,074,309, Cl. 358-82.000.

Chu, Chung Kwang: *See—*
Watanabe, Kyoichi Aloisius; Chu, Chung Kwang; and Fox, Jack Jay, 4,074,042, Cl. 536-1.000.

Chu, Edward J., to Resistoflex Corporation. Method of fabricating welded PFA-to-PTFE structures. 4,073,856, Cl. 264-259.000.

Chu, Frank K. Y.: *See—*
Fein, Marvin Michael; Patnaik, Birendra Kumar; and Chu, Frank K. Y., 4,073,766, Cl. 260-42.140.

Chung, Daniel A., to Goodyear Tire & Rubber Company, The. Shock absorbing unit molded from polyurethane (urea) rubber composition. 4,073,858, Cl. 264-262.000.

Ciaccio, Leonard L.; and Hameyer, Klaus. Method and apparatus for automated measurement of energy oxygen. 4,073,692, Cl. 195-103.50R.

Ciba-Geigy AG: *See—*
Jager, Horst, 4,073,817, Cl. 260-653.10T.

Ciba-Geigy Corporation: *See—*
Beriger, Ernst, 4,073,932, Cl. 424-279.000.
Green, George Edward, 4,074,008, Cl. 428-418.000.
Havalda, Paul, 4,073,065, Cl. 34-71.000.
Huebner, Charles Ferdinand, 4,073,911, Cl. 424-267.000.
Lacroix, Roger; and Haberli, Roland, 4,073,615, Cl. 8-25.000.
Mitra, Panchanan, 4,073,670, Cl. 156-179.000.
Scartazzini, Riccardo; and Bickel, Hans, 4,073,902, Cl. 424-246.000.

Cilento, Rudolfo D.; and Hill, John Anthony, to E. R. Squibb & Sons, Inc. Method of using drying oils as oxygen scavenger. 4,073,861, Cl. 423-219.000.

Cincinnati Milacron Inc.: *See—*
Dawson, James Earl, 4,073,944, Cl. 425-146.000.

Citizen Watch Company Limited: *See—*
Sekiya, Fukuo; and Ebihara, Heihachiro, 4,074,256, Cl. 340-336.000.

City Tank Corporation: *See—*
McKenzie, Roland W.; and Stansberry, Richard, 4,073,393, Cl. 214-83.300.

Clark, Allen C.: *See—*
Broburg, Gregory W.; and Clark, Allen C., 4,074,204, Cl. 330-109.000.

Clark, William H. Magnetic lock pick. 4,073,166, Cl. 70-394.000.

Clarke, Geoffrey, to Square D Company. Protection circuits for computer based control systems. 4,074,336, Cl. 361-88.000.

Clarke, John Alfred; and Howden, Harry, to U.S. Philips Corporation. Optical projector. 4,073,574, Cl. 350-189.000.

Clarke, John T.; Harker, Royce K.; Hittmeier, Michael E.; and Eaton, James W., to Masonite Corporation. Post-press embossing of a consolidated man-made board. 4,073,672, Cl. 156-219.000.

Clayton, Thomas S.: *See—*
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Clegg, Ronald L. E.: *See—*
Pank, John C.; and Clegg, Ronald L. E., 4,073,326, Cl. 144-209.00R.

Clement, Clyde H. Trunk loading apparatus. 4,073,395, Cl. 214-450.000.

Clonch, David, to S & S Corporation. Feeder crusher. 4,073,445, Cl. 241-101.700.

Close, James R.; and Johnson, James R., to Minnesota Mining and Manufacturing Company. Process for wear-resistant ducts. 4,073,318, Cl. 138-149.000.

Clow, Richard G. Parallel data processing system. 4,074,361, Cl. 364-713.000.

Coburn, Robert E., to Molins Machine Company, Inc. Continuous running machines for producing paperboard box blanks. 4,073,222, Cl. 93-36.00M.

Cochran, Michael J.: *See—*
Boone, Gary W.; and Cochran, Michael J., 4,074,351, Cl. 364-200.000.

Codman & Shurtleff, Inc.: *See—*
Hickey, Robert J., deceased; and Hickey, Lisa M., administratrix, 4,073,179, Cl. 72-409.000.

Coe, Peter: *See—*
Aylmer, Norman Noel; Coe, Peter; Watson, John Graham; and Holloway, Brian Percy, 4,073,157, Cl. 61-111.000.

Cole, James D. Electric motor assembly. 4,074,158, Cl. 310-90.000.

Colgate Palmolive Company: *See—*
Ramachandran, Pallassana, 4,073,735, Cl. 252-8.800.

Colin, Jean-Paul, to Ste Anonyme dite: Ateliers et Chantiers de Bretagne - A CB. Device enabling the immobilizing of a piston in its cylinder. 4,073,217, Cl. 92-27.000.
Collin, Per Harald; Flink, Sune Natanael; Widell, Bjorn; Hirsch, Martin; and Reh, Lothar, to Stora Kopparbergs Bergslags Aktiebolag. Method for reducing material containing iron oxides. 4,073,642, Cl. 75-35.000.
Collins, David J., to General Electric Company. Shaft axial position monitoring system. 4,073,184, Cl. 73-37.600.
Collman, James P., to Chevron Research Company. Crown ether activated lactam polymerization. 4,073,778, Cl. 260-78.00L.
Combustion Engineering, Inc.: *See—*
Cepkauskas, Martin D., 4,073,684, Cl. 176-86.00R.
Lowrie, Neely E., 4,073,734, Cl. 210-532.00R.
Comfort Products, Inc.: *See—*
Gross, Alexander Louis; and Giese, Erik O., 4,073,072, Cl. 36-44.000.
Commissariat a l'Energie Atomique: *See—*
Dumont, Maurice; and Marie, Gerard, 4,073,434, Cl. 237-2.00B.
Commonwealth Scientific and Industrial Research Organization: *See—*
Scott, Trevor William; and Hills, Geoffrey Dean Loftus, 4,073,960, Cl. 426-580.000.
Conklin, Robert M.; Everett, Charles J.; and Human, Arthur T., to Holmes Protection, Inc. Contact system for sensing closures. 4,074,246, Cl. 340-274.00R.
Construction Aids, Inc.: *See—*
Knutson, Carlton N., 4,073,109, Cl. 52-281.000.
Conwed Corporation: *See—*
Akerson, David Wallace, 4,073,230, Cl. 101-32.000.
Cook, Darwen John; and Millers, Donald Alexander, II, to Burroughs Corporation. Modular block unit for input-output subsystem. 4,074,352, Cl. 364-200.000.
Coope, Robert L.; and Munson, Lowell W., to Stevens Engineering. Sub plate assembly for machine tools. 4,073,215, Cl. 90-58.00R.
Cooper, Stephen Robert. Alarm box with fingerprint recorder. 4,074,250, Cl. 340-304.000.
Coppell, Stephen M.; and Harrow, Terence A., to G. D. Searle & Co. Propionamide antitumor agents. 4,073,807, Cl. 260-562.00N.
Cordier, Georges, to Rhone-Poulenc Industries. Process for the preparation of unsaturated alcohols. 4,073,813, Cl. 260-617.00C.
Cornforth, John W.; Schofield, John A.; French, Sidney J.; and Gray, Robin T., to Shell Oil Company. Process for the preparation of 2,2-bis(3,5-di-t-butyl-4-hydroxyphenyl)propane. 4,073,815, Cl. 260-619.00A.
Corning Glass Works: *See—*
Allen, Richard E., 4,073,970, Cl. 427-96.000.
Wu, Che-Kuang, 4,073,654, Cl. 106-52.000.
Cotton, Faye O.: *See—*
Whisman, Marvin L.; Reynolds, James W.; Goetzinger, John W.; and Cotton, Faye O., 4,073,719, Cl. 208-180.000.
Whisman, Marvin L.; Goetzinger, John W.; and Cotton, Faye O., 4,073,720, Cl. 208-180.000.
Couture, Paul A.: *See—*
Jentoft, Arthur P.; and Couture, Paul A., 4,073,097, Cl. 52-22.000.
Cowan, Owen O.: *See—*
Dibler, Carson E., deceased; McDonald, Ruth, successor; and Cowan, Owen O., 4,073,392, Cl. 214-83.100.
Cox, Bernard K. Apparatus for producing a foldable plastic strip. 4,073,610, Cl. 425-577.000.
CPC International Inc.: *See—*
Daggy, Elmer E., 4,073,963, Cl. 426-658.000.
Crawford, Donald C., to FMC Corporation. Bag slow down. 4,073,223, Cl. 93-93.0HT.
Crawford, William B.; and Solomon, Anthony T., to Burlington Industries, Inc. Pleating machine. 4,073,246, Cl. 112-121.110.
Creamer, Malcom Kenneth, Jr.: *See—*
Buckley, Frederick, III; Creamer, Malcom Kenneth, Jr.; and Miller, Gerald Aberdeen, 4,074,150, Cl. 307-362.000.
Creely, William G. Appointment reminders. 4,074,251, Cl. 340-309.400.
Crepaco, Inc.: *See—*
Wakeman, Alden H.; and Heiliger, Leonard R., 4,073,605, Cl. 417-283.000.
Croft, John C., to Ric-Wil, Incorporated. Apparatus for generating plastic foam. 4,074,363, Cl. 366-138.000.
Crosslen, Louis John, to Frank Mayer & Associates, Inc. Display case for use with a merchandise display rack. 4,073,557, Cl. 312-284.000.
Crowle, Brian, to RCA Corporation. Voltage regulators of a type using a common-base transistor amplifier in the collector-to-base feedback of the regulator transistor. 4,074,181, Cl. 323-8.000.
Crowley, Norman R.; and Walker, Charles M. Laminate stacking apparatus and method. 4,073,373, Cl. 198-421.000.
Crowley, Patrick Jelf: *See—*
Balasubramanyan, Sugavanam; Shephard, Margaret Claire; and Crowley, Patrick Jelf, 4,073,923, Cl. 424-273.00R.
Csenky, Laszlo, to Szarvasi Vas-Femipari Szovetkezet. Safety power track system. 4,074,092, Cl. 200-51.070.
Cunningham, Sinclair Upton; and Jackson, Douglas, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the. Automatic machines. 4,073,247, Cl. 112-121.120.
Curry, Edward G.; and Sanders, Vernard W., to Henry Soss and Company. Hinge pintle retaining means. 4,073,037, Cl. 16-169.000.
Curry, Edward G.; and Sanders, Vernard W., to Henry Soss and Company. Pintle with adjustable spring tension motor. 4,073,038, Cl. 16-189.000.
Curtis, John P.: *See—*
Hurney, Paul A.; and Curtis, John P., 4,074,310, Cl. 358-84.000.
Curtiss-Wright Corporation: *See—*
Myers, David M., 4,073,268, Cl. 123-8.130.
Custom Trailers Mfg., Inc.: *See—*
Storm, Nelson "Jack", 4,073,593, Cl. 404-114.000.
Cutler-Hammer, Inc.: *See—*
Bischof, John F.; and Fritsch, Ronald J., 4,074,091, Cl. 200-50.00A.
Hults, Harold W.; and Swessel, John A., Jr., 4,074,100, Cl. 200-339.000.
Cutters Machine Company, Inc.: *See—*
Gratsch, Jack M.; and Frederick, Cecil S., 4,073,206, Cl. 83-489.000.
Daggy, Elmer E., to CPC International Inc. Stable, homogeneous buttered table syrups. 4,073,963, Cl. 426-658.000.
Daimler-Benz Aktiengesellschaft: *See—*
Klie, Wolfgang, 4,073,528, Cl. 293-98.000.
Resch, Reinhard, 4,073,543, Cl. 303-10.000.
Dainichi Kinzoku Kogyo Co., Ltd.: *See—*
Ueda, Masanobu, 4,074,349, Cl. 364-107.000.
Daisley, Robert Thomas: *See—*
Hinchcliffe, Dennis; Daisley, Robert Thomas; Harper, Stanley Bernard; and Kilborn, Hilary Mark How'l, 4,073,374, Cl. 198-425.000.
Dale, Richard, to Appollon Designs, Inc. Stand for calculator. 4,073,460, Cl. 248-441.00R.
Damone, Frank, to Damone, Frank. Stroller for a child. 4,073,499, Cl. 280-1.10R.
Dana Corporation: *See—*
Guenther, William D., 4,073,220, Cl. 92-190.000.
Kress, Robert F., 4,073,601, Cl. 416-242.000.
Danckert, Hermann, to Volkswagenwerk Aktiengesellschaft. Vehicle with energy absorbing chassis and engine restraint. 4,073,357, Cl. 180-64.00R.
Danguillier, Wilhelm: *See—*
Gernhardt, Paul; Grams, Wolfgang; Danguillier, Wilhelm; and Pohl, Siegfried, 4,073,628, Cl. 48-62.00R.
Danioni, Francesco, to Italo Danioni S.d.f.; and Sio-Societa per l'Industria dell'Ossigeno e di Altri Gas S.p.a., part interest to each. Comminuting plant at cryogenic temperatures. 4,073,443, Cl. 241-65.000.
Danon, David: *See—*
Swank, Roy L.; and Danon, David, 4,073,723, Cl. 210-23.00R.
Dardenne, Regis, to ACEC, Ateliers de Constructions Electriques de Charleroi. Method and apparatus for measuring the position of a magnetic rod. 4,074,185, Cl. 324-208.000.
Darnbrough, Kenneth: *See—*
Sharpe, Raymond; and Darnbrough, Kenneth, 4,074,180, Cl. 322-29.000.
Darragh, John Irvine; and Inglis, Hugh Stewart, to Imperial Chemical Industries Limited. Manufacture of pyridine and methylpyridines. 4,073,787, Cl. 260-290.00P.
D'Arrigo, Sebastiano; and Ghiringhelli, Giovanni, to SGS-ATES Componenti Elettronici S.p.A. Protective device for a power element of an integrated circuit. 4,074,334, Cl. 361-79.000.
Dart Industries, Inc.: *See—*
Fein, Marvin Michael; Patnaik, Birendra Kumar; and Chu, Frank K. Y., 4,073,766, Cl. 260-42.140.
Dashineau, Melvin A.: *See—*
Ueltz, Herbert F. G.; Dashineau, Melvin A.; and Pino, James J., 4,073,096, Cl. 51-309.00A.
Data Packaging Corporation: *See—*
Lyman, George F., 4,073,695, Cl. 195-127.000.
Daugherty, Charles R. Temporary structure. 4,073,105, Cl. 52-169.900.
Davis, Chester B. Fishing worm threader. 4,073,083, Cl. 43-4.000.
Davis, Earl Klimer; Rogers, William Oakley; and Silvis, Duane Charles, to Motorola, Inc. Glass for semiconductors. 4,073,657, Cl. 106-73.500.
Davis, George B., Jr. Christmas tree series light string. 4,073,564, Cl 339-157.00C.
Davis, Gilbert E., to Energy Research. Valve control apparatus for rotary engines. 4,073,216, Cl. 91-480.000.
Davis, Robert H.: *See—*
Schick, John W.; and Davis, Robert H., 4,073,736, Cl. 252-31.000.
Davis, Walter L.; and Svehaug, Henry V., to Applied Magnetics, Inc. Crab butchering machine. 4,073,041, Cl. 17-71.000.
Dawson, James Earl, to Cincinnati Milacron Inc. Nozzle shut-off valve. 4,073,944, Cl. 425-146.000.
De Laval Separator Company, The: *See—*
D'Orsay, James Alvin, 4,073,339, Cl. 165-94.000.
DeBisschop, James George, to Torrington Company, The. Thrust washer strip. 4,073,162, Cl. 64-17.00R.
Debortoli, George; and Zimmermann, Detlef, to Northern Telecom Limited. Protector for telecommunication lines. 4,074,337, Cl. 361-124.000.
De brey, Robert J.; and Thom, Richard S. Food handling tongs. 4,073,533, Cl. 294-118.000.
Dechene, Ronald L.; Grimaldi, Frank G.; and Newton, Robert E., to Auburn International, Inc. Nonconductive vapor/solid or liquid fraction determination. 4,074,184, Cl. 324-30.00R.
Deeg, Emil W.; and Krohn, David A., to American Optical Corporation. Ophthalmic lens with locally variable index of refraction and method of making same. 4,073,579, Cl. 351-169.000.
Defibrator Aktiebolag: *See—*
Virving, Nils G., 4,073,442, Cl. 241-37.000.
de Jager, Frank; and Martony, Juan Jose, to U.S. Philips Corporation. Vestigial-sideband transmission system for synchronous data signals. 4,074,199, Cl. 325-50.000.
Del Norte Technology, Inc.: *See—*
Parker, William H., 4,073,341, Cl. 166-65.00R.
DeLano, Merritt V., Jr., to Phillips Petroleum Company. Production of carbon monoxide. 4,073,630, Cl. 48-197.00R.
Dell, Basil, to Hendren, Gilbert T., Jr., a part interest. Cranking system of varying radius. 4,073,196, Cl. 74-52.000.
DeLorean, Jack Z.; and Bacon, David C., to Grand Prix of America, Inc. Timing system. 4,074,117, Cl. 235-92.00T.
de Montigny, Armand: *See—*
Moretto, Hans-Heinrich; de Montigny, Armand; Thom, Karl-Friedrich; and Schliebs, Reinhard, 4,073,801, Cl. 260-448.20E.
Denenberg, Byron A.: *See—*
Bull, Rame; Denenberg, Byron A.; and Popovic, Djorde R., 4,073,621, Cl. 23-254.00E.
DeNomme, George L., to Chapin and Bangs Company, The. Powered material handling apparatus. 4,073,386, Cl. 214-1.00F.
De Nora, Oronzio; and De Nora, Vittorio, to Oronzio de Nora Impianti Elettrochimici, S.p.A. Electrolysis cell with vertical anodes and cathodes and method of operation. 4,073,715, Cl. 204-256.000.
De Nora, Vittorio: *See—*
De Nora, Oronzio; and De Nora, Vittorio, 4,073,715, Cl. 204-256.000.
Spaziante, Placido Maria; Santi, Rinaldo; and De Nora, Vittorio, 4,073,707, Cl. 204-105.00R.
Depernet, Dominique: *See—*
Christidis, Yani; and Depernet, Dominique, 4,074,054, Cl. 548-335.000.
Derain, Christian, to Societe Nouvelle des Bennes Saphem. Movable container adjustable in height, for loading on a vehicle. 4,073,396, Cl. 214-515.000.
Derbyshire, George Cecil, to Jacobs Manufacturing Company, Limited, The. Drill chucks. 4,073,498, Cl. 279-62.000.
Desforges, Charles Desmond: *See—*
Brook, Greville Bertram; Bowyer, William Henry; and Desforges, Charles Desmond, 4,073,400, Cl. 220-63.00R.
Desty, Denis Henry, to British Petroleum Company Limited, The. Flarestack Coanda burners with self-adjusting slot at pressure outlet. 4,073,613, Cl. 431-202.000.
de Taddeo, Giancarlo: *See—*
Favron, Sergio, 4,073,084, Cl. 43-42.350.
Detwiler, John H.: *See—*
Koehn, Wilbur R.; and Detwiler, John H., 4,073,280, Cl. 124-72.000.
Deutsche Babcock Aktiengesellschaft: *See—*
Schiemichen, Peter, 4,073,155, Cl. 61-88.000.
Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Bertram, Heidrun; Fahnenstich, Rudolf; Offermanns, Heribert; and Tanner, Herbert, 4,073,945, Cl. 426-2.000.
Koch, Karlheinz; Kolaczinski, Gerhard; Rupilius, Wolfgang; and Stein, Werner, 4,074,013, Cl. 428-457.000.
Roebke, Wolfgang; Kneitel, Dieter; and Parr, Erfried, 4,073,867, Cl. 423-429.000.
vonBebenburg, Walter; and Offermanns, Heribert, 4,073,792, Cl. 260-296.00H.
Deutsche Texaco Aktiengesellschaft: *See—*
Herrmann, Rudolf, 4,073,816, Cl. 260-648.00R.
Devine, Thomas M., Jr., to General Electric Company. Method for joining an anode target comprising tungsten to a graphite substrate. 4,073,426, Cl. 228-122.000.
Dexter, John L.; Kyser, Edmond L.; Mitchell, Charles S.; and Sears, Stephan B., to Silonics, Inc. Ink supply system and print head. 4,074,284, Cl. 346-140.00R.
Dey, Thomas W., to Bausch & Lomb Incorporated. Lighting panel. 4,074,126, Cl. 362-297.000.
Dhein, Rolf: *See—*
Eimers, Erich; Margotte, Dieter; Schmid, Helmut; and Dhein, Rolf, 4,073,769, Cl. 260-45.80R.
Diagnostic Data, Inc.: *See—*
Karler, Arthur, 4,073,897, Cl. 424-230.000.
Diamond Shamrock Corporation: *See—*
Holm, Robert E.; and Battershell, Robert D., 4,073,637, Cl. 71-94.000.
Nagy, Zoltan, 4,073,706, Cl. 204-98.000.
Rowe, Edward A., Jr.; and Cawley, William H., 4,073,066, Cl. 34-73.000.
Dibler, Carson E., deceased; McDonald, Ruth, successor; and Cowan, Owen O., to McDonald, Ruth R., successor, assignment of Carson E. Dibler, deceased. Mobile self-propelled harvester. 4,073,392, Cl. 214-83.100.
Dick, Heinrich, to Voith Getriebe KG. Transmission-ratio-changer for multiple-transmission-ratio transmission arrangement. 4,073,204, Cl. 74-866.000.
Didier Engineering GmbH: *See—*
Protzl, Martin, 4,073,697, Cl. 202-254.000.
Dieck, Ronald L.; and Quinn, Edwin J., to Armstrong Cork Company. Polyphosphazene blends. 4,073,824, Cl. 260-823.000.
Dieck, Ronald L.; and Quinn, Edwin J., to Armstrong Cork Company. Polyphosphazene polymer/silicone rubber blends and foams therefrom. 4,073,825, Cl. 260-824.00R.
Diel, Roger L.: *See—*
Spata, James M.; and Diel, Roger L., 4,073,962, Cl. 426-646.000.
DiGiovanni, Francis J., Jr. Mausoleum and method of construction. 4,073,100, Cl. 52-79.300.
Dilanni, Daniel: *See—*
Brackmann, Warren A.; and Dilanni, Daniel, 4,073,850, Cl. 264-93.000.
Dingess, Billy, to Lester Construction Co. Car coupling. 4,073,507, Cl. 280-477.000.
Dionics, Inc.: *See—*
Kravitz, Bernard L., 4,074,293, Cl. 357-34.000.
Dippel, Heinz: *See—*
Ullrich, Hansjurgen; Dippel, Heinz; and Loss, Karl, 4,073,728, Cl. 210-71.000.
Dischert, Robert Adams; Hurst, Robert Norman; and Luther, Arch Clinton, Jr., to RCA Corporation. Signal processor using charge-coupled devices. 4,074,307, Cl. 358-8.000.
Ditcher, John, to A-Lok Corporation. Gasket seal between sewer pipe and manhole opening. 4,073,048, Cl. 29-450.000.
Dobner, Reinhold; and Hager, Walter, to Pfaff Industriemaschinen GmbH. Method for effecting the sewing of a pocket stitch. 4,073,252, Cl. 112-265.000.
Dobras, Bruce W., to Monarch Marking Systems, Inc. Bar code and method and apparatus for interpreting the same. 4,074,114, Cl. 235-463.000.
Dr. C. Otto & Comp. G.m.b.H.: *See—*
Gernhardt, Paul; Grams, Wolfgang; Danguillier, Wilhelm; and Pohl, Siegfried, 4,073,628, Cl. 48-62.00R.
Haese, Egon, 4,073,862, Cl. 423-220.000.
Ullrich, Hansjurgen; Dippel, Heinz; and Loss, Karl, 4,073,728, Cl. 210-71.000.
Dr. Madaus & Co.: *See—*
Valcavi, Umberto, 4,073,938, Cl. 424-317.000.
Doduco, Eugen Durrwachter: *See—*
Bollian, Erwin, 4,073,425, Cl. 228-116.000.
Doehlman, Harold G.: *See—*
Oder, Charles D.; and Doehlman, Harold G., 4,073,554, Cl. 312-199.000.
Doi, Tetsuo: *See—*
Kojima, Yasuyuki; Tanno, Kiyohiko; Doi, Tetsuo; and Ono, Kunio, 4,074,280, Cl. 346-76.00R.
Doi, Tsunesuke; Komoto, Hiroshi; Chono, Masazumi; Inoue, Akira; Saito, Kazuaki; and Shinozuka, Isao, to Asahi Kasei Kogyo Kabushiki Kaisha. Anti-corrosive agent for metals. 4,073,618, Cl. 21-2.70R.
Dolby Laboratories, Inc.: *See—*
Berkovitz, Robert Abraham; and Gundry, Kenneth James, 4,074,083, Cl. 179-100.1TD.
Dollar, David L.: *See—*
Scholes, Addison B.; and Dollar, David L., 4,073,966, Cl. 427-26.000.
Doman, Glidden S., to Gallagher, William. Damping mechanism for the rotor hub of a helicopter for ground resonance and waddle and its combination with the rotor. 4,073,600, Cl. 416-140.000.
Donermeyer, Donald D.: *See—*
Baatz, James C.; and Donermeyer, Donald D., 4,073,994, Cl. 428-265.000.
Baatz, James C.; and Donermeyer, Donald D., 4,073,995, Cl. 428-265.000.
Martins, Joseph G.; and Donermeyer, Donald D., 4,073,973, Cl. 427-142.000.
Donnelly Mirrors, Inc.: *See—*
Kamerling, Marc A.; Franks, Jeffrey L.; and Wilson, Harold R., 4,073,855, Cl. 264-249.000.
Dore, Alain; Picard, Jean; and Rochereau, Jacques, to Societe d'Applications Generales d'Electricite et de Mecanique (SAGEM). Device for reading displacements of a movable member. 4,074,258, Cl. 340-347.00P.
Dorner, Stefan: *See—*
Barleon, Leopold; Dorner, Stefan; Goetzmann, Odo; and Kussmaul, Guenter, 4,073,682, Cl. 176-38.000.
Dorr-Oliver Incorporated: *See—*
Steever, Andrew Beaumont; and Svencer, Richard Ernest, 4,073,064, Cl. 34-57.00A.
D'Orsay, James Alvin, to De Laval Separator Company, The. Swept surface heat exchanger. 4,073,339, Cl. 165-94.000.
Double E Company, Inc.: *See—*
Flagg, Richard Edward; and Potter, Blaine, 4,073,497, Cl. 279-2.00R.
Doubovetzky, Serge; Forschner, Peter; and Montazeau, Francois, to Societe Toulousaine de Produits Chimiques "Tolochimie". Process for the preparation of phosgene. 4,073,806, Cl. 260-544.00K.
Doumani, Charles, to Blue Cross Laboratories, Inc. Freeze-thaw stable emulsion cookware lubricant. 4,073,411, Cl. 222-192.000.
Doumani, Charles, to Blue Cross Laboratories, Inc. Emulsified cookware lubricant having freeze-thaw stability. 4,073,412, Cl. 222-192.000.
Dover Corporation: *See—*
Martens, Edward W., 4,073,034, Cl. 16-87.00B.
Dow Chemical Company, The: *See—*
Beale, Alvin Francis, Jr., 4,073,704, Cl. 204-70.000.
Begin, Louis E.; and Dunbar, Joseph E., 4,074,049, Cl. 544-82.000.
Caldwell, Donald Lee; and Fuchs, Raymond John, Jr., 4,073,873, Cl. 423-499.000.
Dupree, Wayne P.; and Brown, William F., Jr., 4,074,273, Cl. 346-34.000.
Greenawalt, Eddie Lee; and Geren, Lorenzo Dow, 4,073,121, Cl. 53-112.00A.
Smith, Layle V., 4,073,842, Cl. 264-53.000.
Dowrick, John Sidney, to Beecham Group Limited. Veterinary compo-

sition for the treatment of mammary disorder in animals. 4,073,920, Cl. 424-271.000.

Dragotinov, Alexander; and Hartmann, Harro Lothar, to Siemens Aktiengesellschaft. Method and switching arrangement for synchronizing oscillators of a digital telecommunication network. 4,074,080, Cl. 178-69.100.

Draper, Robert N., to Western Skyways, Inc. Fluid flow monitoring device. 4,073,189, Cl. 73-228.000.

Dreher, Manfrid. Centrifugal drum polishing machine. 4,073,095, Cl. 51-164.000.

Dresser Industries, Inc.: *See—*
Walters, D. F., 4,073,548, Cl. 308-8.200.

D'Silva, Themistocles D J.: *See—*
Kurtz, Arthur Peter, Jr.; and D'Silva, Themistocles D. J., 4,073,930, Cl. 424-277.000.

Dudzinski, Stanley J., to Pittsburgh Corning Corporation. Method for capping cellular glass blocks for the load bearing insulation of liquefied gas storage tanks. 4,073,976, Cl. 427-181.000.

Duester, Everett L.: *See—*
Batts, John H.; and Duester, Everett L., 4,073,457, Cl. 248-340.000.

Duffee, Homer W.: *See—*
Richards, David O.; Jones, Isaac P.; Duffee, Homer W.; and Nutter, Charles E., 4,073,997, Cl. 428-285.000.

Dultgen, Gerd; and Schmidt, Wolfgang, to Bayer Aktiengesellschaft. Process for uniformly filling cavities with a foam insulating material. 4,073,841, Cl. 264-46.600.

Dumont, Maurice; and Marie, Gerard, to Commissariat a l'Energie Atomique. System for heating buildings. 4,073,434, Cl. 237-2.00B.

Dunbar, Joseph E.: *See—*
Begin, Louis E.; and Dunbar, Joseph E., 4,074,049, Cl. 544-82.000.

Duncan Electric Company, Inc.: *See—*
Milligan, James W., 4,074,221, Cl. 338-21.000.

Du Pont de Nemours, E. I., and Company: *See—*
Yates, Richard Alan, 4,073,956, Cl. 426-470.000.

Dupree, Wayne P.; and Brown, William F., Jr., to Dow Chemical Company, The. Sequential value multi-point recording device with unidirectional scan. 4,074,273, Cl. 346-34.000.

Durand, Harry Walter, to Grain Processing Corporation. Gum confections containing potato starch. 4,073,959, Cl. 426-578.000.

Durrer, Bernhard: *See—*
Niederost, Werner; and Durrer, Bernhard, 4,074,341, Cl. 361-331.000.

Dutartre, Maurice; and Roger, Yves, to Regie Nationale des Usines Renault. Device for cold forging the hollow, spherical heads of ball-joint pivots. 4,073,178, Cl. 72-352.000.

Duvall, David S.; Owczarski, William A.; Paulonis, Daniel F.; and Schaefer, Robert P., to United Technologies Corporation. Metallic filler material. 4,073,639, Cl. 75-.50R.

Duyckinck, Robert W.: *See—*
Reinauer, Thomas V.; Duyckinck, Robert W.; and Handwork, Frank B., 4,073,632, Cl. 55-374.000.

Dyckerhoff & Widmann Aktiengesellschaft: *See—*
Finsterwalder, Ulrich; and Seidl, Otto, 4,073,115, Cl. 52-745.000.

Dynamics Corporation of America: *See—*
Parzych, Joseph F., 4,074,162, Cl. 310-245.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Alfter, Franz-Werner; Breitscheidel, Hans-Ulrich; and Lorry, Cosmas, 4,073,535, Cl. 296-137.00A.
Franz, Arnold; and Kopnick, Siegfried, 4,074,015, Cl. 428-526.000.
Nestler, Heinz; and Plankl, Leo Hans, 4,073,972, Cl. 427-136.000.

Dzus Fastener Co., Inc.: *See—*
Gunther, Conrad J., 4,073,455, Cl. 248-291.000.

E. R. Squibb & Sons, Inc.: *See—*
Cilento, Rudolfo D.; and Hill, John Anthony, 4,073,861, Cl. 423-219.000.

E. + U. Gerstch AG, Ski-Produkte: *See—*
Gertsch, Ulrich, 4,073,509, Cl. 280-618.000.

Earls, David E.; and Nampoothiri, C. N. Damodaran, to General Time Corporation. Electronic chime and strike system. 4,073,133, Cl. 58-13.000.

East, Eldon Dwayne. Tubing deflector. 4,073,323, Cl. 141-326.000.

Eastman Kodak Company: *See—*
Musser, Harry Robert, 4,074,061, Cl. 560-193.000.
O'Neill, George J.; and Pacifici, James G., 4,073,777, Cl. 260-75.00S.
Wang, Richard H. S.; and Zannucci, Joseph S., 4,073,745, Cl. 252-403.000.

Eaton Corporation: *See—*
Tinholt, Thomas H., 4,073,370, Cl. 192-58.00B.

Eaton, James W.: *See—*
Clarke, John T.; Harker, Royce K.; Hittmeier, Michael E.; and Eaton, James W., 4,073,672, Cl. 156-219.000

Ebihara, Heihachiro: *See—*
Sekiya, Fukuo; and Ebihara, Heihachiro, 4,074,256, Cl. 340-336.000.

Echeverria, Federico S.: *See—*
Carson, Chester C.; Barton, Sterling C.; and Echeverria, Federico S., 4,074,137, Cl. 250-380.000.

Edelman, William. Control apparatus for the automatic treatment of diabetes. 4,073,292, Cl. 128-214.00E.

Edenhofer, Bernd, to Ionit Anstalt Bernhard Berghaus. Arrangement for measuring temperatures of workpieces to be treated by glow discharge. 4,074,140, Cl. 250-492.00R.

Edholm, John H.: *See—*
Wolinski, Leon E.; Riebling, Richard G.; and Edholm, John H., 4,074,033, Cl. 526-47.000.

Edixhoven, Gerardus Hendrikus, to Hunter Douglas International N.V. Apparatus for assembling louvred blinds. 4,073,044, Cl. 29-24.500.

Edmonson, Douglas A.: *See—*
Hansen, Eldon D.; and Edmonson, Douglas A., 4,073,950, Cl. 426-128.000.

Edson, Harold C. Holder for artist paint tubes. 4,073,418, Cl. 224-45.00K.

Efremov, Petr Evgenievich: *See—*
Korshunov, Evgeny Alexeevich; Bainov, Nikolai Ivanovich; Petrov, Igor Nikolaevich; Konovalov, Georgy Fedorovich; Arshansky, Mikhail Iosipovich; Shmidt, Petr Genrikhovich; Kostrov, Valery Pavlovich; and Efremov, Petr Evgenievich, 4,073,333, Cl. 164-66.000.

Eggleton, Reginald C.; and Williamson, Warren L., to Indianapolis Center for Advanced Research. Peak detector for resolution enhancement of ultrasonic visualization systems. 4,074,223, Cl. 340-1.00R.

Egnaczak, Raymond K.: *See—*
Teumer, Roger G.; Warter, Peter J., Jr.; Squassoni, Gino F.; Tulagin, Vseevolod; and Egnaczak, Raymond K., 4,073,583, Cl. 355-3.00P.

Eguchi, Yasukata, to Janome Sewing Machine Co., Ltd. Intermittent stitching device of sewing machines. 4,073,253, Cl. 112-275.000.

Eheim, Franz, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,073,277, Cl. 123-139.0BD.

Ehrsam, William Friedrich; Meyer, Carl H. W.; Smith, John Lynn; and Tuchman, Walter Leonard, to International Business Machines Corporation. Message verification and transmission error detection by block chaining. 4,074,066, Cl. 178-22.000.

Eichelberger, Charles W.: *See—*
Butler, Walter J.; and Eichelberger, Charles W., 4,074,260, Cl. 340-347.0CC.

Eicker, Rolf: *See—*
Solf, Johannes; and Eicker, Rolf, 4,073,058, Cl. 30-257.000.

Eidenschink, Rudolf: *See—*
Erdmann, Dietrich; Eidenschink, Rudolf; Krause, Joachim; and Pohl, Ludwig, 4,073,742, Cl. 252-299.000.

Eidsmo, Arne; and Lofmark, Bengt Gustav, to Telefonaktiebolaget L M Ericsson. Pilot receiver memory unit in a carrier frequency system. 4,074,073, Cl. 179-15.0BP.

Eimers, Erich; Margotte, Dieter; Schmid, Helmut; and Dhein, Rolf, to Bayer Aktiengesellschaft. Esters of phosphorous acid. 4,073,769, Cl. 260-45.80R.

Eisai Co., Ltd.: *See—*
Kawashima, Hidetoshi; Ohtake, Shinzaburo; Fujimori, Toru; Ohkawa, Isao; and Tajima, Tetsuya, 4,073,910, Cl. 424-266.000.
Yasuda, Koichi; Ikeda, Yusuke; and Nishida, Yukiaki, 4,073,883, Cl. 424-94.000.

Eisenhower, Walter D.: *See—*
Paivinen, John O.; and Eisenhower, Walter D., 4,074,301, Cl. 357-23.000.

Eisert, Manfred; and Schmeidl, Karl, to BASF Aktiengesellschaft. Auramine salts. 4,074,060, Cl. 560-149.000.

Eklof, Ake Torsten; Fengsborn, Per Tage Allan; and Romell, Gunnar Vigg Riss, to Atlas Copco Aktiebolag. Device for damping the recoil of a work tool connected to a percussion tool. 4,073,350, Cl. 173-139.000.

Ekstrom, Bo: *See—*
Steinert, Wolfgang; and Ekstrom, Bo, 4,074,119, Cl. 364-807.000.

Electric Fuel Propulsion Corporation: *See—*
Aronson, Robert R., 4,074,021, Cl. 429-51.000.

Electrostatic Equipment Company: *See—*
Means, Eldon A.; and McMahon, Roy C., 4,073,712, Cl. 204-186.000.

Elger, Walter: *See—*
Skuballa, Werner; Raduechel, Bernd; Vorbrueggen, Helmut; Elger, Walter; Loge, Olaf; and Schillinger, Eckehard, 4,073,934, Cl. 424-305.000.

Eliades, Theo Ioannou; and Ramirez, Noemi Bernardo, to Surpass Chemicals Limited. Nitrite based rust inhibitor complex. 4,073,744, Cl. 252-389.00R.

Ell, William M. Selector. 4,074,116, Cl. 235-83.000.

Eller, J. Marlin. Pumping installation. 4,073,606, Cl. 417-424.000.

Elliott, James P.: *See—*
Hunt, Paul S.; Elliott, James P.; Gulich, Johann F.; Weber, Max H.; Yampolsky, Jack S.; and Lockett, George E., 4,073,267, Cl. 122-32.000.

Elliott, Robert L., to Exxon Research & Engineering Co. Hydrogenated copolymers of conjugated dienes and when desired a vinyl aromatic monomer are useful as oil additives. 4,073,737, Cl. 252-51.50A.

Ellis, James B., to Fibreboard Corporation. Adjustable clamping device. 4,073,317, Cl. 138-147.000.

Endo, Hiroshi: *See—*
Fujiki, Norio; and Endo, Hiroshi, 4,073,359, Ci. 180-98.000.

Endo, Kunio, to Nippondenso Co., Ltd. Electronically-controlled fuel injection system. 4,073,270, Cl. 123-32.0EB.

Energetics Science, Inc.: *See—*
Blurton, Keith F.; and Stetter, Joseph R., 4,073,698, Cl. 204-1.00T.

Energy Absorption Systems: *See—*
Seegmiller, Wan; and Young, Bruce O., 4,073,482, Cl. 267-139.000.

Energy Research: *See—*
Davis, Gilbert E., 4,073,216, Cl. 91-480.000.

Engelhard Minerals & Chemicals Corporation: *See—*
Pfefferle, William C.; and Hettinger, William P., Jr., 4,073,716, Cl. 208-66.000.

Engleway Corporation: *See—*
Vandeweghe, Joseph L., 4,074,225, Cl. 340-237.00R.

English Electric Valve Co., Ltd.: *See—*
Scoles, Graham John, 4,074,202, Cl. 328-258.000.

Epsztein, Bernard; and Kantorowicz, Gerard, to Thomson-CSF. Elastic bulk wave frequency filter. 4,074,213, Cl. 333-71.000.

Erdco Engineering Corporation: *See—*
Bogen, John S.; and Robin, Gary I., 4,074,243, Cl. 340-237.00R.

Erdmann, Dietrich; Eidenschink, Rudolf; Krause, Joachim; and Pohl, Ludwig, to Merck Patent Gesellschaft mit beschrankter Haftung. Cyano-substituted biphenyl compounds and liquid crystalline dielectrics containing the same. 4,073,742, Cl. 252-299.000.

Erickson, John W.; and Williams, Carter P., to Kobe, Inc. Lubricant cooling for high-speed pitot pump. 4,073,596, Cl. 415-180.000.

Erwin, Curtis L., Jr. Flow meter and metering systems. 4,073,186, Cl. 73-114.000.

Erwin, Robert L. Rotary plug valve. 4,073,468, Cl. 251-77.000.

Esanu, Andre, to Societe d'Etudes de Produits Chimiques. Isopropylamino pyrimidine orthophosphate. 4,073,895, Cl. 424-200.000.

Esch, Erich: *See—*
Schmidt, Manfred; Freitag, Dieter; Fries, Hermann; and Esch, Erich, 4,073,757, Cl. 260-19.00R.

Escher Wyss Limited: *See—*
Christ, Alfred; Lehmann, Rolf; and Miller, Helmut, 4,073,549, Cl. 308-9.000.
Fanta, Peter, 4,073,731, Cl. 210-376.000.

Esco Corporation: *See—*
Miller, Franklin L., 4,073,042, Cl. 24-241.00P.

Essel, Albert E., deceased; and by Essel, Virginia G., executrix. Snowplow blade extension. 4,073,077, Cl. 37-50.000.

Essel, Virginia G., executrix: *See—*
Essel, Albert E., deceased; and Essel, Virginia G., executrix, 4,073,077, Cl. 37-50.000.

Essex Group, Inc.: *See—*
Kaduki, Charles L.; and Stoneking, Richard D., 4,073,611, Cl. 431-45.000.

Estes, Roger Q. Disposable noise reducing hearing aid attachment. 4,073,366, Cl. 181-158.000.

Etablissements Leroux S.A.: *See—*
Leroux, Serge Andre, 4,073,177, Cl. 72-339.000.

Etienne, Arlette Therese, to Centre de Recherches Metallurgiques Centrum Voor Research in de Metallurgie. Method of controlling continuous casting of a metal. 4,073,332, Cl. 164-4.000.

Eue, Ludwig: *See—*
Regel, Erik; Eue, Ludwig; and Schmidt, Robert R., 4,073,636, Cl. 71-92.000.

Evenson, Gerald Norman; and Moffett, Robert Bruce, to Upjohn Company, The. Certain as-triazino [4,3-a][1,4]benzodiazepine derivatives. 4,073,785, Cl. 260-243.300.

Everett, Charles J.: *See—*
Conklin, Robert M.; Everett, Charles J.; and Human, Arthur T., 4,074,246, Cl. 340-274.00R.

Exxon Research & Engineering Co.: *See—*
Elliott, Robert L., 4,073,737, Cl. 252-51.50A.
Hamner, Glen P., 4,073,718, Cl. 208-80.000.
Malachesky, Paul A.; and Newman, Gerald H., 4,074,019, Cl. 429-50.000.
Mayer, Ivan, 4,073,822, Cl. 260-683.470.
Powers, Kenneth W.; and Kuntz, Irving, 4,074,035, Cl. 526-185.000.
Saidla, Glen E. W., 4,073,840, Cl. 264-45.300.
Siskin, Michael, 4,073,821, Cl. 260-683.470.
Yates, David J. C.; and Murrell, Lawrence L., 4,073,750, Cl. 252-459.000.

Fahey, Thomas D.; and Schlagel, Samuel, to Steel Storage Systems, Inc. Apparatus for racking steel and the like. 4,073,382, Cl. 211-1.000.

Fahim, Mostafa S. Method of male contraception for domestic mammals having a scrotum. 4,073,289, Cl. 128-24.00A.

Fahnenstich, Rudolf: *See—*
Bertram, Heidrun; Fahnenstich, Rudolf; Offermanns, Heribert; and Tanner, Herbert, 4,073,945, Cl. 426-2.000.

Fair, Samuel S., to Sandgrabber, Inc. Shore erosion control structure. 4,073,145, Cl. 61-4.000.

Fairchild Industries, Inc.: *See—*
Smallwood, John J., 4,073,313, Cl. 137-625.600.

Falconer, David Duncan; and Weinstein, Stephen Brant, to Bell Telephone Laboratories, Incorporated. Joint adaptive echo canceller and equalizer for two-wire full-duplex data transmission. 4,074,086, Cl. 179-170.200.

Fan, Lo Cheng: *See—*
Hearon, William Montgomery; and Fan, Lo Cheng, 4,073,804, Cl. 260-534.00R.

Fansteel Inc.: *See—*
Keifert, Hibbard G.; and Jenstrom, Einar R., 4,073,427, Cl. 228-165.000.

Fanta, Peter, to Escher Wyss Limited. Push-type centrifuge. 4,073,731, Cl. 210-376.000.

Farrar, Edward L., Jr. Pelvic traction belt. 4,073,290, Cl. 128-75.000.

Fassbender, Rolf: *See—*
Lang, Armin; and Fassbender, Rolf, 4,073,140, Cl. 60-405.000.

Faucz, Eugene C.: *See—*
Haas, Werner E. L.; and Faucz, Eugene C., 4,074,276, Cl. 346-74.100.

Favreau, Michel; and Vidal, Serge, to Thomson-CSF. Arrangement for projecting images of markers on to a photosensitive surface in a telecine equipment. 4,073,586, Cl. 355-20.000.

Favron, Sergio, to de Taddeo, Giancarlo. Artificial bait for fishing. 4,073,084, Cl. 43-42.350.

Feather, Jack Vincent. Body attached restraining type exercising device. 4,073,490, Cl. 272-136.000.

Feilchenfeld, Max Hans, to Yissum Research Development Co. of the Hebrew Univ.; and Israel Chemicals Ltd. Oxidation of magnesium chloride. 4,073,875, Cl. 423-504.000.

Fein, Marvin Michael; Patnaik, Birendra Kumar; and Chu, Frank K. Y., to Dart Industries, Inc. Organic borate coupling agents. 4,073,766, Cl. 260-42.140.

Feldberg, Murray: *See—*
O'Rourke, James; and Feldberg, Murray, 4,073,229, Cl. 100-98.00R.

Feldmesser, Julius: *See—*
Thompson, Malcolm J.; Feldmesser, Julius; and Robbins, William E., 4,073,939, Cl. 424-320.000.

Fengsborn, Per Tage Allan: *See—*
Eklof, Ake Torsten; Fengsborn, Per Tage Allan; and Romell, Gunnar Vigg Riss, 4,073,350, Cl. 173-139.000.

Ferrarini, James; and Kuehn, Erich, to ICI Americas Inc. Ethylenically unsaturated monomer solutions containing urylated linear polyester/-polyurethane resins. 4,073,828, Cl. 260-859.00R.

Ferro Corporation: *See—*
Heasley, James H., 4,073,568, Cl. 350-103.000.

Ferro Manufacturing Corporation: *See—*
Pickles, Joseph, 4,073,459, Cl. 248-394.000.

Ferrous Corporation: *See—*
Simmons, Richard W., 4,073,626, Cl. 44-57.000.

Feschenko, Ninel Gavrilovna: *See—*
Kandul, Jury Vasilievich; Semeny, Valery Yakovlevich; Pivovarov, Mikhail Danilovich; Malovik, Vladlen Vasilievich; Mazepa, Ivan Karpovich; and Feschenko, Ninel Gavrilovna, 4,073,809, Cl. 260-606.50P.

Fest, Christa; Hammann, Ingeborg; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. O-alkyl-O-[4-lepidin(6)yl]-(thiono)(thiol) phosphoric (phosphonic) acid esters and arthropodicidal compositions thereof. 4,073,893, Cl. 424-200.000.

Fibreboard Corporation: *See—*
Ellis, James B., 4,073,317, Cl. 138-147.000.

Fielder, Coy M.: *See—*
Rowley, David S.; Walker, Bruce H.; Fielder, Coy M.; and Rohde, Heino J., 4,073,354, Cl. 175-329.000.

Fields, Ellis K.: *See—*
Cerefice, Steven A.; and Fields, Ellis K., 4,073,794, Cl. 260-326.00C.

Fine, Mary Jane: *See—*
Brown, Glendon W.; Fine, Mary Jane; and Hill, Larry O., 4,073,748, Cl. 252-428.000.

Fink, Wolfgang; and Graf, Peter, to Siemens Aktiengesellschaft. Non-mechanical printer operating in accordance with an electrographic process. 4,074,283, Cl. 346-139.00C.

Finsterwalder, Ulrich; and Seidl, Otto, to Dyckerhoff & Widmann Aktiengesellschaft. Process for the production of a bridge girder sectional cantilever construction. 4,073,115, Cl. 52-745.000.

Fishbaugh, Byron L.; Keller, Harold E.; and Stewart, Lionel G., to Goodyear Tire & Rubber Company, The. Method of making vibration damper. 4,073,047, Cl. 29-450.000.

Fisher, John Sergio. Premanufactured modular town house building construction. 4,073,102, Cl. 52-79.130.

Fisher, Michael H.; and Ruyle, William V., to Merck & Co., Inc. 1-Substitutedphenyl-4(1H)-pyridinone hydrazones. 4,073,791, Cl. 260-294.80R.

Fishman, Herbert: *See—*
Shorr, Jacob; and Fishman, Herbert, 4,073,730, Cl. 210-321.00R.

Fitch, Scott McDowell: *See—*
Caputo, Salvatore; Fitch, Scott McDowell; Harris, Cliff Andrew; Kuhar, John, Jr.; Pappas, Andrew Leo; and Redlich, Wayne, 4,074,358, Cl. 364-514.000.

Flagg, Richard Edward; and Potter, Blaine, to Double E Company, Inc. Care chuck stop assembly. 4,073,497, Cl. 279-2.00R.

Flaherty, John J., to Magnaflux Corporation. Conductivity measuring instrument having linearization means and a digital read-out. 4,074,186, Cl. 324-222.000.

Flanigen, Edith Marie; and Patton, Robert Lyle, to Union Carbide Corporation. Silica polymorph and process for preparing same. 4,073,865, Cl. 423-339.000.

Fleischmann, Martin; Goodridge, Francis; and Vance, Christopher John, to National Research Development Corporation. Electrochemical cells. 4,073,702, Cl. 204-59.00R.

Fleming, Robert W.; Sill, Arthur D.; and Sweet, Francis W., to Richardson-Merrell, Inc. Bis-basic ethers of 2,6,-and 2,7-dihydroxyanthraquinones. 4,073,904, Cl. 424-248.580.

Flexibox Limited: *See—*
Bury, Norman Albert, 4,073,161, Cl. 64-13.000.

Flink, Sune Natanael: *See—*
Collin, Per Harald; Flink, Sune Natanael; Widell, Bjorn; Hirsch, Martin; and Reh, Lothar, 4,073,642, Cl. 75-35.000.

Florens, Raymond Leopold, to AFGA-Gevaert N.V. Direct-positive silver halide emulsions. 4,073,652, Cl. 96-101.000.

Florjancic, Dusan: *See—*
Schiele, Otto; and Florjancic, Dusan, 4,073,595, Cl. 415-143.000.

Flottweg-Werk Dr. Georg Bruckmayer GmbH & Co. KG: *See—*
Jager, Ernst Adolf, 4,073,431, Cl. 233-7.000.

Fluid Kinetics, Inc.: *See—*
Gardner, James J.; and Koppehele, Hugh Paul, 4,073,409, Cl. 222-146.0HE.

Fly, Howard G. Portable animal hospital table. 4,073,240, Cl. 108-20.000.
FMC Corporation: *See—*
Crawford, Donald C., 4,073,223, Cl. 93-93.0HT.
Meadow, Morton; and Berkowitz, Sidney, 4,073,868, Cl. 423-443.000.
Foam Cutting Engineers, Inc.: *See—*
Pettingell, Winslow L., 4,073,979, Cl. 427-244.000.
Focht, Bruce E., to Scott Paper Company. Perforated, embossed film to foam laminates having good acoustical properties and the process for forming said. 4,073,991, Cl. 428-138.000.
Foley, Lawrence E., Jr. Oil field pig launcher and receiver. 4,073,303, Cl. 137-15.000.
Ford Aerospace & Communications Corporation: *See—*
Haas, Ronald J.; and Briggs, Donald C., 4,074,018, Cl. 429-21.000.
Ford, Michael Alan, to Perkin-Elmer Limited. Apparatus for changing the speed ratio between first and second displaceable members. 4,073,198, Cl. 74-360.000.
Forman, Ladislav, Mergl, Milos; Mostecky, Jiri; Teply, Milos; and Uher, Jiri, to Vysoka skola chemicko-technologicka. Process for the preparation of a proteinaceous concentrate. 4,073,688, Cl. 195-49.000.
Forsberg, Gunnar Stefan, to Telefonaktiebolaget L M Ericsson. Interference resistant phase-locked loop. 4,074,207, Cl. 331-1.00A.
Forschner, Peter: *See—*
Doubovetzky, Serge; Forschner, Peter; and Montazeau, Francois, 4,073,806, Cl. 260-544.00K.
Fort, Pierre Henri Marie; and Pierrel, Michel, to Pont-A-Mousson S.A. Cooling device for iron pipe centrifugal casting machine. 4,073,335, Cl. 164-154.000.
Fortune, William J., to Great Ideas Corporation. Snow plow blade guard. 4,073,076, Cl. 37-42.0VL.
Foster Grant Co., Inc.: *See—*
Smith, Stuart Bruce, 4,073,843, Cl. 264-53.000.
Fox, Charles W., to McCabe-Powers Body Company. Control system for an aerial device. 4,074,234, Cl. 340-171.00R.
Fox, Jack Jay: *See—*
Watanabe, Kyoichi Aloisius; Chu, Chung Kwang; and Fox, Jack Jay, 4,074,042, Cl. 536-1.000.
Fox, Wayne S., to Kawasaki Motors Corporation, U.S.A. Internal combustion engine shut-off device. 4,073,279, Cl. 123-198.0DC.
Foxton, Michael W.; Gregory, Gordon I.; and Rogers, David M., to Glaxo Laboratories Limited. 7[2-(Aminocarbonylalkoxyimino)acetamido] derivatives of cephalosporin. 4,074,047, Cl. 544-30.000.
Frank, Louis N., to Kranco, Inc. Overhead crane with redundant safety features. 4,073,476, Cl. 254-184.000.
Frank Mayer & Associates, Inc.: *See—*
Crosslen, Louis John, 4,073,557, Cl. 312-284.000.
Frank, Raymond C.; and Frank, Ronald R. Retractable step. 4,073,502, Cl. 280-166.000.
Frank, Ronald R.: *See—*
Frank, Raymond C.; and Frank, Ronald R., 4,073,502, Cl. 280-166.000.
Franklin, Dwaine R. Arrow quiver. 4,073,328, Cl. 150-1.50R.
Franks, Jeffrey L.: *See—*
Kamerling, Marc A.; Franks, Jeffrey L.; and Wilson, Harold R., 4,073,855, Cl. 264-249.000.
Franz, Arnold; and Kopnick, Siegfried, to Dynamit Nobel Aktiengesellschaft. Process for the production of nonflammable laminated materials. 4,074,015, Cl. 428-526.000.
Fraser, Arthur D.; and Inglis, Dwight A., to Harold, Raymond D. Irrigation apparatus. 4,073,309, Cl. 137-344.000.
Fraser, Peter. Lightweight waterbed assembly. 4,073,019, Cl. 5-365.000.
Frederick, Cecil S.: *See—*
Gratsch, Jack M.; and Frederick, Cecil S., 4,073,206, Cl. 83-489.000.
Freeway Corporation: *See—*
Sutowski, Walter S., 4,073,551, Cl. 308-195.000.
Freilich, John Douglas, to Glyco Chemicals, Inc. Di-quaternary ammonium salts of hydantoin and compositions thereof. 4,073,927, Cl. 424-273.00R.
Freilich, John Douglas: *See—*
Sonntag, Norman O. V.; and Freilich, John Douglas, 4,073,926, Cl. 424-273.00R.
Freitag, Dieter: *See—*
Schmidt, Manfred; Freitag, Dieter; Fries, Hermann; and Esch, Erich, 4,073,757, Cl. 260-19.00R.
French, Sidney J.: *See—*
Cornforth, John W.; Schofield, John A.; French, Sidney J.; and Gray, Robin T., 4,073,815, Cl. 260-619.00A.
Frieder, Phillip M.: *See—*
Welsh, Robert C., 4,073,578, Cl. 351-167.000.
Friedrich, Hans, to Siemens Aktiengesellschaft. Apparatus for adjusting a semiconductor wafer by electron beam illumination. 4,073,990, Cl. 428-138.000.
Fries, Hermann: *See—*
Schmidt, Manfred; Freitag, Dieter; Fries, Hermann; and Esch, Erich, 4,073,757, Cl. 260-19.00R.
Fritsch, Ronald J.: *See—*
Bischof, John F.; and Fritsch, Ronald J., 4,074,091, Cl. 200-50.00A.
Fritsch, Walter; and Melcher, Gerhard, to Klockner-Humboldt-Deutz Aktiengesellschaft. Process of smelting sulphidic copper ore concentrates. 4,073,645, Cl. 75-74.000.
Frohberger, Paul-Ernst: *See—*
Buchel, Karl Heinz; Frohberger, Paul-Ernst; and Kaspers, Helmut, 4,073,901, Cl. 424-245.000.
Frohlich, Sigurd. Watch case construction. 4,073,132, Cl. 58-23.0BA.
Frus, John R.: *See—*
Kuo, Benjamin C.; Frus, John R.; and Singh, Gurdial, 4,074,179, Cl. 318-696.000.
Fuchs, Raymond John, Jr.: *See—*
Caldwell, Donald Lee; and Fuchs, Raymond John, Jr., 4,073,873, Cl. 423-499.000.
Fuhrer, Esther Claire: *See—*
Baker, Daniel, deceased; and Borst, Alan W., 4,074,153, Cl. 310-12.000.
Fuji Jukogyo Kabushiki Kaisha: *See—*
Murota, Kozo; Matsumoto, Rempei; Yasuma, Toru; Morinaga, Mamoru; Tajima, Shigeo; Nakamura, Masayuki; and Sakaguchi, Akira, 4,073,361, Cl. 181-228.000.
Fuji Photo Film Co.: *See—*
Noguchi, Masaru, 4,073,566, Cl. 350-3.710.
Fuji Photo Film Co., Ltd.: *See—*
Fujita, Susumu; and Kushibe, Seijiro, 4,074,294, Cl. 354-106.000.
Maekawa, Yukio, 4,073,781, Cl. 260-152.000.
Miyamoto, Akio; Matsukawa, Hiroharu; and Kobayashi, Teruo, 4,073,968, Cl. 427-54.000.
Munakata, Tsuneaki; and Kuboshima, Makoto, 4,074,296, Cl. 354-187.000.
Fuji Photo Optical Co., Ltd.: *See—*
Suzuki, Ryotaro, 4,074,286, Cl. 354-21.000.
Yamagishi, Akira, 4,073,573, Cl. 350-187.000.
Fujii, Hiroshi: *See—*
Tsuchiya, Yoshimasa; and Fujii, Hiroshi, 4,073,520, Cl. 292-216.000.
Fujikake, Kenji; Amaki, Isamu; and Suzuki, Masatoshi, to Toyota Chuo Kenkyusho. Heat exchangers. 4,073,338, Cl. 165-86.000.
Fujiki, Norio; and Endo, Hiroshi, to Nissan Motor Company, Limited. Braking system for avoiding a collision of a vehicle with an obstacle thereof. 4,073,359, Cl. 180-98.000.
Fujimori, Toru: *See—*
Kawashima, Hidetoshi; Ohtake, Shinzaburo; Fujimori, Toru; Ohkawa, Isao; and Tajima, Tetsuya, 4,073,910, Cl. 424-266.000.
Fujimoto, Yoshiji: *See—*
Yajima, Shunichi; Kakumoto, Shigeru; Fujimoto, Yoshiji; and Hananoi, Toshihiro, 4,074,231, Cl. 340-146.3AG.
Fujino, Masahiko; Wakimasu, Mitsuhiro; Taketomi, Shigehisa; and Ishikawa, Eiichiro, to Takeda Chemical Industries, Ltd. Novel polypeptides. 4,073,890, Cl. 424-177.000.
Fujita, Hisaya; Kaieda, Nobuo; Sato, Setsuo; and Kawakami, Kenji, to Yokogawa Electric Works, Ltd. Multipoint recorder. 4,074,274, Cl. 346-34.000.
Fujita, Kazunori: *See—*
Takeuchi, Seiji; Fujita, Kazunori; and Shimokobe, Ikuo, 4,073,725, Cl. 210-31.00C.
Fujita, Susumu; and Kushibe, Seijiro, to Fuji Photo Film Co., Ltd. Data recording means for photographic camera. 4,074,294, Cl. 354-106.000.
Fujitsu Limited: *See—*
Mochida, Yukou; Ogawa, Tadao; and Yamaguchi, Kazuo, 4,074,127, Cl. 250-199.000.
Otomo, Koju; Itoh, Takeshi; Hayashi, Kazuyuki; Omoto, Hiroshi; Yui, Takayuki; and Suzuki, Makoto, 4,074,232, Cl. 340-147.00R.
Fujiwara, Shinobu: *See—*
Masumura, Hitoshi; Fujiwara, Shinobu; and Tanaka, Hitoshi, 4,073,846, Cl. 264-65.000.
Fukuda, Hitoshi: *See—*
Minehisa, Setsuzi; Inui, Tatuo; and Fukuda, Hitoshi, 4,074,105, Cl. 219-137.800.
Fukushima, Ichiro: *See—*
Imai, Kiyoshi; Hasebe, Nobuyuki; Asami, Tomiaki; Soga, Setsuo; Fukushima, Ichiro; and Asahina, Yasuo, 4,074,001, Cl. 428-329.000.
Fukushima, Seitaro, to Mitsubishi Kinzoku K.K. Recovery of chlorine from iron chloride. 4,073,874, Cl. 423-500.000.
Fulkerson, Emmet M., to General Electric Company. Opto-electronic position sensing method. 4,074,104, Cl. 219-121.0LM.
Fulmer, Leon F., Sr., to Shakespeare Company. Vehicular antenna hold down bracket. 4,073,417, Cl. 224-42.10G.
Fulmer Research Institute: *See—*
Brook, Greville Bertram; Bowyer, William Henry; and Desforges, Charles Desmond, 4,073,400, Cl. 220-63.00R.
Funk, Erwin D., to Kamyr Inc. Coal gasification process with improved procedure for continuously discharging ash particles and apparatus therefor. 4,073,629, Cl. 48-77.000.
Furukawa, Kazunori: *See—*
Wada, Motomu; Inoue, Masakazu; Furukawa, Kazunori; and Matsubara, Shigeyoshi, 4,073,844, Cl. 264-55.000.
Furuya, Tadashi, to Nippon Electric Company, Ltd. System for suppressing sideband components of angle-modulated wave. 4,074,198, Cl. 325-3.000.
Futsuhara, Natsuko: *See—*
Yamaki, Naoomi; Futsuhara, Natsuko; Masuda, Kazue; and Tsuchimoto, Koji, 4,073,866, Cl. 423-405.000.
G.A.O. Gesellschaft fur Automation und Organisation mbH: *See—*
Schirrmeister, Harry; and Haberstroh, Markus, 4,073,487, Cl. 271-64.000.
G. D. Searle & Co.: *See—*
Coppell, Stephen M.; and Harrow, Terence A., 4,073,807, Cl. 260-562.00N.
Gabriel, Edwin Zenith. Punched-card programmable analog computer. 4,074,113, Cl. 235-419.000.

Galantay, Eugene E.; and Kathawala, Faizulla G., to Sandoz, Inc. Hypolipidemic allene carboxylic esters. 4,073,936, Cl. 424-308.000.
Galkiewicz, Thomas M.; Petersen, Kenneth C.; and Sullivan, John L., to Schenectady Chemicals, Inc. Tackifiers for elastomers. 4,073,776, Cl. 260-51.0EP.
Galkiewicz, Thomas M.; Petersen, Kenneth C.; and Sullivan, John L., to Schenectady Chemicals, Inc. Tackifiers for elastomers. 4,073,826, Cl. 260-831.000.
Gallagher, William: *See—*
Doman, Glidden S., 4,073,600, Cl. 416-140.000.
Garab, H. Gary, to Albany International Corporation. Auto crucible for metering and transferring liquid metals. 4,073,414, Cl. 222-602.000.
Gardner, James J.; and Koppehele, Hugh Paul, to Fluid Kinetics, Inc. Hot melt dispenser with removeable pump in follower. 4,073,409, Cl. 222-146.0HE.
Garin, Paul V.: *See—*
Biaggini, Benjamin F.; and Garin, Paul V., 4,073,394, Cl. 214-145.00R.
Garrett Corporation, The: *See—*
Parker, Kenneth O., 4,073,340, Cl. 165-166.000.
Garrett-Weldco Industries, Inc.: *See—*
Schmidt, Wilhelm, 4,073,364, Cl. 180-139.000.
Garrigues, Yves G., to Groupement Europeen de la Cellulose. Process for the oxidation of waste liquors arising from the manufacture of paper pulp. 4,073,727, Cl. 210-63.00R.
Garskamp, Arnoldus, to U.S. Philips Corporation. Receiver tuning circuit. 4,074,216, Cl. 334-15.000.
Gasser, Rupert Josef; and Huster, Lienhard Bodo, to Societe d'Assistance Technique pour Produits Nestle, S.A. Bouillon base. 4,073,961, Cl. 426-589.000.
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Gebauer, Gerhard; Brandrup, Johannes; Kraft, Kurt; and Mayer, Franz, to Hoechst Aktiengesellschaft. Coating composition. 4,074,007, Cl. 428-411.000.
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Born, Norman E.; and Kolatorowicz, Edwin E., 4,074,175, Cl. 318-332.000.
Borom, Marcus P., 4,073,662, Cl. 134-2.000.
Butler, Walter J.; and Eichelberger, Charles W., 4,074,260, Cl. 340-347.0CC.
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Fulkerson, Emmet M., 4,074,104, Cl. 219-121.0LM.
Harris, Samuel C., Jr.; and Hanger, William A., 4,074,128, Cl. 250-205.000.
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Katchman, Arthur; and Lee, Gim Fun, Jr., 4,073,765, Cl. 260-40.00R.
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Mark, Victor, 4,073,768, Cl. 260-45.70S.
Nash, Dudley O.; and Clayton, Thomas S., 4,073,441, Cl. 239-265.410.
Peterson, Marvin A., 4,073,788, Cl. 260-29.20N.
Powers, Robert W., 4,073,711, Cl. 204-181.00F.
Quinn, Clayton B., 4,073,774, Cl. 260-47.0UA.
Schaeffer, Robert L.; and Maher, William M., 4,073,056, Cl. 30-123.500.
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Turnbull, Fred G., 4,074,339, Cl. 361-239.000.
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Gerding, Charles Christian, to Jones & Laughlin Steel Corporation. Tilting tundish. 4,073,334, Cl. 164-87.000.
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Gernhardt, Paul; Grams, Wolfgang; Danguillier, Wilhelm; and Pohl, Siegfried, to Dr. C. Otto & Comp. G.m.b.H. Control system for apparatus to gasify fine-grain fuels in a reactor. 4,073,628, Cl. 48-62.00R.
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Gibson, Walter Gold, to RCA Corporation. Delay line network for processing a composite electrical signal. 4,074,308, Cl. 358-38.000.
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Glazar, James M.; and Hoffmann, Erich H. P., to General Atomic Company. Nuclear reactor shutdown system. 4,073,681, Cl. 176-36.00R.
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Go, Santos W., to Owens-Illinois, Inc. Terephthalic acid/P,P-sulfonyldibenzoic acid/ethylene glycol/neopentyl glycol polyester compositions and containers made therefrom. 4,073,949, Cl. 426-106.000.
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Goloff, Alexander, to Caterpillar Tractor Co. Light-weight piston assemblies. 4,073,221, Cl. 92-221.000.
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Goodwin, Charles M. Electrically and manually actuatable door locking structure. 4,073,518, Cl. 292-144.000.

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Chung, Daniel A., 4,073,858, Cl. 264-262.000.
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Gould Inc.: *See—*
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Grain Processing Corporation: *See—*
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Witt, Paul R., Jr., 4,073,947, Cl. 426-13.000.

Grams, Wolfgang: *See—*
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Graphic Systems, Inc.: *See—*
Belanger, Raymond Francis, 4,074,285, Cl. 354-15.000.

Grataloup, Xavier Roger, to Societe Anonyme Dite: Nodet-Gougis. Method and apparatus for pneumatically spreading particulate substances. 4,073,439, Cl. 239-655.000.

Gratsch, Jack M.; and Frederick, Cecil S., to Cutters Machine Company, Inc. Long-handled cutting apparatus for a cloth spreading machine. 4,073,206, Cl. 83-489.000.

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Gregoire, Clyde G.; Hartman, James A.; and Gregoire, Milton J., to Gregg Engineering Corporation. Apparatus for making multiple page printed booklets. 4,073,485, Cl. 270-21.000.

Gregoire, Milton J.: *See—*
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Griffin, Alvin G. Test piece gripping device. 4,073,185, Cl. 73-103.000.

Grill, Helmut; Zschocke, Rainer Hans; Wagner, Josef; Hofrichter, Gernot; and Janiak, P. Stefan, to Klinge Pharma GmbH & Co. Substituted propanol-(2)-derivatives and their nicotinic acid esters, and process for their preparation, and the use thereof as hypolipemic drugs. 4,073,935, Cl. 424-308.000.

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Gross, Alexander Louis; and Giese, Erik O., to Comfort Products, Inc. Air circulation shoe material. 4,073,072, Cl. 36-44.000.

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Grundstrom, Robert Ronnie; and Baylis, Arthur. Locking device for keyholes. 4,073,165, Cl. 70-371.000.

Grunwell, Joyce F.; and Johnston, John O., to Richardson-Merrell, Inc. Method of terminating pregnancy. 4,073,899, Cl. 424-238.000.

Grutsch, James F.; Mallatt, Russell C.; and Steely, Benjamin F., to Standard Oil Company (Indiana). Process for the purification of waste water. 4,073,722, Cl. 210-5.000.

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Guiller, Jacques. Apparatus for freezing small drops of liquid. 4,073,158, Cl. 62-266.000.

Gulas, Hans-Jurgen; and Neuper, Helmut, to Veitscher Magnesitwerke-Actien-Gesellschaft. Fired refractory brick and process for preparing the same. 4,073,656, Cl. 106-57.000.

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Gupta, Rash B.; and Armstrong, David L., to Westinghouse Electric Corporation. Analog control and digital system with integrated interface for electric power and other plants. 4,074,357, Cl. 364-494.000.

Gupta, Vijai P., to Halcon International, Inc. Preparation of glycol esters. 4,073,876, Cl. 423-508.000.

Gurule, Marcelo. Door latch securing device. 4,073,525, Cl. 292-346.000.

Gutjahr, Rolf, to Otto Durr, Firma. Method and device for drying surface treated, especially varnished objects. 4,073,063, Cl. 34-32.000.

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Gwatkin, James deGoulard, III: *See—*
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H. Eicker & Sohne: *See—*
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H. Wilson Corporation: *See—*
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Haas, Werner E. L.; and Faucz, Eugene C., to Xerox Corporation. Magnetic imaging system using heat. 4,074,276, Cl. 346-74.100.

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Hack, Joachim; Schaefer, Dieter; and Motz, Herbert, to BASF Aktiengesellschaft. Magnetic recording media having a low coefficient of friction. 4,074,002, Cl. 428-331.000.

Haditsch, Werner; Rutz, Hansruedi; and Toplak, Ernst, to BBC Brown Boveri & Company Limited. Internally air cooled exciter-current lead-through bolt interconnecting rotor shaft-enclosed lead-in conductor bar and terminal conductor bar leading to rotor winding. 4,074,155, Cl. 310-59.000.

Haese, Egon, to Dr. C. Otto & Comp. G.m.b.H. Process for removing ammonia, hydrogen sulfide and hydrocyanic acid from gases. 4,073,862, Cl. 423-220.000.

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Hall, John B.; Sprecker, Mark A.; Schmitt, Frederick Louis; and Vock, Manfred Hugo, to International Flavors & Fragrances Inc. 1-Acetyl-3,3-dimethyl-(2-propenyl)cyclohexane perfume compositions. 4,073,751, Cl. 252-522.000.

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Hammersburg, Don D. Universal support pads for wheelchair. 4,073,537, Cl. 297-384.000.

Hamming, Richard Wesley; and Kaiser, James Frederick, to Bell Telephone Laboratories, Incorporated. Multisection filter using inflected amplitude change function to sharpen its band-edge responses. 4,074,212, Cl. 333-70.00T.

Hammond, Jack A.; and Karter, Elias M., to Westvaco Corporation. High yield semichemical wood pulping process. 4,073,678, Cl. 162-19.000.

Hamner, Glen P., to Exxon Research & Engineering Co. Process for the hydroconversion and hydrodesulfurization of heavy feeds and residua. 4,073,718, Cl. 208-80.000.

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Handa, Susumu; Tanaka, Yoshiaki; Nishihata, Atsushi; Ueda, Sadashi; Inamoto, Yoshiaki; Tanimoto, Fumio; and Kitano, Hisao, to Kao Soap Co., Ltd. Process for preparation of isocyanuric acid triesters. 4,074,052, Cl. 544-221.000.

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Hanger, William A.: *See—*
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Hankee, Roy H.; and Akman, Alp T., to Xerox Corporation. Pressure sensitive adhesive drafting films for use in electrostatographic copiers. 4,074,000, Cl. 428-323.000.

Hansen, Arne; and Troup, George, to Chemetron Corporation. Cylinder valve for gas fire extinguishing system. 4,073,464, Cl. 251-26.000.

Hansen, Eldon D.; and Edmonson, Douglas A., to Pillsbury Company, The. Easy opening spirally wound dough can. 4,073,950, Cl. 426-128.000.

Hapke, Donald W., to Boeing Company, The; and Aeritalia S.p.A., part interest to each. Combination primary and fan air thrust reversal control systems for long duct fan jet engines. 4,073,440, Cl. 239-265.290.

Harada, Akikazu, to Hitachi, Ltd. Magnetron with harmonic frequency output suppression. 4,074,169, Cl. 315-39.750.

Harakawa, Hiroshi: *See—*
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Hardwick, John F., to Burroughs Corporation. Method and apparatus for recording and reproducing information on a plural-track record disk. 4,074,328, Cl. 360-77.000.

Harker, Royce K.: *See—*
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Harms, Arie Anthonie; and Wark, Johan Gerrit, to U.S. Philips Corporation. Carrier with code. 4,074,189, Cl. 324-73.00R.

Harmsma, Gunter, to Gewerkschaft Eisenhutte Westfalia. Mine roof support assemblies. 4,073,151, Cl. 61-45.00D.

Harnsberger, Bobby G., to Texaco Inc. Sand consolidation method. 4,073,342, Cl. 166-295.000.

Harnsberger, Bobby G., to Texaco Inc. Sand consolidation method. 4,073,343, Cl. 166-295.000.

Harold, Raymond D.: *See—*
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Harper, Stanley Bernard: *See—*
Hinchcliffe, Dennis; Daisley, Robert Thomas; Harper, Stanley Bernard; and Kilborn, Hilary Mark Howl, 4,073,374, Cl. 198-425.000.

Harrington, Earl J., to Overhead Conveyor Company. Power and free conveyor system. 4,073,236, Cl. 104-172.00S.

Harrington Manufacturing Company: *See—*
Jordan, Bertram Lee; and Mitchell, John Davis, 4,073,124, Cl. 56-1.000.
Jordan, Bertram Lee; and Mitchell, John Davis, 4,073,378, Cl. 198-627.000.

Harris, Cliff Andrew: *See—*
Caputo, Salvatore; Fitch, Scott McDowell; Harris, Cliff Andrew; Kuhar, John, Jr.; Pappas, Andrew Leo; and Redlich, Wayne, 4,074,358, Cl. 364-514.000.

Harris, Edward, to Koppers Company, Inc. Press disc valve. 4,073,470, Cl. 251-163.000.

Harris, Robert J.; and Sikes, Gail T., to H. C. Price Co. Method of packaging asphalt material and improved product resulting therefrom. 4,073,760, Cl. 260-28.5AS.

Harris, Samuel C., Jr.; and Hanger, William A., to General Electric Company. Photoelectric signal generating circuits. 4,074,128, Cl. 250-205.000.

Harrison, George W.; and Moore, Billie G. Method and apparatus for sealing a pipeline leak. 4,073,836, Cl. 264-36.000.

Harrow, Terence A.: *See—*
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Hart, Charles G.; Gordon, John S.; and Sorenson, Richard D., to Hayssen Manufacturing Company. Method of and apparatus for feeding randomly received items. 4,073,375, Cl. 198-466.000.

Hart, David Gerald, to Sangamo Electric Company. Keyless unidirectional reset for cumulative demand register. 4,074,192, Cl. 324-103.00R.

Hart, James E., to Westinghouse Air Brake Company. Continual quick service valve device. 4,073,544, Cl. 303-83.000.

Hartdegen, Frank Joseph; and Abdo, Kamal Mohammad, to W. R. Grace & Co. Promotion of feed efficiency. 4,073,884, Cl. 424-94.000.

Hartless, Ray Lawson; and Trozzolo, Anthony Marion, to Bell Telephone Laboratories, Incorporated. Stabilized polymeric composition and product using same. 4,073,771, Cl. 260-45.9NC.

Hartley, Justin. Burglar alarm for use with an automatic garage door opener. 4,074,269, Cl. 343-225.000.

Hartman, James A.: *See—*
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Hartmann, Harro Lothar: *See—*
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Hartmann, Ludwig Albert; and West, Richard Lowell, to ICI Americas Inc. Process for the preparation and purification of 3-(4-lithiosulfophenoxy)-1,2-propanediol. 4,073,802, Cl. 260-512.00R.

Hartwig, Peter Rudolf, to Schloemann-Siemag Aktiengesellschaft. Apparatus for mixing plastics. 4,073,408, Cl. 222-145.000.
Harvey, Randall L.: *See—*
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Hasenbalg, Ralph D., to Vector General, Inc. Vector generator. 4,074,359, Cl. 364-521.000.
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Heasley, James H., to Ferro Corporation. Retroreflector units with three mutually perpendicular surfaces defining a trihedral angle of a rectangular parallelepiped. 4,073,568, Cl. 350-103.000.
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Heid, Christian; and Polster, Johannes, to Cassella Farbwerke Mainkur Aktiengesellschaft. Oxidative after-treatment of materials dyed or printed with sulfur or vat dyestuffs. 4,073,616, Cl. 8-34.000.
Heikkinen, Duane G.; and Kanten, Thomas M., to Minnesota Mining and Manufacturing Company. Fine-metal-particle-based magnetic recording medium of improved environmental stability. 4,074,012, Cl. 428-425.000.
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Heintz, Clifford E., to A-T-O Inc. Cobalt oxide chlorate candle. 4,073,741, Cl. 252-187.00R.
Heinzelmann, Max; Rohloff, Fritz; and Schuren, Hans, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Apparatus for determining the dose equivalent of neutrons. 4,074,136, Cl. 250-392.000.
Heitzman, Gary N.; and Shook, Norma G., to Caterpillar Tractor Co. Composite U Joint guard-step. 4,073,591, Cl. 403-24.000.
Hemmerich, Heinz-Peter; Winter, Gerhard; Rosenkranz, Hans Jurgen; and Woditsch, Peter, to Bayer Aktiengesellschaft. Degradable plastic composition. 4,073,764, Cl. 260-37.00N.
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Herth, Harro; Kraus, Bernd; Sautter, Wilfried; and Wessel, Wolf, to Robert Bosch GmbH. Fuel injection system. 4,073,269, Cl. 123-32.0EE.
Hess, Hans-Jurgen E.; and Schaaf, Thomas K., to Pfizer Inc. Cyanoprostaglandins. 4,074,044, Cl. 542-402.000.
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Hofmeister, Helmut; Laurent, Henry; Wiechert, Rudolf; Annen, Klaus; and Steinbeck, Hermann, to Schering Aktiengesellschaft. 11 Beta-fluoropregnenes. 4,073,900, Cl. 424-243.000.
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Szonntagh, Eugene L., 4,073,053, Cl. 29-570.000.
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Jordan, Bertram Lee; and Mitchell, John Davis, to Harrington Manufacturing Company. Automatic tobacco harvester with improved leaf conveying system. 4,073,378, Cl. 198-627.000.

Jordan, Wesley A.: *See—*
Jones, Duane A.; and Jordan, Wesley A., 4,074,043, Cl. 536-52.000.

Jorgensen, Allen C., to Raymond Lee Organization, Inc., The, a part interest. Collapsible guitar. 4,073,211, Cl. 84-291.000.

Joris, Albert P. Mailbox signal. 4,073,430, Cl. 232-35.000.

Josef Martin Feuerungsbau GmbH: *See—*
Martin, Johannes Josef; and Weber, Erich, 4,073,480, Cl. 266-201.000.

Jossel, Franklin: *See—*
Mammino, Joseph; and Jossel, Franklin, 4,073,965, Cl. 427-22.000.

Judin, Vladimir Konstantinovich: *See—*
Minichev, Vasily Mikhailovich; Simis, Evgeny Moiseevich; and Judin, Vladimir Konstantinovich, 4,074,161, Cl. 310-194.000.

Jukes, John Alan: *See—*
Walling, Jorg-Hein; and Jukes, John Alan, 4,073,265, Cl. 118-634.000.

Jules, Jacques M. Frequency measuring device for telecommunication systems. 4,074,191, Cl. 324-79.00R.

Jurek, Dennis J.: *See—*
Widstrand, John C.; and Jurek, Dennis J., 4,074,156, Cl. 310-62.000.

Jutte, Hans: *See—*
Stuckmann, Dieter; and Jutte, Hans, 4,073,153, Cl. 61-85.000.

Kabushiki Kaisha Daini Seikosha: *See—*
Ikehata, Yukio; Ikenishi, Masataka; Kushida, Shozo; and Kikuchi, Tadahiro, 4,074,093, Cl. 200-52.00R.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Kishitani, Masatoshi; Tamagaki, Yoshiteru; Matsumoto, Takeji; Sugimoto, Mikio; and Namiki, Noriaki, 4,073,152, Cl. 61-63.000.
Takada, Shinichi, 4,073,168, Cl. 70-165.000.

Kabushiki Kaisha Sato Kenkyusho: *See—*
Sato, Yo, 4,073,234, Cl. 101-288.000.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See—*
Takeda, Nobuhiro; Hattori, Masaichi; Kondo, Minoru; and Kato, Tatsuo, 4,074,226, Cl. 340-52.00B.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Asai, Kiyokazu; and Takeuchi, Akihiro, 4,074,152, Cl. 310-334.000.

Kaduki, Charles L.; and Stoneking, Richard D., to Essex Group, Inc. Control system for gas burning apparatus. 4,073,611, Cl. 431-45.000.

Kaieda, Nobuo: *See—*
Fujita, Hisaya; Kaieda, Nobuo; Sato, Setsuo; and Kawakami, Kenji, 4,074,274, Cl. 346-34.000.

Kaiser, Carl; and Lafferty, John Joseph, to SmithKline Corporation. Piperidylidene derivatives of benzo-fused xanthenes, thioxanthenes and dibenzoxepins and antipsychotic use thereof. 4,073,912, Cl. 424-267.000.

Kaiser, James Frederick: *See—*
Hamming, Richard Wesley; and Kaiser, James Frederick, 4,074,212, Cl. 333-70.00T.

Kaji, Tadao; and Homma, Yoshio, to Hitachi, Ltd. Method of fabricating semiconductor device. 4,073,054, Cl. 29-580.000.

Kakinuma, Yoshikazu; and Morokuma, Tadashi, to Olympus Optical Co., Ltd. Endoscope utilizing color television and fiber optics techniques. 4,074,306, Cl. 358-1.000.

Kakito, Akira; Yasui, Junichi; and Koganei, Yoji, to Iwatsu Electric Co., Ltd. Etching processing apparatus. 4,073,028, Cl. 15-102.000.

Kakumoto, Shigeru: *See—*
Yajima, Shunichi; Kakumoto, Shigeru; Fujimoto, Yoshiji; and Hananoi, Toshihiro, 4,074,231, Cl. 340-146.3AG.

Kalmus, Henry P. Tire pressure indicator. 4,074,227, Cl. 340-58.000.

Kalnin, Ilmar L., to Celanese Corporation. Internal chemical modification of carbon fibers to yield a product of reduced electrical conductivity. 4,073,869, Cl. 423-447.100.

Kaloi, Cyril M., to United States of America, Navy. Multiple frequency microstrip antenna assembly. 4,074,270, Cl. 343-700.0MS.

Kamerling, Marc A.; Franks, Jeffrey L.; and Wilson, Harold R., to Donnelly Mirrors, Inc. Mirror assembly method. 4,073,855, Cl. 264-249.000.

Kamyr Inc.: *See—*
Funk, Erwin D., 4,073,629, Cl. 48-77.000.

Kanbier, Dirk; and Goudriaan, Frans, to Shell Oil Company. Catalyst regeneration by circulating catalyst in a hydrotreating oil process. 4,073,721, Cl. 208-251.00H.

Kandul, Jury Vasilievich; Semeny, Valery Yakovlevich; Pivovarov, Mikhail Danilovich; Malovik, Vladlen Vasilievich; Mazepa, Ivan Karpovich; and Feschenko, Ninel Gavrilovna. Method for producing trialkylphosphine oxides. 4,073,809, Cl. 260-606.50P.

Kanebo, Ltd.: *See—*
Nishida, Takeshi; Morioka, Masao; Ohta, Tetsuro; and Yamakawa, Yukio, 4,073,988, Cl. 428-91.000.

Kansai Kagaku Kikai Seisaku Kabushiki Kaisha: *See—*
Noda, Yasuo; and Inoue, Takaya, 4,073,677, Cl. 159-6.00W.

Kansai Paint Company, Limited: *See—*
Nakayama, Yasuharu; Watanabe, Tadashi; Yamashita, Yoshio; Aihara, Tetsuo; and Toyomoto, Isao, 4,073,758, Cl. 260-23.0EP.

Kanten, Thomas M.: *See—*
Heikkinen, Duane G.; and Kanten, Thomas M., 4,074,012, Cl. 428-425.000.

Kantorowicz, Gerard: *See—*
Epsztein, Bernard; and Kantorowicz, Gerard, 4,074,213, Cl. 333-71.000.

Kao Soap Co., Ltd.: *See—*
Handa, Susumu; Tanaka, Yoshiaki; Nishihata, Atsushi; Ueda, Sadashi; Inamoto, Yoshiaki; Tanimoto, Fumio; and Kitano, Hisao, 4,074,052, Cl. 544-221.000.
Ohtani, Naoteru; Koyama, Tutomu; Takeuchi, Takashi; Azuma, Toshihiro; and Matsuda, Morio, 4,073,658, Cl. 106-92.000.

Kapes, William John, Jr., to Bell Telephone Laboratories, Incorporated. LED array imaging system-serial approach. 4,074,318, Cl. 358-230.000.

Kapes, William John, Jr., to Bell Telephone Laboratories, Incorporated. High quality light emitting diode array imaging system. 4,074,320, Cl. 358-230.000.

Kapes, William John, Jr.: *See—*
Goldschmidt, Wilbur Harry; Henning, Hansjuergen Hermann; and Kapes, William John, Jr., 4,074,319, Cl. 358-230.000.

Karapita, Alex D.: *See—*
Karapita, Alexander Donald; and Orr, James Douglas, 4,073,456, Cl. 248-337.000.

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Karler, Arthur, to Diagnostic Data, Inc. Treatment of arthritis and allied conditions with xenylsalate. 4,073,897, Cl. 424-230.000.

Karlskind, Neil, to Gray Tool Company. Wet connector. 4,073,562, Cl. 339-117.00P.

Karter, Elias M.: *See—*
Hammond, Jack A.; and Karter, Elias M., 4,073,678, Cl. 162-19.000.

Kartiala, Tauno F. Sauna heater. 4,073,286, Cl. 126-344.000.

Kashiwa, Ichiro: *See—*
Imai, Makoto; Horiuchi, Teruo; and Kashiwa, Ichiro, 4,073,881, Cl. 424-70.000.

Kasiwagi, Eiichi: *See—*
Hosoda, Minoru; Kasiwagi, Eiichi; Murayama, Fumio; and Isayama, Kohei, 4,073,762, Cl. 260-29.300.

Kaspers, Helmut: *See—*
Buchel, Karl Heinz; Frohberger, Paul-Ernst; and Kaspers, Helmut, 4,073,901, Cl. 424-245.000.

Kasuga, Noboru, to Janome Sewing Machine Co., Ltd. Intermittent drive for sewing machine. 4,073,250, Cl. 112-274.000.

Katchman, Arthur; and Lee, Gim Fun, Jr., to General Electric Company. Filled polyphenylene ether compositions having improved toughness. 4,073,765, Cl. 260-40.00R.

Kathawala, Faizulla G.: *See—*
Galantay, Eugene E.; and Kathawala, Faizulla G., 4,073,936, Cl. 424-308.000.

Kato, Tatsuo: *See—*
Takeda, Nobuhiro; Hattori, Masaichi; Kondo, Minoru; and Kato, Tatsuo, 4,074,226, Cl. 340-52.00B.

Kato, Tokuji: *See—*
Kogo, Hiroshi; Kato, Tokuji; and Uematsu, Takashi, 4,074,317, Cl. 358-181.000.

Katsube, Junki: *See—*
Shimomura, Hiromi; Sugie, Akihiko; Katsube, Junki; and Yamamoto, Hisao, 4,073,933, Cl. 424-299.000.

Katsui, Saburo: *See—*
Washizuka, Isamu; Hashimoto, Shintaro; and Katsui, Saburo, 4,074,118, Cl. 364-712.000.

Kauter, Hans, to Gewerkschaft Eisenhutte Westfalia. Mine roof support assemblies. 4,073,149, Cl. 61-45.00D.

Kawai, Mitsuji. Switch device. 4,074,144, Cl. 307-10.00R.

Kawai, Syuji: *See—*
Yamauchi, Kazuhisa; Takakura, Koichi; Kawai, Syuji; and Ohmori, Akio, 4,073,733, Cl. 210-500.00M.

Kawakami, Kenji: *See—*
Fujita, Hisaya; Kaieda, Nobuo; Sato, Setsuo; and Kawakami, Kenji, 4,074,274, Cl. 346-34.000.

Kawamatsu, Yutaka; Saraie, Takahiro; Imamiya, Eiko; and Hamuro, Yukihiko, to Takeda Chemical Co., Ltd. 2-Halopropionic acid and its derivatives. 4,074,057, Cl. 560-55.000.

Kawami, Youji: *See—*
Torikai, Eiichi; and Kawami, Youji, 4,073,705, Cl. 204-92.000.

Kawamura, Hiroshi; Nishitani, Yoshihisa; and Muta, Katsumi, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for reproducing multiplex video data. 4,074,315, Cl. 358-142.000.

Kawasaki, Hironobu: *See—*
Teramae, Akira; Yamada, Koji; and Kawasaki, Hironobu, 4,074,011, Cl. 428-422.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Yamazaki, Yorio, 4,073,505, Cl. 280-301.000.

Kawasaki Motors Corporation, U.S.A.: *See—*
Fox, Wayne S., 4,073,279, Cl. 123-198.0DC.

Kawashima, Hidetoshi; Ohtake, Shinzaburo; Fujimori, Toru; Ohkawa, Isao; and Tajima, Tetsuya, to Eisai Co., Ltd. Method for treatment of diabetes. 4,073,910, Cl. 424-266.000.

Kawatsu, Toshitatsu, to Sankyo Kogaku Kogyo Kabushiki Kaisha. Fade photographing control apparatus for cine camera. 4,073,580, Cl. 352-91.00C.

Kay, Daniel J.: *See—*
Bowman, Richard C.; and Kay, Daniel J., 4,073,761, Cl. 260-29.300.

Keahl, Gerald T.: *See—*
Way, Allan S.; Glenn, Thomas J.; Sloane, Howard J.; and Keahl, Gerald T., 4,074,272, Cl. 346-33.00A.

Keck, Johannes; Puschmann, Sigfrid; Kruger, Gerd; Noll, Klaus-Reinhold; Leitold, Matyas; and Pieper, Helmut, to Boehringer Ingelheim GmbH. Halo-substituted hydroxybenzyl-amines as secretolytic agents. 4,073,942, Cl. 424-330.000.

Kee, Richard C., to Polaroid Corporation. Compact accessory strobe for cameras with battery enclosed film pack. 4,074,295, Cl. 354-145.000.

Kehm, Walter C., to Baxter Travenol Laboratories, Inc. Blood fractionation process using block copolymers of ethylene oxide and polyoxypropylene. 4,073,886, Cl. 260-112.00B.

Keifert, Hibbard G.; and Jenstrom, Einar R., to Fansteel Inc. Lined equipment with triclad wall construction. 4,073,427, Cl. 228-165.000.

Keller, Harold E.: *See—*
Fishbaugh, Byron L.; Keller, Harold E.; and Stewart, Lionel G., 4,073,047, Cl. 29-450.000.

Keller, Herman F., to Nikkel, Leon; Nikkel, Kermit; and Brown, Lelus B., part interest to each. Hand safety flasher. 4,074,252, Cl. 340-321.000.

Kelley Co., Inc.: *See—*
Runft, Arthur J., 4,074,112, Cl. 200-279.000.

Kelley, George G., to United States of America, Energy. Toroidal band limiter for a plasma containment device. 4,073,680, Cl. 176-3.000.

Kelly, Robert George: *See—*
Lawson, Frank; Ward, Denby Harcourt; and Kelly, Robert George, 4,073,481, Cl. 266-215.000.

Kemira Oy: *See—*
Suppanen, Pekka Ilkka Juhani, 4,073,635, Cl. 71-34.000.

Kennedy, Samuel F. Floor deck structure. 4,073,110, Cl. 52-303.000.

Kenney, George Churchill, II: *See—*
Balas, Charles, Jr.; Lou, David Yuan Kong; and Kenney, George Churchill, II, 4,074,282, Cl. 346-135.000.

Kenway Incorporated: *See—*
Allred, James Kenneth; Liddell, Arlyn G.; Quinn, Edward Barney; and Black, Francis Bischoff, 4,074,120, Cl. 235-419.000.

Keough, Laurence J.; and Butts, Bruce D., to Texas Instruments Incorporated. Keyboard apparatus and method of making. 4,074,088, Cl. 200-5.00A.

Kerff, Anton: *See—*
Carlsson, Eric; Gefvert, Karl Ivan; Hjalmarsson, Thomas; Kerff, Anton; Pejchal, Karel; and Wide, Lars, 4,073,450, Cl. 242-131.000.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See—*
Heinzelmann, Max; Rohloff, Fritz; and Schuren, Hans, 4,074,136, Cl. 250-392.000.

Keslar, Leroy D.; and Vensel, James E., to PPG Industries, Inc. Laminated glazing unit with composite interlayer. 4,073,986, Cl. 428-38.000.

Kienzle, Frank; and Rosen, Perry, to Hoffmann-La Roche Inc. 2H-cyclopenta[b]furan-2-ones and process for preparation. 4,074,045, Cl. 542-426.000.

Kikuchi, Tadahiro: *See—*
Ikehata, Yukio; Ikenishi, Masataka; Kushida, Shozo; and Kikuchi, Tadahiro, 4,074,093, Cl. 200-52.00R.

Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Okamoto, Shosuke; and Hijikata, Akiko, to Mitsubishi Chemical Industries Limited; and Okamoto, Shosuke. N^2-naphthalenesulfonyl-L-argininamides and the pharmaceutically acceptable salts thereof. 4,073,914, Cl. 424-267.000.

Kikumoto, Ryoji: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,891, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,892, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,913, Cl. 424-267.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,916, Cl. 424-267.000.

Kilborn, Hilary Mark How'l: *See—*
Hinchcliffe, Dennis; Daisley, Robert Thomas; Harper, Stanley Bernard; and Kilborn, Hilary Mark How'l, 4,073,374, Cl. 198-425.000.

Kimball International, Inc.: *See—*
Whittington, Billy J.; Welsh, Alan B.; and Burns, Timothy L., 4,073,209, Cl. 84-1.240.

Kimura, Minoru; Tango, Hiroyuki; and Ohmori, Yukio, to Agency of Industrial Science and Technology, The President of the. Method for manufacturing semiconductor devices. 4,073,055, Cl. 29-583.000.

King, James D., to Henny Penny Corporation. Countertop display warmer. 4,074,108, Cl. 219-214.000.

Kinosz, Donald L.; and Haupin, Warren E., to Aluminum Company of America. Electrolytic production of magnesium. 4,073,703, Cl. 204-70.000.

Kinsey, Lewis R. Battery for electric powered vehicles. 4,074,017, Cl. 429-1.000.

Kinson, Philip L.; and Quinn, Clayton B., to General Electric Company. Dehydrochlorination method. 4,073,814, Cl. 260-619.00A.

Kintani, Yoshio; Tsuyuguchi, Michio; Ibaragi, Tetsuo; Yano, Katsuhiro; Sunami, Yoshihiko; Nishioka, Kunihiko; and Sumikin Coke Company Limited, to Sumitomo Metal Industries Limited. Process for preparing briquettes. 4,073,625, Cl. 44-10.00R.

Kirko, Elena Viktorovna: *See—*
Byalko, Mikhail Vladimirovich; Kirko, Elena Viktorovna; Perlovsky, Rafael Shliomovich; and Ryzhnev, Vadim Jurievich, 4,073,183, Cl. 73-23.000.

Kirkpatrick, Alan D., to Robud Co. Lock for rotary die cutting blanket. 4,073,207, Cl. 83-659.000.

Kirkpatrick, Alan D., to Robud Co. Anvil structure for rotary die cutting apparatus. 4,073,208, Cl. 83-659.000.

Kishi, Hidehiro; Harakawa, Hiroshi; Ogawa, Kazuo; and Tsutsui, Seiko, to UBE Industries, Ltd. Wrapping film. 4,073,782, Cl. 260-23.00H.

Kishitani, Masatoshi; Tamagaki, Yoshiteru; Matsumoto, Takeji; Sugimoto, Mikio; and Namiki, Noriaki, to Kabushiki Kaisha Komatsu Seisakusho. System for laying a subterranean water impervious asphalt layer. 4,073,152, Cl. 61-63.000.

Kitajima, Masato: *See—*
Asaeda, Toshio; Suzuki, Ikuo; Imai, Tomoyasu; Kitajima, Masato; and Hota, Kazunori, 4,073,281, Cl. 125-11.0CD.

Kitajima, Tadayuki, to Canon Kabushiki Kaisha. Slit exposure device for use with a stationary original carriage. 4,073,584, Cl. 355-8.000.

Kitano, Hisao: *See—*
Handa, Susumu; Tanaka, Yoshiaki; Nishihata, Atsushi; Ueda, Sadashi; Inamoto, Yoshiaki; Tanimoto, Fumio; and Kitano, Hisao, 4,074,052, Cl. 544-221.000.

Kiuchi, Mitsuyuki; Amagami, Keizo; Mizukawa, Takumi; and Kominami, Hideyuki, to Matsushita Electric Industrial Co., Ltd. Induction heating apparatus using a pair of inversely parallel connected gate-controlled switching devices. 4,074,101, Cl. 219-10.49R.

Kiyokawa, Shin; Sakaguchi, Shokichi; and Takeuchi, Toru. Planar heating element. 4,074,222, Cl. 338-212.000.

Klein, Edgar; Kracke, Reinhard; Nespital, Walter; and Paul, Rudiger, deceased, to Kronos Titan G m.b.H. Manufacture of titanium dioxide pigment seed from a titanium sulfate solution. 4,073,877, Cl. 423-616.000.

Klein, Schanzlin & Becker Aktiengesellschaft: *See—*
Schiele, Otto; and Florjancic, Dusan, 4,073,595, Cl. 415-143.000.

Klie, Wolfgang, to Daimler-Benz Aktiengesellschaft. Bumper for motor vehicles having a shock-absorbing profile. 4,073,528, Cl. 293-98.000.

Klinefelter, Nathan I. Device for pumping out sanded in crab pots. 4,073,079, Cl. 37-78.000.

Kling, Alberto. Wind driven power plant. 4,073,516, Cl. 290-55.000.

Klinge Pharma GmbH & Co.: *See—*
Grill, Helmut; Zschocke, Rainer Hans; Wagner, Josef; Hofrichter, Gernot; and Janiak, P. Stefan, 4,073,935, Cl. 424-308.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Fritsch, Walter; and Melcher, Gerhard, 4,073,645, Cl. 75-74.000.
Kryczun, Alfred; and Melcher, Gerhard, 4,073,646, Cl. 75-76.000.

Kloots, Jacobus, to Applied Fiberoptics, Inc. Method of making fiber-optic cable assembly. 4,073,050, Cl. 29-450.000.

Kluender, Harold Clinton: *See—*
Woessner, Warren Dexter; Sih, Charles John; Kluender, Harold Clinton; Arndt, Henry Clifford; and Biddlecom, William Gerard, 4,074,063, Cl. 560-121.000.

Knapp, Catherine. Amusement device. 4,073,504, Cl. 280-220.000.

Knaub, Edgar W.: *See—*
Buckwalter, Mervin R.; and Knaub, Edgar W., 4,073,975, Cl. 427-170.000.

Kneitel, Dieter: *See—*
Roebke, Wolfgang; Kneitel, Dieter; and Parr, Erfried, 4,073,867, Cl. 423-429.000.

Knight, Clifford J., to Anderson, Lyle V., a part interest. Ceramic-paint coatings. 4,074,010, Cl. 428-422.000.

Knogo Corporation: *See—*
Minasy, Arthur J., 4,074,249, Cl. 340-280.000.

Knorr-Bremse GmbH: *See—*
Pollinger, Hans, 4,073,218, Cl. 92-85.00R.

Knox, Sidney G., to United States of America, Navy. Device for numerically displaying VOR bearing. 4,074,267, Cl. 343-106.00R.

Knudsen, Kenneth F., to American Chain & Cable Company, Inc. Power and free conveyor with engaging means operable on vertically curved sections of track. 4,073,238, Cl. 104-172.00S.

Knull, Kenneth L.: *See—*
Brown, Amos J.; Belshaw, Thomas E.; Knull, Kenneth L.; and Wilke, Wilbur D., 4,073,305, Cl. 137-140.000.

Knutson, Carlton N., to Construction Aids, Inc. Method and apparatus for installing panels in building construction. 4,073,109, Cl. 52-281.000.

Kobayashi, Tatsuo; and Miyazaki, Akira, to Rank Xerox Ltd. Sheet removing device for use in electrophotographic copying machine. 4,073,585, Cl. 355-14.000.

Kobayashi, Teruo: *See—*
Miyamoto, Akio; Matsukawa, Hiroharu; and Kobayashi, Teruo, 4,073,968, Cl. 427-54.000.

Kobayashi, Toshihiko: *See—*
Hayashi, Minoru; Ogino, Mineo; Kobayashi, Toshihiko; and Noda, Masaki, 4,074,090, Cl. 200-19.0DR.

Kobe, Inc.: *See—*
Erickson, John W.; and Williams, Carter P., 4,073,596, Cl. 415-180.000.

Kober, Kasimir, to Chicago Dryer Company. Folder construction. 4,073,486, Cl. 270-69.000.

Koch, Hans, to BBC Brown Boveri & Company, Limited. Gas turbine combustor fed by a plurality of primary combustion chambers. 4,073,134, Cl. 60-39.290.

Koch, Karlheinz; Kolaczinski, Gerhard; Rupilius, Wolfgang; and Stein, Werner, to Henkel KGaA; and Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Corrodible iron-containing surfaces carrying corrosion-inhibiting coating. 4,074,013, Cl. 428-457.000

Kochs Adler AG: *See—*
Schrudde, Reinhold, 4,073,251, Cl. 112-256.000.

Kodric, Joseph, to Inventive Plastic Products Ltd. Shut-off valve for control of flow of molten plastic material. 4,073,469, Cl. 251-86.000.

Koehn, Wilbur R.; and Detwiler, John H. Rapid fire gun. 4,073,280, Cl. 124-72.000.

Koester, Eberhard; Wunsch, Gerd; Schoenafinger, Eduard; and Schneehage, Hans Henning, to BASF Aktiengesellschaft. Stabilization of pyrophoric metal powders with alkylene oxide polymers. 4,073,977, Cl. 427-216.000.

Koganei, Yoji: *See—*
Kakito, Akira; Yasui, Junichi; and Koganei, Yoji, 4,073,028, Cl. 15-102.000.

Kogo, Hiroshi; Kato, Tokuji; and Uematsu, Takashi, to Nissan Motor Company, Limited. Multi-channel video display apparatus using sequential circuit. 4,074,317, Cl. 358-181.000.

Kohler, Werner, to Siemens Aktiengesellschaft. Combined current and voltage measuring apparatus. 4,074,193, Cl. 324-126.000.

Koike, Yoshitaka: *See—*
Yabuta, Keiichiro; and Koike, Yoshitaka, 4,073,542, Cl. 303-6.00C.

Koizumi, Toshimichi, to Olympus Optical Co., Ltd. Objective for video disks. 4,073,575, Cl. 350-214.000.

Kojima, Yasuyuki; Tanno, Kiyohiko; Doi, Tetsuo; and Ono, Kunio, to Hitachi, Ltd. Thermal recording apparatus. 4,074,280, Cl. 346-76.00R.

Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
Wada, Tasaku; and Nakabo, Satoru, 4,074,068, Cl. 178-23.00R.
Yokoi, Hiroshi; and Shiokawa, Takayasu, 4,074,266, Cl. 343-100.0SA.

Kolaczinski, Gerhard: *See—*
Koch, Karlheinz; Kolaczinski, Gerhard; Rupilius, Wolfgang; and Stein, Werner, 4,074,013, Cl. 428-457.000.

Kolatorowicz, Edwin E.: *See—*
Born, Norman E.; and Kolatorowicz, Edwin E., 4,074,175, Cl. 318-332.000.

Koll, Laurel A., to Mobilizer Medical Products, Inc. Transfer mechanism. 4,073,016, Cl. 5-81.00R.

Kollmorgen Technologies Corporation: *See—*
Herrmann, Gunther, 4,073,964, Cl. 427-10.000.
Polichette, Joseph; Leech, Edward J.; and Branigan, John G., 4,073,740, Cl. 252-156.000.

Kolosov, Ivan Alexandrovich. Automatic device for fixing the edge of a moving band. 4,073,448, Cl. 242-57.100.

Komatsu, Sadaharu, to Scriptomatic, Inc. Print position adjusting apparatus for address printer. 4,073,233, Cl. 101-132.500.

Kominami, Hideyuki: *See—*
Kiuchi, Mitsuyuki; Amagami, Keizo; Mizukawa, Takumi; and Kominami, Hideyuki, 4,074,101, Cl. 219-10.49R.

Komoto, Hiroshi: *See—*
Doi, Tsunesuke; Komoto, Hiroshi; Chono, Masazumi; Inoue, Akira; Saito, Kazuaki; and Shinozuka, Isao, 4,073,618, Cl. 21-2.70R.

Kondo, Eiji; and Mitsugi, Takashi, to Shionogi & Co., Ltd. Enzymatic acylation to afford β-lactam antibiotics. 4,073,687, Cl. 195-36.00P.

Kondo, Isao: *See—*
Matsuzaki, Soichiro; Maitani, Yoshihisa; Shimoyama, Kunio; and Kondo, Isao, 4,074,290, Cl. 354-34.000.

Kondo, Kiyoshi; Tunemoto, Daiei; and Hiro, Etsuko, to (Zaidanhojin) Sagami Chemical Research Center. Process for producing 3-formylcyclopentanone derivatives. 4,073,799, Cl. 260-345.80P.

Kondo, Minoru: *See—*
Takeda, Nobuhiro; Hattori, Masaichi; Kondo, Minoru; and Kato, Tatsuo, 4,074,226, Cl. 340-52.00B.

Kondo, Shiro: *See—*
Sato, Masanobu; and Kondo, Shiro, 4,074,082, Cl. 179-100.110.

Konishi Co., Ltd.: *See—*
Yotsuyanagi, Yoshihiko; Araki, Naganori; Nagasawa, Shigeru; and Okitsu, Toshinao, 4,073,756, Cl. 260-18.00N.

Konovalov, Georgy Fedorovich: *See—*
Korshunov, Evgeny Alexeevich; Bainov, Nikolai Ivanovich; Petrov, Igor Nikolaevich; Konovalov, Georgy Fedorovich; Arshansky, Mikhail Iosipovich; Shmidt, Petr Genrikhovich; Kostrov, Valery Pavlovich; and Efremov, Petr Evgenievich, 4,073,333, Cl. 164-66.000.

Konrath, Karl: *See—*
Hofer, Gerald; and Konrath, Karl, 4,073,275, Cl. 123-139.0AF.

Kopecek, Jindrich: *See—*
Lim, Drahoslav; Kopecek, Jindrich; Bazilova nee Sverinova, Hedvika; and Vacik, Jiri, 4,074,039, Cl. 526-303.000.

Kopnick, Siegfried: *See—*
Franz, Arnold; and Kopnick, Siegfried, 4,074,015, Cl. 428-526.000.

Kopp, Klaus F., to Sandoz Ltd. Catheter. 4,073,297, Cl. 128-214.400.

Koppe, Herbert: *See—*
Kummer, Werner; Koppe, Herbert; Stahle, Helmut; and Haarmann, Walter, 4,073,905, Cl. 424-248.560.

Koppehele, Hugh Paul: *See—*
Gardner, James J.; and Koppehele, Hugh Paul, 4,073,409, Cl. 222-146.0HE.

Koppelman, Edward, to Koppelman & Goodman Enterprises. Apparatus and method for aging liquor. 4,073,955, Cl. 426-422.000.

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Koppelman, Edward, 4,073,955, Cl. 426-422.000.

Koppers Company, Inc.: *See—*
Chasey, Henry G., 4,073,472, Cl. 251-229.000.
Harris, Edward, 4,073,470, Cl. 251-163.000.

Koresawa, Saburo: *See—*
Otake, Hiroshi; Koresawa, Saburo; and Hashimoto, Kozo, 4,074,210, Cl. 333-29.000.

Kornek, Karel Anthony, to Imperial Chemical Industries Limited. Electrochromic display device. 4,073,570, Cl. 350-357.000.

Korshunov, Evgeny Alexeevich; Bainov, Nikolai Ivanovich; Petrov, Igor Nikolaevich; Konovalov, Georgy Fedorovich; Arshansky, Mikhail Iosipovich; Shmidt, Petr Genrikhovich; Kostrov, Valery Pavlovich; and Efremov, Petr Evgenievich. Method of continuous casting of ingots. 4,073,333, Cl. 164-66.000.

Koseki, Toshihiko: *See—*
Takagi, Nobuho; Takase, Mituo; Itoh, Takashi; Seno, Katsumi; and Koseki, Toshihiko, 4,073,594, Cl. 415-1.000.

Kostrov, Valery Pavlovich: *See—*
Korshunov, Evgeny Alexeevich; Bainov, Nikolai Ivanovich; Petrov, Igor Nikolaevich; Konovalov, Georgy Fedorovich; Arshansky, Mikhail Iosipovich; Shmidt, Petr Genrikhovich; Kostrov, Valery Pavlovich; and Efremov, Petr Evgenievich, 4,073,333, Cl. 164-66.000.

Kouzai, Keiji; Tabe, Yutaka; Masunaga, Eiji; and Matsuda, Kichiro, to Teitin Limited. Process for producing wholly aromatic polyamide fibers. 4,073,837, Cl. 264-38.000.

Koyama, Tutomu: *See—*
Ohtani, Naoteru; Koyama, Tutomu; Takeuchi, Takashi; Azuma, Toshihiro; and Matsuda, Morio, 4,073,658, Cl. 106-92.000.

Koziol, Jeffrey E.: *See—*
Peyman, Gholam A.; and Koziol, Jeffrey E., 4,073,015, Cl. 3-13.000.

Kracke, Reinhard: *See—*
Klein, Edgar; Kracke, Reinhard; Nespital, Walter; and Paul, Rudiger, deceased, 4,073,877, Cl. 423-616.000.

Kraemer, Stefan; Seger, Michael; and Seidl, Alois, to Wasag-Chemie AG. Filtering process using inorganic synthetically prepared filter sand. 4,073,729, Cl. 210-80.000.

Kraft, Kurt: *See—*
Gebauer, Gerhard; Brandrup, Johannes; Kraft, Kurt; and Mayer, Franz, 4,074,007, Cl. 428-411.000.

Kraftwerk Union Aktiengesellschaft: *See—*
Stadie, Lothar; and Wittchow, Eberhard, 4,074,360, Cl. 364-551.000.

Kranco, Inc.: *See—*
Frank, Louis N., 4,073,476, Cl. 254-184.000.

Kranz, Paul, to United States of America, Navy. Radiosonde circuitry for impedance measurement of an Al_2O_3 absolute water vapor sensor. 4,074,241, Cl. 340-189.00M.

Kraus, Bernd: *See—*
Herth, Harro; Kraus, Bernd; Sautter, Wilfried; and Wessel, Wolf, 4,073,269, Cl. 123-32.0EE.

Krause, Joachim: *See—*
Erdmann, Dietrich; Eidenschink, Rudolf; Krause, Joachim; and Pohl, Ludwig, 4,073,742, Cl. 252-299.000.

Kravitz, Bernard L., to Dionics, Inc. High voltage PN junction and semiconductive devices employing same. 4,074,293, Cl. 357-34.000.

Kress, Robert F., to Dana Corporation. Marine propeller. 4,073,601, Cl. 416-242.000.

Krey Packing Company: *See—*
Adams, Jac, 4,073,686, Cl. 195-2.000.

Krohn, David A.: *See—*
Deeg, Emil W.; and Krohn, David A., 4,073,579, Cl. 351-169.000.

Kroll, Harry: *See—*
Weisberg, Alfred M.; and Kroll, Harry, 4,073,700, Cl. 204-43.00G.

Krom, Cecil, Jr. Wood-splitting attachment. 4,073,325, Cl. 144-193.00A.

Kronos Titan G.m.b.H.: *See—*
Klein, Edgar; Kracke, Reinhard; Nespital, Walter; and Paul, Rudiger, deceased, 4,073,877, Cl. 423-616.000.

Krooss, Robert J. Conveyor cleaning mechanism. 4,073,376, Cl. 198-498.000.

Kruder, George A.; and Gudermuth, Clyde S., Jr., to HPM Corporation. Vented injection molding machine. 4,074,362, Cl. 366-82.000.

Kruger, Gerd: *See—*
Keck, Johannes; Puschmann, Sigfrid; Kruger, Gerd; Noll, Klaus-Reinhold; Leitold, Matyas; and Pieper, Helmut, 4,073,942, Cl. 424-330.000.

Kryczun, Alfred; and Melcher, Gerhard, to Klockner-Humboldt-Deutz Aktiengesellschaft. Method for the thermal refinement of greatly contaminated copper in molten phase. 4,073,646, Cl. 75-76.000.

Kubo, Kyoji: *See—*
Atsukawa, Masumi; Ushio, Hiroyuki; Kuwabara, Haruo; and Kubo, Kyoji, 4,073,864, Cl. 423-242.000.

Kuboshima, Makoto: *See—*
Munakata, Tsuneaki; and Kuboshima, Makoto, 4,074,296, Cl. 354-187.000.

Kuehn, Erich: *See—*
Ferrarini, James; and Kuehn, Erich, 4,073,828, Cl. 260-859.00R.

Kuehn, Lorne A.: *See—*
MacHattie, Lloyd E.; and Kuehn, Lorne A., 4,073,190, Cl. 73-339.00C.

Kuehn, Melvin C., to Ormite, Inc. Synthetic slate. 4,073,848, Cl. 264-120.000.

Kuge, Katutaro, to Tokyo Shibaura Electric Co., Ltd. Controlling apparatus for asynchronous motors with wound rotor. 4,074,174, Cl. 318-197.000.

Kuhar, John, Jr.: *See—*
Caputo, Salvatore; Fitch, Scott McDowell; Harris, Cliff Andrew; Kuhar, John, Jr.; Pappas, Andrew Leo; and Redlich, Wayne, 4,074,358, Cl. 364-514.000.

Kuhn, Martin C.; Stephens, John A.; Noakes, Michael J.; and Rovig, Allen D., to Anaconda Company, The. Sulfidization reaction. 4,073,479, Cl. 266-173.000.

Kulicke, Frederick W., Jr.; Soffa, Albert; Vilenski, Dan; and Brockmann, Asher, to Kulicke and Soffa Industries Inc. Second bond positioning wire bonder. 4,073,424, Cl. 228-4.500.

Kulicke and Soffa Industries Inc.: *See—*
Kulicke, Frederick W., Jr.; Soffa, Albert; Vilenski, Dan; and Brockmann, Asher, 4,073,424, Cl. 228-4.500.

Kulieva, Zhanna Rustamovna, administrator: *See—*
Aliev, Vagab Safarovich; Markarian, Georgy Georgievich; Rustamov, Musa Ismail ogly; Pryanikov, Evgeny Ivanovich; Ismailova, Rustam Gadzhi Ali ogly, deceased; Ismailov, Amina Kyazim Kyzy, administrator; Ismailova, Ali Rustam ogly, administrator; Ismailova, Dzhulietta Rustamovna, administrator; and Kulieva, Zhanna Rustamovna, administrator, 4,073,717, Cl. 208-74.000.

Kumai, Ko; Asano, Koichi; and Bando, Hideharu, to Nippon Steel Corporation. Continuously cast steel slabs for steel sheets having excellent workabilities and method for production thereof. 4,073,643, Cl. 75-49.000.

Kumar, Surinder: *See—*
Chandler, Keith L.; Hyldon, Roy G.; Kumar, Surinder; and O'Mahony, John P., 4,073,948, Cl. 426-44.000.

Kummer, Werner; Koppe, Herbert; Stahle, Helmut; and Haarmann, Walter, to Boehringer Ingelheim GmbH. 2-Amino-4-phenyl-2-imidazolines and salts thereof. 4,073,905, Cl. 424-248.560.

Kuntz, Irving: *See—*
Powers, Kenneth W.; and Kuntz, Irving, 4,074,035, Cl. 526-185.000.

Kuo, Benjamin C.; Frus, John R.; and Singh, Gurdial, to Warner Electric Brake & Clutch Company. Position detection methods and apparatus for stepping motors. 4,074,179, Cl. 318-696.000.

Kuraray Co., Ltd.: *See—*
Yamauchi, Kazuhisa; Takakura, Koichi; Kawai, Syuji; and Ohmori, Akio, 4,073,733, Cl. 210-500.00M.

Kurioka, Hideo: *See—*
Saji, Yasuo; Kurioka, Hideo; Tanaka, Kozo; and Ogawa, Hiroyasu, 4,073,870, Cl. 423-447.600.

Kurozu, Toshio; and Hamada, Yoshikazu, to Mitsui Kinzoku Kogyo Kabushiki Kaisha. Noiseless latch for particular use on vehicle doors. 4,073,519, Cl. 292-216.000.

Kurtz, Arthur Peter, Jr.; and D'Silva, Themistocles D. J., to Union Carbide Corporation. Carbamoyloximes and oximes and insecticidal and miticidal compositions and methods employing them. 4,073,930, Cl. 424-277.000.

Kusano, Masaaki; Okuhara, Shinzi, and Ohhinata, Ichiro, to Hitachi, Ltd. Light-emitting diode element and device. 4,074,299, Cl. 357-17.000.

Kuschel, Konrad, to IFE Gesellschaft mbH. Electromagnetic vibrator with improved spring mounts. 4,074,154, Cl. 310-29.000.

Kushibe, Seijiro: *See—*
Fujita, Susumu; and Kushibe, Seijiro, 4,074,294, Cl. 354-106.000.

Kushida, Shozo: *See—*
Ikehata, Yukio; Ikenishi, Masataka; Kushida, Shozo; and Kikuchi, Tadahiro, 4,074,093, Cl. 200-52.00R.

Kussmaul, Guenter: *See—*
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Kuwabara, Haruo: *See—*
Atsukawa, Masumi; Ushio, Hiroyuki; Kuwabara, Haruo; and Kubo, Kyoji, 4,073,864, Cl. 423-242.000.

Kyoritsu Yuki Co., Ltd.: *See—*
Nishikaji, Takashi; Watanabe, Kenzo; and Sawayama, Shigeru, 4,074,041, Cl. 528-488.000.

Kyser, Edmond L.: *See—*
Dexter, John L.; Kyser, Edmond L.; Mitchell, Charles S.; and Sears, Stephan B., 4,074,284, Cl. 346-140.00R.

Laboratoire le Brun S.A.: *See—*
Quelet, Jean Raymond, 4,073,908, Cl. 424-253.000.

Lace, Melvin A., to Synchro-Start Products, Inc. Permanent magnet A.C. signal generator. 4,074,157, Cl. 310-67.00R.

Lacroix, Roger; and Haberli, Roland, to Ciba-Geigy Corporation. Stable dye solution. 4,073,615, Cl. 8-25.000.

Ladell, Joshua; and Pitcher, Gerald Kennedy, to North American Philips Corporation. Automatic single crystal diffractometer. 4,074,132, Cl. 250-277.00R.

Ladenberger, Volker; Bronstert, Klaus; Hovemann, Friedrich; and Simak, Petr, to BASF Aktiengesellschaft. Lubricating oil compositions containing alkyl acrylate or methacrylate polymers and copolymers of styrene and conjugated diene. 4,073,738, Cl. 252-56.00R.

Lafferty, John Joseph: *See—*
Kaiser, Carl; and Lafferty, John Joseph, 4,073,912, Cl. 424-267.000

Laffoon, Perry D.; and Boettcher, Robert L. Electric power generating apparatus. 4,074,145, Cl. 307-10.00R.

Laing, Nikolaus. Process and device for utilizing meteorological radiations. 4,073,284, Cl. 126-271.000.

Lakerveld, Herman Gerard; and van Rosmalen, Gerard Eduard, to U.S. Philips Corporation. Pivoting mirror device. 4,073,567, Cl. 350-6.500.

Lance, Richard T.: *See—*
Papafingos, Pandelis N.; and Lance, Richard T., 4,073,644, Cl. 75-68.00R.

Lane, Ramon; and Taub, Howard Hyman, to International Business Machines Corporation. Apparatus for acoustically synchronizing drop formation in an ink jet array. 4,074,277, Cl. 346-75.000.

Lang, Armin; and Fassbender, Rolf, to Zahnradfabrik Friedrichshafen AG. Connecting valve for reserve pump. 4,073,140, Cl. 60-405.000.

Lang-Ree, Nils, to N.P.I. Corporation. Rocking meatball cooker. 4,073,225, Cl. 99-339.000.

Lark, John C., to Standard Oil Company (Indiana). Hydrophilic finishing process for hydrophobic fibers. 4,073,993, Cl. 428-261.000.

Larson, Jay Michael: *See—*
Volin, Timothy Earl; Benjamin, John Stanwood; Larson, Jay Michael; and Cairns, Robert Lacock, 4,073,648, Cl. 75-245.000.

Lauer, Thomas R.: *See—*
Groth, Roger L.; Harvey, Randall L.; Lauer, Thomas R.; and Ronnebaum, Morris L., 4,073,346, Cl. 172-439.000.

Lauer, William; and Mouwen, Herman Charles, to Johnson & Johnson; and Purolator, Inc. Media for filtering blood. 4,073,732, Cl. 210-491.000.

Laufbahn, Jennie, to Schon, Henry A., a part interest. Catheter. 4,073,295, Cl. 128-295.000.

Laughlin, Robert Gene, to Procter & Gamble Company, The. Encapsulation process. 4,073,833, Cl. 264-4.000.

Laurel Bank Machine Co., Ltd.: *See—*
Uchida, Isamu, 4,073,488, Cl. 271-263.000.

Laurent, Henry: *See—*
Hofmeister, Helmut; Laurent, Henry; Wiechert, Rudolf; Annen, Klaus; and Steinbeck, Hermann, 4,073,900, Cl. 424-243.000.

Laurent, Jean, to Institut Francais du Petrole. Acoustic wave transducer with automatic compensation of the static pressure variations. 4,074,224, Cl. 340-8.0PC.

Lavigne, Vernon W.: *See—*
Bailey, James R.; and Lavigne, Vernon W., 4,073,563, Cl. 339-128.000.

Lawes, Norman Edward, to Imperial Chemical Industries Limited. Plastics bag. 4,073,429, Cl. 229-62.500.

Lawson, Frank; Ward, Denby Harcourt; and Kelly, Robert George, to Broken Hill Associated Smelters Proprietary Limited, The; and Monash University. Continuous sulphur drossing apparatus. 4,073,481, Cl. 266-215.000.

Lawson, Robert, to British Steel Corporation. Sampling gas for analysis. 4,073,619, Cl. 23-232.00R.

Lawson, William H., Jr. Electrical connector for submersible oil well pump cables. 4,073,559, Cl. 339-94.00R.

Layer, Robert Wesley: *See—*
Son, Pyong-Nae; and Layer, Robert Wesley, 4,073,770, Cl. 260-45.8NW.

Lea, James F., to Sun Oil Company Limited. Ice removal system. 4,073,144, Cl. 61-1.00R.

Leaf, Harry Vincent; and Cassidy, Francis J., to Ark-Les Switch Corporation. Insulated wire splice. 4,074,065, Cl. 174-87.000.

Le Blanc, Destin Allen: *See—*
Le Blanc, Robert Bruce; and Le Blanc, Destin Allen, 4,073,617, Cl. 8-116.00P.

Le Blanc, Robert Bruce; and Le Blanc, Destin Allen. Water-dilutable solutions of dicyandiamide-formaldehyde-phosphoric acid condensates. 4,073,617, Cl. 8-116.00P.

Lederer, Josef: *See—*
Zangenfeind, Helmut; Burchardi, Jurgen; and Lederer, Josef, 4,073,588, Cl. 355-41.000.

Lee, Gim Fun, Jr.: *See—*
Katchman, Arthur; and Lee, Gim Fun, Jr., 4,073,765, Cl. 260-40.00R.

Leech, Edward J.: *See—*
Polichette, Joseph; Leech, Edward J.; and Branigan, John G., 4,073,740, Cl. 252-156.000.
Leeson Electric Corporation: *See—*
Widstrand, John C.; and Jurek, Dennis J., 4,074,156, Cl. 310-62.000.
Lehigh Products, Inc.: *See—*
Malott, Richard C., 4,073,106, Cl. 52-199.000.
Lehmann, Rolf: *See—*
Christ, Alfred; Lehmann, Rolf; and Miller, Helmut, 4,073,549, Cl. 308-9.000.
Lehtinen, Uuno Johannes. Shut off valve apparatus. 4,073,471, Cl. 251-176.000.
Leiblich, Gordon Francis. Structural panel. 4,073,112, Cl. 52-677.000.
Leigh, William Conrad, to Vitramon, Incorporated. Trimmable monolithic capacitors. 4,074,340, Cl. 361-321.000.
Leimgruber, Willy; and Valentine, Donald Herman, Jr., to Hoffmann-La Roche Inc. Process for the preparation of aldehydes. 4,073,811, Cl. 260-611.00A.
Leimgruber, Willy: *See—*
Batcho, Andrew David; Hengartner, Urs Oskar; Leimgruber, Willy; Scott, John William; and Valentine, Donald, Jr., 4,073,795, Cl. 260-326.14T.
Leitold, Matyas: *See—*
Keck, Johannes; Puschmann, Sigfrid; Kruger, Gerd; Noll, Klaus-Reinhold; Leitold, Matyas; and Pieper, Helmut, 4,073,942, Cl. 424-330.000.
Leitz, Julius H. Adjustable dredging and trenching apparatus. 4,073,078, Cl. 37-77.000.
Lennon, Thomas J., to GTE Sylvania Incorporated. Signal analyzer with noise estimation and signal to noise readout. 4,074,201, Cl. 325-363.000.
Leon Chemical & Plastics, Division of U.S. Industries, Inc.: *See—*
Wollen, Carl H., 4,074,014, Cl. 428-506.000.
Lerich, Lester, to Wej-it Corporation. Anchor bolt with visual engagement indicator. 4,073,212, Cl. 85-79.000.
Lerman, Frank; and Bartsch, Raymond C., to National Distillers and Chemical Corporation. Printing on a polyolefin substrate. 4,073,992, Cl. 428-207.000.
Lermann, Peter, to AGFA-Gevaert, A.G. Camera shutter. 4,073,582, Cl. 352-141.000.
Lerner, Julius; and Iglesias, Edmundo J., to Suntech, Inc. System for calibrating a pump. 4,073,304, Cl. 137-101.210.
Leroux, Serge Andre, to Etablissements Leroux S.A. Method for bending thick profiled parts, part obtained thereby and application thereof to pane framings and the like. 4,073,177, Cl. 72-339.000.
Le Roy, Pierre L., to New Research & Development Lab., Inc. Wound clip. 4,073,298, Cl. 128-337.000.
Lester Construction Co.: *See—*
Dingess, Billy, 4,073,507, Cl. 280-477.000.
Lever Brothers Company: *See—*
Pader, Morton; and Netzbandt, William, 4,073,880, Cl. 424-66.000.
Lewis, Paul R., to Aluminum Company of America. Tear-off closure. 4,073,399, Cl. 215-254.000.
Lexnas, Sven-Olof, to Stilexo Johansson & Co. Aktiebolag. Door closing device. 4,073,033, Cl. 16-52.000.
Leyendecker, Helmut, to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH. Sun lamp. 4,074,164, Cl. 313-25.000.
Li, Chi-Tang, to Owens-Illinois, Inc. Glasses, thermally stable high (beta)-cristobalite glass-ceramics and method. 4,073,655, Cl. 106-52.000.
Li, George S., to Standard Oil Company, The. Thermoplastic terpolymers of acrylonitrile, vinyl esters and indene. 4,074,037, Cl. 526-280.000.
Li, George S., to Standard Oil Company, The. Acrylonitrile-styrene-indene interpolymers. 4,074,038, Cl. 526-280.000.
Licata, Aurelio William, to Seton Name Plate Corporation. Color filling indicia simultaneously with debossing. 4,073,671, Cl. 156-219.000.
Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Steinert, Wolfgang; and Ekstrom, Bo, 4,074,119, Cl. 364-807.000.
Liddell, Arlyn G.: *See—*
Allred, James Kenneth; Liddell, Arlyn G.; Quinn, Edward Barney; and Black, Francis Bischoff, 4,074,120, Cl. 235-419.000.
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Liebscher, Anton; Oberg, Sven; Smathers, Kenneth; and Auberry, Horace, to Ro-Search, Inc. Method of manufacture of footwear. 4,073,023, Cl. 12-142.0RS.
Lim, Drahoslav; Kopecek, Jindrich; Bazilova nee Sverinova, Hedvika; and Vacik, Jiri, to Ceskoslovenska akademie ved. Hydrophilic N,N-diethyl acrylamide copolymers. 4,074,039, Cl. 526-303.000.
Lincoln, Edgar Barry: *See—*
Little, Robert K.; and Lincoln, Edgar Barry, 4,073,467, Cl. 251-7.000.
Lindberg, Ulf Henrik Anders; Ross, Svante Bertil; Thorberg, Seth Olov; and Ogren, Sven Ove, to Astra Lakemedel Aktiebolag. Aralkyl amides having antidepressive activity. 4,073,941, Cl. 424-324.000.
Lindenthal, Hans: *See—*
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Lindo, Neil A.: *See—*
Zinnes, Harold; Lindo, Neil A.; and Shavel, John, Jr., 4,074,048, Cl. 544-49.000.
Lindroth, Thomas A.; and Racciato, Joseph S., to Merck & Co., Inc. Printing paste compositions containing sodium cellulose sulfate, and processes therefor. 4,073,653, Cl. 106-26.000.
Linka, Adolf; and Hamma, Gerhard, to Mayer & Cie. Shuttle monitoring device, particularly for multiple-shuttle weaving machines. 4,073,319, Cl. 139-134.000.
Lint, Robert E., to Rohm and Haas Company. Method of making a reinforced foam-filled resin-impregnated fiber glass covered vacuum forming mold plug. 4,073,049, Cl. 29-458.000.
Lion Fat & Oil Co., Ltd.: *See—*
Imai, Makoto; Horiuchi, Teruo; and Kashiwa, Ichiro, 4,073,881, Cl. 424-70.000.
Lion Match Company Limited: *See—*
Pank, John C.; and Clegg, Ronald L. E., 4,073,326, Cl. 144-209.00R.
Lippsmeier, Bernd: *See—*
Hestermann, Klaus; Lippsmeier, Bernd; and Heymer, Gero, 4,073,810, Cl. 260-606.50P.
List, Hans. Apparatus for transporting containers to and from a working station. 4,073,372, Cl. 198-341.000.
Little, Robert K.; and Lincoln, Edgar Barry, to RKL Controls, Inc. High pressure pinch valve. 4,073,467, Cl. 251-7.000.
Litton Business Systems, Inc.: *See—*
Caruso, Jerome, 4,073,539, Cl. 297-455.000.
Innes, Frank T., 4,074,332, Cl. 360-137.000.
Litton Systems, Inc.: *See—*
True, Richard Brownell, 4,074,265, Cl. 343-18.00E.
Livermore, Frederick Caldwell: *See—*
Baraff, David Robbin; Boynton, Robert James; and Livermore, Frederick Caldwell, 4,074,109, Cl. 219-216.000.
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Wretlind, Karl Arvid Johannes; Ljungberg, Stellan; Hakansson, Ivan; and Ajaxon, Bengt Magnus, 4,073,943, Cl. 424-358.000.
Lockett, George E.: *See—*
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Loew, Peter: *See—*
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Lubbe, Bruno. Electric switch structure incorporating trip rod for sensing cable derailment and the like. 4,074,094, Cl. 200-61.130.
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McClure, Charles Michael. Building structure and method of construction. 4,073,103, Cl. 52-93.000.
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Grinberg, Jan; and Miller, Leroy J., 4,073,571, Cl. 350-337.000.
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Miller, William George, to Magnavox Company, The. Circuit for separating chroma and luminance information in a composite video signal. 4,074,321, Cl. 358-31.000.
Millers, Donald Alexander, II: *See*—
Cook, Darwen John; and Millers, Donald Alexander, II, 4,074,352, Cl. 364-200.000.
Milligan, James W., to Duncan Electric Company, Inc. Epoxy bonded silicon carbide lighting-protection valve. 4,074,221, Cl. 338-21.000.
Milliken Research Corporation: *See*—
Tolan, John R., 4,073,420, Cl. 226-42.000.
Minasy, Arthur J., to Knogo Corporation. Magnetic detection means. 4,074,249, Cl. 340-280.000.
Minehisa, Setsuzi; Inui, Tatuo; and Fukuda, Hitoshi, to Hitachi Shipbuilding & Engineering Co., Ltd. Arc welding method and arc welding apparatus. 4,074,105, Cl. 219-137.800.
Minichev, Vasily Mikhailovich; Simis, Evgeny Moiseevich; and Judin, Vladimir Konstantinovich. Pole assembly of a dynamoelectric machine. 4,074,161, Cl. 310-194.000.
Minnesota Mining and Manufacturing Company: *See*—
Bateson, George F.; Brown, Francis W.; and Heilmann, Steven M., 4,074,004, Cl. 428-355.000.
Bryan, Thomas Toplica; and Pluim, Arthur William, Jr., 4,073,999, Cl. 428-311.000.
Close, James R.; and Johnson, James R., 4,073,318, Cl. 138-149.000.
Heikkinen, Duane G.; and Kanten, Thomas M., 4,074,012, Cl. 428-425.000.
Sanders, James F., 4,074,009, Cl. 428-421.000.
Sandvig, Timothy C., 4,073,967, Cl. 427-44.000.
Stevens, John, 4,074,051, Cl. 544-140.000.
Minolta Camera Kabushiki Kaisha: *See*—
Ueda, Hiroshi; and Yoshizaki, Akira, 4,074,291, Cl. 354-51.000.
Mitchell, Charles S.: *See*—
Dexter, John L.; Kyser, Edmond L.; Mitchell, Charles S.; and Sears, Stephan B., 4,074,284, Cl. 346-140.00R.
Mitchell, John Davis: *See*—
Jordan, Bertram Lee; and Mitchell, John Davis, 4,073,124, Cl. 56-1.000.
Jordan, Bertram Lee; and Mitchell, John Davis, 4,073,378, Cl. 198-627.000.
Mitra, Panchanan, to Ciba-Geigy Corporation. Method of forming narrow ribbons of fibers in plastic material. 4,073,670, Cl. 156-179.000.
Mitrofanov, Evgeny Sergeevich: *See*—
Rundkvist, Konstantin Alexandrovich; Ivanov, Nikolai Alexeevich; Ivanov, Boris Gavrilovich; Zarogatsky, Leonid Petrovich; Mitrofanov, Evgeny Sergeevich; and Blekhman, Ilya Izrailevich, 4,073,446, Cl. 241-207.000.
Mitsubishi Chemical Industries Limited: *See*—
Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Okamoto, Shosuke; and Hijikata, Akiko, 4,073,914, Cl. 424-267.000.
Nishikaji, Takashi; Watanabe, Kenzo; and Sawayama, Shigeru, 4,074,041, Cl. 528-488.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,891, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,892, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,913, Cl. 424-267.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,916, Cl. 424-267.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Kawamura, Hiroshi; Nishitani, Yoshihisa; and Muta, Katsumi, 4,074,315, Cl. 358-142.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Atsukawa, Masumi; Ushio, Hiroyuki; Kuwabara, Haruo; and Kubo, Kyoji, 4,073,864, Cl. 423-242.000.
Mitsubishi Kinzoku K.K.: *See*—
Fukushima, Seitaro, 4,073,874, Cl. 423-500.000.
Mitsubishi Paper Mills, Ltd.: *See*—
Yamada, Shoji; Tanaka, Akira; Horii, Shoichi; and Yamashita, Kiyoshi, 4,073,651, Cl. 96-100.00R.
Mitsubishi Rayon Company, Limited: *See*—
Murakami, Fumiki; Teshima, Soichi; and Yokoyama, Toshihiko, 4,074,062, Cl. 560-217.000.
Mitsugi, Itaru; and Hayakawa, Toshio, to Matsushita Electric Industrial Co., Ltd. Multiple push-switch apparatus having flexible element preventing simultaneous actuator depression. 4,074,089, Cl. 200-5.00E.
Mitsugi, Takashi: *See*—
Kondo, Eiji; and Mitsugi, Takashi, 4,073,687, Cl. 195-36.00P.
Mitsui Kinzoku Kogyo Kabushiki Kaisha: *See*—
Kurozu, Toshio; and Hamada, Yoshikazu, 4,073,519, Cl. 292-216.000.
Mitsuno, Tatsuyuki: *See*—
Tabana, Minoru; Mitsuno, Tatsuyuki; Maki, Hiroshi; and Narisawa, Shizuo, 4,073,831, Cl. 260-876.00B.
Miyabayashi, Yoshiyuki; and Tsuchiya, Yoshimasa, to Nissan Motor Company, Limited. Remotely actuated lock arrangement for motor vehicle. 4,073,170, Cl. 70-256.000
Miyagawa Kasei Industry Co., Ltd.: *See*—
Miyagawa, Shiro, 4,074,025, Cl. 429-91.000.
Miyagawa, Shiro, to Miyagawa Kasei Industry Co., Ltd. Indicating device for storage battery. 4,074,025, Cl. 429-91.000.
Miyamoto, Akio; Matsukawa, Hiroharu; and Kobayashi, Teruo, to Fuji Photo Film Co., Ltd. Method for desensitization of a color developer. 4,073,968, Cl. 427-54.000.
Miyazaki, Akira: *See*—
Kobayashi, Tatsuo; and Miyazaki, Akira, 4,073,585, Cl. 355-14.000.
Miyazawa, Yoshihide: *See*—
Ozutsumi, Minoru, Miyazawa, Yoshihide; and Yamaguchi, Masahiko, 4,073,614, Cl. 8-25.000.
Ozutsumi, Minoru; Miyazawa, Yoshihide; and Yamaguchi, Masahiko, 4,074,050, Cl. 544-92.000.
Mizokami, Shigeyoshi: *See*—
Ichikawa, Hiroshi; Sugimoto, Michio; Mizokami, Shigeyoshi; Honna, Kosaku; and Sugahara, Hirozo, 4,073,818, Cl. 260-668.00F.
Mizukawa, Takumi: *See*—
Kiuchi, Mitsuyuki; Amagami, Keizo; Mizukawa, Takumi; and Kominami, Hideyuki, 4,074,101, Cl. 219-10.49R.
Mizutani, Taketomo; Yasunori, Takaharu; and Yoshimi, Kazuyoshi, to Sanyo Electric Co., Ltd. Ceiling fan. 4,073,598, Cl. 416-5.000.
Mobil Oil Corporation: *See*—
Schick, John W.; and Davis, Robert H., 4,073,736, Cl. 252-31.000.
Mobilizer Medical Products, Inc.: *See*—
Koll, Laurel A., 4,073,016, Cl. 5-81.00R.
Mobius, Christian Hermann. Method of removing tannins and reducing clouding in drinks. 4,073,954, Cl. 426-330.300.
Mochida, Yukou; Ogawa, Tadao; and Yamaguchi, Kazuo, to Fujitsu Limited. Optical PCM group transmission repeating system 4,074,127, Cl. 250-199.000.
Modes, Edward, to Powers Regulator Company. Control apparatus for warm up cycle of air distribution system. 4,073,433, Cl. 236-49.000.
Moedritzer, Kurt, to Monsanto Company. Phosphorus flame retardant compositions. 4,073,829, Cl. 260-860.000
Moffett, Robert Bruce, to Upjohn Company, The. Certain as-triazino[4,3-a][1,4]benzodiazepine-1,2-dione compounds. 4,073,784, Cl. 260-243.300.
Moffett, Robert Bruce: *See*—
Evenson, Gerald Norman; and Moffett, Robert Bruce, 4,073,785, Cl. 260-243.300.
Mohan, Arthur Gaudens, to American Cyanamid Company. Process for azoles (ring closure of nitro compounds). 4,074,046, Cl. 542-439.000.
Molins, Desmond Walter, to Molins Limited. Method of making Russian cigarettes. 4,073,300, Cl. 131-61.00A.
Molins Limited: *See*—
Hinchcliffe, Dennis; Daisley, Robert Thomas; Harper, Stanley Bernard; and Kilborn, Hilary Mark How'l, 4,073,374, Cl. 198-425.000.
Molins, Desmond Walter, 4,073,300, Cl. 131-61.00A.
Molins Machine Company, Inc.: *See*—
Coburn, Robert E., 4,073,222, Cl. 93-36.00M.
Monarch Marking Systems, Inc.: *See*—
Dobras, Bruce W., 4,074,114, Cl. 235-463.000.
Monash University: *See*—
Lawson, Frank; Ward, Denby Harcourt; and Kelly, Robert George, 4,073,481, Cl. 266-215.000.
Monsanto Company: *See*—
Baatz, James C; and Donermeyer, Donald D., 4,073,994, Cl 428-265.000.
Baatz, James C.; and Donermeyer, Donald D., 4,073,995, Cl. 428-265.000.
Birum, Gail H., 4,073,767, Cl. 260-45.80R.
Martins, Joseph G.; and Donermeyer, Donald D., 4,073,973, Cl. 427-142.000.
Moedritzer, Kurt, 4,073,829, Cl. 260-860.000.
Montanteme, Jean; Greffe, Andre; and Grandjacques, Francois, to Societe Francaise d'Electrometallurgie. Selective reduction of nickel ore with a low nickel content. 4,073,641, Cl. 75-11.000.
Montazeau, Francois: *See*—
Doubovetzky, Serge; Forschner, Peter; and Montazeau, Francois, 4,073,806, Cl. 260-544.00K.
Moore, Arthur H., to Bridgeport Metal Goods Manufacturing Company, The. Fluorescent lantern. 4,074,122, Cl. 362-200.000.
Moore, Billie G.: *See*—
Harrison, George W.; and Moore, Billie G., 4,073,836, Cl. 264-36.000.
Moore, Charles H. Process of forging large seamless ferrous-metal welding necks and other cylindrical articles. 4,073,174, Cl. 72-254.000.

Moore, Ricky L.; and Hagborg, Winston E., to West Point-Pepperell Inc. Flock treatment. 4,074,005, Cl. 428-378.000.
Moorhouse, John H. Lock structure. 4,073,171, Cl. 70-366.000.
Moreland, Stephen T. Bridge bid recording device. 4,073,493, Cl. 273-148.00R.
Moretto, Hans-Heinrich; de Montigny, Armand; Thom, Karl-Friedrich; and Schliebs, Reinhard, to Bayer Aktiengesellschaft. Process for the preparation of linear and branched chlorosiloxanes. 4,073,801, Cl. 260-448.20E.
Morewood, William Henry: *See—*
Reisner, John Henry; Morewood, William Henry; and Riddle, George Herbert Needham, 4,074,313, Cl. 358-128.000.
Morgan, Chester S., to United States of America, Energy. Preparation of cermets. 4,073,647, Cl. 75-235.000.
Moriconi, Dario J., to Sperry, Raymond L.; and Sperry, Selma. Trash compactor. 4,073,227, Cl. 100-52.000.
Morikawa, Masanobu: *See—*
Okasaka, Hotsuma; Nakamura, Kiyokazu; Morikawa, Masanobu; Tsunashima, Kenji; and Soda, Atsuhiko, 4,073,827, Cl. 260-835.000.
Morinaga, Mamoru: *See—*
Murota, Kozo; Matsumoto, Rempei; Yasuma, Toru; Morinaga, Mamoru; Tajima, Shigeo; Nakamura, Masayuki; and Sakaguchi, Akira, 4,073,361, Cl. 181-228.000.
Morioka, Masao: *See—*
Nishida, Takeshi; Morioka, Masao; Ohta, Tetsuro; and Yamakawa, Yukio, 4,073,988, Cl. 428-91.000.
Moriyama, Hideo, to Moriyama Sangyo Kabushiki Kaisha. Decorative light source including a discharge lamp and resistor within an outer envelope. 4,074,165, Cl. 313-112.000.
Moriyama Sangyo Kabushiki Kaisha: *See—*
Moriyama, Hideo, 4,074,165, Cl. 313-112.000.
Morokuma, Tadashi: *See—*
Kakinuma, Yoshikazu; and Morokuma, Tadashi, 4,074,306, Cl. 358-1.000.
Morse Electro Products Corporation: *See—*
Berger, Bernard, 4,074,327, Cl. 360-74.000.
Morse, Henry William: *See—*
Webb, Paul Dale; and Morse, Henry William, 4,073,607, Cl. 418-86.000.
MOS Technology, Inc.: *See—*
Paivinen, John O.; and Eisenhower, Walter D., 4,074,301, Cl. 357-23.000.
Moskowitz, George. Adjustable blocking means for dosage regulation. 4,073,321, Cl 141-27.000.
Mosler Safe Company, The: *See—*
Oder, Charles D.; and Doehlman, Harold G., 4,073,554, Cl. 312-199.000.
Moss, Margurita L., to Raymond Lee Organization, Inc , The. Comfort quilt. 4,074,107, Cl. 219-212.000.
Mostecky, Jiri: *See—*
Forman, Ladislav; Mergl, Milos; Mostecky, Jiri; Teply, Milos; and Uher, Jiri, 4,073,688, Cl. 195-49.000.
Motorola, Inc.: *See—*
Aichholzer, Ronald Albert, 4,074,214, Cl. 333-73.00S.
Davis, Earl Klimer; Rogers, William Oakley; and Silvis, Duane Charles, 4,073,657, Cl. 106-73.500.
Henry, Tim Warren, 4,074,257, Cl. 340-347.0NT.
Motz, Herbert: *See—*
Hack, Joachim; Schaefer, Dieter; and Motz, Herbert, 4,074.002, Cl. 428-331.000.
Mouwen, Herman Charles: *See—*
Lauer, William; and Mouwen, Herman Charles, 4,073,732, Cl. 210-491.000.
Mulkey, Dennis A.; and Brown, C. Kepler, Jr. Attachment for sewing machines and a method of making overlapped stitches. 4,073,249, Cl. 112-212.000.
Muller, Hans. Apparatus for combined cooling and aeration of biochemical-action vessels. 4,073,696, Cl. 195-142.000.
Muller, Johann; Weerth, Hans Ernst; and Staudenrausch, Georg, to Handtmann, Albert. Apparatus for the production of sausage. 4,073,039, Cl. 17-1.00F.
Muller, Jurgen; Rheude, Alfred; and Schmidt, Manfred, to AGFA-Gevaert, A.G. Ionography imaging chamber. 4,074,133, Cl. 250-315.00A.
Muller, Kurt; Richter, Friedrich; and Schramm, Heinz-Helmut, to Siemens Aktiengesellschaft. Encapsulated, gas-insulated high-voltage apparatus having increased resistance to arc activity. 4,074,064, Cl. 174-28.000.
Multi-Pak Corporation: *See—*
O'Rourke, James; and Feldberg, Murray, 4,073,229, Cl. 100-98.00R.
Munakata, Tsuneaki; and Kuboshima, Makoto, to Fuji Photo Film Co., Ltd. Folding camera. 4,074,296, Cl. 354-187.000.
Munk, Edmund E., to Werzalit Pressholzwerk J.F. Werz K.G. Method of making molded bodies from ligno-cellulose particles. 4,073,851, Cl. 264-109.000.
Munson, Lowell W.: *See—*
Coope, Robert L.; and Munson, Lowell W., 4,073,215, Cl. 90-58.00R.
Munt, Irwin, to Sangamo Weston, Inc. Display excitation and updating circuit. 4,074,255, Cl. 340-336.000.
Murakami, Fumiki; Teshima, Soichi; and Yokoyama, Toshihiko, to Mitsubishi Rayon Company, Limited. Process for producing unsaturated carboxylic acid esters. 4,074,062, Cl. 560-217.000.
Murakami, Kanemichi; Ishida, Yoshihiro; and Okubo, Kazuo, to Shinko Electric Company, Ltd. A.C. Relay system. 4,074,333, Cl. 361-13.000.
Murata, Shuhei. Three-dimensional embroidered article and the method for the production of the same. 4,073,299, Cl. 128-425.000.
Murayama, Fumio: *See—*
Hosoda, Minoru; Kasiwagi, Eiichi; Murayama, Fumio; and Isayama, Kohei, 4,073,762, Cl. 260-29.300.
Murayama, Kuniki: *See—*
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Murison, Alexander Smith: *See—*
O'Reilly, James Michael; and Murison, Alexander Smith, 4,074,331, Cl. 360-104.000.
Murota, Junichi: *See—*
Sakai, Tetsushi; Sakakibara, Yutaka; Murota, Junichi; and Wada, Tsutomu, 4,074,300, Cl. 357-23.000.
Murota, Kozo; Matsumoto, Rempei; Yasuma, Toru; Morinaga, Mamoru; Tajima, Shigeo; Nakamura, Masayuki; and Sakaguchi, Akira, to Fuji Jukogyo Kabushiki Kaisha. Muffler for motor vehicles. 4,073,361, Cl. 181-228.000.
Murrell, Lawrence L.: *See—*
Yates, David J. C.; and Murrell, Lawrence L., 4,073,750, Cl. 252-459.000.
Musser, Harry Robert, to Eastman Kodak Company. Unsaturated polyester containing formal linkages. 4,074,061, Cl. 560-193.000.
Mustapick, Andrew James. Automated merchandising system. 4,073,368, Cl. 186-1.00C.
Muta, Katsumi: *See—*
Kawamura, Hiroshi; Nishitani, Yoshihisa; and Muta, Katsumi, 4,074,315, Cl. 358-142.000.
Myers, David M., to Curtiss-Wright Corporation. Rotary combustion engine with side housing by-pass passages. 4,073,268, Cl. 123-8.130.
Mysels, Karol J., to General Atomic Company. Method of making nuclear fuel elements. 4,073,834, Cl. 264-0.500.
N. J. Phillips Pty. Limited: *See—*
Phillips, Ian Ross; and Reynolds, Mervyn Frank, 4,073,293, Cl. 128-223.000.
N.P.I. Corporation: *See—*
Lang-Ree, Nils, 4,073,225, Cl. 99-339.000.
Naaijer, Geert Jan, to U.S. Philips Corporation. Peak detecting with constant fractional offset. 4,074,149, Cl. 307-351.000.
Naarmann, Herbert; Penzien, Klaus; and Gausepohl, Hermann, to BASF Aktiengesellschaft. Manufacture of heat-stable brominated oligomers of monovinyl-aromatic compounds. 4,074,032, Cl. 526-44.000.
Nadal, Guy, to Saft-Societe des Accumulateurs Fixes et de Traction. Casing of an electric cell. 4,074,022, Cl. 429-54.000.
Nadir, Mark T., to Macklin, Kenneth E. Novel bistable light modulators and display element and arrays therefrom. 4,074,253, Cl. 340-324.00M.
Nagasawa, Shigeru: *See—*
Yotsuyanagi, Yoshihiko; Araki, Naganori; Nagasawa, Shigeru; and Okitsu, Toshinao, 4,073,756, Cl. 260-18.00N.
Nagase, Minoru, to Nippon Air Brake Company, Ltd., The. Electro-pneumatic control apparatus for an electric/friction brake blending system. 4,073,541, Cl. 303-3.000.
Nagata, Susumu: *See—*
Nakagawa, Mutsuaki; Wakasa, Yutaka; Uchiike, Hisayuki; and Nagata, Susumu, 4,074,354, Cl. 364-200.000.
Nagy, Zoltan, to Diamond Shamrock Corporation. Brine treatment for trace metal removal. 4,073,706, Cl. 204-98.000.
Nakabo, Satoru: *See—*
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Nakagawa, Mutsuaki; Wakasa, Yutaka; Uchiike, Hisayuki; and Nagata, Susumu, to Yokogawa Electric Works, Ltd. Process control system. 4,074,354, Cl. 364-200.000.
Nakagawa, Yasuhiko: *See—*
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Nakajima, Yasuo: *See—*
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Nakajima, Yoshiyuki: *See—*
Akito, Eiichiro; Nakajima, Yoshiyuki; and Horioka, Masayoshi, 4,073,931, Cl. 424-298.000.
Nakamoto, Soichi; Ito, Tadashi; Ito, Fumio; and Isobe, Yasuo, to Canon Kabushiki Kaisha. System for indicating photographic information. 4,074,292, Cl. 354-53.000.
Nakamura, Katsuyuki: *See—*
Matsuo, Shunji; Sasaguri, Kiichiro; Nakamura, Katsuyuki; Matsumoto, Yoshio; and Sato, Mikio, 4,073,775, Cl. 260-47.0EP.
Nakamura, Kiyokazu: *See—*
Okasaka, Hotsuma; Nakamura, Kiyokazu; Morikawa, Masanobu; Tsunashima, Kenji; and Soda, Atsuhiko, 4,073,827, Cl. 260-835.000.
Nakamura, Masayuki: *See—*
Murota, Kozo; Matsumoto, Rempei; Yasuma, Toru; Morinaga, Mamoru; Tajima, Shigeo; Nakamura, Masayuki; and Sakaguchi, Akira, 4,073,361, Cl. 181-228.000.
Nakamura, Michiharu: *See—*
Aiki, Kunio; Nakamura, Michiharu; and Umeda, Junichi, 4,073,676, Cl. 156-624.000.
Nakanishi Conveyors Co. Ltd.: *See—*
Wakabayashi, Takao, 4,073,237, Cl. 104-172.00C.
Nakayama, Mutumi: *See—*
Soga, Mitsuo; Takase, Yuuzo; Ishikawa, Manabu; Nakazawa, Masahiko; and Nakayama, Mutumi, 4,074,034, Cl. 526-56.000.
Nakayama, Yasuharu; Watanabe, Tadashi; Yamashita, Yoshio; Aihara, Tetsuo; and Toyomoto, Isao, to Kansai Paint Company, Limited. Emulsion compositions. 4,073,758, Cl. 260-23.0EP.

Nakazawa, Masahiko: *See—*
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Nalco Chemical Company: *See—*
Tai, Wun Ten, 4,073,763, Cl. 260-29.4UA.
Namiki, Noriaki: *See—*
Kishitani, Masatoshi; Tamagaki, Yoshiteru; Matsumoto, Takeji; Sugimoto, Mikio; and Namiki, Noriaki, 4,073,152, Cl. 61-63.000.
Namoto, Yoshiteru: *See—*
Sakumoto, Hideki; and Namoto, Yoshiteru, 4,074,329, Cl. 360-85.000.
Nampoothiri, C. N. Damodaran: *See—*
Earls, David E.; and Nampoothiri, C. N. Damodaran, 4,073,133, Cl. 58-13.000.
Napco Security Systems, Inc.: *See—*
Stockdale, Roy, 4,074,248, Cl. 340-276.000.
Narisawa, Shizuo: *See—*
Tabana, Minoru; Mitsuno, Tatsuyuki; Maki, Hiroshi; and Narisawa, Shizuo, 4,073,831, Cl. 260-876.00B.
Nash, Dudley O.; and Clayton, Thomas S., to General Electric Company. Gas turbine engine nozzle apparatus including a nozzle flap slot seal. 4,073,441, Cl. 239-265.410.
National Blank Book Company, Inc.: *See—*
Cassidy, Raymond T., 4,073,553, Cl. 312-184.000.
National Distillers and Chemical Corporation: *See—*
Lerman, Frank; and Bartsch, Raymond C., 4,073,992, Cl. 428-207.000.
Voos, Frank J.; and Magoulick, David M., 4,073,312, Cl. 137-877.000.
National Instrument Company, Inc.: *See—*
Bennett, Richard Nelson, 4,073,322, Cl. 141-169.000.
National Research Development Corporation: *See—*
Broadway, Alexander Richard William, 4,074,160, Cl. 310-184.000.
Bunting, Walter, 4,074,190, Cl. 324-77.00A.
Fleischmann, Martin; Goodridge, Francis; and Vance, Christopher John, 4,073,702, Cl. 204-59.00R.
Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek Ten Behoeve Van Nijverheid Handel en Verkeer: *See—*
Ritter, Fridolin J., 4,073,882, Cl. 424-84.000.
Nee, Paul, to Roger Pelleray. Method for the automatic manufacture of pressurized or liquefied gas tanks. 4,074,106, Cl. 219-137.00R.
Nelson Irrigation Corporation: *See—*
Meyer, Larry P., 4,073,438, Cl. 239-227.000.
Nelson, Iver L., to Champion International Corporation. Taping apparatus. 4,073,119, Cl. 53-76.000.
Nelson, Lyle C. Ball-operated labyrinthic lock. 4,073,169, Cl. 70-166.000.
Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-3,7-inter-m-phenylene-11-deoxy-PGE$_1$ compounds 4,073,805, Cl. 260-590.00C.
Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-aminomethyl-PGA and 9-deoxy-9,10-didehydro-PGD analogs. 4,073,808, Cl. 260-563.00R.
Nespital, Walter: *See—*
Klein, Edgar; Kracke, Reinhard; Nespital, Walter; and Paul, Rudiger, deceased, 4,073,877, Cl. 423-616.000.
Nestler, Heinz; and Plankl, Leo Hans, to Dynamit Nobel Aktiengesellschaft. Surface protection for porous materials. 4,073,972, Cl. 427-136.000.
Netzbandt, William: *See—*
Pader, Morton; and Netzbandt, William, 4,073,880, Cl. 424-66.000.
Neuper, Helmut: *See—*
Gulas, Hans-Jurgen; and Neuper, Helmut, 4,073,656, Cl. 106-57.000.
New Research & Development Lab., Inc.: *See—*
Le Roy, Pierre L., 4,073,298, Cl. 128-337.000.
Newman, David P., to Yellow Springs Instrument Company, Inc., The. Membrane for enzyme electrodes. 4,073,713, Cl. 204-195.00B.
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Newton, Robert E.: *See—*
Dechene, Ronald L.; Grimaldi, Frank G.; and Newton, Robert E., 4,074,184, Cl. 324-30.00R.
Neyer, Robert D., to Yarway Corporation. Steam trap. 4,073,306, Cl. 137-183.000.
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Suh, John T., 4,073,798, Cl. 260-340.50R.
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Niederost, Werner; and Durrer, Bernhard, to Cerberus AG. Interlocked separable fire sensor construction. 4,074,341, Cl. 361-331.000.
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Nagase, Minoru, 4,073,541, Cl. 303-3.000.
Nippon Electric Company, Ltd.: *See—*
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Nippon Kayaku Kabushiki Kaisha: *See—*
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Nippon Steel Corporation: *See—*
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Nippon Telegraph and Telephone Public Corporation: *See—*
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Nishida, Takeshi; Morioka, Masao; Ohta, Tetsuro; and Yamakawa, Yukio, to Kanebo, Ltd. Suede-like artificial leathers and a method for manufacturing same. 4,073,988, Cl. 428-91.000.
Nishida, Yukiaki: *See—*
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Nishikaji, Takashi; Watanabe, Kenzo; and Sawayama, Shigeru, to Mitsubishi Chemical Industries Limited; and Kyoritsu Yuki Co., Ltd. Process for preparing solid water soluble polymers. 4,074,041, Cl. 528-488.000.
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Noda, Yasuo; and Inoue, Takaya, to Kansai Kagaku Kikai Seisaku Kabushiki Kaisha. Reversibly rotated wiper in an evaporator. 4,073,677, Cl. 159-6.00W.
Noguchi, Masaru, to Fuji Photo Film Co. Beam scanning device using a stationary hologram. 4,073,566, Cl. 350-3.710.
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Nordberg, Svein T.; and Shaner, Donald R., to GTE Sylvania Incorporated. Mounting means for a circuit breaker. 4,074,219, Cl. 337-186.000.
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Nordskog, Robert A., to Nordskog Company Inc. Brake and tie-down mechanism. 4,073,369, Cl. 188-5.000.
Noren, Tore H. Dishwasher with downwardly movable door counterbalanced by spring-biased toggle joints. 4,073,555, Cl. 312-229.000.
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Bastian, Robert Edward, 4,073,576, Cl. 350-273.000.
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Peters, Martinus T. J., 4,073,739, Cl. 252-62.10P.
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Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, to Mitsubishi Chemical Industries Limited; and Okamoto, Shosuke. N^2-alkoxynaphthylsulfonyl-L-argininamides and the pharmaceutically acceptable salts thereof. 4,073,892, Cl. 424-177.000.
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Okamuro, James A., to Borroughs Tool & Equipment Corporation. Piston pin installing and removing method. 4,073,051, Cl. 29-427.000.
Okasaka, Hotsuma; Nakamura, Kiyokazu; Morikawa, Masanobu; Tsunashima, Kenji; and Soda, Atsuhiko, to Toray Industries, Inc. Thermoplastic resinous composition. 4,073,827, Cl. 260-835.000.
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Olig, Eugene A., to Giddings & Lewis, Inc. Methods and apparatus for automatic movement of a member to precisely indexed positions despite signal drift or offset. 4,074,177, Cl. 318-602.000.
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Omley, Herbert A., 4,073,423, Cl. 227-7.000.
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O'Neill, George J.; and Pacifici, James G., to Eastman Kodak Company. Radiation crosslinkable polyester and polyesteramide compositions containing sulfonate groups in the form of a metallic salt and unsaturated groups. 4,073,777, Cl. 260-75.00S.
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Optiz, Wolfgang; and Hennen, Hans, to Hoechst Aktiengesellschaft. Joint combustion of off-gases and liquid residues containing chlorinated hydrocarbons with hydrochloric acid recovery. 4,073,871, Cl. 423-481.000.
Orange, A. C. Push-in can top. 4,073,403, Cl. 220-269.000.
Orban, Jean M., to Vivitar Corporation. Voltage regulator with thermal overload protection. 4,074,170, Cl. 315-120.000.
O'Reilly, James Michael; and Murison, Alexander Smith, to Burroughs Corporation. Magnetic recording head structure for recording on both sides of a record member. 4,074,331, Cl. 360-104.000.
Orlandi, John F.; and Rauch, John E., to Belden Corporation. Twining and cabling system. 4,073,127, Cl. 57-58.360.
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Ostrowski, Jerzy; Sierputowski, Piotr; Turkowski, Lukasz; Jablkiewicz, Jerzy; Pacholski, Jan; and Jedryka, Tadeusz, to Centralny Osrodek Badawczo-Rozwojowy Maszyn Wlokienniczych. Method and apparatus for manufacture of yarn. 4,073,129, Cl. 57-58.890.
Otake, Hiroshi; Koresawa, Saburo; and Hashimoto, Kozo, to Matsushita Electric Industrial Co., Ltd. Distribution type delay line. 4,074,210, Cl. 333-29.000.
Otomo, Koju; Itoh, Takeshi; Hayashi, Kazuyuki; Omoto, Hiroshi; Yui, Takayuki; and Suzuki, Makoto, to Hitachi, Ltd.; Nippon Telegraph and Telephone Public Corporation; Oki Electric Industry Co., Ltd.; Nippon Electric Company, Ltd.; and Fujitsu Limited. Data sending and receiving system for packet switching network. 4,074,232, Cl. 340-147.00R.
Otsuki, Akira; and Nishino, Makoto, to Toyo Ink Manufacturing Co., Ltd. Method of resin encapsulating electrical parts with UV curing of fire retardant resin. 4,073,835, Cl. 264-22.000.
Otsuki, Tatsukiyo; and Takata, Sinya. Method for producing yellow hydrated ferric oxide. 4,073,878, Cl. 423-633.000.
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Byalko, Mikhail Vladimirovich; Kirko, Elena Viktorovna; Perlovsky, Rafael Shliomovich; and Ryzhnev, Vadim Jurievich, 4,073,183, Cl. 73-23.000.
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Ramsden, Frederick G. Shock absorber installation tool. 4,073,046, Cl. 29-401.00R.
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Kobayashi, Tatsuo; and Miyazaki, Akira, 4,073,585, Cl. 355-14.000.
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Rayburn, Herbert F. Viewer for a strip of film. 4,073,581, Cl. 352-129.000.

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Nyberg, David Dolph, 4,073,830, Cl. 260-860.000.
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Raymond, Eugene B. Spark plug terminal. 4,073,565, Cl. 339-223.00S.
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Perera, Armand, 4,073,515, Cl. 285-158.000.
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Gibson, Walter Gold, 4,074,308, Cl. 358-38.000.
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Pankove, Jacques Isaac, 4,074,139, Cl. 250-492.00A.
Reisner, John Henry; Morewood, William Henry; and Riddle, George Herbert Needham, 4,074,313, Cl. 358-128.000.
Robe, Thomas Joseph, 4,074,205, Cl. 330-257.000.
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Reed, Robert T., to Walton Products, Inc. Car coupler. 4,073,385, Cl. 213-100.00R.
Regel, Erik; Eue, Ludwig; and Schmidt, Robert R., to Bayer Aktiengesellschaft. Azolylamidine compounds and herbicidal compositions. 4,073,636, Cl. 71-92.000.
Regie Nationale des Usines Renault: *See—*
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Regnaut, Bernard, to Societe Generale de Constructions Electriques et Mecaniques "Alsthom et Cie". Cross-feed fuel cell battery with filter press type structure of polygonal cross-section. 4,074,020, Cl. 429-34.000.
Reh, Lothar: *See—*
Collin, Per Harald; Flink, Sune Natanael; Widell, Bjorn; Hirsch, Martin; and Reh, Lothar, 4,073,642, Cl. 75-35.000.
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Benda, David; and Reigel, Franklin G., 4,073,558, Cl. 316-18.000.
Reinauer, Thomas V.; Duyckinck, Robert W.; and Handwork, Frank B., to United States Filter Corporation. Filter bag assembly. 4,073,632, Cl. 55-374.000.
Reisner, John Henry; Morewood, William Henry; and Riddle, George Herbert Needham, to RCA Corporation. Electron beam disc recorder. 4,074,313, Cl. 358-128.000.
Resch, Reinhard, to Daimler-Benz Aktiengesellschaft. Switching device for the indirect alteration of the mechanical brake pedal transmission. 4,073,543, Cl. 303-10.000.
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Chu, Edward J., 4,073,856, Cl. 264-259.000.
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Kirkpatrick, Alan D., 4,073,208, Cl. 83-659.000.
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Roe, Edward A.; and Schulte, Harold F. Centrifugal casting machine. 4,073,336, Cl. 164-286.000.
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Roed, Finn, to Norsk Hydro a.s. Means for cooling of self-baking anodes in aluminum electrolysis cells. 4,073,714, Cl. 204-243.00R.
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Rowe, Edward A., Jr.; and Cawley, William H., to Diamond Shamrock Corporation. Methylene chloride phosphatizing. 4,073,066, Cl. 34-73.000.
Rowley, David S.; Walker, Bruce H.; Fielder, Coy M.; and Rohde, Heino J., to Christensen, Inc. Earth-boring drill bits. 4,073,354, Cl. 175-329.000.
Royce, John H., to Traverse City Iron Works. Valve for fire hydrants. 4,073,307, Cl. 137-283.000.
Royce, Peter. Advancement of stuck phonograph needles. 4,073,495, Cl. 274-1.00R.
Ruben, Samuel. Rechargeable voltaic cell with lead mercury amalgam anode and lead peroxide cathode. 4,074,029, Cl. 429-198.000.
Ruben, Samuel. Process for producing nickel oxide cathodic reactant for primary cells. 4,074,030, Cl. 429-223.000.
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Rundkvist, Konstantin Alexandrovich; Ivanov, Nikolai Alexeevich; Ivanov, Boris Gavrilovich; Zarogatsky, Leonid Petrovich; Mitrofanov, Evgeny Sergeevich; and Blekhman, Ilya Izrailevich. Inertia cone crusher. 4,073,446, Cl. 241-207.000.
Runft, Arthur J., to Kelley Co., Inc. Switch assembly having movable contact face configuration for penetrating frost or ice layer on adjacent contact surface. 4,074,112, Cl. 200-279.000.
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Saito, Masaaki, to Nissan Motor Company, Limited. Air-fuel metering system for internal combustion engine and apparatus to control air fuel ratio of air-fuel being applied to engine. 4,073,274, Cl. 123-119.00R.
Sajfert, Drago, to Volkswagenwerk Aktiengesellschaft. Lock arrangement for a motor vehicle door. 4,073,526, Cl. 292-347.000.
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Sandberg, Rune Verner; and Akerman, Sven Bengt Arvid, to Astra Lakemedel Aktiebolag. Local anesthetics tertiary aminoalkoxyphenyl ethers. 4,073,917, Cl. 424-267.000.
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Sandvig, Timothy C., to Minnesota Mining and Manufacturing Company. Method for rendering substrates resistant to abrasion. 4,073,967, Cl. 427-44.000.
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Sauber, Charles J. Outrigger pad. 4,073,454, Cl. 248-188.200.
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Smith, Trevor Stanley; and Bloom, Joseph Louis, to Lucas Industries Limited. Control valves for fluids. 4,073,135, Cl. 60-39.28R.
SmithKline Corporation: *See—*
Kaiser, Carl; and Lafferty, John Joseph, 4,073,912, Cl. 424-267.000.
Snodgrass, Elvin E. Fowl-shaped container. 4,073,397, Cl. 215-1.00C.
Snowdon, Brian, to Macawber Engineering Limited. Material handling apparatus. 4,073,244, Cl. 110-165.00R.
Snyder, David E., to U.S. Industries, Inc. Valve. 4,073,466, Cl. 251-63.400.
Snyder, Edward, III: *See—*
Beny, Janos; Ryan, John W.; and Snyder, Edward, III, 4,073,088, Cl. 46-265.000.
Snyder, Martin, to Pettibone Laboratories, Inc. Chlorine dioxide and quaternary ammonium salts as sterilizing agents. 4,073,888, Cl. 424-149.000.
Societe Anonyme de Telecommunications: *See—*
Boutmy, Patrick E.; and Walraet, Jean G., 4,074,074, Cl. 179-15.0BW.
Societe Anonyme des Ateliers Houget Duesberg Bosson: *See—*
Bouhon, Pierre Hubert Marie Joseph, 4,073,126, Cl. 57-58.950.
Societe Anonyme Dite: Nodet-Gougis: *See—*
Grataloup, Xavier Roger, 4,073,439, Cl. 239-655.000.
Societe Anonyme dite : Societe Europeenne de Propulsion: *See—*
Stauff, Emile J., 4,073,213, Cl. 89-1.701.
Societe d'Applications Generales d'Electricite et de Mecanique (SAGEM): *See—*
Dore, Alain; Picard, Jean; and Rochereau, Jacques, 4,074,258, Cl. 340-347.00P.
Societe d'Assistance Technique pour Produits Nestle, S.A.: *See—*
Gasser, Rupert Josef; and Huster, Lienhard Bodo, 4,073,961, Cl. 426-589.000.
Societe d'Etudes de Produits Chimiques: *See—*
Esanu, Andre, 4,073,895, Cl. 424-200.000.
Societe Francaise d'Electrometallurgie: *See—*
Montanteme, Jean; Greffe, Andre; and Grandjacques, Francois, 4,073,641, Cl. 75-11.000.
Societe Generale de Constructions Electriques et Mecaniques "Alsthom et Cie": *See—*
Regnaut, Bernard, 4,074,020, Cl. 429-34.000.
Societe Nouvelle des Bennes Saphem: *See—*
Derain, Christian, 4,073,396, Cl. 214-515.000.
Societe Toulousaine de Produits Chimiques "Tolochimie": *See—*
Doubovetzky, Serge; Forschner, Peter; and Montazeau, Francois, 4,073,806, Cl. 260-544.00K.
Soda, Atsuhiko: *See—*
Okasaka, Hotsuma; Nakamura, Kiyokazu; Morikawa, Masanobu; Tsunashima, Kenji; and Soda, Atsuhiko, 4,073,827, Cl. 260-835.000.
Soffa, Albert: *See—*
Kulicke, Frederick W., Jr.; Soffa, Albert; Vilenski, Dan; and Brockmann, Asher, 4,073,424, Cl. 228-4.500.
Soga, Mitsuo; Takase, Yuuzo; Ishikawa, Manabu; Nakazawa, Masahiko; and Nakayama, Mutumi, to Asahi Denka Kogyo K.K. Hardenable composition. 4,074,034, Cl. 526-56.000.
Soga, Setsuo: *See—*
Imai, Kiyoshi; Hasebe, Nobuyuki; Asami, Tomiaki; Soga, Setsuo; Fukushima, Ichiro; and Asahina, Yasuo, 4,074,001, Cl. 428-329.000.
Solaron Corporation: *See—*
Lof, George O. G., 4,073,283, Cl. 126-270.000.
Solf, Johannes; and Eicker, Rolf, to H. Eicker & Sohne. Barber scissors. 4,073,058, Cl. 30-257.000.
Solie, James C.: *See—*
McClocklin, Samuel B.; and Solie, James C., 4,073,315, Cl. 137-629.000.
Solomon, Anthony T.: *See—*
Crawford, William B.; and Solomon, Anthony T., 4,073,246, Cl. 112-121.110.
Son, Pyong-Nae; and Layer, Robert Wesley, to B. F. Goodrich Company, The. Substituted decahydroquinolines and their use as ultraviolet light stabilizers. 4,073,770, Cl. 260-45.8NW.

Sonntag, Norman O. V., to Glyco Chemicals, Inc. Hydantoin derivatives and broad spectrum bactericidal/fungicidal compositions thereof. 4,073,924, Cl. 424-273.00R.
Sonntag, Norman O. V.; and Freilich, John Douglas, to Glyco Chemicals, Inc. Mono-quaternary ammonium salts of hydantoin and compositions thereof. 4,073,926, Cl. 424-273.00R.
Sony Corporation: *See—*
Ohsawa, Mitsuo, 4,074,075, Cl. 179-15.0BT.
Sorenson, Richard D.: *See—*
Hart, Charles G.; Gordon, John S.; and Sorenson, Richard D., 4,073,375, Cl. 198-466.000.
Southern Pacific Transportation Company: *See—*
Biaggini, Benjamin F.; and Garin, Paul V., 4,073,394, Cl. 214-145.00R.
Southwire Company: *See—*
Womack, William B. M.; Starnes, Ralph Emory, Jr.; Headrick, John Charles; and Martin, Ronald Ray, 4,073,978, Cl. 427-235.000.
Soykan, Ferhun H., to Special Metals Corporation. Method of melting slag. 4,073,640, Cl. 75-10.00R.
Spampinato, Dominic Patrick, to International Business Machines Corporation. Word line clamping circuit and decoder. 4,074,237, Cl. 365-230.000.
Spar Aerospace Products Limited: *See—*
Taylor, Henry James; and Ibbotson, Philip Nicholas Peter, 4,073,201, Cl. 74-665.00L.
Spartus Corporation: *See—*
Jauch, Christian M. J., 4,073,130, Cl. 58-9.000.
Spata, James M.; and Diel, Roger L., to Ralston Purina Company. Process for the production of a protein product. 4,073,962, Cl. 426-646.000.
Spaziante, Placido Maria; Santi, Rinaldo; and De Nora, Vittorio, to Parel Societe Anonyme. Method of operating a circulating bed cell. 4,073,707, Cl. 204-105.00R.
Special Metals Corporation: *See—*
Soykan, Ferhun H., 4,073,640, Cl. 75-10.00R.
Specker, Manfred: *See—*
Metz, Gunter; and Specker, Manfred, 4,073,918, Cl. 424-270.000.
Speckhard, Arthur. Digital printout arrangement with magnetic field carriage drive. 4,074,067, Cl. 178-23.00R.
Speelman, Irving A.; and Raczkowski, Jan, to Propper Manufacturing Co., Inc. Disposable valve. 4,073,314, Cl. 137-625.470.
Spence, Junior C.; Rorrer, Robert J.; and Holt, James L., to J.P. Stevens & Co., Inc. Double catch thread narrow weave fabric. 4,073,320, Cl. 139-383.00R.
Sperry, Raymond L.: *See—*
Moriconi, Dario J., 4,073,227, Cl. 100-52.000.
Sperry, Selma: *See—*
Moriconi, Dario J., 4,073,227, Cl. 100-52.000.
Spisak, Steve: *See—*
Shoup, Thomas E.; and Spisak, Steve, 4,074,103, Cl. 219-98.000.
Sprecker, Mark A.: *See—*
Hall, John B.; Sprecker, Mark A.; Schmitt, Frederick Louis; and Vock, Manfred Hugo, 4,073,751, Cl. 252-522.000.
Square D Company: *See—*
Clarke, Geoffrey, 4,074,336, Cl. 361-88.000.
Squassoni, Gino F.: *See—*
Teumer, Roger G.; Warter, Peter J., Jr.; Squassoni, Gino F.; Tulagin, Vseevolod; and Egnaczak, Raymond K., 4,073,583, Cl. 355-3.00P.
Stach, Leonard J.; and Wilke, Robert N., to Velsicol Chemical Corporation. Oxadiazolidine substituted phosphorus compounds. 4,073,894, Cl. 424-200.000.
Stadie, Lothar; and Wittchow, Eberhard, to Kraftwerk Union Aktiengesellschaft. Fuel and feedwater-monitoring system of a once-through steam generator. 4,074,360, Cl. 364-551.000.
Stahle, Helmut: *See—*
Kummer, Werner; Koppe, Herbert; Stahle, Helmut; and Haarmann, Walter, 4,073,905, Cl. 424-248.560.
Stahlin, Walter: *See—*
Schmidt, Walter; and Stahlin, Walter, 4,073,355, Cl. 177-83.000.
Stalter, Robert J.; and Burkholder, Theodore B., to Goodyear Tire & Rubber Company, The. Contoured foam mattress. 4,073,020, Cl. 5-355.000.
Stalter, Robert J.: *See—*
Burkholder, Theodore B.; Stalter, Robert J.; and Skotynsky, Paul N., 4,073,839, Cl. 264-45.100.
Stam, John G.: *See—*
Hamanaka, Ernest S.; and Stam, John G., 4,073,783, Cl. 260-239.100.
Standard Oil Company, The: *See—*
Li, George S., 4,074,037, Cl. 526-280.000.
Li, George S., 4,074,038, Cl. 526-280.000.
Standard Oil Company (Indiana): *See—*
Cerefice, Steven A.; and Fields, Ellis K., 4,073,794, Cl. 260-326.00C.
Grutsch, James F.; Mallatt, Russell C.; and Steely, Benjamin F., 4,073,722, Cl. 210-5.000.
Lark, John C., 4,073,993, Cl. 428-261.000.
Standing, Charles N.; and Olabode, Hamilton A., to Pillsbury Company, The. Method of making dehydrated potato. 4,073,952, Cl. 426-242.000.
Stanley, James Robert; and Topham, Silas Charles, to Medical Development Corporation. Negative pressure drainage vessel. 4,073,294, Cl. 128-278.000.
Stanley, Philip E.: *See—*
Woods, William E.; Stanley, Philip E.; Izbicki, Kenneth J.; and Ramsdell, Steven C., 4,074,353, Cl. 364-200.000.
Stanley Tools Limited: *See—*
Gilbert, Richard, 4,073,057, Cl. 30-153.000.
Stansberry, Richard: *See—*
McKenzie, Roland W.; and Stansberry, Richard, 4,073,393, Cl. 214-83.300.
Stanton, Raymond E.: *See—*
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Starnes, Ralph Emory, Jr.: *See—*
Womack, William B. M.; Starnes, Ralph Emory, Jr.; Headrick, John Charles; and Martin, Ronald Ray, 4,073,978, Cl. 427-235.000.
Staudenrausch, Georg: *See—*
Muller, Johann; Weerth, Hans Ernst; and Staudenrausch, Georg, 4,073,039, Cl. 17-1.00F.
Stauff, Emile J., to Societe Anonyme dite : Societe Europeenne de Propulsion. Assembly for launching a projectile. 4,073,213, Cl. 89-1.701.
Ste Anonyme dite: Ateliers et Chantiers de Bretagne - A CB: *See—*
Colin, Jean-Paul, 4,073,217, Cl. 92-27.000.
Steel Storage Systems, Inc.: *See—*
Fahey, Thomas D.; and Schlagel, Samuel, 4,073,382, Cl. 211-1.000.
Steely, Benjamin F.: *See—*
Grutsch, James F.; Mallatt, Russell C.; and Steely, Benjamin F., 4,073,722, Cl. 210-5.000.
Steen, Donald B., to United States of America, Navy. Coaxial, polarity-reversing switch. 4,074,099, Cl. 200-153.00S.
Steever, Andrew Beaumont; and Svencer, Richard Ernest, to Dorr-Oliver Incorporated. Refractory construction dome for fluidized bed reactor. 4,073,064, Cl. 34-57.00A.
Stege, Heinz: *See—*
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Stein, Werner: *See—*
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Steinbeck, Hermann: *See—*
Hofmeister, Helmut; Laurent, Henry; Wiechert, Rudolf; Annen, Klaus; and Steinbeck, Hermann, 4,073,900, Cl. 424-243.000.
Steinbicker, Richard N.; and Rauch, Stewart E., to Bethlehem Steel Corporation. Acid electrotinning bath. 4,073,701, Cl. 204-54.00R.
Steinert, Wolfgang; and Ekstrom, Bo, to Licentia Patent-Verwaltungs-G.m.b.H. Code word determination. 4,074,119, Cl. 364-807.000.
Steinmann, Eugene B., Jr. Automobile body dent puller tool. 4,073,181, Cl. 72-479.000.
Stephens, John A.: *See—*
Kuhn, Martin C.; Stephens, John A.; Noakes, Michael J.; and Rovig, Allen D., 4,073,479, Cl. 266-173.000.
Stephens, Ronald M. Device for impregnating paper. 4,073,264, Cl. 118-250.000.
Steprath, Werner: *See—*
Buzga, Heinrich; Steprath, Werner; and Pause, Kurt, 4,073,661, Cl. 134-1.000.
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Stetter, Joseph R.: *See—*
Blurton, Keith F.; and Stetter, Joseph R., 4,073,698, Cl. 204-1.00T.
Stevens, Amy L. Portable playpen. 4,073,017, Cl. 5-97.000.
Stevens Engineering: *See—*
Coope, Robert L.; and Munson, Lowell W., 4,073,215, Cl. 90-58.00R.
Stevens, John, to Minnesota Mining and Manufacturing Company. 3-Pyrazolidinone derivatives. 4,074,051, Cl. 544-140.000.
Stevens, Petrus Franciscus, to U.S. Philips Corporation. Gamma camera in which only the three largest signals are used for position determination. 4,074,135, Cl. 250-366.000.
Stewart, Lionel G.: *See—*
Fishbaugh, Byron L.; Keller, Harold E.; and Stewart, Lionel G., 4,073,047, Cl. 29-450.000.
Stilexo Johansson & Co. Aktiebolag: *See—*
Lexnas, Sven-Olof, 4,073,033, Cl. 16-52.000.
Stires, John C., III. Strip chart recorder. 4,074,275, Cl. 346-19.000.
Stirling, Irene: *See—*
Wood, Hamish Christopher Swan; and Stirling, Irene, 4,073,786, Cl. 260-251.500.
Stith, Morris Randall, Jr. Valve. 4,073,308, Cl. 137-340.000.
Stix, Nathan, to United States Shoe Corporation, The. Method of making a shoe. 4,073,024, Cl. 12-142.00J.
Stockdale, Roy, to Napco Security Systems, Inc. Dual operating control circuits for intrusion detection systems. 4,074,248, Cl. 340-276.000.
Stockman, Richard Franklin, to Air Preheater Company, Inc., The. Rotary regenerator pin rack seal. 4,073,337, Cl. 165-9.000.
Stoessel, Herman V.; and Prichard, Daniel R., to Hesston Corporation. Feed rolls having automatic speed control. 4,073,377, Cl. 198-624.000.
Stone, Raymond S.: *See—*
Bosworth, Clive J.; Bridgstock, Neil E.; Stone, Raymond S.; and McLaughlin, William L., 4,073,260, Cl. 118-8.000.
Stoneking, Richard D.: *See—*
Kaduki, Charles L.; and Stoneking, Richard D., 4,073,611, Cl. 431-45.000.

Stora Kopparbergs Bergslags Aktiebolag: *See—*
Collin, Per Harald; Flink, Sune Natanael; Widell, Bjorn; Hirsch, Martin; and Reh, Lothar, 4,073,642, Cl. 75-35.000.
Storm, Nelson "Jack", to Custom Trailers Mfg., Inc. Method and apparatus for providing a power screed board. 4,073,593, Cl. 404-114.000.
Stremeckus, Robert. Fish lure box. 4,073,085, Cl. 43-54.50R.
Strong, Herbert M.; and Tuft, Roy E., to General Electric Company. High pressure reaction vessel for quality control of diamond growth on diamond seed. 4,073,380, Cl. 206-219.000.
Stuby, Kenneth P.: *See—*
Honn, James Joseph; and Stuby, Kenneth P., 4,074,342, Cl. 361-411.000.
Stuckmann, Dieter; and Jutte, Hans, to Gewerkschaft Eisenhutte Westfalia. Drive shields for tunnelling. 4,073,153, Cl. 61-85.000.
Studier, Martin H.: *See—*
Huston, John L.; Scott, Robert G.; and Studier, Martin H., 4,073,624, Cl. 44-1.00R.
Sugahara, Hirozo: *See—*
Ichikawa, Hiroshi; Sugimoto, Michio; Mizokami, Shigeyoshi; Honna, Kosaku; and Sugahara, Hirozo, 4,073,818, Cl. 260-668.00F.
Sugie, Akihiko: *See—*
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Sugimoto, Michio: *See—*
Ichikawa, Hiroshi; Sugimoto, Michio; Mizokami, Shigeyoshi; Honna, Kosaku; and Sugahara, Hirozo, 4,073,818, Cl. 260-668.00F.
Sugimoto, Mikio: *See—*
Kishitani, Masatoshi; Tamagaki, Yoshiteru; Matsumoto, Takeji; Sugimoto, Mikio; and Namiki, Noriaki, 4,073,152, Cl. 61-63.000.
Sugiura, Akio; and Nojiri, Tadao, to Nippondenso Co., Ltd. Method and apparatus to read-in bar-coded information. 4,074,115, Cl. 235-462.000.
Suh, John T., to Nicholas International Limited. Preparation of ethylamine derivatives. 4,073,798, Cl. 260-340.50R.
Sullivan, Albert M., Jr., to United States of America, Army. Code signal processing circuitry for IFF transponder beacon. 4,074,263, Cl. 343-6.8LC.
Sullivan, John L.: *See—*
Galkiewicz, Thomas M.; Petersen, Kenneth C.; and Sullivan, John L., 4,073,776, Cl. 260-51.0EP.
Galkiewicz, Thomas M.; Petersen, Kenneth C.; and Sullivan, John L., 4,073,826, Cl. 260-831.000.
Sulzer Brothers Limited: *See—*
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Sumida, Kunio A., to Siegel, Robert H.; and Albin, Maurice, as coexecutors of the estate of Leonard V. Shapiro, deceased. Balanced reciprocating tool driven by rotary motion. 4,073,349, Cl. 173-59.000.
Sumikin Coke Company Limited: *See—*
Kiritani, Yoshio; Tsuyuguchi, Michio; Ibaragi, Tetsuo; Yano, Katsuhiro; Sunami, Yoshihiko; Nishioka, Kunihiko; and Sumikin Coke Company Limited, 4,073,625, Cl. 44-10.00R.
Sumitomo Chemical Company, Limited: *See—*
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Tabana, Minoru; Mitsuno, Tatsuyuki; Maki, Hiroshi; and Narisawa, Shizuo, 4,073,831, Cl. 260-876.00B.
Wada, Motomu; Inoue, Masakazu; Furukawa, Kazunori; and Matsubara, Shigeyoshi, 4,073,844, Cl. 264-55.000.
Sumitomo Metal Industries Limited: *See—*
Kiritani, Yoshio; Tsuyuguchi, Michio; Ibaragi, Tetsuo; Yano, Katsuhiro; Sunami, Yoshihiko; Nishioka, Kunihiko; and Sumikin Coke Company Limited, 4,073,625, Cl. 44-10.00R.
Sumrell, Gene: *See—*
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Sun Electric Corporation: *See—*
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Sun Oil Company Limited: *See—*
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Sun Oil Company of Pennsylvania: *See—*
Seitzer, Walter H., 4,073,819, Cl. 260-674.00N.
Sun Ventures, Inc.: *See—*
Cassar, Richard D., 4,073,896, Cl. 424-205.000.
Sunami, Yoshihiko: *See—*
Kiritani, Yoshio; Tsuyuguchi, Michio; Ibaragi, Tetsuo; Yano, Katsuhiro; Sunami, Yoshihiko; Nishioka, Kunihiko; and Sumikin Coke Company Limited, 4,073,625, Cl. 44-10.00R.
Suntech, Inc.: *See—*
Lerner, Julius; and Iglesias, Edmundo J., 4,073,304, Cl. 137-101.210.
Mayer, Robert, 4,074,242, Cl. 340-213.100.
Suppanen, Pekka Ilkka Juhani, to Kemira Oy. Process for producing a slurry suitable for the manufacture of a mixed fertilizer containing nitrogen plus phosphorus. 4,073,635, Cl. 71-34.000.
Surpass Chemicals Limited: *See—*
Eliades, Theo Ioannou; and Ramirez, Noemi Bernardo, 4,073,744, Cl. 252-389.00R.
Sutowski, Walter S., to Freeway Corporation. Rolling type bearing and method for making same. 4,073,551, Cl. 308-195.000.
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Asaeda, Toshio; Suzuki, Ikuo; Imai, Tomoyasu; Kitajima, Masato; and Hota, Kazunori, 4,073,281, Cl. 125-11.0CD.
Suzuki, Makoto: *See—*
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Suzuki, Masatoshi: *See—*
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Suzuki, Ryotaro, to Fuji Photo Optical Co., Ltd. Automatic exposure control device for a camera including automatic film speed setting means. 4,074,286, Cl. 354-21.000.
Svehaug, Henry V.: *See—*
Davis, Walter L.; and Svehaug, Henry V., 4,073,041, Cl. 17-71.000.
Svencer, Richard Ernest: *See—*
Steever, Andrew Beaumont; and Svencer, Richard Ernest, 4,073,064, Cl. 34-57.00A.
Swain, Richard Slaughter, to Norlin Music, Inc. Selection switch memory circuit. 4,074,233, Cl. 340-147.0LP.
Swank, Roy L.; and Danon, David. Anti-coagulating and filtering blood. 4,073,723, Cl. 210-23.00R.
Sweet, Francis W.: *See—*
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Swessel, John A., Jr.: *See—*
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Switchcraft, Inc.: *See—*
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Symon, Roger James, to Rolls-Royce (1971) Limited. Fuel system for gas turbine engines. 4,073,136, Cl. 60-39.28R.
Synchro-Start Products, Inc.: *See—*
Lace, Melvin A., 4,074,157, Cl. 310-67.00R.
Systems Engineering & Manufacturing Corporation: *See—*
Shorr, Jacob; and Fishman, Herbert, 4,073,730, Cl. 210-321.00R.
Systron-Donner Corporation: *See—*
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Szalai, Gabor, to Magyar Vagon- es Gepgyar. Vehicle driving gear system. 4,073,358, Cl. 180-75.000.
Szarvasi Vas-Femipari Szovetkezet: *See—*
Csenky, Laszlo, 4,074,092, Cl. 200-51.070.
Szewczuk, Thomas M.: *See—*
Allen, James M.; and Szewczuk, Thomas M., 4,073,599, Cl. 416-97.00R.
Szonntagh, Eugene L., to Honeywell Inc. Method of making a reference electrode. 4,073,052, Cl. 29-570.000.
Szonntagh, Eugene L., to Honeywell Inc. Method of making an ion responsive electrode. 4,073,053, Cl. 29-570.000.
Tabana, Minoru; Mitsuno, Tatsuyuki; Maki, Hiroshi; and Narisawa, Shizuo, to Sumitomo Chemical Company, Limited. Thermoplastic resin composition. 4,073,831, Cl. 260-876.00B.
Tabe, Yutaka: *See—*
Kouzai, Keiji; Tabe, Yutaka; Masunaga, Eiji; and Matsuda, Kichiro, 4,073,837, Cl. 264-38.000.
Tabler, Herman L.; Tabler, Regine M.; and Lokey, Edwin L. Dispensing apparatus with self contained spout. 4,073,413, Cl. 222-529.000.
Tabler, Regine M.: *See—*
Tabler, Herman L.; Tabler, Regine M.; and Lokey, Edwin L., 4,073,413, Cl. 222-529.000.
Tai, Wun Ten, to Nalco Chemical Company. Stabilization of cationically modified acrylamide polymers. 4,073,763, Cl. 260-29.4UA.
Tajima, Shigeo: *See—*
Murota, Kozo; Matsumoto, Rempei; Yasuma, Toru; Morinaga, Mamoru; Tajima, Shigeo; Nakamura, Masayuki; and Sakaguchi, Akira, 4,073,361, Cl. 181-228.000.
Tajima, Tetsuya: *See—*
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Takada, Shinichi, to Kabushiki Kaisha Komatsu Seisakusho. Device for releasably locking a cap on a closed position. 4,073,168, Cl. 70-165.000.
Takagi, Nobuho; Takase, Mituo; Itoh, Takashi; Seno, Katsumi; and Koseki, Toshihiko, to Hitachi, Ltd. Pump starting method for hydraulic machinery. 4,073,594, Cl. 415-1.000.
Takakura, Koichi: *See—*
Yamauchi, Kazuhisa; Takakura, Koichi; Kawai, Syuji; and Ohmori, Akio, 4,073,733, Cl. 210-500.00M.
Takara Co., Ltd.: *See—*
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Takase, Mituo: *See—*
Takagi, Nobuho; Takase, Mituo; Itoh, Takashi; Seno, Katsumi; and Koseki, Toshihiko, 4,073,594, Cl. 415-1.000.
Takase, Tuneo; and Yamaguchi, Tetsuo, to Tokyo Shibaura Electric Co., Ltd. Time-setting and displaying mode control circuit for an electronic timepiece. 4,073,131, Cl. 58-23.00R.
Takase, Yuuzo: *See—*
Soga, Mitsuo; Takase, Yuuzo; Ishikawa, Manabu; Nakazawa, Masahiko; and Nakayama, Mutumi, 4,074,034, Cl. 526-56.000.
Takasugi, Kazuo, to Hitachi, Ltd. Detecting circuit. 4,074,335, Cl. 361-87.000.
Takata, Sinya: *See—*
Otsuki, Tatsukiyo; and Takata, Sinya, 4,073,878, Cl. 423-633.000.
Takeda Chemical Co., Ltd.: *See—*
Kawamatsu, Yutaka; Saraie, Takahiro; Imamiya, Eiko; and Hamuro, Yukihiko, 4,074,057, Cl. 560-55.000.
Takeda Chemical Industries, Ltd.: *See—*
Fujino, Masahiko; Wakimasu, Mitsuhiro; Taketomi, Shigehisa; and Ishikawa, Eiichiro, 4,073,890, Cl. 424-177.000.

Takeda, Nobuhiro; Hatton, Masaichi; Kondo, Minoru; and Kato, Tatsuo, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Brake malfunction warning and indicating system for automobiles. 4,074,226, Cl. 340-52.00B.
Takeda, Shuichi: *See—*
Ookawa, Taro; and Takeda, Shuichi, 4,073,093, Cl. 49-381.000.
Taketomi, Shigehisa: *See—*
Fujino, Masahiko; Wakimasu, Mitsuhiro; Taketomi, Shigehisa; and Ishikawa, Eiichiro, 4,073,890, Cl. 424-177.000.
Takeuchi, Akihiro: *See—*
Asai, Kiyokazu; and Takeuchi, Akihiro, 4,074,152, Cl. 310-334.000.
Takeuchi, Seiji; Fujita, Kazunori; and Shimokobe, Ikuo, to Hitachi, Ltd. Method and apparatus for liquid chromatography under elevated pressure. 4,073,725, Cl. 210-31.00C.
Takeuchi, Takashi: *See—*
Ohtani, Naoteru; Koyama, Tutomu; Takeuchi, Takashi; Azuma, Toshihiro; and Matsuda, Morio, 4,073,658, Cl. 106-92.000.
Takeuchi, Toru: *See—*
Kiyokawa, Shin; Sakaguchi, Shokichi; and Takeuchi, Toru, 4,074,222, Cl. 338-212.000.
Takeuchi, Yasuhisa; Maio, Kenji; and Matsumoto, Junichiro, to Nissan Motor Company, Limited; and Hitachi, Ltd. Vehicle brake controlling device for anti-skid control of vehicle wheels. 4,073,545, Cl. 303-109.000.
Tallman, John F.: *See—*
Pert, Candace B.; Pert, Agu; and Tallman, John F., 4,073,885, Cl. 424-101.000.
Tamagaki, Yoshiteru: *See—*
Kishitani, Masatoshi; Tamagaki, Yoshiteru; Matsumoto, Takeji; Sugimoto, Mikio; and Namiki, Noriaki, 4,073,152, Cl. 61-63.000.
Tamao, Yoshikuni: *See—*
Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Okamoto, Shosuke; and Hijikata, Akiko, 4,073,914, Cl. 424-267.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,913, Cl. 424-267.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,916, Cl. 424-267.000.
Tamao, Yoshikuno: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,891, Cl. 424-177.000.
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Tanaka, Akira: *See—*
Yamada, Shoji; Tanaka, Akira; Horii, Shoichi; and Yamashita, Kiyoshi, 4,073,651, Cl. 96-100.00R.
Tanaka, Hiroo: *See—*
Senju, Ryoichi; and Tanaka, Hiroo, 4,073,689, Cl. 195-63.000.
Tanaka, Hitoshi: *See—*
Masumura, Hitoshi; Fujiwara, Shinobu; and Tanaka, Hitoshi, 4,073,846, Cl. 264-65.000.
Tanaka, Kozo: *See—*
Saji, Yasuo; Kurioka, Hideo; Tanaka, Kozo; and Ogawa, Hiroyasu, 4,073,870, Cl. 423-447.600.
Tanaka, Yoshiaki: *See—*
Handa, Susumu; Tanaka, Yoshiaki; Nishihata, Atsushi; Ueda, Sadashi; Inamoto, Yoshiaki; Tanimoto, Fumio; and Kitano, Hisao, 4,074,052, Cl. 544-221.000.
Tango, Hiroyuki: *See—*
Kimura, Minoru; Tango, Hiroyuki; and Ohmori, Yukio, 4,073,055, Cl. 29-583.000.
Tanimoto, Fumio: *See—*
Handa, Susumu; Tanaka, Yoshiaki; Nishihata, Atsushi; Ueda, Sadashi; Inamoto, Yoshiaki; Tanimoto, Fumio; and Kitano, Hisao, 4,074,052, Cl. 544-221.000.
Tanner Electronic Systems: *See—*
Tanner, James L.; and Rist, Bruno A., 4,074,311, Cl. 358-118.000.
Tanner, Herbert: *See—*
Bertram, Heidrun; Fahnenstich, Rudolf; Offermanns, Heribert; and Tanner, Herbert, 4,073,945, Cl. 426-2.000.
Tanner, James L.; and Rist, Bruno A., to Tanner Electronic Systems. Television security system. 4,074,311, Cl. 358-118.000.
Tanno, Kiyohiko: *See—*
Kojima, Yasuyuki; Tanno, Kiyohiko; Doi, Tetsuo; and Ono, Kunio, 4,074,280, Cl. 346-76.00R.
Tarbell, Harlan E.: *See—*
Raabe, Paul J.; and Tarbell, Harlan E., 4,073,673, Cl. 156-244.000.
Tarrson, Emanuel B.; Tisma, Steven; and Ritch, Donald, to John O. Butler Company. Thread storage and dispensing system. 4,073,419, Cl. 225-44.000.
Taub, Howard Hyman: *See—*
Lane, Ramon; and Taub, Howard Hyman, 4,074,277, Cl. 346-75.000.
Taylor, David L. Customized putter. 4,073,492, Cl. 273-80.200.
Taylor, Henry James; and Ibbotson, Philip Nicholas Peter, to Spar Aerospace Products Limited. Powered wrist joint. 4,073,201, Cl. 74-665.00L.
TDK Electronics Co., Ltd.: *See—*
Masumura, Hitoshi; Fujiwara, Shinobu; and Tanaka, Hitoshi, 4,073,846, Cl. 264-65.000.
Teac Corporation: *See—*
Sakai, Yoshiaki; and Murayama, Kuniki, 4,074,325, Cl. 360-39.000.
Teeny, Parry S.: *See—*
Teeny, Samuel J.; and Teeny, Parry S., 4,073,261, Cl. 118-16.000.
Teeny, Samuel J.; and Teeny, Parry S. Article moistener. 4,073,261, Cl. 118-16.000.
Teijin Limited: *See—*
Akito, Eiichiro; Nakajima, Yoshiyuki; and Horioka, Masayoshi, 4,073,931, Cl. 424-298.000.
Arakawa, Tamio, 4,073,857, Cl. 264-291.000.
Teitin Limited: *See—*
Kouzai, Keiji; Tabe, Yutaka; Masunaga, Eiji; and Matsuda, Kichiro, 4,073,837, Cl. 264-38.000.
Teledyne Industries, Inc.: *See—*
Icenbice, Phineas J., Jr., 4,074,230, Cl. 340-146.1BE.
Telefonaktiebolaget L M Ericsson: *See—*
Eidsmo, Arne; and Lofmark, Bengt Gustav, 4,074,073, Cl. 179-15.0BP.
Forsberg, Gunnar Stefan, 4,074,207, Cl. 331-1.00A.
Telejector Ltd.: *See—*
Cammilleri, Angelo M., 4,074,322, Cl. 358-237.000.
Teply, Milos: *See—*
Forman, Ladislav; Mergl, Milos; Mostecky, Jiri; Teply, Milos; and Uher, Jiri, 4,073,688, Cl. 195-49.000.
Teramae, Akira; Yamada, Koji; and Kawasaki, Hironobu, to Nippon Steel Corporation. Topcoated phosphated bolts, nuts and washers. 4,074,011, Cl. 428-422.000.
Teshima, Soichi: *See—*
Murakami, Fumiki; Teshima, Soichi; and Yokoyama, Toshihiko, 4,074,062, Cl. 560-217.000.
Testline Instruments, Inc.: *See—*
Boatman, Roger M.; and Hall, Melvin R., 4,074,188, Cl. 324-52.000.
Teumer, Roger G.; Warter, Peter J., Jr.; Squassoni, Gino F.; Tulagin, Vseevolod; and Egnaczak, Raymond K., to Xerox Corporation. Photoelectrophoretic heat and pressure transfer mechanism. 4,073,583, Cl. 355-3.00P.
Texaco Inc.: *See—*
Harnsberger, Bobby G., 4,073,342, Cl. 166-295.000.
Harnsberger, Bobby G., 4,073,343, Cl. 166-295.000.
McGann, Rodney, 4,073,832, Cl. 261-118.000.
Seguin, Ronald D.; and Raymond, Douglas D., 4,073,154, Cl. 61-86.000.
Texas Instruments Incorporated: *See—*
Boone, Gary W.; and Cochran, Michael J., 4,074,351, Cl. 364-200.000.
Breazeale, Billy H., 4,073,969, Cl. 427-75.000.
Keough, Laurence J.; and Butts, Bruce D., 4,074,088, Cl. 200-5.00A.
Tubbs, Graham S., 4,074,355, Cl. 364-200.000.
Tezuka, Tohru: *See—*
Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Okamoto, Shosuke; and Hijikata, Akiko, 4,073,914, Cl. 424-267.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,073,891, Cl. 424-177.000.
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Thiokol Corporation: *See—*
Wagner, William F., 4,073,242, Cl. 110-8.00R.
Thom, Karl-Friedrich: *See—*
Moretto, Hans-Heinrich; de Montigny, Armand; Thom, Karl-Friedrich; and Schliebs, Reinhard, 4,073,801, Cl. 260-448.20E.
Thom, Richard S.: *See—*
De brey, Robert J.; and Thom, Richard S., 4,073,533, Cl. 294-118.000.
Thomas, Marion V. Railroad warning signal device. 4,073,453, Cl. 246-125.000.
Thomas, Roy, to International Computers Ltd. Data storage and retrieval systems. 4,074,235, Cl. 364-900.000.
Thompson, Malcolm J.; Feldmesser, Julius; and Robbins, William E., to United States of America, Agriculture. Control of nematodes and other helminths employing certain amides. 4,073,939, Cl. 424-320.000.
Thomson-CSF: *See—*
Charransol, Pierre; Hauri, Jacques; and Athenes, Claude, 4,074,077, Cl. 179-15.0AT.
Epsztein, Bernard; and Kantorowicz, Gerard, 4,074,213, Cl. 333-71.000.
Favreau, Michel; and Vidal, Serge, 4,073,586, Cl. 355-20.000.
Thorberg, Seth Olov: *See—*
Lindberg, Ulf Henrik Anders; Ross, Svante Bertil; Thorberg, Seth Olov; and Ogren, Sven Ove, 4,073,941, Cl. 424-324.000.
Thorton-Trump, Walter Edmond. Conversion package for aircraft de-icing machines. 4,073,437, Cl. 239-131.000.
Tiemeijer, Robert, to U.S. Philips Corporation. Electronic switching signal generator for use in television. 4,074,316, Cl. 358-181.000.
Tien, Ping King: *See—*
Ballman, Albert Anthony; Brown, Harold; Martin, John Martin; and Tien, Ping King, 4,073,675, Cl. 156-600.000.
Tierney, Timothy P., to Raymond Lee Organization, Inc., The. Security step or stop for slidable door. 4,073,522, Cl. 292-262.000.

TII Corporation: *See—*
Simokat, Frank L., 4,074,338, Cl. 361-129.000.

Timpe, Wolfgang: *See—*
Salzmann, Theodor; Timpe, Wolfgang; and Weibelzahl, Manfred, 4,074,348, Cl. 363-160.000.

Tinholt, Thomas H., to Eaton Corporation. Viscous fan drive assembly arrangement. 4,073,370, Cl. 192-58.00B.

Tisma, Steven: *See—*
Tarrson, Emanuel B.; Tisma, Steven; and Ritch, Donald, 4,073,419, Cl. 225-44.000.

Titmus Eurocon Kontaktlinsen KG: *See—*
Hofer, Peter, 4,073,577, Cl. 351-160.000.

T'Jampens, Germain Remi, to U.S. Philips Corporation. Halogen incandescent lamp whose filler gas comprises bromine, chlorine and hydrogen. 4,074,168, Cl. 313-222.000.

Toho Beslon Co., Ltd.: *See—*
Saji, Yasuo; Kurioka, Hideo, Tanaka, Kozo; and Ogawa, Hiroyasu, 4,073,870, Cl. 423-447.600.

Tokai Seiki Co., Ltd.: *See—*
Nitta, Tomio, 4,073,612, Cl. 431-126.000.

Tokura, Yoichi; and Hashimoto, Shinichiro, to Nippon Telegraph & Telephone Public Corporation. Method and apparatus for judging voiced and unvoiced conditions of speech signal. 4,074,069, Cl. 179-1.0SC.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Kuge, Katutaro, 4,074,174, Cl. 318-197.000.
Takase, Tuneo; and Yamaguchi, Tetsuo, 4,073,131, Cl. 58-23.00R.

Tolan, John R., to Milliken Research Corporation. Pull roll apparatus. 4,073,420, Cl. 226-42.000.

Tom McGuane Industries, Inc.: *See—*
Burgess, Ronald R., 4,073,272, Cl. 123-103.00B.

Tomsky, Harry W.: *See—*
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Tonomura, Shinji: *See—*
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Topham, Silas Charles: *See—*
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Toplak, Ernst: *See—*
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Toray Industries, Inc.: *See—*
Okasaka, Hotsuma; Nakamura, Kiyokazu; Morikawa, Masanobu, Tsunashima, Kenji; and Soda, Atsuhiko, 4,073,827, Cl 260-835.000.

Torelli, Vesperto: *See—*
Poittevin, Andre; and Torelli, Vesperto, 4,073,919, Cl. 424-270.000.

Torikai, Eiichi; and Kawami, Youji, to Agency of Industrial Science & Technology. Method for treating used or exhausted photographic fixing solution. 4,073,705, Cl. 204-92.000.

Tornabene, Michael G. Wave-action power apparatus. 4,073,142, Cl. 60-502.000.

Torrington Company, The: *See—*
DeBisschop, James George, 4,073,162, Cl. 64-17.00R.

Torza, Sergio: *See—*
Albarino, Robert Vincent; and Torza, Sergio, 4,073,974, Cl. 427-163.000.

Tothero, Dwight L.: *See—*
Abendschein, Frederic Henry; Ivey, John Saxon; Roberts, Richard W.; and Tothero, Dwight L., 4,073,603, Cl. 417-222.000.

Totsu, Katsuyuki. Screw. 4,073,210, Cl. 85-45.000.

Townsend, Richard F. Adjustable volume measuring cup. 4,073,192, Cl. 73-429.000.

Toyo Cloth Co., Ltd.: *See—*
Okabe, Kenji, 4,073,984, Cl. 427-444.000.

Toyo Ink Manufacturing Co., Ltd.: *See—*
Otsuki, Akira; and Nishino, Makoto, 4,073,835, Cl. 264-22.000.

Toyoda-Koki Kabushiki-Kaisha: *See—*
Asaeda, Toshio; Suzuki, Ikuo; Imai, Tomoyasu; Kitajima, Masato; and Hota, Kazunori, 4,073,281, Cl. 125-11.0CD.

Toyomoto, Isao: *See—*
Nakayama, Yasuharu; Watanabe, Tadashi; Yamashita, Yoshio; Aihara, Tetsuo; and Toyomoto, Isao, 4,073,758, Cl. 260-23.0EP.

Toyota Chuo Kenkyusho: *See—*
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Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Hashimoto, Kametaro; Ushitani, Kenji; Serino, Yoichi; and Arakawa, Tadaoki, 4,073,474, Cl. 251-368.000.
Hayashi, Minoru; Ogino, Mineo; Kobayashi, Toshihiko; and Noda, Masaki, 4,074,090, Cl. 200-19.0DR.

Traverse City Iron Works: *See—*
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Tree Guying Systems, Inc.: *See—*
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Trippel, Gerhard, to International Business Machines Corporation. Magnetic record carrier. 4,074,016, Cl. 428-626.000.

Trippi, Anthony C. Bypass dispenser unit for automatic ice maker 4,073,159, Cl. 62-340.000.

Trostmann, Erik; and Albertsen, Ove, to A/S Daloon Method for the production of rolled foods products. 4,073,953, Cl. 426-297.000

Troup, George: *See—*
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Troxler, Franz; and Wiskott, Erik, to Sandoz Ltd Isoquinoline compounds. 4,073,909, Cl. 424-258.000.

Trozzolo, Anthony Marion: *See—*
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True, Richard Brownell, to Litton Systems, Inc Microwave power combiner. 4,074,265, Cl. 343-18.00E.

TRW Inc.: *See—*
Shoup, Thomas E.; and Spisak, Steve, 4,074,103, Cl. 219-98.000.

Tsuchimoto, Koji: *See—*
Yamaki, Naoomi; Futsuhara, Natsuko; Masuda, Kazue; and Tsuchimoto, Koji, 4,073,866, Cl. 423-405.000.

Tsuchiya, Yoshimasa; and Fujii, Hiroshi, to Nissan Motor Company, Limited. Latch mechanism. 4,073,520, Cl. 292-216.000.

Tsuchiya, Yoshimasa: *See—*
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Tsunashima, Kenji: *See—*
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Tsuruzawa, Teruya; and Ueda, Muneyuki, to Nippon Seal Co., Ltd. Cleaning brush. 4,073,027, Cl. 15-172.000.

Tsutsui, Seiko: *See—*
Kishi, Hidehiro; Harakawa, Hiroshi; Ogawa, Kazuo; and Tsutsui, Seiko, 4,073,782, Cl. 260-23.00H

Tsuyuguchi, Michio: *See—*
Kiritani, Yoshio, Tsuyuguchi, Michio; Ibaragi, Tetsuo, Yano, Katsuhiro; Sunami, Yoshihiko; Nishioka, Kunihiko; and Sumikin Coke Company Limited, 4,073,625, Cl. 44-10.00R.

Tubbs, Graham S., to Texas Instruments Incorporated. Digital microprocessor system with shared decode. 4,074,355, Cl. 364-200.000.

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Tuller, Harold W.; and Nussbaum, Ralph W., to Allied Chemical Corporation. Production of low molecular weight polyanhydrides. 4,074,036, Cl. 526-238.000.

Tunemoto, Daiei: *See—*
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Turbo Engineering Corporation: *See—*
Rodler, Waldo E., Jr., 4,073,257, Cl. 115-12.00R.

Turkowski, Lukasz: *See—*
Ostrowski, Jerzy; Sierputowski, Piotr; Turkowski, Lukasz; Jablkiewicz, Jerzy; Pacholski, Jan; and Jedryka, Tadeusz, 4,073,128, Cl. 57-58.890.
Ostrowski, Jerzy; Sierputowski, Piotr; Turkowski, Lukasz; Jablkiewicz, Jerzy; Pacholski, Jan; and Jedryka, Tadeusz, 4,073,129, Cl. 57-58.890.

Turnbull, Fred G., to General Electric Company. Method and apparatus for measuring the speed of a rotating shaft. 4,074,339, Cl. 361-239.000.

Tyson, Charles P.: *See—*
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UBE Industries, Ltd.: *See—*
Kishi, Hidehiro; Harakawa, Hiroshi; Ogawa, Kazuo; and Tsutsui, Seiko, 4,073,782, Cl. 260-23.00H.

Uchida, Isamu, to Laurel Bank Machine Co., Ltd. Device for detecting the thickness of sheets. 4,073,488, Cl. 271-263.000.

Uchiike, Hisayuki: *See—*
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Ueda, Hiroshi; and Yoshizaki, Akira, to Minolta Camera Kabushiki Kaisha. Single lens reflex camera with automatic exposure control mechanism. 4,074,291, Cl. 354-51.000.

Ueda, Masanobu, to Dainichi Kinzoku Kogyo Co., Ltd. Method and a system of numerically controlling a cutting machine. 4,074,349, Cl. 364-107.000.

Ueda, Muneyuki: *See—*
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Ueda, Sadashi: *See—*
Handa, Susumu; Tanaka, Yoshiaki; Nishihata, Atsushi; Ueda, Sadashi; Inamoto, Yoshiaki; Tanimoto, Fumio; and Kitano, Hisao, 4,074,052, Cl. 544-221.000.

Ueltz, Herbert F. G.; Dashineau, Melvin A.; and Pino, James J., to U.S.

Industries, Inc. Process for the manufacture of abrasive material. 4,073,096, Cl. 51-309.00A.

Uematsu, Takashi: *See—*
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Uher, Jiri: *See—*
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Ullrich, Hansjurgen; Dippel, Heinz; and Loss, Karl, to Dr. C. Otto & Comp. G.m.b.H. Process for treating flushing liquor. 4,073,728, Cl. 210-71.000.

Ultra Centrifuge Nederland N.V.: *See—*
Visser, Kommer, 4,073,710, Cl. 204-129.650.

Umeda, Junichi: *See—*
Aiki, Kunio; Nakamura, Michiharu; and Umeda, Junichi, 4,073,676, Cl. 156-624.000.

Underwood, Gene E., to Occidental Oil Shale, Inc. Raise bore drilling machine. 4,073,352, Cl. 175-53.000.

Union Carbide Corporation: *See—*
Flanigen, Edith Marie; and Patton, Robert Lyle, 4,073,865, Cl. 423-339.000.
Kurtz, Arthur Peter, Jr.; and D'Silva, Themistocles D. J., 4,073,930, Cl. 424-277.000.
Urry, Lewis Frederick, 4,074,023, Cl. 429-56.000.

Union Oil Company of California: *See—*
Young, Donald C., 4,073,633, Cl. 71-28.000.

Uniroyal, Inc.: *See—*
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Unistrut Corporation: *See—*
Irish, Elwood, 4,073,114, Cl. 52-710.000.

United Chemical Corporation: *See—*
Van Cleave, Jon Stephen, 4,073,983, Cl. 427-421.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the: *See—*
Cunningham, Sinclair Upton; and Jackson, Douglas, 4,073,247, Cl. 112-121.120.

United States Filter Corporation: *See—*
Reinauer, Thomas V.; Duyckinck, Robert W.; and Handwork, Frank B., 4,073,632, Cl. 55-374.000.

U.S. Industries, Inc.: *See—*
Snyder, David E., 4,073,466, Cl. 251-63.400.
Ueltz, Herbert F. G.; Dashineau, Melvin A.; and Pino, James J., 4,073,096, Cl. 51-309.00A.

United States of America
Agriculture: *See—*
Bailey, August V.; Boudreaux, Gordon J.; Sumrell, Gene; and Novak, Arthur F., 4,074,058, Cl. 560-105.000.
Popper, Karel; Camirand, Wayne M.; Williams, Gerald S.; and Mecchi, Edward P., 4,073,747, Cl. 252-412.000.
Thompson, Malcolm J.; Feldmesser, Julius; and Robbins, William E., 4,073,939, Cl. 424-320.000.
Army: *See—*
Bates, Calvin Dwight, 4,074,211, Cl. 333-31.00R.
Sullivan, Albert M., Jr., 4,074,263, Cl. 343-6.8LC.
Energy: *See—*
Huston, John L.; Scott, Robert G.; and Studier, Martin H., 4,073,624, Cl. 44-1.00R.
Kelley, George G., 4,073,680, Cl. 176-3.000.
Morgan, Chester S., 4,073,647, Cl. 75-235.000.
Whisman, Marvin L.; Reynolds, James W.; Goetzinger, John W.; and Cotton, Faye O., 4,073,719, Cl. 208-180.000.
Whisman, Marvin L.; Goetzinger, John W.; and Cotton, Faye O., 4,073,720, Cl. 208-180.000.
Health, Education and Welfare: *See—*
Pert, Candace B.; Pert, Agu; and Tallman, John F., 4,073,885, Cl. 424-101.000.
Willson, Robert D.; and Henderson, Terry L., 4,073,194, Cl. 73-646.000.
Navy: *See—*
Brown, R. Bernard, 4,073,590, Cl. 356-209.000.
Kaloi, Cyril M., 4,074,270, Cl. 343-700.0MS.
Knox, Sidney G., 4,074,267, Cl. 343-106.00R.
Kranz, Paul, 4,074,241, Cl. 340-189.00M.
San Miguel, Anthony, 4,073,985, Cl. 428-35.000.
Steen, Donald B., 4,074,099, Cl. 200-153.00S.

U.S. Philips Corporation: *See—*
Brewer, Robert J., 4,074,302, Cl. 357-24.000.
Clarke, John Alfred; and Howden, Harry, 4,073,574, Cl. 350-189.000.
de Jager, Frank; and Martony, Juan Jose, 4,074,199, Cl. 325-50.000.
Garskamp, Arnoldus, 4,074,216, Cl. 334-15.000.
Harms, Arie Anthonie; and Wark, Johan Gerrit, 4,074,189, Cl. 324-73.00R.
Jagers, Henricus P.; and Sanders, Rudolf, 4,074,121, Cl. 362-13.000.
Janssen, Johannes Hendrikus Hubertus, 4,074,173, Cl. 318-138.060.
Lakerveld, Herman Gerard; and van Rosmalen, Gerard Eduard, 4,073,567, Cl. 350-6.500.
Naaijer, Geert Jan, 4,074,149, Cl. 307-351.000.
Schroder, Gerd, 4,073,432, Cl. 235-92.0FQ.
Stevens, Petrus Franciscus, 4,074,135, Cl. 250-366.000.
Tiemeijer, Robert, 4,074,316, Cl. 358-181.000.
T'Jampens, Germain Remi, 4,074,168, Cl. 313-222.000.
van den Broek, Cornelis Pieter; and van Lieshout, Johannes Maria Josephus, 4,074,167, Cl. 313-222.000.
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van der Leeuw, Bart, 4,074,163, Cl. 313-13.000.
van Rosmalen, Gerard Eduard, 4,074,312, Cl. 358-128.000.
Velzel, Christiaan Hendrik Frans; and Greve, Peter Ferdinand, 4,074,314, Cl. 358-128.000.
Wesselink, Gustaaf Adolf; Roelofs, Hendrik; and Ponsen, Gijsbert Johannes, 4,074,172, Cl. 315-307.000.
Woodworth, Frederick Arthur; and Zobel, Ernst-Guenther, 4,074,171, Cl. 315-241.00P.

United States Shoe Corporation, The: *See—*
Stix, Nathan, 4,073,024, Cl. 12-142.00J.

United Technologies Corporation: *See—*
Duvall, David S.; Owczarski, William A.; Paulonis, Daniel F.; and Schaefer, Robert P., 4,073,639, Cl. 75-.50R.
Messman, Leonard A.; Wooding, Harold C., Jr.; and Waehner, Glenn C., 4,074,130, Cl. 250-223.00R.
Roberts, Richard, 4,073,137, Cl. 60-39.320.

University of Illinois Foundation: *See—*
Long, David M., Jr., 4,073,879, Cl. 424-5.000.

University of Toledo, The: *See—*
Zrudsky, Donald R., 4,074,076, Cl. 179-15.0BL.

UOP Inc.: *See—*
Vora, Bipin V., 4,073,823, Cl. 260-683.480.

Upjohn Company, The: *See—*
Axen, Udo F., 4,073,803, Cl. 260-515.00A.
Evenson, Gerald Norman; and Moffett, Robert Bruce, 4,073,785, Cl. 260-243.300.
Moffett, Robert Bruce, 4,073,784, Cl. 260-243.300.
Nelson, Norman A., 4,073,805, Cl. 260-590.00C.
Nelson, Norman A., 4,073,808, Cl. 260-563.00R.

Urban, Friedrich: *See—*
Oeder, Dieter; Gropper, Hans; and Urban, Friedrich, 4,074,040, Cl. 526-352.000.

Urry, Lewis Frederick, to Union Carbide Corporation. Primary dry cell with masked separator. 4,074,023, Cl. 429-56.000.

Ushio, Hiroyuki: *See—*
Atsukawa, Masumi; Ushio, Hiroyuki; Kuwabara, Haruo; and Kubo, Kyoji, 4,073,864, Cl. 423-242.000.

Ushitani, Kenji: *See—*
Hashimoto, Kametaro; Ushitani, Kenji; Serino, Yoichi; and Arakawa, Tadaoki, 4,073,474, Cl. 251-368.000.

Utility Products, Inc.: *See—*
Wright, Allen C., 4,073,367, Cl. 182-204.000.

Vacik, Jiri: *See—*
Lim, Drahoslav; Kopecek, Jindrich; Bazilova nee Sverinova, Hedvika; and Vacik, Jiri, 4,074,039, Cl. 526-303.000.

Valcavi, Umberto, to Istituto Biochimico Italiano di Loredana Lorenzini S.a.s.; and Dr. Madaus & Co. 19,20-Bis-nor-prostenoic acids as hypolipemic compounds. 4,073,938, Cl. 424-317.000.

Valentine, Donald, Jr.: *See—*
Batcho, Andrew David; Hengartner, Urs Oskar; Leimgruber, Willy; Scott, John William; and Valentine, Donald, Jr., 4,073,795, Cl. 260-326.14T.

Valentine, Donald Herman, Jr.: *See—*
Leimgruber, Willy; and Valentine, Donald Herman, Jr., 4,073,811, Cl. 260-611.00A.

Van Alstine Audio Systems, Inc.: *See—*
Broburg, Gregory W.; and Clark, Allen C., 4,074,204, Cl. 330-109.000.

van Cappelle, Hendrik Cornelis, to Hoogovens Ijmuiden, BV. Ship loading system. 4,073,390, Cl. 214-14.000.

Vance, Christopher John: *See—*
Fleischmann, Martin; Goodridge, Francis; and Vance, Christopher John, 4,073,702, Cl. 204-59.00R.

Van Cleave, Jon Stephen. Preventive treatment for Otitis Externae. 4,073,937, Cl. 424-312.000.

Van Cleave, Jon Stephen, to United Chemical Corporation. Method and composition for decreasing water resistance to movement. 4,073,983, Cl. 427-421.000.

van den Berg, Johannes Cornelis Maria. Method and apparatus for receiving sound intended for stereophonic reproduction. 4,074,084, Cl. 179-100.1TD.

van den Bosch, Steven, to P.F.W. Beheer B.V. Spiro-1,2,4-trithiolan containing flavoring agents and method of use. 4,073,957, Cl. 426-535.000.

van den Broek, Cornelis Pieter; and van Lieshout, Johannes Maria Josephus, to U. S. Philips Corporation. Halogen incandescent lamp. 4,074,167, Cl. 313-222.000.

van der Gaag, Hendrik, to U.S. Philips Corporation. Keyboard contact and signal line arrangement. 4,074,261, Cl. 340-365.00R.

van der Leeuw, Bart, to U.S. Philips Corporation. Discharge lamp with heat shield. 4,074,163, Cl. 313-13.000.

van der Lely, Cornelis; and Nieuwenhoven, Hendricus Jacobus Cornelis. Roofing of buildings. 4,073,099, Cl. 52-69.000.

Van der Schoot, Martinus R., to Westinghouse Electric Corporation. Boron control system for a nuclear power plant. 4,073,683, Cl. 176-86.00L.

Vandeweghe, Joseph L., to Engleway Corporation. Emergency detection alarm and evacuation system. 4,074,225, Cl. 340-237.00R.

Van Hoose, Fred C.: *See—*
Gordon, Steven R., 4,073,475, Cl. 254-66.000.

van Lieshout, Johannes Maria Josephus: *See—*
van den Broek, Cornelis Pieter; and van Lieshout, Johannes Maria Josephus, 4,074,167, Cl. 313-222.000.

van Rosmalen, Gerard Eduard, to U.S. Philips Corporation. Automatic dithering optical focusing system using an oscillating mirror in the path of the radiation beam. 4,074,312, Cl. 358-128.000.

van Rosmalen, Gerard Eduard: *See—*
Lakerveld, Herman Gerard; and van Rosmalen, Gerard Eduard, 4,073,567, Cl. 350-6.500.
Vassallo, Alphonse C. Parts cleaner. 4,073,029, Cl. 15-302.000.
Vector General, Inc.: *See—*
Hasenbalg, Ralph D., 4,074,359, Cl. 364-521.000.
Veeder Industries, Inc.: *See—*
Schiller, Robert J.; and Perrill, Theodore Charles, 4,074,356, Cl. 364-465.000.
Veitscher Magnesitwerke-Actien-Gesellschaft: *See—*
Gulas, Hans-Jurgen; and Neuper, Helmut, 4,073,656, Cl. 106-57.000.
Velsicol Chemical Corporation: *See—*
Anderson, Arnold L., 4,073,772, Cl. 260-45.75B.
Stach, Leonard J.; and Wilke, Robert N., 4,073,894, Cl. 424-200.000.
Velzel, Christiaan Hendrik Frans; and Greve, Peter Ferdinand, to U.S. Philips Corporation. Apparatus for optically reading a record carrier and correcting focus error. 4,074,314, Cl. 358-128.000.
Vensel, James E.: *See—*
Keslar, Leroy D.; and Vensel, James E., 4,073,986, Cl. 428-38.000.
Vian, David Roy; and Price, Stephen Glenn, to Hayden Trans-Cooler, Inc Quick connect device for auto radiators. 4,073,512, Cl. 285-12.000.
Vidal, Serge: *See—*
Favreau, Michel; and Vidal, Serge, 4,073,586, Cl. 355-20.000.
Vilenski, Dan: *See—*
Kulicke, Frederick W., Jr.; Soffa, Albert; Vilenski, Dan; and Brockmann, Asher, 4,073,424, Cl. 228-4.500.
Virving, Nils G., to Defibrator Aktiebolag. Electrically controlled system for regulating the grinding space in a grinding apparatus. 4,073,442, Cl. 241-37.000.
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Reufer, Christian, 4,073,421, Cl. 226-97.000.
Visser, Kommer, to Ultra Centrifuge Nederland N.V. Method of machining electrically conducting substances by electrochemical attack. 4,073,710, Cl. 204-129.650.
Vitramon, Incorporated: *See—*
Leigh, William Conrad, 4,074,340, Cl. 361-321.000.
Vivitar Corporation: *See—*
Orban, Jean M., 4,074,170, Cl. 315-120.000.
Vock, Manfred Hugo: *See—*
Hall, John B.; Sprecker, Mark A.; Schmitt, Frederick Louis; and Vock, Manfred Hugo, 4,073,751, Cl. 252-522.000.
Vofsi, David: *See—*
Cabasso, Israel; Jagur-Grodzinski, Joseph; and Vofsi, David, 4,073,754, Cl. 260-17.00R.
Vogel, James P. Foldable plant support. 4,073,091, Cl. 47-45.000.
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Wurst, Bert; and Vogt, Harald, 4,073,203, Cl. 74-866.000.
Voith Getriebe KG: *See—*
Armasow, Waldemar; and Lindenthal, Hans, 4,073,139, Cl. 60-357.000.
Dick, Heinrich, 4,073,204, Cl. 74-866.000.
Volin, Timothy Earl; Benjamin, John Stanwood; Larson, Jay Michael; and Cairns, Robert Lacock, to International Nickel Company, Inc., The. Thermoplastic prealloyed powder. 4,073,648, Cl. 75-245.000.
Volkswagenwerk Aktiengesellschaft: *See—*
Danckert, Hermann, 4,073,357, Cl. 180-64.00R.
Sajfert, Drago, 4,073,526, Cl. 292-347.000.
vonBebenburg, Walter; and Offermanns, Heribert, to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler. 5-Aryl-pyrido-(b-6,7)-1,4-diazaepine with an additional fused heterocyclic ring. 4,073,792, Cl. 260-296.00H.
Voos, Frank J.; and Magoulick, David M., to National Distillers and Chemical Corporation. Charge and relief valve. 4,073,312, Cl. 137-877.000.
Vora, Bipin V., to UOP Inc. Alkylation process utilizing HF regenerator stream to a multi-tray main fractionator. 4,073,823, Cl. 260-683.480.
Vorbrueggen, Helmut: *See—*
Skuballa, Werner; Raduechel, Bernd; Vorbrueggen, Helmut; Elger, Walter; Loge, Olaf; and Schillinger, Eckehard, 4,073,934, Cl. 424-305.000.
Voross, Zoltan, to Sun Electric Corporation. Apparatus for measuring the dwell of an automotive ignition system. 4,074,183, Cl. 324-16.00R.
Voss, Joachim. Process for analog/digital conversion. 4,074,259, Cl. 340-347.0AD.
Vysoka skola chemicko-technologicka: *See—*
Forman, Ladislav; Mergl, Milos; Mostecky, Jiri; Teply, Milos; and Uher, Jiri, 4,073,688, Cl. 195-49.000.
W. R. Grace & Co.: *See—*
Hartdegen, Frank Joseph; and Abdo, Kamal Mohammad, 4,073,884, Cl. 424-94.000.
Wacker-Chemie GmbH: *See—*
Wiest, Hubert; Berger, Rainer; and Lieb, Erwin, 4,073,779, Cl. 260-79.3MU.
Wada, Motomu; Inoue, Masakazu; Furukawa, Kazunori; and Matsubara, Shigeyoshi, to Sumitomo Chemical Company, Limited. Preparation of crosslinked polyolefin foams and the mold. 4,073,844, Cl. 264-55.000.
Wada, Tasaku; and Nakabo, Satoru, to Kokusai Denshin Denwa Kabushiki Kaisha. Flying printing system using type belt. 4,074,068, Cl. 178-23.00R.
Wada, Tsutomu: *See—*
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Waehner, Glenn C.: *See—*
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Wagner, Josef: *See—*
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Wagner, William F., to Thiokol Corporation. Sewage sludge disposal. 4,073,242, Cl. 110-8.00R.
Wahlbeck, Hans Gustav Erik. Method and apparatus for continuously soldering of chains of precious metals or plated therewith. 4,073,428, Cl. 228-178.000.
Wainer, Eugene, to Horizons Incorporated. Continuous channel electron beam multiplier. 4,073,989, Cl. 428-131.000.
Wakabayashi, Takao, to Nakanishi Conveyors Co. Ltd. Power and free conveyor with pusher disengaging means operable on curved sections of conveyor track. 4,073,237, Cl. 104-172.00C.
Wakasa, Yutaka: *See—*
Nakagawa, Mutsuaki; Wakasa, Yutaka; Uchiike, Hisayuki; and Nagata, Susumu, 4,074,354, Cl. 364-200.000.
Wakeman, Alden H.; and Heiliger, Leonard R., to Crepaco, Inc. Rotary pump construction with cleaning feature. 4,073,605, Cl. 417-283.000.
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Walker, Bruce H.: *See—*
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Wallace, Edward Morris; and Gosselin, Robert George, to Wallace Mfg. Corporation. Hook style pruning shear. 4,073,059, Cl. 30-261.000.
Wallace Mfg. Corporation: *See—*
Wallace, Edward Morris; and Gosselin, Robert George, 4,073,059, Cl. 30-261.000.
Walling, Jorg-Hein; and Jukes, John Alan, to Northern Telecom Limited. Electrostatic powder coating apparatus. 4,073,265, Cl. 118-634.000.
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Walters, D. F., to Dresser Industries, Inc. Sealing system for a rotary rock bit. 4,073,548, Cl. 308-8.200.
Walters, Donald H. Railing with interfitting rectangular and curved cross section members. 4,073,477, Cl. 256-22.000.
Walton Products, Inc.: *See—*
Reed, Robert T., 4,073,385, Cl. 213-100.00R.
Walworth, Bryant Leonidas: *See—*
Bullock, Milon Walker; and Walworth, Bryant Leonidas, 4,074,059, Cl. 560-135.000.
Walz, Robert A. Method and apparatus for repairing a crack in a pane of plate glass. 4,073,094, Cl. 51-111.00R.
Wang, Jin-Liang; Brown, Melvin; and Menapace, Henry R., to Goodyear Tire & Rubber Company, The. Olefin metathesis process. 4,073,820, Cl. 260-683.00D.
Wang, Joseph Y.: *See—*
Okamoto, Yoshiyuki; Wang, Joseph Y.; and Chou, Eng J., 4,073,726, Cl. 210-45.000.
Wang, Richard H. S.; and Zannucci, Joseph S., to Eastman Kodak Company. Multichromophoric benzotriazole ultraviolet stabilizers and their use in organic compositions. 4,073,745, Cl. 252-403.000.
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Wark, Johan Gerrit: *See—*
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Warner Electric Brake & Clutch Company: *See—*
Kuo, Benjamin C.; Frus, John R.; and Singh, Gurdial, 4,074,179, Cl. 318-696.000.
Warner-Lambert Company: *See—*
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Warren, Millard R., to Warren Insulated Bloc, Inc. Insulated masonry block. 4,073,111, Cl. 52-407.000.
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Wasag-Chemie AG: *See—*
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Wasco Products, Inc.: *See—*
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Washizuka, Isamu; Hashimoto, Shintaro; and Katsui, Saburo, to Sharp Kabushiki Kaisha. Calculator construction. 4,074,118, Cl. 364-712.000.

Watanabe, Kenzo: *See—*
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Watanabe, Kuniyuki, to Nissan Motor Company, Limited. Arrangement of fuel system in motor vehicle. 4,073,360, Cl. 180-104.000.
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Buda, Dennis; Broman, Rodney L.; and Waters, John R., 4,073,694, Cl. 195-103.700.
Watson, John Graham: *See—*
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Way, Allan S.; Glenn, Thomas J.; Sloane, Howard J.; and Keahl, Gerald T., to Beckman Instruments, Inc. Spectrophotometer having independently controlled chart scale expansion and chart format selection. 4,074,272, Cl. 346-33.00A.
Webasto-Werk W. Baier GmbH & Co.: *See—*
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Webb, Edward A.; Barakitis, Nikolaos; and Pigott, Keith, to GTE Sylvania Incorporated. Ultraviolet emitting arc discharge lamp. 4,074,166, Cl. 313-185.000.
Webb, Paul Dale; and Morse, Henry William, to Ingersoll-Rand Company. Gas compressor system. 4,073,607, Cl. 418-86.000.
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Martin, Johannes Josef; and Weber, Erich, 4,073,480, Cl 266-201.000.
Weber, Klaus; Ludemann, Heinz; Schubert, Andreas; and Pustka, Karel, to AGFA-Gevaert, A.G. Method and apparatus for assembling and pocketing sections of photographic films. 4,073,118, Cl. 53-23.000.
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Roser, Gerhard K., 4,073,231, Cl. 101-48.000.
Schick, Margery L.; and Anderson, Bror E., 4,074,003, Cl. 428-341.000.
Weber, Max H.: *See—*
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Webster, Douglas G. Speedometer and odometer apparatus. 4,074,196, Cl. 324-166.000.
Weck, Friedrich J.; Hunkins, James; and Rinsler, Samuel J. Newsprint coupon separator. 4,073,982, Cl. 427-270.000.
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Weibelzahl, Manfred: *See—*
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Falconer, David Duncan; and Weinstein, Stephen Brant, 4,074,086, Cl. 179-170.200.
Weisberg, Alfred M.; and Kroll, Harry. Process for producing by electrodeposition bright deposits of gold and its alloys. 4,073,700, Cl. 204-43.00G.
Weischedel, Richard C., to General Electric Company. Power supply system with parallel regulators and keep-alive circuitry. 4,074,182, Cl. 323-25.000.
Weiss, Martin Joseph: *See—*
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Welsh, Robert C., to Frieder, Phillip M., a part interest. Spectacle lens for aphakia patients. 4,073,578, Cl. 351-167.000.
Welzel, Josef, to Hermann Hemscheidt Maschinenfabrik. Suspended valve control device. 4,073,150, Cl. 61-45.00D.
Wendel, I. L., to Lowe, James L. Fluid handling system. 4,073,285, Cl. 126-271.000.
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Wessel, Wolf: *See—*
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West, Richard Lowell: *See—*
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Baron, William James, 4,073,981, Cl. 427-259.000.
Western Skyways, Inc.: *See—*
Draper, Robert N., 4,073,189, Cl. 73-228.000.
Westinghouse Air Brake Company: *See—*
Hart, James E., 4,073,544, Cl. 303-83.000.
Westinghouse Electric Corporation: *See—*
Allen, James M.; and Szewczuk, Thomas M., 4,073,599, Cl. 416-97.00R.
Gupta, Rash B.; and Armstrong, David L., 4,074,357, Cl. 364-494.000.
Riley, John A., 4,074,346, Cl. 363-50.000.
Salvati, John G.; and Skalka, Paul, 4,074,218, Cl. 335-176.000.
Santilli, James N., 4,074,220, Cl. 337-276.000.
Van der Schoot, Martinus R., 4,073,683, Cl. 176-86.00L.
Westvaco Corporation: *See—*
Hammond, Jack A.; and Karter, Elias M., 4,073,678, Cl. 162-19.000.
Wheeler, Richard J. Bottle supported shelf apparatus. 4,073,241, Cl. 108-91.000.
Whisman, Marvin L.; Reynolds, James W.; Goetzinger, John W.; and Cotton, Faye O., to United States of America, Energy. Process for preparing lubricating oil from used waste lubricating oil. 4,073,719, Cl. 208-180.000.
Whisman, Marvin L.; Goetzinger, John W.; and Cotton, Faye O., to United States of America, Energy. Method for reclaiming waste lubricating oils. 4,073,720, Cl. 208-180.000.
Whitaker, Edward. Support device. 4,073,462, Cl. 248-537.000.
White, Alan Chapman; and Black, Robin Michael, to John Wyeth & Brother Limited. Pyrimido[1,2-B]isoquinolines. 4,073,906, Cl. 424-251.000.
Whiteside, George D.: *See—*
Johnson, Bruce K.; and Whiteside, George D., 4,074,288, Cl. 354-33.000.
Whittington, Billy J.; Welsh, Alan B.; and Burns, Timothy L., to Kimball International, Inc. Method and circuitry for digital-analog frequency generation. 4,073,209, Cl. 84-1.240.
Wide, Lars: *See—*
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Widell, Bjorn: *See—*
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Widstrand, John C.; and Jurek, Dennis J., to Leeson Electric Corporation. Air cooling means for dynamoelectric machine. 4,074,156, Cl. 310-62.000.
Wiechert, Rudolf: *See—*
Hofmeister, Helmut; Laurent, Henry; Wiechert, Rudolf; Annen, Klaus; and Steinbeck, Hermann, 4,073,900, Cl. 424-243.000.
Wieland, George E., Jr.; and Rudzki, Eugene M., to Bethlehem Steel Corporation. Method of producing silicon steel strip. 4,073,668, Cl. 148-113.000.
Wiest, Hubert; Berger, Rainer; and Lieb, Erwin, to Wacker-Chemie GmbH. Hydrolysis-resistant, film-forming copolymer dispersions. 4,073,779, Cl. 260-79.3MU.
Wiles, James P.: *See—*
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Wilkerson, Alan W. Watt meter providing electrical signal proportional to power. 4,074,194, Cl. 324-142.000.
Will, Fritz G., to General Electric Company. Dendrite-inhibiting electrolytic solution and rechargeable aqueous zinc-halogen cell containing the solution. 4,074,028, Cl. 429-105.000.
Willhoft, Edward Max Adolf. Process for producing a product containing aluminum and chlorine. 4,073,872, Cl. 423-496.000.
Williams, Arthur C. Method and apparatus for rigidly interconnected ceiling and wall construction. 4,073,108, Cl. 52-238.000.
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Willson, Robert D.; and Henderson, Terry L., to United States of America, Health, Education and Welfare. Noise chrono-dosimeter system. 4,073,194, Cl. 73-646.000.
Willums, Jan-Olaf; and Hody, Dieter. Method of underwater hydraulic conveying for ocean mining and the like. 4,073,080, Cl. 37-195.000.
Wilmonti, Richard D., to Hughes Aircraft Company. Adaptive threshold clutter processor. 4,074,264, Cl. 343-17.10R.
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Wilson, Harry Howard, Jr., to H. Wilson Corporation. Rigid mobile cabinet for audio-visual aids. 4,073,556, Cl. 312-250.000.

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Wissinger, Lawrence H. Combination reflector and light shield. 4,074,123, Cl. 362-319.000.

Witt, Paul R., Jr., to Grain Processing Corporation. Preparation of a beer-type beverage. 4,073,947, Cl. 426-13.000.

Wittchow, Eberhard: *See—*
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Woessner, Warren Dexter; Sih, Charles John; Kluender, Harold Clinton; Arndt, Henry Clifford; and Biddlecom, William Gerard, to Miles Laboratories, Inc. Bicycloalkyl derivatives of prostaglandins. 4,074,063, Cl. 560-121.000.

Wolinski, Leon E.; Riebling, Richard G.; and Edholm, John H., to Pratt & Lambert. Chemical milling of neoprene rubber. 4,074,033, Cl. 526-47.000.

Wollen, Carl H., to Leon Chemical & Plastics, Division of U.S. Industries, Inc. Article including acrylic adhesive bonding vinyl coatings to polymeric substrates. 4,074,014, Cl. 428-506.000.

Womack, William B. M.; Starnes, Ralph Emory, Jr.; Headrick, John Charles; and Martin, Ronald Ray, to Southwire Company. Immersion-treating tubular elements. 4,073,978, Cl. 427-235.000.

Wood, Hamish Christopher Swan; and Stirling, Irene, to Burroughs Wellcome Co. 2-Amino-4-hydroxy-6-hydroxymethyl-7,7-diethyl-7,8-dihydropteridine and the 7-spirocyclohexyl analogue thereof. 4,073,786, Cl. 260-251.500.

Wood, Loren E., to Black, Sivalls & Bryson, Inc. Preassembled pressure relief apparatus. 4,073,402, Cl. 220-207.000.

Wooding, Harold C., Jr.: *See—*
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Woods, William E.; Stanley, Philip E.; Izbicki, Kenneth J.; and Ramsdell, Steven C., to Honeywell Information Systems Inc. Trap mechanism for a data processing system. 4,074,353, Cl. 364-200.000.

Woodworth, Frederick Arthur; and Zobel, Ernst-Guenther, to U.S. Philips Corporation. Electronic flash device. 4,074,171, Cl. 315-241.00P.

Wrenn, Francis P. Roll forming, measuring and cutting apparatus. 4,073,447, Cl. 242-56.00R.

Wretlind, Karl Arvid Johannes; Ljungberg, Stellan; Hakansson, Ivan; and Ajaxon, Bengt Magnus, to Apoteksvarucentralen Vitrum AB. Method of enhancing the administration of pharmalogically active agents. 4,073,943, Cl. 424-358.000.

Wright, Allen C., to Utility Products, Inc. Level support guard. 4,073,367, Cl. 182-204.000.

Wright, Donald E. Level. 4,073,062, Cl. 33-388.000.

Wright, Gary Thorup: *See—*
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Wright, Jeremy: *See—*
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Wu, Che-Kuang, to Corning Glass Works. Optical articles prepared from hydrated glasses. 4,073,654, Cl. 106-52.000.

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Wurst, Bert; and Vogt, Harald, to Robert Bosch GmbH. Electronic transmission gear change control system. 4,073,203, Cl. 74-866.000.

Wyburn-Mason, Roger, to Simoons, John R. A. Treatment of rheumatoid arthritis and related diseases. 4,073,922, Cl. 424-273.00R.

Wynn-Smith, David, to Chroma-Flex, Inc. Video effects apparatus and method. 4,074,309, Cl. 358-82.000.

Xerox Corporation: *See—*
Haas, Werner E. L.; and Faucz, Eugene C., 4,074,276, Cl. 346-74.100.
Hankee, Roy H.; and Akman, Alp T., 4,074,000, Cl. 428-323.000.
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Mammino, Joseph; and Jossel, Franklin, 4,073,965, Cl. 427-22.000.
Rokos, George Hedley Storm, 4,074,143, Cl. 250-552.000.
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Teumer, Roger G.; Warter, Peter J., Jr.; Squassoni, Gino F.; Tulagin, Vseevolod; and Egnaczak, Raymond K., 4,073,583, Cl. 355-3.00P.

Yabuta, Keiichiro; and Koike, Yoshitaka, to Nissan Motor Company, Limited. Fluid pressure control device and motor vehicle braking system incorporating such device. 4,073,542, Cl. 303-6.00C.

Yahraus, William A., to Gould Inc. Sleeve bearing. 4,073,550, Cl. 308-23.000.

Yajima, Shunichi; Kakumoto, Shigeru; Fujimoto, Yoshiji; and Hananoi, Toshihiro, to Hitachi, Ltd. Pattern processing system. 4,074,231, Cl. 340-146.3AG.

Yamada, Koji: *See—*
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Yamada, Shoji; Tanaka, Akira; Horii, Shoichi; and Yamashita, Kiyoshi, to Mitsubishi Paper Mills, Ltd. Image-forming layer containing silver halide emulsion and magenta coupler. 4,073,651, Cl. 96-100.00R.

Yamagishi, Akira, to Fuji Photo Optical Co., Ltd. Zoom lens system. 4,073,573, Cl. 350-187.000.

Yamaguchi, Kazuo: *See—*
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Yamaguchi, Masahiko: *See—*
Ozutsumi, Minoru; Miyazawa, Yoshihide; and Yamaguchi, Masahiko, 4,073,614, Cl. 8-25.000.
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Yamakawa, Yukio: *See—*
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Yamaki, Naoomi; Futsuhara, Natsuko; Masuda, Kazue; and Tsuchimoto, Koji, to Agency of Industrial Science and Technology of Japan. Process for converting nitrogen dioxide into nitrogen monoxide. 4,073,866, Cl. 423-405.000.

Yamamoto, Hisao: *See—*
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Yamauchi, Kazuhisa; Takakura, Koichi; Kawai, Syuji; and Ohmori, Akio, to Kuraray Co., Ltd. PVA membrane and method for preparing the same. 4,073,733, Cl. 210-500.00M.

Yamazaki, Masafumi; and Nakagawa, Yasuhiko, to Nissan Motor Company, Limited. Torch ignition type internal combustion engine. 4,073,271, Cl. 123-75.00B.

Yamazaki, Yorio, to Kawasaki Jukogyo Kabushiki Kaisha. Stand device for a two-wheeled motorcycle. 4,073,505, Cl. 280-301.000.

Yampolsky, Jack S.: *See—*
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Yanagawa, Nobuyuki, to Ricoh Company, Ltd. Cleaning unit for an optical system in a copying machine. 4,074,217, Cl. 355-30.000.

Yano, Katsuhiro: *See—*
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Yarway Corporation: *See—*
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Yasuda, Koichi; Ikeda, Yusuke; and Nishida, Yukiaki, to Eisai Co., Ltd. Method for treatment of impaired hearing. 4,073,883, Cl. 424-94.000.

Yasui, Junichi: *See—*
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Yasujima, Nobuo; Arai, Juichiro; Itokawa, Natsuo; and Okino, Katsumoto. Process of manufacturing terminals of a heat-proof metallic thin film resistor. 4,073,971, Cl. 427-103.000.

Yasuma, Toru: *See—*
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Yasunori, Takaharu: *See—*
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Yates, David J. C.; and Murrell, Lawrence L., to Exxon Research & Engineering Co. Method for preparing a highly dispersed supported nickel catalyst. 4,073,750, Cl. 252-459.000.

Yates, Richard Alan, to Du Pont de Nemours, E. I., and Company. Foam texturization of fungal mycelial fibers. 4,073,956, Cl. 426-470.000.

Yellow Springs Instrument Company, Inc., The: *See—*
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Yevick, George J., to Personal Communications, Inc. Method of recording on a microfiche. 4,073,650, Cl. 96-46.000.

Yissum Research Development Co. of the Hebrew Univ.: *See—*
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Yokogawa Electric Works, Ltd.: *See—*
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Nakagawa, Mutsuaki; Wakasa, Yutaka; Uchiike, Hisayuki; and Nagata, Susumu, 4,074,354, Cl. 364-200.000.
Saigusa, Tokuji, 4,073,191, Cl. 73-706.000.

Yokoi, Hiroshi; and Shiokawa, Takayasu, to Kokusai Denshin Denwa Kabushiki Kaisha. System for receiving radio waves through single antenna apparatus. 4,074,266, Cl. 343-100.0SA.

Yokoyama, Toshihiko: *See—*
Murakami, Fumiki; Teshima, Soichi; and Yokoyama, Toshihiko, 4,074,062, Cl. 560-217.000.

Yoshida Kogyo K.K.: *See—*
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Yoshida, Noboru. Unit and combined housing structures. 4,073,101, Cl. 52-79.100.

Yoshimi, Kazuyoshi: *See—*
Mizutani, Taketomo; Yasunori, Takaharu; and Yoshimi, Kazuyoshi, 4,073,598, Cl. 416-5.000.

Yoshizaki, Akira: *See—*
Ueda, Hiroshi; and Yoshizaki, Akira, 4,074,291, Cl. 354-51.000.

Yotsuyanagi, Yoshihiko; Araki, Naganori; Nagasawa, Shigeru; and Okitsu, Toshinao, to Konishi Co., Ltd. Solid adhesive compositions. 4,073,756, Cl. 260-18.00N.

Young, Bruce O.: *See—*
Seegmiller, Wan; and Young, Bruce O., 4,073,482, Cl. 267-139.000.

Young, Donald C., to Union Oil Company of California. Topical nitrogen fertilization method. 4,073,633, Cl. 71-28.000.

Yui, Takayuki: *See—*
Otomo, Koju; Itoh, Takeshi; Hayashi, Kazuyuki; Omoto, Hiroshi; Yui, Takayuki; and Suzuki, Makoto, 4,074,232, Cl. 340-147.00R.

Zahnradfabrik Friedrichshafen AG: *See—*
Lang, Armin; and Fassbender, Rolf, 4,073,140, Cl. 60-405.000.

(Zaidanhojin) Sagami Chemical Research Center: *See—*
Kondo, Kiyoshi; Tunemoto, Daiei; and Hiro, Etsuko, 4,073,799, Cl. 260-345.80P.

Zangenfeind, Helmut; Burchardi, Jurgen; and Lederer, Josef, to AAG-FA-Gevaert, A.G. Apparatus for applying indicia to films and envelopes in photographic processing laboratories. 4,073,588, Cl. 355-41.000.

Zannucci, Joseph S.: *See—*
Wang, Richard H. S.; and Zannucci, Joseph S., 4,073,745, Cl. 252-403.000.

Zaretti, Luigi. Precast element for the construction of trenched structures and the process related thereto. 4,073,148, Cl. 61-42.000.

Zarogatsky, Leonid Petrovich: *See—*
Rundkvist, Konstantin Alexandrovich; Ivanov, Nikolai Alexeevich; Ivanov, Boris Gavrilovich; Zarogatsky, Leonid Petrovich; Mitrofanov, Evgeny Sergeevich; and Blekhman, Ilya Izrailevich, 4,073,446, Cl. 241-207.000.

Zenker, Nicolas: *See—*
Callery, Patrick S.; Wright, Jeremy; and Zenker, Nicolas, 4,073,929, Cl. 424-273.00R.

Zetco Manufacturing Company, Incorporated: *See—*
Carter, Norman R., 4,073,388, Cl. 214-8.50A.

Zilver, Edwin. Device for making a curtain hang in regular pleats. 4,073,331, Cl. 160-348.000.

Zimmermann, Detlef: *See—*
Debortoli, George; and Zimmermann, Detlef, 4,074,337, Cl. 361-124.000.

Zinnes, Harold; Lindo, Neil A.; and Shavel, John, Jr., to Warner-Lambert Company. Process for the preparation of 4-hydroxy-2H-1,2-benzothiazine-3-carboxamide 1,1-dioxides. 4,074,048, Cl. 544-49.000.

Zobel, Ernst-Guenther: *See—*
Woodworth, Frederick Arthur; and Zobel, Ernst-Guenther, 4,074,171, Cl. 315-241.00P.

Zrudsky, Donald R., to University of Toledo, The. Chopper-multiplexer system for measurement of remote low-level signals. 4,074,076, Cl. 179-15.0BL.

Zschocke, Rainer Hans: *See—*
Grill, Helmut; Zschocke, Rainer Hans; Wagner, Josef; Hofrichter, Gernot; and Janiak, P. Stefan, 4,073,935, Cl. 424-308.000.

Zumin Tricerri, Silvia; and Chiarani, Lino, to Pierrel S.p.A. 3-[5'(1-Methyltetrazolylthiomethyl)]-7-[2(3''-nitroimidazolyl)acetyl amino]-cephalosporanic acid, salts, and its pharmaceutical composition. 4,073,903, Cl. 424-246.000.

Zwirlein, John F., to Olin Corporation. Automatically controlled cleaning fluid circuit for a foam generating apparatus and method. 4,073,664, Cl. 134-18.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 14TH DAY OF FEBRUARY, 1978

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Abraham, James G.: *See—*
Willke, Herbert L.; and Abraham, James G., Re. 29,539, Cl. 254-89.00R.

Adams, William E.; and Lucht, Wilbert A., to United States Steel Corporation. Torque balanced rope. Re. 29,537, Cl. 57-148.000.

Armco Steel Corporation: *See—*
Willke, Herbert L.; and Abraham, James G., Re. 29,539, Cl. 254-89.00R.

Budzich, Tadeusz. Load responsive fluid control valve. Re. 29,538, Cl. 137-596.200.

Ciba-Geigy AG: *See—*
Randell, Donald Richard; and Pickles, Wilfred, Re. 29,540, Cl. 260-966.000.

Fearing, Donald David. Marking tag. Re. 29,536, Cl. 40-301.000.

Lucht, Wilbert A.: *See—*
Adams, William E.; and Lucht, Wilbert A., Re. 29,537, Cl. 57-148.000.

Pickles, Wilfred: *See—*
Randell, Donald Richard; and Pickles, Wilfred, Re. 29,540, Cl. 260-966.000.

Randell, Donald Richard; and Pickles, Wilfred, to Ciba-Geigy AG. Phosphorylated alkylphenol/phenol ester mixtures. Re. 29,540, Cl. 260-966.000.

United States Steel Corporation: *See—*
Adams, William E.; and Lucht, Wilbert A., Re. 29,537, Cl. 57-148.000.

Willke, Herbert L.; and Abraham, James G., to Armco Steel Corporation. Leg supported offshore structure with jacking apparatus. Re. 29,539, Cl. 254-89.00R.

LIST OF PLANT PATENTEES

Andrea, Frank. Geranium plant. 4,215, 2-14-78, Cl. 68.000.

Holtkamp, Reinhold. African violet plant. 4,213, 2-14-78, Cl. 69.000.

Holtkamp, Reinhold. African violet plant. 4,214, 2-14-78, Cl. 69.000.

LIST OF DESIGN PATENTEES

Acoustic Fiber Sound Systems, Inc.: *See—*
Croup, Robert E., 247,236, Cl. D14-33.000.
Croup, Robert E., 247,237, Cl. D14-35.000.

American Optical Corporation: *See—*
Armbruster, John T., 247,245, Cl. D16-83.000.
Napoli, Joseph D., 247,251, Cl. D24-17.000.

Armbruster, John T., to American Optical Corporation. Dual viewer attachment for a microscope. 247,245, 2-14-78, Cl. D16-83.000.

Aurora S.p.A.: *See—*
Verona, Franco, 247,246, Cl. D19-45.000.

Baechtle, Charles Paul; and Stram, John Van Dyke, to International Business Machines Corporation. Keyboard. 247,239, 2-14-78, Cl. D14-40.000.

Ball Corporation: *See—*
Campbell, William B., 247,229, Cl. D11-135.000.
Campbell, William B., 247,230, Cl. D11-137.000.

Barber, Robert N. Portable reel for electric extension cable. 247,218, 2-14-78, Cl. D8-359.000.

Baxter Travenol Laboratories, Inc.: *See—*
Bruni, James G.; Hauser, Stephen G.; Lessner, David Lynnwood; and Macemon, James Herbert, 247,226, Cl. D10-46.000.
Bruni, James G.; Hauser, Stephen G.; Lessner, David Lynnwood; and Macemon, James Herbert, 247,227, Cl. D10-46.000.

Beckwith, Edward K. Tooth-shaped sand timer. 247,225, 2-14-78, Cl. D10-44.000.

Bourke, Robert E., to GAF Corporation. Transparency projector. 247,242, 2-14-78, Cl. D16-21.000.

Brown, Brian E.; and Hall, Alfred G., to Moduloc Concrete Products (London) Ltd. Pre-cast concrete unit for manholes. 247,254, 2-14-78, Cl. D25-36.000.

Bruni, James G.; Hauser, Stephen G.; Lessner, David Lynnwood; and Macemon, James Herbert, to Baxter Travenol Laboratories, Inc. Spectrophotofluorometer. 247,226, 2-14-78, Cl. D10-46.000.

Bruni, James G.; Hauser, Stephen G.; Lessner, David Lynnwood; and Macemon, James Herbert, to Baxter Travenol Laboratories, Inc. Component for a spectrophotofluorometer. 247,227, 2-14-78, Cl. D10-46.000.

Burlington Industries, Inc.: *See—*
Carroll, Barry G., 247,223, Cl. D9-193.000.

Calkins, James Stewart: *See—*
Nilsen, Alfred; and Calkins, James Stewart, 247,213, Cl. D8-18.000.

Campbell, William B., to Ball Corporation. Plaque. 247,229, 2-14-78, Cl. D11-135.000.

Campbell, William B., to Ball Corporation. Plaque. 247,230, 2-14-78, Cl. D11-137.000.

Carroll, Barry G., to Burlington Industries, Inc. Pantyhose package. 247,223, 2-14-78, Cl. D9-193.000.

Combi Co., Ltd.: *See—*
Nakao, Shinroku, 247,258, Cl. D34-15.00B.

Cote, Paul L., to Gentex Corporation. Hand-held microphone. 247,235, 2-14-78, Cl. D14-12.000.

Croup, Robert E., to Acoustic Fiber Sound Systems, Inc. Loudspeaker. 247,236, 2-14-78, Cl. D14-33.000.

Croup, Robert E., to Acoustic Fiber Sound Systems, Inc. Loudspeaker. 247,237, 2-14-78, Cl. D14-35.000.

Daiwa Seiko, Inc.: *See—*
Okada, Kiyoshi, 247,247, Cl. D22-25.000.

Daugherty, Gaye Lorraine. Planter. 247,204, 2-14-78, Cl. D6-137.000.

Degremont S.A.: *See—*
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Dwillies, Paul K. L.: *See—*
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Paone, Anthony N.; and Montgomery, William P., 247,222, Cl. D9-192.000.

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Baechtle, Charles Paul; and Stram, John Van Dyke, 247,239, Cl. D14-40.000.

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NOTE.—First number, class; second number, subclass; third number, patent number

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627 4,073,378
796 4,073,379

CLASS 200

5 A 4,074,088
5 E 4,074,089
19 DR 4,074,090
50 A 4,074,091
51.07 4,074,092
52 R 4,074,093
61.13 4,074,094
81.9 M 4,074,095
81.9 R 4,074,097
83 D 4,074,096
144 R 4,074,098
153 S 4,074,099
279 4,074,112
339 4,074,100

CLASS 202

254 4,073,697

CLASS 204

1 T 4,073,698
13 4,073,699
43 G 4,073,700
54 R 4,073,701
59 R 4,073,702
70 4,073,703
4,073,704
92 4,073,705
98 4,073,706
105 R 4,073,707
106 4,073,708
113 4,073,709
129.65 4,073,710
181 F 4,073,711
186 4,073,712
195 B 4,073,713
243 R 4,073,714
256 4,073,715

CLASS 206

219 4,073,380
331 4,073,381

CLASS 208

66 4,073,716
74 4,073,717
80 4,073,718
180 4,073,719
4,073,720
251 H 4,073,721

CLASS 210

5 4,073,722
23 H 4,073,724
23 R 4,073,723
31 C 4,073,725
45 4,073,726
63 R 4,073,727
71 4,073,728
80 4,073,729
321 R 4,073,730
376 4,073,731
491 4,073,732
500 M 4,073,733
532 R 4,073,734

CLASS 211

1 4,073,382
1.5 4,073,383
134 4,073,384

CLASS 213

100 R 4,073,385

CLASS 214

1 F 4,073,386
6 P 4,073,387
8.5 A 4,073,388
10.5 D 4,073,389
14 4,073,390
65 4,073,391
83.1 4,073,392
83.3 4,073,393
145 R 4,073,394
450 4,073,395
515 4,073,396

CLASS 215

1 C 4,073,397
253 4,073,398
254 4,073,399

CLASS 219

10.49 R 4,074,101
10.55 E 4,074,102
98 4,074,103
121 LM 4,074,104
137 R 4,074,106
137.8 4,074,105
212 4,074,107
214 4,074,108
216 4,074,109
240 4,074,110
275 4,074,111

CLASS 220

63 R 4,073,400
88 R 4,073,401
207 4,073,402
269 4,073,403

CLASS 221

63 4,073,404
89 4,073,405
102 4,073,407

CLASS 222

94 4,073,406
145 4,073,408
146 HE 4,073,409
181 4,073,410
192 4,073,411
4,073,412
529 4,073,413
602 4,073,414

CLASS 223

92 4,073,415

CLASS 224

5 H 4,073,416
42.1 G 4,073,417
45 R 4,073,418

CLASS 225

44 4,073,419

CLASS 226

42 4,073,420
97 4,073,421
129 4,073,422

CLASS 227

7 4,073,423

CLASS 228

4.5 4,073,424
116 4,073,425
122 4,073,426
165 4,073,427
178 4,073,428

CLASS 229

62.5 4,073,429

CLASS 232

35 4,073,430

CLASS 233

7 4,073,431

CLASS 235

83 4,074,116
92 FQ 4,073,432
92 T 4,074,117
419 4,074,113
4,074,120
462 4,074,115
463 4,074,114

CLASS 236

49 4,073,433

CLASS 237

2 B 4,073,434

CLASS 238

349 4,073,435

CLASS 239

8 4,073,436
131 4,073,437
227 4,073,438
265.29 4,073,440
265.41 4,073,441
655 4,073,439

CLASS 241

37 4,073,442
65 4,073,443
73 4,073,444
101.7 4,073,445
207 4,073,446

CLASS 242

56 R 4,073,447
57.1 4,073,448
107.1 4,073,449
131 4,073,450
191 4,073,451

CLASS 244

118 R 4,073,452

CLASS 246

125 4,073,453

CLASS 248

188.2 4,073,454
291 4,073,455
337 4,073,456
340 4,073,457
4,073,458
394 4,073,459
441 R 4,073,460
475 R 4,073,461
537 4,073,462

CLASS 249

102 4,073,463

CLASS 250

199 4,074,127
205 4,074,128
212 4,074,129
223 R 4,074,130
237 G 4,074,131
277 R 4,074,132
315 A 4,074,133
324 4,074,134
366 4,074,135
380 4,074,137
392 4,074,136
435 4,074,138
492 A 4,074,139
492 R 4,074,140
517 4,074,141
551 4,074,142
552 4,074,143

CLASS 251

7 4,073,467
26 4,073,464
58 4,073,465
63.4 4,073,466
77 4,073,468
86 4,073,469
163 4,073,470
176 4,073,471
229 4,073,472
298 4,073,473
368 4,073,474

CLASS 252

8.8 4,073,735
31 4,073,736
51.5 A 4,073,737
56 R 4,073,738
62.1 P 4,073,739
156 4,073,740
187 R 4,073,741
299 4,073,742
309 4,073,743
389 R 4,073,744
403 4,073,745
404 4,073,746
412 4,073,747
428 4,073,748
455 R 4,073,749
459 4,073,750
522 4,073,751

CLASS 254

66 4,073,475
89 R Re.29,539
184 4,073,476

CLASS 256

22 4,073,477
27 4,073,478

CLASS 260

2.1 R 4,073,752
2.3 4,073,753
17 R 4,073,754
17.4 BB 4,073,755
18 N 4,073,756
19 R 4,073,757
23 EP 4,073,758
23 H 4,073,782
28.5 AS 4,073,759
4,073,760
29.2 N 4,073,788
29.3 4,073,761
29.4 UA 4,073,762
37 N 4,073,763
40 R 4,073,764
42.14 4,073,765
45.7 S 4,073,766
45.75 B 4,073,768
45.8 NW 4,073,772
45.8 R 4,073,770
4,073,767
4,073,769
45.9 NC 4,073,771
47 CP 4,073,773
47 EP 4,073,775
47 UA 4,073,774
51 EP 4,073,776
75 S 4,073,777
78 L 4,073,778
79.3 MU 4,073,779
112 B 4,073,886
112.5 R 4,073,780
152 4,073,781
239.1 4,073,783
243.3 4,073,784
4,073,785
251.5 4,073,786
290 P 4,073,787
293.58 4,073,789
293.73 4,073,790
294.8 R 4,073,791
296 H 4,073,792
306.8 D 4,073,793
326 C 4,073,794
326.14 T 4,073,795
326.33 4,073,796
327 M 4,073,797
340.5 R 4,073,798
345.8 P 4,073,799
404.5 4,073,800
448.2 E 4,073,801
512 R 4,073,802
515 A 4,073,803
534 R 4,073,804
544 K 4,073,806
562 N 4,073,807
563 R 4,073,808
590 C 4,073,805
606.5 P 4,073,809
4,073,810
611 A 4,073,811
613 R 4,073,812
617 C 4,073,813
619 A 4,073,814
4,073,815
648 R 4,073,816
653.1 T 4,073,817
668 F 4,073,818
674 N 4,073,819
683 D 4,073,820
683.47 4,073,821
4,073,822
683.48 4,073,823
823 4,073,824
824 R 4,073,825
831 4,073,826
835 4,073,827
859 R 4,073,828
860 4,073,829
4,073,830
876 B 4,073,831
966 Re.29,540

CLASS 261

118 4,073,832

CLASS 264

0.5 4,073,834
4 4,073,833
22 4,073,835
36 4,073,836
37 4,073,838
38 4,073,837
45.1 4,073,839
45.3 4,073,840
46.6 4,073,841
53 4,073,842
4,073,843
55 4,073,844
65 4,073,845
4,073,846
89 4,073,847
93 4,073,850
109 4,073,851
120 4,073,848
122 4,073,852
132 4,073,853
161 4,073,854
236 4,073,849
249 4,073,855
259 4,073,856
262 4,073,858
291 4,073,857
322 4,073,859

CLASS 266

173 4,073,479
201 4,073,480
215 4,073,481

CLASS 267

139 4,073,482

CLASS 269

25 4,073,483
321 CF 4,073,484

CLASS 270

21 4,073,485
69 4,073,486

CLASS 271

64 4,073,487
263 4,073,488
277 4,073,489

CLASS 272

136 4,073,490

CLASS 273

29 B 4,073,491
80.2 4,073,492
148 R 4,073,493
150 4,073,494

CLASS 274

1 R 4,073,495
9 B 4,073,496

CLASS 279

2 R 4,073,497
62 4,073,498

CLASS 280

1.1 R 4,073,499
87.04 R 4,073,500
164 R 4,073,501
166 4,073,502
203 4,073,503
220 4,073,504
301 4,073,505
402 4,073,506
477 4,073,507
478 R 4,073,508
618 4,073,509

CLASS 281

15 R 4,073,510

CLASS 285

3 4,073,511
12 4,073,512
93 4,073,513
127 4,073,514
158 4,073,515

CLASS 290

55 4,073,516

CLASS 292

60 4,073,517
144 4,073,518
216 4,073,519
4,073,520
256.65 4,073,521
262 4,073,522
264 4,073,523
341.12 4,073,524
346 4,073,525
347 4,073,526
4,073,527

CLASS 293

98 4,073,528

CLASS 294

19 A 4,073,529
19 R 4,073,530
83 R 4,073,531
107 4,073,532
118 4,073,533

CLASS 296

37.16 4,073,534
137 A 4,073,535
137 G 4,073,536

CLASS 297

384 4,073,537
417 4,073,538
455 4,073,539

CLASS 301

108 A 4,073,540

CLASS 303

3 4,073,541
6 C 4,073,542
10 4,073,543
83 4,073,544
109 4,073,545
115 4,073,546

CLASS 307

10 R 4,074,144
4,074,145
60 4,074,146

230 4,074,147
279 4,074,148
351 4,074,149
362 4,074,150
4,074,151

CLASS 308

6 C 4,073,547
8.2 4,073,548
9 4,073,549
23 4,073,550
195 4,073,551
201 4,073,552

CLASS 310

12 4,074,153
29 4,074,154
59 4,074,155
62 4,074,156
67 R 4,074,157
90 4,074,158
154 4,074,159
184 4,074,160
194 4,074,161
245 4,074,162
334 4,074,152

CLASS 312

184 4,073,553
199 4,073,554
229 4,073,555
250 4,073,556
284 4,073,557

CLASS 313

13 4,074,163
25 4,074,164
112 4,074,165
185 4,074,166
222 4,074,167
4,074,168

CLASS 315

39.75 4,074,169
120 4,074,170
241 P 4,074,171
307 4,074,172

CLASS 316

18 4,073,558

CLASS 318

138 4,074,173
197 4,074,174
332 4,074,175
371 4,074,176
602 4,074,177
631 4,074,178
696 4,074,179

CLASS 322

29 4,074,180

CLASS 323

8 4,074,181
25 4,074,182

CLASS 324

16 R 4,074,183
30 R 4,074,184
51 4,074,187
52 4,074,188
73 R 4,074,189
77 A 4,074,190
79 R 4,074,191
103 R 4,074,192
126 4,074,193
142 4,074,194
158 D 4,074,195
166 4,074,196
205 4,074,197
208 4,074,185
222 4,074,186

CLASS 325

3 4,074,198
50 4,074,199
335 4,074,200
363 4,074,201

CLASS 328

258 4,074,202

CLASS 330

4.3 4,074,203
109 4,074,204
257 4,074,205
269 4,074,206

CLASS 331

1 A 4,074,207
94.5 P 4,074,208

CLASS 332

19 4,074,209

CLASS 333

29 4,074,210
31 R 4,074,211
70 T 4,074,212
71 4,074,213
73 S 4,074,214
80 R 4,074,215

CLASS 334

15 4,074,216

CLASS 335

176 4,074,218

CLASS 337

186 4,074,219
276 4,074,220

CLASS 338

21 4,074,221
212 4,074,222

CLASS 339

94 R 4,073,559
99 R 4,073,560
112 R 4,073,561
117 P 4,073,562
128 4,073,563
157 C 4,073,564
223 S 4,073,565

CLASS 340

1 R 4,074,223
8 PC 4,074,224
52 B 4,074,226
58 4,074,227
146.1 AG 4,074,229
146.1 AQ 4,074,228
146.1 BE 4,074,230
146.3 AG 4,074,231
147 LP 4,074,233
147 R 4,074,232
171 R 4,074,234
189 M 4,074,241
213.1 4,074,242
237 R 4,074,225
4,074,243
244 R 4,074,244
248 B 4,074,245
274 R 4,074,246
276 4,074,247
4,074,248
280 4,074,249
304 4,074,250
309.4 4,074,251
321 4,074,252
324 AD 4,074,254
324 M 4,074,253
336 4,074,255
4,074,256
347 AD 4,074,259
347 CC 4,074,260
347 NT 4,074,257
347 P 4,074,258
365 R 4,074,261
365 S 4,074,262

CLASS 343

6.8 LC 4,074,263
17.1 R 4,074,264
18 E 4,074,265
100 SA 4,074,266
106 R 4,074,267
4,074,268
225 4,074,269
700 MS 4,074,270
882 4,074,271

CLASS 346

19 4,074,275
33 A 4,074,272
34 4,074,273
4,074,274
74.1 4,074,276
75 4,074,277
4,074,278
4,074,279
76 R 4,074,280
110 R 4,074,281
135 4,074,282
139 C 4,074,283
140 R 4,074,284

CLASS 350

3.71 4,073,566
6.5 4,073,567
103 4,073,568
137 4,073,569
174 4,073,572
187 4,073,573
189 4,073,574
214 4,073,575
273 4,073,576
337 4,073,571
357 4,073,570

CLASS 351

160 4,073,577
167 4,073,578
169 4,073,579

CLASS 352

91 C 4,073,580
129 4,073,581
141 4,073,582

CLASS 354

15 4,074,285
21 4,074,286
23 D 4,074,289
31 4,074,287
33 4,074,288
34 4,074,290
51 4,074,291
53 4,074,292
106 4,074,294
145 4,074,295
187 4,074,296
285 4,074,297
299 4,074,298

CLASS 355

3 CH 4,073,587
3 P 4,073,583
8 4,073,584
14 4,073,585
20 4,073,586
30 4,074,217
41 4,073,588
50 4,073,589

CLASS 356

209 4,073,590

CLASS 357

17 4,074,299
23 4,074,300
4,074,301
24 4,074,302
33 4,074,303
34 4,074,293
59 4,074,304
67 4,074,305

CLASS 358

1 4,074,306
8 4,074,307
31 4,074,321
38 4,074,308
82 4,074,309
84 4,074,310
118 4,074,311
128 4,074,312
4,074,313
4,074,314
142 4,074,315
181 4,074,316
4,074,317
230 4,074,318
4,074,319
4,074,320
237 4,074,322
243 4,074,323
296 4,074,324

CLASS 360

39 4,074,325
55 4,074,326
74 4,074,327
77 4,074,328
85 4,074,329
102 4,074,330
104 4,074,331
137 4,074,332

CLASS 361

13 4,074,333
79 4,074,334
87 4,074,335
88 4,074,336
124 4,074,337
129 4,074,338
239 4,074,339
321 4,074,340
331 4,074,341
411 4,074,342

CLASS 362

13 4,074,121
200 4,074,122
217 4,074,124
271 4,074,125
297 4,074,126
319 4,074,123

CLASS 363

14 4,074,343
44 4,074,344
48 4,074,345
50 4,074,346
158 4,074,347
160 4,074,348

CLASS 364

107 4,074,349
4,074,350
200 4,074,351
4,074,352
4,074,353
4,074,354
4,074,355
465 4,074,356
494 4,074,357
514 4,074,358
521 4,074,359
551 4,074,360
712 4,074,118
713 4,074,361
807 4,074,119
900 4,074,235

CLASS 365

104 4,074,238
176 4,074,239
192 4,074,240
200 4,074,236
230 4,074,237

CLASS 366

82 4,074,362
138 4,074,363

CLASS 403

24 4,073,591

CLASS 404

89 4,073,592
114 4,073,593

CLASS 415

1 4,073,594
143 4,073,595
180 4,073,596
201 4,073,597

CLASS 416

5 4,073,598
97 R 4,073,599
140 4,073,600
242 4,073,601

CLASS 417

185 4,073,602
222 4,073,603
226 4,073,604
283 4,073,605
424 4,073,606

CLASS 418

86 4,073,607
241 4,073,608

CLASS 423

140 4,073,860
219 4,073,861
220 4,073,862
222 4,073,863
242 4,073,864
339 4,073,865
405 4,073,866
429 4,073,867
443 4,073,868
447.1 4,073,869
447.6 4,073,870
481 4,073,871
496 4,073,872
499 4,073,873
500 4,073,874
504 4,073,875
508 4,073,876
616 4,073,877
633 4,073,878

CLASS 424

5 4,073,879
66 4,073,880
70 4,073,881
84 4,073,882
94 4,073,883
4,073,884
101 4,073,885
147 4,073,887
149 4,073,888
164 4,073,889
177 4,073,890
4,073,891
4,073,892
200 4,073,893
4,073,894
4,073,895
205 4,073,896
230 4,073,897
233 4,073,898
238 4,073,899
243 4,073,900
245 4,073,901
246 4,073,902
4,073,903
248.56 4,073,905
248.58 4,073,904
251 4,073,906
253 4,073,907
4,073,908
258 4,073,909
266 4,073,910
267 4,073,911
4,073,912
4,073,913
4,073,914
4,073,915
4,073,916
4,073,917
270 4,073,918
4,073,919
271 4,073,920
273 R 4,073,921
4,073,922
4,073,923
4,073,924
4,073,925
4,073,926
4,073,927
4,073,928
4,073,929
277 4,073,930
279 4,073,932
298 4,073,931
299 4,073,933
305 4,073,934
308 4,073,935
4,073,936
312 4,073,937
317 4,073,938
320 4,073,939
324 4,073,940
4,073,941
330 4,073,942
358 4,073,943

CLASS 425

146 4,073,944
442 4,073,609
577 4,073,610

CLASS 426

2 4,073,945
4,073,946
13 4,073,947
44 4,073,948
106 4,073,949
128 4,073,950
237 4,073,951
242 4,073,952
297 4,073,953
330.3 4,073,954
422 4,073,955
470 4,073,956
535 4,073,957
559 4,073,958
578 4,073,959
580 4,073,960
589 4,073,961
646 4,073,962
658 4,073,963

CLASS 427

10 4,073,964
22 4,073,965
26 4,073,966
44 4,073,967
54 4,073,968
75 4,073,969
96 4,073,970
103 4,073,971
136 4,073,972
142 4,073,973
163 4,073,974
170 4,073,975
181 4,073,976
216 4,073,977
235 4,073,978
244 4,073,979
259 4,073,981
270 4,073,982
421 4,073,983
444 4,073,984

CLASS 428

35 4,073,985
38 4,073,986
81 4,073,987
91 4,073,988
131 4,073,989
138 4,073,990
4,073,991
207 4,073,992
261 4,073,993
265 4,073,994
4,073,995
274 4,073,996
285 4,073,997
310 4,073,998
311 4,073,999
323 4,074,000
329 4,074,001
331 4,074,002
341 4,074,003
355 4,074,004
378 4,074,005
379 4,074,006
404 4,073,980
411 4,074,007
418 4,074,008
421 4,074,009
422 4,074,010
4,074,011
425 4,074,012
457 4,074,013
506 4,074,014
526 4,074,015
626 4,074,016

CLASS 429

1 4,074,017
10 4,074,027
21 4,074,018
34 4,074,020
50 4,074,019
51 4,074,021
54 4,074,022
56 4,074,023
86 4,074,024
91 4,074,025
104 4,074,026
105 4,074,028
198 4,074,029
223 4,074,030

CLASS 431

45 4,073,611
126 4,073,612
202 4,073,613

CLASS 526

44 4,074,032
47 4,074,033
49 4,074,031
56 4,074,034
185 4,074,035
238 4,074,036
280 4,074,037
4,074,038
303 4,074,039
352 4,074,040

CLASS 528

488 4,074,041

CLASS 536

1 4,074,042
52 4,074,043

CLASS 542

402 4,074,044
426 4,074,045
439 4,074,046

CLASS 544

30 4,074,047
49 4,074,048
82 4,074,049
92 4,074,050
140 4,074,051
221 4,074,052

CLASS 548

305 4,074,053
335 4,074,054
347 4,074,055

CLASS 560

51 4,074,056
55 4,074,057
105 4,074,058
121 4,074,063
135 4,074,059
149 4,074,060
193 4,074,061
217 4,074,062

CLASSIFICATION OF DESIGNS

D2—	310	247,201		179	247,212		193	247,223		155	247,234		83	247,245	D34—	5 GC	247,257
	330	247,202	D8—	18	247,213	D10—	38	247,224	D14—	12	247,235	D19—	45	247,246		5 ST	247,256
D6—	91	247,203		51	247,214		44	247,225		33	247,236	D22—	25	247,247		15 B	247,258
	137	247,204		88	247,215		46	247,226		35	247,237	D23—	1	247,248			247,259
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PATENT AND TRADEMARK OFFICE NOTICES

TITLE 37—PATENTS, TRADEMARKS AND COPYRIGHTS

Chapter I—Patent and Trademark Office, Department of Commerce

Rule Promulgation Relating to Multiple Dependent Claims and Drawing Requirements

AGENCY: Patent and Trademark Office, Commerce

ACTION: Final Rule.

SUMMARY: This notice adopts rule changes which permit the use of multiple dependent claims and prescribe when, and in what circumstances, drawings or additional drawings need to be furnished. These rule changes are necessary because of amendments to sections 41, 112 and 113, Title 35 United States Code, which become effective on January 24, 1978. The rule changes are intended to carry into effect the changes made by the amendments to the noted sections.

DATES: Effective date, January 24, 1978. The amended rules apply to applications filed on and after the effective date, even though such applications may be entitled to the benefit of an earlier filing date.

FOR FURTHER INFORMATION CONTACT: Mr. Louis O. Maassel by telephone at (703) 557-3070, or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

SUPPLEMENTARY INFORMATION: This notice changes several rules to conform with 35 U.S.C. sections 41, 112 and 113 as amended by Public Law 94-131, effective January 24, 1978, the date of entry into force of the Patent Cooperation Treaty. Notice was given on January 12, 1977 in the Federal Register (42 FR 2632-2644) and on February 8, 1977 in the OFFICIAL GAZETTE (955 O.G. 350-363) of a proposal to amend Title 37 of the Code of Federal Regulations due to the entry into force of the Patent Cooperation Treaty and Public Law 94-131 (94th Congress; 89 Stat. 658). Interested persons were invited to comment on the proposal on or before May 26, 1977, on which date a public hearing was held. The time for submitting written comments was extended until August 31, 1977 by a notice published on June 23, 1977 in the Federal Register (42 FR 31812) and on July 12, 1977 in the OFFICIAL GAZETTE (960 O.G. 8). Comments relevant to the rule changes being promulgated were submitted by only two persons. These comments have been subtantially adopted. A transcript of the hearing, the letters and written statements received, and a summary and analysis of the comments are available for public inspection in Room 11E10 of Crystal Plaza Building 3, 2021 Jefferson Davis Highway, Arlington, Virginia. These changes provide for the filing of multiple dependent claims and for later submission of drawings in applications where such drawings are not necessary for the understanding of the subject matter sough to be patented. This rule change promulgation is directed to only those portions of the proposed rule changes relating to sections 1.75, 1.81 and 1.83 which are required on January 24, 1978, due to the coming into force of Public Law 94-131. The other proposed rules relating to implementation of the Patent Cooperation Treaty will be promulgated later.

Good cause is found for the publication of this notice less than 30 days before the effective date of these rules, since it would be in the public interest for the amended rules to take effect on the same date as the statute.

Paragraph (c) of Section 1.75 differs from the proposal in that two additional sentences have been added indicating how fees will be calculated for multiple dependent claims and claims depending therefrom. No comments were received concerning this rule as originally proposed.

Paragraph (c) of Section 1.81 has been rewritten to adopt a revision suggested by one of the two persons who submitted comments. Paragraph (d) is a quote from revised 35 U.S.C. 113 and is added to include the restrictions relating to additional drawings.

The proposed amendments to paragraphs (a) and (b) of Section 1.83 were opposed by both persons who commented and they have not been adopted, but a new paragraph (c) is added in view of those comments. Accordingly, 37 CFR Part 1 is amended as follows:

1. By amending Section 1.75 by revising paragraph (c) and adding paragraphs (f) and (g) to read as follows:

Section 1.75 *Claim(s).*

* * * * * * *

(c) One or more claims may be presented in dependent form, referring back to and further limiting another claim or claims in the same application. Any dependent claim which refers to more than one other claim ("multiple dependent claim") shall refer to such other claims in the alternative only. A multiple dependent claim shall not serve as a basis for any other multiple dependent claim. For fee calculation purposes, a multiple dependent claim will be considered to be that number of claims to which direct reference is made therein. For fee calculation purposes, also, any claim depending from a multiple dependent claim will be considered to be that number of claims to which direct reference is made in that multiple dependent claim. Claims in dependent form shall be construed to include all the limitations of the claim incorporated by reference into the dependent claim. A multiple dependent claim shall be construed to incorporate by reference all the limitations of each of the particular claims in relation to which it is being considered.

* * * * * * *

(f) If there are several claims, they shall be numbered consecutively in Arabic numerals.

(g) All dependent claims should be grouped together with the claim or claims to which they refer to the extent possible.

2. By revising Section 1.81 to read as follows:

Section 1.81 *Drawings required.*

(a) The applicant for a patent is required to furnish a drawing of his invention where necessary for the understanding of the subject matter sought to be patented; this drawing must be filed with the application.

(b) Drawings may include illustrations which facilitate an understanding of the invention (for example, flow sheets in cases of processes, and diagrammatic views).

(c) Whenever the nature of the subject matter sought to be patented admits of illustration by a drawing without its being necessary for the understanding of the subject matter and the applicant has not furnished such a drawing, the examiner will require its submission within a time period of not less than two months from the date of the sending of a notice thereof.

(d) Drawings submitted afer the filing date of the application may not be used to overcome any insufficiency of the specification due to lack of an enabling disclosure or otherwise inadequate disclosure therein, or to supplement the original disclosure thereof for the purpose of interpretation of the scope of any claim.

3. By adding a new paragraph (c) to Section 1.83 to read as follows:

Section 1.83 *Content of drawing.*

* * * * * * *

(c) Where the drawings do not comply with the requirements of paragraph (a) and (b) of this section, the examiner shall require such additional illustration within a time period of not less than two months from the date of the sending of a notice thereof. Such corrections are subject to the requirements of Section 1.81(d).

The Patent and Trademark Office has determined that this document does not contain a major proposal requiring preparation of an Economic Impact Statement under Executive Orders 11821 and 11949 and OMB Circular A-107.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

Approved: Jan. 12, 1978.

JORDAN J. BARUCH,
Assistant Secretary for Science and Technology.

[43 FR 4014]

Dated: Jan. 31, 1978.

[FR Doc. 78-2607; Filed 1-30-78; 8:45 am]

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,366,546, Re. S.N. 865,000, Filed Dec. 27, 1977, Cl. 176/40, NUCLEAR REACTOR, Andrew James Anthony, et al., Owner of Record: *Combustion Engineering, Inc., Windsor, Conn.*, Attorney or Agent: Eldon H. Luther, Ex. Gp.: 221

3,483,782, Re. S.N. 861,190, Filed Dec. 16, 1977, Cl. 83/202, SELF-CONTAINED FEED ROLL FOR POWER PUNCH PRESSES, Harry Eyberger, Owner of Record: *Vamco Machine and Tool Inc., Pittsburgh, Pa.*, Attorney or Agent: Stanley J. Price, Ex. Gp.: 324

3,557,796, Re. S.N. 865,610, Filed Dec. 29, 1977, Cl. 128/419, DIGITAL COUNTER DRIVEN PACER, John W. Keller, Jr., et al., Owner of Record: *Cordis Corporation, Miami, Fla.*, Attorney or Agent: Melvin R. Jenney, et al., Ex. Gp.: 335

3,737,153, Re. S.N. 846,782, Filed Oct. 31, 1977, Cl. 266/240, MOLTEN METAL HOLDING FURNACE SYSTEM, Theodore J. Steffora, et al., Owner of Record: *Lectromelt Corporation, Pittsburgh, Pa.*, Attorney or Agent: Fred Wiviott, et al., Ex. Gp.: 325

3,866,651, Re. S.N. 851,621, Filed Nov. 14, 1977, Cl. 152/313, FLAT FREE PNEUMATIC TIRE AND VOID FREE FILLING THEREFOR, Edward N. Gomberg, Owner of Record: *Inventor,* Attorney or Agent: John B. Young, et al., Ex. Gp.: 314

3,925,713, Re. S.N. 854,463, Filed Dec. 6, 1977, Cl. 318/575, AUTOMATICALLY GUIDING WORKPIECES THROUGH A MACHINE, Richard M. Richmond, Owner of Record: *The Shoe & Allied Trades Research Association, Kettering Northamptonshire, England,* Attorney or Agent: Lawrence I. Lerner, et al., Ex. Gp.: 217

3,926,061, Re. S.N. 863,181, Filed Dec. 16, 1977, Cl. 74/22 R, DIFFERENTIAL DRIVE ROTATING DISC IMPACT PRINTER, Gary R. Paulson, Owner of Record: *Hewlett-Packard Co., Palo Alto, Calif.*, Attorney or Agent: Michael L. Sherrard, Ex. Gp.: 345

3,926,422, Re. S.N. 861,100, Filed Dec. 15, 1977, Cl. 269/160, APPARATUS FOR SUPPORTING AND POSITIONING OF A WORK-PIECE DURING WELDING, Bobby R. Wilson, Owner of Record: *Inventor,* Attorney or Agent: Vern L. Oldham, et al., Ex. Gp.: 323

3,932,943, Re. S.N. 850,028, Filed Nov. 9, 1977, Cl. 34/5, METHOD OF PREPARATION OF LYOPHILIZED BIOLOGICAL PRODUCTS, Angelis R. Briggs, et al., Owner of Record: *E. I. Du Pont de Nemours and Company, Wilmington, Del.*, Attorney or Agent: James L. Jersild, Ex. Gp.: 344

3,934,333, Re. S.N. 854,058, Filed Nov. 23, 1977, Cl. 29/611, METHOD OF CONSTRUCTING BILATERAL HEATER UNIT, John W. Churchill, Owner of Record: *Inventor,* Attorney or Agent: Paul M. Craig, Jr., et al., Ex. Gp.: 321

3,942,178, Re. S.N. 861,214, Filed Dec. 16, 1977, Cl. 343/5 PD, INTRUSION DETECTION SYSTEM, Kenneth R. Hackett, Owner of Record: *Pittway Corporation, Syosset, N.Y.*, Attorney or Agent: Sewall P. Bronstein, et al., Ex. Gp.: 222

3,974,107, Re. S.N. 862,381, Filed Dec. 20, 1977, Cl. 252/520, RESISTORS AND COMPOSITIONS THEREFOR, Peter Francis Carcia, Owner of Record: *E. I. Du Pont de Nemours and Co., Wilmington, Del.*, Attorney or Agent: James A. Forstner, Ex. Gp.: 223

3,982,486, Re. S.N. 844,116, Filed Oct. 17, 1977, Cl. 102/24 HC, NON EXPENDABLE POSITIONING FRAME FOR MULTIPLE EXPLOSIVE CHARGES, Robert E. Eckels, Owner of Record: *Inventor,* Attorney or Agent: Richard D. Law, Ex. Gp.: 221

3,986,673, Re. S.N. 844,515, Filed Oct. 25, 1977, Cl. 239/423, NOZZLE ASSEMBLIES FOR ATOMIZING AND MIXING DIFFERENT FLUIDS AND COMBINING THE MIXTURES WITH SOLIDS AND THE LIKE, Louis Beck, Owner of Record: *Inventor,* Attorney or Agent: Harold F. McNenny, Ex. Gp.: 313

3,999,292, Re. S.N. 864,932, Filed Dec. 27, 1977, Cl. 30/105, PIPE CUTTING TOOL, Clinton E. Breese, Owner of Record: *Breese Manufacturing, Inc., Jacksonville Beach, Fla.*, Attorney or Agent: George H. Baldwin, Ex. Gp.: 323

4,028,582, Re. S.N. 862,188, Filed Dec. 19, 1977, Cl. 313/422, GUIDED BEAM FLAT DISPLAY DEVICE, Charles Hammond Anderson, et al., Owner of Record: *RCA Corporation, New York, N.Y.*, Attorney or Agent: Eugene M. Whitacre, et al., Ex. Gp.: 252

PATENT NOTICES

Certificates of Correction for the Week of Feb. 21, 1978

Re. 29,326	4,036,979	4,048,004	4,053,699
D. 245,478	4,039,195	4,048,190	4,053,711
D. 246,259	4,040,146	4,048,241	4,053,767
3,652,867	4,040,984	4,048,254	4,053,898
3,676,339	4,041,279	4,048,255	4,054,186
3,708,601	4,041,623	4,048,282	4,054,273
3,781,936	4,041,631	4,048,312	4,054,306
3,843,761	4,042,107	4,048,510	4,054,520
3,846,189	4,042,372	4,048,570	4,054,675
3,883,576	4,042,610	4,048,597	4,054,689
3,953,038	4,042,683	4,048,663	4,054,824
3,970,253	4,043,240	4,048,672	4,055,065
3,975,753	4,043,790	4,049,368	4,055,384
3,975,835	4,043,791	4,049,982	4,055,575
3,983,155	4,043,835	4,050,482	4,055,596
3,985,969	4,043,963	4,050,523	4,055,597
3,986,012	4,044,076	4,050,762	4,055,627
3,988,815	4,044,253	4,050,802	4,055,669
4,009,291	4,044,297	4,050,951	4,055,897
4,012,520	4,044,408	4,051,008	4,056,118
4,012,598	4,044,643	4,051,504	4,056,254
4,013,513	4,045,248	4,051,641	4,056,547
4,013,894	4,045,294	4,051,645	4,056,567
4,017,526	4,045,378	4,051,670	4,056,573
4,017,623	4,045,419	4,051,677	4,056,637
4,017,646	4,045,667	4,051,708	4,056,658
4,017,746	4,045,738	4,051,762	4,056,847
4,019,039	4,045,780	4,051,805	4,056,854
4,020,271	4,045,833	4,052,043	4,056,975
4,021,365	4,045,972	4,052,178	4,056,988
4,025,400	4,045,994	4,052,244	4,057,003
4,027,019	4,045,995	4,052,527	4,057,082
4,027,104	4,046,132	4,052,594	4,057,135
4,027,203	4,046,181	4,052,628	4,057,143
4,028,932	4,046,488	4,052,692	4,057,171
4,029,882	4,046,545	4,052,717	4,057,236
4,030,372	4,046,859	4,052,751	4,057,337
4,032,621	4,046,885	4,053,101	4,057,445
4,033,279	4,047,119	4,053,130	4,057,782
4,033,519	4,047,156	4,053,236	4,058,102
4,034,642	4,047,411	4,053,252	4,058,266
4,034,959	4,047,441	4,053,347	4,058,268
4,035,112	4,047,454	4,053,544	4,058,310
4,035,318	4,047,531	4,053,613	4,058,327
4,036,082	4,047,619	4,053,618	4,064,577
4,036,864	4,047,906	4,053,632	

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 28, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-9-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	8-17-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	7-15-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	1-10-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	3-7-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	12-10-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	8-3-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	2-7-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	6-21-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-3-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	5-6-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-3-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	5-16-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	1-3-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-6-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures: Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	4-26-77

Expiration of patents: The patents within the range of numbers indicated below expire during January 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,966,681 to 2,970,312, inclusive
Plant Patents..... Numbers 2,009 to 2,018, inclusive

REISSUES

FEBRUARY 21, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,541

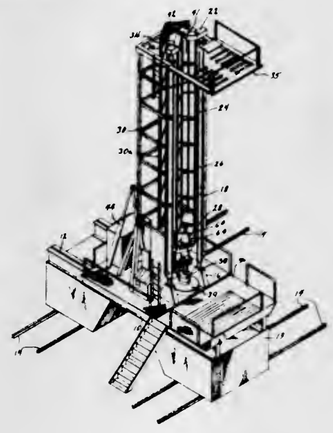
HYDRAULIC DRILLING RIG AND POWER SWIVEL

Duane K. Russell, Bothell, Wash., assignor to Western Gear Corporation, Everett, Wash.

Original No. 3,949,818, dated Apr. 13, 1976, Ser. No. 510,378, Sept. 30, 1974. Application for reissue Nov. 16, 1976, Ser. No. 742,278

Int. Cl.[2] E21B *19/14*

U.S. Cl. 175—52 **25 Claims**



15. The method of moving pipe in an earth-working operation including connecting pipe sections to a power swivel by threadably joining the sections to a rotary driven stem assembly of the power swivel and alternately tripping lengthy, connected pipe sections from the earth, the improvement comprising:

removing the rotary driven stem assembly from the power swivel, leaving a central passage; and

moving the pipe and the power swivel axially relative to each other for removal of the pipe from the earth by causing the pipe to move through said central passage.

Re. 29,542

POWER APPARATUS FOR TRUCK LOADING ELEVATOR

Lawrence I. Richards, Elk Grove Village, Ill., assignor to Autoquip Corporation, Chicago, Ill.

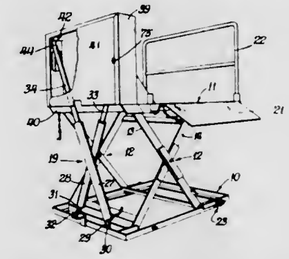
Original No. 3,880,259, dated Apr. 29, 1975, Ser. No. 331,641, Feb. 12, 1973. Application for reissue July 12, 1976, Ser. No. 704,476

Int. Cl.[2] B66B *11/04*

U.S. Cl. 187—18 **7 Claims**

8. In an apparatus such as a dock lift or the like and for use with a source of hydraulic fluid under pressure, said apparatus comprising a frame having two sides and two ends, a vertically movable platform device above the frame and also having two corresponding sides and two corresponding ends, two pair of scissors means respectively connecting opposite sides of the frame and platform device, and power means at one end of the frame and connecting the frame and platform device for vertically moving the platform device with respect to the frame, the improvement comprising:

said power means comprising two hydraulic cylinders each cylinder having a closed end, a piston rod extending from the other end of the cylinder and connecting members on the closed end and the distal end of the piston rod, one of said cylinders having one member thereof pivotally secured to the frame at one side and the second member thereof pivotally secured to the platform device at the other side, the other of said cylinders having one member thereof pivotally secured to the frame at said other side and the second member thereof pivotally secured to the platform device at said one side, each cylinder having a first hydraulic connection adjacent the closed end thereof and a second hydraulic connection adjacent the other end thereof, said power means including two hydraulic fluid conduits, one of said conduits communicating with the first connection of one cylinder and the second connection of the other cylinder to provide fluid communication therebetween, the other of said conduits communicating with the second connection of said one cylinder and the first connection of said other cylinder to provide fluid communication



therebetween, fluid supply line means through which hydraulic fluid flows from said source when said platform device is to be raised and through which hydraulic fluid returns from said cylinders when said platform device is to be lowered, and means connecting the fluid supply line means and said conduits for preventing hydraulic fluid from flowing from said one of said conduits to said other of said conduits when the platform device is not being raised or lowered, whereby a load imposed on said platform at a first side thereof will push down on the hydraulic cylinder connected to said first side of the platform which hydraulic cylinder will in turn act through the respective communication to energize the other hydraulic cylinder to apply a downward pulling force on the other side of the platform.

Re. 29,543

ELEVATOR CONTROL SYSTEM

William Frank Glaser, Eastchester, N.Y., assignor to Otis Elevator Company, New York, N.Y.

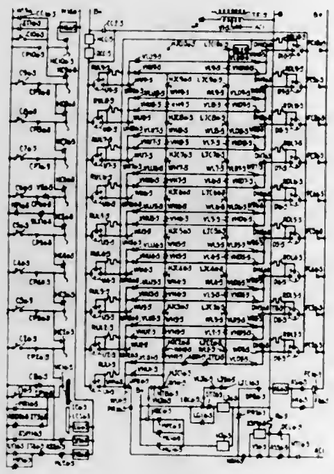
Original No. 3,412,826, dated Nov. 26, 1968, Ser. No. 249,977, Jan. 3, 1963. Continuation of Ser. No. 92,549, Nov. 24, 1970, which is a continuation of Ser. No. 304,163, Aug. 13, 1952, abandoned. Application for reissue Nov. 12, 1975, Ser. No. 631,288

Int. Cl.[2] B66B *1/18*

U.S. Cl. 187—29 R **43 Claims**

33. In an elevator control system, in combination, a plurality of cars arranged to serve a plurality of floors, means for registering calls for service, means for each car for stopping the car at floors at which calls are registered, a sensing circuit comprising unilateral conducting devices corresponding to the path of the cars, a source of power having a first and a return lead, means for energizing the sensing circuit from the first lead at points corresponding to registered calls, said sensing circuit in response thereto conducting current in two directions for calls registered at floors intermediate the terminal floors, said two directions corresponding to both directions in which a car can travel from said intermediate floors, current responsive means connected to the sensing circuit and to

the return lead arranged to shunt current from said circuit at points corresponding to the car positions, and car starting means



actuated by said current responsive, means for starting said car in response to current shunted from said circuit.

Re. 29,544

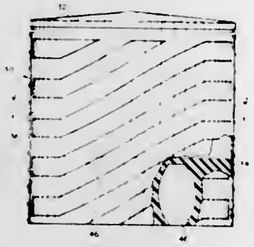
ENERGY ABSORBING DECELERATION BARRIERS

John C. Fitch, Lakeville, Conn., assignor to Energy Absorption Systems, Inc., Chicago, Ill.

Original No. 3,606,258, dated Sept. 20, 1971, Ser. No. 788,890, Jan. 2, 1969. Continuation-in-part of Ser. No. 665,359, Sept. 5, 1967, abandoned. Application for reissue Dec. 6, 1976, Ser. No. 748,122

Int. Cl.² E01F *15/00*

U.S. Cl. 256—13.1 **11 Claims**



1. Sacrificial inertial barrier apparatus for decelerating a vehicle as it approaches a hazardous area comprising at least one frangible barrier unit adapted to be positioned in the path of said vehicle in a manner to be substantially freely displaceable upon impact by said vehicle, at least the upper portion of said unit comprising a dispersible mass of predetermined density and said unit having a lower light-weight collapsible support portion, the density of said lower support portion being appreciably below said predetermined density, the mass and density of said upper portion of said unit being so related to the mass and density of said lower support portion as to dispose the center of gravity of said barrier units substantially at the level of the center of gravity of said vehicle *when said barrier unit is in a static state prior to impact as well as during the incidence of impact* whereby upon impact the inertia of the dispersible mass decelerates the vehicle without imparting a substantial vertical moment to the vehicle.

Re. 29,545

CLOSURE COUNTERBALANCE

Robert J. Deisenroth, Durango, Colo., assignor to Excel Industries, Inc., Elkhart, Ind.

Original No. 3,797,817, dated Mar. 19, 1974, Ser. No. 265,334, June 22, 1972. Application for reissue Feb. 19, 1976, Ser. No. 659,203

Int. Cl.² F16F *3/04*

U.S. Cl. 267—71 **13 Claims**



1. A counterbalance for a movable closure on a structure, comprising first and second tubular members telescopingly connected together in sliding relationship, each of said members having abutment structure at the outer end thereof, a compression coil spring within said members, the end of said spring pressing against said abutment structures thereby urging said tubular members apart, the outer diameter of said spring being less than the inner diameter of either of the tubular members, an elongated wooden rod within said tubular members in engagement at one end with the abutment structure of one of said members and extending into said spring in sliding contact therewith to guide same, said wooden rod terminating short of the abutment structure of the other of said tubular members when said tubular members are telescoped together.

Re. 29,546

DRIP LEVEL IRRIGATION

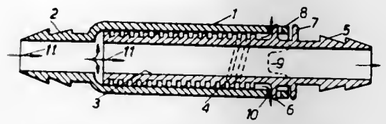
Symcha Blass, Tel Aviv, Israel, and Ishajahu Blass, 26 Maneh Street, Tel Aviv, Israel, assignors to Ishajahu Blass, Tel Aviv, Israel

Original No. 3,604,728, dated Sept. 14, 1971, Ser. No. 861,123, Sept. 25, 1969. Application for reissue Sept. 12, 1973, Ser. No. 396,948

Claims priority, application Australia, Jan. 3, 1969, 48630/69

Int. Cl.² F16L *55/00*

U.S. Cl. 285—14 **11 Claims**



1. An irrigation dripper unit to connect adjacent pipeline sections, comprising an outer tubular member and an inner tubular member, each having first and second opposite end portions, said inner tubular member being axially slidable into said outer tubular member, means retaining said inner tubular member within the outer tubular member, the first end portion of the outer tubular member being disposed adjacent and projecting beyond the second end portion of the inner tubular member, the first end portion of the inner tubular member being disposed adjacent and projecting beyond the second end portion of the outer tubular member, said first end portions of said tubular members serving to connect adjacent pipeline sections, a continuous elongated helical groove formed in the surface of one of the tubular members and defining a continuous conduit with respect to the contiguous surface of the other tubular member, one end of said helical conduit being disposed adjacent the second end portion of the inner tubular member and defining an inlet communicating with the interior of said inner tubular member, at least one port defining an outlet formed in said unit adjacent to and communicating with the opposite end of the helical conduit and the exterior of said unit whereby said conduit defines a continuously open path to the

exterior of the unit, for flow of a portion of the fluid that may be flowing through the interior of said inner tubular member.

Re. 29,547

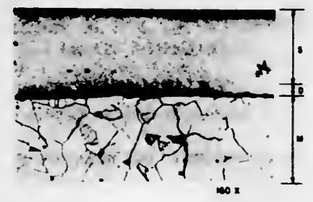
NICKEL SILICON AND REFRACTORY METAL ALLOY

William Harrison Severns, Jr., Wilmington, Del., and Gaylord Darrel Smith, Mountainside, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Original No. 3,361,560, dated Jan. 2, 1968, Ser. No. 543,651, Apr. 19, 1966. Continuation-in-part of Ser. No. 269,818, April 1, 1963, Pat. No. 3,257,178. Application for reissue Aug. 16, 1974, Ser. No. 498,229

Int. Cl.² C22C *19/00*

U.S. Cl. 148—32 **20 Claims**



14. An alloy consisting essentially of a substantial amount of at least one metal A and a substantial amount of cobalt, and silicon, metal A being selected from the group consisting of molybdenum and tungsten; the sum of the amounts of metal A and cobalt being at least 60 atomic percent of the alloy; the amount of silicon and the relative amounts of metal A and cobalt being such as to provide 30–85 volume percent of said alloy in the Laves phase; said Laves phase being distributed in a relatively soft matrix of the remaining 70–15 percent of said alloy.

Re. 29,548

JOINT SEALANT COMPOSITION

Dana C. Payne, Alameda, and Jack L. Chandler, Hayward, both of Calif., assignors to Superior Products Company, Inc., Sparks, Nev.

Original No. 3,549,575, dated Dec. 22, 1970, Ser. No. 819,415, Apr. 25, 1969. Continuation-in-part of Ser. No. 535,004, March 17, 1966, abandoned. Application for reissue May 10, 1976, Ser. No. 684,751

Int. Cl.² C08L *91/00*

U.S. Cl. 260—28.5 AS **13 Claims**

1. A single component liquid hot pour type joint sealant composition comprising, about 2 to 25% vinyl chloride resin, and a liquid coal tar pitch component consisting essentially of a pitch fraction having a boiling point of between about 355° C. and about 450° C.

Re. 29,549

PACKAGE FOR ENCAPSULATED ELECTRICAL COMPONENTS

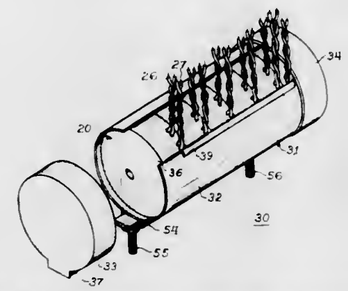
Joseph T. Charles, Arlington Heights, Ill., assignor to Coil Sales & Manufacturing Company, Rolling Meadows, Ill.

Original No. 3,691,294, dated Sept. 12, 1972, Ser. No. 78,630, Oct. 5, 1970. Continuation-in-part of Ser. No. 877,384, Nov. 17, 1969, abandoned. Application for reissue Jan. 7, 1974, Ser. No. 431,365

Int. Cl.² H01F *17/08, 15/02, 27/04*

U.S. Cl. 178—46 **12 Claims**

1. A package for encasing a plurality of encapsulated electrical components each having at least a pair of leads, comprising: an elongated hollow case adapted to receive a plurality of said electrical components in an end-to-end relation, said case having a continuous slot extending along a first line parallel to the longitudinal axis of said case between its enclosed ends for passing said leads to the outside of said case and having means for permitting removal of individual electrical components from said case, and means on the outside of said case for mounting the package, said mounting means disposed along a second line parallel to the longitudinal axis of said case and offset from a plane passing through said first line and the longitudinal axis of said case, said mounting means including a guide track and at least a pair of mounting studs having an enlarged head slidably supported in said guide track, said mounting studs including a locking nut for locking said studs in place.



Re. 29,550

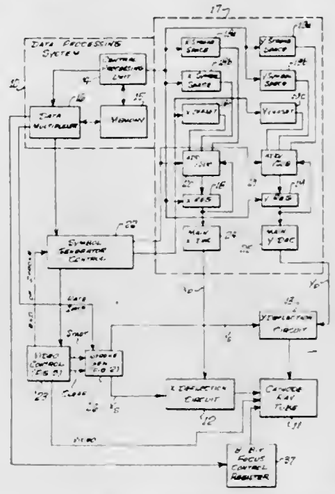
GRAPHIC SYMBOL GENERATOR

John A. Bantner, Los Angeles, Calif., assignor to Information International Inc., Los Angeles, Calif.

Original No. 3,946,365, dated Mar. 23, 1976, Ser. No. 424,220, Dec. 13, 1973. Application for reissue Aug. 12, 1976, Ser. No. 713,667

Int. Cl.² G06F *15/20, 3/14*; B41B *19/14*

U.S. Cl. 364—900 **16 Claims**



17. Apparatus employing a cathode ray tube for displaying lines of graphic symbols by displaying parallel line segments using the electron beam of the cathode ray tube having deflection circuits connected to a data processing system which stores in digital form control data for generation of symbols to be displayed on a baseline, including data which defines the starting point of said baseline for said line of graphic symbols in a fixed Cartesian coordinate system, comprising

analog deflection control means responsive to digital signals for producing analog deflection control signals X_p and Y_p for said beam in said Cartesian coordinate system,

X and Y registers for storing digital values for said analog deflection control means, said digital values being provided as a line starting point by said data processing system for each line of symbols,

a pair of digital means for adding and subtracting deflection control values to the contents of said respective X and Y registers,

means responsive to data from said data processing system for generating stroke signals X_1 and Y_1 applied to said respective X and Y deflection control means for each successive stroke,

means responsive to data from said data processing system for generating a video control signal to blank and unblank said cathode ray beam during each stroke to produce said parallel line segments,

a plurality of spacing registers associated in pairs, one of each pair for a different axis of said Cartesian coordinate system for storing line segment spacing data, a first pair for storing stroke spacing data, a second pair for storing symbol spacing data and a third set for storing baseline offset data for each stroke of each symbol, said offset data providing not only stroke offset in a direction normal to said baseline for symbols that extend below said baseline, but also stroke offset in a direction parallel to said baseline for symbols that are slanted with respect to said baseline, all of said paired registers being conneced to said pair of digital means for adding and subtracting deflection control values,

means responsive to control of said data processing system for updating the contents of said X and Y registers and said paired spacing registers, and

means responsive to control of said data processing system for adding the contents of respective ones of a pair of spacing data registers to said X and Y registers during the course of displaying a line of symbols by generating on the face of said cathode ray tube a sequence of symbols with respect to an imaginary line coincident with said baseline and anywhere on said face with any orientation in respect to said fixed Cartesian coordinate system.

PLANT PATENTS

GRANTED FEBRUARY 21, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,216
AFRICAN VIOLET PLANT

Reinhold Holtkamp, Wertherstrasse 112, 4294 Isselburg, Germany

Filed Nov. 30, 1976, Ser. No. 746,192
Int. Cl.[2] A01H 5/00
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet known by the cultivar name Maryland and characterized particularly as to uniqueness by the combined characteristics of large star-shaped flowers which are medium blue in flower color and non-dropping; generally round, medium green foliage; erect, upright and strong flower stems; compact growth habit; continuous flowering and very uniform first flowering, approximately 6–7 weeks after potting.

4,217
CHRYSANTHEMUM PLANT

John Robert Culbert, Monticello, Ill., assignor to University of Illinois Foundation, Urbana, Ill.

Filed Mar. 3, 1977, Ser. No. 773,978
Int. Cl.[2] A01H 5/00
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of chrysanthemum plant substantially as herein shown and described, characterized particularly as to novelty by anemone type flowers consisting of white spooned ray florets loosely arranged in 1 to 2 concentric rows about the yellow cushion of disc florets which results in the dainty, airy, bicolor appearance of the flowers, by the slow development of the flowers which remain attractive from their youngest open stage past full maturity resulting in long "shelf life", by the versatile nature of the flowers in that they may be grown either disbudded for increased size or in sprays for increased production of smaller flowers, by flower buds which develop normally in from 7½ to 9 weeks from start of initiation throughout the year, and by strong, leafy plants which average 3 to 5 breaks per pinched plant making a showy display of 3½" to 4" disbudded flowers or of 2" to 3" flowers borne in sprays.

PATENTS

GRANTED FEBRUARY 21, 1978

ERRATA

For CLASS	See PATENT NO.
126–276	4,074,704
126–271	4,074,705
126–271	4,074,706
126–343.5 A	4,074,707
126–360 A	4,074,708
128–002 A	4,074,709
128–002.05 P	4,074,710
128–002.05 A	4,074,711
128–079	4,074,712
128–92 C	4,074,713
128–218 P	4,074,714
128–218 P	4,074,715
128–287	4,074,716
128–303.1	4,074,717
128–303.14	4,074,718
128–303.1	4,074,720
128–461	4,074,721
131–008 R	4,074,722
131–198 R	4,074,723
131–267	4,074,724
366–007	4,074,894
418–068	4,074,954
062–128	4,074,987
206–546	4,075,078
544–018	4,075,203
560–073	4,075,241
560–190	4,075,242
260–876 B	4,075,285
260–877	4,075,286
260–878	4,075,287
260–879	4,075,288
260–890	4,075,289
260–897 A	4,075,290
260–933	4,075,291
260–986	4,075,292
261–020	4,075,293
261–034 A	4,075,294
261–036 R	4,075,295
261–041 D	4,075,296
261–104	4,075,297
261–114 TC	4,075,298
264–25	4,075,299
264–032	4,075,300
264–040.7	4,075,301
264–043	4,075,302

ERRATA—continued

264–044	4,075,303
264–046.5	4,075,304
429–161	4,075,368
235–420	4,075,460
235–466	4,075,461
235–302.3	4,075,466
362–031	4,075,467
362–072	4,075,469
362–287	4,075,470
362–300	4,075,471
362–255	4,075,472
256–013.1	4,075,473
315–209	4,075,476
365–154	4,075,609
365–107	4,075,610
365–002	4,075,611
365–171	4,075,612
365–087	4,075,613
364–200	4,075,679
365–156	4,075,690

PATENTS

GRANTED FEBRUARY 21, 1978

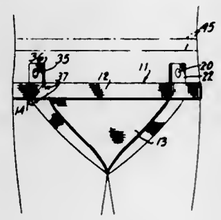
GENERAL AND MECHANICAL

4,074,364

HOLD-DOWN DEVICE FOR SHIRTS AND THE LIKE

Gerald N. Lucero, 4161 E. Mission, No. 17, Pomona, Calif. 91766

Filed June 7, 1976, Ser. No. 693,340
Int. Cl.² A41B *3/04*
U.S. Cl. 2—117 **6 Claims**



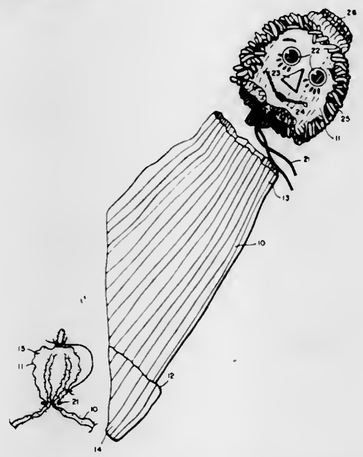
1. A hold-down device for a shirt comprising
an elastic hipband for surrounding the hips of a wearer,
front and rear elastic fabric flaps secured to said hipband,
said flaps converging downwardly to fit the crotch of said wearer,
means attaching the lower ends of said flaps together,
upstanding tabs attached to said hipband and spaced therealong, and means for removably attaching the lower portion of said shirt to said tabs.

4,074,365

CAP AND METHOD OF MANUFACTURE

Walter E. Schuessler, 800 Redbud Lane, Wilmette, Ill. 60091, and Richard D. Schuessler, 142 Abingdon, Kenilworth, Ill. 60043

Filed Jan. 28, 1977, Ser. No. 762,658
Int. Cl.² A42B *1/04*
U.S. Cl. 2—201 **9 Claims**



1. A cap comprising a knitted tubular head portion having an open lower end adapted to fit over the head of a wearer and an upper end, a bag-like top portion having an opening forming a pocket therein, the upper end of the head portion extending through the opening into the pocket of the top portion, and constricting means extending around the opening of the top portion for constricting the opening about the head portion.

4,074,366

POLY(N-ACETYL-D-GLUCOSAMINE) PRODUCTS

Richard Carl Capozza, Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 558,525, March 14, 1975, Pat. No. 3,989,535, which is a division of Ser. No. 441,717, Feb. 11, 1974, abandoned, which is a division of Ser. No. 558,526, March 14, 1975, Pat. No. 3,988,411. This application July 22, 1976, Ser. No. 707,912
Int. Cl.² A61F *1/00*
U.S. Cl. 3—1 **3 Claims**

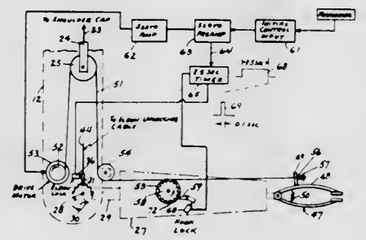
1. A surgical prosthesis comprising non-absorbable filaments shaped as a living tissue reinforcing element, and mixed with and coacting with said non-absorbable filaments, in at least a part of the element, a structure consisting essentially of poly(N-acetyl-D-glucosamine), whereby on implantation in living tissue, the poly(N-acetyl-D-glucosamine) is absorbed by the living tissue which replaces the poly(N-acetyl-D-glucosamine) and interlocks with the non-absorbable filaments, said prosthesis being sterile at time of implantation.

4,074,367

PROSTHETIC LOAD-LIFT HOOK LOCKING MECHANISM

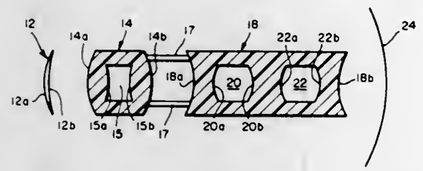
John H. Loveless, Silver Spring, Md., assignor to The United States of America as represented by the Administrator of Veterans' Affairs, Washington, D.C.

Filed Sept. 16, 1976, Ser. No. 724,062
Int. Cl.² A61F *1/00, 1/06*
U.S. Cl. 3—1.1 **7 Claims**



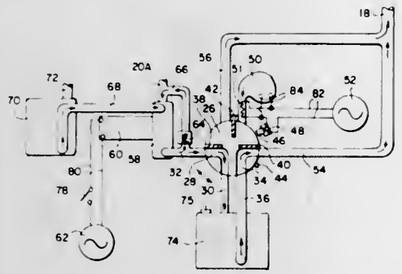
1. In an artificial limb unit, an upper arm portion, a forearm member pivoted to said upper arm portion to define an elbow joint, a terminal device on the end of said forearm member, a drive motor on said upper arm portion, means to energize said motor, power transmission means drivingly interconnecting said motor, forearm member and terminal device for elevating said forearm member, and means on said forearm member locking said terminal device while the forearm member is being elevated by said motor; said power transmission means comprising a cable and pulley system operatively coupling said motor, forearm member and terminal device; said cable and pulley system including a cable portion extending along said forearm member toward said terminal device and being operatively connected to said terminal device; and said means locking the terminal device comprising means locking said cable portion against movement while the forearm member is being elevated, which comprises a ratchet wheel journalled on said forearm member, means coupling said cable portion to said ratchet wheel, movable pawl means on the forearm member lockingly engageable with said ratchet wheel, and pawl operating means for lockingly engaging said pawl means with said ratchet wheel during the elevation of said forearm member.

4,074,368
INTRAOCULAR LENS WITH HIGH MAGNIFICATION
Chauncey F. Levy, Jr., 1299 Portland Ave., Rochester, N.Y. 14621, and Richard J. Pegis, Rochester, N.Y., assignors to said Chauncey F. Levy, Jr., by said Richard J. Pegis
Filed Sept. 8, 1976, Ser. No. 721,198
Int. Cl.[2] A61F 1/16, 1/24
U.S. Cl. 3—13 8 Claims



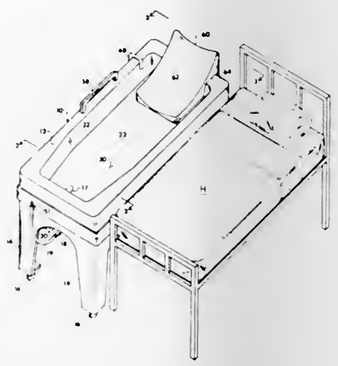
1. An intraocular lens system comprising a body of a transparent material of a size and shape for implantation in the human eye and having front and rear surfaces, said body including a plurality of transparent bubbles completely enclosed therein and optically in tandem along the length thereof, the transverse internal surfaces of said body that define the front and rear boundaries of said bubbles being optically curved for refracting light passing lengthwise through said body and said bubbles between the front and rear surfaces of said body, the boundaries of a bubble adjacent to the front surface being curved for positive refraction of light and the boundaries of a bubble adjacent to the rear surface being curved for negative refraction.

4,074,369
SHAMPOOING UNIT
Flossie G. Harmon, 3109 N. 15th St., Philadelphia, Pa. 19132
Filed July 8, 1976, Ser. No. 703,690
Int. Cl.[2] A61H 35/00
U.S. Cl. 4—159 4 Claims



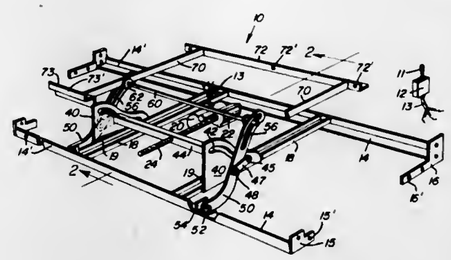
1. A portable shampooing unit comprising lightweight flexible hood means, sealing means extending around the opening in said hood for holding said hood to the scalp area of the head of a person and substantially preventing leakage of air, shampoo and water from said hood when said hood is in position, flexible manifold means in said hood, first conduit means leading into said manifold opening means in said manifold to provide fluids adjacent the scalp area of a person wearing said hood, second conduit means leading out of said hood for venting said hood of liquid or air, water supply means operatively connected to water pump means, shampoo supply means, air pump means and first valve means, said first valve means being movable into a first position for operatively connecting the discharge end of said water pump and said shampoo supply with said first conduit, said first valve being movable into a second position for operatively connecting the discharge end of said water pump with said first conduit, said first valve being movable into a third position for operatively connecting the discharge end of said air pump with said first conduit, said first valve means comprises a rotary valve having first channel means and second channel means simultaneously movable therein, said first valve operatively connected to said first conduit through third conduit means and fourth conduit means leading from said first valve into said first conduit, said first valve being rotatable into a first position for operatively connecting said pump and the inlet end of said shampoo supply through said first channel and simultaneously connecting said second channel with the outlet end of said shampoo supply and said fourth conduit, said first valve movable into a second position for operatively connecting the outlet end of said pump and said third conduit through said first channel, said first valve movable into a third position for connecting the outlet of said air pump to said first conduit through one of said first channel means and said second channel means, and one of said third conduit means and said fourth conduit means, means for preventing said first channel and said second channel from being rotated to operatively connect the outlet of said water pump with the outlet of said air pump, second valve means movable into a first position for operatively connecting said second conduit to the influent end of said water pump, said second valve being movable into a second position for discharging fluids from said second conduit whereby shampoo and water can be delivered under pressure to said manifold through said first conduit and provide an agitating action in said hood after which said shampoo or water may be recirculated through said second conduit into said pump to provide efficient use of shampoo or rinse water after which such shampoo or rinse water may be discharged and an air stream for drying hair can be introduced into the hood and vented from the hood.

4,074,370
BATHING APPARATUS FOR HOSPITAL OR BEDRIDDEN PATIENTS
George W. Harmony, III, Marion, Va., assignor to Mediglas, Inc., Charlotte, N.C.
Filed Apr. 2, 1976, Ser. No. 673,290
Int. Cl.[2] A47K 3/0, 3/022
U.S. Cl. 4—173 R 5 Claims



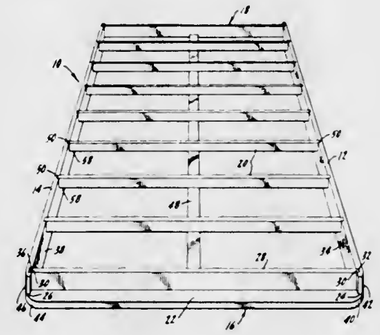
1. A portable institutional bathing apparatus for use beside a hospital bed comprising:
a. a tub portion including:
i. a molded bathing chamber formed of a strong, lightweight, moldable material covered with a gel coating and having a bottom wall and a relatively shallow side and end walls;
ii. a skirt substantially surrounding said molded bathing chamber and depending from the upper edge of said side and end walls and extending downwardly a distance greater than the depth of said side and end walls;
iii. a reinforcing plate secured to and extending between the opposite sides and ends of said skirt in supporting relation to the undersurface of said bottom wall;
b. a leg frame attached to and supporting said tub portion and including a plurality of legs with casters at the lower extremities thereof;
c. a drain opening in said bottom wall in communication with a drain conduit means, and a pump in operative communication with said drain conduit for depositing drain water where desired, even to locations of higher elevation; and
d. an extensible fill hose means separate from said drain conduit means and mounted on said apparatus having an outlet into said bathing chamber and means at the opposite end for connection to conventional available faucets, whereby fill water is introduced directly from institutional plumbing into said bathing chamber.

4,074,371
MOTORIZED HIDE-A-BED ACTUATING MECHANISM
John L. Lindbloom, Overland Park, Kans., assignor to Christian Services, Inc., Lee's Summit, Mo.
Filed Aug. 4, 1976, Ser. No. 712,608
Int. Cl.[2] A47C 17/14
U.S. Cl. 5—13 5 Claims



1. An actuation apparatus for causing translation of movable portions of a sofa bed and the like between different functional conformations, the apparatus comprising:
a stationary mounting frame connected to stationary portions of the sofa bed;
guide means mounted on the stationary mounting frame on opposite sides thereof, the guide means each having an S-shaped slot formed therein, the slots being aligned;
motor means pivotally mounted on the stationary mounting frame;
screw means driven by the motor means;
cross drive shaft means mounted for driven movement on the screw means;
follower means mounted on each end of the cross drive shaft means, each follower means respectively extending toward the guide means on that side of the stationary mounting frame adjacent said follower means and being slidably received within the slot in said guide means;
link means pivotally connected to the follower means at one end of said link means;
pivot arm means each pivotally mounted at a lower end to the stationary mounting frame adjacent to each of the guide means, the link means being pivotally mounted to each of the pivot arm means medially of the lengths of said pivot arm means, the pivot arm means each having an arcuate slot formed in the upper ends thereof;
cross rod means having follower members at each end thereof, the follower members being slidably received respectively within adjacent arcuate slots in the pivot arm means;
a movable frame mounted to the movable portions of the sofa bed, the cross rod means being connected to the movable frame; and,
switch means for activating the motor means, energization of the motor means driving the screw means to cause the cross drive shaft means to be linearly displaced, the follower means following the S-shaped slots in the guide means to cause the link means and the pivot arm means pivotally connected thereto to be displaced vertically, the cross rod means following the slots in the pivot arm means to displace vertically the movable frame and thus the movable portions of the sofa bed connected thereto.

4,074,372
FOUNDATION UNIT FRAME
Martin Schulz, Jr., Brenham, Tex., assignor to Steadley Company, Inc., Carthage, Mo.
Filed Apr. 9, 1976, Ser. No. 675,472
Int. Cl.[2] A47C 23/04
U.S. Cl. 5—263 7 Claims

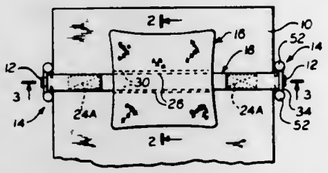


1. A framework structure for a foundation unit including
a. a pair of spaced, elongated parallel side rails oriented with their greatest cross sectional dimension extending generally vertically,
b. a pair of end members extending between said side rails at opposite ends thereof, each of said end members comprising:
i. a base slat extending between said side rails, said base slat being oriented with its greatest cross sectional dimension extending substantially horizontally and being located in a recess excised from each end of each side rail which is shaped to accommodate the base slat, and
ii. an end slat extending between said side rails above said base slat, said end slat being oriented with its greatest cross sectional dimension extending generally vertically and having formed at either end thereof a tenon which matingly engages a conforming mortise excised from each side rail, said tenon being formed in a wedge-shaped, dovetail configuration such that said tenon and said mortise interlock in a tongue and groove fashion,
c. a plurality of cross slat members extending between said side rails intermediate the ends thereof, each of said cross slat members being oriented with its greatest cross sectional dimension extending generally vertically, said greatest cross sectional dimension of the cross slat members being less than the greatest cross sectional dimension of said side rails, and
d. means interlocking each end of said cross slat members internally within said side rails to prevent relative movement therebetween.

4,074,373
SYSTEM FOR ATTACHING PILLOW TO X-RAY TABLE
Frank S. Garofalo, Old Westbury, N.Y., assignor to F. Garofalo Electric Co., Inc., Brooklyn, N.Y.
Filed Feb. 6, 1976, Ser. No. 656,006
Int. Cl.[2] A47C 21/00
U.S. Cl. 5—325 10 Claims

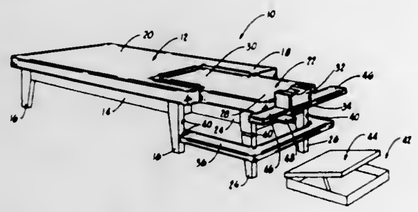
1. A system for attaching a pillow to an X-ray table or the like, including, in combination, a belt for connection with a pillow with which the system is intended to be used, belt

holders for opposite sides of the table, one of the belt holders including means for detachably securing it to one edge of the table and having a surface extending generally transverse of the length of the belt and around which the belt is looped to change the direction in which the belt extends around an angle of approximately 180°, whereby an end portion of the belt extends along a part of the belt between the pillow and the belt holder, and detachable fastening means that connect the end portion of the belt with said part of the belt over which the end



portion extends after being looped around said surface of the belt holder, and characterized by a concave guide with which an end of the belt contacts to lead the end portion of the belt into a loop around said surface of the clamp, the concave guide being a connecting element of generally cylindrical contour and extending for the full length of said surface, the belt holder having a block secured to each end of the connecting element and integral therewith, and a shaft extending between the blocks and having a circumferential surface that constitutes the surface about which the belt is looped.

4,074,374
READING BED
Mark G. Ayesh, 1510 Lane, Apt. B6, Topeka, Kans. 66604
Filed Oct. 18, 1976, Ser. No. 733,243
Int. Cl.² A47C *21/00*
U.S. Cl. 5—327 R **5 Claims**



1. A reading bed for reading for extended periods, the bed comprising:

a padded elongated horizontal body support for supporting the lower portion of the body, said body support mounted on a body support frame having vertical legs attached thereto for supporting said body support thereon;

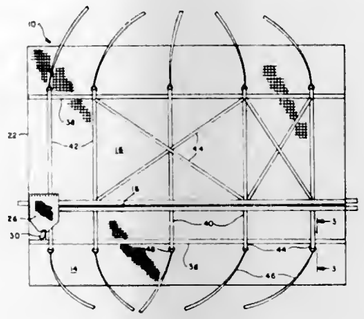
an elongated "T" shaped head board hingeably attached to one end of said body support for supporting the upper portion of the body, said head board mounted on a head board frame having vertical legs attached thereto for supporting said head board thereon;

a head pillow hingeably attached to said head board for supporting the head of the body;

a horizontal "U" shaped adjustable arm support shelf, said shelf attached to said head board frame, and one end of said body support frame for supporting the arms of the body; and

a plurality of parallel horizontal grooves in said vertical legs of said body support frame and said head board frame for receiving a portion of said arm support shelf, by selecting corresponding parallel grooves in said legs, the height of said shelf is adjusted.

4,074,375
UTILITY SECURITY BLANKET
Harry Y. Kella, P.O. Box 483, La Mesa, Calif. 92041
Continuation-in-part of Ser. No. 683,914, May 5, 1976, abandoned. This application Dec. 20, 1976, Ser. No. 752,027
Int. Cl.² A47G *23/00, 9/00*
U.S. Cl. 5—336 **3 Claims**



1. A blanket comprising a simple rectangular single thickness panel of bed clothing material suitable for use as an above-the-body blanket only and having means for easy separation thereof into two discrete portions;

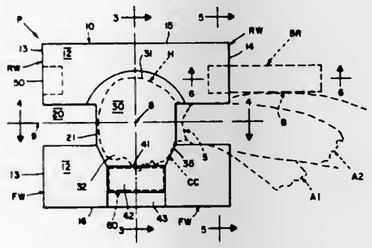
said means being capable of easy re-uniting said portions to reconstitute the blanket;

straps secured to and extending over said blanket with strap extensions at opposite sides of said blanket for securement to a bed frame, whereby the blanket functions as a restraining means;

said strap extensions having means for easy detachment from said straps;

said means for separation into portions being a slide fastener extending along a line effectively from end to end of the blanket and said straps also being discontinuous along said line so that the blanket can be separated into two portions, by an attendant, without untieing said strap extensions.

4,074,376
CONTOURED SECURITY PILLOW
Helen Inez Bond, 19416 Northeast Ave., Battle Ground, Wash. 98604
Filed Mar. 30, 1977, Ser. No. 782,619
Int. Cl.² A47G *9/00*
U.S. Cl. 5—338 **11 Claims**



1. A contoured security pillow adapted to receive one shoulder and a symmetrical side of the head of a hemiside reclining person, said pillow comprising a resiliently compressible pad extending uprightly along a vertical-axis and lengthwise along a longitudinal-axis and said pad including: a top-side, a bottom-side intersecting said vertical axis and adapted to be stably superimposed upon a sleeping bed or similar reclining substrate, and a pair of longitudinally separated upright ends including a left-end and a right-end, and a pair of transversely

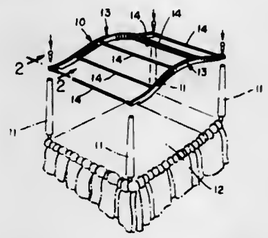
separated upright sides including a front-side and a rear-side, said pad being provided with the following contours:

A. A facerest depending from the pad top-side and surrounding the pad vertical-axis, said facerest including a higher elevation rear-contour portion that slopes gently downwardly toward and merges with a lower front-contour portion;

B. At least one longitudinal channel to accommodate the reclining person's shoulder adjacent his downward facial cheek, said channel having its trailing-end at a pad end and an upright leading-end at the facerest and being located one-third to two-thirds the distance from said pad end to the vertical-axis thereof, said longitudinal channel throughout intersecting the pad top-side and bottom-side and thereby providing a pillow rear-wing and front-wing, said front-wing adjacent the channel leading-end including a chin-restraint portion extending uprightly adjacent the facerest front-contour; and

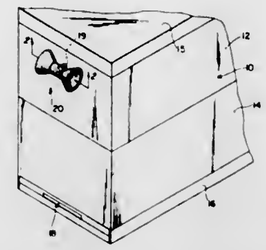
C. A frontal cutaway commencing at the pad front-side and extending transversely rearwardly therefrom and terminating at the facerest front-contour, said frontal cutaway also extending through the pad top-side whereby the directionally forward vision of the hemiside reclining and faceresting pillow user is unobstructed by the pillow frontal parts.

4,074,377
BED CANOPY FRAME
Kenneth H. Gutner, 3285 Dato, Highland Park, Ill. 60035
Filed July 8, 1976, Ser. No. 703,618
Int. Cl.² A47C *29/00*
U.S. Cl. 5—362 **10 Claims**



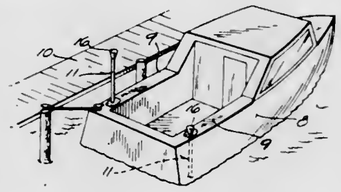
1. A bed canopy frame comprising two longitudinal members and a plurality of lateral members adapted to be interconnected adjacent the ends thereof to said longitudinal members to form a generally rectangular frame, each of said longitudinal members forming an arched side of said frame and being constructed of resilient plastic material and each of said longitudinal members having parallel top and bottom portions with a transverse portion joining said top and bottom portions, said longitudinal members being equipped with a plurality of receptacles for securing the ends of said lateral members in releasably adjustable fashion, each of said receptacles being a block integral with said transverse portion of an associated longitudinal member, said transverse portion and said block having a bore therethrough for receiving the end of an associated lateral member, said lateral members being rods and said bores being of circular cross-section with a diameter no greater than the diameter of said rods, and slot means in said blocks communicating with said bores to permit bore enlargement upon receipt of said rods.

4,074,378
AIR VENTILATOR FOR BEEHIVES
Vladimir Shaparew, R.R. No. 1, Oakville, Ontario, Canada (L6J 4Z2)
Filed Nov. 10, 1976, Ser. No. 740,744
Int. Cl.² A01K *47/06*
U.S. Cl. 6—1 **3 Claims**



1. In combination, a hive for bees including a entrance opening for the bees and a ventilation aperture located in an upper portion of a side wall of the hive remote from and above the entrance opening so as to provide ventilation through natural air convection, and air ventilator means, mounted on the hive in communication with said ventilation aperture, for, responsive to air movement externally thereof, creating suction adjacent to said ventilation aperture so as to draw air out of said hive, and for preventing direct air flow into said ventilation aperture, said air ventilator means comprises means defining a first air passage perpendicular to the plane of the side wall in which said ventilation aperture is located and in communication with said ventilation aperture and means defining a second air passage extending transverse to said first air passage and in communication with said first air passage, said second air passage being in communication with said first air passage at a central location thereof intermediate the end portions thereof and the cross section of the end protions of said second air passage being larger than that of said central portion thereof.

4,074,379
BOARDING HANDLE FOR BOATS
Leroy W. Grossman, 74 Palm Club, Pompano Beach, Fla. 33062; Jack Collins, and E. Eugene Kohls, both of Milwaukee, Wis., assignors to Leroy W. Grossman, Pompano Beach, Fla.
Filed May 4, 1977, Ser. No. 793,746
Int. Cl.² B63B *17/00*
U.S. Cl. 9—1.6 **11 Claims**



1. A boarding handle securable to the gunwale of a boat to facilitate boarding and leaving the boat, comprising:

A. inner and outer substantially rigid telescoped tubes which when unrestrained are freely axially slidable relative to one another;

B. mounting means at one end of the outer tube by which it, and hence the entire handle, is securable to the gunwale of a boat with its axis substantially perpendicular to the gunwale and with the telescoped tubes projecting down through a hole in the gunwale into the space therebeneath, so that the inner tube may be moved between a lowered inoperative position substantially entirely below the

gunwale in which position only its upper end is accessible from above the gunwale, and a raised operative position projecting up from the gunwale;

C. means by which the raised operative position of the inner tube is defined, said last named means comprising

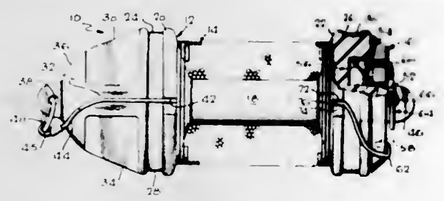
(1) latch means yieldingly projecting from the external surface of the inner tube, and

(2) keeper means fixed with respect to the outer tube to receive said latch means and thereby hold the inner tube against axial movement in either direction with respect to the outer tube,

said keeper means being positioned adjacent to said mounting means and so located with respect thereto as to be above the gunwale when the handle is secured thereto; and

D. manually operable means by which said latch means may be disengaged from the keeper means to free the inner tube for axial movement with respect to the outer tube.

4,074,380
RECOVERY BUOY
David H. Parker, 336 Via Pasqual, Redondo Beach, Calif. 90277
Filed Jan. 31, 1977, Ser. No. 763,871
Int. Cl.² B63B *21/52, 51/02*
U.S. Cl. 9—8 R **20 Claims**



1. A recovery and marker buoy, comprising:

an enlongated body of buoyant material having axially opposite ends;

a first flange member at one of said ends;

a second flange member at the second one of said ends;

a cylindrical central spindle intermediate said first and second flange members, said flange members including opposed frusto-conical surfaces interconnecting said flange members with said spindle;

a location indicating head formed integrally with said first flange member on the axis of said body;

a weight associated with said second flange member on the axis of said body;

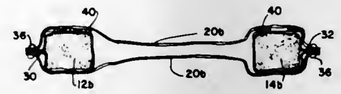
clamp means for detachably mounting said weight on said second flange member and being coupled to said weight;

a line wound around said central spindle and having a first end, and a second end, said second end extending through said weight, in looped fashion, and being secured to said clamp means to securely retain said weight on the line second end upon detachment of said clamp means from said second flange member and dislodgement of said weight therefrom; and

means for securing said first end of said line to said location indicating head and

means for detachably mounting said weight to said second flange, whereby upon release of said weight from said second flange member and said body, anchoring of said weight at a selected location beneath water level may be effected and said line unreels from said central spindle under the buoyant force of said body, enabling the latter to freely float to the surface of the water, in which condition said location indicating head, upon surfacing, is operable to mark a location.

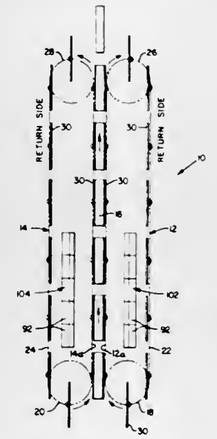
4,074,381
WATER SCOOTER
Ann T. Patton, 3042 Holdridge, Waukegan, Ill. 60085; Betty Ann Roscetti, 738 W. Wrightwood No. 1, Chicago, Ill. 60614, and Lisa Held, 3042 Hildridge, Waukegan, Ill. 60085
Filed Aug. 9, 1976, Ser. No. 713,016
Int. Cl.² A63B *31/00*
U.S. Cl. 9—310 J **1 Claim**



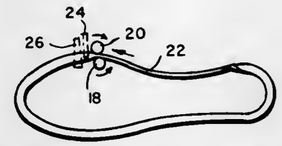
1. A swimming aid and water scooter apparatus comprising a pair of elongated flexibly and resiliently disposed flotation elements spatially disposed apart in general parallel relation at a distance measured by the transverse dimension of the body to use the apparatus, a sheet of waterproof canvas or plastic provided to over-wrap the pair of flotation elements to comprise a completed loop structure about said pair of flotation elements, and a selective arrangement of a plurality of grommets placed securely through the sheet into the adjacent portion of the flotation element to fix the loop structure about the flotation elements, the loop structure being provided with using to add resistance to the sheet so that the body is less likely to slide off the apparatus, the length of the apparatus being between one and three times of the distance the flotation elements are apart, the flotation elements being of soft, pliable, buoyant foam material covered with nylon reinforced waterproof canvas, and each of the flotation elements being constructed along a side thereof to provide an attachment strip to which the grommets are secured in rows along the length dimension of said attachment strip, said sheet of the apparatus is provideed with a slightly longer dimension of sheet on a top than on a bottom side to provide a body-receiving-surface when the apparatus is to be used, the ends of the flotation elements are covered with said nylon reinforced waterproof canvas, a Velcro fastening means is disposed on mating surfaces between the flotation elements and the sheet to provide a securing means and a cushioning means for the body using the apparatus, and a top loop of said sheet forms a hammock forming means for the body as the apparatus is used as an improved water scooter and design in serving to facilitate sensory motor integration for a user.

4,074,382
HEATING APPARATUS FOR BOOK FORMING AND CREASING IRONS
Anthony Ferdinand Palme, Avon, and Daniel Inott Streeter, Glastonbury, both of Conn., assignors to The Smyth Manufacturing Company, Bloomfield, Conn.
Filed Sept. 28, 1976, Ser. No. 727,433
Int. Cl.² B42C *19/00*
U.S. Cl. 11—1 CP **7 Claims**

1. A book forming apparatus comprising first and second endless loop carriages, means supporting the carriages for continuous synchronized movement, the carriages each having a working side, a return side and a series of book hinge creasing iron means supported on each carriage, the working sides of the carriages defining a book flow path therebetween with the creasing iron means supported for movement by their respective carriages along their working sides being in parallel spaced confronting relation for receiving and transporting a book along said book flow path between each corresponding pair of creasing iron means, and first and second stationary heating means fixed in position for heating the creasing iron means of the carriages upon movement of said creasing iron means along their respective return side upstream of their respective working side for applying a hinge crease to a book with the assistance of heat each of said first and second heating means including a separate control means for selectively varying the energy produced and for heating the creasing iron means to a desired temperature prior to its passage into the book flow path.



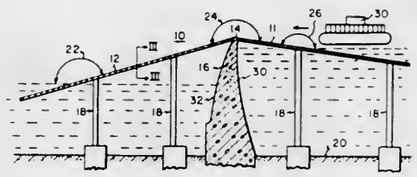
4,074,383
LASTING MACHINE WITH LATEX ADHESIVE DELIVERY
Martin Kaplan, Lexington, and Joseph V. Tassone, Milford, both of Mass., assignors to Compo Industries, Inc., Waltham, Mass.
Filed Mar. 17, 1977, Ser. No. 778,504
Int. Cl.² A43D *21/00*
U.S. Cl. 12—145 **23 Claims**



1. The method of adhesively attaching the lasting margin of an upper to the latex-receptive bottom of a shoe with latex comprising progressively and uninterruptedly stretching successive increments of the lasting margin perpendicular to the bottom with the aid of a pair of oppositely turning gripping and feeding rolls, one of which has contact with the inner side of the lasting margin and the other with the outside of the lasting margin and then releasing the pressing the margin into engagement with the bottom with the aid of wiping means, said method comprising continually delivering wet liquid latex onto the rotating surface of said one feed roll at a place substantially two-thirds of the way around from the place of stretching in the direction opposite to rotation for transfer from the place of delivery to the lasting margin at the place of stretching, directing a jet of air toward the surface of said one feed roll at a place substantially one-quarter way around from the place of stretching in the direction opposite to rotation at a pressure such as to assist in spreading the liquid latex on the surface uniformly and at a temperature such as to cause it to partially coagulate and become adhesive and, at the place of stretching, pressing the partially coagulated adhesive layer of latex in engagement with the lasting margin, said method including continuously presenting uncoated areas of the lasting margin to the place of stretching, continuously supplying fresh portions of partially coagulated adhesive latex to said incremental uncoated areas as they are advanced to said place of stretching, releasing the uncoated margin and pressing the coated margin into engagement with the latex-receptive surface of the bottom.

14. Lasting apparatus for lasting footwear with latex comprising a pair of oppositely turning work gripping and feeding rolls of oppositely tapering frustoconical configuration supported for rotation about spaced parallel axes with their frustoconical surface spaced for receiving between them the lasting margin of a shoe upper, said gripping and feeding rolls being arranged so that one of the rolls has a downwardly divergent frustoconical surface for engagement with the inner side of the lasting margin and fixed and rotating wipers at the delivery side of the gripping and feeding rolls for folding the lasting margin downwardly as it is released from the gripping and feeding rolls and for pushing the folded margin inwardly parallel to the surface of the bottom, nozzle means for gravitationally delivering wet, nontacky, nonadhesive liquid latex onto the surface of said one feed roll at a place substantially two-thirds of the way around from the place of engagement of said one feed roll, with the inner side of the lasting margin, and means for spreading and rendering said wet liquid latex partially coagulated and adhesive before it reaches said place of engagement.

4,074,384
RIVER RAMP FOR HOVERCRAFT
James D. Takacs, Rte. No. 1, Box 250, Grove, Okla. 74344
Filed Aug. 26, 1976, Ser. No. 717,572
Int. Cl.² E01D *1/00*
U.S. Cl. 14—1 **6 Claims**



4. Apparatus to provide for the traversal of a hovercraft over a river dam including a lock comprising:

a ramp having an upper and lower end, the upper end being upstream of the dam and the lower end being downstream of the dam, both the upper end of said ramp and the lower end of said ramp being at least partially submerged in the water;

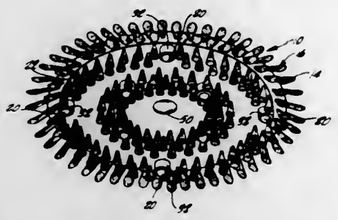
said ramp including a raised portion located intermediate the upper and lower ends and extending above the crest of the dam; and,

support means permanently mounting the upper and lower ends of said ramp with respect to the dam.

4,074,385
CARPET CLEANING BRUSH
Lawrence F. Howard, 20599 Barnard Ave., Walnut, Calif. 91789; James W. Mills, 16727 Fellowship, Valinda, Calif. 91744, and James L. Shannon, 7914 Greenbush, Van Nuys, Calif. 91402
Filed July 6, 1976, Ser. No. 703,086
Int. Cl.² A46B *7/08;* A47L *11/16*
U.S. Cl. 15—180 **8 Claims**

1. A brush for cleaning carpet comprising a base member; a plurality of bundles of bristles disposed about and extending from the underside of said base member, each of said bundles being spaced from the bundles adjacent thereto; and means carried by the underside of said base member for supporting

said brush, said means being (mounted for) vertically moveable with respect to said base such that said means undergoes verti-



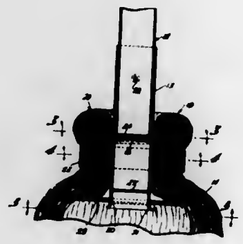
cal oscillatory motion in response to vibration of said base member.

4,074,386

ROOFING MOP

Bascom A. Drake, 7245 NW. 37th Ave., Miami, Fla. 33147

Filed Mar. 1, 1977, Ser. No. 773,433
Int. Cl.[2] A47L *13/20*
U.S. Cl. 15—229 R **1 Claim**



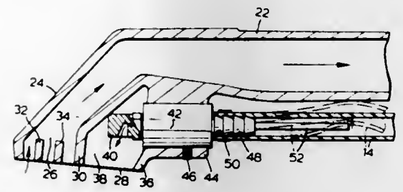
1. A roofing mop comprising, in combination, a tubular metal support member, a plurality of flexible mop strands peripherally arranged about and secured to one end portion of said tubular support member in depending relation with respect thereto, a circular spreader disc coaxially secured to said one end of said tubular support member for constraining said mop strands radially outwardly of said support member, the diameter of said spreader disc being approximately three times the diameter of said tubular support member, said spreader disc being provided with a central circular opening of substantially the same diameter as the outer diameter of said tubular metal support member, an outer portion of said one end of said tubular support member being received through said central opening, the projecting terminal end portion of said one end of said tubular support member being outwardly flared to retain said spreader disc in secured position with respect to said support member, a metal disc press-fitted within said tubular metal support member to block the passage of hot tar backwardly therethrough, said plurality of flexible mop strands comprising a plurality of doubled-over bunches of said strands, an annular wire binding member secured to said tubular support member and over which said bunches of strands are looped, and clamping band means between said wire binding member and said support disc for clamping said plurality of strands peripherally about said tubular support member.

4,074,387

VACUUM CLEANER ATTACHMENT

Paul Arato, Don Mills; Antony Leikes, Toronto, and Larry Ronald Reid, Scarborough, all of Canada, assignors to Centaur Floor Machines Ltd., Don Mills, Canada

Filed Dec. 27, 1976, Ser. No. 754,726
Int. Cl.[2] A47L *7/00*
U.S. Cl. 15—322 **5 Claims**



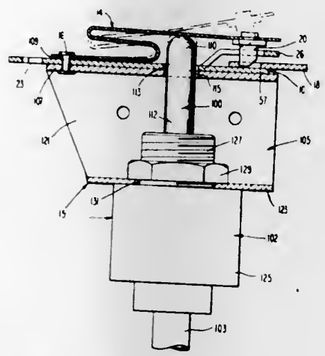
1. A vacuum cleaner attachment comprising:
a first conduit having an outlet end adapted to be connected to a vacuum source, and an inlet end;
a second conduit having an inlet end adapted to be connected to a source of cleaning fluid, and an outlet end;
a valve of the outlet end of said second conduit, the valve having a manually operable operating member adapted to open and close the said valve;
an applicator head in fluid communication with the inlet end of said first conduit and the outlet end of said second conduit;
a resilient sleeve having a first longitudinal aperture receiving the first conduit, and a second longitudinal aperture receiving the second conduit, said longitudinal apertures being disposed in generally side-by-side relationship;
the operating member of said valve being disposed within said sleeve, and being manually operable in response to manual pressure exerted on a portion of the exterior of said sleeve adjacent the underlying operating member.

4,074,388

RESETTABLE, HEAT ACTUATABLE FIRE LINK

Francis J. McCabe, 239 Hastings Court, Doylestown, Pa. 18901

Continuation of Ser. No. 676,483, April 13, 1976, Pat. No. 4,041,570. This application Apr. 26, 1977, Ser. No. 791,022
The portion of the term of this patent subsequent to Aug. 16, 1994, has been disclaimed.
Int. Cl.[2] E05F *15/2*
U.S. Cl. 16—48.5 **7 Claims**



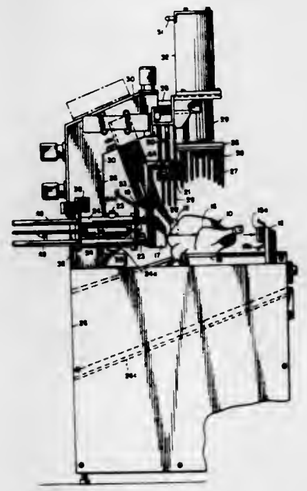
1. A resettable fire link comprising,
(a) a releasable member;
(b) gripping means associated with said releasable member for engaging said releasable member in a normal position, and for releasing said releasable member in an actuated position, said gripping means comprising at least one mounting element and heat responsive means for causing said gripping means to move to the normal position in response to a preselected ambient temperature and for causing said gripping means to move to the actuated position in response to a preselected increase in said ambient temperature; and
(c) mechanical activation means associated with said mounting element for movement from a first withdrawn to a second extended position, said mechanical activation means in said first withdrawn position allowing said gripping means to move between said normal and said activated position and for causing said gripping means to move to the activated position in response to movement of said mechanical activation means to said second extended position.

4,074,389

POULTRY CARCASS-TREATING APPARATUS

James M. Blair; Michael Sebring, both of Phoenix, Ariz.; Warren H. Underwood, and William P. Bley, both of Minneapolis, Minn., assignors to Armour and Company, Phoenix, Ariz.

Division of Ser. No. 382,409, July 25, 1973, Pat. No. 3,946,117, which is a division of Ser. No. 106,492, Jan. 14, 1971, Pat. No. 3,754,302. This application Aug. 18, 1975, Ser. No. 605,452
Int. Cl.[2] A22C *21/00*
U.S. Cl. 17—11 **21 Claims**



1. Apparatus for treating poultry carcass having a central notch in the forward portion thereof comprising a frame, a stop member, means for mounting and moving said stop member to a position in which it is fixed and rigid with respect to said frame, means for pressing said carcass at the rear thereof and for moving the carcass forwardly of said frame to bring said stop member into engagement with said central notch whereby said carcass is held in clamped engagement between said stop member and said pressing means.

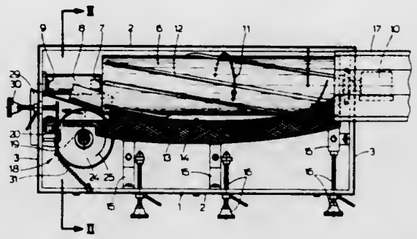
4,074,390

FOWL GIZZARD SEPARATOR

Pieter Meyn, Noordeinde 72, Oostzaan, Netherlands

Filed Feb. 27, 1976, Ser. No. 662,205
Int. Cl.[2] A22C *21/00*
U.S. Cl. 17—11 **7 Claims**

1. Apparatus for separating the gizzard from a package of interconnected entrails removed from a fowl or the like, comprising a frame;
cutting means mounted within said frame;
supporting means mounted within said frame for supporting a gizzard while leaving the remaining entrails of said package dangling therefrom;
transport means connected with said frame for moving said gizzard towards said cutting means while said remaining entrails dangle from the supporting means; and



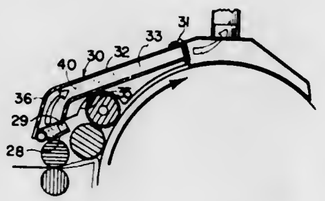
driving means operationally connected with said transport means and supported by said frame, said transport means cooperating with said cutting means in such manner that said remaining entrails are cut free from said gizzard by said cutting means.

4,074,391

CRUSH ROLL PLENUM FOR CARDING MACHINES

Robert B. Jenkins, Jr., and Jack A. Poindexter, both of Gastonia, N.C., assignors to Jenkins Metal Corporation, Gastonia, N.C.

Filed Jan. 19, 1977, Ser. No. 760,728
Int. Cl.[2] D01G *15/82*
U.S. Cl. 19—107 **1 Claim**



1. In a carding machine having a main cylinder and a doffer cylinder, top and bottom crush rolls with scraper blades operatively associated therewith and a doffer plenum supported above the doffer cylinder, a crush roll plenum extending forwardly from the doffer plenum toward the crush rolls and comprising:
a. a suction chamber including
1. a top wall,
2. side walls depending from the top wall,
3. a bottom wall extending between the side walls of the suction chamber, and
4. a suction inlet opening toward the top crush roll,
b. means connecting said crush roll plenum to said doffer plenum for relative movement thereto into and out of operative position,
c. means establishing communication between the interior of said doffer plenum and the interior of said suction chamber when in the operative position,
d. said means for establishing communication between the interior of said doffer plenum and the interior of the suction chamber comprising a front wall in the crush roll plenum and openings in the front wall of said doffer plenum and the front wall of the crush roll plenum dimensioned to register with each other,
e. the side walls of the suction chamber extending outwardly from the front wall of the crush roll plenum and terminating in overlying relation to the top crush roll,
f. the bottom wall of said suction chamber joining the side

walls of the suction chamber at their juncture with the opening in the front wall of the crush roll plenum and extending downwardly from the opposite end portions of said side walls toward the top crush roll and terminating in closely spaced relation to the scraper blade for the top crush roll,

g. said top wall of the suction chamber including a downturned portion spaced forwardly from and extending in parallel relation to the downturned front portion of the bottom wall to define the said suction inlet opening toward the top crush roll,

h. a manifold having a plurality of air outlet openings extending axially therealong and facing the juncture of the scraper blade with the top crush roll, and

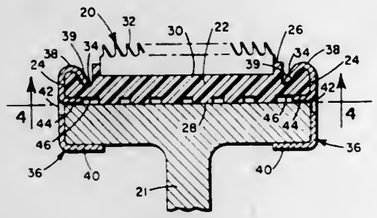
i. means for introducing compressed air on a predetermined cycle into said manifold.

4,074,392

CARD CLOTHING CLIPPED TOP AND A METHOD OF MANUFACTURING THEREFOR

Alfred R. Bechtel, Jr., Portsmouth, R.I., assignor to Ashworth Bros., Inc., Fall River, Mass.

Filed July 6, 1976, Ser. No. 702,679
Int. Cl.² D01G *15/24*
U.S. Cl. 19—113 **6 Claims**



1. A card clothing clipped top adapted to be attached to a flat comprising: a substantially rigid base having top and bottom surfaces, a longitudinal groove in said top surface adjacent each side thereof, a plurality of carding teeth mounted on said base and extending upwardly therefrom, a pair of clips for attaching said top to the flat, one of said clips being located on one side of the flat and the other of said clips being located on the other side of the flat, each of said clips having an upper portion engaged in a corresponding one of said grooves without penetrating into said base, a lower portion adapted to be engaged with the bottom surface of the flat and an intermediate portion connecting said upper and lower portions, and a plurality of tabs provided on said intermediate portion extending inwardly therefrom to engage said bottom surface of said base without penetrating into said base to hold each of said clips thereon by a coaction between said upper portion and said tabs.

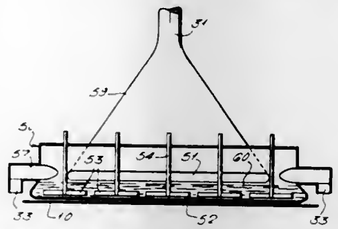
4,074,393

METHOD AND APPARATUS FOR DRY FORMING A LAYER OF FIBERS

Denis Raymond Hicklin, Bath, and Brian William Attwood, Bristol, both of England, assignors to Karl Kroyer St. Anne's Limited, Bristol, England

Filed Dec. 12, 1975, Ser. No. 640,219
Claims priority, application United Kingdom, Jan. 18, 1975, 02251/75
Int. Cl.² D04H *1/00*
U.S. Cl. 19—303 **11 Claims**

1. A method of dry forming a layer of fibers comprising the steps of conveying discrete fibers in a stream of carrier air to an inlet of a distributor housing having a fixed, perforated, bottom wall and having carrier air outlet means located above said bottom wall comprising an outlet open to atmosphere and an outlet for the removal of excess fibers; agitating the fibers to form a bed of fibers across and on top of said perforated bottom wall of the housing, said bed of fibers being formed below said carrier air outlet; and sucking fibers from the bed downwards through the bottom wall and onto a moving foraminous forming surface positioned immediately below said perforated bottom wall to form a layer of said fibers on said moving foraminous surface, whereby at least most of the carrier air which enters the housing escapes through said carrier air outlet means above the bed of fibers, and whereby the fibers pass from the bed through the fixed bottom wall of the housing to the moving forming surface under the influence of suction and gravity alone.

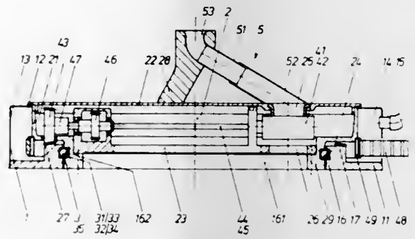


4,074,394

APPARATUS FOR DEPOSITING A SLIVER IN A SLIVER CAN

Helmut Kunig, and Klaus Reinke, both of Hamburg, Germany, assignors to Hanseatischer Maschinenbau G.m.b.H., Hamburg, Germany

Filed Sept. 12, 1974, Ser. No. 505,233
Claims priority, application Germany, Oct. 24, 1973, 2353889
Int. Cl.² B65H *54/80*
U.S. Cl. 19—159 R **2 Claims**



1. Apparatus for depositing a sliver into a sliver can, comprising

a support having an upwardly directed surface provided with a first annulus of gear teeth;

an anti-friction bearing mounted on said support for rotation in a substantially horizontal plane;

a coiler plate journalled in said bearing for rotation about an upright axis,

said coiler plate having a circumferential rim which carries a second annulus of gear teeth located substantially in said plane, and also being provided with a sliver discharge opening eccentric to said axis;

a pair of cooperating feed rollers mounted above said opening for rotation with said coiler plate,

said feed rollers defining with one another a nip above said discharge opening;

guide means for guiding a sliver to said nip from above said feed rollers,

said guide means comprising a holder on said coiler plate rotatable therewith and having a nozzle coaxial with said axis of rotation,

a tubular socket inclined to said axis and extending from said nozzle towards said nip,

and a tubular member slidably telescoped onto said socket and movable to an extended position in which a free end of said tubular member is located above said nip, and a retracted position in which said free end is retracted laterally and upwardly of said nip so as to afford access thereto;

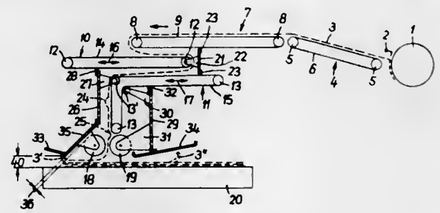
and drive means for said feed rollers, including a rotatable gear coaxial with said first annulus, and a toothed drive belt located substantially in said plane and surrounding said second annulus so that, when motion is imparted to said belt, the belt rotates said coiler plate substantially without vibration due to the location of said belt relative to said plane.

4,074,395

WEB LAYERING DEVICE

Werner Frosch, Beckedorf, and Wolfgang Uliczka, Bremen, both of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Nov. 9, 1976, Ser. No. 740,213
Claims priority, application Germany, Nov. 19, 1975, 2551898
Int. Cl.² B65H *45/103*
U.S. Cl. 19—163 **12 Claims**



1. In a machine for layering a web of textile fibers, composed of a plurality of web conveying units including a stationary web delivery unit, a first layering carriage unit mounted to undergo a back and forth movement and to receive a fiber web from the delivery unit, a further layering carriage unit disposed in sequence with the first layering carriage unit and mounted to undergo a back and forth movement, an additional layering unit movable together with the further layering carriage unit for conveying a web away from the further layering carriage unit, and a transporting unit for transporting a layered web from the additional layering unit, the improvement comprising air guidance means located at a region of transfer of such a web between two of said units for forming an air guidance channel with said two units to create, during conveyance of a web in a web layering procedure, an air stream traveling substantially tangentially to the direction of travel of the web.

4,074,396

CLASP WITH ENCLOSED PIN

Ronald N. Swimley, Phoenix, Ariz., assignor to Siron Industries, Inc., Phoenix, Ariz.

Continuation-in-part of Ser. No. 567,183, April 11, 1975, abandoned. This application Sept. 27, 1976, Ser. No. 727,298
Int. Cl.² A44B *9/00*
U.S. Cl. 24—162 **2 Claims**

1. A U-shaped clasp for engaging between its legs material to be held together comprising:

an elongated body member formed in a U-shaped configuration to define a pair of juxtapositioned legs connected together at a common end,

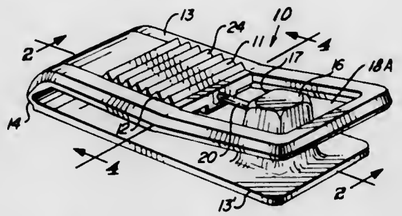
a track comprising a tongue and a first groove formed along the outer surface of one of said legs for accepting a member slidable therealong, said tongue and first groove extending along the length of said one of said legs,

said one of said legs being provided with a first opening adjacent its free end,

a slide member mounted for slidable movement along said track and being provided with a second groove configured for receiving and interlocking with said tongue of said track for preventing lateral movement of said slide member relative to said track, whereby movement of said slide member along said track frictionally restrains said slide member along the full length of said track,

a dome shaped protrusion extending from the inner surface of said other leg of said body member for penetrating said first opening in said one of said legs when in a material engaging position,

said protrusion being provided with a second opening in alignment with said track,



the outside surface of said slide member being ridged to aid in moving the slide member along the track and said slide member being provided with a pin for penetrating said second opening when moved toward said protrusion,

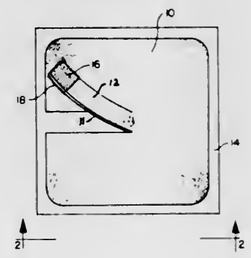
whereby material to be gripped by said clasp forced between the common ends of said body member and over said protrusion is wedgingly engaged between said slide member and said other leg and penetrated by said pin as it moves into said protrusion.

4,074,397

DEVICE FOR SECURING CORDS, TUBES, AND THE LIKE

Stanley A. Rosin, 115 S. Indian Ave., Palm Springs, Calif. 92262

Filed Oct. 15, 1976, Ser. No. 732,725
Int. Cl.² A61M *25/02*
U.S. Cl. 24—73 AS **3 Claims**

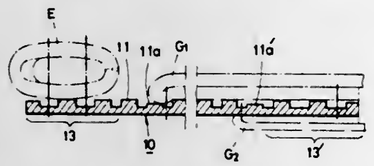


1. A device for securing cords, tubes and the like to a supporting surface comprising: a flexible fabric pad and having a pressure-sensitive adhesive layer on one surface thereof; an elongated flexible fabric strip member formed as a cut-out portion of said pad also having the pressure-sensitive adhesive layer on one surface thereof, said strip member having one end integral with said pad and having a distal end; a first tab having a multiplicity of minute hook members formed thereon, said first tab being affixed to the distal end of said strip member on one side thereof; a second tab having a multiplicity of minute hook members formed thereon, said second tab being affixed to the distal end of said strip member on the other side thereof; said flexible fabric being a material capable of receiving the hook members of the tabs in fastening relationship therewith when the tabs are selectively pressed against the pad after the strip member has been looped around a tube, cord, or the like, to be secured by the device.

4,074,398
SLIDE FASTENER TAPE

Yoshio Matsuda, Nyuzen, and Yoshitoki Tsubokawa, Kurobe, both of Japan, assignors to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Sept. 17, 1975, Ser. No. 613,997
Claims priority, application Japan, Sept. 27, 1974, 49-117522
The portion of the term of this patent subsequent to Apr. 5, 1994, has been disclaimed.
Int. Cl.² A44B 19/12
U.S. Cl. 24—205.1 C 3 Claims

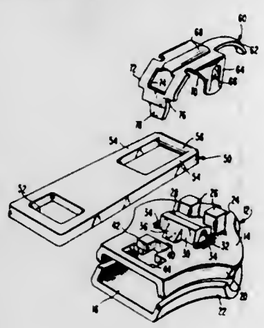


1. In a slide fastener stringer tape having a warp-knit structure with alternate wales and interwale grooves, the improvement comprising chain stitches, tricot stitches, warp threads and additional stitches transversely spanning a plurality of wales, defining in the tape a web portion and at least one marginal edge portion adjoining said web portion, said marginal edge portion having a wale of lesser height than the other wales of such marginal edge portion, said wale of lesser height being constituted solely by some of said tricot stitches and some of said additional stitches and defining a guide path for sewing stitches.

4,074,399
SLIDER FOR SLIDE FASTENER

Stanley G. Kedzierski, Saegertown, Pa., assignor to Textron, Inc., Providence, R.I.

Filed Nov. 8, 1976, Ser. No. 740,006
Int. Cl.² A44B 19/30
U.S. Cl. 24—205.14 R 6 Claims

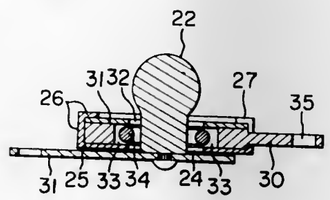


1. A slider for a slide fastener comprising in combination,
a slider body having upper and lower spaced parallel wings joined by a connecting post,
said upper wing having formed on the top surface thereof a spring groove extending forward to the connecting post,
a pair of upstanding lugs disposed on opposite sides of a longitudinal center line of the slider body and adjacent the spring groove formed on the top surface of the upper wing,
a spring support disposed on the upper wing adjacent the pair of upstanding lugs and having a boss disposed on a vertical surface thereof, said boss having a cam surface defined by a steep ramp-like triangular extension,
said spring support having retention means in opposite end surfaces thereof,
cut-out slots disposed in the upper wing adjacent each of said retention cavities,
a spring holding finger extending upward and rearward from the upper wing and defining a rear cam surface along a surface thereof, said rear cam surface being positioned to face said ramp-like triangular extension,
said spring holding finger extending over a locking hole provided through the upper wing,
a pull tab having a pair of extending pull arms formed along an end thereof and joined by a cross bar extending therebetween, said cross bar being disposed for co-operating movement between said rear cam surface of the spring holding finger and the said ramp-like triangular extension of the spring support,
a locking spring having a plate-like body with an elongated and downwardly curved projection extending to the spring groove from its front end and having a pair of downwardly extending retention arms formed midway along its sides, said retention arms being positioned each in a cut-out slot and having retaining tabs bent inwardly and disposed for engagement within said retention means of the spring support,
sloped abutment surfaces provided on the bottom of the locking spring connected to back edges of each of the retention arms and to the main portion of the locking spring by canted surfaces,
a downwardly canted abutment surface of the locking spring having a cut-out portion positioned for receiving said holding finger, and
a tail portion extending vertically downward from the canted abutment surface of the locking spring and terminating in the locking hole as a locking prong, said locking prong disposed to prevent movement of the slider along the slide fastener when in normal position whereby any pulling of the pull tab lifts the locking prong to free the slider for movement.

4,074,400
FASTENINGS SUITABLE FOR PERSONAL ORNAMENTS

Nisuke Sekiguchi, Tokyo, Japan, assignor to Sekiguchi Seisakusho Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1977, Ser. No. 775,426
Int. Cl.² A44G 17/00
U.S. Cl. 24—218 1 Claim

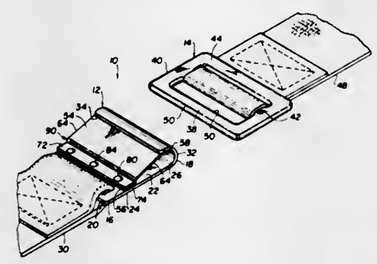


1. A fastening suitable for a personal ornament, which comprises a male member (A) and a female member (B); the male member (A) including a base plate 21 on which a projecting portion 22 is provided; the female member (B) including a casing 23 which has a base plate 25 and an upstanding edge 26 formed by bending a marginal portion of the base plate 25; the base plate 25 having an opening 24 which can receive the projecting portion 22; the upstanding edge 26 having an opening 27 through which an ornament-fitting portion 30 of a ring plate 28 may be projected outwards; the ring plate 28 having an opening 29 whose diameter is larger than that of the opening 24 of the base plate 25; the ring plate 28 having the ornament-fitting portion 30 in the form of an projection; the ring plate 28 being placed in the casing 23 in such a manner that the ornament-fitting portion 30 projects through the opening 27; a ring-like cover plate 31 being placed on the upper surface of the ring plate 28; the cover plate 31 having an opening 32 whose diameter is virtually the same as that of the opening 24 of the base plate 25; a partially opened annular spring 34 being placed on a recess channel which is defined by the upper surface of the base plate 25 of the casing 23, by the internal wall of the ring plate 28, which wall surrounds the opening 29, and by the lower surface of the ring-like cover plate 31, whereby the spring 34 is disposed on the recess channel in such a position that an internal portion of the spring 34 is present in an inner area of the openings 24 and 32; the upstanding edge 26 of the casing 23 being bent inwards to fix the ring-like cover plate 31.

4,074,401
SNAP ASSEMBLY

Dominic J. Spinosa, Wantagh, and Frank Knoll, Huntington Sta., both of N.Y., assignors to East/West Industries, Inc., Farmingdale, N.Y.

Filed Dec. 16, 1976, Ser. No. 751,320
Int. Cl.² A44B 13/02
U.S. Cl. 24—236 18 Claims

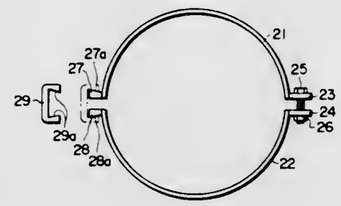


1. A snap assembly adapted to receive a cooperating buckle element, said snap assembly comprising:
A. a base having oppositely disposed front and rear ends, with upper and lower surfaces intermediate said ends, and spaced apart sides extending between said front and rear surfaces,
B. a hook integrally formed with said front end of said base and extending inwardly in the direction of said rear end and terminating in a distal end,
C. said hook having an inner surface bounding one side of said hook facing said upper surface of said base for forming an enclosure for receiving the buckle element therein,
D. a flexible locking member adapted to be moved relative to said inner surface of said hook, said locking member having an outer end and an oppositely disposed free end, with spaced apart sides intermediate said ends, said outer end formed by a wall having one surface thereof extending in overlapping relationship with and secured to said base, the width of said base and said locking member as defined respectively by each of said spaced apart sides being substantially equal to each other,
E. load distribution means extending in overlapping relationship to the oppositely disposed surface of said wall, said load distribution means including a plate extending transversely between said spaced apart sides of said base and said locking member,
F. coupling means for securing said base, said wall, and said plate to each other, such that any load on said wall is distributed across said plate, said coupling means comprises a plurality of spaced apart fasteners,
G. resilient means for continuously urging said free end of said locking member into abutting pressural engagement with said inner surface of said hook and being movable toward and away from said inner surface, and
H. said resilient means comprising
1. a rib integrally joined by an arcuate configuration at one end thereof with said wall and extending upwardly therefrom,
2. a clip integrally joined by an arcuate configuration at one end thereof with the other end of said rib, said arcuate configurations each being in the form of radii that are substantially conformal to each other with said clip terminating in said free end of said locking member and inclined upwardly relative to said base for movement relative thereto, and
3. said movement of said locking member providing an angle of deflection in said clip and in said rib so as to obtain a relatively large translation of said free end of said locking member while maintaining a relatively low stress concentration in said locking member by distribution of said stress in each said arcuate configuration.

4,074,402
PIPE CLAMP

Osamu Taketani, Tokyo, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

Filed Sept. 19, 1975, Ser. No. 615,083
Claims priority, application Japan, Sept. 25, 1974, 49-109604
Int. Cl.² B65D 63/00
U.S. Cl. 24—268 2 Claims



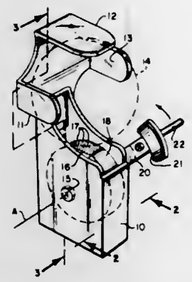
1. A pipe clamp apparatus for clamping around the outer circumference of a pipe, said apparatus comprising:
a plurality of arc-shaped bands circumferentially surrounding the outside of said pipe;
first clamping projections integrally formed on the opposing longitudinal sides of at least two of said arc-shaped bands, each of said first clamping projections having a hole therethrough aligned with the hole through the other clamping projection;
paired second clamping projections integrally formed on opposing longitudinal sides of at least two of said arc-shaped bands and extending at least partially along the length of said sides, each pair of said projections slanting outwardly away from the outer longitudinal surface of said bands at straight angles thereto and each projection being slanted in a direction opposite to the direction of the opposing projection of said pair of projections, each of said slanted projections having a slanted surface extending outward from said arc-shaped band and the longitudinal direction of said slanted surface being parallel to the longitudinal axis of said pipe surrounded by said arc-shaped bands;
removable clip means having a groove therein, said groove having straight longitudinal sides formed at the same angles as said slant surfaces, fitted over each pair of said second clamping projections for tightly holding said slant surfaces of said second clamping projections therein; and
bold and nut means fitted through said aligned holes in said first clamping projections for attaching and forcing said first clamping projections toward each other.

4,074,403

TENNIS BALL NAPPER

Clifton Martin Jones, 844 10th St., Santa Monica, Calif. 90403

Filed Dec. 22, 1976, Ser. No. 753,439
Int. Cl.[2] D06C *11/00*
U.S. Cl. 26—29 R 7 Claims



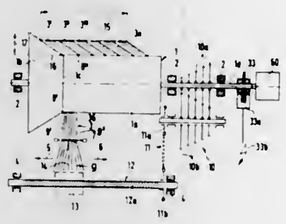
1. A tennis ball napper including, in combination:
(a) an open frame structure having spring finger means for lightly gripping a tennis ball;
(b) a napping wheel;
(c) a shaft to which said napping wheel is secured, mounted in the frame for rotating said napping wheel in a plane including the center of said tennis ball, the periphery of said napping wheel including radially extending bristles successively engaging the nap on said ball when said napping wheel is rotated to thereby cause said ball to rotate in said spring finger means about an axis parallel to the axis of rotation of said napping wheel; and
(d) means mounted directly to the shaft for rotating with said shaft and extending adjacent to one side of said napping wheel and including a friction pad positioned for periodically engaging a side portion of said tennis ball to thereby turn the ball slightly about an axis different from its axis of rotation when engaged by said bristles, whereby substantially the entire surface area of said tennis ball is automatically successively engaged by said bristles after several rotations of said napping wheel.

4,074,404

APPARATUS FOR CONTROLLING APPLICATION OF WARP SECTIONS DURING WARPING

Kurt Schenk, Degersheim, Switzerland, assignor to Maschinenfabrik Benniger AG, Uzwil, Switzerland

Filed Apr. 21, 1977, Ser. No. 789,545
Claims priority, application Switzerland, Apr. 23, 1976, 5124/76
Int. Cl.[2] D02H *13/26*
U.S. Cl. 28—185 8 Claims



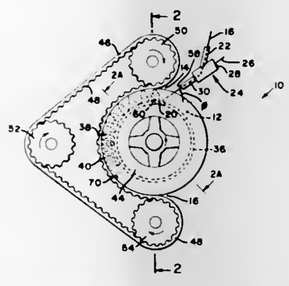
1. In an apparatus for controlling the application of warp sections during a warping operation, wherein a winding of predetermined length of warp threads and application height is exposed to a warping operation wherein successive threads withdrawn from the bobbins of a bobbin creel and each delivered by means of a stop motion and thread brake to a warping reed are formed at that location into a warp section upon a winding drum of a winding machine, the improvement comprising:
means for calculating at any point in time a theoretical, momentary reference-application of the wound-up warp sections on the basis of fixed data inherent to the material undergoing warping and the number of revolutions of the winding drum;
means for measuring at the same time the actual-application of the warp sections; and
means for comparison of the calculated momentary reference-application with the measured momentary actual-application at such point in time and for generating a signal in the presence of deviations, which signal brings about a correction by adjusting the thread tension of the thread withdrawn from the creel.

4,074,405

APPARATUS FOR TEXTURIZING YARN

Hsin Lang Li, Parsippany; Hendrikus Johan Oswald, Morristown, and Alfred Louis Liland, Wharton, all of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Continuation of Ser. No. 527,464, Nov. 26, 1974, abandoned.
This application Apr. 9, 1976, Ser. No. 675,353
Int. Cl.[2] D02G *1/12*
U.S. Cl. 28—257 8 Claims



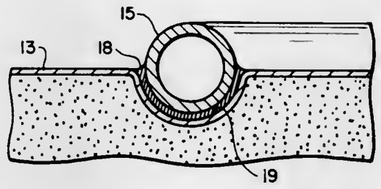
1. Apparatus for crimping a tow of continuous filaments comprising:
a. a chamber having an inlet opening for receiving the filaments, and an outlet opening for withdrawing the filaments;
b. a movable perforate yarn-receiving means at least partially disposed in said chamber adjacent said inlet opening;
c. fluid directing means having an angular disposition relative to said yarn-receiving means for directing a stream of compressible fluid containing said filaments into contact with said yarn-receiving means to initiate crimping thereof, the angle of disposition ranging from about 15° to 75° and being such that impingement of said filaments on said yarn-receiving means occurs within said chamber; said yarn-receiving means being adapted to separate the major portion of said fluid from said filaments and to expel it from said chamber and to provide a continuously moving surface associated with said chamber, the velocity of said surface being adjusted to cause overfeeding of said filaments into said chamber, the ratio between the velocity of said filaments and the velocity of said surface and the angular disposition of said fluid directing means being such that said filaments are initially crimped by impact against said surface and deflected therefrom against a mass of said tow to produce final crimping of the filaments, and emerge from the chamber in crimped form.

4,074,406

METHOD FOR MANUFACTURING SOLAR ENERGY COLLECTORS

John B. Boyd, 177 Hemlock Court, Palo Alto, Calif. 94306, and Norman E. Rees, 334 Hawthorne Ave., Palo Alto, Calif. 94301

Filed June 25, 1976, Ser. No. 699,692
Int. Cl.[2] B23P *15/26*
U.S. Cl. 29—157.3 C 10 Claims



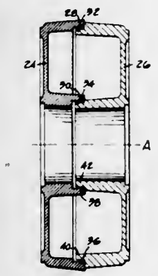
1. A method for fabrication of radiant heat collector panels comprising:
a. forming thermally conductive tubing into a desired shape pattern;
b. placing a thin, thermally conductive lamina permanently in contact with a mechanically resistive backing material, said lamina and backing material having a combined yield strength, in a direction perpendicular to the surface of the lamina, which is less than the yield strength of the thermally conductive tubing in a direction perpendicular to the length of the tubing;
c. placing the formed tubing in contact with the thermally conductive lamina such that the wall of the tubing contacts the lamina along the entire length of the tubing; and, d. pressing the tubing against the lamina and backing material combination, whereby the tubing is urged into the lamina and backing material causing the lamina to conform to the contour of the copper tubing over a substantial portion of the surface of the tubing.

4,074,407

METHOD FOR MAKING A HOLLOW-BODIED CASTER WHEEL

Carl O. Christensen, Alamo, Calif., assignor to Roll-Rite Corporation, Oakland, Calif.

Filed Mar. 17, 1977, Ser. No. 778,486
Int. Cl.[2] B21D *53/26*
U.S. Cl. 29—159 R 2 Claims



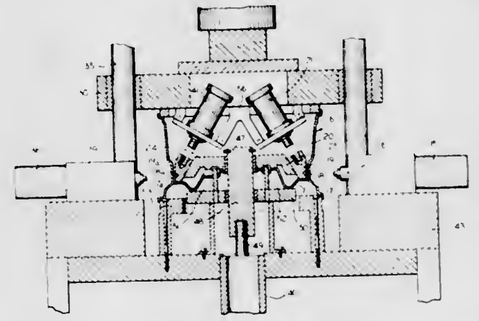
1. A method of making a hollow-bodied caster wheel from castings forming an outer and an inner wheel body half respectively, each said half having generally cylindrical flanges coaxial with the axis of said wheel, the inner surface of said flanges on said outer half being slightly closer to said axis than the outer surface of said flanges on said inner half when said halves are at the same temperature, comprising the steps of:
a. causing said inner half to assume a sufficiently low temperature and said outer half to assume a sufficiently high temperature to cause said outer surface to be closer to said axis than said inner surface;
b. placing said flanges of said outer half axially over said flanges of said inner half while said halves are at said differing temperatures; and
c. allowing said halves to assume equal temperatures.

4,074,408

METHOD FOR MAKING VEHICLE WHEEL ASSEMBLY

Dalton M. Davis, Clayton, Calif., assignor to FDI, Inc., Cleveland, Ohio

Filed June 21, 1976, Ser. No. 698,420
Int. Cl.[2] B21H *1/02;* B21K *1/32*
U.S. Cl. 29—159.01 11 Claims



1. A method for manufacturing a wheel assembly by fixedly attaching a metallic center body means having a hub portion and an outer peripheral band, to a metallic tire rim means juxtaposed around said peripheral band in a concentric manner through the use of a plurality of telescoping protruberances, each of which extends radially and at which indentation and nesting of said tire rim means and said outer band of said center body means occurs, said protruberances being fabricated by a plurality of aligned male and female forming tool means, which co-operate with tool support fixture means comprising the steps of:
forcing and maintaining said center body means within said tire rim means in an interference fit so that said tire rim means is closely juxtaposed to said outer peripheral band of said center body means through said tool support fixture means;
firmly located and positioning said plurality of female forming tool means along the interior circumferential perimeter of said outer peripheral band so as to abut a portion of said female forming tool means between said interior circumferential perimeter and said tool support fixture means to maintain said female forming tool means in an aligned restrained position with respect to said male tool means and said wheel assembly during actuation of said male tool means;
forcing said respective plurality of aligned male forming tool means, positioned on the outside of the tire rim means, into said tire rim means and in turn said center body means towards and into said female forming tool means so as to dimple a portion of said tire rim means into said outer peripheral band of said center body together, thereby forming said protruberance; and
withdrawing said plurality of male forming tool means from the region of said formed protruberance.

4,074,409

COMPOUND BOW STRING CHANGER

Jimmie T. Smith, 6737 E. 5th Place, Tulsa, Okla. 74112

Filed May 4, 1976, Ser. No. 683,166
Int. Cl.[2] B23P *19/02*
U.S. Cl. 29—235 8 Claims

1. A bow stringing apparatus comprising:
a. an elongated flexible pull cord being adjustable in length

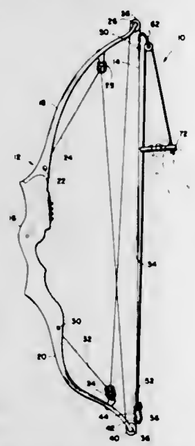
to provide a cord length longer than the distance between cable ends of a compound bow when a bow is strung but shorter than twice said distance and having a substantially uniform diameter;

b. a first cable attachment means removably attachable to one cable end between an associated bow string support and its associated eccentric pulley;

c. a second cable attachment means removably attachable to an opposite cable end between an associated bow string support means and its associated eccentric pulley, a rotatable sheave carried by the second cable attachment means;

d. an elongated bar having cord attachment means at one end and a transverse bore therethrough spaced from the cord attachment means, said bore being of a diameter substantially equal to that of the pull cord;

whereby one end of the pull cord being secured to the first cable attachment means, the other end being slidably disposed through said transverse bore in the elongated bar, passed around the rotatable sheave and secured to the elongated bar cord attachment means.



7. A method for changing a bow string of a compound bow by means of a tent cord type tightening apparatus and comprising the steps of;

a. attaching a first attachment means to one compound bow cable end;

b. attaching a second attachment means to an opposite compound bow cable end;

c. orienting a pull bar perpendicular to a bow string of a compound bow and pulling the pull bar along a pull cord until a compound bow is compressed thereby relaxing a bow string;

d. orienting the bar substantially parallel to a bow string thereby locking a bow under compression;

e. removing and replacing a bow string from a bow string support;

f. reorienting the bar perpendicular to a bow string and relaxing tension thereby transferring tension to a bow string;

g. removing the tightening apparatus.

4,074,410

LOCK EXTRACTOR

Robert L. Jarm, Buffalo Grove, Ill., assignor to Credit Industry Associates, Inc., Arlington Heights, Ill.

Filed Dec. 30, 1975, Ser. No. 645,321
Int. Cl.² B23P *19/04*
U.S. Cl. 29—265 **10 Claims**

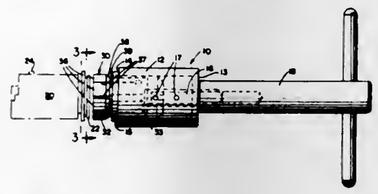
1. A device for extracting the lock from a lock assembly, said device comprising:

a collar having an end surface adapted to engage the lock assembly, said end surface having an inner cam edge;

a threaded shaft positioned within said collar having at one end a handle which bears against said collar;

a collet slidably positioned within said collar having an internally threaded portion which engages said threaded shaft; and

a plurality of outwardly biased spring teeth having inwardly projecting engaging portions formed on said collet which surround and loosely engage the lock when said collet is



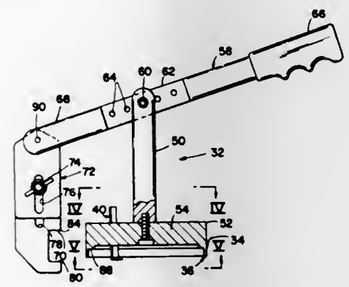
in an extended position wherein the ends of said teeth protrude beyond said collar and said spring teeth having an outer cam surface for engagement with said inner cam edge of said surrounding collar thereby urging said spring teeth to tighten about said lock when the collet is withdrawn within said collar, whereby the turning of said handle will cause the collet to withdraw completely within said collar and thereby extract said lock from the lock assembly.

4,074,411

RING REMOVING WRENCH

David A. Willard, 545 Elder Court, San Jose, Calif. 95123, and Raymond W. Thomas, 1369 Lexington Drive, San Jose, Calif. 95117

Filed Apr. 29, 1977, Ser. No. 792,148
Int. Cl.² B23P *19/08*
U.S. Cl. 29—267 **13 Claims**



1. Apparatus for removing and replacing a ring which fits tightly about a cylindrical member, said member proceeding away from a generally flat surface, a generally circular flange proceeding from a portion of said surface located outwardly radially of said ring; said apparatus comprising:

a sleeve sized to fit about said ring with a first end of said sleeve adjacent said surface;

means carried by said sleeve and spaced circumferentially thereabout for engaging a first end of said ring, said first ring end being adjacent said surface;

means for selectively positioning said first ring end engaging means in and out of engagement with said first ring end;

a support extending from a second end of said sleeve away from said surface;

a lever;

means for pivotally attaching a central portion of said lever to said support; and

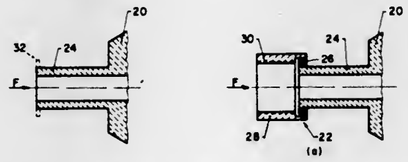
means attached adjacent an end of said lever for engaging with said flange whereby on pivoting of said lever to cause said flange engaging means to exert a force on said flange towards said surface, said first end ring engaging means move said ring away from said surface and remove said ring from said cylindrical member.

4,074,412

METHOD OF REPAIRING OR REINFORCING TUBULAR PLASTIC MEMBERS

Franjo Miskic, Gajeva UL. 23, Hrvatska, 41000-Zagreb, Yugoslavia

Filed Oct. 4, 1976, Ser. No. 729,455
Claims priority, application Yugoslavia, Oct. 8, 1975, 2568/75
Int. Cl.² B23P *7/00*
U.S. Cl. 29—401 E **3 Claims**



1. A method of repairing a plastic hose connector including a tubular member having an outer end portion which originally included an outwardly projecting annular lip retaining a captive nut, the method comprising the steps of:

(a) applying to the member under the action of heat, a metal sleeve which is of a shape and size selected to closely fit and make surface-to-surface contact with the tubular plastic member at the region thereof to be repaired, the sleeve having an outer end which includes a lip simulating said lip of the tubular plastic member and retaining a captive nut, the sleeve being heated to a temperature sufficient to cause melting of the surface of the member where it contacts the metal sleeve, and the sleeve being applied to the member in a position such that the lip and nut of the sleeve replace the corresponding original parts of the hose connector; and,

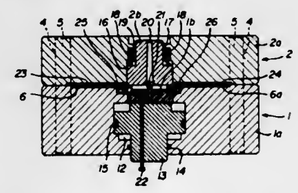
(b) abruptly cooling the plastic member and sleeve.

4,074,413

METHOD AND APPARATUS FOR MANUFACTURING SEPARABLE SLIDING CLASP FASTENERS

Riccardo Taccani, Via Civitali 50, 20148 Milan, Italy

Filed Jan. 14, 1977, Ser. No. 759,572
Claims priority, application Switzerland, Jan. 22, 1976, 792/76
Int. Cl.² B21D *53/50*; B29D *5/00*
U.S. Cl. 29—408 **2 Claims**



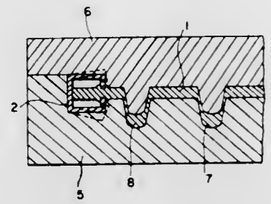
1. In a method of manufacturing separable sliding clasp fasteners, from a continuous fastener comprising two halves each formed of a continuous support-strip carrying a continuous row of interlocking elements made of thermoplastic material, each separable fastener comprising a separating device formed of one female part and two male parts, one on each of the fastener halves and one of which is displaceable in the female part, a top stop on each of the halves, and a sliding clasp, the movement of which in opposite directions respectively provides locking and unlocking of the two rows of interlocking elements, the improvement which comprises said two male parts of one fastener, the two top stops of another fastener, support-strip reinforcements along the male parts and said stops, and an opening for introducing a sliding clasp, are simultaneously prepared by introducing a section of each of the two uncoupled and spaced halves of a continuous fastener into a mold in such a manner that the support-strip of each section is placed above two strip-reinforcement imprints arranged in the mold one behind the other at a distance greater than the length of the sliding clasp, and that the row of interlocking elements is placed in a channel traversing the mold and formed from two partitions, each of said partitions being adjacent to one of the two opposite ends of the imprints; injecting melted thermoplastic material into the mold; permitting the injected material to solidify, and then cutting the solidified material between the two sections in such a manner as to form the two opposite lateral sides of the two male parts and of the two top stops, and an opening between said male parts and said male parts and said stops having a breadth and a length greater than those of a sliding clasp to be introduced.

4,074,414

PROCESS FOR THE PRODUCTION OF LETTERING OR SYMBOL TEMPLATES

Gerold Anderka, Ellerbek, and Lasse Kuparinen, Hamburg, both of Germany, assignors to Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.

Filed July 9, 1976, Ser. No. 703,876
Claims priority, application Germany, July 11, 1975, 2531051
Int. Cl.² B29C *17/02, 17/10, 27/00*
U.S. Cl. 29—509 **6 Claims**



1. A process for the production of a lettering or symbol template having at least one symbol cut out and at least one template strip on a longitudinal edge thereof, comprising:

A. inserting a sheet of thermoplastic material, together with at least one template strip having free edges positioned to extend around a longitudinal edge of said sheet, between a punch part and a matrix part;

B. penetrating said sheet with said punch, to force at least one portion of said sheet out of the plane of sheet while leaving said portion attached to said sheet by thin connecting areas of connecting material; while simultaneously

C. pressing the free edges of said at least one template strip around a longitudinal edge of said sheet so as to penetrate said free edges into said thermoplastic material; and

D. separating said at least one forced out portion by severing said thin connecting areas, thereby defining said template.

4,074,415

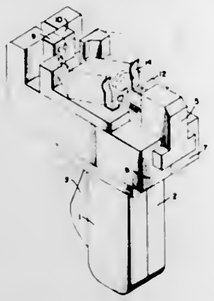
FIBER OPTIC SEAL ASSEMBLY

Lorin R. Stieff, P.O. Box 263, Kensington, Md. 20795

Filed Feb. 14, 1977, Ser. No. 768,435
Int. Cl.² B25B *27/02*
U.S. Cl. 29—520 **20 Claims**

13. A method for assembly of a fiber optic seal comprising stripping a predetermined length of sheath from and end of a fiber optic bundle and exposing the fibers, inserting the

stripped fibers in a seal block and inserting the block in a retainer, moving an anvil toward a collet in the block in which



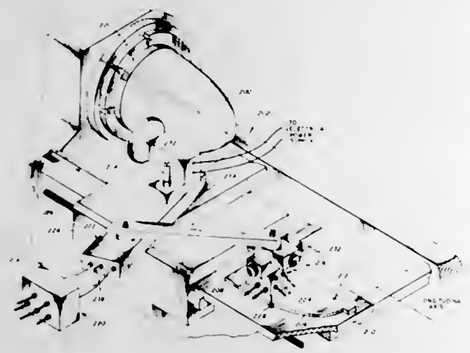
ends of the stripped fibers are held and securing the collet in the block.

4,074,416

MIRROR AND METHOD OF MAKING SAME

Werner R. Rambauske, Carlisle, and John J. Grabowski, Andover, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 463,697, April 24, 1974, which is a continuation-in-part of Ser. No. 268,271, July 3, 1972, Pat. No. 3,841,737. This application Sept. 13, 1976, Ser. No. 722,844
Int. Cl.[2] B22D *11/26*
U.S. Cl. 29—527.4 **2 Claims**



1. The method of fabricating a blank for a mirror comprising the steps of:
(a) casting a base from an alloy of nickel (35%) and iron;
(b) machining a surface of the base to correspond with the desired contour of the mirror;
(c) applying, in a plasma jet, a coating of tungsten carbide to the machined surface of the base; and
(d) grinding the coating of tungsten carbide to correspond with the desired contour of the mirror.

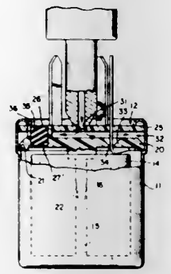
4,074,417

METHOD OF SEALING ELECTRICAL HOUSING

Godfrey R. Pearce; William J. Breeden, and Francis R. See, all of Glasgow, Ky., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Continuation of Ser. No. 504,367, Sept. 9, 1974, abandoned. This application Apr. 5, 1976, Ser. No. 673,495
Int. Cl.[2] H05K *5/03*
U.S. Cl. 29—570 **5 Claims**

1. A method of making an electrical device comprising the steps of providing a container having an open end, placing in the container an electrical body having receptacles at each end thereof, positioning a disc-like member having a positioning means adjacent to the electrical body and the open end of the container to thereby project the positioning means into the receptacle of the electrical body, positioning a rigid member adjacent to the disc-like member, making the extremity at the



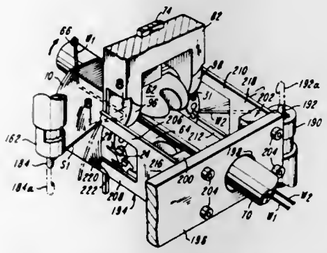
open end of the container dimensionally smaller than the dimension of the rigid member, and moving a curable material between the disc-like member and the rigid member to occupy a volume between the members and contact side walls of the container and thereby close the container.

4,074,418

STATOR COIL WINDING AND LEAD WIRE CONNECTION

Harold I. Pearsall, Centerville, Ohio, assignor to The Globe Tool and Engineering Company, Dayton, Ohio

Filed July 23, 1976, Ser. No. 708,190
Int. Cl.[2] H02K *15/095*
U.S. Cl. 29—596 **12 Claims**



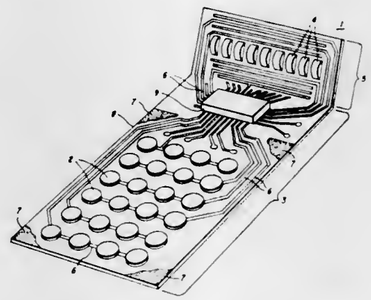
1. In a method of winding a coil onto a stator core and for connecting lead wires extending from the coil into slots in one or more terminal boards mounted on the stator core, the steps comprising:
a. at the end of the winding of a coil by a shuttle, stopping the shuttle movement adjacent one end of the stator core,
b. engaging the section of wire between the coil and the shuttle and moving said section to one side of the stator core,
c. guiding said section into alignment with one of said slots,
d. inserting said section into said one of said slots,
e. clamping the wire portion between said one of said slots and the shuttle, and
f. cutting the wire portion between the clamped portion thereof and said one of said slots.

4,074,419

PRINTED WIRING BOARD WITH ANGLED PORTION AND ITS METHOD OF MANUFACTURE

Stephen L. Hanni, Richardson, and Dudley B. Johnson, Irving, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 16, 1976, Ser. No. 667,333
Int. Cl.[2] H05K *3/00*
U.S. Cl. 29—625 **10 Claims**



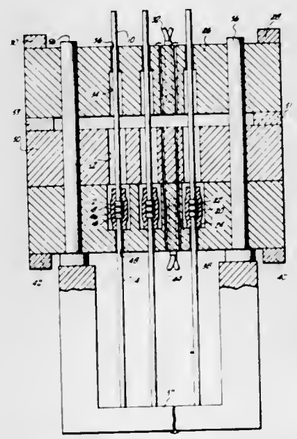
1. A method of manufacturing a printed wiring board with an angled portion comprising:
(a) forming a metal substrate;
(b) coating the metal substrate with an insulating material;
(c) additively forming a plurality of conductors on the insulating material after the step of coating said substrate; and
(d) bending the insulated metal substrate and at least one conductor formed thereon, thereby causing the insulated substrate to occupy at least two major planes.

4,074,420

METHOD AND APPARATUS FOR THE ASSEMBLY OF JACKETED ELECTRONIC DEVICES

Clyde A. Lofdahl, Los Altos, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Aug. 5, 1976, Ser. No. 712,037
Int. Cl.[2] H01R *43/02*
U.S. Cl. 29—628 **18 Claims**



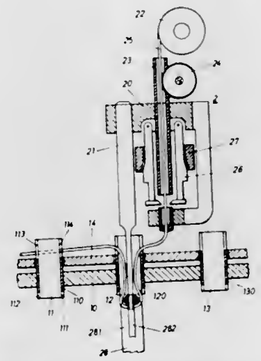
1. A method for assembling electronic devices, including the steps of
loading the heating chambers of a first heating block with leads and electronic components;
loading the heating chambers of a second heating block with jackets for electronic components;
positioning the second heating block above the first heating block and aligning the heating chambers of each heating block;
heating the first heating block with the leads and electronic components positioned therein to fix the leads to the electronic components;
moving the fixed leads and electronic components into the heating chambers of the second heating block following alignment of the heating chambers of the heating blocks; and
heating the second block with the fixed leads and electronic components therein to fix the jackets about the fixed leads and electronic components.

4,074,421

METHOD AND APPARATUS FOR CONNECTING CONDUCTORS TO TERMINALS OF AN APPARATUS

Rolf Torgny Reutling, Stockholm, and Nils Anders Rune Thysk, Skarholmen, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Sept. 15, 1976, Ser. No. 723,446
Claims priority, application Sweden, Oct. 17, 1975, 7511665
Int. Cl.[2] H01R *43/00*
U.S. Cl. 29—628 **7 Claims**



1. A method of connecting an isolated electrical conductor to terminal tags of an apparatus in which a fixture having a series of holes formed therethrough is provided which series of holes is patterned in correspondence with the tags of the apparatus, comprising: advancing the electrical conductor to a first one of said series of holes of said fixture; repeatedly advancing said electrical conductor to the other of said series of holes, one after another; forming a loop through at least some of said series of holes after said electrical conductor has been advanced to the respective hole in which the loop is to be formed; thereafter inserting the tags of the apparatus through said series of holes which correspond therewith until the ends of said tags bear against the inner portions of said loops; and then joining said tag ends to the inner portions of said loops for permanent fastening.

4. An apparatus for connecting an isolated electrical conductor to terminal tags of a device, comprising: a fixture having a series of holes formed therein, said series of holes being patterned after said terminal tags of the device; storage means for storing said electrical conductor situated above said fixture; a cutter mounted for reciprocal movement toward and away from said fixture so that when said electrical conductor is advanced to said series of holes said cutter in its downward position will form loops in at least some of said holes, said cutter having an end nearest said fixture which is of narrower width than the rest of said cutter, carriage means mounting said storage means and said cutter for movement along said fixture to lay said electrical conductor above said holes; and fork means positioned below said fixture also mounted on said carriage means mounting said storage means and said cutter, said fork means having a first leg and a second leg which define

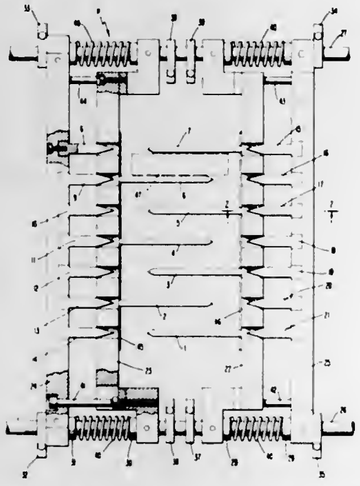
therebetween a space of greater dimension than the width of said end of said cutter, said fork means expanding the bottom of each loop formed in a hole in a direction transverse to the lengthwise direction of the hole so that the bottom portion of the loop is of greater dimension than the diameter of the hole whereby the loop is held in the hole.

4,074,422

APPARATUS FOR HOLDING ELECTRODE SETS

Anders Börjesson, Alvangen, and Tore Rehnberg, Nol, both of Sweden, assignors to Aktiebolaget Tudor, Sundbyberg, Sweden

Filed Jan. 26, 1977, Ser. No. 762,562
Claims priority, application Sweden, Sept. 12, 1975, 7513827
Int. Cl.² H01M 2/14
U.S. Cl. 29—730 **12 Claims**



1. Apparatus for firmly holding electrode sets during the manufacture of electrical batteries, said apparatus comprising:
a plurality of laterally spaced partitions for separating sets of electrodes;
spaced partition holders each carrying some of said partitions;
said partition holders being movable toward one another to close around electrode sets disposed therebetween;
a plurality of wedges disposed substantially coplanar with said partitions;
said wedges being wider than said partitions;
spaced wedge holders each carrying some of said wedges;
said wedge holders being movable toward one another to move said wedges into overlying relation with said partitions to hold said electrode sets tightly.

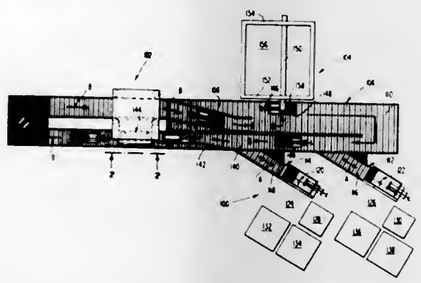
4,074,423

SYSTEM AND APPARATUS FOR ASSEMBLING INDUSTRIAL LEAD-ACID STORAGE BATTERIES

Hector L. DiGiacomo, Lafayette Hill, and John A. Sacco, Wernersville, both of Pa., assignors to General Battery Corporation, Reading, Pa.

Continuation-in-part of Ser. No. 652,715, Jan. 27, 1976. This application June 14, 1976, Ser. No. 695,858
Int. Cl.² H01H 69/02
U.S. Cl. 29—730 **14 Claims**

1. A system for assembly industrial batteries, comprising:
a. conveying surface, comprising: a main surface; and at least one spur surface contiguous to said main surface;
b. a plurality of stacking box means freely movable across said conveying surface for selectively receiving, aligning and retaining the plates and separators of any of a plurality of sizes of battery plates so that the terminal edge of a battery stack formed from said separators and plates is locates in a reference plane substantially parallel to and spaced apart from said conveying surface at a preselected distance;
c. tilt table means for moving between a normal and a stacking position, said tilt table means comprising a tiltable portion of said spur surface, said tiltable portion in the normal position communicating with the remaining portion of said spur surface for transfer of one or more of said



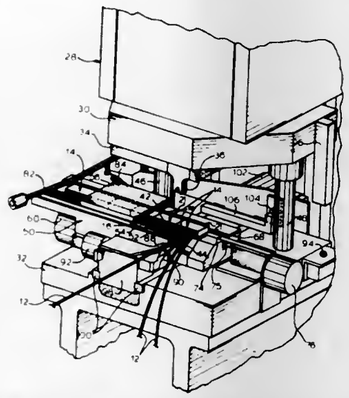
stacking box means therebetween, and in said stacking position for engaging and tilting said stacking box means through an acute angle with respect to said conveying surface to thereby allow the stacking of plates and separators therein; and
d. a burning station in communication with said main surface for receiving at least one stacking box means having disposed therein at least one battery stack with a terminal edge disposed within said reference plane, said burning station operating to form battery straps.

4,074,424

CRIMPING AND WIRE LEAD INSERTION MACHINE

Dushan C. Deshich, Elmhurst; Frank P. Chmela, Downers Grove, and Kenneth L. Kufner, Hickory Hills, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Mar. 1, 1977, Ser. No. 773,186
Int. Cl.² H01R 5/10
U.S. Cl. 29—753 **7 Claims**



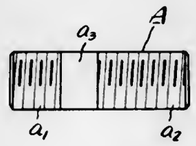
1. In a machine for crimping a plurality of electrical terminals one at a time onto wire leads, said machine including a press actuable for up and down movement and a die assembly mounted on said press, said die assembly including a die shoe with a crimp station whereat a terminal is crimped onto a wire lead, a punch holder opposite and spaced from said die shoe mounted on said press for movement therewith having punch means mounted over the crimp station to engage a terminal thereat, and a terminal feed assembly for supporting and feeding a strip of terminals one at a time to the crimp station in response to the movement of the press, the improvement comprising:
an insertion station on the die shoe adjacent and aligned with the crimp station;
a housing feed assembly on the die shoe for supporting at least one connector housing, said housing having a plurality of terminal receiving recesses formed therein, and indexing one of said recesses at the insertion station; and
an insertion assembly, including means for gripping a terminated wire lead at the crimp station, for inserting said terminated wire lead into a terminal receiving recess at the insertion station.

4,074,425

APPARATUS FOR AUTOMATICALLY FEEDING AND SETTING STUD BOLTS

Hiroshi Hashimoto; Tetsuo Abe, and Akira Kato, all of Aichi, Japan, assignors to Sanyo Machine Works, Ltd., Japan

Filed Mar. 21, 1977, Ser. No. 779,836
Claims priority, application Japan, Mar. 19, 1976, 51-30282; Oct. 23, 1976, 51-142849[U]
Int. Cl.² B23P 19/06; B25B 23/04
U.S. Cl. 29—813 **2 Claims**



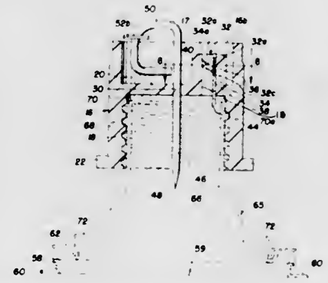
1. An apparatus for automatically feeding and setting stud bolts comprising a parts feeder unit including a parts feeder whereby a number of randomly charged stud bolts are arranged in a row and delivered; a bolt orienting unit including a reversing plate placed in the vicinity of the passageway of stud bolts and adapted to be projected and retracted in response to a detection signal from a direction detector for detecting the direction of stud bolts, whereby when a stud bolt is detected by said direction detector, if the stud bolt is found to have a forward direction it is allowed to pass with its direction maintained but if it is found to have a backward direction the reversing plate is projected in response to a detection signal from said direction detector to reverse the direction of the stud bolt and allow the latter to pass with its direction thus reversed, thereby assuring that when stud bolts are to be delivered their direction is always oriented; an escapement unit including a block which has a through-hole adapted to receive an axially directed stud bolt and which is slidably disposed in the guide hole of a housing so as to be reciprocated by the extension and retraction of the piston rod of an air cylinder, and a mechanical valve disposed at an end of the housing and having its operating portion projecting into the guige hole so that when the block is advanced its leading end actuates the mechanical valve to feed compressed air into the through-hole so as to forcibly deliver the stud bolt received in the through-hole; an impact wrench unit including a socket having an internally threaded portion engageable with the threaded portions of stud bolts, said socket being threadedly fitted in the front end of a piston which is inserted in the square hole of a block fixed to a cylinder barrel integrally joined to a pneumatically operable driving device so that said piston is slidable relative to the cylinder barrel and the rotation of the cylinder barrel can be transmitted thereto, and a self-holding valve adapted to be manually reset to stop the driving of said driving device and cut off the air being fed into the piston chamber for said piston and simultaneously feed air to the air cylinder of said escapement unit, so that said impact wrench unit is reliably fed with stud bolts one by one from said escapement unit and upon feeding of a stud bolt the driving device is driven while air is fed into the piston chamber so that the socket is rotated while being advanced to screw the stud bolt into intended work; a pneumatic pressure control unit for feeding compressed air produced by a compressor to said escapement unit and said impact wrench unit; and an electric control unit for driving and controlling said parts feeder of said parts feeder unit, said direction detector of said bolt orienting unit and said compressor of said pneumatic pressure control unit.

4,074,426

THREADED BLADE HOLDER

Michael W. Brandt, 1111 W. Mockingbird, Dallas, Tex. 75247

Filed Aug. 24, 1976, Ser. No. 717,092
Int. Cl.² B67B 7/00, 7/44
U.S. Cl. 30—1.5 **11 Claims**



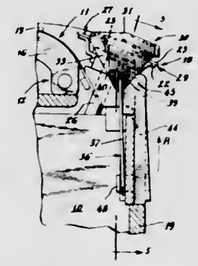
1. A blade holder comprising: a body, said body having an internally threaded hollow bore formed therein; a top on the body extending across one end of the bore, said top having a T-shaped blade receiving opening extending therethrough; a flat pointed cutting blade having a single cutting edge; and means in said T-shaped opening detachably securing said cutting blade to the top of the body such that the cutting blade extends downwardly into the bore in the body.

4,074,427

AUXILIARY TRIMMER ASSEMBLY

Michael John Marchetti, Bridgeport, and Edward Szymansky, Jr., Fairfield, both of Conn., assignors to Sperry Rand Corporation, Bridgeport, Conn.

Filed Jan. 12, 1976, Ser. No. 648,056
Int. Cl.² B26B 19/10
U.S. Cl. 30—34.1 **13 Claims**



1. In an electric dry shaver,
a. a casing having a main cutter head mounted thereon,
b. a trimmer unit mounted on said casing adjacent said main cutter head and having a cutting surface formed by a stationary cutter and movable cutter mounted for movement relative thereto,
c. a protective guard assembly for said trimmer unit including a member for covering the cutting surface thereof,
d. said movable cutter of said trimmer unit provided with a pair of spaced and parallel rows of cutting surfaces, the first surface arranged in a plane above the main cutter

head and the second surface projecting outwardly of said casing, and

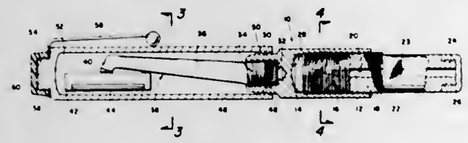
e. means mounting said guard member for controlled movement between positions alternately covering or exposing said second cutting surface and including spring means attached to said casing and having portions connected to said guard member.

4,074,428

POCKET RAZOR AND SHAVE CREAM DISPENSER

Raymond P. Roberts, Box 1117, Tulsa, Okla. 74101

Filed Feb. 4, 1977, Ser. No. 765,611
Int. Cl.² B26B *19/38*
U.S. Cl. 30—41 **4 Claims**



1. A pocket-size combination razor and shave cream dispense comprising housing means having an internally threaded chamber therein for receiving a quantity of shave cream therein, an externally threaded plug-type plunger member threadedly secured directly to the inner periphery of the chamber at one end thereof and extending into the chamber, said plug-type plunger member having a central bore extending longitudinally therethrough providing communication between the chamber and the atmosphere whereby movement of the plug-type plunger member in one direction with respect to the chamber forces the shave cream through the bore for discharge into the atmosphere, end cap means removably secured to the outer end of the plunger member for selectively closing the outer end of the bore, razor means removably secured to the housing means and extending longitudinally outwardly therefrom in a direction away from said plunger member whereby said plunger member is operable without removal of the razor from the housing means, and cover means removably secured to said housing in the proximity of said razor means for selectively encasing said razor during periods of non-use.

4,074,429

NOVEL LATHERING DEVICE AND RAZOR ASSEMBLY

Thomas G. Roberts, Box 223, R.D. No. 3, Stroudsburg, Pa. 18360

Filed Aug. 23, 1976, Ser. No. 716,547
Int. Cl.² B26B *21/44*
U.S. Cl. 30—41 **16 Claims**



1. A lathering device for attachment to a razor to provide a lathering composition in advance of the razor blade, which comprises:

a. a soap cake;

b. a container means for holding said soap cake; and

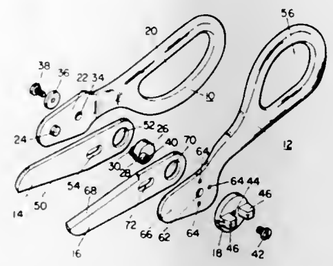
c. a means for securing the combination of soap cake and container means to said razor.

4,074,430

SHEARS

Tsuneyoshi Sugiyama, Seki, Japan, assignor to Feather Kogyo Kabushiki Kaisha, Japan

Filed Nov. 2, 1976, Ser. No. 737,984
Claims priority, application Japan, Jan. 20, 1976, 51-515213
Int. Cl.² B26B *13/04*
U.S. Cl. 30—260 **3 Claims**



1. A shears comprising a pair of handles, a pair of blades and a circular and rotatable cam containing projections eccentrically located on both sides thereof, holes located on the upper part of each of the blades to receive the cam, holes located on each of the blade-holding portions of the handles to receive the cam projections, wherein the pair of handles and blades are held together and operated by means of said circular and rotatable cam in such a manner that the cam is sandwiched between the blades and fits into said receiving holes of the upper portions of the blades and wherein the handles are then fitted onto the projections located on both sides of the cam, and a knob lined up with the cam-projection receiving hole of one of the handles such that the angle between the handles and the blades may be changed by rotation of the cam.

4,074,431

SURGICAL KNIFE ASSEMBLY, SURGICAL BLADE, AND METHOD OF MANUFACTURE THEREOF

John R. Beaver, Lexington, and George J. Kozlowski, Bedford, both of Mass., assignors to Rudolph Beaver, Inc., Belmont, Mass.

Filed Apr. 21, 1976, Ser. No. 678,866
Int. Cl.² B26B *3/00*
U.S. Cl. 30—353 **5 Claims**



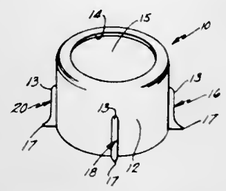
1. An elongated strip of metal formed into a guide portion and a series of blades extending from an edge of the guide portion at spaced intervals, said blades each having an outer edge extending parallel to the axis of the guide portion and being connected to the guide portion by a weakened portion, said strip being formed of a metal suitably heat treated to provide sufficient brittleness to permit separation of the blade from the strip by bending the blade out of the plane of the strip to cause fracture at the weakened portion.

4,074,432

INDEX COVER FOR KNOCK-OUT PUNCH

Romeo Alfieri, 336 W. 15th St., Holland, Mich. 49423

Filed May 24, 1976, Ser. No. 689,517
Int. Cl.² B26F *1/00*
U.S. Cl. 30—360 **9 Claims**



1. A removable indexing cover for use on a knock-out punch comprising a relatively thin-walled resilient, open ended body having a first end and a second end and shaped to fit snugly over the outer periphery of a cutting die associated with the knock-out punch, said body integrally including at least a pair of outwardly and longitudinally extending indexing projections having a first end spaced downwardly from said first end of said body and a second end flush with said second end of the body and extending outwardly a greater distance than said first end, said second end of said projections defining a pointed tip, and wherein said projections are spaced at a predetermined angular relationship from each other to provide means for aligning the knock-out punch on an object.

4,074,433

INTERMAXILLARY TOOTH MOVING DEVICE

John E. Nelson, Holtwood, Pa., assignor to Hamilton Technology, Inc., Lancaster, Pa.

Filed Sept. 7, 1976, Ser. No. 720,837
Int. Cl.² A61C *7/00*
U.S. Cl. 32—14 E **18 Claims**



1. An orthodontic appliance for intermaxillary tooth correction comprising a pair of housings, a pulley rotatable inside each said housing, means for coupling said pulleys together including a cable end wrapped around each pulley and extending outwardly from each housing, and a spring in each housing coupled to said pulley for applying a bias force to said pulley tending to draw said cable ends into said respective housings, said cable ends having enlargements for preventing them from being wholly drawn into said housings.

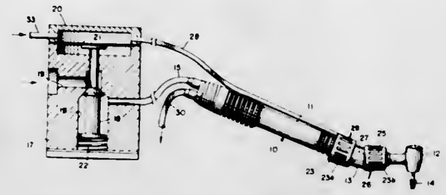
4,074,434

PRESSURE-RESPONSIVE SPEED CONTROL FOR DENTAL HANDPIECES

Milton R. Nielsen, Melrose Park, and Robert A. Olsen, Palatine, both of Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.

Continuation-in-part of Ser. No. 262,095, June 12, 1972, abandoned. This application Feb. 12, 1976, Ser. No. 657,358
Int. Cl.² A61C *1/10*
U.S. Cl. 32—27 **16 Claims**

1. A pressure-responsive speed control system for dental handpieces comprising a dental handpiece having a workhead, an elongated pliant chamber having an exposed wall portion capable of being squeezed by an operator to reduce the internal cross section of said chamber, said chamber having an inlet communicating with a gas supply line and with pressure-responsive means, said pressure-responsive means being operatively connected to said handpiece for controlling the operating speed of said workhead, said chamber also having an outlet spaced a substantial distance along the length of said chamber from said inlet for bleeding gas from said chamber during operation of said speed control system.

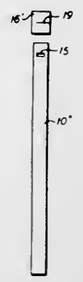


4,074,435

DISPOSABLE SALIVA EJECTOR

John Harry Orsing, Avangsgatan 2, S-253 71 Helsingborg, Sweden

Filed May 17, 1976, Ser. No. 687,134
Claims priority, application Sweden, May 20, 1975, 7505700; Mar. 10, 1976, 7603150
Int. Cl.² A61C *17/04*
U.S. Cl. 32—33 **5 Claims**



1. A disposable saliva ejector comprising a tubular stem open at both ends thereof, one open end of which being adapted to form a suction inlet opening through which saliva can be drawn by suction, and the other end thereof being adapted to be connected to a suction tube; and an external sleeve circumferentially disposed about said one end of the tubular stem and covering part thereof, defining with the exterior wall of the stem at least one passage therebetween; said sleeve having a cut extending over at least half the circumference thereof, and being formed of flexible material allowing the sleeve to be opened at the cut and the outer end portion of the sleeve to be turned away from the end of the tubular stem.

4,074,436

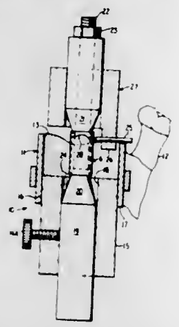
APPARATUS FOR USE IN SHAPING A TUBULAR DENTAL IMPRESSION ACCESSORY

Kenneth Henry Marshall, Castlecrag, Australia, assignor to Premach Pty. Limited, Sydney, Australia

Filed July 6, 1976, Ser. No. 702,962
Claims priority, application Australia, July 15, 1975, 2358/75
Int. Cl.² A61C *3/02*
U.S. Cl. 32—49 **3 Claims**

1. In a dental jig for the preparation of a patient's tooth for a jacket crown by which radial reduction and the provision of a contoured sub-gingival shoudler is effected on the tooth by a

cutting bur enclosed by a tubular sleeve having a contoured cam surface at a first end which functions to guide the axial extension of the cutting bur to determine the contour of the formed sub-gingival shoulder, apparatus for providing a contoured end on a dental impression tube to correspond said tube end to the contour of said sub-gingival shoulder to permit matching abutment of said tube end to said shoulder when an impression is to be made of the prepared tooth, said apparatus comprising a pair of confronting centering cones between which said impression tube is clamped, a cylindrical portion



supporting each said cone, a bored spigot about one of said cylindrical portions and securable in a second end of said tubular sleeve, means for anchoring said one cylindrical portion in said spigot in a position where a portion of said impression tube is located internally of and opposite said contoured cam surface, a collar slidable and rotatable upon the other said cylindrical portion, scribing means engageable with said portion of said impression tube to produce said contoured end and being carried by said collar, and means abutting said contoured cam surface to guide said scribing means during rotation of said collar.

4,074,437

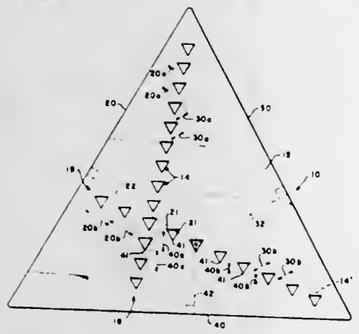
DRAFTING TEMPLATE

Peter G. Kindersley, 35 Wincrest Drive, Glens Falls, N.Y. 12801

Filed Nov. 18, 1976, Ser. No. 742,991

Int. Cl.² B43L *13/02*

U.S. Cl. 33—41 B **9 Claims**



1. A drafting instrument comprising an equilateral polygon-shaped sheet having x straight-edged sides wherein x is an integer larger than 2,

a plurality of equilateral polygon-shaped openings formed in said sheet, each opening having yx straight-edged sides wherein y is a positive integer,

said openings being disposed with respect to said sheet straight-edged sides so that for each opening there is a line perpendicular to each straight-edge side of said sheet that bisects an apex of said opening, and

said plurality of openings disposed in at least one series, in each series the distance from the apex of each opening to a corresponding apex in an adjacent opening being a constant throughout the series, relative to a given straight edge of said sheet, and a line connecting the corresponding apeces in a series intersecting each line extending perpendicular to the midpoint of each said sheet sides, and intersecting a line bisecting each corner of said sheet.

4,074,438

PROFILE INDICATOR

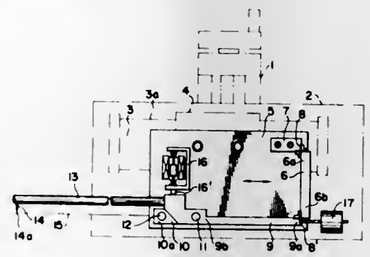
Yasuo Takeda, Utsunomiya, Japan, assignor to Kabushiki Kaisha Mitutoyo Seisakusho, Tokyo, Japan

Filed Mar. 3, 1976, Ser. No. 663,518

Claims priority, application Japan, Mar. 19, 1975, 50-036878[U]

Int. Cl.² G01B *5/20, 7/28*

U.S. Cl. 33—174 P **2 Claims**



1. In a profile indicator for measuring the contour of a surface, said indicator comprising a slide plate, an arm carried by the slide plate, and a stylus attached to one end of the arm, the improvement which comprises

a first link bar having a first pivot and a second pivot spaced from the first pivot, said first link being pivotally connected at said first pivot to said slide plate for swinging movement in a plane parallel to said slide plate,

a third link bar having a third pivot and a fourth pivot and pivotally connected to said slide plate at said third pivot for swinging movement in a plane parallel to said slide plate,

a second link bar having one end pivotally connected to said first link bar at said second pivot, and pivotally connected to said third link bar at said fourth pivot at the point on the second link bar which is spaced from said second pivot, said arm with the stylus being fixed to said second link bar, said first, second, third and fourth pivots, said first, second and third members, and said arm being positioned and configured such that swinging movement of said second link bar results in a compensating swinging movement of said first link bar to cause the tip of the stylus to move in a straight line.

4,074,439

MOLD DISCHARGE RACK GAPPING APPARATUS

Alfred J. Capriotti, Falls Township, Bucks County; Louis G. Lazzaretti, Economy Borough, and Brian O'Donnell, Bristol Township, Bucks County, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 31, 1975, Ser. No. 645,597

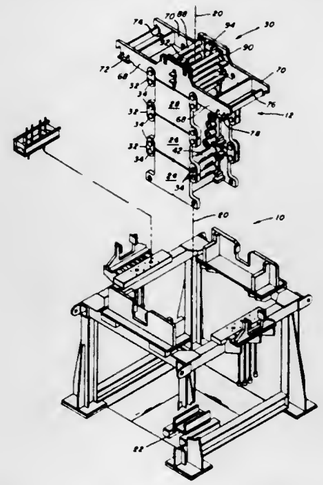
Int. Cl.² G01C *15/00*

U.S. Cl. 33—286 **10 Claims**

1. Apparatus for accurately gapping and spacing a continuous casting discharge rack used in casting a steel product which is passed therethrough, such steel product having a given width dimension, a given depth dimension, a length dimension which is dependent upon the amount of material being cast and a centerline, such discharge rack including width and depth defining elements for defining a given width and a given depth dimension for such product, said gapping and spacing apparatus comprising:

a support base;

means for establishing a gapping and spacing standard for such width and depth defining elements, said gapping and spacing means being secured to said support base and extending outwardly therefrom, said spacing and gapping means providing a standard, at least along part of its extension, for the measurement of the width and depth dimensions of such width and depth defining elements, said gapping and spacing means having a centerline passing therethrough which is collinear with the centerline of the width and depth dimension to be measured therefrom;



means, connected to said support base, adapted to receive such discharge rack and establish a plane of support for such discharge rack upon said apparatus normal to the centerline of said gapping and spacing means; and

means, formed as a portion of said means adapted to receive and establish a plane of support for the discharge rack, for precisely positioning a given benchmark point on successive discharge racks on said support base in a given spacial relationship to the centerline of said spacing and gapping means for establishing a common centerline through such successive discharge racks collinear with said centerline of said spacing and gapping standard establishing means, such that when a plurality of discharge racks are aligned in operational association with one another in a continuous casting machine, relative to the same given benchmark point on each, the centerlines through each discharge rack are aligned collinearly.

4,074,440

AUTOMATIC VACUUM DEHYDRATING APPARATUS IN A SLURRY CARRYING VESSEL

Tomiyasu Nohara, Takaki; Yoshiyuki Matsuno, Nagasaki; Hisamitsu Harada, and Akinori Yamada, both of Kobe, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo and Kabushiki Kaisha Kobe Seikosho, Kobe, both of Japan

Continuation-in-part of Ser. No. 568,681, April 16, 1975, abandoned. This application May 24, 1976, Ser. No. 689,514

Claims priority, application Japan, Apr. 24, 1974, 49-46810

Int. Cl.² F26B *13/30*

U.S. Cl. 34—92 **2 Claims**

1. In combination with a slurry carrying vessel having a hold for slurry, the hold having a bottom, an automatic dehydrating system, comprising:

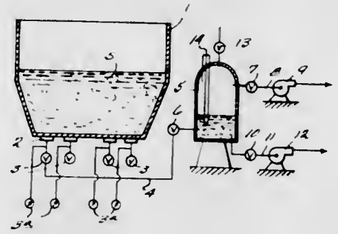
means defining a plurality of ports in the hold bottom;

a vacuum tank and means for drawing a vacuum in the tank;

dehydrating pipe means connected between the tank and each port and including a branch line for each port;

an automatically openable automatically closable valve interposed in each branch line so that each port is communicated through the respective branch line to the vacuum tank only when the respective valve is open;

a pressure sensing valve controller interposed in each branch line upstream of said valve therein, each controller including means for sensing the pressure in the hold near the respective port;



each controller being operatively connected to the respective valve for opening and closing that valve;

each controller sensing means including means for sensing whether the pressure in the hold near the respective port is close to atmospheric pressure, within a selected range having one limit below atmospheric pressure and another limit above atmospheric pressure, for closing the respective valve only if the sensed pressure lies within this range and for opening the respective valve if the sensed pressure is not within said range.

4,074,441

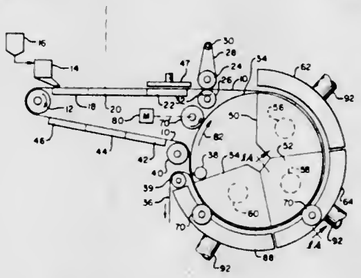
ROTARY THROUGH DRYER HAVING MULTIPLE VACUUM CHAMBERS AND ASSOCIATED HEATERS

Frederick D. Helversen, 1290 SW. Sixth Ave., Portland, Oreg. 97204, and Morris R. Rivers, Vancouver, Wash., assignors to Frederick D. Helversen, Portland, Oreg.

Filed Mar. 8, 1976, Ser. No. 664,992

Int. Cl.² D21F *5/18*

U.S. Cl. 34—122 **13 Claims**



1. A sheet drying apparatus comprising:

a movable endless foraminous conveyor for carrying fibrous sheet material to be dried;

forming means for forming said sheet material on said conveyor from liquid stodz deposited on said conveyor;

a rotary dryer drum having foraminous side wall about which said conveyor extends for drying the sheet material on the same conveyor on which it is formed;

support means including bearings for supporting the dryer drum for rotation;

a plurality of separate vacuum chambers fixedly mounted within the dryer drum for drawing moisture from the

sheet material into said chambers through said side wall of said drum, each chamber having a separate fixed exhaust conduit which extends out through an end of the dryer drum at a position radially spaced from the support means;

vacuum means connected to the exhaust conduits of said vacuum chambers for independently controlling the vacuum pressures in said chambers;

heating means outside of the dryer drum for causing heated gas to flow through the sheet material and said conveyor into said vacuum chambers for heating the sheet material in a plurality of heating zones of different temperatures positioned over and in registration with the vacuum chambers; and

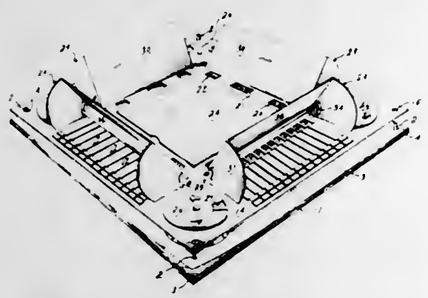
removal means for removing the sheet material from said conveyor after it is dryed.

4,074,442

APPARATUS FOR TEACHING AND PLAYING CONTRACT BRIDGE

Joseph Gérard Landry, 754 Raymond St., St. John, Canada

Filed Aug. 4, 1976, Ser. No. 711,549
Int. Cl.[2] G09B *19/22*
U.S. Cl. 35—8 B **4 Claims**



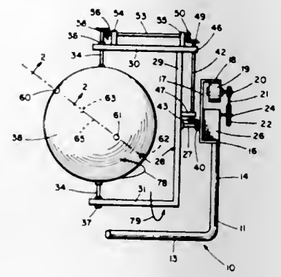
1. An apparatus for teaching and playing a card game comprising a baseplate, at least one sheet operatively resting on the baseplate, having playing cards indicia marked on one face thereof and arranged in series each representative of a player's hand, and having sequence of play indicia marked on said one face and arranged in series repesentative of a sequence of play, each of said sequence of play indicium registering with a corresponding playing card indicium in a transverse direction relative to the corresponding series of playing card indicia, a top plate overlying said one sheet and having series of elongated apertures, each of said elongated apertures operatively extending lengthwise in one of said transverse directions and overlying the corresponding sequence of play indicium and playing card indicium, slides slidably attached to said top plate and retained in overlying relationship with said apertures respectively, each slidably displaceable lengthwise in the transverse direction defined by the corresponding sequence of play indicium and playing card indicium, and each settable in anyone of three distinct positions including a position overlying both corresponding indicia, a position uncovering only the corresponding sequence of play indicium, and a position uncovering only the corresponding playing card indicium, and shields operatively fixed on said top plate and concealing said series of indicia from other players' views, as compared to the player having the corresponding hand, and wherein each of said shields operatively overlies both corresponding series of sequence of play indicia and playing card indicia and a flap is adjustably carried in each shield and selectively conceals the corresponding series of sequence of play indicia.

4,074,443

ATOM DEMONSTRATOR

Edward D. Wilkerson, P.O. Box 755, South Court, Normandy Beach, N.J. 08739

Filed Nov. 16, 1976, Ser. No. 742,193
Int. Cl.[2] G09B *23/26*
U.S. Cl. 35—18 A **1 Claim**



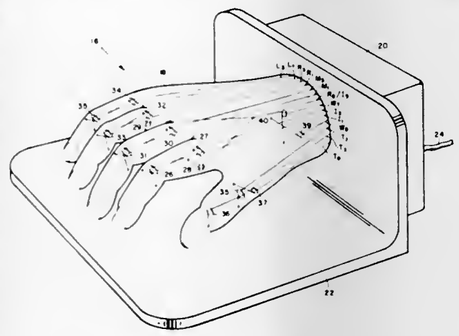
1. An atom demonstrator, comprising; frame means, a motor mounted on said frame means, a yoke rotatably mounted on said frame means about a first axis and driven by said motor, a globe rotatably mounted on said yoke, said globe being rotatably driven by said motor about a second axis stationary with respect to said yoke, said motor being connected to simultaneously rotate said yoke and said globe, and four light bulbs on said globe evenly spaced in a circle in a plane extending diametrically through the globe bulbs being present on the globe only in the aforementioned plane so that the bulbs represent the electrons of an atom so that as the globe is rotated simultaneously about the first and second axes, the bulbs will scribe curvilinear paths representing the motion of the electrons.

4,074,444

METHOD AND APPARATUS FOR COMMUNICATING WITH PEOPLE

Charles J. Laenger, Sr.; Sam R. McFarland, and Harry H. Peel, all of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Filed Sept. 30, 1976, Ser. No. 728,404
Int. Cl.[2] G09B *21/04*
U.S. Cl. 35—35 A **12 Claims**



1. A method for communicating with persons who understand the one-hand manual alphabet, consisting of the following steps:

generating a coded signal for a preselected alphanumeric character, said preselected alphanumeric character being one of a plurality of alphanumeric characters;

converting said coded signal to generate a single output for said preselected alphanumeric character;

moving a mechanical hand in response to said single output to form said preselected alphanumeric character in said one-hand manual alphabet;

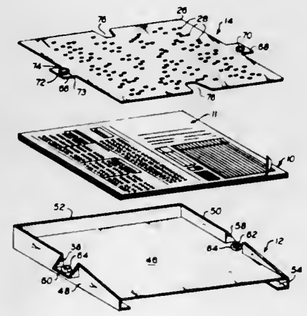
reading said preselected alphanumeric character by feeling said mechanical hand.

4,074,445

METHOD AND APPARATUS FOR CONSTRUCTING AND GRADING OBJECTIVE EXAMINATIONS

Ben Joseph Friedman, 315 E. Ninth St., New York, N.Y. 10003

Filed Mar. 24, 1975, Ser. No. 561,593
Int. Cl.[2] G09B *3/08*
U.S. Cl. 35—48 A **5 Claims**



1. Apparatus for scoring an examination answer sheet of the type having question indicia for designating a plurality of questions and a plurality of separately positioned answer spaces associated with each question indicia corresponding to a plurality of possible answers thereto, said apparatus comprising:

a grading tray including a base support for said answer sheet;

a template having a plurality of holes therein corresponding to predetermined answer spaces on said answer sheet representing the correct answers for said plurality of questions;

means on said base support for registering said template holes with said spaces on said answer sheet disposed on said base support, said template being variably orientable relative to said answer sheet on said base support, whereby to change the answer spaces on said answer sheet in register with said template holes;

means for indicating the orientation of said template relative to said answer sheet;

said template relative to said answer sheet and said answer sheet being rectangular and said registering means comprising an upstanding wall for engaging no more than three sides of the rectangular peripheries of said template and answer sheet;

said registering means further comprising a discontinuity in the periphery of said template and a plurality of complementary interfitting surface discontinuities in said upstanding wall.

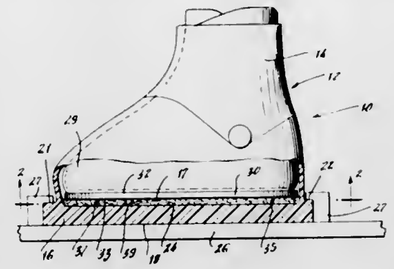
4,074,446

SKI BOOT

Joel Howard Eisenberg, 53A Blackhawk Lane, Stratford, Conn. 06497

Filed June 18, 1976, Ser. No. 697,437
Int. Cl.[2] A43B *5/04, 13/18;* A63G *9/16*
U.S. Cl. 36—120 **17 Claims**

1. A ski boot for holding a foot of a skier, said ski boot comprising an outer boot having a substantially inflexible upper shell, and support means disposed inside said outer boot near said ski in such a manner that said support means is laterally tiltable with respect to said ski and said outer boot upon



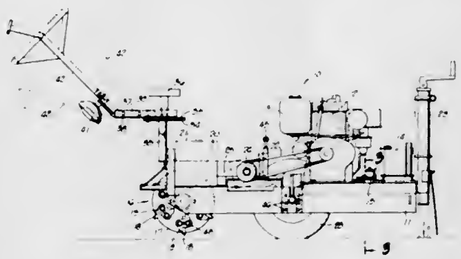
inversion or eversion of said foot, and means for attaching said ski boot to a ski.

4,074,447

STUMP CUTTING AND PRECISION DIGGING APPARATUS

Norman E. Shivers, Jr.; David E. Shivers, both of 121 W. El Segundo, Los Angeles, Calif. 90061, and Paul N. Shivers, 424 E. Foothill Blvd., Apt. D, Monrovia, Calif. 91610

Filed Aug. 16, 1976, Ser. No. 714,568
Int. Cl.[2] A01G *23/06*
U.S. Cl. 37—2 R **18 Claims**



1. A stump cutting and digging apparatus comprising in combination:

a main supporting frame of a vehicle member, the frame having an integral elongated channel which acts as a guide for controlling cut material;

a cutting wheel mounted on the frame and longitudinally aligned with the channel for rotation about a horizontal axis transverse to said channel, said cutting wheel having a plurality of radially extending cutting teeth circumferentially mounted on the cutting wheel; and

drive means for powering said cutting wheel to cut material and to convey a majority of the cut material through the channel of said frame of the vehicle member.

4,074,448

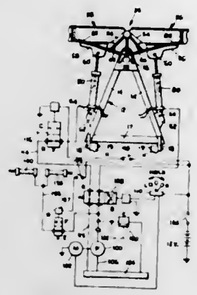
HINGED SNOWPLOW, CONVERSION KIT, AND METHOD THEREFOR

W. Wally Niemela, Box 165E, Chassell, Mich. 49916

Filed June 17, 1976, Ser. No. 697,037
Int. Cl.[2] E01H *5/00*
U.S. Cl. 37—41 **51 Claims**

1. A hinged snowplow for vehicles comprising a support frame having an outwardly extending projection; means for securing said support frame to a vehicle; a pair of generally elongated plow blades; a central hinge having a generally vertical axis; means for securing said plow blades to said hinge one on either lateral side thereof for pivotal movement about

said generally vertical axis independent of one another; said hinge including a single, generally vertical, hinge support member extending toward and secured to said outwardly extending projection of said support frame generally intermediate the top and bottom of said hinge, and forming a central support for said hinge and blades, said hinge support member tapering toward said outwardly extending projection from above and below said projection and extending over, beyond, and inwardly of the outermost end of said projection for stability and support strength; a pair of blade positioning arm means for positioning said blades and holding said blades as positioned, each of said arm means extending between said support frame and one of said plow blades; means for pivotally securing each of said arm means to both its respective plow blade and said support frame; said blades being movable between positions forming a forwardly extending V with said central hinge forwardmost to a forwardly open V position having the lateral plow blade edges extending forwardly of said central hinge as well as positions therebetween.



4,074,449

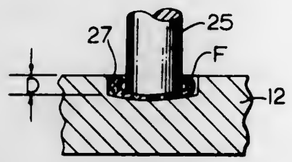
METHOD OF MAKING A LOADER BUCKET CUTTING EDGE WITH RECESSED BOLT STUDS

William E. Lanz, Joliet, and Visvaldis A. Stepe, Willow Springs, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 733,689, Oct. 18, 1976, Pat. No. 4,052,803. This application May 9, 1977, Ser. No. 795,357

Int. Cl.[2] E02F *9/28;* A01B *35/26*

U.S. Cl. 37—141 R **5 Claims**



1. A method for forming a cutting edge for use on a loader bucket or the like comprising the steps of

forming at least one recess on said cutting edge,

positioning a lower end of a fastening stud in said recess, and

welding the lower end of said fastening stud to said cutting blade.

4,074,450

BINDER FOR DATA CARRIER HOLDERS

Dieter Klaus-Jürgen Schweinsberg, 8631 Lautertal-Unterlauter, Germany

Filed Oct. 13, 1976, Ser. No. 732,014

Claims priority, application Germany, Apr. 26, 1976, 2618261

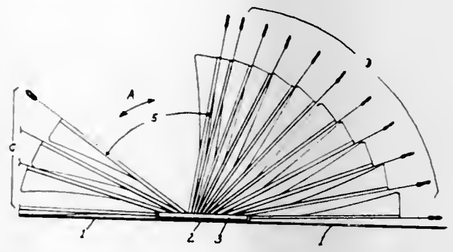
Int. Cl.[2] G09F *13/00*

U.S. Cl. 40—403 **3 Claims**

1. A binder comprising a substantially rectangular flat front cover member, a substantially rectangular flat rear cover member, and a back member hingedly connecting said front cover member and said rear cover member along adjacent edges thereof, data carrier holders mounted at said back member by means of guide rails disposed at those back member edges

which are not hingedly connected to said front cover member or said rear cover member, said guide rails being provided with straight grooves facing each other,

rod means being provided at that data carrier holder edge which, when mounted at said back member, is adjacent thereto, said rod means extending beyond said holder edge and having end portions slidingly and pivotably received in said grooves,



the number of data carrier holders mounted in said rails by means of said rod end portions being sufficiently small to leave a substantial amount of the guide rail length unoccupied for sliding movement of said end portions, each data carrier holder comprising a pocket member folded of resilient plastic film and having a substantially rectangular rear wall and two lateral front flaps whose opposing edges are spaced from each other, said front flaps being provided with score lines such that the flaps are biased away from said rear wall, said rod means axis being substantially perpendicular to said opposing flap edges, the bias of all flaps facilitating unfolding of said binder between two adjacent holders.

4,074,451

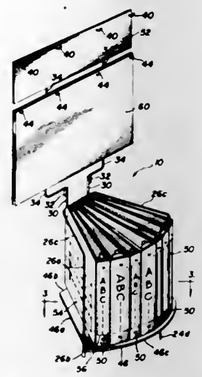
DISPLAY DEVICE

Sidney I. Jacobson, 4248 D'Este Court, Apt. 104, Lake Worth, Fla. 33463; Harold D. Jacobson, 2126 Valley Road, Northbrook, Ill. 60062, and Arthur F. Jacobson, 1281 Lynn Terrace, Highland Park, Ill. 60035

Filed Aug. 9, 1976, Ser. No. 712,858

Int. Cl.[2] G09F *1/00;* A47B *65/00*

U.S. Cl. 40—610 **5 Claims**



1. A point-of-purchase display device for supporting and displaying loose-leaf binders and for supporting order blanks for enabling a purchaser to selectively order the binders in accordance with specifications which best meet the purchaser's requirements, comprising a self-supporting loose-leaf

binder receiving portion, and an order blank supporting portion associated with the loose-leaf binder receiving portion, said binder receiving portion having a base frame which has a front facing member joined at its ends to rearwardly and inwardly extending side members, each of said side members being joined at its rearwardmost end to a back member which is substantially parallel to and shorter in length than the front facing member, said base frame further having a support member joined to the front member and the back member of the base frame between the side members and extending outwardly from the front member of the base frame, said binder receiving portion also having a side support frame provided with upwardly extending members joined to the base frame at the front facing member thereof, each of the upwardly extending members of the side support frame having rearwardly and inwardly extending side members joined to the upper end thereof, the rearwardmost end of each of the side members of the side support frame being joined to a back member which is substantially parallel to the back member of the base frame of the binder receiving portion, said order blank supporting portion of the display device having upwardly extending binder receiving portion engaging members joined to the back members of the base frame and the side support frame of the binder receiving portion, said binder receiving portion engaging members having means for detachably receiving an order blank supporting frame, said order blank supporting frame having upwardly extending substantially vertical members joined to a horizontally extending order blank receiving member for supporting a plurality of order blanks in an elevated position above the loose-leaf binder receiving portion of the display device, said order blanks having indicia thereon which enable a purchaser to self-initiate the ordering to his exact specifications of a binder, or binders, supported on the loose-leaf binder receiving portion of the display device.

4,074,452

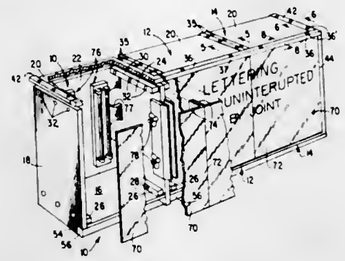
KNOCKDOWN LIGHTING BOXES AND MEANS FOR CLAMPING THE FRONT PANELS THEREOF

Alex J. Bellinder, 221 Highland Drive, Mundelein, Ill. 60060

Filed Aug. 12, 1976, Ser. No. 713,695

Int. Cl.[2] G09F *13/00*

U.S. Cl. 40—571 **10 Claims**



1. A plurality of light boxes adapted to be transported and/or stored in a knocked-down and disassembled condition to be assembled, set up, and connected together, comprising spaced end walls, a rear wall, top and bottom members and a divider between each pair of adjacent light boxes, a front panel for each light box, each front panel having a flange at right angles to the plane of the panel, clamping means including a pair of elongated strips connected by fastening means engaging the flanges of adjacent front panels for securing the adjacent flanges on adjacent panels together, said strips having beveled edges to eliminate shadows on the associated front panels so that the front panels are connected to each other free of exterior mullions therebetween to present a continuous front panel surface, and lighting means positioned inside each said light box for illuminating said front panels.

4,074,453

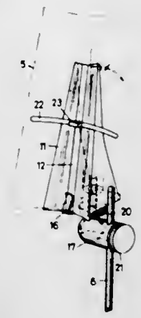
DEVICE FOR HOLDING FLEXIBLE, YIELDABLE INFORMATION CARRIERS

John E. Knox, Klosterhof 4, 7581 Eisental-Affental, Germany

Filed July 14, 1975, Ser. No. 595,815

Int. Cl.[2] B41J *11/64*

U.S. Cl. 40—352 **3 Claims**



1. A device for holding flexible, yieldable information carriers such as paper in a correct readable position, comprising:

securing means for clamping the flexible, yieldable information carrier to at least partially stiffen the same, so that it remains in a freely supported reading position, said securing means comprising a member including first and second connected surfaces,

said first surface including a longitudinally running curve and a magnetic strip built-in to said first surface, said second surface being connected with said first surface with a laterally running curve,

a runner including magnetizable means associated with and cooperating with said magnetic strip, a retaining clamp associated with the bottom of said first surface and cooperating with said runner whereby to retain an unstable information carrier pressed against said first surface,

a groove holding element formed on one pair of two opposite sides of said second surface for holding an information carrier thereagainst, a flexible yieldable strip having its ends held by said groove holding element on each of said two opposite sides, said yieldable strip being wider than the distance between said two opposite sides and adjusted to press against said second surface and held thereto by said groove holding elements, and gripper means associated with said yieldable strip for separating said strip from said second surface whereby to permit insertion of an information carrier onto said second surface, said member being adapted to have an information carrier placed onto either said first or said second surfaces whereby to permit said member to be used in different positions thereof.

4,074,454

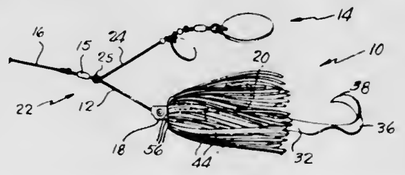
FISHING LURE

Carl R. Cordell, Jr., P.O. Box 2020, Hot Springs, Ark. 71901

Filed Nov. 22, 1976, Ser. No. 744,099

Int. Cl.[2] A01K *85/00*

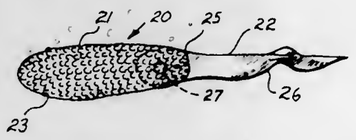
U.S. Cl. 43—42.28 **23 Claims**



1. A lure for attachment to a fish hook, which comprises

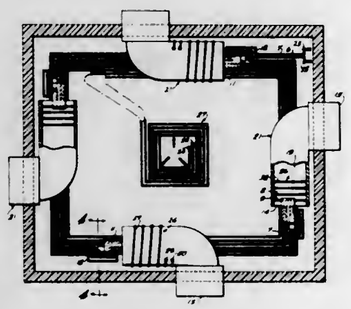
skirt means having a plurality of skirt members, and curled tail means comprising a thin piece of flexible material having substantially planar parallel flat surfaces and including an elongated body portion and a curvilinear tail portion extending integrally from one end thereof, the other end of said elongated body portion of said piece of flexible material being connected to said skirt means.

4,074,455
FISHING LURE
William O. Williams, Jr., 1309 Lynhurst Drive, Gastonia, N.C. 28052
Filed July 12, 1976, Ser. No. 704,453
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.06 **12 Claims**



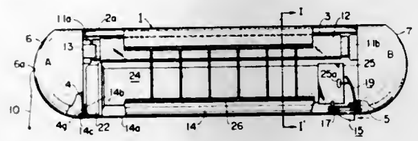
1. A fishing lure having a body of soft plastic material with a surface that is formed with a plurality of small closely spaced pockets of generally semispherical configuration having internal surface characteristics for releasable retention of air bubbles in said pockets when said lure is immersed in water to provide a glistening scaly appearance and a life-like breathing effect upon release of air bubbles.

4,074,456
PEST TRAP
Robert Wayne Tidwell, 15330 Harding Lane, Leisure City, Fla. 33030
Filed Oct. 18, 1976, Ser. No. 733,320
Int. Cl.[2] A01M *1/22, 23/38*
U.S. Cl. 43—98 **7 Claims**



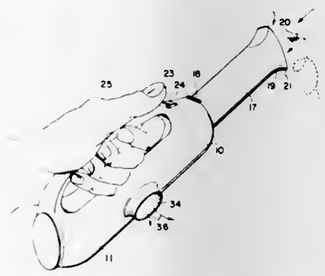
1. A trap apparatus containing a bait to attract rodents, insects, and like pests, comprising:
an enclosure;
means for entry into said enclosure;
a source of electricity;
a first open circuit powered by said source of electricity positioned within said enclosure and disposed in surrounding relationship to the bait, whereby the pest must engage said first open circuit to reach the bait;
a second open circuit mounted within the interior of said entry means;
a tripper yieldably attached to said entry means;
said tripper disposed for electrical activation of said second open circuit upon receiving the weight of the pest, whereby the pest must engage said second open circuit to retreat up said entry means.

4,074,457
INSECTS CATCHER ASSEMBLY
Hitoshi Sato; Hazime Watanabe; Kazumasa Miura, all of Kawaguchiko, and Koji Kudo, Matsudo, all of Japan, assignors to Kawaguchiko Seimitsu Co., Ltd., Kawaguchiko, Japan
Filed May 12, 1976, Ser. No. 685,928
Claims priority, application Japan, May 12, 1975, 50-57126
Int. Cl.[2] A01M *1/04*
U.S. Cl. 43—113 **8 Claims**



1. In an insects catcher assembly comprising a framework, fluorescent lamp means mounted within the framework for attracting flying insects theretowards and a sticky insects catcher band strip positioned in proximity to said fluorescent lamp means, the improvement comprising:
a pan extending longitudinally with respect to said lamp for collecting insect bodies and being adapted to be detachably attached to the framework; and
holding means extending upwardly from both ends of said pan for holding the sticky insects catcher band strip under tension in a working position substantially parallel to said longitudinal direction of said pan.

4,074,458
FLY GUN
Richard E. Catlett, Port Angeles, Wash., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed Feb. 23, 1976, Ser. No. 660,711
Int. Cl.[2] A01M *1/06*
U.S. Cl. 43—139 **2 Claims**



1. A portable hand-held motorized suction unit for use in entrapping flying insects, comprising
a housing enclosing a motorized fan in an interior chamber, said housing formed with an inlet opening to said chamber to which opening nozzle section having an internal opening is externally joined, with
a mesh cage mounted in said chamber between the said fan and said nozzle opening, said cage open to the said chamber inlet opening,
said nozzle section formed with a flared inlet opening, in which
a handle is externally mounted to the housing, the axis of which handle is generally parallel to the axis of the nozzle section, amd perpendicular to the axis of
an external exhaust opening formed in the housing, which is joined to said interior chamber, said exhaust opening extending to the atmosphere in a direction perpendicular both to the axis of the nozzle section and to the axis of the handle so that exhaust air expelled through said outlet opening to the atmosphere is directed away from both the inlet opening of the nozzle section and away from the body of a user holding the handle when the nozzle section is pointed forward of the body of the user.

4,074,459
TOY BALLERINA DOLL
Ana Lopez, GPO Box 329, New York, N.Y. 10001
Filed Feb. 14, 1977, Ser. No. 768,088
Int. Cl.[2] A63H *13/02*
U.S. Cl. 46—47 **1 Claim**



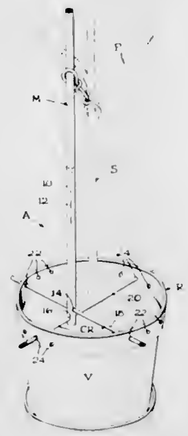
1. A toy, comprising in combination, a doll mounted along a single line extending through said doll and protruding from upper and lower ends thereof, opposite ends of said line being free and each end being fitted with a ring for being held in hands of an operator, and said opposite ends of said line extending from said doll and being flexible so that they can be wound up; said doll being made in the appearance of a ballerina dancer, said line being comprised of a length of chain, a string and a rubber band, said chain being attached to and contained within said doll and extending from a top of a head thereof, to a crotch thereof, one said extending end of said line comprising said string, and the other said extending end of said line comprising said rubber band, and said doll having movable legs and arms.

4,074,460
DOLL SIMULATING SUCKING ACTION
Herbert Thorn, Great Neck, and Harvey Berkin, Merrick, both of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.
Filed July 1, 1976, Ser. No. 701,470
Int. Cl.[2] A63H *13/02*
U.S. Cl. 46—135 R **21 Claims**



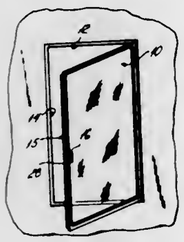
1. A doll assembly comprising,
a hollow head portion having a mouth aperture and a pair of flexible cheek portions,
an actuator member, said actuator member comprising an elongated rod slidably mounted in said head for longitudinal sliding movement towards and away from said mouth aperture, and
means for connecting said actuator member to said flexible cheek portions for flexing said cheek portions inwardly when said actuator member is moved away from said mouth aperture with said connecting means comprising a rigid frame with a central portion which surrounds said rod and is mounted on said rod for movement therewith and having a pair of arms respectively secured to the interior of said flexible cheek portions.

4,074,461
PLANT SUPPORT
Abraham Hirschman, 9039 Sligo Creek, Apt. 1003, Silver Spring, Md. 20901
Filed Apr. 1, 1977, Ser. No. 783,832
Int. Cl.[2] A01G *9/02*
U.S. Cl. 47—70 **31 Claims**



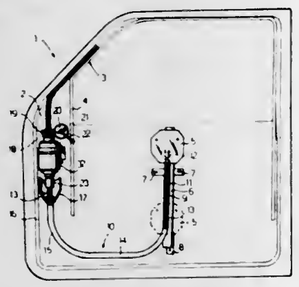
1. Upright plant-support means for use with peripheral rim portions of flower pots and other plant-growing vessels, comprising:
(a) a vessel for growing flowers and plants, said vessel having an upstanding peripheral rim;
(b) mast means including an elongated mast having a longitudinal axis and adaptable for disposition with said axis in a generally vertical manner in conjunction with the plant-growing vessel;
(c) said mast means including a lowermost free end portion provided closely adjacent thereto with a pair of cross-disposed apertures each formed to pass generally through the axis of said mast means generally transverse to its length and in relatively close but axially spaced relation at generally right angles to each other;
(d) a pair of elongated, mast-supported rods for respectively traversing said cross-disposed apertures at said lowermost end portion of said mast means and in close-fitting slidable relation, for stabilizing said mast in vertically supported relation to said rods;
(e) mounting means for respectively interconnecting predeterminable rim portions of said vessel with generally end portions of said cross-oriented rods, for affixing the mast and cross-rod assembly to said plant-growing vessel with said mast in the generally vertical position; and
(f) said pair of rods being in assembly with both said mast means and said vessel rim, and respectively being of at least vessel-rim-chord-spanning length generally horizontally spanning across and operatively mounting in a cross-disposed manner with the selectively predeterminable circumferentially spaced rim portions of said vessel.

4,074,462
MULTI-POSITION WINDOW
Murray Parker McHeffey, Little Silver, N.J., assignor to Extrudart Metal Products, Inc., Clifton, N.J.
Filed Dec. 6, 1976, Ser. No. 747,491
Int. Cl.² E06B *11/00*
U.S. Cl. 49—192 **7 Claims**



1. In a multi-position window having a drive train coupled to a window handle, said drive train movable around the edge of the window cooperating with respective elements in the frame of the window to permit the window to be closed, tilted open, or swung open by movement of the handle and associated drive train to respective positions, an improvement comprising safety detent means connected to said window and actuated when said window is opened to either a tilt or swung open position to block said drive train against movement from the position corresponding to said respective open position of said window, said handle locked in the respective position enabling said window to assume said tilt or swung open positions, said safety detent means comprising a catch member spring biased to block movement of said train, a projecting end of said catch member and a strike attached to said frame bearing against said projecting end to move said catch member from said blocking position when the window is closed, further comprising a key operated latch, said train comprising a slot, said slot of said train and said latch cooperating to block movement of said handle to said swing open position and to permit movement of said handle for said window to assume said tilt position.

4,074,463
ELECTRICALLY CONTROLLED WINDOW REGULATOR
Franco Colanzi, Turin, Italy, assignor to RIV - SKF Officine di Villar Perosa S.p.A., Turin, Italy
Filed Sept. 15, 1976, Ser. No. 723,384
Claims priority, application Italy, July 27, 1976, 68871/76
Int. Cl.² E05F *11/48*
U.S. Cl. 49—352 **5 Claims**



1. An electrically controlled window regulator, particularly for raising and lowering a window mounted in a motor vehicle door, the regulator comprising:

slide means rigidly connectable to said window;

a guide for said slide means, said guide being rigidly connectable to a support for said window;

a flexible screw connected to said slide means and arranged to make outward and return translatory movements to move said slide means along said guide between a closed and an open position, said flexible screw consisting at least partly of a precompressed spring;

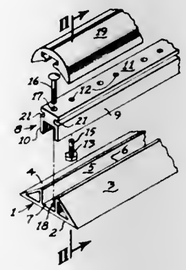
a flexible sheath in which said flexible screw extends in slidable manner, said flexible sheath having an end portion which extends along said guide and is formed with a slot-form opening extending therealong;

an appendix connecting said slide means to said flexible screw and extending through said slot-form opening in said flexible sheath;

a recirculating ball nut through which the precompressed spring extends and which is coupled drivingly to said precompressed spring, whereby rotation of the ball nut brings about translation of the flexible screw; and

a reversible electric motor connectable to said support and having a central hollow through shaft which is rotated upon operation of the motor, the flexible screw extending through said shaft and said shaft being connected to said recirculating ball nut so that the ball nut rotates with said shaft.

4,074,464
ADJUSTABLE THRESHOLD
Dariel McCay, P.O. Box 649, Lexington, Tenn. 38151
Filed Oct. 4, 1976, Ser. No. 729,859
Int. Cl.² E06B *1/70*
U.S. Cl. 49—468 **5 Claims**



1. An adjustable threshold including:

a. an elongated base having a bottom, holes in the bottom, sloping sides, and vertical walls, the vertical walls and bottom of the base forming a channel extending through the length of the base and the sloping sides connecting the upper surfaces of the vertical walls and the outer edges of the bottom;

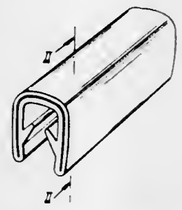
b. an elongated bar positioned in the channel and having an inverted U-shaped cross-section formed by depending legs connected on their upper surface by an elongated step-plate, having a horizontal upper surface, the step-plate having elongated grooves along its length and holes having their axis perpendicular to the upper surface of the step-plate with at least two of said holes internally threaded;

c. bolts screwed into the threaded holes in the step-plate with the head of the bolts resting on the bottom of the base;

d. screws passing through holes in the step-plate and the holes in the bottom of the base, and

e. an elongated cover constructed of flexible rubber material and having a crescent-shaped cross-section with a convex outer surface and concave inner surface, depending legs having V-shaped outer ends biased toward each other and elongated protrusions along the length of the concave inner surface, with the cover fitted over the base and bar, and its protrusions fitting within the grooves of the step-plate.

4,074,465
FLEXIBLE CHANNEL-SHAPED SEALING AND GUIDING STRIPS
Robert G. Bright, Viersen, Germany, assignor to Draftex Development AG, Switzerland
Filed Jan. 7, 1976, Ser. No. 647,183
Claims priority, application United Kingdom, Jan. 9, 1975, 888/75
Int. Cl.² E06B *7/16*
U.S. Cl. 49—491 **1 Claim**



1. A channel-shaped sealing strip, comprising a plurality of side-by-side strip-like metal elements each being of U-shape so as to define two legs and a base,

each element overlapping the adjacent elements on each side of it but so that each pair of alternate elements overlaps the same face of the intervening element,

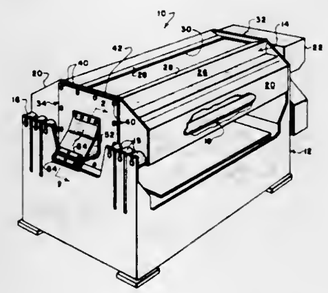
flexible connecting links each connecting part only of the length of one leg of one of the elements to a corresponding part, only, of the adjacent leg of the next element and being integral with the connected elements,

the elements being otherwise not directly connected to each other,

the connecting links being attached to the elements along lines which are spaced inwardly of the elements from the side edges thereof, each connecting link extending between positions spaced from the distal ends of the two legs that it connects and extending between those positions in a direction inclined with respect to the major planes defined by the two legs the particular link connects, and

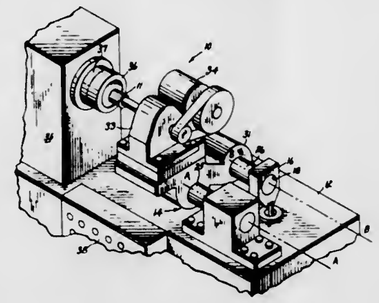
a covering of elastomeric material completely enclosing the elements and their connecting links.

4,074,466
VIBRATORY FINISHING SYSTEM
John F. Rampe, Cleveland, Ohio, assignor to Rampe Research, Cleveland, Ohio
Filed Mar. 29, 1977, Ser. No. 782,519
Int. Cl.² B24B *31/00*
U.S. Cl. 51—163.1 **18 Claims**



1. A vibratory finishing machine comprising a frame, a tub adapted to receive workpieces and finishing media and having an outlet for workpieces and finishing media, mounting means mounting the tub on the frame for vibratory movement, vibratory drive means for vibrating the tub to impart a finishing action to its contents, and discharge means for discharging workpieces and media through the tub outlet including closure means responsive to pressure forces exerted by tub contents on the closure means for periodically opening and closing the tub outlet.

4,074,467
GRINDING MACHINE CONTROL
Edward George Robillard, Cherry Valley, Mass., assignor to Cincinnati Milacron-Heald Corporation, Worcester, Mass.
Filed Mar. 14, 1977, Ser. No. 777,024
Int. Cl.² B24B *49/00*
U.S. Cl. 51—165.92 **24 Claims**



1. A grinding machine of the type having a base, a wheelhead carrying an abrasive wheel, a wheel motor for rotating the abrasive wheel, a headstock supported on the base and means for effecting relative movement between the wheelhead and its stock, said effecting means being responsive to a control generating a number of signals to define a grinding cycle having a number of modes including:

(1) a rapid advance mode for positioning the wheelhead and headstock preparatory to grinding and during which no grinding is anticipated, said rapid mode being initiated by a first signal from the control,

(2) a gap eliminator mode for positioning the wheelhead and headstock to initiate the grinding process, said control generating a second signal to terminate the rapid advance mode and begin the gap eliminator mode, and

(3) a grinding mode for performing the grinding operation, wherein the improvement comprises:

(a) means responsive to the wheel motor for providing a grinding force signal representing the forces of the grinding process, said providing means operating with each grinding cycle to continuously compensate the grinding force signal as a function of the changes in the nongrinding forces on the wheel motor;

(b) means responsive to the first signal and the grinding force signal and connected to the effecting means for producing an interference signal to modify the grinding cycle in response to the grinding force signal exceeding a predetermined magnitude;

(c) means responsive to the second signal and the grinding force signal and connected to the effecting means for producing a gap elimination signal in response to the grinding force signal exceeding the predetermined magnitude, said gap elimination signal operating to terminate the gap eliminator mode and begin the grinding mode; and

(d) means responsive to the grinding force signal for producing an output signal in response to the grinding force signal exceeding a second predetermined magnitude; and

(e) means responsive to the output signal for controlling the grinding cycle.

4,074,468

APPARATUS FOR THE CONTINUOUS ON-TRACK TRUING OF RAILWAY RAILS

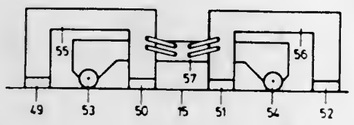
Romolo Panetti, 24 Parc Chateau Banquet, Geneva, Switzerland

Filed July 14, 1975, Ser. No. 595,685

Claims priority, application Switzerland, Jan. 13, 1975, 337/75

Int. Cl.[2] B24B *23/00*

U.S. Cl. 51—178 **2 Claims**



1. Apparatus for the continuous on-track alignment of railway rails, said apparatus comprising a plurality of contact elements constituting points of support of the apparatus on the rail, means dividing the contact elements into three longitudinally aligned groups capable of each moving by itself and parallel to one another, means associated with said groups for causing the same to exert predetermined pressure on the rail which is to be aligned, the contact elements in at least the first of said groups being fixedly arranged therein on a common support and means hingably connecting said groups together so that they are constrained to move parallel to one another, the first group having two contact elements which are abrasive grinding elements, the third group having two contact elements which are abrasive grinding elements, the second group being interposed between the other two groups of abrasive elements and having two contact elements so that between the two abrasive elements of the two groups there is always one contact element.

4,074,469

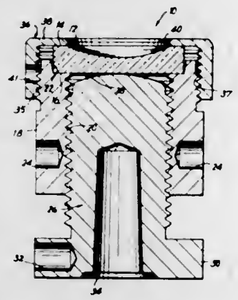
APPARATUS FOR MANUFACTURING LENSES

Benjamin Nuchman, 820 Birchwood Drive, Westbury, N.Y. 11590, and Sang Y. Whang, 8445 SW. 148th Drive, Miami, Fla. 33143

Division of Ser. No. 440,882, Feb. 8, 1974, abandoned. This application June 26, 1975, Ser. No. 590,648

Int. Cl.[2] B24B *41/06*

U.S. Cl. 51—217 L **10 Claims**



1. A tool for forming a lens from a lens blank having an axial region and a periphery, comprising means for holding said lens while providing access to the opposed sides thereof passing through the axis of said lens blank and means for applying distorting force along said axis to one of said sides of said lens blank for axially displacing the axial region of said blank relative to all points on the periphery of the blank, said holding and distorting means including a body member having an axial bore therethrough terminating in an end wall formed with an axial aperture therethrough, said end wall defining a seat for receipt of said blank within said bore, a plunger dimensioned for receipt within said bore for applying said distorting force, thread means on the bore of said body and said plunger member for application of said distorting force upon the rotational displacement of said plunger member, jig means for fixedly supporting said body member and including a rotatable member for engaging said plunger member for selective rotation thereof, and means for measuring the displacement of the axial region of said lens blank in response to said distorting force, said measuring means including micrometer means having a displaceable plunger for effecting measurement and means supporting said micrometer means with said plunger axially aligned with respect to said axial bore of said body member and positioned for engagement against said lens blank.

4,074,470

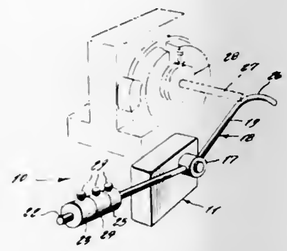
ANTI-CHATTERING, GRINDING COUNTERBALANCE DEVICE

Nicola Lore, 35 Burkhardt Ave., Bethpage, N.Y. 11714

Filed Jan. 3, 1977, Ser. No. 755,953

Int. Cl.[2] B24B *41/06*

U.S. Cl. 51—238 S **1 Claim**



1. An anti-chattering, grinding, counterbalance device, comprising in combination, a heavy base block supporting pivotally free a rocking lever, one end of said rocking lever adjustably supporting a plurality of counterbalancing weights while an opposite end of said rocking lever bears against a side surface of a free end of a work supported at its other end in a chuck during a grinding operation; a screw secured to a side of said base block having a shoulder around which said rocking lever pivots; said rocking lever being comprised of a collar pivoted around said screw shoulder, a pair of rods secured radially to said collar a first said rod being straight throughout its length and on which said weights are supported, and the other said rod having an accurate end being all on a flat plane that is at right angle to a longitudinal axis of said screw; each said weight being securable on said rod by a set screw.

4,074,471

PROCESS FOR NUCLEATING DIAMONDS

Rangachary Komanduri, and Milton C. Shaw, both of Pittsburgh, Pa., assignors to Carnegie-Mellon University, Pittsburgh, Pa.

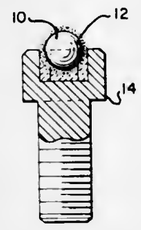
Continuation of Ser. No. 514,394, Oct. 15, 1974, abandoned. This application Feb. 13, 1976, Ser. No. 657,891

Int. Cl.[2] B01J *3/06*; C01B *31/06*

U.S. Cl. 51—295 **4 Claims**

1. A process for nucleating diamonds in the absence of a pressure vessel which comprises:

(a) depositing a mixture of a metal solvent catalyst for forming diamond from graphite and graphite on an abrasive grain which provides a hard substrate which is at least as hard as tungsten carbide; and



(b) subjecting the coated abrasive grain to a grinding action with a work material which produces the necessary temperature and pressure to form diamond.

4,074,472

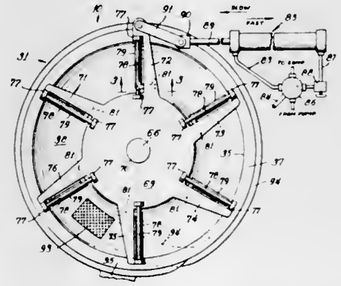
IMPROVED FINISHING METHOD

Gunther W. Balz, Kalamazoo, Mich., assignor to Roto-Finish Company, Kalamazoo, Mich.

Division of Ser. No. 573,906, May 2, 1975, Pat. No. 4,012,869. This application Nov. 1, 1976, Ser. No. 737,382

Int. Cl.[2] B24B *1/00*

U.S. Cl. 51—313 **8 Claims**



1. A process for finishing a part or parts while preventing contact engagement between said parts which comprises:

(1) maintaining said part or parts and a finishing material in a finishing chamber, each part or group of parts arranged in a compartment defined by a pair of partitions oriented substantially transversely to the walls of said chamber,

(2) applying vibratory motion to said chamber to cause said part or parts to be finished and to move along said chamber,

(3) moving one of said partitions and said finishing chamber with respect to the other in a first direction, corresponding to the direction in which said part or parts move, for a limited distance while said partitions are arranged in positions intermediate said parts for isolating said parts,

(4) moving said partitions from said positions intermediate said parts to new and out-of-the-way positions not intermediate said parts thereby to permit said partitions and said parts to move past one another,

(5) moving the same one of said partitions and said finishing chamber with respect to the other in a second direction in a reverse or backward relationship to said first direction, the movements defined under steps 3) and 5) being reciprocating movements,

(6) returning said partitions to positions which are intermediate said parts, and

(7) separating said parts from said finishing material.

4,074,473

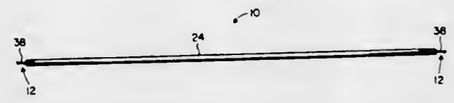
CONTROLLED THERMAL EXPANSIVITY STRUCTURE

Paul T. Nelson, Rolling Hills Estates, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Jan. 2, 1975, Ser. No. 537,980

Int. Cl.[2] E04C *3/00*

U.S. Cl. 52—1 **10 Claims**



1. A controlled thermal expansivity structure comprising:

first, second, and third elongate members aligned parallel to a common axis;

first connecting means joining one end of said first member and one end of said second member for relative endwise adjustment of said latter members along said axis and securing said latter members against relative endwise thermal expansion and contraction at a fixed transverse plane of said first member;

second connecting means joining the other end of said second member and one end of said third member for relative endwise adjustment of said latter members along said axis and securing said latter members against relative endwise thermal expansion and contraction at a fixed transverse plane of said second member;

said first member extending from said one end toward said other end of said second member and said third member extending from said other end toward said one end of said second member;

said second and third members having differing thermal coefficients; and

said first and second members and said second and third members being independently relatively adjustable after assembly of the several members to adjust the overall length of said structure and to adjust selectively the effective coefficient of thermal expansion of said structure at any length within a given range of said length adjustment through a range including positive, negative, and zero coefficient values.

4,074,474

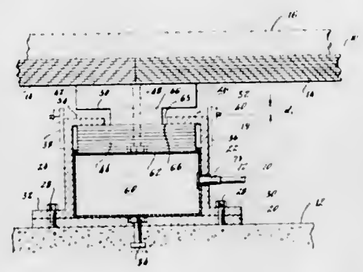
FLOOR SUPPORT ARRANGEMENT

Nicholas G. Cristy, 9 S. View Ave., Pleasantville, N.Y. 10570

Filed Oct. 8, 1975, Ser. No. 620,767

Int. Cl.[2] E04D *15/00*

U.S. Cl. 52—2 **18 Claims**



1. An improved floor support arrangement for theatrical, dancing and athletic activities comprising:

A. a base platform having a surface thereof;

B. a floor;

C. rigid support means positioned between said base platform surface and said floor for rigidly supporting said floor above said base surface;

D. an inflatable pneumatic support means positioned between said base platform surface and said floor for vertically displacing and resiliently supporting said floor above said rigid support means, said pneumatic support means substantially enclosed by said rigid support means;

E. said rigid support means adapted for receiving and supporting a floor load transferred thereto from said inflated pneumatic support means; and

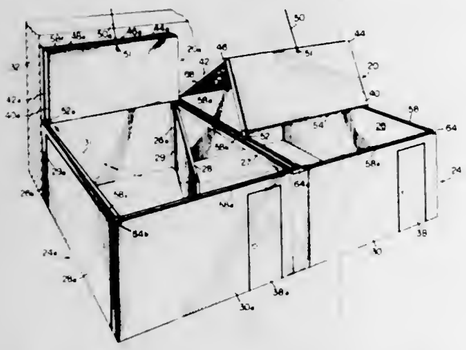
F. control means for selectively causing said pneumatic support means to seat said floor on said rigid support means for transferring said floor load from said pneumatic support means to said rigid support means or to displace said floor from said rigid support means to said pneumatic support means whereby said floor is alternatively rigidly or resiliently supported.

4,074,475

COLLAPSIBLE ROOM MODULE CONSTRUCTION AND METHOD OF ASSEMBLY

Carl D. Wahlquist, Woodland Hills, Calif., assignor to Building Components Research, Inc., Los Angeles, Calif.

Filed Jan. 28, 1977, Ser. No. 763,437
Int. Cl.[2] E04B *1/343*
U.S. Cl. 52—70 17 Claims



1. In an improved building structure for a collapsible room module usable for selectively transforming a large space into smaller spaces and having an assembly of generally vertically-oriented foldable front, rear and side wall panels for forming a room, the improvement comprising:

a foldable ceiling unit having at least two ceiling panels hinged together to accommodate (a) folding at least one of the ceiling panels with respect to the other into a storage configuration and (b) unfolding the ceiling panels to form a ceiling for the room formed by the wall panels;

wheels attached to said ceiling unit for accommodating unfolding of the panels; and

means for guiding the ceiling unit as the wheels traverse at least a portion of the edges of the side wall panels when the ceiling unit is unfolded, said guiding means comprising means for acoustically and hermetically sealing the room around at least a portion of the ceiling's periphery when said ceiling unit is unfolded onto the room.

4,074,476

TUBULAR DWELLING CONSTRUCTION

Imanol Ordorika, Cantil No. 175, Jardines del Pedregal, Mexico City, Mexico

Continuation of Ser. No. 480,553, June 17, 1974, abandoned. This application Dec. 2, 1975, Ser. No. 636,970
Int. Cl.[2] E04B *1/348*
U.S. Cl. 52—79.2 10 Claims

1. A plurality of tubular dwellings arranged in a stacked configuration, each of said dwellings have side walls integrally cast with an upper segment and a lower segment to form a self-supporting modular unit, each of said units comprising:

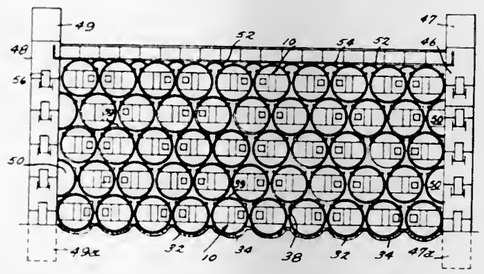
a. an interior floor and ceiling also integrally cast or formed with said side walls and said upper and lower segments, at least a portion of ceiling and said upper segment providing for an upper internal chamber for containing water or the like, said floor and said lower segment providing for a lower internal chamber for containing sewage or the like;

b. means arranged on said upper segment for feeding water or the like through an inlet into said upper internal chamber;

c. means arranged on said lower segment for draining sewage or the like from said lower internal chamber; and

d. a plurality of supporting ledges disposed along an exterior surface of said unit;

wherein a first bottom row of said units are placed side-by-side, said units being supported upon a foundation of a gravel bed or the like in a plurality of ditches in the ground, at least a second and a third row of said units



being stacked upon said first row, each of the even-numbered rows being provided at both ends thereof with complementary rooms which complete said even-numbered rooms,

wherein each unit in said second row is supported by two of said units in said first row, said ledges of each of said units in said second row abutting against corresponding ledges on said two units in said first row,

wherein means for providing lateral support are arranged proximate to said units to secure said units in a stacked configuration said means comprising a tower adjacent to each end of said rows, each of said towers being embedded into the ground, the arrangement including precast arches bridged across the upper segments of each side-by-side unit in the uppermost row of said stacked configuration, and an upper floor disposed against said precast arches and against said upper segments of said uppermost row of units, each of said units being provided with a ventilating means.

4,074,477

MODULAR BUILDING STRUCTURE

John F. Runyon, 91 Kent St., Apt. 4, St. Paul, Minn. 55102

Continuation-in-part of Ser. No. 145,768, May 21, 1971, abandoned. This application Sept. 17, 1973, Ser. No. 397,765
Int. Cl.[2] E04B *1/32*
U.S. Cl. 52—86 15 Claims

1. A modular building structure of configuration approximating the surface generated by regular, uniform movement of a plane curve, said structure comprised of:

(A) a plurality of interconnected basic structural modules of alternately repeating right and left handed (mirror image) form, each right handed module being adjacent to a left handed module and adjacent modules interconnected side to side along a boundary interface;

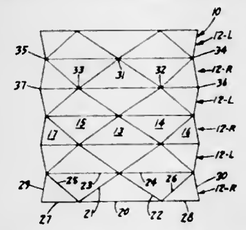
(B) a series of limit planes defining the two furthermost module sides and the boundary interface between adjacent modules, each plane equally displaced from the next;

(C) each module being comprised of a plurality of interconnected hinged rigid structural components, each component being hingedly connected to at least two other components, parts of said components lying in said limit planes;

(D) those parts of the module components lying in one limit plane being serially connected to form one side of a module, making an approximation of a plane curve determining the contour of the building structure; those parts on the oposite side of the same module lying in the next adjacent limit plane being serially connected to form the opposite side of the module, making a different approximation of the same plane curve;

(E) other parts of said components occupying the three dimensional space between two adjacent limit planes extending between and interconnecting said parts of the components which form said two different approximations of plane curves;

(F) the parts of said components lying in said limit planes being constrained from moving outside their respective



planes by pairs of said module components connected at and symmetrical left and right about said limit planes, components of each right hand module paired with like components of each left hand module;

(G) the parts of said components lying at the ends of said modules defined by the end tips of said plane curve, being connected to fixed supports constraining said parts to fixed points;

(H) a single module being made rigid and determinate according to the rules of structural analysis, with the constraints to be contributed by its mirror image adjacent modules replaced by the condition that neither side of the single module is permitted to deflect out of a plane;

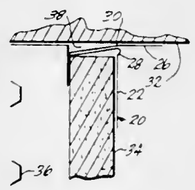
(I) the structure composed of a plurality of said modules being made rigid and determinate by the action of each module constraining the sides of adjacent modules not to deflect out of said limit planes, by said two furthermost module sides being connected to fixed planar supports, and by said module ends being connected at fixed support points.

4,074,478

DRYWALL BEAD ACCESSORY

Barry A. Rutherford, 10008 Forbes, Sepulveda, Calif. 91343

Filed Mar. 8, 1976, Ser. No. 664,481
Int. Cl.[2] E04B *5/57*
U.S. Cl. 52—98 5 Claims



1. A drywall casing bead comprising:

a first flat elongated strip adapted to overlie the surface of the drywall;

a lip formed along one elongated edge of said first strip to provide a bead for the application of masking materials;

a second flat elongated strip extending from the side of the lip opposite said first strip at approximately right angles to said first strip, the second strip being adapted to be inserted in a space between the edge of the drywall and an adjacent surface; and

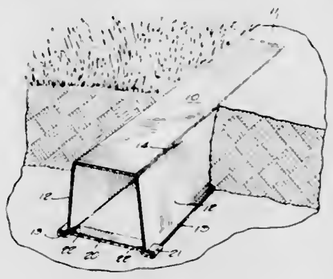
a third flat elongated strip, integral with said second strip, extending from the lip in the opposite direction from said second strip to form a T-shaped structure, said third strip being scored and intentionally weakened along a line directly opposite the lip whereby the third strip provides a removal tear strip.

4,074,479

LAWN EDGING

Richard W. Krupka, 2747 Donegal Road, Racine, Wis. 53405

Filed Apr. 25, 1977, Ser. No. 790,364
Int. Cl.[2] A01G *1/00*; E01C *11/22*
U.S. Cl. 52—102 8 Claims



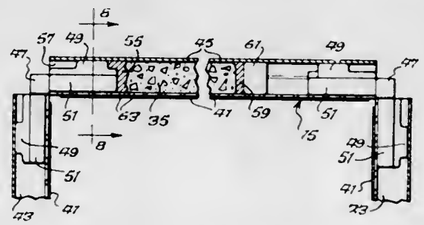
1. A lawn edging comprising linear box sections having a top wall and two side walls wherein the novelty comprises side walls that are straight in lateral cross-section and inclined between about 10° and 30° to a vertical plane to form an isosceles trapezoid with said top wall and an underlying surface, outwardly directed flanges at the bottom of each side wall, and a plurality of clips, each said clip having an inwardly directed channel at each end to receive a said outwardly directed flange and an outwardly directed abutment engageable with the inner margin of the flange to retain the flange in the channel.

4,074,480

KIT FOR CONVERTING SINGLE-GLAZED WINDOW TO DOUBLE-GLAZED WINDOW

Henry W. G. Burton, 161 St. James Place, Buffalo, N.Y. 14222

Filed Feb. 12, 1976, Ser. No. 657,376
Int. Cl.[2] E04B *1/66*; E06B *7/12*
U.S. Cl. 52—127 5 Claims



1. A kit of components for converting a single-glazed window into a double-glazed window which comprises a plurality of elongated spacing side members of tubular shape adapted to be assembled together at the ends thereof to form a spacing frame to fit about the periphery of the single-glazed window, at least one of said members having an opening in a wall communicating with the interior of such assembled frame, a desiccant

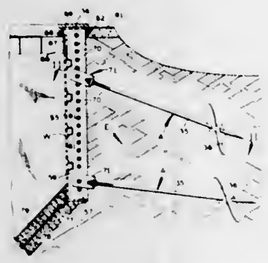
inside such member, sealant in said member sealing off the desiccant therein so as to prevent contact between it and moisture in air except through the opening communicating with the interior of the assembled frame when said opening is not closed off, and readily removable tape sealing means closing off said opening.

4,074,481

IN-GROUND SWIMMING POOL CONSTRUCTION

Robert S. Lang, Tampa; Rodney Morris Post, Largo, and Thomas Leo Hogan, Tampa, all of Fla., assignors to L. F. Lang & Son Pools Inc., Tampa, Fla.

Division of Ser. No. 687,537, May 18, 1976. This application May 13, 1977, Ser. No. 796,527
Int. Cl.² E04H *3/16*
U.S. Cl. 52—169.8 **3 Claims**



1. In an in-ground swimming pool construction which includes a swimming pool shell structure having substantially rigid, pre-formed plastic sides received in an excavation and spaced by backfill from the ground thereat, the sides of the shell structure comprising horizontally and vertically reinforced rigid individual wall sections connected end-to-end, a concrete pool bottom extending across the bottom of the excavation at the lower end of said pool shell structure, and reinforcing rods embedded in said concrete pool bottom and extending therein to locations close to its periphery, the improvement comprising:

a plurality of ground anchors embedded in the ground at the sides of the pool shell structure in said excavation;

said ground anchors comprising auger-type anchors each having an elongated, rod-like, rigid, central stem extending transversely outward from the adjacent side of the pool shell structure into the ground and a transverse anchor plate extending spirally around said stem;

said reinforcing rods having hooking portions at said locations close to the periphery of the concrete pool bottom;

said wall sections at their lower ends resting directly on said concrete bottom at its periphery and having connectors with hooking portions thereat which are hooked to said hooking portions of said reinforcing rods within and close to the periphery of said concrete pool bottom for anchoring the respective lower ends of said wall sections to the pool bottom;

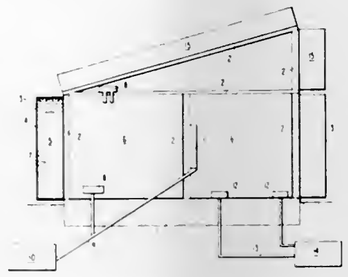
and a plurality of adjustable connector means operatively connecting the sides of the pool shell structure to the adjacent ends of the corresponding ground anchor stems for lateral adjustment of the respective sides while the hooking portions at their lower ends remain hooked to the corresponding hooking portions of the reinforcing rods in the concrete pool bottom.

4,074,482

RADIATION REFLECTING BUILDING

Carl N. Klahr, 678 Cedar Lawn Ave., Lawrence, N.Y. 11559

Filed Jan. 9, 1976, Ser. No. 647,934
Int. Cl.² B32B *1/05*
U.S. Cl. 52—171 **37 Claims**



1. A radiation reflecting building comprising in combination:

(a) a basic support structure,

(b) a structural framework attached to said basic support structure,

(c) at least one container module with at least one translucent surface, supported by said structural framework,

(d) a translucent dispersion medium within said container module, and

(e) a quantity of microparticle material in the form of microparticles dispersed within said dispersion medium, wherein the index of refraction of the microparticle material differs substantially from that of said dispersion medium and wherein the microparticle material has a ratio of optical absorption coefficient to optical scattering coefficient of less than 0.2, and

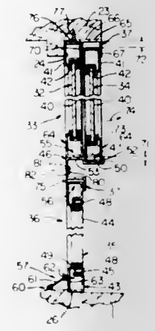
wherein the concentration of microparticles in the dispersion medium and the container internal dimension perpendicular to said container surface provide an optical path length through said dispersion medium layer of at least four scattering lengths.

4,074,483

APPARATUS FOR HOLDING PANELS IN A WINDOW CONSTRUCTION

Donald E. Vickstrom, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Feb. 14, 1977, Ser. No. 768,069
Int. Cl.² E06B *3/28*
U.S. Cl. 52—202 **18 Claims**



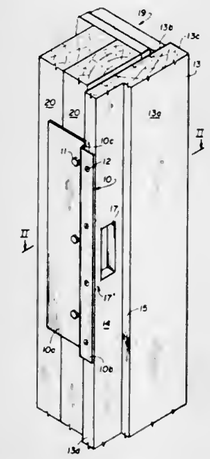
1. In a window construction comprising; peripheral framing members including an upper member having a vertically disposed supporting surface, a lower member having a vertically disposed supporting surface, and a pair of spaced parallel side members connected between opposite ends of said upper and lower members with each side member having a vertically disposed supporting surface, said peripheral framing members defining an opening in said construction with said vertical surfaces being disposed in a common plane; a plurality of three panels disposed within said opening; and means holding said panels within said opening; the improvement wherein said holding means comprises; a horizontally disposed rail having a substantially U-shaped channel for receiving a lower end portion of a first panel therewithin, said U-shaped channel being defined by a horizontal bight and a pair of vertically disposed legs including an inner leg and an outer leg extending from opposite ends thereof, an extension extending horizontally from a central part of said inner leg, said horizontal extension cooperating with a portion of said inner leg thereabove to define a first L-shaped channel for receiving a second of said three panels therewithin, said rail also having a second L-shaped channel disposed beneath said first L-shaped channel and adapted to receive a third panel therewithin; and at least one substantially F-shaped clip adapted to engage and hold upper portions of said first and second panels within said opening.

4,074,484

DOORWAY FRAMING

James Queren, 218-07 43rd Ave., Bayside, N.Y. 11361

Filed Oct. 12, 1976, Ser. No. 731,304
Int. Cl.² E05C *21/00*; E06B *1/04*
U.S. Cl. 52—214 **7 Claims**



1. A doorway framing comprising, in combination:

1. a wooden door frame side rail having two substantially parallel major faces and two minor faces substantially perpendicular to the major faces, one of the major faces having a recessed end portion delimited by one of the minor faces and a shoulder constituting a stop for a door, and the door frame side rail defining a door latch bolt hole in the recessed end portion,

2. a wall including wooden wall stud means adjacent the other major face of the door frame side rail, the door frame side rail being mounted on the wall and the minor faces of the door frame side rail extending substantially parallel to the wall, and

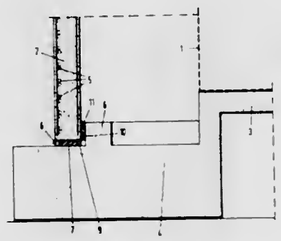
3. a reinforcement plate extending over a substantial portion of the wall stud means and a substantial portion of the one minor face of the door frame side rail, the reinforcement plate being securely affixed to the wall stud means and the one minor face of the door frame side rail and covering a substantial region of the minor door frame side rail face adjacent and beyond the door latch bolt hole, the securely affixed plate holding the side rail of the wooden door frame firmly in position.

4,074,485

SAFETY WALL FOR A STORAGE TANK

Nicolaas Arie Hendriks, Rotterdam, Netherlands, assignor to Bouwmaatschappij Nederhorst B. V., Gouda, Netherlands

Continuation of Ser. No. 631,849, Nov. 13, 1975, abandoned. This application Apr. 27, 1977, Ser. No. 791,466
Claims priority, application Netherlands, May 13, 1975, 7505591
Int. Cl.² E04G *11/06*
U.S. Cl. 52—224 **2 Claims**



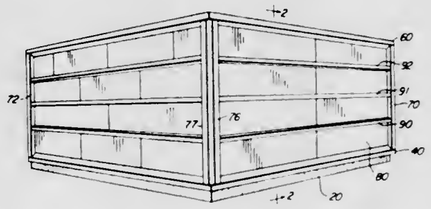
1. A safety wall for a storage tank containing liquids dangerous to the environment, such as liquid natural gas, acrylonitrile, ammonia, ethylene, propylene, propane and hydrocyanic acid compounds, said safety wall formed by a cylindrical, circumferentially closed and prestressed concrete wall surrounding the tank with relatively small interspace, a horizontal supporting floor, said safety wall resting freely on said horizontal supporting floor, tensioning wires circumferentially prestressing said wall, tubes in said wall accommodating said tensioning wires which do not bond to the concrete, a circular supporting floor on which said safety wall rests adjacent a centering ring formed by an elevation of said circular supporting floor concentrically within said safety wall and surrounding the tank with small interspace, and elastically deformable sealing material being arranged between the lower end of the safety wall and the adjoining surfaces of both the wall supporting floor and said ring, said circular supporting floor being supported independently of the supporting floor of the tank, a circular floor bridging the spacing between the circular supporting floor and the tank supporting floor, said circular floor being laid with some freedom of movement on the circular wall supporting floor and the tank supporting floor.

4,074,486

PANEL WALL CONSTRUCTION

Kenneth R. Grearson, Park Ridge, Ill., assignor to Multuloc Corporation, Chicago, Ill.

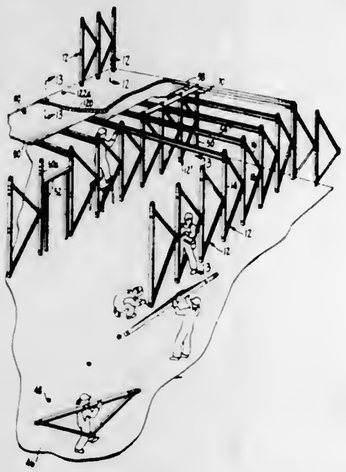
Continuation-in-part of Ser. No. 625,147, Oct. 23, 1975, Pat. No. 3,974,608. This application July 20, 1976, Ser. No. 705,472
The portion of the term of this patent subsequent to Aug. 17, 1993, has been disclaimed.
Int. Cl.² E04B *2/38*
U.S. Cl. 52—235 **9 Claims**



1. A panel wall construction of the type having alternating panels and panel carrying structural members comprising:

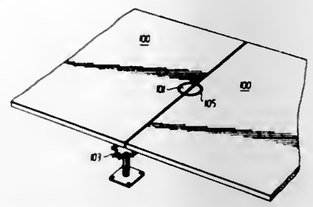
horizontal spaced sheet metal structural shapes of generally box-tee having three adjacent box walls, the fourth box wall being split into two segments, opposing legs extending away from the box section at about 90° from the ends of the split box walls for a distance to accommodate desired panels, the outer end of said legs extending away from each other forming flanges at about 90° to said legs and forming a channel to accept the edges of a wall panel;
lower sill sheet metal structural shape having the same design as said spaced shapes;
upper cap sheet metal structural shape having the same design as said spaced shapes;
said sill shape and cap shape aligned with said spaced shapes to accept panels in the channel of said sill and cap shape;
panels in said channels of each adjacent said spaced structural shapes and adjacent sill shape and cap edge locking said spaced shapes, sill shape and cap shaped into a rigid structure without separate fasteners; and
vertical corner sheet metal structural shape assemblies comprising two of said sheet metal box-tee shapes having one flange of one shape inserted into the slot between opposing legs of the other box-tee shape.

4,074,487
MULTI-STORY WALL FRAMING SYSTEM AND METHOD
Lawrence H. Daniels, Piedmont; Murray C. Hood, and Bogus-law Burdzinski, both of Oakland, all of Calif., assignors to Kaiser Steel Corporation, Oakland and Custom Rolled Corrugated Metals Co., Albany, both of Calif.
Filed Jan. 28, 1974, Ser. No. 436,894
Int. Cl.² E04C *3/04*; E04H *12/10*
U.S. Cl. 52—236.3 **11 Claims**



1. A frame element adapted to be assembled in combination with a plurality of like elements to form a composite framework for a building wherein said elements comprise the vertical load carrying structure of the framework and the lateral bracing therefor, said element comprising a load bearing stud member having connectors at either end thereof for engagement with mating connectors of a corresponding element whereby said stud members may be secured together in vertically aligned axial load bearing engagement with one another, said connectors comprising a male member secured at one extremity of said stud member and extending axially thereof and an axial opening formed in the opposite end of the stud member, said opening having a cross-sectional shape substantially congruent to that of said male member to afford telescopic engagement in said opening of the male member of a corresponding element; upper and lower obliquely extending brace members, said brace members having first ends secured to said stud members adjacent the respective extremities thereof and second ends joined to one another in spaced relationship to said stud member at a junction point intermediate the upper and lower extremities of the stud member, said brace members having attachment affording means at the second ends thereof for engagement with the stud member of an adjacent corresponding frame element whereby said brace members may horizontally brace the stud member of such an adjacent frame element.

4,074,488
ELEVATED FLOOR ASSEMBLY
George F. Ray, III, Rockville, Md., assignor to Liskey Archectural Mfg. Inc., Glen Burnie, Md.
Division of Ser. No. 476,543, June 5, 1974, Pat. No. 3,943,674, which is a continuation-in-part of Ser. No. 306,417, Nov. 14, 1972, abandoned. This application Dec. 19, 1975, Ser. No. 642,259
Int. Cl.² E04F *15/024*
U.S. Cl. 52—263 **10 Claims**

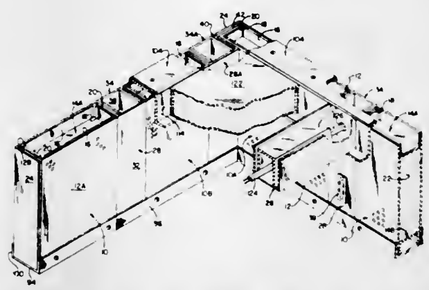


1. An elevated false floor assembly of panels having a level and even tread surface, comprising a plurality of panels arranged side-by-side in rows and supported on pedestals at their corners, the sides of adjacent panels substantially abutting one another and being interconnected by releaseable tie means located intermediate the corners thereof, said panels each being load bearing and comprising upper and lower spaced apart metal sheets, at least one tie securing the spaced apart upper and lower sheets of each panel to the corresponding upper and lower sheets respectively, of an adjacent panel adjacent each abutting side thereof, the horizontal and vertical movements of any one panel being resisted and shared by said upper and lower sheets of adjacent panels, said tie extending generally vertically for substantially the entire panel thickness between said spaced apart upper and lower sheets of that panel, said tie being removable from above the tread surface.

4,074,489
WALL PANEL ASSEMBLY
Alan Eckel, Westford, Mass., assignor to Eckel Industries, Inc., Cambridge, Mass.
Continuation-in-part of Ser. No. 643,698, Dec. 13, 1975. This application Sept. 27, 1976, Ser. No. 727,034
Int. Cl.² E04B *1/00*
U.S. Cl. 52—272 **19 Claims**

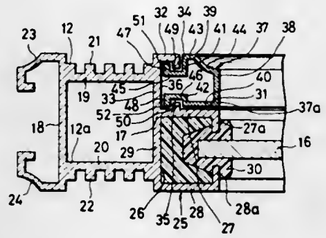
1. A modular wall assembly comprising in combination:
at least first and second panels with each of said first and second panels including a substantially flat body and a tongue at one edge of said body extending substantially parallel to and spaced from said body so as to form a first channel therebetween, said first and second panels being aligned and oriented so as to form a corner,
a first connector member disposed between said first and second panels, said first connector member having first and second side flanges extending transversely to one another, said first side flange extending within the first channel of said first panel and making a snug fit with the adjacent tongue and body of said first panel and the said second side flange being spaced from said body of said first panel and extending substantially parallel to the plane of said body so as to form a second channel therebetween;

a second connector member disposed between said first and second panels, said second connector member having two parallel spaced-apart side plates and a web connected to and supporting said side plates, one of said side plates extending within the first channel of said second panel and making a snug fit with the adjacent tongue and body of said second panel, and the other of said side plates extending within said second channel and making a snug fit with



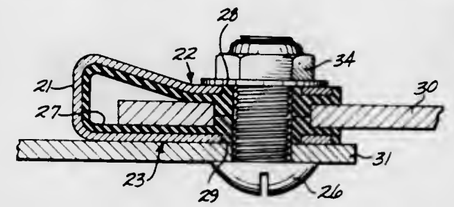
the adjacent second side flange of said first connector member and the body of said first panel; and
a third connector member disposed between said first and second panels, said third connector member fhaving two parallel spaced-apart side plates and a web connected to and supporting said side plates, the side plates of said third connector extending between and making a snug fit with said tongue of said second panel and said second side flange of said first connector member.

4,074,490
DECORATIVE WINDOW SASH FRAME ASSEMBLY
Mitsuo Nagase, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan
Filed Jan. 24, 1977, Ser. No. 762,052
Claims priority, application Japan, Jan. 23, 1976, 51-7027[U]
Int. Cl.² E06B *1/18*
U.S. Cl. 52—312 **3 Claims**



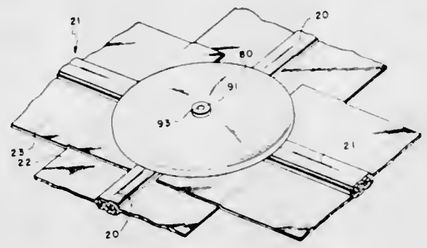
1. A window sash frame assembly for peripherally holding a panel member comprising: a rectangular frame having a raised decorative pattern on its interior surface, said frame having a pair of inwardly opening, continuous interior and exterior channel sections formed around the inner periphery of said frame and defining spaced channels, said interior channel section having a retaining means, and said exterior channel section being adapted to receive and hold the peripheral edge of the panel member at both sides thereof in one of said channels; and
a decorative attachment means extending along the interior channel section and disposed in part only in the other of said channels, said decorative attachment means having an engagement means engaging said retaining means to detachably retain said decorative attachment means in spaced relation relative to said one channel.

4,074,491
CLIP SHOCK MOUNT
Graham Elsworth Bell, Renton, and Alden Bernard Winters, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Oct. 26, 1976, Ser. No. 735,655
Int. Cl.² E04B *1/62*
U.S. Cl. 52—394 **8 Claims**



1. A clip shock mount, comprising: a U-shaped metal band having a pair of legs forming part of the U-shape; the free end of each of the legs having an aperture and said apertures being in alignment; a resilient material fixedly attached to the inner surface of the U-shaped metal band; and said resilient material having an integrally formed bushing, within each of the apertures, with a collar of resilient material extending inwards of the U-shaped metal band.

4,074,492
PREFABRICATED WATERTIGHT STRUCTURAL SYSTEM
Harold G. Simpson, and Michael W. Davis, both of Oklahoma City, Okla., assignors to Star Manufacturing Co. of Oklahoma, Oklahoma City, Okla.
Filed Dec. 31, 1975, Ser. No. 645,565
Int. Cl.² E04B *2/08*
U.S. Cl. 52—419 **8 Claims**



1. A prefabricated roofing system comprising:
a group of panels contiguously arrayed in side-by-side and end-to-end abutting, junction-defining relationship on a supporting substructure, each panel including
a first sheet metal member;
a second sheet metal member spaced from the first sheet metal member and disposed substantially parallel thereto;
a body of foam insulation substantially filling the space between and bonded to the first and second sheet metal members;
a thin, flexible, elastomer membrane extending over and being substantially continuously bonded to the first sheet metal members for forming a fluid-tight covering over the array of panels;
an extruded elastomer fastener connecting each edge of each of said membranes, said fasteners having end portions coverging towards each other defining an interstitial region at the junction of a plurality of said membranes; and,
apparatus forming a sealed connection between said con-

verging end portions, said apparatus including a first plate disposed below said fasteners, a second plate disposed above said fasteners, said first and second plates each having an interior side surface which overlaps said converging end portions, a viscous, adhesive sealing material the constituent particles of which flow in response to pressure applied to the interior side surface of at least one of said plates, and means clamping said plates together to cause the sealing material to flow between the plates into the interstitial region.

4,074,493

CONNECTING REINFORCING BARS IN AN ACCESS HOLE

Christopher David Outram, Thames Ditton, England, assignor to CCL Systems Limited, England

Filed Oct. 15, 1976, Ser. No. 732,578
Claims priority, application United Kingdom, Oct. 15, 1975, 42357/75
Int. Cl.² E04C *1/10*
U.S. Cl. 52—583 **8 Claims**



1. In a structure comprising a pair of concrete bodies strengthened with reinforcing bars, said bodies having an access hole formed therebetween, with said reinforcing bars terminating adjacent said access hole, and being aligned on opposite sides of said access hole, the improvement comprising a sleeve secured on the end of each reinforcing bar adjacent said hole, each of said sleeves being internally threaded and being in communication with said access hole, a connecting bar having a length slightly less than the width of said hole and being positioned between the ends of said reinforcing bars, said connecting bar being provided at each end with an internally threaded sleeve, threaded studs being threadedly secured in said first mentioned sleeves and said internally threaded sleeves to connect said connecting bar with said reinforcing bars, and said reinforcing bars, connecting bar and studs being in alignment.

4,074,494

LARGE-SIZE PLATE-SHAPED BUILDING ELEMENTS AND PROCESS FOR MAKING THE SAME

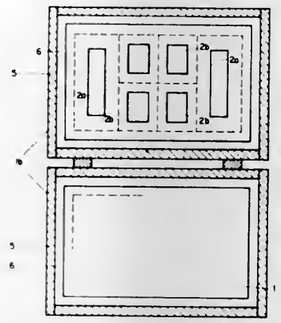
Carl Otto Pels Leusden, von Ossietzky-Ring 8, 43 Essen 14; Robert Stupperich, Janssenstr. 5, 43 Essen 1, and Hans-Bernd Weber, Lunerkamp 20, 43 Essen 13, all of Germany

Filed Dec. 13, 1974, Ser. No. 532,549
Claims priority, application Germany, Dec. 13, 1973, 2361945
Int. Cl.² E04C *2/04*; C04B *33/30, 33/32*
U.S. Cl. 52—606 **12 Claims**

1. Plate bricks made of ceramic material in the shape of plates or boards, so as to achieve uniform shrinkage and avoid shrinkage differences, and cracking, or deformation during drying comprising a plurality of adjacent parallel groups of pipes forming a unitary element wherein said groups of pipes comprise at least one pipe, and each of said plurality of groups of pipes have the same hydraulic diameter and the same wall thickness, and made in accordance with the process comprising the steps of:

(a) forming wet ceramic material into a monolithic body or blank subdivided into and containing members each having walls surrounding a plurality of open-end parallel tubular passages of approximately the same hydraulic cross-section, each said walls having substantially the same and a constant and uniform thickness, said passages being separated by common walls;

(b) passing drying air solely through said passages at a temperature and velocity effective to reduce the moisture content evenly over the entire cross-section of the formed body while avoiding deformation or crack formation, and the hydraulic cross-sections together with the wall thickness effecting an even drying of the cross section when said dry air is passed through said passages;



(c) preventing drying of the outer surfaces while simultaneously passing said drying air solely through said passages by maintaining thereon a covering layer of waterproof and steamproof material; and

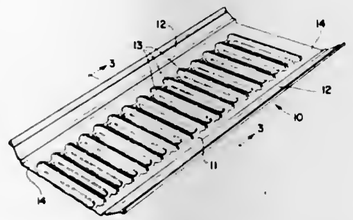
(d) burning the dried building element.

4,074,495

SHEET METAL PANEL

Ernest Robert Bodnar, 29 Blackdown Crescent, Islington, Toronto, Ontario, Canada

Continuation-in-part of Ser. No. 580,709, May 27, 1975, Pat. No. 4,027,517, which is a continuation-in-part of Ser. No. 431,098, Jan. 7, 1974, abandoned, which is a continuation-in-part of Ser. No. 311,703, Dec. 7, 1972, abandoned. This application Aug. 25, 1976, Ser. No. 717,658
Int. Cl.² E04C *2/32*
U.S. Cl. 52—613 **2 Claims**



1. A roll formed sheet metal panel formed of strip sheet metal cut to a predetermined length, said panel comprising;

a central portion and two side portions;

continuous roll formed longitudinal fold formations extending continuously along both side portions of said panel running from one end to the other thereof without interruption;

a plurality of identical transverse ridges and indentations of continuous sinusoidal shape in elevation formed in the central portion of said panel, along a length less than the length of said panel, and extending from side to side of said central portion between said longitudinal fold formations, and terminating just short of said longitudinal fold formations;

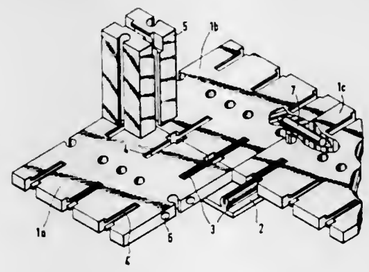
flat planar junction portions of said central portion at each end of said panel extending from side to side of said central portion between said longitudinal fold formations wherein said transverse ridges and indentations are absent, and being flanked by said longitudinal fold formations on either side thereof, said transverse ridges and indentations having upper and lower extremities, the lower extremities of said indentations lying in a common plane with a plane containing said planar junction portions, and said indentations extending to one side only of said plane, and exhibiting compound concave and convex curved contours characterized by an absence of flat sections and sharp angles, and complementary continuous lengthwise mating formations formed in said longitudinal fold formations, whereby said panels may be interlocked in edge to edge relation to form a structure.

4,074,496

COMPOSITE PLATE

Artur Fischer, Weinhalde 34, D-7244 Waldachtal 3 (Tumlingen), Germany

Filed July 29, 1977, Ser. No. 820,129
Claims priority, application Germany, Aug. 12, 1976, 7625293[U]
Int. Cl.² E04C *2/00, 1/10*
U.S. Cl. 52—622 **8 Claims**



1. In an assembly kit of the type having a structural element provided with an undercut coupling projection, a combination comprising

at least two structural plates each having two undercut slots, said plates being adapted to be located adjacent to each other with at least one of said slots of each structural plate extending at least substantially parallel to a slot of the respective other structural plate; and

a plate-like connecting member having two elongated substantially parallel undercut projections each engageable in one of said slots of the respective structural plate so that, when said elongated undercut projections engage in respective slots of said structural plates, the structural plates are assembled with one another so as to form a large composite plate, and the structural element can be connected to such composite plate by inserting the coupling projection thereof into a respective other one of said slots.

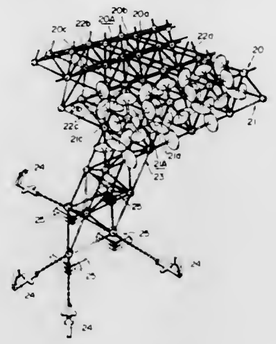
4,074,497

UNDERWATER TRUSSES FOR BREAKWATER STRUCTURE

Taisaburo Ono, 2-2-39, Shinjuka, Zushi, Japan

Filed June 1, 1976, Ser. No. 691,612
Int. Cl.² E04G *7/20*
U.S. Cl. 52—648 **9 Claims**

1. Construction elements of underwater trusses for a breakwater structure comprising first and second co-linearly disposed, hollow web members having at opposite ends thereof engaging means and at adjacent ends thereof flanges extending perpendicular thereto, an annular plate disposed between said flanges, means for connecting said flanges and said annular plate together and hollow joint members engaged at the opposite ends of said hollow web members with said engaging means, a tension member extending through said hollow web



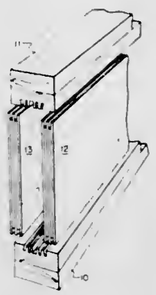
members and having ends extending into the hollow portions of said hollow joint members and fixedly connected therein.

4,074,498

FABRICATED WOOD BEAM

James R. Keller, Tualatin, and William A. Nickerson, Portland, both of Oreg., assignors to Wm. A. Nickerson & Co., Ltd., Tualatin, Oreg.

Continuation-in-part of Ser. No. 558,350, March 14, 1975, Pat. No. 3,991,535. This application Nov. 5, 1976, Ser. No. 743,532
Int. Cl.² E04C *3/02*
U.S. Cl. 52—690 **4 Claims**



1. A fabricated wood beam comprising a pair of wood chord members and plywood web members interconnecting said chord members by means of glued tongue and groove joints, said web members comprising two sheets of plywood in face to face juxtaposition with the grain of the wood in the face veneers of both sheets running approximately perpendicular to the length of the chord members, each sheet having at least one intervening layer of veneer in which the grain of the wood runs approximately parallel with the length of said chord members, said face veneers projecting beyond said intervening layers on two opposite edges of said web members to form tongues on each of said opposite edges, longitudinal grooves in each of said chord members spaced apart to receive said tongues, said grooves in each chord member comprising a pair of outer grooves each having a width corresponding to the thickness of an outer face veneer on said web members to receive said outer face veneers, said outer grooves being inclined from top to bottom relative to each other to bend said outer face veneers on said web members out of parallelism with each other and form a self-locking dovetail type joint when said chord members are pressed onto said web members and said grooves including an intermediate groove having a width corresponding to the combined thickness of the adjacent face veneers on said web members to receive both of said

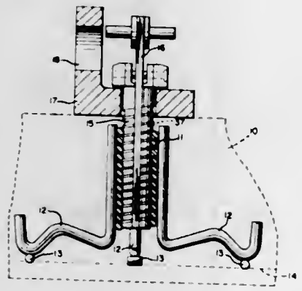
adjacent face veneers on said two web members, said bent outer face veneers holding all of said members together in assembled relation without external clamps while the glue in said joints is setting.

4,074,499

FILLER PLUG FOR COIL INSERT IN CONCRETE SLAB OR PANEL

Richard C. Mess, Washington Township, Montgomery County, Ohio, assignor to The Dayton Sure-Grip & Shore Company, Miamisburg, Ohio

Continuation-in-part of Ser. No. 648,521, Jan. 12, 1976, abandoned. This application Jan. 21, 1977, Ser. No. 761,263
Int. Cl.² E04B *1/38*
U.S. Cl. 52—705 **9 Claims**



1. A coil insert for temporary use in combination with a coil bolt of predetermined diameter on the bottom of a mold in the fabrication of a poured concrete slab of predetermined thickness, comprising:

(a) a substantially cylindrical wire coil composed of a predetermined number of turns cooperating to define an interior threaded surface sized for threaded reception of said bolt,

(b) means secured to said coil for supporting said coil in perpendicular spaced relation with the upper surface of the slab, said upper surface being parallel to said bottom surface of the mold, and

(c) a plug filing said coil, said plug consisting of

a hollow elastomeric body having the outer surface thereof proportioned and threaded for firm matching engagement within said interior threaded surface of said coil upon predetermined radial compression and axial expansion from the substantially unstressed condition of said elastomeric body, said plug having an unstressed diameter greater than said predetermined diameter of said coil bolt, said plug being open at the lower end thereof and closed at the upper end thereof, and

stem means, attached to said upper end of said plug, of sufficient strength for applying a pulling force to said plug causing sufficient elongation and radial contraction thereof for withdrawal from said coil and the slab after the slab has set to expose said threaded coil interior for reception of said bolt, said stem means being of a diameter less than said elastomeric body and proportioned to extend from said closed plug end beyond said slab surface.

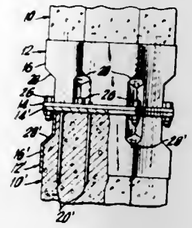
4,074,500

CONCRETE PILE COUPLING DEVICE

Guy Bisutti, 951 Montee de l'Eglise, Ile Bizard, Quebec, Canada

Filed Mar. 16, 1976, Ser. No. 667,349
Int. Cl.² E04C *3/30*
U.S. Cl. 52—726 **3 Claims**

1. A high strength pile coupling device for attaching concrete piles end to end, the device comprised of two identical joint members demountably attachable one to the other, each member being fixedly attached to the ends, respectively, of two axially juxtaposed piles, a joint member comprising a hollow cylindrical sleeve having a first end and a second end, the cylindrical sleeve at the first end thereof securely mounted at right angles to a flanged end plate, the flanged end plate having a true planar surface on the side opposite the sleeve, the flanged end plate perimeter being coextensive with the radial cross section of the piling, the sleeve being open at the second end thereof, means securely mounted within the sleeve to the end plate and extending through the open end of the sleeve, the means when mounted to a pile end being imbedded within and bonded to the internal structures within the concrete pile, a



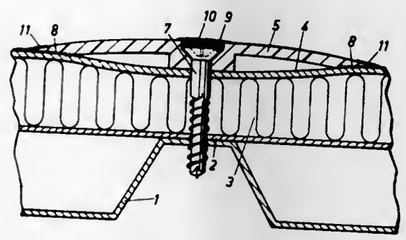
plurality of holes in the end plate positioned about the perimeter thereof in spaced relationship one to another, the sleeve having indented recesses to clear the end plate holes leaving the holes in the end plate exterior to the sleeve, fastener means sized to pass through the end plate holes, whereby when the true planar surfaces of two flanged end plates are axially aligned and juxtaposed, and the fastener means mounted through the flanged end plate holes of each member, a high strength axially aligned coupling of the concrete piles is formed.

4,074,501

METHOD OF SECURING A SEALING LAYER TO A SUPPORT

Sune Allan Sandqvist, Skalldalsvagen 34, S-430 80 Goteborg, Sweden

Filed Apr. 20, 1976, Ser. No. 678,665
Claims priority, application Sweden, Apr. 24, 1975, 75047423
Int. Cl.² E04B *7/00*
U.S. Cl. 52—741 **11 Claims**



1. An improved method of securing a sheet-like sealing layer to a springy underlying support, using elastic plates each having an aperture therethrough and elongate fastening means having a head and dimensioned to pass through a plate aperture up to the head and penetrate into said support for fastening the plate thereto, comprising:

(a) disposing said sealing layer on said support;

(b) applying a bonding agent on top of said sealing layer on the intended areas of securement of said plates;

(c) inserting ones of said fastening means through respective ones of said plates and pressing said plates against said sealing layer at the areas at which the bonding agent was applied for compressing the springy underlying support beneath said plates and securing said plates to the springy underlying support with said fastening means, and for securely joining said plates to said sealing layer by means of said bonding agent; and

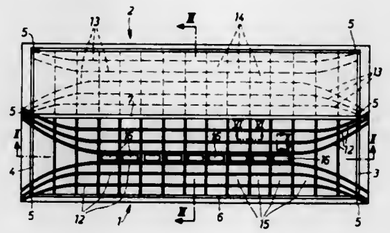
(d) bonding the heads of said fastening means to said plates for preventing relative movement between said plates and said heads of said fastening means.

4,074,502

METHOD FOR MANUFACTURING A SUPPORT FRAMEWORK

Emil Peter, Rosentalstrasse 78, Winterthur, Switzerland

Filed Oct. 18, 1976, Ser. No. 733,276
Claims priority, application Switzerland, Oct. 22, 1975, 13674/75
Int. Cl.² E04B *1/00, 7/00*
U.S. Cl. 52—741 **27 Claims**



1. A method of manufacturing a support framework containing at least one suspension element arched in one direction and serving as a roof construction, said suspension element including a plurality of tension elements and a plurality of preformed fabricated components extending between said tension elements, and with said method comprising the steps of: forming a reinforcement construction for taking up horizontal forces with said reinforcement construction including two horizontal supports extending in spaced relation from one another transversely to the intended direction of arching of the suspension element and compression type reinforcement components interconnecting said two horizontal supports, supporting the reinforcement construction upon upstanding supports, arranging tension elements of the suspension element in a substantially catenary spatial curve between the horizontal supports and anchoring such tension elements to said reinforcement construction at the region of the upstanding supports, before or after anchoring of the tension elements attaching to the tension elements concrete form elements for forming from concrete joints between fabricated components of the support framework, supporting said fabricated components between said tensioning elements on said concrete form elements, and pouring concrete joints between said fabricated components.

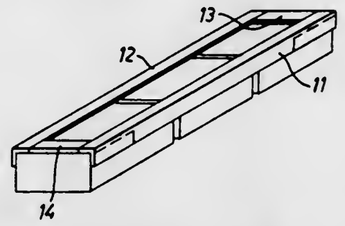
4,074,503

BRICK LAYING DEVICE

Robert Duncan Watt, and Brian William Gordon Orr, both of 96 Carisbrooke Road, Newport, Isle of Wight, England

Filed Nov. 21, 1975, Ser. No. 634,058
Int. Cl.² E04D *15/00*; E04B *2/00*; E04E *11/00*
U.S. Cl. 52—749 **9 Claims**

1. A device for use in laying bricks, which comprises a frame adapted to be placed on a previously laid course of bricks to define a trough of even depth overlying said course wherein a layer of mortar may be laid ready to receive the next brick or bricks to be laid, the frame having two longitudinally extending side members spaced apart and parallel to one another and a pair of parallel spaced apart end members connecting the ends of said side members; at least one of the longitudinal members comprising a horizontally positioned element which rests on the horizontal surface of the said course and a vertically positioned element which rigidly depends from and along the outer edge of said horizontal element and is in contact with the vertical face of said course to insure linear alignment of said course; said horizontal element extending inwardly over said course of bricks to define the whole of one edge of the trough, the inward extension being preselected to provide a required recess for pointing and said horizontal element having



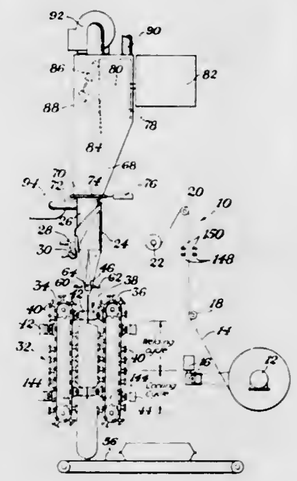
a thickness chosen to provide the required depth of mortar to be applied; said spaced end members lying totally above the plane of the underside of said horizontal element when laid over a course of bricks.

4,074,504

METHOD OF FORMING FILLING AND SEALING AN INDUSTRIAL SIZE BAG

Eddie Lee Greenawalt, and Lorenzo Dow Geren, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

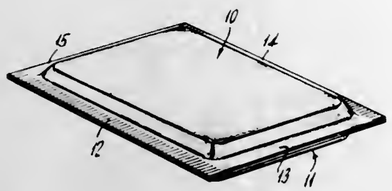
Continuation of Ser. No. 572,581, April 28, 1975, which is a division of Ser. No. 460,864, April 15, 1974, Pat. No. 3,925,963, which is a continuation-in-part of Ser. No. 347,923, April 4, 1973, abandoned. This application Dec. 6, 1976, Ser. No. 747,742
Int. Cl.² B65B *9/12, 31/00*
U.S. Cl. 53—22 A **15 Claims**



1. In the method of producing bags by forming a flexible generally vertical tube about a hollow filling mandrel, periodically clamping the tube underneath the filling mandrel and drawing the same downwardly, to provide successive product receiving spaces, and periodically dumping pre-measured product loads into the tube subsequent to each clamping step, the steps comprising: forming a narrow, channel between the inside surface of the tube and the filling mandrel to provide communication between the product receiving space and the atmosphere, and partially evacuating each successive product receiving space to make available cooperately with the channel forming step, a high velocity stream of air that is sucked downwardly between the tube and the filling mandrel to

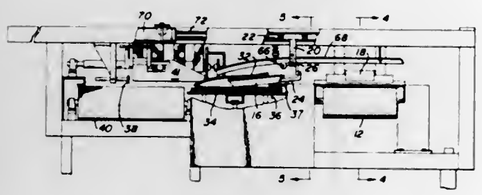
thereby wash over the inside surface of the tube to minimize contamination of the sealing area.

4,074,505
METHOD AND APPARATUS FOR PACKAGING ARTICLES
Eitan Keren, Wayne, and Harold J. Brown, Lyndhurst, both of N.J., assignors to Sealed Air Corporation, Fair Lawn, N.J.
Filed Jan. 3, 1977, Ser. No. 756,254
Int. Cl.[2] B65B *9/02*
U.S. Cl. 53—28 **12 Claims**



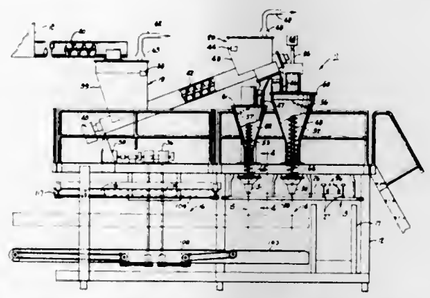
10. The method of sealing articles between sheets of material each having a cohesive coating on one side thereof comprising the steps of feeding said sheets between spaced sets of individually pivoted rollers adjusted to engage the edges of said sheet to form edge seals, forming spaced parallel upper and lower transverse seals on that portion of said sheets immediately below said rollers and simultaneously severing the sheets between the last said seals whereby an article inserted between said sheets is completely enclosed by said edge seals and the lower of said transverse seals and severed from the sheets to form a discrete package while the upper of said transverse seals forms the bottom of the next successive package still in engagement with said rollers.

4,074,506
PACKAGING APPARATUS
Bernd Sander, Halle, Germany, assignor to Cito Kunststoffe und Verpackungsfolien Erich Gilberg KG, Kunsebeck, Germany
Filed Dec. 22, 1976, Ser. No. 753,247
Int. Cl.[2] B65B *57/10, 43/34*
U.S. Cl. 53—59 R **11 Claims**



1. Apparatus for automatically bagging open top trays comprising a first conveyor for delivering open top trays to pushing means arranged to automatically push an open top tray off said conveyor and into a separate open bag at a bagging station, a second conveyor for receiving each bagged tray, said second conveyor including means for applying pressure to the top surface of the tray as the tray is moved along said second conveyor, means along side said second conveyor for sealing a bagged tray by welding the open end of the bag adjacent a side edge of the tray and for trimming scrap off the bag adjacent the weld as each bagged tray moves along said second conveyor, said pushing means including a carriage and a pusher support for reciprocation toward and away from the bagging station, means for removing scrap away from the second conveyor, and means downstream from said welding means for contacting and smoothing the weld bead in conformity to the shape of the tray.

4,074,507
BAG FILLING MACHINE FOR POWDERY MATERIAL
Walter Ruf, New City, and Harry Edward Rothmann, Valhalla, both of N.Y., assignors to St. Regis Paper Company, New York, N.Y.
Filed Dec. 27, 1976, Ser. No. 754,176
Int. Cl.[2] B65B *1/32, 43/34*
U.S. Cl. 53—59 W **26 Claims**

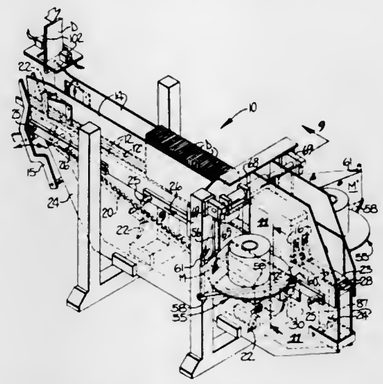


9. A bag filling machine comprising in combination,
a base,
a bag filling station on said base,
gripper means carried on said base,
actuator means to move said gripper means,
said gripper means movable by said actuator means to grip near the top of a bag,
a hopper adapted to contain a powdery material and having an outlet,
an auger in said hopper,
means to control said actuator means to raise said gripper means and any said bag to have an opening of the bag received on said outlet of said hopper,
fill control means to control the filling of a bag on said hopper outlet,
weighing means responsive to the weight on said gripper means relative to said base,
drive means to rotate said auger to move material in said hopper to said outlet, and
means responsive to a predetermined weight of said filled bag on said gripper means to actuate said fill control means to stop the filling of any said bag.

4,074,508
APPARATUS FOR COMPRESSING AND BANDING A PREDETERMINED NUMBER OF ARTICLES
Philip Lane Reid, Duncan, S.C., assignor to Riegel Textile Corporation, New York, N.Y.
Filed Dec. 21, 1976, Ser. No. 752,906
Int. Cl.[2] B65B *57/14, 13/04, 13/20, 13/32*
U.S. Cl. 53—62 **30 Claims**

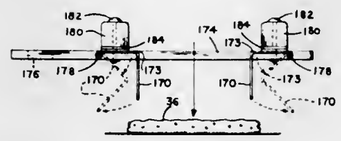
1. Apparatus for compressing and banding a predetermined number of generally flat, compressible articles, such as disposable diapers, comprising:
means positioned generally at one end of said apparatus for successively receiving the articles and for positioning the articles successively in a longitudinally extending row;

means for moving a group of a predetermined number of the articles from said receiving and positioning means in a generally longitudinal path of travel to generally the other end of said apparatus and for longitudinally compressing the group of articles at the other end of said apparatus;
means for positioning banding material across the path of travel of the group of articles and for allowing the banding material to position itself around the leading end and sides of the group of articles as the group is moved to the other end of said apparatus;
means for moving the banding material around the trailing end of the group of compressed articles positioned at the other end of said apparatus;
means for sealing the banding material together in encircling relation around the compressed group of articles; and



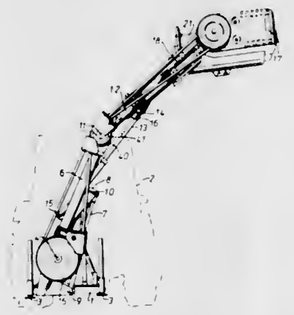
control means operatively connected to said article moving and compressing means, said band material moving means and said band material sealing means for sequentially controlling and operating these said means for the compressing and banding operation by said apparatus, said control means comprising a source of electrical energy, an electrical circuit means respectively connected between said source of electrical energy and said article moving and compressing means, said banding material moving means and said banding material sealing means for selectively supplying electrical energy therebetween for sequentially operating same, and separate manually operated switches connected in said electrical circuit means for being opened and closed for manually controlling operation of said article moving and compressing means, said banding material moving means and said banding material sealing means.

4,074,509
APPARATUS FOR FORMING, INTERLEAVING AND DISPENSING FOOD PATTIES
Bernard Miles, 119 Trenton Ave., Point Pleasant Beach, N.J. 08742
Filed May 5, 1976, Ser. No. 683,339
Int. Cl.[2] B65B *63/00, 35/54*
U.S. Cl. 53—122 **22 Claims**



1. Means for interleaving and stacking formed food patties, comprising:
a support means;
a non-magnetically attracted member supporting said support means;
means to periodically dispense individual interleaving sheets onto said support means;
means to periodically dispense formed food patties onto said interleaving sheets on said support means;
means to sequentially synchronize the dispensing of said interleaving sheets and said formed patties onto said support means; and
said support means comprising:
support arms pivotably connected to said non-magnetically attracted member movable from a raised closed to a lower open position, said arm having a portion that extends from said pivotable connection and formed from magnetically effected material;
said support arms constructed and arranged to move in pendulum-like motion upon impact of a formed food patty onto said interleaving sheets, from said raised closed position to said lower open position and then towards said raised closed position; and
magnetic means disposed on said non-magnetically attracted member above said support arms in contact with said portion of said magnetically succeptible support arms in said closed position to thereby hold said support arms in said closed position and to assist in returning said support arms to said closed position from said open position.

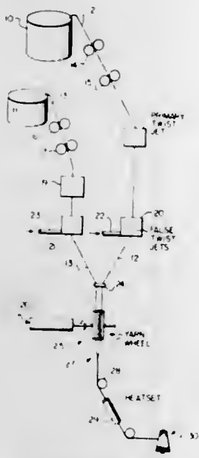
4,074,510
MACHINE FOR CUTTING HEDGES, GRASS AND OTHER ARBOREAL GROWTH
William Thomas Teagle, Blackwater, Truro, England
Filed Mar. 3, 1976, Ser. No. 663,433
Int. Cl.[2] A01D *55/18*
U.S. Cl. 56—233 **16 Claims**



1. A machine for cutting or trimming hedges, grass, weeds, crops and other vegetable or arboreal growth, said machine comprising:
a supporting frame for mounting upon the rear end of an agricultural tractor, said tractor having a power take-off shaft;
a shaft journaled in said supporting frame for operative connection to said power take-off shaft;
a laterally extending boom mounted at its inner end on said supporting frame for pivotal movement about an axis parallel to the longitudinal axis of said tractor;
a work-head pivotally mounted on the outer end of said boom for movement about an axis parallel with said pivotal axis of said boom;
means operable from said tractor for independently moving said boom and said work-head about their pivotal axes;
a rotor mounted in said work-head;
a plurality of flails extending radially outwardly from said rotor;
a driving pulley mounted on said shaft;
a first driven pulley rotatably mounted on said work-head;

a primary belt drivingly coupling said driving pulley and said first driven pulley;
a second driving pulley rotatably mounted on said workhead and rotatable with said first driven pulley;
a second driven pulley coaxial with and mounted to said rotor; and
a secondary belt drivingly coupling said second driving pulley to said second driven pulley, whereby said primary and secondary belts serve to transmit power from said tractor to said rotor.

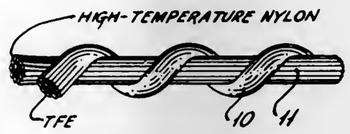
4,074,511
SELF TWIST YARN STRAND SYSTEM
Phillip W. Chambley, and Alan H. Norris, both of Rome, Ga., assignors to Champion International Corporation, Stamford, Conn.
Filed Dec. 30, 1976, Ser. No. 755,671
Int. Cl.[2] D01H *7/90*
U.S. Cl. 57—34 AT **13 Claims**



1. An apparatus for forming a self-twist plural strand yarn comprising
means for forming at least two singles yarn strands;
means for twisting each of said strands individually to form twisted strands each having longitudinally spaced nodes at which the direction of twist reverses;
means for guiding and carrying said strands into closely spaced substantially parallel paths with the nodes of one strand substantially aligned with the nodes of each other strand; and
means for fastening each of said strands together at said nodes and for self-twist plying of the strands between said nodes,
and wherein said means for guiding and carrying comprises a rotatable guide member,
and said means for node fastening includes rotating contact means carried by said rotatable guide member, said contact means being exposed to said yarn paths at spaced intervals for fixing said strands together at the regions of said nodes.

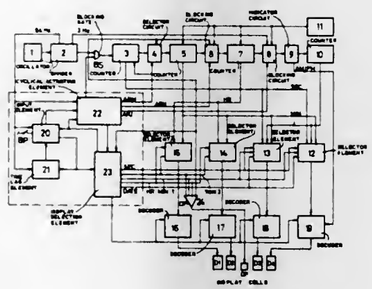
4,074,512
LOW-FRICTION FABRIC BEARING
Richard J. Matt, Simsbury, Conn., assignor to Textron, Inc., Providence, R.I.
Division of Ser. No. 160,661, July 8, 1971, Pat. No. 3,765,978. This application July 3, 1973, Ser. No. 376,235
Int. Cl.[2] D02G *3/04, 3/36;* D04C *1/06*
U.S. Cl. 57—140 BY **14 Claims**

1. A size-free low-friction fabric for void-free impregnation with a curable synthetic resin, said fabric being the washed product of construction from a yarn comprising a compounded bundle of sized TFE filaments and sized filaments of a high-temperature nylon in the proportion of at least no more than 50 percent TFE by volume and loosely twisted to an extent not



substantially exceeding three twists per inch; whereby, when said fabric is embodied in a bearing surface potted with a synthetic resin, the resin may be induced to flow into and throughout the cleaned and loose yarn bundle, for substantially intimate and continuous and void-free consolidation therewith.

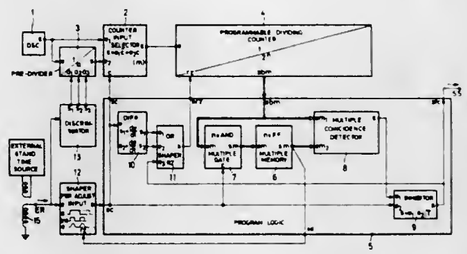
4,074,513
ELECTRONIC DISPLAY DEVICE
Jean-Marie Donze, and Georges Vuffray, both of La-Chaux-de-Fonds, Switzerland, assignors to Girard-Perregaux S.A., Switzerland
Filed May 5, 1976, Ser. No. 683,282
Claims priority, application Switzerland, May 7, 1975, 5903/75
Int. Cl.[2] G04B *27/08;* G04C *3/00*
U.S. Cl. 58—4 A **10 Claims**



1. An electronic time piece comprising:
a plurality of display cells,
a plurality of counters for processing data to be transmitted to said cells through a coupling device,
a control circuit means for enabling modification of said data, said control circuit means comprising:
a switch,
an input circuit energized by said switch and having first and second outputs for providing activating and intervention signals respectively,
a cyclical activating circuit means having an input channel and a plurality of output channels,
an input connection between said first output of said input circuit and said input channel,
a plurality of selectively energized means coupled one each to said output channels and a plurality of intervention circuits coupled one each to said selectively energized means, each of said selectively energized means being conditioned for operation in response to actuation of a corresponding output channel for providing signals from said second output of said input circuit to a respective intervention circuit, each of said intervention circuits being connected to one of said counters,
an intervention connection coupling together said second output of said input circuit, said input channel, and said plurality of selectively energized means, said activating circuit rendered operative in response to the concurrent

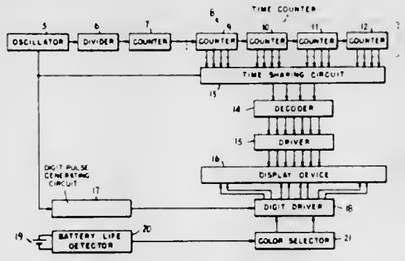
presence at the input channel of an activating signal and an intervention signal, said signals issuing from said input circuit in response to at least one depression of said switch for causing the successive actuation of said output channels in a predetermined order each for a predetermined length of time, said actuation of an output channel for a said predetermined length of time conditioning for operation a respective selectively energized means for said predetermined length of time in such a manner that the issuing by said input circuit of a second intervention signal in response to a further depression of said switch during a said predetermined length of time provides said second intervention signal through said respective selectively energized means solely to that intervention circuit which is coupled to the output channel activated during said predetermined length of time.

4,074,514
ISOCHRONOUS PERIOD GENERATOR HAVING MEANS FOR ADJUSTING THE ISOCHRONOUS PERIOD
Jean M. Vaucher, Brugg, Switzerland, assignor to Dynacore, S.A., Switzerland
Continuation-in-part of Ser. No. 391,048, Aug. 24, 1973, abandoned. This application Sept. 3, 1975, Ser. No. 609,941
Claims priority, application Switzerland, Aug. 24, 1972, 12570/72
Int. Cl.[2] G04C *3/00;* H03K *21/32, 1/17;* H03B *3/04*
U.S. Cl. 58—23 AC **21 Claims**



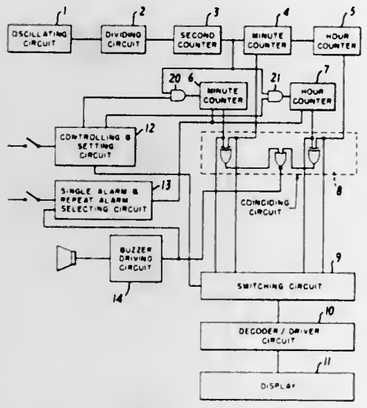
1. An electronic watch, in which a resettable isochronal period is repeated, including a time base means for supplying, for the measurement of time, a periodic signal, said time base means including a high frequency source provided with a quartz oscillator operating at its natural frequency, the period of oscillation of said oscillator defining the maximum deviation which is to be tolerated for the isochronal period when the isochronal period has been readjusted, and a frequency divider counter having an input which receives the high frequency of said source, said counter having an operating cycle constituting the isochronal period and restrictable to a memorized number "*n*" of counting steps less than the natural counting capacity of said counter; means, in the watch, for picking-up standard time information of a predetermined period from outside the watch and generating a signal corresponding to the predetermined period; conditioning means, connected to said picking-up means, for readjusting the isochronal period including means for receiving and recognizing the signal from the picking-up means to control transfer of the watch from working in an autonomous mode in which the isochronal period is produced to a readjustment mode in which the isochronal period is readjusted, said time base means further including a programmable memory means, connected to said counter and said conditioning means for memorizing the number "*n*", which memorized number acts on said counter during the autonomous mode to cause said counter to be reset, said conditioning means and said time base means including said programmable memory means causing, in the readjustment mode, a redetermination of the number "*n*" as a function of the standard time period picked-up, wherein the redetermination is constituted by said conditioning means causing zero resetting of said counter at the start of the standard time period, said high frequency source supplying the high frequency to said input of said counter without the number "*n*" acting on said counter, thereby enabling said counter to count freely within the field of its natural capacity, and said programmable memory means memorizing the state of counting of said counter at the end of the standard time period as a new readjusted, value of the number "*n*", wherein the improvement comprises:
a single detector means have a logic circuit, which merges said receiving and recognition means and said picking-up means, for receiving from the outside of the watch, through the detection of a physical action without physical contact between the physical action and the watch, a simple signal defining both the signal received and recognized by said means for receiving and recognizing to control the transfer of the watch from the autonomous mode to the readjustment mode by a given logic state which said logic circuit assumes and the standard time period by the interval of time for which this logic state lasts, said single detector means establishing the readjustment mode for the duration of the standard time period, which the interval of time for which the logic state lasts measures exactly, and wherein said detecting means establishes the autonomous mode for the entire time the standard time period is not being picked-up.

4,074,515
ELECTRONIC TIMEPIECE WITH BATTERY LIFE DISPLAY
Kazuhiro Asano, Chiba, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan
Filed July 15, 1976, Ser. No. 705,445
Claims priority, application Japan, July 15, 1975, 50-87114
Int. Cl.[2] G04B *19/34;* G04C *3/00*
U.S. Cl. 58—23 BA **3 Claims**



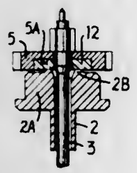
1. In a digital electronic timepiece the combination of:
alphanumerical display means comprising two sets of visual display elements disposed closely adjacent alongside one another, each set of said display elements being of a different display color from the other,
battery means for supplying power for illuminating said display means,
means for detecting whether the voltage of said battery means is above or below a predetermined value, and
switching means controlled by said detecting means for supplying power from said battery means to selected elements of one of said sets when the voltage of said battery means is above said value and to selected elements of the other of said sets when said voltage is below said value.

4,074,516
ALARM ELECTRONIC TIMEPIECE
Kenichi Kondo, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan
Filed Oct. 13, 1976, Ser. No. 732,029
Claims priority, application Japan, Oct. 13, 1975, 50-123006
Int. Cl.² G04C *21/00*
U.S. Cl. 58—38 R **7 Claims**



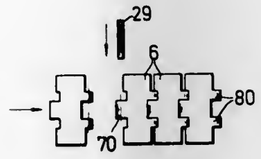
1. In an electronic timepiece of the type having a minute counter and an hour counter: settable and resettable means for storing an alarm time therein; means for detecting a coincidence between the stored alarm time and the contents of the minute and hour counters for developing a coinciding signal in response thereto; means responsive to said coinciding signal for producing an alarm; first manual means for switching between a first state and a second state; and means responsive to said coinciding signal for resetting the means for storing when the first manual means is in the first state and for maintaining the means for storing in the set condition when the first manual means is in the second state; whereby the timepiece can be selectively used in single alarm and repeat alarm modes.

4,074,517
GEAR TRAIN FOR A WRIST WATCH
Yoshio Tatsumi, and Tooru Kadowaki, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan
Filed July 14, 1976, Ser. No. 705,006
Claims priority, application Japan, July 14, 1975, 50-98181
Int. Cl.² G04B *13/02*
U.S. Cl. 58—140 R **5 Claims**



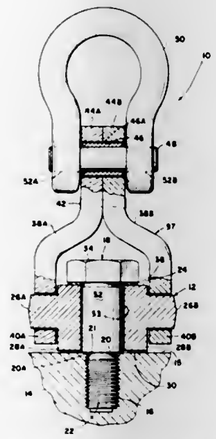
1. A gear train for a wrist watch movement comprising in combination: a center pipe, a gear wheel rotatably mounted coaxially with and at one end of said center pipe, said gear wheel being connected to a hand of the watch, and a jewel recessed in the lower face of said gear wheel and rotatably engaging said end of said center pipe, whereby the friction factor of said gear wheel in a rotary state is reduced.

4,074,518
APPARATUS FOR MAKING A LINK-TYPE CONVEYOR BELT
Klaus Taubert, Herkersdorf; Reimund Benner, and Friedrich Judt, both of Eiserfeld, all of Germany, assignors to Meyer, Roth & Pastor Maschinenfabrik GmbH, Cologne, Germany
Filed Nov. 15, 1976, Ser. No. 742,202
Claims priority, application Germany, Nov. 15, 1975, 2551453
Int. Cl.² B21L *11/02*
U.S. Cl. 59—15 **4 Claims**



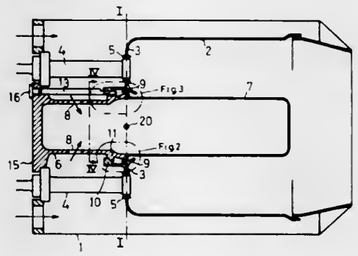
1. An apparatus for making a link-type belt formed of a plurality of plate members having hinge eyes and linked together by hinge bolts passing through the aligned hinge eyes of adjoining plate members, comprising:
(a) a first bending press means for prebending free ends of lateral portions projecting outwardly from two opposite sides of a planar plate member for providing a prebent part at the terminus of each said lateral portion; said first bending press means including a reciprocating ram; a backup support cooperating with said ram; bending rollers arranged laterally of said ram and said backup support for engaging the free ends of the lateral portions of the plate member held between said ram and said backup support; and means for supporting said bending rollers;
(b) a second bending press means for bending each said lateral portion into an orientation substantially perpendicular to the respective plate member; and
(c) an anvil-and-die assembly means for rolling-in each lateral portion for forming hinge eyes on each plate member.

4,074,519
SWIVEL SHACKLE
Charles Ronald Garrett, Tulsa, Okla., assignor to American Hoist & Derrick Company, Tulsa, Okla.
Filed Mar. 31, 1977, Ser. No. 783,153
Int. Cl.² F16G *15/08*
U.S. Cl. 59—95 **8 Claims**



1. A swivel shackle means for applying a tensile load to an object, comprising;
a. a shoulder bolt adapted to be attached to said object, said bolt having a cylindrical portion of larger diameter than the attachment portion, said larger diameter portion providing a shoulder which presses against the surface of said object, to resist transverse bending moments on said bolt;
b. a load ring of unitary construction, having a body portion, including a circular bored opening, and adapted to rotate about said cylindrical portion of said shoulder bolt, and including two oppositely extending shaft portions, coaxial with each other, and perpendicular to the axis of said bore;
c. a Y-shaped pivot assembly, having bored openings on the ends of the two arms of said Y, said openings adapted to rotate about said shaft extensions of said load ring; and
d. an opening through the leg of said Y-shaped pivot assembly, adapted to receive the pin of a shackle.

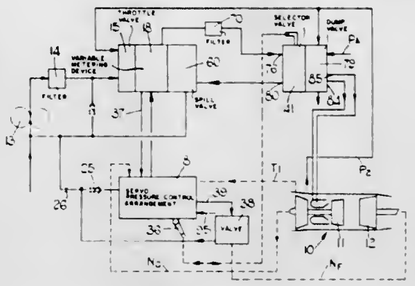
4,074,520
COMBUSTION CHAMBER FOR GAS TURBINE
Martin Mansson, and Ragnar Torstenfelt, both of Finspong, Sweden, assignors to Stal-Laval Turbin AB, Finspong, Sweden
Filed Aug. 4, 1976, Ser. No. 711,675
Claims priority, application Sweden, Aug. 5, 1975, 7508805
Int. Cl.² F02C *7/20*
U.S. Cl. 60—39.32 **5 Claims**



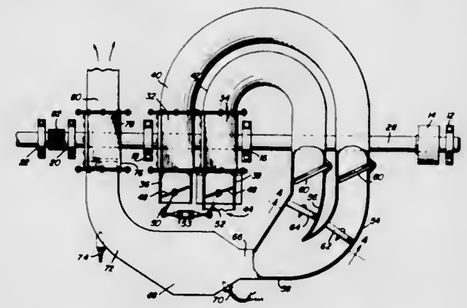
1. In a combustion chamber of the type adapted for use with a gas turbine, said chamber including an outer mantle; a cylindrical flame tube arranged within said outer mantle, said flame tube having an upstream end wall; a center tube extending within said flame tube through a central opening in said end wall, said central opening being sized to permit movement of said end wall relative to said center tube and said center tube being provided with openings to pass air into the center of said flame tube; and a plurality of burnes arranged around said center tube and extending into said flame tube through a corresponding plurality of openings in said end wall, each of said plurality of openings being sized to permit movement of said end wall relative to said burners, the improvement comprising: the placement of said central opening and said plurality of openings in said end wall of said flame tube for said center tube and said burners in a common plane, whereby a certain angular deviation between the longitudinal axis of said flame tube and said center tube is permitted.

4,074,521
FUEL CONTROL SYSTEM FOR A GAS TURBINE ENGINE
Trevor Stanley Smith, Sutton Coldfield, England, assignor to Lucas Industries Limited, Birmingham, England
Filed Sept. 8, 1976, Ser. No. 721,234
Claims priority, application United Kingdom, Sept. 16, 1975, 37971/75
Int. Cl.² F02C *9/08*
U.S. Cl. 60—39.28 R **8 Claims**

1. A fuel control system for a gas turbine engine, comprising a variable metering device through which fuel flows, in use, to the engine, a throttle valve in series with said metering device, said throttle valve including means responsive to an increase in the pressure at an outlet of the engine compressor for reducing fuel flow through the throttle valve, means, responsive to a first servo pressure derived from the pressure difference across said throttle valve, for controlling said variable metering device, and means responsive to a difference between desired and actual engine speeds for varying said first servo pressure.



4,074,522
ROTARY ENGINE
Jimmy J. McDowell, P.O. Box 11456, Tucson, Ariz. 85706
Filed Sept. 7, 1976, Ser. No. 721,321
Int. Cl.² F02C *5/02*
U.S. Cl. 60—39.61 **10 Claims**

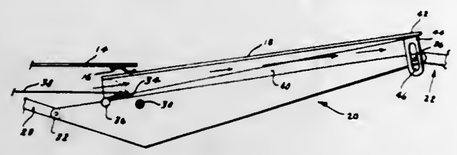


1. In combination, a main rotary shaft, first and second rotary pumps driven from said main shaft each including an inlet and an outlet, mixing and combustion chamber means into which the outlets of said pumps open, the inlet of one of said pumps comprising an air inlet, the inlet of the other of said pumps comprising an air and fuel mixture inlet, charge forming means operatively connected to said inlet of the other pump for providing an overly rich mixture of air and fuel thereto, a rotary motor drivingly connected to said main shaft and including a combustion gas inlet and an exhaust outlet, said mixing and combustion chamber means including an outlet connected to said combustion gas inlet.

4,074,523
PRESSURE ACTUATED COLLAPSIBLE CURTAIN LINERS FOR A GAS TURBINE ENGINE NOZZLE
Richard P. Holler, Palm Beach Gardens, and Connie W. McMath, North Palm Beach, both of Fla., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Dec. 8, 1976, Ser. No. 748,581
Int. Cl.² F02K *1/12, 11/02*; F02C *7/18*
U.S. Cl. 60—266 **2 Claims**

1. A cooling control system for convergent-divergent turbo jet engine exhaust nozzles comprising: in a convergent exhaust nozzle section, a movable curtain liner means hingedly attached to the exhaust nozzle section and forming a duct for cooling airflow when in a first position; means connected to said curtain liner for limiting movement thereof, door means

positioned at one end of said curtain liner and mounted on the exhaust nozzle section and in hinged relationship therewith;



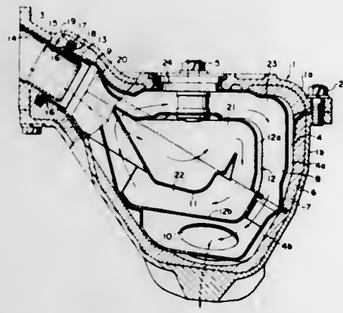
means for controlling movement of said door means, and means for creating a seal between the engine and curtain liner.

4,074,524

MANIFOLD REACTOR

Taro Ikeya, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed May 4, 1976, Ser. No. 683,226
Claims priority, application Japan, Feb. 18, 1976, 51-16856
Int. Cl.² F01N *3/10*
U.S. Cl. 60—282 **2 Claims**



1. A manifold reactor comprising:
an inner core;
an outer core which encloses said inner core therein;
said outer core having an inlet tube mounted therein;
said inner core having a tubular portion for introducing exhaust gases therein;
said tubular portion having a flanged inlet end;
said inlet tube being telescopically received by said tubular portion;
an annular elastic seal element made of a stack of a plurality of annular heat resistant elastic metal sheets and having an L-shaped cross section defined by a flange portion and a tubular portion;
said flange portion of said annular seal element being connected to said flanged inlet end of said inner core tubular portion in a manner such that a relative axial movement between said annular seal element and said inner core tubular portion is prevented while said tubular portion of said annular seal element is received between said inner core tubular portion and said inlet tube; and
said annular seal element being slidably engaged on a peripheral surface of said inlet tube.

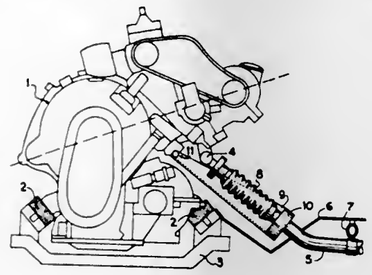
4,074,525

EXHAUST DEVICE FOR A COMBUSTION ENGINE

Robert Le Salver, Chanteloup Les Vignes, France, assignor to Automobiles Peugeot, Paris, France

Filed June 22, 1976, Ser. No. 698,505
Claims priority, application France, July 4, 1975, 75 21175
Int. Cl.² F01N *7/08*
U.S. Cl. 60—322 **5 Claims**

1. A gas exhaust device for and in combination with a combustion engine and a structure on which structure the engine is elastically mounted, said device comprising an exhaust manifold carried by the engine, an exhaust pipe which includes a flexible section and is connected to the manifold, the flexible section being disposed adjacent an upstream end of the exhaust



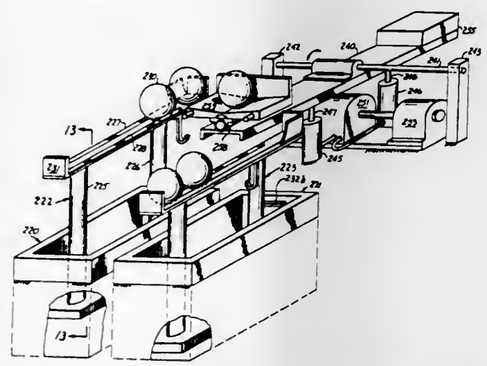
pipe relative to the flow of exhaust gases through the pipe, a support independent of said structure, a part of the exhaust pipe located immediately downstream of the flexible section relative to said flow being connected to the support, and a flexible connection connecting the support to the engine.

4,074,526

PRESSURE SOURCE AND SYSTEMS INCORPORATING IT

William S. West, 380 Cliff Drive, Apt. 2, Pasadena, Calif. 91107

Division of Ser. No. 432,667, Jan. 17, 1974, Pat. No. 3,961,480.
This application Feb. 2, 1976, Ser. No. 659,979
Int. Cl.² F03G *3/00*
U.S. Cl. 60—325 **19 Claims**



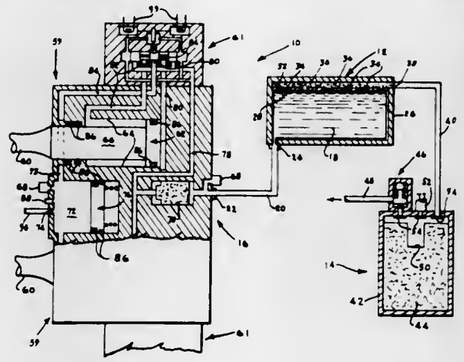
1. A pressure source comprising: pressurizing means comprising an enclosure which bounds a chamber, said enclosure comprising a first and a second portion, at least one of which is movable relative to the other as a consequence of a force applied to one of them so as to reduce the volume of the chamber and thereby to place under pressure liquid which is contained therein; a conduit leading from said chamber through which a stream of said liquid under pressure can flow for use in doing work; discrete weight means; buoyant lift means for elevating said weight means as the consequence of a rise in a water level on which the lift means floats; force transmission means so disposed and arranged as to apply force from an elevated weight means to one of said portions for reducing the volume of said chamber as a consequence of the descent in elevation of said weight means; whereby to produce said stream under pressure; and means for transferring said elevated weight means from said lift means to said force transmission means.

4,074,527

SELF-CONTAINED POWER SUBSYSTEM

James E. Sadler, Huntington Beach, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 9, 1976, Ser. No. 675,678
Int. Cl.² F15B *15/18*
U.S. Cl. 60—325 **4 Claims**



1. A self-contained, complete power subsystem comprising at least one actuator, an actuator module operatively connected to said actuator, hydraulic source means connected to said actuator module for providing an operative hydraulic fluid to said actuator module, and means connected to said hydraulic source means for providing motive force to said hydraulic fluid, said actuator module comprising at least one manifold, said manifold having a plurality of fluid passageways therein, said passageways being connected to said hydraulic source means, a fluid plenum, a piston located within said plenum, said passageways being connected to said plenum and said plenum being connected by a rupturable seal to the atmosphere in order to release to the atmosphere said hydraulic fluid which has been used within said subsystem, and a servo-valve, said servo-valve being connected to said passageways, weaus for actuating to direct said servo-valve said hydraulic fluid within said passageway in a preselected manner thereby causing the operation of said actuator, whereby upon actuation of said means for providing motive force to said hydraulic fluid, said hydraulic fluid is directed to said actuator module thereby providing controlled operation of said actuator for the predetermined period of time in which hydraulic fluid is available prior to release of said operative hydraulic fluid to the atmosphere.

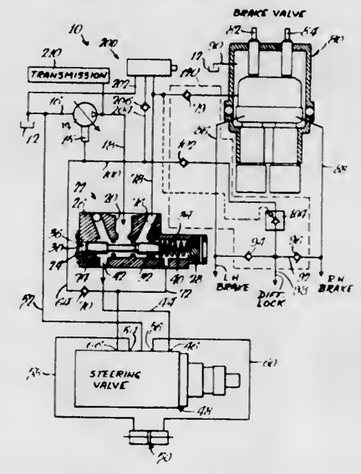
4,074,528

HYDRAULIC CONTROL SYSTEM WITH PRIORITY FLOW CONTROL

Patrick M. Lourigan, Kenosha, and Ramkishan Khatti, Racine, both of Wis., assignors to J. I. Case Company, Racine, Wis.

Filed Aug. 2, 1976, Ser. No. 710,802
Int. Cl.² F15B *11/20*
U.S. Cl. 60—422 **5 Claims**

1. A hydraulic control system including a reservoir, a pump having pressure compensating means associated therewith, first and second flow control means controlling flow to first and second fluid operated devices and a priority flow control valve between said flow control means and said pump, said priority flow control valve including a housing having a valve bore therein with a valve spool slidable in said valve bore and cooperating therewith to define first and second chambers on opposite ends of said spool, biasing means in said first chamber biasing said spool to a first position, said housing having an inlet port connected to said pump and communicating with said bore and first and second outlet ports respectively connected to said first and second flow control means, said first outlet port being in communication with said inlet port when said valve spool is in said first position while said valve spool blocks flow to said second outlet port, means connecting said first outlet port to said second chamber, connection means between said first fluid operated device and said pressure compensating means providing pilot pressure flow from said first fluid operated device to said pressure compensating means when said first control means is in either actuated position to operate said pump as a function of the pressure of fluid in said first fluid operated device, said connection means being connected to said first chamber so that said valve spool is moved as a function of the pump pressure, the pilot pressure and the biasing means, unidirectional valve means in said connection



means preventing flow from said pressure compensating means to said first chamber and said first fluid operated device, said second fluid operated device including first and second fluid operated brake actuating means with first and second conduits connecting said first and second fluid operated brake actuating means to said second flow control means, a branch conduit between said first and second conduits having a pair of opposed unidirectional valves therein preventing flow between said first and second conduits and unidirectional valve means connected to said branch conduit between said opposed unidirectional valves and to said pressure compensating means for preventing flow from said pressure compensating means to said first and second fluid operated brake actuating means.

4,074,529

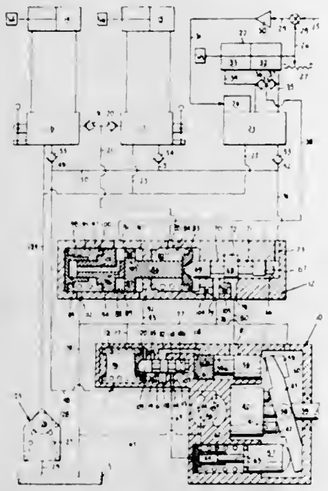
LOAD RESPONSIVE SYSTEM PUMP CONTROLS

Tadeusz Budzich, 80 Murwood Drive, Moreland Hills, Ohio 44022

Filed Jan. 4, 1977, Ser. No. 756,618
Int. Cl.² F16H *39/46*; F15B *11/16*
U.S. Cl. 60—445 **36 Claims**

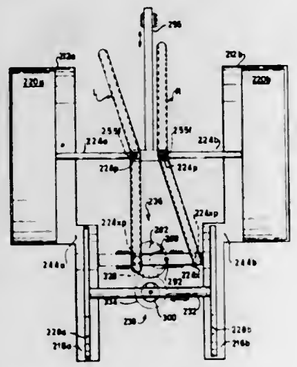
1. A fluid power and control system comprising a fluid pump, a fluid motor driving a load, and valve means interposed between said pump and said motor to control said load, flow changing means operable to vary fluid flow delivered from said pump to said fluid system to vary pressure in said fluid system, first control means having means operable to limit through said flow changing means maximum pressure of said system to a fixed predetermined level, second control means having means operable to limit through said flow changing means minimum pressure of said system to a fixed predetermined level, control signal generating means to generate a control signal proportional to magnitude of said load, and third control means responsive to said control signal having means operable through said flow changing means to maintain a preselectable relatively constant ratio between pressure of said

fluid system and pressure necessary to support said load and to vary pressure differential between pressure of said fluid system



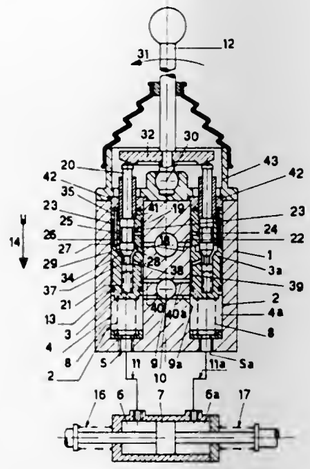
and pressure necessary to support said load with variation in magnitude of said load.

4,074,530
HOT GAS ENGINE CONTROL
Norman E. Polster, Argenta, Canada, assignor to Josam Manufacturing Co., Michigan City, Ind., a part interest
Filed Nov. 30, 1976, Ser. No. 746,128
Int. Cl.² F02G *1/06*
U.S. Cl. 60—518 **10 Claims**



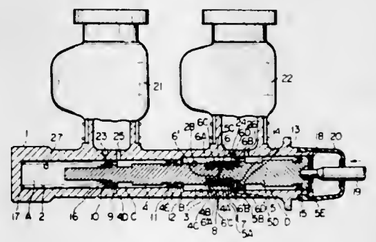
1. A hot gas engine comprising:
a housing supporting a rotary output element;
a displacer cylinder space associated with the housing and having one end serving as a hot chamber end;
a work cylinder space associated with said housing and communicating with the other end of, and with the displacer cylinder space defining a space receiving a gas as the engine fluid working medium;
a displacer mounted to reciprocate in the displacer cylinder space and having a displacer connector shaft projecting from the displacer cylinder space and slidably mounted relative to said housing;
a piston slidably mounted in the work cylinder space and having a piston connecting rod projecting from the work cylinder space and slidably mounted relative to said housing;
motion converting means connecting the piston rod and the output element for motion conversion between reciprocation of the piston and rotation of the output element;
interconnecting means interconnecting the piston with the displacer for reciprocating the displacer at the same rate as and with a predetermined phase relation to the piston reciprocation; the last said means including control means for varying the displacer stroke length for a maximum stroke length to a zero stroke length thereby varying the gas volume moved by the displacer in each engine cycle for control of developed torque, and for zero torque development with output element rotation by continued load motion to avoid windage energy losses due to displacer motion by providing a stationary condition of the displacer.

4,074,531
OLEODYNAMIC SERVO CONTROL
Corrado Menini, Bologna, Italy, assignor to Lamborghini Oleodinamica S.p.A., Bologna, Italy
Continuation of Ser. No. 449,472, March 8, 1974, abandoned.
This application Sept. 3, 1976, Ser. No. 720,428
Int. Cl.² F15B *3/00*
U.S. Cl. 60—547 **4 Claims**



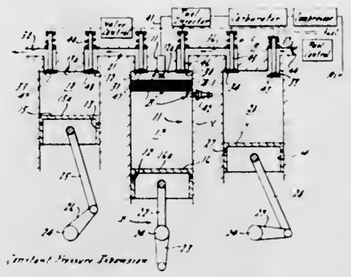
1. A servo-control system for the positioning of a load, comprising:
a load-driving piston reciprocable in a piston cylinder and provided with spring means tending to hold said piston in a neutral intermediate position within said chamber, said piston having a head dividing said piston cylinder into two compartments;
a servomechanism including two symmetrical pressure cylinders, a pair of plungers in said pressure cylinders defining therein two pressure chambers of variable volume, each plunger being provided with an axial bore forming a valve chamber which communicates via an internal passage in said plunger with a variable space adjacent a face of the respective plunger remote from the corresponding pressure chamber, each plunger having a solid face confronting its respective pressure chamber, each pressure chamber being provided with a discharge port communicating with a respective compartment of said piston cylinder;
a pair of valve members in said plungers having stems traversing the axial bores thereof and projecting therefrom at ends remote from said pressure chambers, each valve chamber being provided with an inlet orifice and with an outlet orifice axially separated from each other by the corresponding valve member, said internal passage terminating at a location of said valve chamber between said orifices, each valve member being axially shiftable with respect to the corresponding plunger between first and second limiting relative positions in which said internal passage is disconnected from said inlet orifice and from said outlet orifice, respectively, restricted flow paths existing between said internal passage and said orifices in intermediate relative positions of the corresponding valve members;
conduit means connecting a common supply port for high-pressure hydraulic fluid to the inlet orifices of both plungers and connecting a common discharge port for said fluid to the outlet orifices thereof;
relatively strong first biasing means urging each plunger into a withdrawn position in which the corresponding pressure chamber has its maximum volume and communicates with said discharge port;
relatively weak second biasing means urging each valve member into its first limiting relative position for cutting off the corresponding outlet port and internal passage from the corresponding inlet port; and
an operating element movable in either direction from a midposition for coacting with either of said stems to displace the respective valve member against the force of said second biasing means from said first limiting relative position toward said second limiting relative position, thereby generating fluid pressure in said variable space to advance the corresponding plunger from said withdrawn position against the force of said first biasing means and closing said discharge post while reducing the volume of the associated pressure chamber with resulting buildup of fluid pressure in one of said compartments to displace said piston in a respective direction against the force of said spring means until the fluid pressure in said variable space balances the combined force of said first biasing means and said spring means, hydraulic fluid present in the other of said compartments being concurrently discharged via the pressure chamber associated with the other plunger and being replenished at low pressure from said discharge port upon subsequent reversal of the piston motion.

4,074,532
HYDRAULIC MASTER CYLINDER
Yoshihiro Hayashida, Chigasaki, and Tetsuo Haraikawa, Funabashi, both of Japan, assignors to Tokico Ltd., Japan
Filed Feb. 17, 1976, Ser. No. 658,662
Claims priority, application Japan, Feb. 18, 1975, 50-20109
Int. Cl.² B60T *11/20*
U.S. Cl. 60—562 **4 Claims**



1. A master cylinder construction comprising a cylinder having two piston chambers of different diameters, a first piston and a second piston slidably disposed respectively in said piston chambers, reduced diameter stems projecting from the opposing end portions of the pistons, respectively, a flange formed around the outer periphery of each of the stems, one of said stems having a substantially spherical end surface abutting the opposed end of the other of said stems, a split sleeve consisting of at least two cooperating elements and having inwardly projecting portions on the inner circumferential surface thereof at the opposite ends respectively, said split sleeve being around said reduced diameter stems with the inwardly projecting portions engaging behind the respective flanges, and a sleeve member around the outer circumference of the split sleeve portions for retaining the split sleeve portions in the cylindrical shape, one of said pistons having an axially extending portion adjacent said reduced diameter stem, the diameter of said extending portion being complementary and smaller or equal to the inner diameter of the sleeve member, whereby when coupling the pistons, the sleeve member is positioned on the extending portion beforehand and thereafter is moved axially to surround the split sleeve portions.

4,074,533
COMPOUND REGENERATIVE ENGINE
Thomas R. Stockton, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed July 9, 1976, Ser. No. 703,884
Int. Cl.² F02G *1/02*
U.S. Cl. 60—620 **6 Claims**

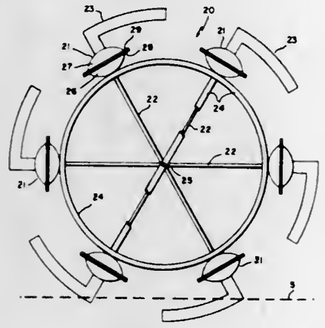


1. A hot gas Ericsson-Stirling cycle engine, comprising:
(a) first means defining a relatively hot and a relatively cool gas chamber for confining a working fluid, said working fluid containing a combustible constituent,
(b) Second means associated with said chambers for shifting a major part of the working fluid between said chambers while extracting work from the thermal energy content thereof, said second means providing for two constant volume processes in the Ericsson-Stirling cycle and being effective to intermittently release thermal energy directly thereinto as a result of combustion of a portion of said working fluid, said second means having a catalytic combustor and regenerator located in said hot chamber facilitating said combustion of a portion of said working fluid, said catalytic working fluid passing reversibly therethrough, and
(c) third means coupled to said chambers for substituting new working fluid for existing or combusted working fluid.

4,074,534
THERMODYNAMIC MOTOR
Wesley W. Morgan, 208 Dandelion, San Antonio, Tex. 78213
Filed Feb. 3, 1977, Ser. No. 765,269
Int. Cl.² F01K *7/00*
U.S. Cl. 60—675 **9 Claims**

1. A thermodynamic motor adapted to be at least partially immersed in a heated liquid comprising a frame, an axle mounted for rotation of said frame, a plurality of diagonally disposed pairs of tanks mounted in spaced relationship on said frame, a flexible diaphragm in each tank forming inner and outer chambers, a conduit interconnecting the inner chambers of each pair of tanks, at least one radiator communicating with the outer chamber of each tank, a volatile liquid substantially filling at least said radiator of each tank, and a fluid carried in said inner chambers of each pair of tanks whereby the radiator of the lower tank of each pair at the bottom of its travel is at least partially immersed in said heated liquid and upon volati-

zation of said volatile liquid the vapor pressure distends said diaphragm, forces the fluid from the inner chamber of said tank



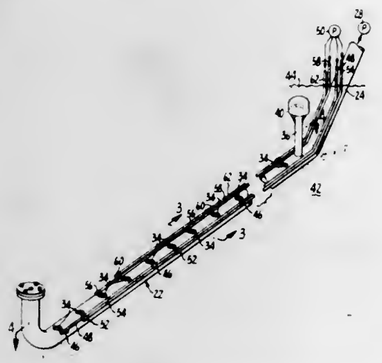
and a corresponding volume into the inner chamber of the opposing tank and shifts the center of gravity of each of said pairs of tanks about said axle to cause rotation of said motor.

4,074,535

SELF-CLEANING FIXED DREDGE

Townsend L. Schoonmaker, 265 Summit Ave., San Rafael, Calif. 94901

Filed Dec. 21, 1973, Ser. No. 427,077
Int. Cl.² E02B *3/02*
U.S. Cl. 61—2 **2 Claims**



1. An apparatus for removing sediment submerged in water which comprises a stationary conduit submerged under a body of water near the bottom thereof and having lateral passageway means opening into the conduit and distributed along its length with the apparatus arranged to provide fluid streams entering the conduit through the lateral passageway means to carry water and sediment into the conduit, the improvement for tendering the apparatus self-cleaning which comprises a plurality of nozzles mounted in fixed position adjacent to the conduit directed transversely across the fluid streams entering the lateral passageway means, and a source of high pressure fluid connected to the nozzles for directing fluid jets from the nozzles across the fluid stream to remove and abrade objects blocking the stream, the lateral passageway means including a plurality of orifices opening into the stationary conduit which are spaced along its length and further including means for separately connecting the nozzles in selected groups to the source of pressurized fluid, each nozzle being oriented to direct a jet of pressurized fluid laterally across the exterior opening of a separate orifice, but spaced from the separate orifice so as not to impinge upon it, wherein the nozzles are divided into at least two groups on opposite sides of the conduit surface, the nozzles within each group being spaced at predetermined distances along the length of the conduit in alternation with the nozzles of the other groups, and wherein the means for connecting the nozzles to the source of high pressure fluid includes a plurality of pipes, each group being connected to the source of high pressure fluid by a separate pipe.

4,074,536

OIL WELL CONSOLIDATION TREATING

Bill M. Young, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Aug. 2, 1976, Ser. No. 710,751
Int. Cl.² E02D *3/14*
U.S. Cl. 61—36 C **7 Claims**

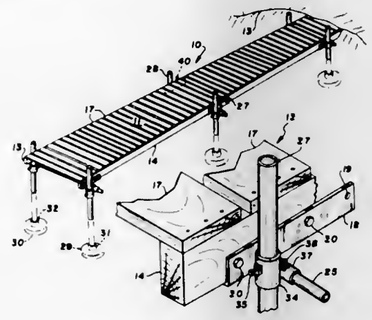
1. A process for increasing the stability and resistance to degradation by aqueous media of a consolidated permeable mass where the permeable mass contains exposed siliceous surfaces comprising, contacting said permeable mass with a treating fluid containing at least one organosilicon compound having a hydrophobic group and a silica bonding group, and maintaining said treating fluid in contact with said permeable mass under conditions which cause said organosilicon compound to form a hydrophobic film on said siliceous surfaces and increases resistance to degradation by water.

4,074,537

DOCK BRACKET

John Peter Gronlie, 4248 - 41st Ave. South, Minneapolis, Minn. 55406

Filed May 18, 1977, Ser. No. 798,137
Int. Cl.² F02B *3/20*
U.S. Cl. 61—48 **5 Claims**



1. Shoreline dock means for providing an elevated support and walking ramp over the surface of a body of water adjacent the shore and comprising in combination:

a. an elongated ramp having laterally disposed support stringers with a walking surface secured to the upper edge thereof;

b. a plurality of pairs of stringer cradle means secured to said stringers with each member of each pair of said cradles being secured in opposed relationship, one to another, and said stringers and with each of said cradle means having a first sleeve means secured to one of said cradle means with said sleeve means comprising a casing having a bore formed therein and extending generally transversely to the axis of said stringer;

c. post means arranged to be positioned laterally adjacent each of said cradle means for supporting said ramp and having pad means secured to the base thereof and with a second sleeve means arranged to be vertically adjustably attached thereto, with said second sleeve means comprising a casing having a bore formed therein to be slideably retained on said post means and locking means for lockably retaining said second sleeve means on said post;

d. third sleeve means secured to said second sleeve means and comprising a casing having a bore formed therein and with said bore extending generally at right angles to the bore in said second sleeve means;

e. cross-member support means arranged to be slideably received within said first and third sleeve means and extending transversely of said lateral stringers and through opposed pairs of said first sleeve means and arranged to be lockably received within opposed pairs of said first sleeve means; and

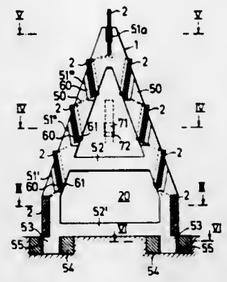
f. locking means coupled to said first sleeve means for adjustably securing said cross-member support means thereto.

4,074,538

WALL STRUCTURES

Jürgen Peter Janus, Neuer Markt 17, 5657 Haan, Rhineland, Germany

Filed Feb. 25, 1976, Ser. No. 661,337
Claims priority, application Germany, Mar. 26, 1975. 2513268; July 21, 1975, 2532520
Int. Cl.² E02D *17/00*
U.S. Cl. 61—47 **11 Claims**



1. An acoustic barrier wall comprising:

at least two concrete support structures spaced apart in a longitudinal direction and each having an apex and two beams standing on the ground and extending outwardly and downwardly from said apex to form an inverted V;

a plurality of support brackets integral with and spaced vertically along each of said beams and spaced horizontally in a direction transverse to said longitudinal direction;

a rectangular concrete elongated wall panel extending longitudinally between each of said support brackets on one of said structures and the corresponding support bracket on the other structure, said panels each being oriented generally vertically and defining an interior space substantially closed in the transverse horizontal direction and open in the upward direction, said brackets being so oriented that said wall panels each tip outwardly at their upper edges from the wall panels of the other beams; and

a mass of earth filling said space and having an upper surface suitable for planting exposed between said wall panels.

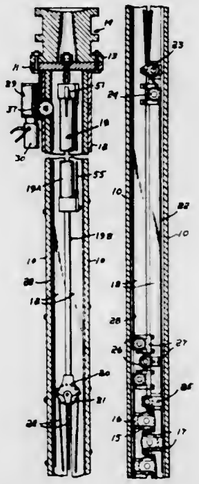
4,074,539

EXPANSIBLE MANDREL WITH AN EXTERNAL, CABLE ACTUATING WINCH

Charles L. Guild, 7 Stone Tower Lane, Barrington, R.I. 02806, and Goodman B. Willard, P.O. Box 62, Newport, Oreg. 97365

Filed Sept. 23, 1976, Ser. No. 725,952
Int. Cl.² E02D *7/30*
U.S. Cl. 61—53.72 **12 Claims**

1. An expansible mandrel for use in driving or withdrawing tubular piles and the like, said mandrel comprising sections, a head connected to and joining the upper ends of the sections, said sections being shaped and dimensioned so that they may move towards and away from each other to have a first, pile-entering relationship and a second, pile-gripping relationship, at least one cable within and extending lengthwise of the mandrel with one end connected thereto, first and second series of sheaves within the mandrel, one series for each section and spaced lengthwise thereof, means connecting said sheaves to their respective sections, the cable in such trained engagement with first and second series sheaves that the cable is held sinuous thereby in one of said relationships, the sheave connecting means providing that a straightening pull on the cable exerts force in opposite directions on the two sheave series to force the sections relative to each other into the other of their relationships, said mandrel having an opening in its upper end adjacent said head, and a power operated unit including a



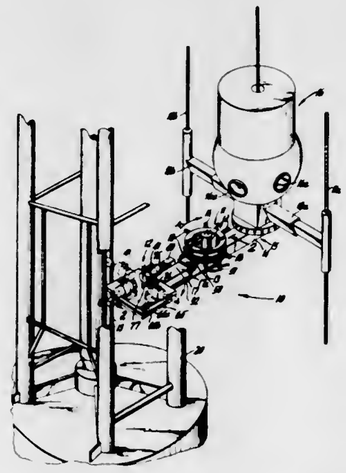
winch, a motor connected to the winch drum to rotate it in a winding direction, and means operable to effect the progressive winding of the cable on the drum lengthwise thereof, the other end of said cable connected to said drum, means connecting said unit to the outside of said mandrel with the drum positioned relative to the opening to enable said cable to be secured thereto and wound or unwound therefrom.

4,074,540

TOOL SYSTEM FOR SUBMERGIBLE CHAMBER

Burton Hoster Mason, P.O. Box 504, Covington, La. 70433, and Marvin Feldman, 788 Columbus Ave., New York, N.Y. 10025

Filed Mar. 10, 1976, Ser. No. 665,628
Int. Cl.² B63C *11/40*
U.S. Cl. 61—69 R **20 Claims**



1. A tool system for a submergible chamber comprising tool drive means mounted at the outward end of a work arm for the chamber, said tool drive means comprising means to connect a

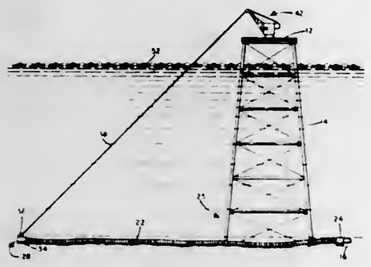
tool therewith, means to mount a plurality of tools so as to be disposed between the tool drive means and the chamber, so that at least one of said tools is in alignment with said connection means, and means associated with said work arm to provide movement between said tool drive means and said one tool, so that the tool connects with the tool drive means, whereby the connection of the tool to the tool drive means provides use of the tool in conjunction with the submerged chamber operation at an underwater work station, without the need for surfacing the chamber.

4,074,541

METHOD OF INSTALLING A FLEXIBLE RISER

Joe Cooper Lochridge, Houston, Tex., assignor to Brown & Root, Inc., Houston, Tex.

Filed July 5, 1977, Ser. No. 812,822
Int. Cl.² F16L *1/04*
U.S. Cl. 61—110 **8 Claims**



1. A method of providing a continuous fluid flow path from a relatively rigid pipeline laying along the bottom of a body of water to an above water surface connection on an offshore apparatus comprising the steps of

laying said pipeline along the bottom of said body of water toward said offshore apparatus from a pipelaying vessel,

terminating said pipeline at a point sufficient to reach approximately to said offshore apparatus at its supporting base,

connecting to said pipeline at said terminated end, a flexible tubular pipeline member having sufficient strength to withstand the normal operating flow path conditions,

continuing to lay said flexible member and the pipeline,

terminating said flexible member at a length at least sufficient to reach said above water connectin on said apparatus from the connection with the pipeline on the bottom of the body of water, and

connecting to a free end of said flexible member a connection means,

whereby said flexible member can be drawn and secured to said offshore apparatus to provide a continous flow path between said connection and said pipeline.

4,074,542

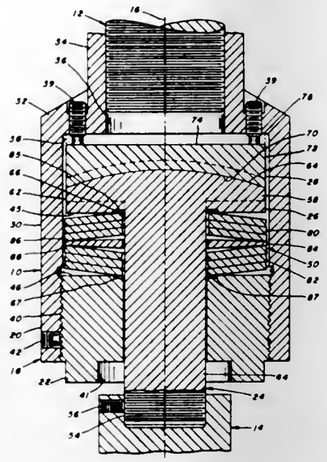
COUPLING

Andrew Hankosky, Pittsburgh, and E. Frederick Schoeneweis, Coraopolis, both of Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Nov. 3, 1976, Ser. No. 738,366
Int. Cl.² F16D *3/06*
U.S. Cl. 64—30 R **7 Claims**

1. A coupling comprising:

a pair of members drivingly interconnected for relative movement beyond spaced surfaces of a lost motion connection; frusto-conical spring means between said spaced surfaces having a first annular rim engaging one of the spaced surfaces and second annular rim engaging a frusto-conical spacer means operatively connected to the other of said spaced surfaces, the conical angle of the spring means being less than the conical angle of the spacer means such that the spring means increasingly deflects toward the opposed surface of the spacer means upon relative movement therebetween until complete engagement therewith whereat further deflection is prevented and a direct driving connection established between the members.

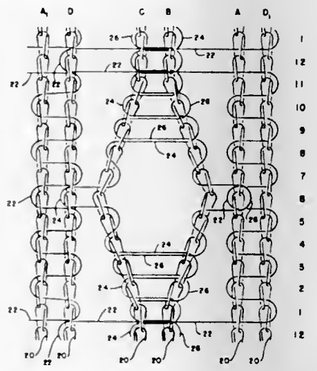


4,074,543

LACE AND A METHOD FOR ITS MANUFACTURE

Frederick O. G. Schmidt, Mohnton, Pa., assignor to Allura Corporation, Reading, Pa.

Filed Oct. 26, 1976, Ser. No. 735,466
Int. Cl.² D04B *21/00*
U.S. Cl. 66—193 **3 Claims**



1. A net material knit on a raschel knitting machine characterized in appearance by a repetitive pattern of squares that circumscribe small six-sided figures, the net being defined by a primary and a secondary group of threads,

each thread of the primary group being continuously chain-stitched to provide a plurality of adjacent, independent knitted wales,

each thread of the secondary group being unlooped with respect to itself but laid into the loops of the wales of the primary group in a selected manner that fixedly positions the wales with respect to each other and establishes the pattern of the lace,

a first thread of the secondary group passing through the loops of an adjacent pair of wales to form the side edges of adjacent pattern repeats and link them together,

the first thread of the secondary group also being caused to interconnect in the weft direction the opposite sides of a given repeat unit to complete the square pattern in the weft direction,

a second adjacent pair of knitted wales partially displaced and held in the weft direction within the interior of the defined square of the netting by a second and third thread of the secondary group of threads,

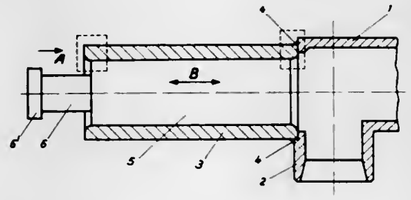
the second and third threads of the secondary group joining the wales of the second pair to each other adjacent the top and bottom of the repeat pattern intermediate the side edges and joining each wale of the second pair to the adjacent wale of the first pair at a midpoint in the side wall of the square in the warp direction.

4,074,544

HEATING DEVICES FOR THE HEAT TREATMENT OF TEXTILE FILAMENTS OR YARNS

Walter Lüthi, Ebnat-Kappel, Switzerland, assignor to Heberlein Maschinenfabrik AG, Switzerland

Filed Jan. 31, 1977, Ser. No. 764,240
Claims priority, application Switzerland, Feb. 12, 1976, 1704/76; Apr. 26, 1976, 5196/76
Int. Cl.² D06B *23/18*
U.S. Cl. 68—5 E **7 Claims**



1. A heating device for the heat treatment of textile filaments and yarns comprising a container including first and second openings at opposite ends thereof, respectively for entry and exit of yarn passing through said container, said container being further formed with a port for the admission into said container of a fluid heating medium at superatmospheric pressure, first and second tubular extensions respectively sealingly connected to said opposite ends of said container so that each of the openings at each end of said container opens within the end of the tubular extension at that end, first and second plungers formed so as to provide a close sliding fit in respective ones of said first and second tubular extensions, each said plunger including a longitudinal surface having a groove arrangement therein of U-shaped cross-section and extending along at least a substantial portion of said plunger, the depth and width of the U-shaped cross-section being at least approximately equal and having a value of at least 0.1 mm, said groove arrangement being positioned for the passage of yarn from outside one of said tubular extensions along the groove arrangement in the plunger in that tubular extension, then through said container into the other said tubular extension and through the groove arrangement in the plunger in said last mentioned tubular extension to the outside thereof, said plungers substantially completely preventing the escape of heating medium from said container through said tubular extensions while yarn travels through said container and along said groove arrangement.

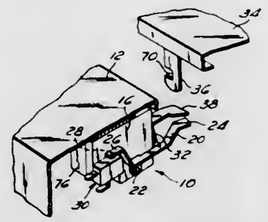
4,074,545

BIMETAL LID LOCK

Richard P. Case, Webster City, Iowa, assignor to Franklin Manufacturing Company, St. Cloud, Minn.

Filed Aug. 26, 1976, Ser. No. 718,056
Int. Cl.² D06F *37/42*
U.S. Cl. 68—12 R **2 Claims**

1. A safety interlock for a door of an appliance or the like having motor driven means therein, comprising a door movable between open and closed positions, a motor driving said driven means, a frame member, a latch mechanism mounted on said frame member, said latch mechanism including switch means having a switch arm pivotally connected to said frame member for movement along a path of travel in a first plane, said switch arm having first and second ends, a switch mounted on said frame and being in the path of travel of said switch arm, a bimetallic element having first and second ends, said bimetallic element being fixed at said first end to said frame member and carrying latch finger means at said second end, said bimetallic element, upon the application of heat



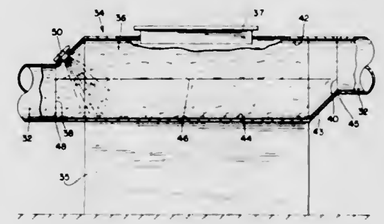
thereto, being movable to move said latch finger in a second plane angularly related to said first plane, said switch closing a portion of an electrical circuit upon movement of said switch arm, said motor and bimetallic element being in said circuit, a timer control switch in said circuit operable to complete the remainder of the circuit, projection means carried by said door and engaging said switch arm upon closure of said door, said projection means having a notch therein positioned in said second plane when the door is closed and engageable by said latch finger upon application of heat to said bimetallic element when said circuit is completed.

4,074,546

FLUID TREATING SYSTEM FOR TEXTILE FIBERS

James H. Roberson, Greenville, S.C., assignor to Crompton & Knowles Corporation, New York, N.Y.

Filed Nov. 24, 1976, Ser. No. 744,673
Int. Cl.² D06B *1/02*
U.S. Cl. 68—205 R **14 Claims**



1. A fluid treatment apparatus for textile fibrous material comprising:

a. a pneumatic conveyor duct for textile fibrous material;

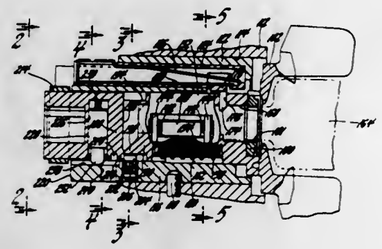
b. means for creating an air flow within said duct;

c. a fiber treating chamber forming part of said duct and which includes an outlet opening, an inlet opening and a central passageway which extends between said openings, said inlet opening having a smaller cross section than said central passageway in respective planes which are transverse to the longitudinal axis of said central passageway, said central passageway having a surface which extends from a first point on the periphery of said inlet opening to a second point on the periphery of said outlet opening and extends no further from the longitudinal axis of said central passageway than said first point; whereby said surface is wiped by fiber entering said passageway; and

d. means located adjacent said inlet opening for spraying fiber treating fluid within said central passageway toward

said surface, whereby fibrous material entering said passageway through said inlet opening is treated by said fluid.

4,074,547
LOCK CYLINDER ASSEMBLY
Edward H. Seidewand, Rochester, N.Y., assignor to General Motors Corporation, Detroit, Mich.
Filed Dec. 8, 1976, Ser. No. 748,492
Int. Cl.² E05B *15/16*
U.S. Cl. 70—1.5 **4 Claims**



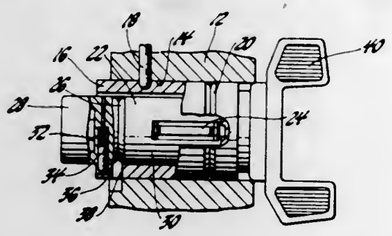
1. In a lock assembly having a lock core rotatable in a cylindrical opening in a housing and locking means acting between the core and the housing to normally lock the core against rotation in the housing and to unlock the core to permit rotation when a properly bitted key is inserted into a key slot of the core, the improvement comprising:

first retaining means acting between the housing and the core to define a normal longitudinal relation therebetween and permit limited axial movement of the core relative the housing upon forced extraction of the core from the housing;

second retaining means acting between the housing and core and being effective upon limited axial movement of the core relative the housing to block further axial movement of the core relative the housing;

said core having a weakened cross section whereby the core breaks upon forced extraction of the core beyond the range of limited axial movement.

4,074,548
LOCK CYLINDER ASSEMBLY
Thomas J. Milton, Essexville, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Dec. 8, 1976, Ser. No. 748,491
Int. Cl.² E05B *63/00*
U.S. Cl. 70—1.5 **3 Claims**



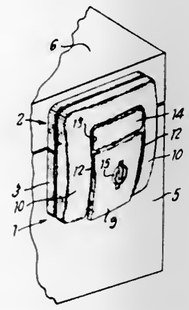
1. In a lock assembly having a sleeve mounted on a housing, a lock core rotatable in the sleeve and having a key receiving slot, and locking means acting between the core and the sleeve to normally lock the core against rotation in the sleeve and to unlock the core to permit rotation when a properly bitted key is inserted into the core, the improvement comprising:

frangible retaining means acting between the sleeve and the core to define the normal longitudinal relation therebetween and permit limited axial movement of the core relative the sleeve upon forced longitudinal extraction of the core from the sleeve;

second retaining means acting between the sleeve and core and being effective upon limited axial movement of the core relative the sleeve to block further axial movement of the core relative the sleeve;

and said sleeve and core having weakened cross sections whereby the sleeve and the core are both broken at their weakened cross sections upon forced axial extraction of the core.

4,074,549
LOCK MECHANISM
Li Sze Yee, Kowloon, Hong Kong, assignor to Kwoon Kwen Metal Ware Company Limited, Kowloon, Hong Kong
Filed Sept. 2, 1976, Ser. No. 719,993
Claims priority, application United Kingdom, Sept. 26, 1975, 39540/75
Int. Cl.² E05B *65/48*
U.S. Cl. 70—7 **12 Claims**



1. A lock mechanism comprising a mounting part, a manually operable part, a retaining part and a stabiliser part, said parts being pivotally connected together as a substantially parallelogram linkage with the retaining part and mounting part located on opposed sides of such linkage; the manually operable part, retaining part and stabiliser part of the linkage being pivotable relative to the mounting part between a locking condition, in which the retaining part is intended to engage a component which is to be secured by the mechanism and further in which the operable part is substantially parallel with and lies adjacent to the mounting part, and a release condition in which the retaining part is intended to be dis-engaged from said securable component; pivotal movement of the linkage between its locking and release conditions being effected by manual displacement of the operable part relative to the mounting part; and wherein a lock device is provided on one of said parts to be optionally engageable with a further of said parts by which pivotal movement of the linkage can be prevented when the mechanism is in its locking condition.

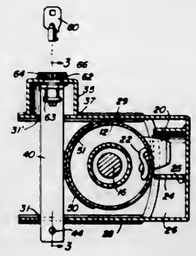
4,074,550
VEHICLE IGNITION SWITCH LOCK DEVICE
James W. Rowlings, 93 St. Gregory St., Dorchester, Mass. 02124
Filed Oct. 7, 1976, Ser. No. 730,641
Int. Cl.² B60R *25/00*; H01H *9/28*
U.S. Cl. 70—237 **9 Claims**

1. A vehicle ignition switch lock device installable about the vehicle steering column in surmounting relation to an ignition switch mounted on said steering column, the device comprising:

a solid-walled housing member adapted to fit against a side portion of the steering column, the housing member having an opening disposed in at least a portion of one side thereof, the opening receiving the ignition switch therewithin to substantially cover the ignition switch;

a pair of leg members extending from the housing member on opposite sides of the opening therein, the leg members being tangentially contiguous to the steering column and being of a length greater than the diameter of said steering column, free ends of the leg members lying in spaced opposed relation to each other beyond the edges of the column when the device is mounted on said column, the free ends of the leg members each having an elongated aperture formed therein;

a bar member, the bar member being received within the apertures in the free ends of the leg members, the bar member, the leg members, and the body of the housing member essentially circumscribing the steering column,

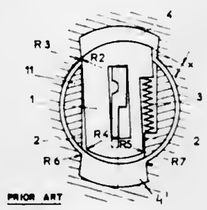


the bar member further having an elongated slot formed in one end thereof;

lock means having a positionally displaceable latch member and carried on one of the leg members, the latch member being engageable within the slot in the bar member to lock the bar member to the leg members, thereby to lock the device onto the steering column; and

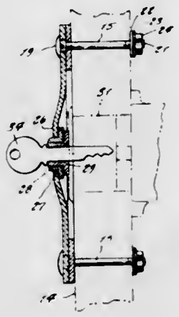
a shielding member disposed within the housing member and attached to an inner wall thereof, the longitudinal axis of the shielding member being perpendicular to the longitudinal axis of the steering column when the device is mounted on said column, the ingition switch being thereby enclosed and covered by the shield member.

4,074,551
CYLINDER LOCKS HAVING PLATES
Paul Lipschutz, Croissy, France, assignor to Neiman S. A., Courbevoie, France
Continuation of Ser. No. 593,137, July 3, 1975, abandoned. This application Sept. 15, 1976, Ser. No. 723,000
Int. Cl.² E05B *29/02*
U.S. Cl. 70—364 R **11 Claims**



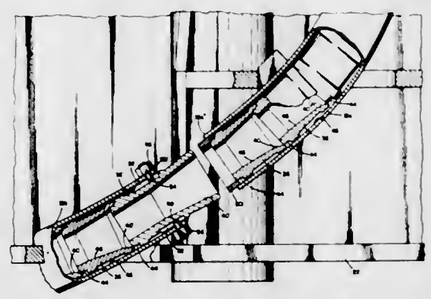
1. A cylinder lock having a cylindrical barrel provided with radially slidable plates elastically biased to project from said barrel into at least one groove in the body of the lock, wherein one radial end portion of each said plates projects slightly from the barrel and the other of the radial end portions of each said plates is disposed on the cylindrical surface of said barrel, in the position to which said plates are returned inside the barrel by the insertion of a correctly coded key for the lock to free the lock, said one radial end portion being constituted as means abutting a surface defining said groove to resist picking.

4,074,552
BURGLAR RESISTANCE LOCK ADAPTER KIT
Frank C. Smith, 28-14 Bronx Park East, Apt. 41, Bronx, N.Y. 10467
Filed Jan. 17, 1977, Ser. No. 759,736
Int. Cl.² E05B *15/16*
U.S. Cl. 70—417 **3 Claims**



1. A burglar resistance lock adapter kit comprising, in combination, a thin steel plate and a thin steel frame of approximately the same size mounted on a front side of a door by means of carriage bolts and enclosing a rotatable key bushing positioned in front of a tumbler of a lock of said door, an extra long key for insertion through said key bushing and into said lock for unlocking said lock, a sleeve fitted around said key bushing with said key bushing being rotatable within said sleeve, said thin steel plate having a bulging section and a central opening in said bulging section, said sleeve and key bushing extending through said central opening, and flange means on said key bushing and sleeve to retain them behind said bulging section of said thin steel plate.

4,074,553
LAYING PIPE
Harold E. Woodrow, Worcester, Mass., assignor to Morgan Construction Company, Worcester, Mass.
Filed Jan. 3, 1977, Ser. No. 756,361
Int. Cl.² B21D *11/00*
U.S. Cl. 72—66 **5 Claims**



1. In a rolling mill, a rotatable laying pipe for forming a longitudinally moving product length into a helix, comprising: at least one rigid curved tubular pipe section having entry and exit ends; liner means axially received in said pipe section for providing a guiding surface for a product length passing through the laying pipe, the said guiding surface being spaced radially inwardly from the inner surface of said pipe section; and, retaining means at the entry and exit ends of said pipe section for axially retaining said liner means in said pipe section.

4,074,554

FASTENER PLACING APPARATUS

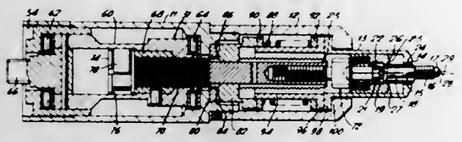
Frederick Arthur Summerlin, Wheathampstead, England, assignor to Aerpat A.G., Zug, Switzerland

Continuation-in-part of Ser. No. 662,873, March 1, 1976, abandoned, which is a continuation of Ser. No. 454,817, March 26, 1974, abandoned. This application Dec. 9, 1976, Ser. No. 749,177

Claims priority, application United Kingdom, Mar. 29, 1973, 15238/73

Int. Cl.² B21J *15/34*

U.S. Cl. 72—114 8 Claims



1. Apparatus for placing a fastener by pulling a threaded first part of the fastener towards and/or into a second part of the fastener, which apparatus comprises abutment means having an abutment face for abutting the second part of the fastener and defining a tool axis at right angles to said abutment face, a threaded mandrel for threadedly engaging the first part of the fastener, and a tubular auxiliary member coaxial with said tool axis and surrounding said mandrel with clearance, said auxiliary member being reciprocable along said tool axis relative to said abutment means and projecting forwardly of said abutment means when at the forward end of its reciprocation, said mandrel being reciprocable and rotatable and having limited freedom to move out of alignment with said tool axis, said freedom to move limited by the auxiliary member.

4,074,555

METHOD OF AND APPARATUS FOR IMPROVING HOT-ROLLED SHEET-METAL STRIPS

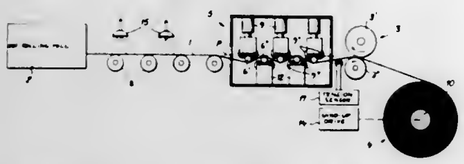
Oskar Noé, Mulheim (Ruhr), Germany, assignor to BWG Bergwerk-und Walzwerk Maschinenbau Gesellschaft mit beschrankter Haftung, Duisburg, Germany

Filed Aug. 13, 1976, Ser. No. 714,279

Claims priority, application Germany, Aug. 21, 1975, 2537188

Int. Cl.² B21D *1/02*

U.S. Cl. 72—128 8 Claims



1. A method of improving the quality of a hot-rolled strip of ferrous sheet metal, comprising the steps of:

(a) cooling a hot-rolled strip, on its exit from a rolling mill, to a temperature in an elevated range of substantially 600° to 800° C;

(b) alternatively bending said strip at said temperature in opposite directions with resulting elongation and equalization of deformations due to nonuniform cooling in step (a); and

(c) thereupon winding the strip around a mandrel.

4,074,556

APPARATUS FOR ROLL WORKING

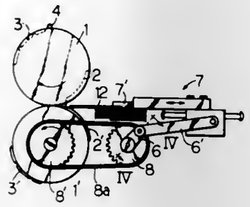
Kouichi Takeda, Okazaki; Hiroshi Sato, and Toshimi Onishi, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Dec. 28, 1976, Ser. No. 755,082

Claims priority, application Japan, Aug. 8, 1976, 51-094351

Int. Cl.² B21H *9/00*

U.S. Cl. 72—196 10 Claims



1. A roll working apparatus for processing a work between paired impressions on a pair of rolls, comprising:

a pair of synchronously rotating rolls, wherein one of said rolls is provided with a plurality of male impressions, each of which is arranged on the roller surface thereof, and the other of said rolls is provided with a corresponding number of female impressions, each of which is engageable with one of said male impressions, one after another, during each complete rotation of said pair of rolls;

a plurality of work-positioning means disposed on one of said rolls for regulating the position of the work fed to the rolls;

feeding means for selectively feeding the work to one of said positioning means such that the work can be selectively fed to any desired pair of impressions; and

timing means for controlling the timing of said selective feeding of the work to any desired pair of impressions.

4,074,557

METAL EXTRUSION PROCESS WITH HIGH REDUCTION

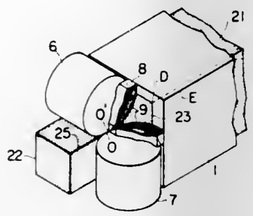
Samon Yanagimoto, Kodaira; Koshiro Aoyagi; Susumu Mizunuma, both of Kitakyushu, and Kouki Nambu, Nohgata, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Oct. 27, 1976, Ser. No. 736,182

Claims priority, application Japan, Oct. 30, 1975, 50-131061; Nov. 5, 1975, 50-133314

Int. Cl.² B21B *15/00*

U.S. Cl. 72—206 6 Claims



1. A metal extrusion process for producing a shaped steel product having a sharply angled corner portion by high reduction of a workpiece, comprising:

disposing a plurality of work rolls to form a completely enclosed rotary die;

disposing a forming die at said rotary die, said forming die having an inlet with a cross-sectional shape the same as the cross-sectional shape of the workpiece to be extruded and tapering from said inlet and to said rotary die and having portions which fill the gaps between end portions of said work rolls on the input side of said rotary die;

feeding a metal workpiece which is at a rolling temperature into a guide container means connected to the forming die and having the cross-sectional shape of the workpiece to be extruded; and

exerting a force on the workpiece for urging it through said guide container means toward said rotary die and through said die and driving said rolls for extruding the metal workpiece continuously through the rotary die.

4,074,558

ROLL CHANGING APPARATUS

Norman L. Pim, Salem, Ohio, assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Feb. 17, 1977, Ser. No. 769,449

Int. Cl.² B21B *31/10*

U.S. Cl. 72—239 22 Claims



1. Roll changing apparatus for a roll member having an axis and a coaxial roll neck comprising, roll neck engaging means having an axis and vertically aligned diametrically opposed axially spaced apart lower and upper load bearing surface means for respectively engaging diametrically opposed axially spaced apart lower and upper portions of said roll neck, said lower portion being spaced axially inwardly along said roll neck from said upper portion, support means movable axially of said roll member, means mounting said roll neck engaging means on said support means for pivotal movement about a horizontal axis perpendicular to said axis of said roll neck engaging means, and means for pivoting said roll neck engaging means and thus said load bearing surface means about said horizontal axis between first and second positions, said load bearing surface means in said first position freely receiving said roll neck therebetween and in said second position engaging said portions of said roll neck to support said roll member as a cantilever.

4,074,559

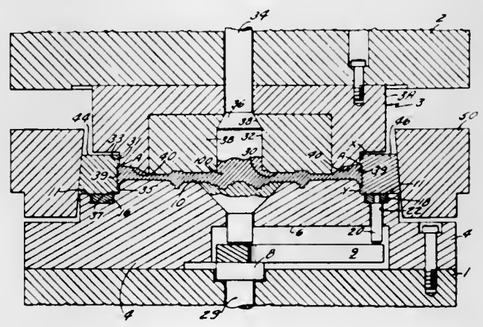
FORGING METHOD

David J. Beane, and Ronald M. Kaplan, both of North Palm Beach, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 635,181, Nov. 25, 1975, Pat. No. 4,051,708. This application Nov. 22, 1976, Ser. No. 744,069

Int. Cl.² B21K *1/32*

U.S. Cl. 72—354 3 Claims



1. In combination, an apparatus for forming a disc with integral blades from a preformed forging having one finished side surface and one side surface with a finished inner surface and an enlarged unfinished outer surface including a press, lower die means, upper die means, rim die means, said lower die means comprising a die portion for supporting one finished side surface, said upper die means having a center inner die portion for engaging said finished inner surface and a separate outer die portion therearound for engaging said enlarged unfinished outer surface, said center inner die portion having a finished forging surface to mate with the finished inner surface of the preformed forging, said outer die portion having a finished forging surface to engage the enlarged unfinished outer surface, said rim die means having radially extending blade cavities, means for holding said center inner die portion against the finished inner surface of the preformed forging while pressing the outer die portion downwardly against the enlarged unfinished outer surface to provide a finished outer surface and press the material into the blade cavities, said center inner die portion having an upwardly facing surface, said outer die portion having a part extending radially inwardly over said upwardly facing surface, said part extending radially inwardly being spaced from said upwardly facing surface, deformable means being placed between said part extending radially inwardly and said upwardly facing surface to limit the forces transmitted between said outer die portion as it moves downwardly and said center inner die portion by deformation of the deformable means.

4,074,560

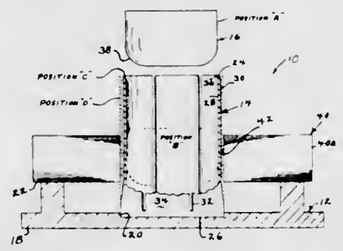
APPARATUS AND METHOD FOR SIZING STATOR BORES

Hollis D. Sisk, 329 Ridge Meadow, Chesterfield, Mo. 63017

Filed Nov. 22, 1976, Ser. No. 744,443

Int. Cl.² B21D *41/02*

U.S. Cl. 72—393 3 Claims



1. Apparatus for sizing stator bores for electric motors comprising:

a support member;

an elongated tubular sleeve member carried by the support member extending through and entirely along the length of a bore formed in a stator core, the sleeve comprising a first elongated portion having a first diameter including a plurality of elongated segments extending substantially along the length of the sleeve member terminating at a second portion having a second diameter greater than the first diameter; and

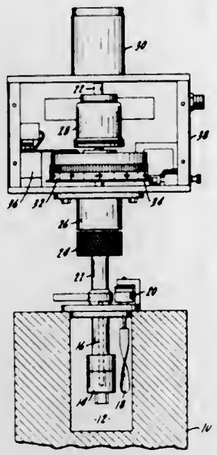
sizing plug means for insertion substantially through the sleeve member in interference-fitting relationship with the elongated segments for radially expanding the first portion of the sleeve member outwardly toward the second diameter of the second portion for forming a substantially constant diameter sleeve member along the entire length of the bore.

4,074,561

MEANS FOR MEASURING THE PLASTICITY OF COAL

Willis H. Brockschmidt, Downers Grove; Robert W. Brockschmidt, Lisle, and John D. Grabenhofer, Addison, all of Ill., assignors to Fuel Research & Instrument Co., Villa Park, Ill.

Filed Nov. 15, 1976, Ser. No. 741,790
Int. Cl.² G01N *25/04*
U.S. Cl. 73—17 R **5 Claims**



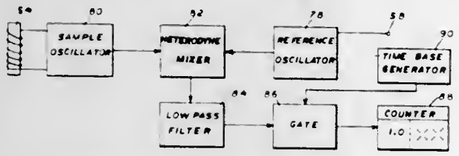
1. A means for measuring the plastic characteristics of coal including a bath of molten metal, a crucible with a coal sample therein positioned in said bath, a stir rod in said coal sample and a drive motor for said stir rod, and means for measuring movement of the stir rod as the coal plasticizes, including a calibrated disc having a uniformly slotted periphery operatively engaged for rotation with said stir rod, means for counting the number of revolutions of said calibrated disc, optical sensing means positioned adjacent said disc, including a pair of spaced light sources positioned on one side of said slotted periphery and a pair of spaced phototransistors, in alignment with said light sources and positioned on the opposite side of said slotted periphery, and a counter connected to said optical sensing means for recording stir rod movement within a given time reference.

4,074,562

METHOD AND APPARATUS FOR MEASURING FLUID SPECIFIC GRAVITY

Howard L. North, Jr., Newfoundland, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Jan. 13, 1977, Ser. No. 759,011
Int. Cl.² G01N *9/00*
U.S. Cl. 73—32 A **19 Claims**



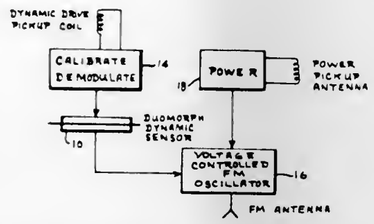
1. Apparatus for measuring fluid specific gravity comprising; a housing, a hollow tube mounted in the housing and open at both ends, means on the housing for communication with a source of fluid to be introduced into one end of the hollow tube, means on the housing for connection of pressure differential means to the other end of the hollow tube for causing fluid to flow from the fluid source into the hollow tube, vibration means for vibrating the tube containing the fluid at its natural resonant frequency by the interaction of the magnetic field generated by alternating current passed through the tube and a steady magnetic field generated by a permanent magnet, temperature sensing means for automatically compensating for fluid temperature differences affecting sample density and vibrating tube elastic modulus and response means to measure the vibration frequency of the tube and sample therein and compare the measurement with a predetermined reference frequency correlated to the substance on whose density the specific gravity is based to determine the specific gravity of the fluid.

4,074,563

IN-SITU MEASUREMENT APPARATUS

Herman P. Briar, Rancho Cordova, and Kenneth W. Bills, Jr., Sacramento, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 12, 1976, Ser. No. 731,484
Int. Cl.² G01N *33/22*
U.S. Cl. 73—35 **10 Claims**



1. An in-situ measurement apparatus for solid fuel rocket engines comprising in combination:

an excitation means generating a power signal and dynamic drive signal, said power signal and said dynamic drive signal being combined to provide an R.F. field, said R.F. field being radiated by said excitation means,

a sensing means embedded in the propellant mass of a solid fuel rocket engine, said sensing means receiving said R.F. field, said sensing means extracting said power signal and said dynamic drive signal from said R.F. field, said sensing means utilizing said dynamic drive signal to provide a data signal, said sensing means utilizing said power signal to modulate said data signal, said sensing means transmitting said modulated data signal, and,

a signal processing means to receive said modulated data signal, said signal processing means demodulating said modulated data signal to provide said data signal, said data signal representing the state of said propellent mass.

4,074,564

RECONSTRUCTION SYSTEM AND METHOD FOR ULTRASONIC IMAGING

Weston A. Anderson, Palo Alto, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 464,072, April 25, 1974, abandoned.
This application Dec. 29, 1975, Ser. No. 645,061
Int. Cl.² G01N *29/04*
U.S. Cl. 73—596 **39 Claims**

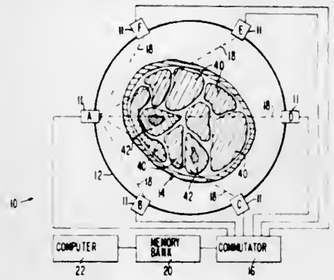
32. A method of reconstructing an image of the interior of a specimen having regions therein which differentially affect the velocity of pulses of energy transmitted therethrough, said method comprising the steps of:

irradiating the specimen with energy pulses, causing transmission thereof along a plurality of intersecting paths through each region of said specimen;

detecting the energy pulses after being transmitted through the specimen;

determining the time delay which occurs as a result of the pulses being transmitted through the specimen; and

mathematically reconstructing the differential velocity coefficients for the regions which differentially affect the velocity of the pulses transmitted through the specimen to



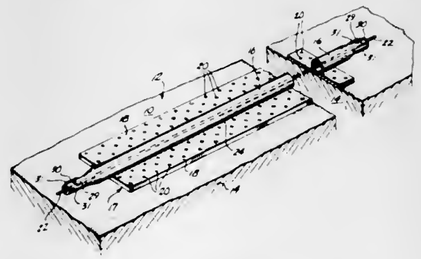
provide an image of the internal spatial relationships within said specimen.

4,074,565

VIBRATORY-WIRE STRAIN GAGE

Richard K. Harris, Seattle; (Charles) Bill (William) Jewsbury, Bellevue, and Dale W. Shoup, Edmonds, all of Wash., assignors to The Slope Indicator Company, Seattle, Wash.

Filed Feb. 17, 1977, Ser. No. 769,543
Int. Cl.² G01B *7/16*
U.S. Cl. 73—88.5 R **6 Claims**



1. A vibratory-wire strain gage, comprising:

an elongated metallic base strip adapted for rigid attachment to a structural member;

a metal tube having one side rigidly fused to said strip along its length;

a vibratory-wire extending coaxially through said tube in spaced apart relation to the inner wall thereof;

each end of said tube being collapsed into squeezegripping relation to the wire end therein; and

said wire having a predetermined tension which is maintained by said gripping relations.

4,074,566

INTAKE AIR AMOUNT DETECTING DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Hideki Obayashi, Aichi; Tokio Kohama, Nishio; Tadashi Hattori, and Minoru Nishida, both of Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

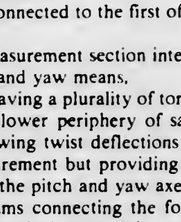
Filed Oct. 26, 1976, Ser. No. 735,885
Claims priority, application Japan, Nov. 1, 1975, 50-131922
Int. Cl.² G01F *1/68*
U.S. Cl. 73—116 **5 Claims**

1. An intake air amount detecting device for an internal combustion engine, comprising:

a temperature detector housing including a housing member of a heat-insulating material disposed within an intake pipe of an internal combustion engine and defining first and second through-holes substantially parallel to the axis of said intake pipe;

first and second shock-absorbing sleeves of a shock-absorbing material having outer faces disposed in face-to-face contacting relationship with the inner surfaces of said first and second through-holes, respectively;

at least one electric heater supported by said shock-absorbing sleeve and including heat generating wire means disposed within said first shock-absorbing protective sleeve;



a first temperature detecting element supported and disposed within said first shock-absorbing protective sleeve downstream of said electric heater;

said first and second through-holes being substantially thermally insulated from each other; and

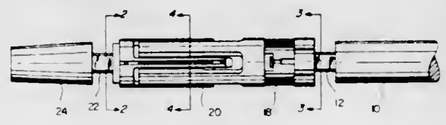
a second temperature detecting element supported by and disposed in said second shock-absorbing protective sleeve.

4,074,567

LOW INTERACTION WIND TUNNEL BALANCE

Eugene V. Horanoff, Clarksville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 6, 1977, Ser. No. 794,506
Int. Cl.² G01M *9/00*
U.S. Cl. 73—147 **23 Claims**



1. A strain gage balance for measuring component forces and moments applied to the body of a test model disposed in a flow field of a test wind tunnel, said balance adapted for mounting at one end to said tunnel by means of a sting and at the other end to said model comprising:

first and second means for measuring pitch and yaw load applied to said model,

said sting being connected to the first of said pitch and yaw means,

a roll moment measurement section integrally connected to said first pitch and yaw means,

said roll section having a plurality of torsion webs spaced at the upper and lower periphery of said roll section and capable of allowing twist deflections for the balance for roll load measurement but providing a constraint on deflections along the pitch and yaw axes,

a plurality of beams connecting the forward and aft nonwebbed portions of said roll section, said beams consisting of a support beam integral with the forward portion of said roll section, said support beam having a recess therein defining a thin beam, a thin intermediate beam integral with said thin beam, said intermediate beam being integrally connected to a roll gage beam capable of deflection in response to a rolling moment, whereby said thin beam has the capability of reducing any deflections induced in said roll gage beam due to an axial force or pitching moment, said intermediate beam is capable of reducing any side force and yaw load which said roll gage beam may experience;

an axial force measurement cage attached to said roll section, said axial cage being integral with said second pitch

and yaw means, said axial cage having longitudinal beams of cruciform construction acting as an integral unit, a plurality of axial deflection beams integrally formed with said longitudinal beams allowing said longitudinal beams to respond as a unit under an axial force without transmitting roll moments or pitch and yaw loads, a central beam fixed to said roll section and integrally formed with said axial deflection beams, a cross beam integrally connected to said central beam at one end and at its other end to an axial gage beam which is capable of deflection in response to an axial force, said axial gage beam also being integrally formed with said longitudinal beams via thin flexure beams, whereby said longitudinal beams transmit said axial load to said axial gage beam, said axial deflection beams being capable of carrying pitch, yaw loads and roll moments without allowing much deflection of the axial gage beam due to pitch, yaw loads and roll moments acting on said model, said thin flexure beams, acting like pin joints, reduce interaction and transmit the axial force loading to said axial gage beam, and;

means responsive to the deflection of said roll and axial gage beams for indicating the magnitude and direction of said rolling moments and axial forces, respectively.

4,074,568

FLUIDIC OSCILLATING JET FOR HIGH FREQUENCY GUST TUNNEL

Hermann Viets, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 7, 1976, Ser. No. 684,429
Int. Cl.² G01M 9/00
U.S. Cl. 73—147 **7 Claims**



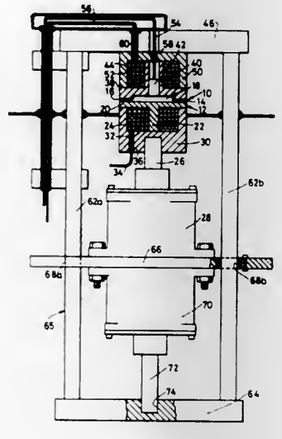
4. An apparatus for gust response testing of an aerodynamic test device, comprising: a gust wind tunnel having a flow of gas therethrough at a predetermined velocity with the test device positioned in the gas flow; a plurality of fluidic nozzles within said gust tunnel upstream of said test device; each of said fluidic nozzles having an elongated exit port; means for directing a flow of gas through the elongated exit port of each nozzle; a first elongated control port positioned on one side of said exit port of each nozzle; a second elongated control port on the side of said exit port opposite from said first control port of each nozzle; a first elongated flow attachment plate extending forward of said first control port in the direction of gas flow from said exit port of each nozzle; a second flow attachment plate extending forward of said second control port in the direction of gas flow from said exit port of each nozzle; means for alternately admitting ambient gas surrounding said nozzle members to said first control port and said second control port of each nozzle with a predetermined phase relation between the nozzles.

4,074,569

APPARATUS FOR DETERMINING MATERIAL PROCESSING CHARACTERISTICS

Ronald William Sambrook, and John Harold Beesley, both of Shrewsbury, England, assignors to Rubber and Plastics Research Association, England

Filed Dec. 30, 1976, Ser. No. 755,937
Int. Cl.² G01N 3/08
U.S. Cl. 73—15.6 **8 Claims**



1. Apparatus for testing the processing behaviour of a viscoelastic material, comprising:

a support;

a first ram mounted on one side of the support;

a first platen carried by the piston of the first ram;

a frame slidably mounted on the support, the frame including elgonate side members slidably received in said support for enabling relative sliding between the frame and support in a direction parallel to the direction of displacement of the piston of said first ram, a first end member disposed on said one side of said support and a second end member disposed on the other side of the support;

a second platen carried by said first end member of the frame and disposed adjacent said first platen for defining a test chamber therebetween;

a second ram disposed on the other side of said support between the support and said second end member and with its piston displacement direction parallel to that of said first ram, said first and second rams being displaceable through first and second predetermined distances respectively,

means for activating said first and second rams in timed sequence,

and a pressure transducer carried by one of said platens for providing an electrical signal representative of the instantaneous load in a test sample when placed in said test chamber,

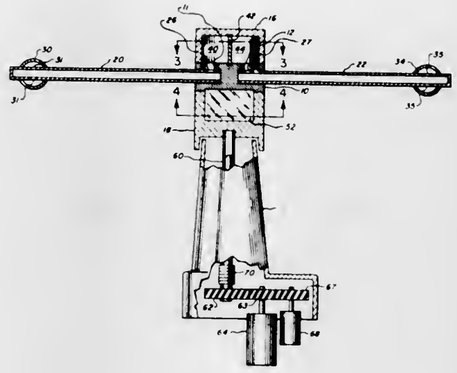
the arrangement being such that actuation of the second ram causes relative displacement of the frame and support to bring the first and second platens into first relative positions wherein they are spaced apart by a first predetermined distance and subsequent actuation of the first ram displaces the first platen relative to the support to bring the first and second platens into second relative positions wherein they are spaced apart by a second, smaller predetermined distance.

4,074,570

FLUID SPEED MEASURING APPARATUS

John L. Bellman, Lancaster, and William R. Deazley, Cowlesville, both of N.Y., assignors to Calspan Corporation, Buffalo, N.Y.

Filed Mar. 15, 1977, Ser. No. 777,876
Int. Cl.² G01C 21/10
U.S. Cl. 73—182 **11 Claims**



1. A fluid speed indicating apparatus for mounting on a movable body comprising:

hub means;

a first pair of generally aligned, tubular arms mounted in said hub means;

a second pair of generally aligned, tubular arms mounted in said hub means perpendicular to said first pair of arms;

means for rotating said hub means and thereby said first and second pairs of arms at a substantially constant angular speed;

four fluid pressure sensing means mounted respectively to each arm of said first and second pair of arms at the same radial distance;

first pressure responsive means operatively connected to said fluid pressure sensing means attached to said first pair of arms for sensing the steady state pressure difference between the fluid pressure sensing means attached to said first pair of arms and for producing a first signal whose amplitude is proportional to the magnitude of the velocity of fluid flow past said fluid pressure sensing means attached to said first pair of arms;

second pressure responsive means operatively connected to said fluid pressure sensing means attached to said second pair of arms for sensing the steady state pressure difference between the fluid pressure sensing means attached to said second pair of arms and for producing a second signal whose amplitude is proportional to the magnitude of the velocity of fluid flow past said fluid pressure sensing means attached to said second pair of arms;

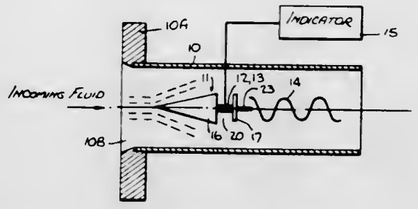
whereby the amplitude of said first and second signals is proportional to the magnitude of the velocity of flow past said fluid pressure sensing means and varies at the rotational frequency at which said means for rotating said hub means is rotating said first and second pair of arms and the complete sine and cosine components of the velocity of the body are obtained.

4,074,571

OBSTACLE ASSEMBLY FOR VORTEX TYPE FLOWMETER

Thomas H. Burgess, Horsham, Pa., assignor to Fischer & Porter Co., Warminster, Pa.

Filed Aug. 1, 1974, Ser. No. 493,855
Int. Cl.² G01F 1/00
U.S. Cl. 73—194 B **2 Claims**



1. A flowmeter of the vortex type comprising:

(A) a flow tube through which fluid to be measured is conducted;

(B) an obstacle assembly disposed within said tube and constituted by a front section fixedly mounted across the tube and contoured to cause flow separation and downstream vortices having a periodicity which is a function of flow rate, and a rear non-streamlined section behind said front section and extending across said tube to define a gap with respect to said front section, said rear section having a tail extending across said tube and projecting from said rear section, said rear section being in strip form and defining with said tail a T-shaped body in which the strip is the base and extends across said tube and the tail is the leg and extends in the longitudinal direction in said tube, the length of said leg being about equal to the width of said base, the dimensions of said tail relative to said rear section being such as to produce surges in a path going around the tail to positively reinforce said vortices, and

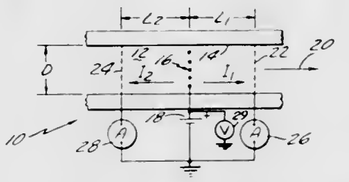
(C) means to sense said vortices to produce a signal whose frequency is proportional to flow rate.

4,074,572

METHOD AND APPARATUS FOR SENSING THE FLUX OF A FLOWING FLUID

Robert H. Bullis, Avon; Russell G. Meyerand, Jr., and Walter J. Wiegand, Jr., both of Glastonbury, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed July 28, 1975, Ser. No. 599,560
Int. Cl.² G01F 1/64
U.S. Cl. 73—194 F **16 Claims**



1. Apparatus for determining the flux of a fluid having a particle density N comprising:

means for providing a region having an axis along which the fluid flows in passing therethrough, the region having a cross sectional area A which is perpendicular to the axis;

charged particle source means capable of maintaining an electric potential V and extending essentially perpendicular to the flow axis to provide charged particles in the fluid adjacent to the source means;

first collection means separated from the charged particle source means by a distance L_1 and extending across the region essentially perpendicular to the flow axis to collect charged particles which drift from the charged particle source means along the flow axis in the direction of flow of the fluid and form a first electric current, I_1, said first means being capable of either a positive or negative electric potential with respect to the charged particle source means;

second collection means separated from the charged particle source means by a distance L_2 and extending across the region essentially perpendicular to the flow axis to collect charged particles which drift from the charged particle source means along the flow axis in the direction opposite to the flow of the fluid and form a second electric current, I_2, said second collection means being capable of an electrical potential which is of the same sign as the potential of the first collection means;

means for providing an electric field E, essentially coaxial with the direction of fluid flow between the charged particle source means and both the first and second collection means to induce charged particles to drift parallel to the axis toward the first and second collection means, the strength of the field E and the pressure of the fluid P allowing the operating range in the ratio E/P to cause the ion mobility at standard conditions of temperature and pressure to remain constant between the first and second collection means;

means for sensing the first electric current I_1;

means for sensing the second electric current I_2; and

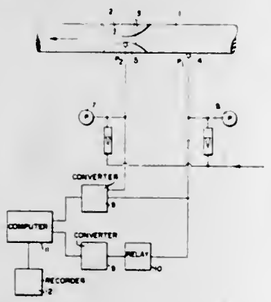
means for sensing the potential difference between the charged particle source means and the first and second collection means to allow a combining of I_1, I_2 and V with the apparatus parameters A, L_1 and L_2, and the number density of particles at standard conditions N_o, with the standard ion mobility of the fluid, to directly relate the fluid flux passing through the area A to the ratio of the difference in the electric currents, (I_1-I_2) to the sum of the electric currents, (I_1+I_2).

4,074,573

METHOD AND APPARATUS FOR THE MEASUREMENT OF VOLUMETRIC FLOWRATE IN PIPES AND DUCTS

Benedikt Nordhofen, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 24, 1976, Ser. No. 717,074
Claims priority, application Germany, Sept. 10, 1975, 2540223
Int. Cl.² G01F *1/36*
U.S. Cl. 73—205 R **1 Claim**



1. An apparatus for the measurement of the volumetric flowrate in a duct having a throttle device therein; said apparatus comprising: a first and a second pressure device for measuring pressure; means connecting said first pressure device upstream of the throttle device; means connecting said second pressure device at said throttle device; said first pressure device being operable to measure a pressure p_1 and said second pressure device being operable to measure a pressure p_2; a first signal converter connected to said pressure devices for producing a first electric signal representative of the pressure p_1; a second signal converter connected to said pressure devices for producing a second electric signal representative of the pressure difference p_1-p_2, lead means for connecting said first and second converters to a computer to apply said first and second electric signals thereto, said computer being of the type for producing a signal F according to the relation

$$F=A(p_1-p_2)+B(p_1-p_2)^n+C(p_1-p_2)^n\cdot p_1+D$$

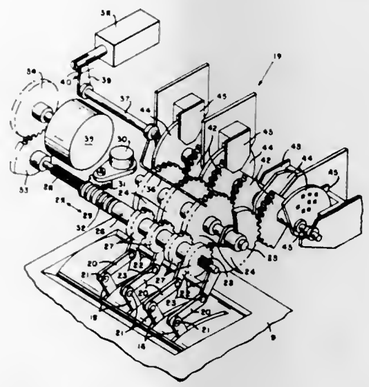
wherein A, B, C and D are empirically determined constants that vary according to the shape and size of the duct, and n is substantially 0.5 but may be determined by means of a regression statement; and limiting means between said first converter and the computer for limiting the value p to a value not exceeding the pressure which corresponds to a completely filled duct.

4,074,574

POSTAGE METER CONVERSION APPARATUS

Keith E. Schubert, Rowayton, and Louis T. Canevari, Norwalk, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Mar. 23, 1976, Ser. No. 669,529
Int. Cl.² F16H *5/96*
U.S. Cl. 74—335 **9 Claims**



1. A postage meter conversion apparatus for converting a lever operated mechanical postage meter into an electrically controlled postage meter, said conversion apparatus comprising:

a drive shaft having a cylindrical rack on one end thereof, and a plurality of spaced apart drive gears on an opposite end thereof;

a first motor operatively connected to said drive shaft for rotatively driving said drive shaft and each of said drive gears;

a pinion gear in driving engagement with said rack of said drive shaft for axially moving said drive shaft to a number of drive gear actuating positions;

a second motor operatively connected to said pinion gear for rotatively driving said pinion gear to axially move said drive shaft; and

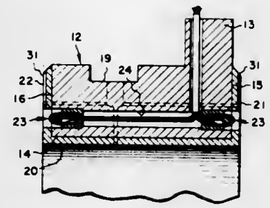
an output shaft having a plurality of spaced apart, drivable gears, each of said drivable gears being operatively connected to a lever of said postage meter, each of the drivable gears being individually driven by one of said drive gears, each drive gear being associated with a particular drivable gear and being in rotative engagement therewith as said drive shaft is caused to axially move to a particular drive gear actuating position.

4,074,575

TEMPERATURE AND FAILURE INDICATING PROBE FOR A BEARING

Mark Otho Bergman, and Paul Clement Rentmeester, both of La Crosse, Wis., assignors to The Trane Company, La Crosse, Wis.

Filed Oct. 12, 1976, Ser. No. 731,857
Int. Cl.² G01K *1/08*; H01H *3/16*
U.S. Cl. 73—344 **6 Claims**



1. A combination temperature and failure indicating probe for use in a bearing, said probe comprising:

a. temperature sensing means for producing a first electrical signal related to its temperature;

b. tubular enclosure means having a closed end and an opposite end, said temperature sensing means being disposed therein at a location adjacent said closed end, said tubular enclosure means, including the closed end thereof, being constructed of a material which is electrically conductive and therefore capable of receiving a second electrical signal;

c. electrical conductor means connected to said temperature sensing means and to said tubular enclosure means for carrying said first and second electrical signals to a point of use; and

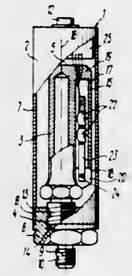
d. mounting means for supporting said tubular enclosure means in a bearing, said mounting means being constructed of electrically insulating material.

4,074,576

FLUID PRESSURE MEASURING DEVICE

Lev Dmitrievich Bryzzhev, ulitsa Artema, 20/22, kv. 21, and Viktor Semenovich Kupko, prospekt Traktorostroitelei, 160, kv. 270, both of Kharkov, U.S.S.R.

Filed July 28, 1975, Ser. No. 599,852
Int. Cl.² G01L *9/12*
U.S. Cl. 73—702 **11 Claims**



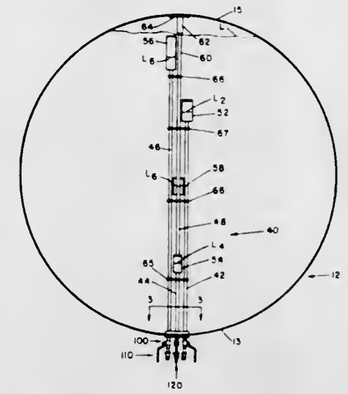
1. A fluid pressure transducer comprising: a housing; a resilient member located in said housing and made in the form of a sleeve whose open end receives a fluid the pressure of which is to be measured; a vibrating member in the form of a strip and having end faces, said vibrating member being located on a side surface of said resilient member and being parallel to its axis; two supports for securing the end faces of the vibrating member to said resilient members; an excitor located in said housing and intended to induce oscillations in said vibrating member, said excitor including means for generating a signal having a frequency which varies under the effect of the fluid pressure upon said resilient member by a value proportional to the variation in the vibrating member oscillation frequency.

4,074,577

SAMPLING ASSEMBLY FOR TAKING A SAMPLE OF LIQUID AT A DESIRED LEVEL IN A TANK

John A. Krug, St. Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Mar. 30, 1977, Ser. No. 782,647
Int. Cl.² G01N *1/16*
U.S. Cl. 73—421 B **11 Claims**



1. A sampling assembly for taking a sample from a desired level in a tank comprising:

at least one tube extending from the outside of the tank to a selected level within the tank; the inner end of said tube being in fluid communication with a sampling chamber; said sampling chamber having a sampling chamber opening in its lower portion in communication with the inside of the tank; sampling valve means for removing a sample from the tube located at the outer end portion of the tube; whereby when the tank is not loaded, air enters the sampling chamber and the tube from within the tank through said sampling chamber opening and/or from the outside of the tank when the sampling valve is open; the volume of said sampling chamber and said tube being such that air is compressed in the tube and in the sampling chamber as the tank is filled with liquid; said compressed air preventing the liquid from entering the tube through said sampling chamber opening when the tank is being loaded with liquid; and whereby when the sampling valve means is opened to take a sample, the air pressure in the tube and in the sampling chamber is relieved, and the pressure in the tank resulting from the weight of the lading and/or superatmospheric pressure in the tank forces a liquid sample through the tube to the outside of the tank.

4,074,578

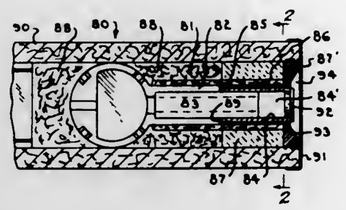
MOLTEN METAL SAMPLER

William J. Collins, 7005 Madison St., Merrillville, Ind. 46410

Division of Ser. No. 595,155, July 11, 1975, Pat. No. 4,002,073.
This application May 26, 1976, Ser. No. 690,055
Int. Cl.² G01N *1/12*
U.S. Cl. 73—425.4 R **16 Claims**

1. A device for obtaining a sample of molten metal, said device comprising an elongated tubular open ended casing, wall structure disposed in said casing and forming a chamber and a tubular extension, an inner tube secured in said extension, an outer tube secured about said first tube and having an entrance for initially receiving molten metal for flow through the

tubes into said chamber, means secured in and to said casing and provided with an opening affording access to said entrance, and said means being formed to funnel molten metal into said entrance.

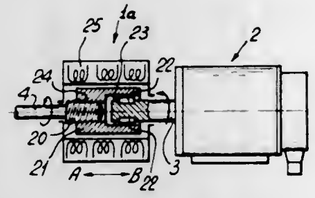


4,074,579

DEVICE FOR DETECTING DIFFERENCES IN ANGULAR POSITIONS OF TWO SHAFTS ROTATING IN OPPOSITE DIRECTIONS

Luciano Franzolini, Milan, Italy, assignor to EL.GE. Apparecchiature Elettroniche Industriali S.p.A., Varese, Italy

Filed Oct. 31, 1975, Ser. No. 627,658
Claims priority, application Italy, Nov. 8, 1974, 29228/74
Int. Cl.[2] G01P *3/08*
U.S. Cl. 73—507 **2 Claims**



1. A device for detecting the difference in the rotary speeds of two rotating shafts, comprising means for coaxially mounting the two shafts for rotation in the same direction, a low power precision stepping motor for imparting a programmed speed of rotation to one of the shafts, means interconnecting the shafts and displaceable in response to a change in the relative angular position of the two rotating shafts, the interconnecting means comprising a bush of magnetic material and acting as the core of a differential transformer freely axially movably mounted on the one shaft and corotational therewith, the bush having an internally threaded portion, and an externally threaded screw portion on the other shaft, the externally threaded screw portion and the internally threaded push portion meshing to form an axially displaceable interconnection, and an immobile sensor fixedly mounted adjacent the interconnecting means, the sensor being mechanically disconnected from the interconnecting means and arranged to detect displacement of the interconnecting means in response to the change in the relative angular position of the rotating shafts.

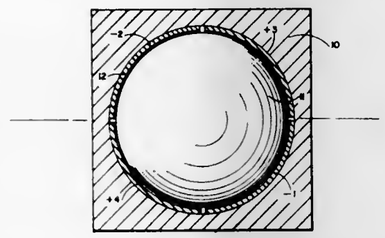
4,074,580

ELECTROSTATIC PICKOFF SYSTEM FOR BALL GYROS OF THE ELECTROSTATIC LEVITATION TYPE

Joseph C. Boltinghouse, Whittier, and James L. Atkinson, La Mirada, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 47,506, June 18, 1970, abandoned. This application Dec. 19, 1975, Ser. No. 642,502
Int. Cl.[2] G01C *19/28, 19/30, 19/46*
U.S. Cl. 74—5.6 D **14 Claims**

1. A gyroscope comprising:
a case;
a ball adapted to be spun about a spin axis, said ball being provided with a radial unbalance so that said ball orbits as it spins about the spin axis;
a set of electrostatic electrodes disposed within said case and in a three dimensional array about said ball;
circuit means for establishing electrical field signals between said electrodes and said ball;
pickoff means associated with said electrodes and responsive to the approach and recession of said ball for modulating the electrical field signals between said ball and said electrodes in a phase and amplitude pattern unique to the particular orientation of the spin axis of said ball relative to said electrodes;



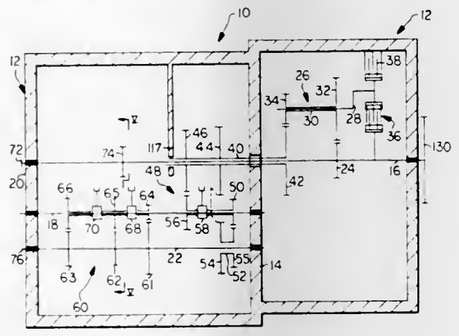
signal circuits coupled to said pickoff means for demodulating the modulated electrical field signals to develop demodulated signals;
means responsive to the demodulated signals for developing phase information signals indicative of the attitude of the spin axis of said ball relative to said set of electrodes; and
computing means responsive to the phase information signals for computing the attitude of the spin axis of said ball relative to said set of electrodes.

4,074,581

COMPACT TRANSMISSION HAVING A POWER TAKEOFF SHAFT AND HYDRAULICALLY ACTUATED CLUTCHES

W. Gene Stevens, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 11, 1976, Ser. No. 685,475
Int. Cl.[2] F16H *3/08, 37/00*
U.S. Cl. 74—15.66 **8 Claims**



1. A vehicle transmission comprising:
a housing including first, second and third generally parallel wall members;
input shaft means transpiercing generally normally and journalled in said first, second and third generally parallel wall members;
an output shaft journalled in said second wall member and journalled and transpiercing said third wall member, said output shaft disposed in a generally parallel relation to said input shaft;
a first sun gear drivingly associated with said input shaft means;
an intermediate output shaft coaxially mounted about said input shaft means and journalled in said second wall member;
a second sun gear drivingly mounted on said intermediate output shaft, said first and second sun gears disposed between said first and second generally parallel wall members;
a planet carrier coaxially mounted about said input shaft means;
a plurality of clustered planet gears each cluster rotatably mounted on said planet carrier and each cluster comprised of a first planet gear and a second planet gear integrally formed one with the other, said first planet gear intermeshing with and driven by said first sun gear, said second planet gear having a different number of drive teeth than said first planet gear and intermeshing with and driving said second sun gear;
first clutch means for selectively connecting said planet carrier with said input shaft means to rotate said intermediate output shaft at a speed equal to said input shaft means;
first brake means for selectively stopping rotation of said planet carrier relative said input shaft means to allow said plurality of second planet gears to rotate said intermediate output shaft at a different speed than said input shaft means;
a countershaft journalled in generally parallel relation to said input shaft means between said second and third wall members;
a directional drive section driven by said intermediate output shaft comprising a forward pinion gear drivingly mounted on said intermediate output shaft, a reverse pinion gear drivingly mounted on said intermediate output shaft, a forward driven gear rotatably mounted on said countershaft, a reverse driven gear rotatably mounted on said countershaft and in intermeshing relationship with said reverse pinion gear, a reversing cluster gear rotatably mounted on said output shaft including a first gear in intermeshing relationship with said forward pinion gear and a second gear integrally formed with said first gear and intermeshing with said forward driven gear, and directional drive engagement means associated with said countershaft and selectively movable in a first direction for drivingly engaging said forward driven gear with said countershaft and selectively movable in a second direction for drivingly engaging said reverse driven gear with said countershaft; and
a plurality of speed-reducing drive means selectively engageable with said countershaft for rotating said output shaft at differing rotational speeds relative said countershaft,
wherein the transmission housing further comprises a half-wall between the second and third walls, and further wherein the intermediate output shaft is journalled in said half wall.

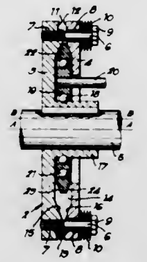
4,074,582

HOISTING DEVICE

Manfred Harig, Lindlar-Linde, Germany, assignor to N.V. Western Gear Europe S.A., Aartselaar, Belgium

Filed Sept. 13, 1976, Ser. No. 722,764
Claims priority, application Belgium, Sept. 26, 1975, 254583; Dec. 1, 1975, 254684
Int. Cl.[2] F16H *55/36, 55/52*
U.S. Cl. 74—230.24 **27 Claims**

1. Hoisting device, characterized by the fact that it mainly consists of a housing to which the load is suspended, and in this housing a driving pulley consisting of two half pulleys for the cable, which is suspended from a fixed point, whereby this driving pulley is provided with means which press the cable uniformly or practically uniformly into the driving pulley over a large arc, and with means which press aforesaid half pulleys away from each other at the locations where the cable enters and leaves the pulley, in such a manner that no friction occurs when the cable enters or leaves the driving pulley, whereby this pressing apart is performed in such a manner that no or practically no increase of pressure occurs on the cable on the other side of the pulley.

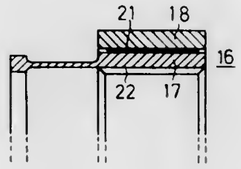


4,074,583

COMPOSITE EPICYCLIC GEAR RING AND METHOD OF MANUFACTURE

Hans-Erik Hansson, Finspong, Sweden, assignor to Stal-Laval Turbin AB, Finspong, Sweden

Filed Dec. 7, 1976, Ser. No. 748,781
Claims priority, application Sweden, Dec. 9, 1975, 7513832
Int. Cl.[2] F16H *1/06*
U.S. Cl. 74—413 **4 Claims**



1. An inner-toothed ring for an epicyclic gear comprising a plurality of concentric ring elements arranged one within the other and clamped together by shrink fitting one ring to another, the average cross-sectional area of the concentric ring elements being about $hbn^{-1/2}$, where n is the number of ring elements and h and b are the radial thickness and width of a theoretical single element ring which has the same stress level under radial loading as each one of said plurality of concentric ring elements in a ring having n concentric ring elements.

4,074,584

DOMESTIC FOOD MIXERS

David William Bushnell, 15 Fifth Avenue, Denvilles, Havant, Hampshire, England

Filed Nov. 5, 1976, Ser. No. 739,306
Int. Cl.[2] F16H *1/12, 1/20*
U.S. Cl. 74—421 A **8 Claims**

1. A domestic food mixer comprising, in combination:
(a) a plastics material housing including a base portion and a cover portion;
(b) locating elements on said base portion;
(c) means defining a pair of apertures adjacent one end of the base portion;
(d) a bearing plate secured in the base portion of the housing in overlying relation to said apertures;
(e) a pair of pinions each having a lower axial shaft extending on the lower side of the pinion and an upper axial shaft

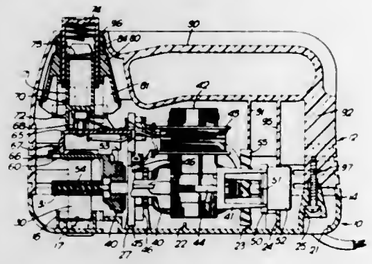
extending on the upper side of the pinion, the lower axial shaft being located in one of the apertures and having a shoulder resting on said bearing plate, said upper axial shaft having a shoulder thereon;

(g) an electric motor;

(h) a frame of said electric motor resting on said locating elements on said base portion;

(i) an armature shaft on said electric motor;

(j) a drive worm on said armature shaft engaged between said pinions;



(k) a mounting plate forming part of said electric motor frame, said mounting plate having means defining two apertures therein, one engaging each upper axial shaft, the mounting plate engaging on the shoulders of the upper axial shaft;

(l) abutments means on the cover portion of the housing engaging said electric motor; and

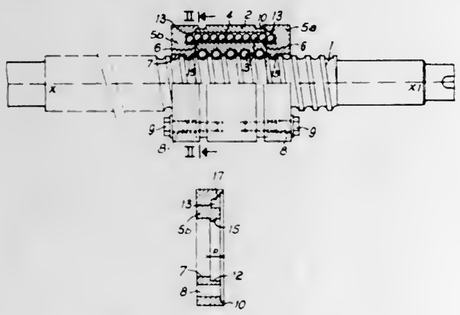
(m) securing means holding the cover and base portions together, whereby said pinions and electric motor are held in place.

4,074,585

BALL SCREW

Aimé A. Richaud; Pierre F. Moreno, and Guy A. Rimbaud, all of Forcalquier, France, assignors to L'Agence Nationale de Valorisation de la Recherche ANVAR, Neuilly-sur-Seine, France

Filed Feb. 24, 1975, Ser. No. 552,209
Claims priority, application France, Feb. 26, 1974, 74 06446
Int. Cl.² F16H *1/18*
U.S. Cl. 74—424.8 R **6 Claims**



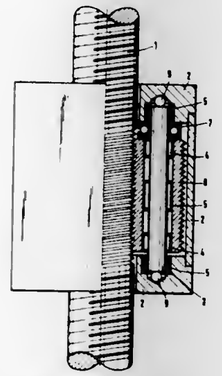
1. A drive transmitting mechanism for converting rotary motion into translatory movement comprising, a screw threaded shaft, an internally threaded hollow sleeve member surrounding said shaft and having opposed flat ends, the threads of said shaft and sleeve having the same pitch whereby they define a helical passage between said sleeve and shaft, a plurality of balls of substantially the same diameter located in said passage, and said passage having opposite ends respectively located adjacent the opposed ends of said sleeve; a single pair of identically shaped one piece molded end plates respectively secured to said opposed ends of said sleeve having a central bore receiving said shaft; and means for transferring said balls between said opposite ends of said helical passage, said means consisting of a longitudinal bore extending through the sleeve parallel to said shaft between said opposed ends of the sleeve and having a diameter greater than that of said balls and said end plates having substantially flat end surfaces facing respectively toward and mating with their associated flat end of the sleeve, each of said flat end surfaces of the end plates facing said sleeve having an arcuate recess formed therein consisting of a counter bore coaxial with and extending radially outwardly over only a part of the periphery of said central bore and a groove opening towards the adjacent flat end face of the sleeve and having an inner end which communicates with and is tangential to said arcuate recess and an opposite outer end which communicates with the end of said sleeve bore in the adjacent end of the the sleeve; said arcuate recess having a radial depth greater than the radius of the balls and an axial width greater than the diameter of the balls; said groove in said end plates having a greater cross section than the cross section of said balls to allow said balls to pass therethrough.

4,074,586

TRAVELING NUT ASSEMBLY WITH LOW FRICTION AND AUTOMATIC BRAKE

Hans Nussbaum, Korker Str. 6, 7641 Bodersweier, Germany

Filed Nov. 29, 1976, Ser. No. 745,785
Int. Cl.² F16H *1/20*
U.S. Cl. 74—424.8 C **11 Claims**



1. A traveling nut assembly carried on a threaded spindle for linear movement therealong in response to rotation of the spindle about its rotational axis, the traveling nut assembly comprising:

a housing through which the spindle extends;

a roller within said housing having a low friction mounting and operatively engaging the spindle;

bearing means carried by said housing; and

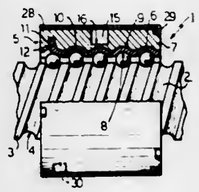
clutch means responsive to rotation of said roller for selectively effecting frictional engagement between said roller and said bearing means, said clutch means being engaged when the spindle is rotated in one direction so that sliding friction between said roller and said bearing means provides increased resistance to axial movement of the traveling nut on the spindle, said clutch means being disengaged when the spindle is rotated in the other direction so that said roller rotates without substantial resistance.

4,074,587

SCREW-NUT SCREW TRANSMISSION COUPLING

Enzo Brusasco, Turin, Italy, assignor to Roltra S.p.A., Milan, Italy

Filed Aug. 12, 1976, Ser. No. 714,075
Claims priority, application Italy, July 27, 1976, 68870/76
Int. Cl.² F16H *1/18, 1/20, 55/22*
U.S. Cl. 74—424.8 R **19 Claims**



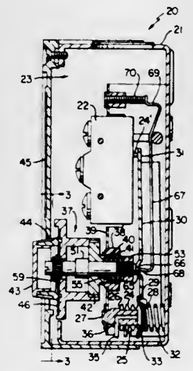
1. A screw-nut screw transmission coupling, comprising an elongate member formed externally with an external helical groove of uniform pitch, a plurality of ball bearings, and a tubular member through which said elongate member extends with radial slack, said tubular member comprising first and second tubular sleeves which are rigidly connected in coaxial arrangement with the first sleeve disposed within the second sleeve, said first sleeve being formed with an internal helical groove of pitch substantially equal to the pitch of said external helical groove, said internal helical groove cooperating with said external helical groove to define a first duct, said second sleeve being formed with a second duct which communicates with said first duct at two points spaced apart therealong by way of at least one hole formed in said first sleeve, said first and second ducts thereby forming an endless rolling duct in which the ball bearings are disposed.

4,074,588

CONTROL UNIT HAVING AN ADJUSTABLE DIFFERENTIAL AND METHOD OF MAKING THE SAME

Edward P. Cumming, Milford, Conn., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 456,813, April 1, 1974, Pat. No. 3,952,611.
This application Feb. 18, 1976, Ser. No. 659,168
Int. Cl.² G05G *1/04*
U.S. Cl. 74—522 **15 Claims**



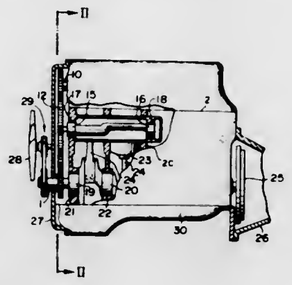
1. In a method of making a control unit having a condition selector means, an actuator and a condition responsive device for actuating said actuator when said condition responsive device senses a condition selected by said selector means, the improvement comprising the steps of disposing a lever in said unit so as to be operatively associated with said actuator and said device whereby said device can actuate said actuator by said lever, forming said selector means with an adjustable part thereof that is engageable with said lever for providing a pivot point for said lever, forming said adjustable part to have an adjustable lost motion with said selector means, and adjusting said adjustable part to adjust said adjustable lost motion thereof and thus the differential in the operation of said actuator by said device.

4,074,589

FOUR CYLINDER IN-LINE ENGINE WITH DRIVING BALANCER SYSTEM

Hirokazu Nakamura, and Hikoichi Motoyama, both of Kyoto, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Sept. 17, 1975, Ser. No. 614,163
Claims priority, application Japan, Oct. 16, 1974, 49-119778
Int. Cl.² F16F *15/10*
U.S. Cl. 74—604 **2 Claims**



1. A cylinder and piston engine, comprising;

a cylinder block;

a crankshaft disposed therein and having cylinder and piston means for rotating it at a crankshaft speed;

a cam shaft for timing intake and exhaust operations in the cylinder means; and

a balancer system for balancing vibromotive forces acting on the cylinder block on operation of the piston means, the system comprising first and second balancer shafts laterally spaced from the crankshaft on two sides of that shaft and substantially parallel thereto, and a timing mechanism disposed at an end of the cylinder block and driven by the crankshaft for driving the balancer shafts and also the cam shaft, the timing mechanism comprising a single elongate endless member engaging the several shafts to drive the first and second balancer shafts in directions opposite to one another, both at a speed equal to twice the crankshaft speed, and

wherein the timing mechanism includes a gear fitted to one of the balancer shafts to drive the shaft, and a gear shaft having idler gear means fitted thereto to be driven thereby and meshing with said gear, said elongate endless member being enabled to drive the gear shaft and the other balancer shaft to effect the rotating of the balancer shafts in opposite directions, and also to drive the cam shaft.

4,074,590

ARRANGEMENT FOR COOLING A LUBRICANT-FILLED, FINNED GEAR CASE BY MEANS OF A BUILT-IN FAN

Helmut Jörg, Raffaelgasse 25, 1200 Vienna, Austria

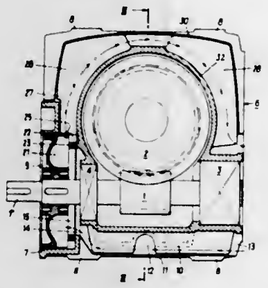
Filed Aug. 5, 1975, Ser. No. 601,999
Claims priority, application Austria, Aug. 7, 1974, 6446/74
Int. Cl.² F16H *57/02*
U.S. Cl. 74—606 A **6 Claims**

1. A fan-cooled, lubricant filled, gear case unit, comprising:

a stationary gear case of substantially rectangular shape having a top and bottom, opposed ends and opposed sides,

said case containing gearing including a shaft rotatably extending out through one end wall of said gear case;

a single fan wheel connected to said shaft, said one end wall of said gear case including a recess through which said shaft extends, said fan wheel being contained within said recess for rotation with respect thereto, the outer rim of said recess and the outer face of said one end wall being coplanar;



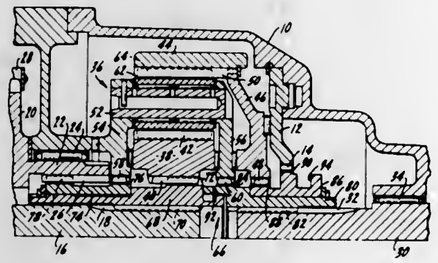
the top, bottom and side walls of said gear case all being provided with rib-like projections defining air channels between said projections, and means covering the outside of said projections on said top, bottom and ends of said case, a first group of said air channels communicating with the suction side of said fan wheel and the remaining group of said air channels communicating with the pressure side of said fan wheel.

4,074,591

COMBINED TORQUE PROPORTIONING AND REDUCTION DRIVE ASSEMBLY

Wesley Marion Dick, Fort Wayne, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 8, 1976, Ser. No. 730,774
Int. Cl.² F16H *37/06, 3/44, 57/10*
U.S. Cl. 74—674 **14 Claims**



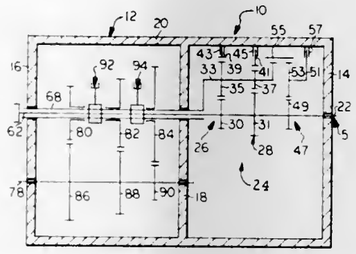
1. A planetary gear assembly comprising first, second, and third rotatable members, a sun gear element, a carrier element, a ring gear element, a plurality of planet gears journaled on said carrier element and in mesh with said sun and ring gear elements, and means for shifting said assembly to first and second operating modes, said means being shiftable to a first operating position engaging said first member with one element, engaging said second and third members with another element, and grounding the remaining element, said means being shiftable to a second operating position engaging fourth element, said shifting means being movable to another position wherein said shaft and carrier are engaged through said first element, said sun gear and first member are engaged through said second element, and said ring gear and second member are engaged through said third element.

4,074,592

DIRECT DRIVE TRANSMISSION WITH HYDRAULICALLY ACTUATED FORWARD AND REVERSE CLUTCHES

W. Gene Stevens, Dunlap, and Willis E. Windish, Pekin, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 29, 1976, Ser. No. 681,661
Int. Cl.² F16H *37/04*
U.S. Cl. 74—740 **5 Claims**



1. A vehicle transmission for an engine driven vehicle comprising:

a housing, including a first wall, a second wall, a mid wall disposed between said first and said second walls, and outer casing means, said first, second, and mid walls extending generally perpendicular to said outer casing means, said outer casing means, said first wall and said second wall for substantially encompassing the transmission;

input shaft means journalled in and extending through said first wall, said mid wall, and said second wall, and including an input shaft, a splined coupling sleeve, and a power take-off shaft, said power take-off shaft coupled to said input shaft by said splined coupling sleeve;

a plurality of planetary gear arrangements including a common planet carrier, a low-range planetary gear arrangement, and a high-range planetary gear arrangement, each of said planetary gear arrangements including a sun gear drivingly associated with said input shaft, a plurality of planet gears rotatingly mounted on said common planet carrier, a ring gear, and brake means selectively actuable for stopping rotation of said ring gear so that said common planet carrier rotates at a predetermined speed relative said input shaft, and wherein actuation of said low-range planetary gear arrangement brake means rotates said common planet carrier at a slower speed relative to said input shaft than actuation of said high-range planetary gear arrangement brake means;

a reverse planetary section including a reverse sun gear drivingly associated with said input shaft, a reverse planet carrier rotatable about said input shaft means, a plurality of reverse planet gears rotatingly mounted on said planet carrier and in intermeshing relationship with said reverse sun gear, a reverse ring gear in intermeshing relationship with said reverse planet gears, and drivingly coupled with said common planet carrier, and a reverse brake means selectively actuable to stop rotation of said reverse planet carrier;

an intermediate quill shaft coaxially mounted about said input shaft means and driven by said planet carrier;

an output shaft journalled in and extending from said mid wall through said second wall;

a low-range speed change means including a low-range drive gear rotatably mounted on said intermediate quill shaft and a low-range driven gear drivingly mounted on said output shaft;

a mid-range speed change means including a mid-range drive gear rotatably mounted on said intermediate quill shaft, and a mid-range driven gear drivingly mounted on said output shaft;

a low-range clutch movable in a first direction to drivingly engage said low range drive gear with said intermediate quill shaft and movable in a second direction to drivingly engage said mid-range drive gear with said intermediate quill shaft; and

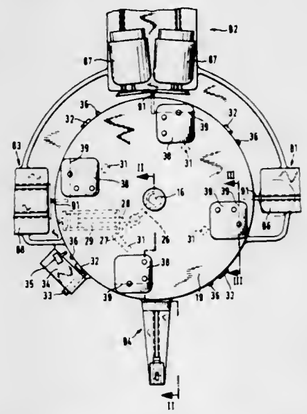
a high-range speed change means including a high-range drive gear rotatably mounted on said intermediate quill shaft, a high-range driven gear drivingly mounted on said output shaft, and high-range drive engagement means selectively operable to drivingly engage said high-range drive gear with said intermediate quill shaft.

4,074,593

MACHINE FOR TREATING CIRCULAR TOOTHED SAWS

Otto Stier, Biberach, Riss, Germany, assignor to Vollmer Werke Maschinenfabrik GmbH, Germany

Filed Feb. 22, 1977, Ser. No. 770,949
Claims priority, application Germany, Feb. 24, 1976, 2607473
Int. Cl.² B23D *63/14; B24B 5/00*
U.S. Cl. 76—37 **9 Claims**



1. A machine for treating circular toothed saws, comprising:

a stand;

a table rotatably mounted in said stand so as to be rotatable between a preparation station and at least one tooth treating station;

at least two rotatable cotters mounted on said table and spaced angularly by a distance corresponding to the angular distance between said stations;

means for securing a circular saw to said cotter so that said saw is rotatable with said cotter,

feeding means for rotating each saw by at least one tooth spacing;

locking means for releasably locking each cotter in a given position between successive feeds; and

said treating station including means for treating the saw teeth after successive rotations of the saw blade by said cotter.

4,074,594

ROTARY CUTTER FOR AGGLOMERATED FOAM PLASTIC

Arthur G. Dall, and Donald L. Morgan, both of Jasper, Ind., assignors to North American Products Corporation, Atlanta, Ga.

Filed Jan. 21, 1977, Ser. No. 760,946
Int. Cl.² B21K *21/00; B26D 1/12; B27G 13/00*
U.S. Cl. 76—101 A **5 Claims**

1. The method of making a cutter which is rotatable in one direction for imparting a predetermined profile to a surface on a workpiece, which method comprises:

A. providing a plurality of substantially identical block-like cutting elements of hard metal, each having opposite front and rear end faces, opposite side faces, and opposite top and bottom faces;

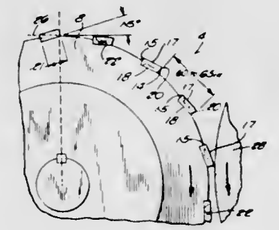
B. forming a body having an axis and having an axially extending surface which is substantially circular and concentric to said axis on every plane normal thereto;

C. delineating on said surface of said body marks which define the intersections with said surface of a series of planes which are normal to said axis and are spaced apart by uniform distances slightly less than the width of a cutting element as measured between its side faces;

D. forming axially extending shallow grooves in said body that open to its said surface and are substantially V-shaped in cross-section, each of said grooves having

(1) one surface which faces in said direction of rotation and lies substantially on a radial plane that also contains said axis,

(2) the other surface of each groove being substantially normal to said one groove surface, said grooves being arranged at uniform circumferential intervals around the body;



E. by reference to said marks, bonding said cutting elements to the body in said grooves,

(1) with each cutting element having its rear face substantially flatwise engaging said one surface of a groove, and

(2) its bottom face flatwise overlying said other surface of the same groove, and

(3) with all of said cutting elements in a consistent relationship to the planes defined by said marks such that every cutting element is in axially offset relationship to at least one circumferentially adjacent cutting element and has its kerf in slightly overlapping relationship to the kerf of said circumferentially adjacent cutting element; and

F. with the body confined to rotation about its axis, grinding the top faces of cutting elements adjacent to their front faces, to define cutting edges on the several cutting elements and to cause each set of said cutting edges that extend across a common plane normal to said axis to be spaced at a substantially uniform distance from said axis.

4,074,595

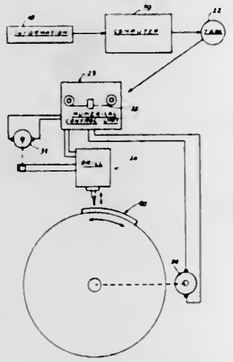
MEANS FOR PRODUCING DIE BOARD AND CUTTING RULES FOR SAME

Louis E. Sauer, and Orville C. Miller, both of St. Louis, Mo., assignors to Centenary Central, Inc., St. Louis, Mo.

Division of Ser. No. 318,220, Dec. 26, 1972, which is a continuation-in-part of Ser. No. 184,248, Sept. 27, 1971, abandoned, which is a division of Ser. No. 840,384, July 9, 1969, Pat. No. 3,696,480. This application June 21, 1974, Ser. No. 481,773
Int. Cl.² B21K *5/20*
U.S. Cl. 76—107 C **6 Claims**

1. A system for automatically producing a die board having spaced holes therein defining a preselected design and adapted to receive tangs of die rule segments, and for automatic production of die rule segments of a design having depending tangs wherein said segments are adapted for reception in said spaced holes, said system comprising means for developing

data defining said preselected die board design and defining said die rule design for reception in said die board of said preselected design, which data are adapted to be stored, apparatus for storing said developed data, means for receiving said stored data for producing electrical signals in response thereto corresponding to said die board and rule designs, work forming means adapted to physically apply said preselected die



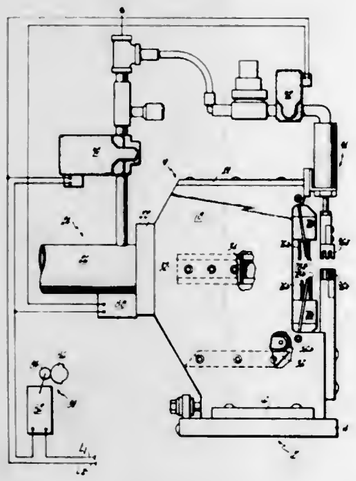
board design to a die board in the form of spaced holes in response to said electrical signals, and rule cutting means responsive to said electrical signals for producing said die rule segments with supporting tangs from a length of die rule blank, said die rule segments being of lengths, and said supporting tangs being of number and spacing for reception in the holes of said die board in accordance with said preselected design.

4,074,596

WIRE STRIPPING APPARATUS

Merle C. Mihulka, Boyne City, Mich., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Jan. 27, 1977, Ser. No. 762,913
Int. Cl.² H02G *1/12*
U.S. Cl. 81—9.51 **3 Claims**



1. A device for stripping insulation from the end of an insulated wire, comprising:

a housing assembly;

an inner housing slidably mounted for reciprocable movement with respect to said housing assembly, said inner housing being movable between actuated and retracted positions;

a pair of cutting blades;

means for slidably mounting said cutting blades for reciprocable movement on said inner housing;

ram means for providing a linear movement between actuated and deactuated positions;

motion conversion means for converting the linear movement of said ram means into linear movement of said cutting blades in a direction radial to the axis defined by the linear movement of said ram means;

stop means for arresting movement of said motion conversion means at a predetermined point in the operating cycle of said device; and

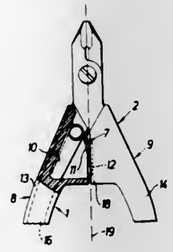
said ram means and said stop means being effective to initiate movement of said inner housing toward the retracted position after said movement of said motion conversion means has been arrested.

4,074,597

PLIERS

Conny Erik Jansson, Enkoping, Sweden, assignor to AB Bahco Verktyg, Enkoping, Sweden

Filed Nov. 30, 1976, Ser. No. 746,080
Claims priority, application Sweden, Dec. 19, 1975, 7514465
Int. Cl.² B25B *7/02*
U.S. Cl. 81—417 **3 Claims**



1. Pliers with two limbs (1,2) pivotally united in a joint (3) and with a spring (7) which is arranged between them to move the handles (8,9) of the limbs apart, and has an end part (10) attached in a recess (15) in the handle (8) of one limb (1), and a free end part (11) which, when the handles (8,9) are moved towards each other against the spring bias, engages glidingly in an open trough-shaped guiding track (12) facing the first limb (1), on the handle (9) of the other limb (2), and is so orientated that its place of engagement against the guiding track (12), during the movement of the handles (8,9) towards each other, is moved in a direction away from the joint (3) of the pliers, characterized in that the recess (15) and the guiding track (12) are situated in handle sleeves (13,14) arranged on respective limbs (1,2), the handle sleeve (14) provided with the guiding track (12) having a projection (18) facing towards the opposing handle sleeve (13), the guiding track (12) extending along the face of the projection turned towards the handle sleeve (13).

4,074,598

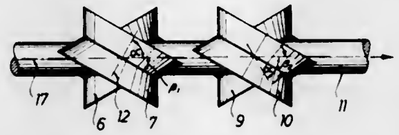
INFEED DEVICE FOR A TURNING MACHINE FOR FINISHING THE PERIPHERAL SURFACES OF ELONGATED WORKPIECES OF CYLINDRICAL CROSS-SECTION

Karl-Gustav Weck, Solingen, Germany, assignor to Kieserling & Albrecht Werkzeugmaschinenfabrik, Solingen, Germany

Filed July 9, 1976, Ser. No. 703,937
Claims priority, application Germany, July 12, 1975, 2531320
Int. Cl.² B23B *5/00*
U.S. Cl. 82—20 **4 Claims**

1. In a turning machine with a cutter head for finishing the peripheral surface of elongated workpieces of circular cross-section, such as rods, wires and tubes, movable in longitudinal direction through the machine while the cutter head revolves in a predetermined direction about the axis of a workpiece, an

infeed device comprising at least one pair of inlet rolls, each having a peripheral surface of V-shaped cross-section and a plane of symmetry normal to the axis thereof, the plane of symmetry of each roll of a pair including with the direction of



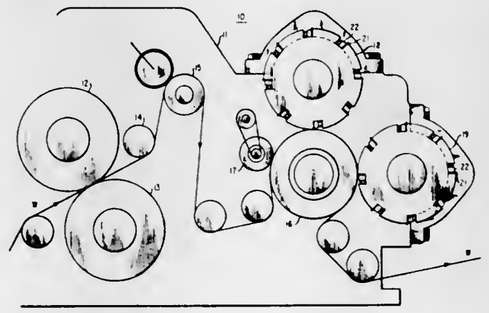
movement of the workpiece through the machine, an angle which is greater than zero and smaller than 10°, with the planes of symmetry of the rolls in said at least one pair of rolls inclined in opposite directions with respect to the direction of movement of the workpiece.

4,074,599

PAPER WEB PERFORATING MACHINE

Frederick G. Allen, Loxbro, Canada, assignor to Wood Industries, Inc., Middlesex, N.J.

Filed July 14, 1976, Ser. No. 705,247
Int. Cl.² B23D *25/12*; B26D *1/56*
U.S. Cl. 83—346 **13 Claims**



1. A high speed paper web cutting machine having at least one cutting cylinder, said perforating cylinder having at least one groove spaced axially extending over the length thereof, a knife blade means having radially extending cutting edges adjustably clamped in said groove, said machine comprising an anvil cylinder adapted for carrying a paper web, said anvil cylinder having a smooth, hardened surface, said cutting cylinder disposed to operate in close relationship with said anvil cylinder, and said knife blade means being adjusted in such manner, as to have their cutting edges able to cut a paper web, touching said surface of said anvil cylinder said anvil cylinder formed from a hollow sleeve member having end cap members permanently fixed thereto; each of said end cap members having a substantially solid portion on one end thereof and a conical shaped cavity on the other end thereof such that the moment of enertia of the anvil cylinder is significantly altered from that of a solid member and such that resonant frequency of the anvil cylinder in a radial direction is altered.

4,074,600

ROTATION APPARATUS FOR WORK PIECES

Rouchdy B. Raphael, 319 Lyon NE., Grand Rapids, Mich. 49503

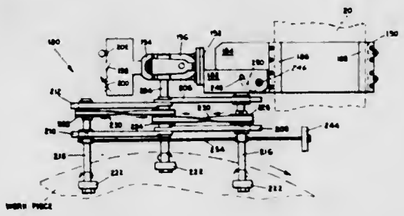
Division of Ser. No. 562,592, March 27, 1975, Pat. No. 3,995,521. This application May 12, 1976, Ser. No. 685,623
Int. Cl.² B26D *7/06*
U.S. Cl. 83—411 R **12 Claims**

1. Apparatus for positioning the center of a circular arc to be cut in a work piece with a band saw or other cutting tool or apparatus, the tool or apparatus being of the type including a work support table and a cutting means positioned to cut through a work piece supported by the work support table, said apparatus comprising:

base means for engaging the work table of the cutting tool or apparatus and supporting a work piece to be cut, said base means having a first end adapted to fit adjacent the cutting means, a second end remote from the cutting means,

an arm extending toward the cutting means and support means mounted at a fixed position on said second end of said base for supporting said arm in cantilivered fashion spaced above said base and the work piece and for positioning said arm laterally generally at a right angle to the plane of said blade;

center point determining means on said arm for positioning the center point of the arc of the work piece to be cut



against said base means and means for moving said center point determining means toward and away from the cutting means along and over said base means to determine the length of the radius of the arc to be cut in the work piece whereby when the center point of the arc to be cut on the work piece is so positioned, the work piece can be rotated about the center point to cut an extremely accurate, precise circular arc in the work piece;

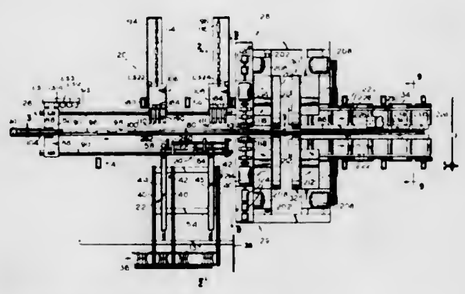
rotation means for rotating a work piece to cut an arc therein including at least a pair of generally opposing wheels for engaging opposite surfaces of a work piece; means for rotating said wheels and thus the work piece including motive power means for simultaneously driving said wheels.

4,074,601

AUTOMATIC SAWMILL

Lyle D. Warren, 500 Birch St., Sweet Home, Oreg. 97386, and Robert W. Brewster, 5924 SE. McNary Road, Milwaukee, Oreg. 97222

Division of Ser. No. 434,903, Jan. 21, 1974, Pat. No. 3,960,041, which is a division of Ser. No. 190,589, Oct. 19, 1971, Pat. No. 3,811,487. This application Dec. 29, 1975, Ser. No. 644,571
Int. Cl.² B27B *15/08*
U.S. Cl. 83—425.2 **17 Claims**



1. Sawmill apparatus comprising:

cutting means, and carriage means for receiving a log and propelling the same substantially longitudinally with respect to said cutting means,

backstand means movable in a direction normal to said

carriage means to provide for positioning of said log relative to said carriage means,

charger means for moving a log substantially in the direction of said backstand means to a position where the log is substantially aligned with a position determined by said backstand means,

said carriage means having log engaging means associated therewith for engaging said log in the aligned position thereof so that said carriage means can propel said log substantially longitudinally with respect to the cutting means,

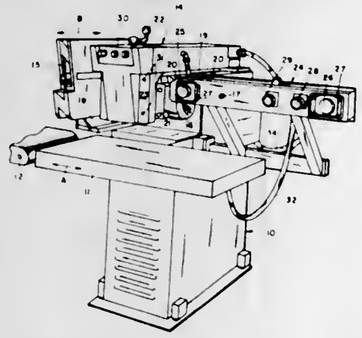
and means for measuring said log and in response thereto moving said backstand means to a position relative to the cutting means for making predetermined cuts in said log positioned relative to the side of said log in accordance with the measured dimension of said log.

4,074,602

DEFECTING SAW

Robert W. Brower, Allendale, Mich., assignor to C. O. Porter Machinery Company, Grand Rapids, Mich.

Filed Dec. 30, 1976, Ser. No. 755,594
Int. Cl.² B23Q *11/06*; B27G *19/02*
U.S. Cl. 83—471.2 **13 Claims**



1. A saw comprising:

a carriage and controllable means for moving said carriage between a first retracted position and a second extended position;

a sawing element mounted on said carriage and means for actuating said sawing element;

a pair of spaced operator actuated push button switches for cycling said sawing element and carriage between said first and second positions;

a control circuit including a timing circuit coupled to said pair of push button switches, said control circuit coupled to said controllable carriage moving means and responsive to the actuation of said push button switches for actuating said controllable carriage moving means only when said push button switches are simultaneously actuated and for returning said carriage to its first position whenever either one of said push button switches are released; and

safety circuit means coupled to said means for actuating said sawing element such that said sawing element can be actuated only when said carriage is in said first position.

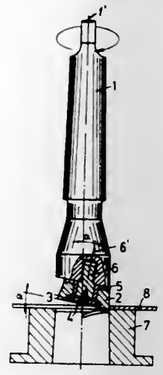
4,074,603

NIBBLING TOOL

Ulf Bengtsson, 11 Valhallagatan, Linkoping, Sweden

Filed July 12, 1976, Ser. No. 704,692
Claims priority, application Sweden, July 15, 1975, 7508079
Int. Cl.² B23D *27/00*
U.S. Cl. 83—596 **9 Claims**

1. A nibbling tool for contour cutting and forming holes in a plate, said tool comprising first and second opposed members between which a plate is inserted for being cut, each one of said members having a cutting edge each said edge lying in their respective plane; a shaft rotatable about a first longitudinal axis, means rotatably supporting said first member from said shaft for rotation about a second axis which is inclined at an acute angle with respect to the first axis, said second axis being inclined with respect to the plane of said second member



such that the cutter plane of the first member is inclined with respect to the cutter plane of the second member at said acute angle, said first and second members being spaced such that insertion of a plate therebetween will frictionally block rotation of said first member about said second axis and produce rocking of said first member about said first axis, as said shaft rotates, for cutting said plate.

4,074,604

SAW CHAIN COMPRISING CAM LINKS AND CUTTER LINKS WITHOUT INTEGRAL DEPTH GAUGES

Lawrence Goldblatt, Hamilton; Werner Weiss, Burlington, and Peter A. MacIntyre, Waterdown, all of Canada, assignors to Textron, Inc., Providence, R.I.

Filed Sept. 23, 1976, Ser. No. 725,710
Int. Cl.² B27B *33/14*
U.S. Cl. 83—830 **19 Claims**



1. A saw chain comprising an alternating series of center links and pairs of side links pivotally joined to form a chain;

certain of said pairs of side links being cutter pairs comprising a cutter side link on one side of the chain and a connecting side link on the other side of the chain;

said cutter link comprising a link body portion bearing an upstanding cutter tooth;

each said cutter link of said chain being formed without an integral depth gauge thereon;

the pair of side links next preceding each cutter pair being a cam pair comprising a connecting side link on the same side of the chain as the following cutter link and a cam link on the opposite side of the chain from the following cutter link;

said cam link comprising a link body portion bearing an upstanding cam portion having an upwardly and rearwardly inclined forward edge and a rearwardly projecting tail;

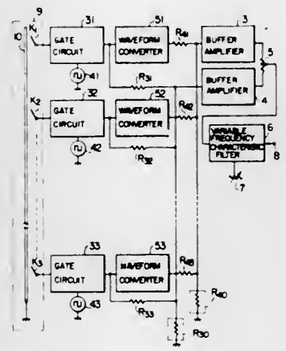
the maximum height of said center links and of said connecting side links being substantially less than the height of the cam portion of said cam link.

4,074,605

KEYBOARD OPERATED ELECTRONIC MUSICAL INSTRUMENT

Junnosuke Shigeta, and Tomiji Munehiro, both of Hirakata, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 11, 1976, Ser. No. 685,136
Claims priority, application Japan, May 16, 1975, 50-58811; May 16, 1975, 50-58834; May 16, 1975, 50-58835
Int. Cl.² G10H *1/00, 5/02*
U.S. Cl. 84—1.22 **6 Claims**



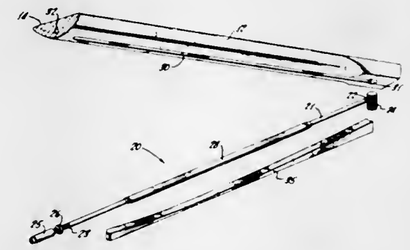
1. A keyboard operated electronic musical instrument comprising a plurality of playing keys and a plurality of key switches each playing key actuating a respective key switch, a plurality of gate means coupled to said plurality of key switches, each gate means actuated in response to actuation of a respective key switch, a square wave tone signal generating source applied to each gate means, each of said gate means providing a square wave output signal when actuated, a plurality of waveform converters coupled to respective gate means for converting the output of said gate means to a waveform other than a square wave, a first musical tone signal processing circuit for receiving the output signals from each of said waveform converters, a second musical tone processing circuit for receiving the output signals from each of said gate means, and means for variably mixing the output signals from said first and second tone signal processing circuits and for providing said mixed output signals as a musical tone output.

4,074,606

MUSICAL INSTRUMENT TRUSS ROD ASSEMBLY

C. Leo Fender, 2851 Rolling Hills Drive, SP. 33, Fullerton, Calif. 92635

Filed Oct. 20, 1976, Ser. No. 734,286
Int. Cl.² G10D *3/00*
U.S. Cl. 84—293 **4 Claims**



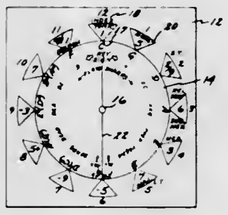
1. In a musical instrument of the type including a neck having a slot in one side thereof for receipt of a truss rod assembly, said truss rod assembly including an elongate, curved truss rod, a fixed anchor nut at one end of said truss rod, and a washer and tension nut at the other end of said truss rod, rotation of said tension nut increasing or decreasing the tension on said truss rod to adjust the curvature of said instrument neck, the improvement wherein a major portion of said truss rod, between said anchor nut and said washer, is flat in a plane perpendicular to the plane of curvature of said truss rod to increase the flexibility of said truss rod.

4,074,607

MUSIC MAGIC CIRCULAR CALCULATOR

Charles Stephen Bond, 2625 Whites Point Drive, San Pedro, Calif. 90732

Filed Aug. 26, 1974, Ser. No. 500,386
Int. Cl.² G09B *15/02*
U.S. Cl. 84—471 SR **13 Claims**



1. A device of the slide rule type useful in music analysis which comprises:

(1) a base plate member;

(2) a circular disk member mounted thereon;

(3) a first series of 12 indicia, representative of the 12 notes of an octave of the musical scale disposed on one of said members in a circle of fifths progression;

(4) a second series of 12 indicia cooperative with the first series of indicia, including note identifying indicia; and

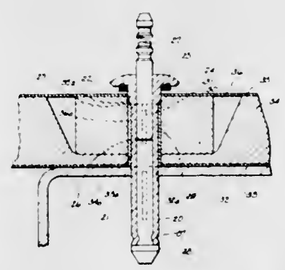
(5) an index and a plurality of 11 calibration marks in circular progression therefrom on the other of said members including a common identifying color at the index mark and representative of the root note, at the fourth calibration mark and representative of the second note, and at the first calibration mark and representative of the third note of a major triad musical chord, and a lighter shade of said identifying color at the tenth calibration mark to identify the fourth note of a dominant seventh card.

4,074,608

BLIND SPACER FASTENER

George Siebol, Orange, Calif., assignor to Armco Steel Corporation, Middletown, Ohio

Continuation of Ser. No. 632,498, Nov. 17, 1975, abandoned. This application May 13, 1977, Ser. No. 796,538
Int. Cl.² F16B *13/06*
U.S. Cl. 85—71 **11 Claims**



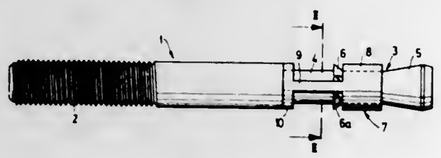
1. A spacer fastener for effectively joining a first member to a second member with a controlled space therebetween which comprises: a main rivet sleeve having an enlarged sleeve head

thereon to engage the outside of said first member and a free end removed from said sleeve head; rivet pin having a shank with a constant diameter portion within said main rivet sleeve and having a pin head thereon engaging said sleeve free end said rivet pin shank including a pull portion with gripping means thereon extending beyond said sleeve head, said main rivet sleeve having a bore throughout its length which is substantially equal in diameter to the maximum diameter of said rivet pin shank throughout the extent thereof so as to initially just nicely receive a major portion of said constant diameter pin portion and axially spaced external means for picking up the underside of said first member and the outside of said second member respectively, as said pin head is drawn against said sleeve free end towards said sleeve head.

4,074,609
ANCHOR BOLT ASSEMBLY

Albert Busler, Altmuhldorf, Germany, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Sept. 30, 1976, Ser. No. 728,160
Claims priority, application Germany, Oct. 1, 1975, 2543912
Int. Cl.[2] F16B *13/06*
U.S. Cl. 85—77 **11 Claims**

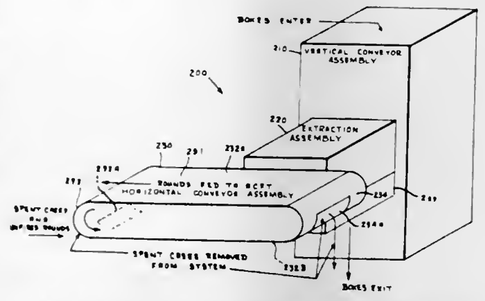


1. An anchor bolt assembly for insertion into a borehole formed in a support structure such as for use in securing a part to the support structure, comprising an axially elongated anchor bolt and an expanding member mounted on said anchor bolt, said anchor bolt having a forward end to be inserted first into the borehole and a rearward end, said anchor bolt having a first axially extending section extending from the rearward end toward and spaced from the forward end thereof, a second axially extending section located intermediate the forward end of said anchor bolt and the end of said first section closer to the forward end of said anchor bolt, said second section having a smaller diameter than said first section, an axially extending expanding section located between the forward end of said anchor bolt and the end of said second section closer to the forward end of said anchor bolt, said expanding member having a tubular shaped section laterally enclosing at least an axially extending portion of said second section and located between said first section and said expanding section, said expanding section having side surfaces arranged to displace the tubular shaped section of said expanding member radially outwardly, means associated with said first section for displacing said anchor bolt in the axial direction extending from the forward end toward the rearward end of said anchor bolt for displacing said expanding section into said expanding member for expanding said tubular shaped section thereof radially outwardly into anchoring contact with the surfaces of the borehole, wherein the improvement comprises a stop means mounted on said second section for engaging said expanding member as said anchor bolt is displaced axially through said tubular shaped section thereof for preventing said expanding section from passing completely through said tubular shaped section whereby the anchoring effect would be lost, said first section is cylindrically shaped, said second section is cylindrically shaped and is coaxial with and extends from said first section, and said expanding section extending axially from the end of said second section remote from said first section, said expanding section being frusto-conically shaped with the smaller diameter end thereof located at the junction with said second section, said expanding member comprises a pair of oppositely arranged shell sections forming said tubular section, said expanding member includes a ring shaped retaining member spaced axially from said shell sections in a direction toward the rearward end of said anchor bolt, and axially extending connecting members connected to and extending between said shell sections and said retaining member.

4,074,610
AUTOMATED AMMUNITION LOADING/DOWNLOADING SYSTEM

William E. Lock, 183 Wygant Road, Horseheads, N.Y. 14845, and Charles J. Churillo, 221 Gilda Place, Fort Walton Beach, Fla. 32548

Filed June 18, 1976, Ser. No. 697,662
Int. Cl.[2] F41F *9/02*
U.S. Cl. 89—34 **6 Claims**



1. An automated system for loading and downloading a plurality of identical items from a plurality of identical containers housing said identical items, wherein said system is adapted for use in loading and downloading identical rounds of ammunition from identical standardized containers to an aircraft that is structured and powered by another system to receive and to use live rounds of said ammunition and to reject cartridge cases of spent rounds of said ammunition, comprising:

a. a loader assembly which includes conveyor elements and comprises:

1. a vertical conveyor assembly, which includes an interrupted intermittent motion device, comprising:

a. a rotatable input drive shaft;

b. a primary driver wheel disposed on said input drive shaft, with said primary driver wheel having an internal surface, a locking groove in said internal surface, and a driver roller connected to and protruding from said internal surface:

c. a secondary driver wheel disposed on said input drive shaft, with said secondary driver wheel having an internal surface facing said internal surface of said primary driver wheel, a locking groove in said internal surface, and a driver roller connected to and protruding from said internal surface;

d. a two-sided indexing driven wheel having:

aa. a first side surface facing said internal surface of said primary driver wheel, with said first side surface of said two-sided indexing driven wheel having four adjacent and circumferentially-spaced drive slots therein which are dimensioned and configurated, individually and separately, to accept, engage with, and releasably hold said driver roller of said primary driver wheel, and with said first side surface also having six locking rollers connected to and protruding from said first side surface;

bb. and, a second side surface facing said internal surface of said secondary driver wheel, with said second side surface of said two-sided indexing driven wheel having one drive slot therein dimensioned and configurated to accept, engage with, and releasably hold said driver roller of said secondary driver wheel, and with said second side surface also having two locking rollers connected to and protruding from said second side surface;

e. and, a rotatable output shaft on which is disposed said two-sided indexing driven wheel;

2. an extraction assembly operatively associated with said vertical conveyor assembly;

3. a horizontal conveyor assembly operatively associated with said extraction assembly, wherein said horizontal conveyor assembly comprises:

aa. a housing having a flat table-like upper surface, a lower surface, and two end portions, with each said end portion having an opening configurated and dimensioned to accept and permit the passage therethrough of said cartridges of spent rounds of ammunition;

bb. a plurality of identical individual ammunition round-carrier elements connected in an endless chain fashion;

cc. and, means for moving, in an endless chain manner, said individual round-carrier elements across said flat table-like upper surface, said end portions, said end openings, and said lower surface of said housing;

whereby said cartridges of spent ammunition rounds fall through said openings in said end portions of said horizontal conveyor assembly housing;

4. and, a reloading assembly operatively associated with said horizontal conveyor assembly;

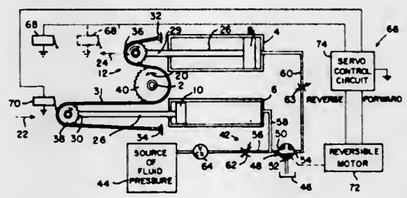
b. means for housing said conveyor elements, wherein said conveyor elements housing means has a first open end and a second open end, with said first open end in communication with said loader assembly, and wherein said conveyor elements housing means includes flexible chuting having a first open end and a second open end;

c. and, a loader assembly/aircraft interface unit in communication with said open end of said conveyor elements housing means, and also simultaneously in communication with the other system in the aircraft.

4,074,611
FLUID PRESSURE ACTUATOR FOR PRODUCING ROTATIONAL MOTION

Ralph F. Hereth, 3608 Clover Valley Road, Port Orchard, Wash. 98366

Continuation-in-part of Ser. No. 500,447, Aug. 26, 1974, abandoned. This application Mar. 3, 1976, Ser. No. 663,569
Int. Cl.[2] F01B *9/00;* **F01L** *25/08, 33/04*
U.S. Cl. 91—179 **12 Claims**

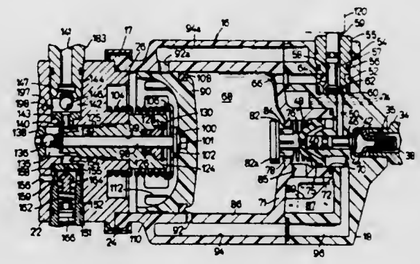


1. A fluid pressure actuator for producing bidirectional rotational motion of a rotary shaft, comprising: first and second fluid pressure operated piston motors, said second piston motor having a larger effective cross-sectional area than said first piston motor, each adapted to exert a driving force in response to application of fluid pressure thereto; linkage means interconnecting said piston motors to the shaft for transmitting their respective driving forces to the shaft in opposed relation, so as to cause alternate reversing rotation thereof upon alternate advancement and retraction of said piston motors; and fluid pressure control means including a fluid pressure source arranged to supply constant fluid pressure to said first piston motor, a fluid pressure return, and a single control valve connected with said fluid pressure source, said fluid pressure return and said first and second piston motors and including means for (1) maintaining fluid pressure on said first piston motor composed solely of fluid from said fluid pressure source while exhausting fluid from said second piston motor to said fluid return, thereby causing said rotary shaft to rotate in a first direction, and for (2) connecting said second piston motor to said source of fluid pressure and said first piston motor while blocking both said piston motors from said fluid pressure return, thereby causing said rotary shaft to rotate in a second direction opposite said first direction.

4,074,612
FLUID OPERATED HYDRAULIC PUMP

Douglas P. Miller, Milwaukee, Wis., assignor to Applied Power Inc., Milwaukee, Wis.

Filed Aug. 25, 1976, Ser. No. 717,748
Int. Cl.[2] F01L *25/04, 23/00*
U.S. Cl. 91—290 **6 Claims**



1. A fluid driven motor comprising:

a motor body having a motor chamber formed therein, said motor chamber having an end wall, an inlet passage in communication between said motor chamber and a fluid source, and an exhaust passage in communication between said motor chamber and a point of pressure relief;

a motor piston reciprocable within said chamber for an intake stroke away from said end wall and an exhaust stroke toward said end wall;

a bore in said end wall and including an inlet port for said inlet passage and an exhaust port for said exhaust passage;

a reciprocably movable shuttle valve poppet including a piston portion in said bore and an exhaust port seal;

said exhaust port seal being located in said motor chamber for cooperating with said exhaust port for preventing fluid flow through said exhaust passage during said intake stroke of said motor piston and for permitting fluid flow through said exhaust passage during said exhaust stroke, said exhaust port seal being engagable by said motor piston when the latter nears the end of its exhaust stroke;

a reciprocable check valve poppet in said bore cooperating with said inlet port for preventing fluid flow through said inlet passage during said exhaust stroke of said motor piston and for permitting fluid flow through said inlet passage during said intake stroke;

means for connecting said shuttle valve poppet to said check valve poppet whereby movement of said exhaust port seal to open or close said exhaust port is accompanied by movement of said check valve poppet to close or open said inlet port, respectively;

biasing means in said bore for continuously acting on said shuttle valve poppet to releasably maintain said exhaust port seal in closed position and said check valve poppet in open position as said motor piston moves through its intake stroke;

means, including a passage, for supplying pressurized fluid from said motor chamber to said piston portion of said bore when said motor piston is near the end of its intake stroke for moving said shuttle valve poppet against the action of said biasing means to thereby move said exhaust port seal to open position and to move said check valve poppet to closed position;

said exhaust port seal being movable to closed position and said check valve poppet to open position by engagement of said motor piston with said exhaust port seal when said motor piston is near the end of its exhaust stroke; and

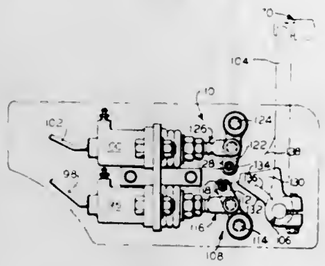
a throttle valve in said inlet passage for controlling fluid flow through said inlet passage.

4,074,613

VARIABLY BIASED CONTROL MECHANISM

John R. Muntjanoff, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 543,579, Jan. 23, 1975, Pat. No. 3,990,552.
This application July 21, 1976, Ser. No. 707,161
Int. Cl.² F15B *11/16, 13/06*
U.S. Cl. 91—413 **4 Claims**



1. A control mechanism for power train including first and second hydraulically operable motor means, and a source of fluid under pressure, the control mechanism comprising:

a control valve for selectively communicating the source of fluid under pressure with the first and second motor means;

control lever means for operating the control valve, the control lever means including a control lever and a common control element, the control lever movable in a first direction to actuate the first motor means, and the control lever movable in a second direction to hydraulically actuate the second motor means;

manually operable means for positioning the control lever;

first biasing lever means operably interconnected between said manually operable means and said common control element and cooperating with said common control element for moving said control lever in said first direction of travel at a relatively low rate of modulation; and

second biasing lever means operably interconnected between said manually operable means and said common control element and cooperating with said common control element for moving said control lever in said second direction of travel at a relatively high rate of modulation.

4,074,614

VALVING FOR DUAL RADIAL PISTON MOTOR

Charles E. Beals, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

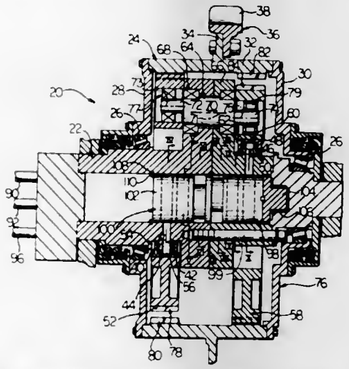
Filed Oct. 7, 1976, Ser. No. 730,491
Int. Cl.² F01B *13/06*
U.S. Cl. 91—490 **12 Claims**

1. A fluid transfer apparatus comprising:

fixed body means defining a bore and defining first passage means communicating with said bore and through which fluid may flow into the bore, and second passage means communicating with the bore and through which fluid may flow from the bore;

a plurality of piston and cylinder means reciprocably associated with the fixed body means;

a valving element rotatable within said bore defined by the fixed body means and defining means such that as the valving element is rotated relative to the fixed body means, communication is provided between each piston and cylinder means, and the first and second passage means of the fixed body means alternately, to alternately direct fluid to and allow flow of fluid from each piston and cylinder means, wherein the means defined by the valving element comprising (i) first channel means defined thereabout and communicating with the first passage means defined by the fixed body means (ii) second channel means disposed about a portion of the valving element and communicating with some of said piston and cylinder means, (iii) internal passage means communicating the first and second channel means, wherein the means defined by the valving element further comprise (iv) third channel means disposed thereabout and communicating with the second passage means defined by the fixed body means, (v) fourth channel means disposed about a portion of the valving element and communicating with the other piston and



cylinder means, and (vi) internal passage means communicating the third and fourth channel means; and

means for generally balancing lateral forces applied to the valving element by fluid pressure applied thereto and released therefrom through the second and fourth channel means, wherein the means for generally balancing lateral forces comprise first additional channel means disposed about a portion of the valving element on a side thereof generally opposite the second channel means, and means communicating fluid pressure to said first additional channel means from said first passage means defined by the first body means, and second additional channel means defined by and disposed about a portion of the valving element on a side thereof generally opposite the fourth channel means, and means communicating the second additional channel means with the second passage means defined by the fixed body means.

4,074,615

ORBITING MOTOR GEAR DRIVE

Bennett W. Avery, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 7, 1976, Ser. No. 730,554
Int. Cl.² F01B *13/06*
U.S. Cl. 91—490 **14 Claims**

1. A fluid pressure apparatus comprising:

fixed body means;

a first orbiting member disposed about said fixed body means, defining a plurality of outwardly-projecting teeth;

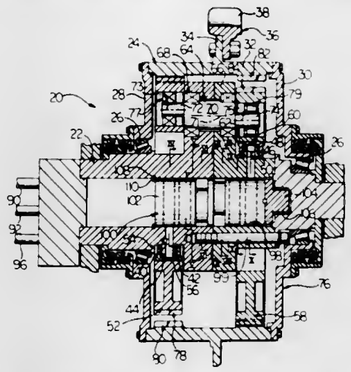
a second orbiting member disposed about said fixed body means, defining a plurality of outwardly-projecting teeth equal in number to the teeth defined by the first member;

means movably mounting the first and second orbiting members relative to the fixed body means for determining orbiting movement of the first and second orbiting members relative to the fixed body means;

a first plurality of piston and cylinder means operatively interconnecting the fixed body means and first orbiting member;

a second plurality of piston and cylinder means operatively interconnecting the fixed body means and second orbiting member;

rotary body means defining a first plurality of inwardly-projecting teeth of a number greater than the number of teeth defined by the first orbiting member, the teeth of the orbiting member being adaptable for engagement with the first plurality of teeth of the rotary body means, and defining a second plurality of inwardly-projecting teeth of a number equal to the number of the first plurality of inwardly-projecting teeth defined by the rotary body



means, the teeth of the second orbiting member being adaptable for engagement with the second plurality of teeth of the rotary body means, and

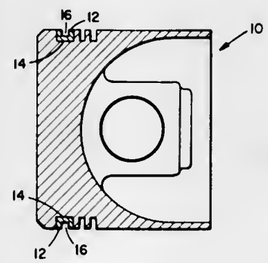
wherein the means movably mounting the first and second orbiting members relative to the fixed body means comprise a plurality of crankshafts, each defining a main body portion rotatably mounted to the fixed body means, a first extending portion spaced from the axis of rotation of the main body portion and to which the first orbiting member is rotatably mounted, and a second extending portion spaced from the axis of rotation of the main body portion and to which the second orbiting member is rotatably mounted.

4,074,616

ALUMINUM PISTON WITH STEEL REINFORCED PISTON RING GROOVES

Preston Lee Gale, East Peoria, and Jack E. Fair, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 2, 1975, Ser. No. 609,264
Int. Cl.² F16J *1/00, 9/22*
U.S. Cl. 92—222 **1 Claim**



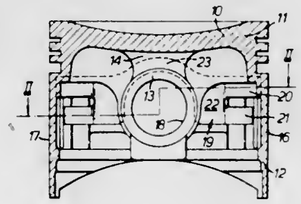
1. A piston comprising a body of aluminum or aluminum alloy which is at least about 88% pure aluminum having a cylindrical outer surface and a unitary insert ring made of austenitic stainless steel, said insert ring being embedded in said body about said cylindrical outer surface of said body spaced from the ends thereof and coaxial therewith, said insert ring having an outer surface with a diameter about equal to the outer diameter of said cylindrical outer surface of said body and an inner surface with a diameter substantially less than said outer diameter thereof, said inner and outer surfaces of said insert ring being joined by side surfaces with the material of said insert ring alloyed with the aluminum of said body to provide a diffusion zone at least about 0.009 inch thick throughout the interface between said body and the inner and side surfaces of said insert ring, and a circumferential groove formed in said outer surface of said insert ring.

4,074,617

PISTONS FOR INTERNAL COMBUSTION ENGINES OR FOR COMPRESSORS

Frederick Edward Cockcroft, Bradford, England, assignor to Hepworth & Grandage Ltd., England

Filed July 16, 1976, Ser. No. 705,787
Claims priority, application United Kingdom, Aug. 12, 1975, 33464/75
Int. Cl.² F16J *1/04, 1/06*
U.S. Cl. 92—228 **4 Claims**



1. A light metal piston for an internal combustion engine or a compressor, having a crown, a skirt integrally connected to said crown in a manner to provide an internal cavity in the piston, and affording opposite thrust faces, gudgeon pin bosses having bores opening into said cavity, and two expansion control inserts made of a material of lower coefficient of thermal expansion than the light metal, each insert conforming to the internal shape of the piston skirt, each said insert having

a pair of connecting portions each anchored in a gudgeon pin boss;

a further portion interconnecting said pair of connecting portions;

a pair of elongated first bands, having the inner face thereof open to said cavity, each extending from a said connecting portion part way only round one of said thrust faces to form a bi-metallic element therewith, each said first band being near the crown end of said skirt;

a pair of elongated second bands, having the inner face thereof entirely open to said cavity, each extending from a said connecting portion, being spaced apart from and substantially parallel with and independent from said first bands, each said second band extending part way only round one of said thrust faces to form a bi-metallic element therewith, each said second band being nearer the open end of said skirt than each said first band; said first bands being substantially longer than said second bands,

whereby said first bands exert a greater degree of thermal expansion control for a given temperature change than do said second bands.

4,074,618

PROCESS AND APPARATUS FOR GLUEING CARTON BODIES

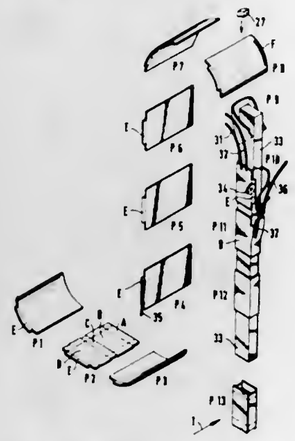
Luigi Gennari, Cremona, Italy, assignor to Kartocol Anstalt, Vaduz, Liechtenstein

Filed Feb. 24, 1976, Ser. No. 661,039

Claims priority, application Switzerland, Mar. 4, 1975, 2821/75

Int. Cl.² B31B *1/26*

U.S. Cl. 93—49 M **11 Claims**



1. A method of fabricating a carton open at its opposite ends including:

providing a plurality of planar carton blanks,

disposing a plurality of blanks in a horizontal stack,

conveying carton blanks one after the other along a predetermined path,

disposing the carton blanks one after the other about a substantially vertically disposed elongated form forming a portion of said path including displacing the cartons one by one from the stack and transporting each blank in a substantially vertically upward direction, and reversing the direction of travel of each blank after transport in the vertically upward direction for movement in a substantially vertically downward direction about the form, said form having the cross-sectional shape of the fabricated open ended carton,

wrapping each carton blank about the form,

overlapping opposed side flaps of each carton blank one over the other along one side of the form to close the blank about the form,

gluing the overlapped side flaps of each carton one to the other,

displacing the closed carton blank substantially vertically along the form,

maintaining the sides of the closed carton blank against the form as the closed carton blank is displaced therealong, and

discharging the open-ended carton from the form in a substantially vertical orientation with the opposite ends thereof opening vertically.

4,074,619

HEADING MACHINE

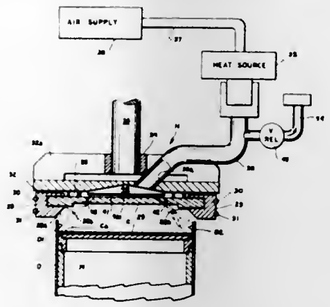
James J. Feliks, Doraville, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Nov. 10, 1976, Ser. No. 740,476

Int. Cl.² B31B *17/60*

U.S. Cl. 93—55.1 R **8 Claims**

1. A heading machine for securing the outer peripheral sealing edge area of a closure plate to an inner sealing area at one end of a tubular element, at least one of said sealing areas being coated with thermoplastic material, said machine comprising a mandrel for supporting a tubular element thereabout with an end of said tubular element projecting beyond an end of said mandrel to define a sealing area on the inner surface thereof and with a closure plate disposed within said end of said tubular element and in engagement with said end of said mandrel, a reciprocable header including a support element, a pressure pad mounted on said support element and defining a manifold therebetween, a plurality of jet passages formed in



said pressure pad and arranged to direct hot air from said manifold toward said sealing area and said sealing edge area, and outwardly expandable inwardly biased crimping segments mounted on said pressure pad and arranged to engage and crimp the projecting end of said tubular element inwardly, said pressure pad being engageable with the crimped projecting end of said tubular element and being effective to impart sealing force thereto.

4,074,620

DEVICE FOR PREVENTING THE FLOW OF AIR THROUGH AN OPENING BETWEEN TWO ROOMS OR SPACES

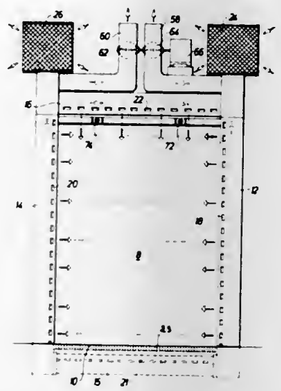
Bror Ingvar Erling Jansson, Henriksdalsringen 75 nb, S-131 00 Nacka, Sweden

Filed Oct. 28, 1976, Ser. No. 736,673

Claims priority, application Sweden, Nov. 6, 1975, 7512468

Int. Cl.² F24F *9/00*

U.S. Cl. 98—36 **21 Claims**



1. A device for preventing flow of air through an opening in a wall between two spaces wherein

air flow generating members are provided to generate by air exhaust at least two air curtains in each space,

said two curtains originating from the vicinity of the whole length of two opposite boundary edges of the opening,

said air curtains being directed obliquely towards each other to form a wedge-shaped air curtain arrangement directed into each of the spaces,

said arrangement defining a closed air volume which fills the whole opening and extends therethrough a certain length into each of the spaces,

each of said air flow generating members for generating the air curtains in each of the spaces being adapted to take in air for exhaust from the same space into which the air is exhausted,

sensing members at the opening for sensing the air flow therethrough and the direction of the net air flow through the opening,

regulating means connected to said sensing members and to said air flow generating members and responsive to the detection of the direction of air flow by said sensing members to regulate the air curtains so that the net air flow is stopped.

4,074,621

INFUSION-MAKING MACHINE

Serge Leon Louis Cailliot, Neuilly-sur-Seine, France, assignor to Societe Normande de Services, Colombes; Anvar Agence Nationale de Valorisation de la Recherche, Neuilly-sur-Seine; Societe Generale pour le Financement de l'Innovation Soginnove, Paris; Bertrand Cor, Paris and Arnaud Gastinne, Paris, all of, France, part interest to each

Filed June 11, 1976, Ser. No. 694,939

Claims priority, application France, June 13, 1975, 75 18665; Feb. 26, 1976, 76 05377

Int. Cl.² A47J *31/22, 31/24, 31/42*

U.S. Cl. 99—286 **20 Claims**

1. In an infusion making machine comprising:

a rotatably mounted central shaft threaded near its upper end,

a grinding chamber encircling said threaded part, and

means for introducing a solid flavored material into said grinding chamber, the improvement which comprises:

planetary gearing encircling said shaft and means for rotating said gearing and said shaft,

an eccentric, circular housing surrounding said shaft, and defining a centrifuging chamber, said housing being mounted to be driven by said gearing at a speed less than that of said shaft,

means for leading a liquid and ground material from said grinding chamber into said centrifuging chamber,

a self-cleaning filter on the inside of said centrifuging chamber,

a scraper carried by said gearing for removing residue from said filter, and means for leading said residue and an infusion separately from said machine.

4,074,622

APPARATUS FOR THE CONTINUOUS PRODUCTION OF STANDARDIZED MILK

Heinrich Niemeyer, Oelde, Germany, assignor to Westfalia Separator AG, Oelde, Germany

Filed Apr. 20, 1976, Ser. No. 678,589

Claims priority, application Germany, Apr. 23, 1975, 2517938

Int. Cl.² A23C *9/00, 13/02*

U.S. Cl. 99—456 **4 Claims**

1. Apparatus for the continuous production of standardized milk having a predetermined fat content from raw milk having a variable and higher fat content which comprises:

a. a separator for separating the raw milk into separated cream and skim milk and having an inlet line for feeding of raw milk to the separator, a first discharge line for separated cream, and a second discharge line for skim milk,

b. a by-pass line interconnecting said discharge lines for conveying a portion of the separated cream to the skim milk for remixing of cream with the skim milk to provide standardized milk in the second discharge line, and a regulating valve mounted in one of said lines for said separated cream for proportioning the amount of cream remixed with the skim milk,

c. means for withdrawing a sample of the standardized milk from the second discharge line, which means is connected with the second discharge line,

d. a first two-way valve in the first discharge line downstream of the by pass line for receiving cream not remixed with the skim milk and having a first outlet and a second outlet, a conduit connected to the first outlet for discharge of separated cream from the process,

e. a second two-way valve in the second discharge line downstream of the connection of the sampling means to the second discharge line, having a first outlet and a second outlet, a conduit connected to the first outlet of the second two-way valve for discharge of standardized milk from the process,

f. a recycle conduit connected to each of the second outlets of the two two-way valves for recycling of separated cream and standardized milk to the separator,

g. a fat test and controller for receiving the withdrawn sample and determining the fat content thereof and effective to control the regulator valve, and to control the two-way valves for discharge of separated cream and standardized milk when the fat content of the standardized milk is within preselected tolerances and recycle separated cream and standardized milk to the separator when the fat content of the standardized milk is outside of the preseclected tolerances.

4,074,623

METHOD FOR BINDING A CROP BALE

Allen A. White, Peabody, Kans., assignor to Hesston Corporation, Hesston, Kans.

Filed Nov. 16, 1976, Ser. No. 742,178

Int. Cl.² B65B *13/28*

U.S. Cl. 100—3 **10 Claims**

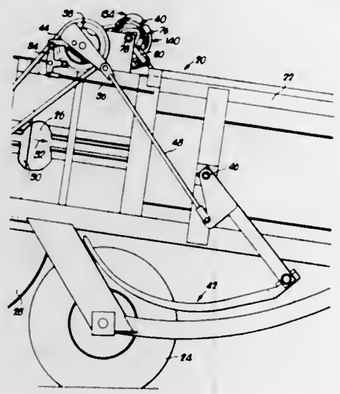
1. In a baling operation where a bale is progressively formed and incrementally advanced through a baling chamber by intermittently packing successive charges of new material against a source of yieldable resistance across the path of travel of the bale, a method of binding the bale that includes the steps of:

prior to packing the first charge of a bale, joining a pair of binding strands from two separate sources of supply for a first time to start a loop and present a bight across the baling chamber;

simultaneously drawing additional lengths of the strands from the two sources of supply as the bight is progressively lengthened by the packing of material into the bight; and

when the bale has reached a predetermined size, closing the

bight around the bale to form a complete loop and joining the strands for a second time at the point of completion of the loop,



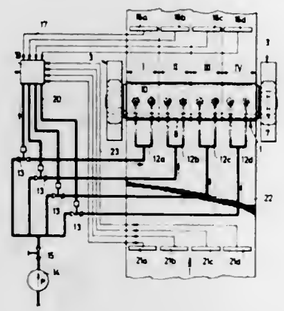
the second joining of strands for one bale and the first joining of strands for the next succeeding bale being carried out successively.

4,074,624

METHOD OF ADJUSTING THE CONTACT PRESSURE OF A ROLLING MILL AND APPARATUS FOR THE PERFORMANCE THEREOF

Peter Biörnstad, Zurich, and Anton Dolenc, Winterthur, both of Switzerland, assignors to Escher Wyss Limited, Zurich, Switzerland

Filed Nov. 15, 1976, Ser. No. 742,366
Claims priority, application Switzerland, Dec. 8, 1975, 15950/75
Int. Cl.² B30B *13/00*; B21B *13/02*; B30B *3/04*
U.S. Cl. 100—35 **15 Claims**



1. A method of adjusting the contact pressure of a rolling mill for rolling a web of material, comprising the steps of:

providing at least one pair of rolls comprising at least one controlled deflection roll equipped with a plurality of hydrostatic pressure elements operable by a hydraulic pressure medium and a counter-roll cooperating with said controlled deflection roll;

passing a web of material through the nip between the controlled deflection roll and the counter-roll;

measuring at a number of measuring locations across the web of material the action of the pair of rolls upon the throughpassing web of material after the web of material has departed from the nip of the pair of rolls to form measured values characteristic of such action of the pair of rolls; and,

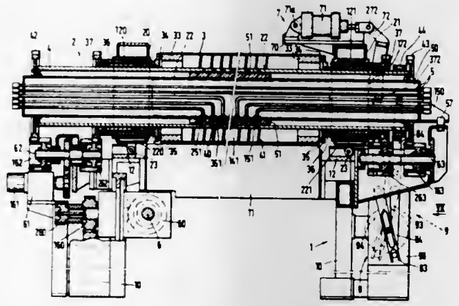
adjusting the pressure of the pressure medium fed to the individual pressure elements associated with the measuring locations in accordance with said measured values so as to obtain a required reference value at the measuring locations.

4,074,625

SCREEN PRINTING MACHINE

Mathias Mitter, Falkenstrasse 57, 4815 Schloss Holte, Germany

Filed Sept. 27, 1976, Ser. No. 726,875
Claims priority, application Germany, Sept. 29, 1975, 2543423
Int. Cl.² B41F *15/38, 15/10*
U.S. Cl. 101—128.1 **15 Claims**



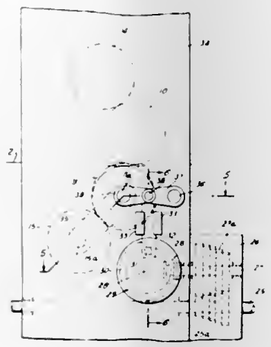
1. A screen printing machine, comprising an endless printing screen of generally annular configuration; end bearing units located at the respective ends of the annulus formed by said endless printing screen and mounting the latter for advancement in an endless path; connecting means connecting said end bearing units with one another to form a carriage unit on which said screen is mounted; means for advancing a workpiece web to be printed in a working path beneath the annulus formed by said screen and in a direction transverse to the longitudinal axis of said annulus; and reciprocating means for reciprocating said carriage unit and said screen in direction transverse of said working path during the advancement of said web in said working path whereby the patterning on the workpiece web is varied.

4,074,626

METHOD AND APPARATUS FOR CONTINUOUSLY PRINTING UNCASED FOLDED BOOKS

Hans-Dieter Werner, Leipzig, Germany, assignor to VEB Polygraph, Leipzig, Germany

Continuation of Ser. No. 423,815, Dec. 11, 1973, Pat. No. 3,964,387, which is a division of Ser. No. 285,521, Aug. 31, 1972, abandoned. This application Mar. 8, 1976, Ser. No. 664,802
Int. Cl.² B41F *5/06, 13/50*
U.S. Cl. 101—221 **2 Claims**



1. In an arrangement for printing books, newspapers, and the like, in combination, transporting means for continuously transporting a paper web along a predetermined path; *n* page printing machines, *n* being an integer equal to at least three, the *n* printing machines being arranged spaced from one another along the path, each so arranged that whenever activated it prints upon the travelling web always the same respective one of *n* different page imprints; control means for so controlling the *n* machines that each becomes activated and prints its associated page imprint upon the web only during each *n*th cycle and after so printing is kept unactivated and does not print upon the web for the next-following *n* minus one cycles, a cycle being constituted by the time interval required for an arbitrarily selected reference point on the travelling web to travel a preselected distance along the path, the control means including means for so controlling the timing and sequence in which the individual ones of the *n* machines become activated and print that in so printing each machine prints upon a longitudinal section of the paper web not printed upon by any of the others of the *n* machines; and means for cutting off successive printed portions of the web to form discrete sheets and assembling together such sheets, each printing machine being a page printing machine including a page printing roller set, each set being mounted for movement between an inoperative position and a printing position in which it always produces one and the same page imprint, wherein each of said printing roller sets includes a pair of printing rollers spaced from each other when in said inoperative position and in contact with opposite sides of said web when in said printing position so that both sides of each web section are imprinted, and wherein said control means includes a series of control devices operatively connected with one roller of each pair of said printing rollers for moving the respective roller between said inoperative and printing positions so that the moved printing roller is in said printing position during one revolution, wherein the printing rollers of each pair are horizontal and include an upper and a lower roller on opposite sides of said web, wherein said control devices are connected with respective ones of said lower rollers for moving the same between a higher printing position and a lower inoperative position spaced from said web and from the respective upper roller, and wherein said web sags to a position downwardly spaced from said upper roller when said lower roller is moved to said lower inoperative position.

4,074,627

APPARATUS FOR PREVENTING NON-UNIFORM APPLICATION OF INK

Norbert Otto Eck, Zell; Siegfried Alfons Stark, Rottendorf, and Erich Georg Wieland, Wurzburg, all of Germany, assignors to Koenig & Bauer Aktiengesellschaft, Wurzburg, Germany

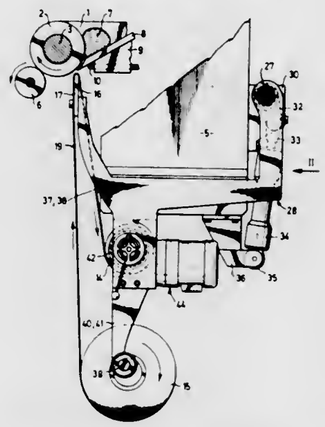
Filed Dec. 6, 1976, Ser. No. 747,750
Claims priority, application Germany, Dec. 12, 1975, 2555993
Int. Cl.² B41F *35/00*
U.S. Cl. 101—425 **10 Claims**

1. Apparatus for preventing the unwanted build up of particles of printing ink on the edge of a doctor blade in an ink fountain for a rotary printing press and for removing any built up particles, said apparatus comprising:

a support blade generally parallel with the edge of the doctor blade, said support blade being positioned closely adjacent to but spaced from the doctor blade;

a movable cleaning web advanceable transversely over said support blade and close to the edge of the doctor blade to contact built up ink particles and remove the built up ink particles from the doctor blade;

means for advancing said cleaning web; and



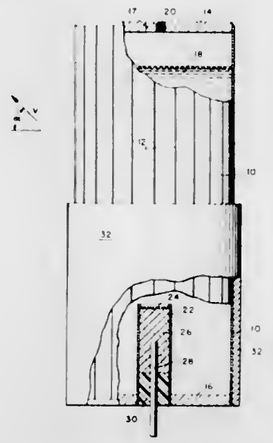
means for varying the position of said support blade with respect to the doctor blade to vary the spacing of said support blade from the doctor blade.

4,074,628

FAX CANISTER WITH A BOTTOM BURSTER CHARGE AND DISPERSION CONTROL RING

Larry G. Manning, Ridgecrest, Calif., and Richard J. Zabelka, Brimley, Mich., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 21, 1966, Ser. No. 560,377
Int. Cl.² F42B *25/12*
U.S. Cl. 102—6 **1 Claim**



1. Apparatus for dispersing fuel into the atmosphere for mixing therewith to produce an explosive cloud, comprising:

(a) a cylindrical canister having upper and lower non-failing end walls, adapted to be oriented in the air with its longitudinal axis in a generally vertical direction,

(b) a burster tube disposed adjacent the lower end wall and extending part way the length of the canister, said burster tube containing a high explosive adapted to produce a shock wave when detonated,

(c) a dispersion control ring surrounding the canister and extending from the lower wall to about the mid-portion of the canister, and

(d) a fuel contained within the canister and substantially filling the same,

(e) the construction and arrangement being such that when the detonator is actuated the canister first fails radially in the portion above the control ring and next fails, together with the control ring, therebelow, whereby the second named failure produces upwardly and outwardly components, producing a fuel cloud of inverted generally frustoconical shape.

4,074,629

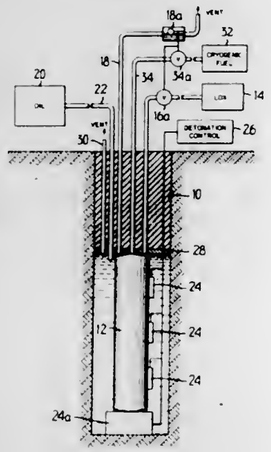
BLASTING AGENT AND METHOD

Stirling A. Colgate, 122 Piedra Loop, Los Alamos, N. Mex. 87544

Continuation-in-part of Ser. No. 590,489, June 25, 1975, abandoned. This application Sept. 24, 1976, Ser. No. 726,183

Int. Cl.² F42D *1/00*

U.S. Cl. 102—23 **9 Claims**



1. A method of blasting comprising the steps of placing a cryogenic container of closed cell plastic foam in a blast hole, placing at least one fluid fuel in the blast hole, conducting liquid oxygen into the container from a source safely remote from the blast hole through a cryogenic fill line, at least the part of the fill line near the hole being of closed cell plastic foam, and setting off at least one initiator charge in the blast hole to initiate detonation or fluid-fluid explosive self-mixing or both detonation and fluid-fluid explosive self-mixing of the liquid oxygen and fuel.

4,074,630

METHODS AND PLUGS TO SEAL APERTURES IN TUBE PLATES OF HEAT EXCHANGERS PROVIDED WITH TUBE PLATES WHICH ARE LOCALLY SEALED WITH THESE METHODS AND SUCH PLATES

Nicolaas Abraham Zondag, Roosendaal, Netherlands, assignor to Explosive Metal Working Holland B.V., Roosendaal, Netherlands

Division of Ser. No. 662,045, Feb. 27, 1976, Pat. No. 4,021,907. This application Feb. 10, 1977, Ser. No. 767,454

Int. Cl.² F42B *3/04;* **F16L** *55/10;* **F28F** *11/00*

U.S. Cl. 102—24 R **5 Claims**

1. An explosively radially expandable plug to seal an aperture in a tube plate of a heat exchanger in a place, where a tube extends with an end portion in a boring of said plate, said plug having a metal body with two coaxial walls forming cavities separated from one another by a partition and each one of said



cavities opening towards an individual end of the plug and containing an explosive charge with firing means.

4,074,631

BALLAST TAMPING IMPLEMENT ON A MOBILE TRACK TAMPER

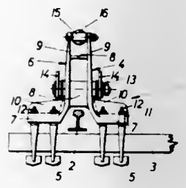
Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed June 14, 1976, Ser. No. 695,732

Claims priority, application Austria, Feb. 20, 1976, 1239/76

Int. Cl.² E01B *27/16*

U.S. Cl. 104—12 **5 Claims**



1. A ballast tamping implement mounted on a mobile track tamper arranged for mobility on a track consisting of a multiplicity of ties and two rails fastened to the ties, the tamping implement being capable of tamping ballast under respective ones of the ties and constituted by a rigid unit consisting essentially of

1. a tamping tool holder having
   a. an arm having a longitudinal plane of symmetry and mounted on the tamper for pivoting in a plane vertical to the track and passing through a respective one of the rails, the longitudinal plane of symmetry of the tamping tool holder arm extending on the vertical plane, and
   b. two arms rigidly connected to, and extending transversely of the track from, the vertically extending arm to the left and to the right of the vertical plane whereby the tamping tool holder is centered with respect to the one rail, and
2. at least one stationary ballast tamping tool mounted on each of the transversely extending holder arms and extending vertically downwardly from the holder arms for immersion in the ballast to the left and to the right of the one rail.

4,074,632

SWITCH FOR MONORAIL TRACK WITH ROTARY DRIVE SHAFT

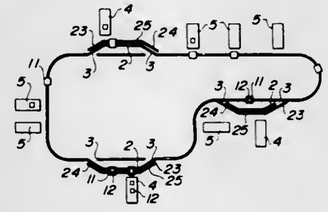
Yutaka Kurahasi, and Nobuyuki Ihara, both of Tokyo, Japan, assignors to SI Handling Systems, Inc., Easton, Pa.

Filed Dec. 11, 1975, Ser. No. 639,938

Claims priority, application Japan, Dec. 13, 1974, 49-150420[U]

Int. Cl.² B61B *13/12;* **E01B** *25/12*

U.S. Cl. 104—130 **14 Claims**



1. Apparatus comprising:

a. a main conveyor line and an auxiliary conveyor line, a junction between said lines,

b. each conveyor line having only one track and a horizontally disposed drive shaft, said shafts being rotatable about their longitudinal axes and being disposed below the elevation of said track,

c. at least one vehicle for movement along said lines, said vehicle having a wheel for rolling contact with a horizontal surface of said tracks and a drive wheel for frictional contact with said shafts, means biasing said drive wheel so that its axis of rotation is angled with respect to the longitudinal axis of one of said shafts,

d. a transfer means at said junction for transferring the vehicle between said lines in a manner so that said drive wheel is transferred from driving contact with one shaft to driving contact with the other shaft, and

e. means associated with the auxiliary conveyor line adjacent the junction for changing the speed of the vehicle.

4,074,633

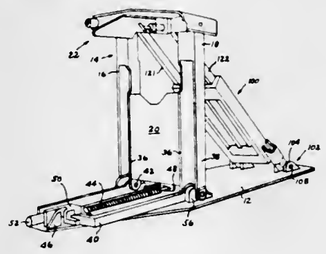
TRAILER HITCH HAVING ELASTOMER-IN-SHEAR CUSHIONING IN THE DIAGONAL STRUT

Paul E. Hicks, Jr., Florissant, and James C. Hammonds, St. Charles, both of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 457,256, April 2, 1974, abandoned. This application Aug. 1, 1975, Ser. No. 601,149

Int. Cl.² B65J *1/22;* **B60P** *7/00*

U.S. Cl. 105—368 B **28 Claims**



1. In a trailer hitch for holding piggyback highway trailers in place on a railway flat car deck including a generally vertical support member having means at its lower end pivotally mounting the vertical support member on the deck, and having pivotally mounted thereon at its upper end a kingpin engagement assembly for holding in place the kingpin of a highway trailer; a diagonal strut extending longitudinally with respect to said deck, the improvement comprising:

an energy absorbing cushioning assembly mounted within said diagonal strut; said cushioning assembly including a longitudinally extending fixed member inclined with respect to said deck; said fixed member having means integral therewith for affixing the same to the deck of a railway car; a pair of longitudinally extending movable members spaced on either side from said fixed member, also inclined with respect to said deck; said movable members having means attached thereto for affixing said movable members to one of said kingpin engagement assembly and said vertical support member; at least one cover plate integrally affixed to said movable members; a resilient assembly integrally affixed to said fixed and said movable members, said resilient assembly comprising at least one elastomeric member having a hardness withn the range of about 40 to 70 durometer; the ability to absorb at least about 35 ft. lbs. of energy per cubic inch, and the ability to absorb at least about 100,000 pounds of force in 9 inches of travel; whereby when loads are applied to said kingpin engagement assembly said elastomeric member will deflect in shear and cushion both vertical and horizontal components of said applied loads; said hitch comprising means for lowering said hitch to an inoperative hitch position wherein said diagonal strut extends generally horizontally adjacent the car deck, and wherein said hitch does not extend vertically more than about 6 inches above the deck in said inoperative position.

4,074,634

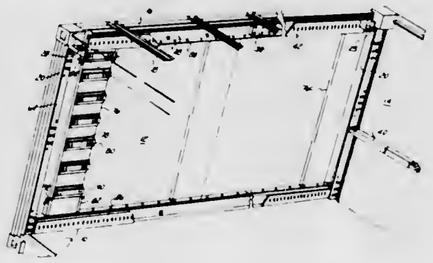
CARGO CONTAINER WITH A CARGO RESTRAINT SYSTEM HAVING ADJUSTABLE PANELS

Conley H. Snow, Clawson, Mich., and Rudolph Messerschmidt, Alexandria, Va., assignors to Brooks & Perkins, Incorporated, Southfield, Mich., by said Snow and The United States of America as represented by the Secretary of the Army, Washington, D.C., by said Messerschmidt

Filed Mar. 22, 1976, Ser. No. 668,924

Int. Cl.² B61D *45/00*

U.S. Cl. 105—493 **6 Claims**



1. A cargo container comprising an elongated container having a cargo space defined between a floor, longitudinally extending parallel vertical side walls, and a top wall,

said container having vertical load-sustaining metal posts at the four corners thereof,

a pair of upper rails extending longitudinally of the container at opposite sides thereof, and each upper rail fixed at its ends to the upper portions of the posts at one side of the container,

a pair of lower rails extending longitudinally of the container at opposite sides thereof and fixedly secured thereto,

a plurality of vertically elongated panels dimensioned to extend between the upper and lower rails,

releasable locking means carried in part by said rails and in part by said panels adjacent the upper and lower ends thereof, said locking means when released permitting movement of said panels into desired positions longitudi-

nally of said rails and engageable thereat to lock said panels in the desired positions,

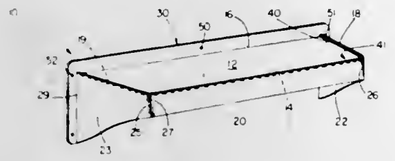
each of said panels having a plurality of vertically spaced horizontal belt rail portions each provided with a series of latch-receiving openings for receiving latch elements provided at opposite ends of cargo restraint bars adapted to be latched to extend between oppositely positioned pairs of panels locked at required positions longitudinally of said rails, the upper ends of said panels being located directly beneath said upper rails whereby the uppermost belt rail portions on said panels are below said upper rails, said upper rails being each provided along the inner side thereof with an elongated continuous recess, and an upper belt rail secured to each of said upper rails to overlie said recess from end to end, said upper belt rail having a series of latch-receiving openings for the latch elements provided at the end of the cargo restraint bars.

4,074,635

PLASTIC SHELF UNIT

Alfred G. Stauble, Hollis, N.H., assignor to Belleview, Inc., Hollis, N.H.

Filed Mar. 28, 1977, Ser. No. 781,685
Int. Cl.[2] A47B *17/00*
U.S. Cl. 108—27 **5 Claims**



1. An integrally molded, one-piece, nestable, plastic shelf unit comprising,

a flat horizontal support wall having a front edge, a rear edge longer than said front edge, and side edges extending therebetween, the distance between said side edges increasing rearwardly,

an integral front wall extending downwardly from the front edge of said support wall,

integral sidewalls extending downwardly from the side edges of said support wall, and

an integral external mounting flange wall extending outwardly from the rear edges of said support wall and said sidewalls providing an unobstructed rear opening of greater horizontal dimension than that of said front wall,

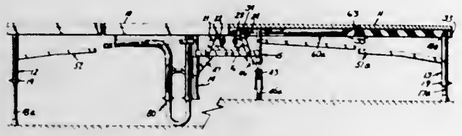
whereby said shelf unit is nestable within another unit having the same construction, for storage and shipment.

4,074,636

ELEVATIONALLY ADJUSTABLE FOLDING STAGE

Kermit H. Wilson, 7001 Antrim Road, Edina, Minn. 55435

Continuation-in-part of Ser. No. 638,167, Dec. 5, 1975, Pat. No. 3,991,491. This application Dec. 27, 1976, Ser. No. 754,334
Int. Cl.[2] A47B *3/00*
U.S. Cl. 108—113 **6 Claims**



1. A foldable, height adjustable stage, comprising:

(a) first and second main support legs interconnected to form a base frame;

(b) first and second stage surface members;

(c) means hingeably connecting said first and second stage surface members to said base frame for movement between a storage position wherein said stage surface members are generally vertically disposed above said base frame, and an operable position in which said stage surface members are generally horizontally disposed to define a continuous stage surface;

(d) first and second outer leg means connected to said first and second stage surface members respectively, remote from said base frame for supporting said stage surface members when in their operable positions;

(e) means for adjusting the length of said first and second outer leg means;

(f) first and second auxiliary support leg means mounted respectively to said first and second stage surface members adjacent the hingeable connection thereof to said base frame;

(g) means for adjusting said auxiliary support leg means between a storage position and an operable position in which said support legs extend outward from said stage surface members further than said main support legs for supporting said stage in an elevated position; and

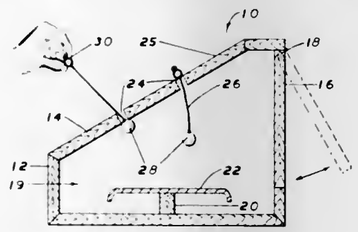
(h) said auxiliary support leg means including floor or surface contacting portions which extend, when said stage is in an elevated position, towards the center of said stage beneath the hingeable connection of said stage surface members to said base frame, so as to further support the center portion of said stage in its elevated position.

4,074,637

PILFER PROOF DISPLAY UNIT

Cornelius Lorenzen, Jr., 338 Runny Mede Road, Essex Fells, N.J. 07021

Filed Apr. 9, 1976, Ser. No. 675,470
Int. Cl.[2] E05G *1/10*
U.S. Cl. 109—38 **5 Claims**



1. A pilfer proof display case, which comprises;

a housing including sidewalls and a bottom wall;

an open tray adapted to support an article for display, mounted on said housing, said tray having a display surface;

a portal communicating between the display surface and the interior of said housing;

said portal being of a dimension insufficient to permit the passage of said articles;

a flexible line slidably mounted in said portal, said line having a first end extendable beyond said display surface and outside of said housing and adapted to secure said article, said flexible line having a second end within the interior of said housing;

a mass of dimension which will not permit its passage through said portal, connected to said second end, said mass being positioned within said housing so as to be free of impinging with the sidewalls thereof;

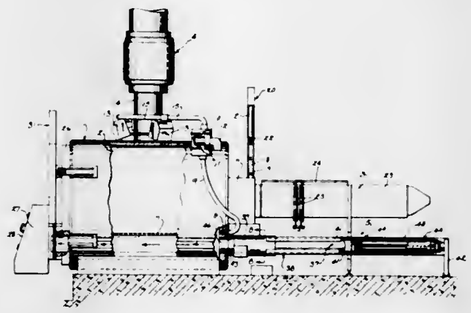
an audible alarm, mounted on said housing beneath said mass, said alarm being activatable by being struck by said mass, which occurs upon the release of said mass by removal of the connection between said mass and said article.

4,074,638

APPARATUS FOR AGITATING AND REMOVING NON-COMBUSTIBLE MATERIAL FROM AN INCINERATOR

Benjamin U. Miller, Hales Corners, Wis., assignor to Kelley Company, Inc., Milwaukee, Wis.

Filed July 16, 1976, Ser. No. 705,760
Int. Cl.[2] F23G *5/00*; F23K *3/12*; F23J *1/00*
U.S. Cl. 110—8 R **10 Claims**



1. An apparatus for agitating and removing non-combustible material from a combustion chamber, comprising a housing defining a chamber to receive waste material and having a discharge opening and having a second opening aligned with the discharge opening, a door to enclose said discharge opening and movable between an open and a closed position, a ram disposed for movement within said second opening between a retracted position wherein the ram is located outside of the chamber and an extended position wherein the ram extends across said chamber toward said discharge opening, and a cylinder unit disposed outside of said housing and operably connected to said ram for moving said ram between said retracted and extended positions, said cylinder unit includes a pair of generally parallel vertically disposed cylinders with each cylinder having a piston rod slidably disposed therein, the piston rod of the lower cylinder of said pair being connected to a fixed object and the piston rod of the upper cylinder of said pair being connected to said ram, and connecting means for connecting the cylinders together, extension of the piston rod with respect to said upper cylinder acting to move the ram in a first stroke of movement and extension of said lower cylinder with respect to its piston rod acting to move the ram in a second stroke of movement, partial extension of said ram acting to agitate the waste material in the chamber and urge the partially combusted waste toward said discharge opening and full extension of said ram acting to discharge non-combustible material through said discharge opening.

4,074,639

TRAILER FOR FARM TRACTORS WITH DRIVEN MEMBER POWERED BY P.T.O.

James H. Hodgson, Vinton, Iowa, assignor to Chromalloy American Corporation, New York, N.Y.

Filed Feb. 10, 1977, Ser. No. 767,380
Int. Cl.[2] A01C *23/02*
U.S. Cl. 111—6 **8 Claims**

1. In combination, a support vehicle attached to a draft connection of a farm tractor which has a three point hitch and which has a power take-off in a horizontal plane above the level of the draft connection, and a soil working implement which is carried on said three point hitch and extending rearwardly of said draft connection, said soil working implement being movable by said three point hitch between a ground engaging position and a raised position, said support vehicle comprising, in combination:

a wheeled chassis;

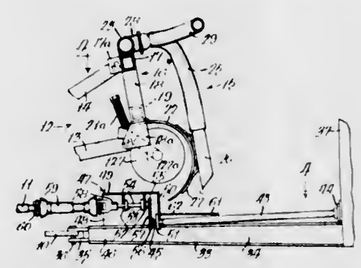
a draft tongue at the front of said chassis at the level of the draft connection extending forwardly past said soil working implement and attached to said draft connection, the length of said draft tongue being sufficient that when the tractor is turned relative to the draft tongue interference between the soil working implement and the front of the chassis is avoided;

a driven member mounted at the front of the support vehicle;

and power transmission means for detachably connecting said driven member for operation from the tractor power take-off, said power transmission means including,

a drive shaft extending along the draft tongue below the horizontal plane of the power take-off,

an input shaft supported on the forward portion of the draft



tongue in the horizontal plane of the power take-off, the rear of said input shaft, said drive shaft and said draft tongue, being so related to the soil working implement that when the soil working implement is raised by the three point hitch the lowermost part of said implement clears the rear of the input shaft and vertically clears the draft tongue and the drive shaft, so the tractor may be turned relative to the draft tongue without interference between said implement and any of said input shaft, said draft tongue and said drive shaft,

means on the input shaft to detachably receive a drive link to the power take-off,

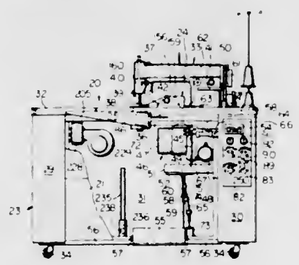
and means drivingly interconnecting the input shaft with the drive shaft.

4,074,640

AUTOMATIC SEWING MACHINE

Takashi Chano, Yokohama, and Kohji Masuda, Sagamihara, both of Japan, assignors to Tokyo Juki Kogyo Kabushiki Kaisha and Kayaba Industry Co., Ltd., both of Tokyo, Japan

Filed Mar. 4, 1976, Ser. No. 664,038
Claims priority, application Japan, Mar. 13, 1975, 50-29557; Aug. 20, 1975, 50-101556
Int. Cl.[2] D05B *19/00, 33/00, 35/10*
U.S. Cl. 112—121.11 **8 Claims**



1. An automatic sewing machine comprising:

a sewing machine mechanism including a table, a seam forming mechanism for sewing two superposed layers of fabric together and a fabric feed mechanism,

a detector member disposed upstream of said seam forming mechanism in a fabric feed direction and including a pair

of detector elements each sensing individually each free side edge of said two layers of fabric and independently generating a signal representative thereof,

a separator plate disposed upstream of said seam forming mechanism in said feed direction and adapted to be positioned between free side edges of said two layers of fabric,

a first manipulator means adapted to engage the upper surface of the upper fabric layer on the upper side of said separator plate and having a pinion rotatable about an axis parallel to said fabric feed direction,

a second manipulator means adapted to engage the lower surface of the lower fabric layer on the lower side of said separator plate and having a pinion rotatable about an axis parallel to said fabric feed direction,

a pair of electric motors adapted to operate in response to signals from said detector member to individually rotate said pinions of said first and second manipulator means in forward and reverse directions to thereby positively position said free side edges of the two layers of fabric on said detector elements,

a first pressure means adapted to apply the engaging force of said first manipulator means to the upper layer of fabric and release said engaging force from the layer,

a second pressure means adapted to apply the engaging force of said second manipulator means to the lower layer of fabric and release said engaging force from the layer, and

means for retracting said first and second manipulator means from said upper and lower layers of fabric, respectively, when said engaging forces of the first and second manipulator means are released from the layers of fabric.

6. An automatic sewing machine comprising a sewing machine mechanism having a table, a presser foot, a lever for lifting said presser foot, and an electric motor mechanism having a clutch and a lever for operating said clutch, an air cylinder for operating said presser foot lifting lever, an air cylinder for shifting said clutch operation lever, an air table disposed at a selected position on said table and including a plurality of air holes which are slanted in the direction of advancement of the workpieces and which are arranged in a surface in contact with the workpieces so as to facilitate advancing movement of the workpieces, a stacker having supporting rods, a rockable gripping bar for gripping an intermediate portion of sewn workpieces in cooperation with said supporting rods when a sewing operation on the workpieces has been completed, blower means for blowing the trailing half portion of the sewn workpieces off said table to stack such trailing half portion of the workpieces onto said supporting rods while the sewn workpieces are being gripped by said gripping bar, controller means for effecting sequential control of the operation of driven elements of said sewing machine mechanism and the operation of said members associated with said sewing machine mechanism, a detector member means adapted to sense the position of free side edges of the workpieces to be sewn in response to an output signal from said controller means at least during a high speed forward sewing operation and to then provide an operation termination signal to said controller means upon the detection of the terminal end of the sewn workpieces, manipulator means operable in response to a signal representing the position of the free side edges of the workpieces from said detector member means to compensate for any deviation of the position of the free side edges of the workpieces, and an auxiliary guide means positioned at the front edge of said table to impart a clockwise moment to the workpieces as the workpieces are fed by the feed mechanism of the sewing machine mechanism, said auxiliary guide means including a sloped portion having an adjustable angle.

4,074,641

SEWING MACHINE

Lars Helge Gottfrid Tholander, Fagelstigen 7, and Kenneth Oscar Emanuel Skogward, Oxhagsgatan 147, both of Huskvarna, Sweden (S-56100)

Filed June 10, 1975, Ser. No. 585,564
Claims priority, application Sweden, June 13, 1974, 7407800
Int. Cl.[2] D05B *3/02*
U.S. Cl. 112—158 D **7 Claims**



1. A sewing machine having a needle bar which is movable in a substantially vertical direction and which is reciprocatingly pivotal about a horizontal axis, a crank mechanism arranged to operate said needle bar connected to a drive shaft arranged in the machine, a shuttle mechanism arranged beneath the needle bar and operable in conjunction therewith to form a stitch, and a reciprocatingly movable cloth-feeding means, a code converter and setting means, said code converter including means for converting a variable binary code to mechanical control movements determined by said setting means, at least one of the reciprocating movements effected by the needle bar and the cloth-feeding means being produced by said code converter for converting a variable binary code to mechanical control movements determined by said setting means, and drive means arranged in the code converter in dependence upon a central control unit which comprises coding means for transmitting binary coded signals to the code converter, said code converter comprising a plurality of sets of cam discs mounted and axially displaceable on a common shaft and individually adjustable with respect to a zero position by said setting means, each set of cam discs being disposed with axial cams facing one another, and stopping means and entrainers cooperating with the setting means, characterized in that said drive means comprises an oscillating motion mechanism means, means transferring limited movements determined by the magnitude of the oscillating motion to a first disc in each set of cam discs, said stopping means and entrainers co-operating with the setting means and being positioned in relation to the magnitude of the oscillating motion in the several cam sets to engage at the ends of the oscillating motion a second disc in each set of cam discs to produce relative movements between the discs in the respective cam sets, said limited movements being transferred as reciprocating movements to at least one of said needle bar and cloth-feeding means, respectively, of the sewing machine.

4,074,642

SEWING MACHINE WITH PROGRAMMABLE MEMORY

John Addison Herr, Garwood, N.J., assignor to The Singer Company, New York, N.Y.

Filed July 27, 1976, Ser. No. 709,050
Int. Cl.[2] D05B *3/02*
U.S. Cl. 112—158 E **9 Claims**

1. In a sewing machine having stitch forming means operative to form successive stitches including mechanism for influencing the switch position coordinates of said successive stitches in the formation of a pattern of stitches, logic means responsive to input data representative of stitch position coordinates for producing stitch position coordinate electrical signals, actuating means responsive to signals from said logic means for controlling the position of said stitch forming means in accordance with input data fed to said logic means, and re-programmable programming means operable connected with said sewing machine, said programming means being responsive to operator manipulation and including static memory means operative for storing digital input data corresponding to a stitch pattern selected by the operator and for transmitting electrical digital output signals to said logic means such that an operator may select a stitch pattern program for entry



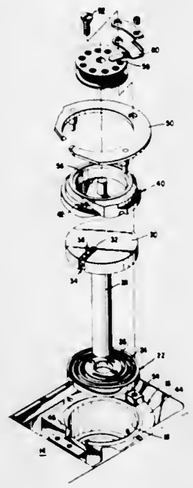
into the sewing machine for automatic reproduction of the switch pattern by the sewing machine and said programming means including a plurality of switching layers with each said layer being responsive when activated for producing voltage signals representative of input data of switch position coordinate information.

4,074,643

RAIL-BEARING FOR ROTARY SHUTTLES

Stanley Joseph Ketterer, Jamesburg, and William Weisz, Rockaway, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed June 21, 1976, Ser. No. 697,886
Int. Cl.[2] D05B *57/14*
U.S. Cl. 112—181 **3 Claims**



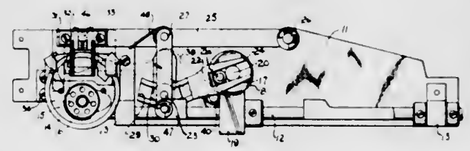
1. In a sewing machine having a thread carrying needle, a rotary shuttle, said shuttle being adapted for catching successive loops of needle thread in the formation of stitches, a drive mechanism for imparting movement to said shuttle, and stationary support means having a plane surface over which said shuttle moves, bearing means comprising cooperating and engaging structures formed circularly on the plane surface of said support means over which said shuttle moves and on the surface of said shuttle adjacent to said support means plane surface at least one of said bearing means projecting from the surface on which it is formed sufficiently to maintain a spaced relationship between the body of said shuttle and the plane surface of said support means and to singularly restrain radial movement of said shuttle relative to the axis of rotary movement thereof, and means for maintaining the engagement of said cooperating structures.

4,074,644

FEED MECHANISM FOR SEWING MACHINE

Kimikazu Matsuda, and Yoshihiro Yamaguchi, both of Osaka, Japan, assignors to Maruzen Sewing Machine Co., Ltd., Moriguchi, Japan

Filed Nov. 23, 1976, Ser. No. 744,315
Claims priority, application Japan, Dec. 20, 1975, 50-172345[U]; Dec. 22, 1975, 50-154187
Int. Cl.[2] D05B *27/02*
U.S. Cl. 112—215 **5 Claims**



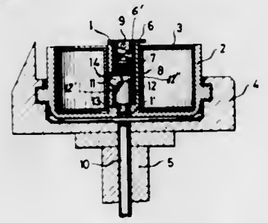
1. An actuating mechanism for the feed dog of a sewing machine comprising a rigid lever mounted for rocking movement about a first fixed vertical axis and having an aperture at its distal end, a driving element, means operatively connecting said lever with said driving element for imparting oscillating rocking movement to said lever, a feed dog support carrying a feed dog, said support having a horizontal slot and a vertical pin bridging said slot with the pin passing through the opening in the lever, the axis of said pin constituting a second vertical axis, the feed dog support thereby being oscillative angularly and vertically on said second vertical axis relative to said lever, an arcuate guideway for controlling the attitude of said feed dog support, the radius of curvature of said guideway being equal to the radial distance between said first and second vertical axes, a control arm rigid with said feed dog support and having an end portion received in said guideway, said feed dog support when oscillated by said lever being caused to be rocked by said guideway about said second vertical axis relative to said lever so as to maintain the feed dog substantially in a straight line work feeding attitude, and means operatively connecting said driving element with said feed dog support for oscillating said feed dog support vertically in synchronism with its angular oscillating movement.

4,074,645

CONTROLLED BRAKING DEVICE FOR THE GRIPPER-THREAD BOBBIN OF A DOUBLE LOCK-STITCH SEWING MACHINE

Gunter Droste, Leopoldshohe; Klaus-Dieter Seiler, both of Kirchlengern, and Wilhelm Stapel, both of Bunde, all of Germany, assignors to Durkoppwerke GmbH, Bielefeld, Germany

Filed Dec. 17, 1976, Ser. No. 751,976
Claims priority, application Germany, Dec. 19, 1975, 405651
Int. Cl.[2] D05B *63/00*
U.S. Cl. 112—229 **9 Claims**



1. A gripper-thread bobbin brake for a double lock-stitch

sewing machine which comprises the combination with a bobbin housing having a spindle adapted to receive a bobbin with a core of the bobbin surrounding said spindle, and a gripper-shaft axially aligned with said housing and said spindle, of:

a brake element in said housing juxtaposed with said bobbin;

a brake plunger received in said spindle and axially displaceable therein for shifting said brake element into engagement with said bobbin; and

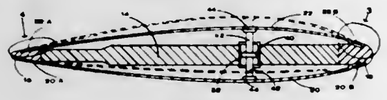
an actuating rod extending through said shaft and engageable with said plunger for displacing same to engage said element with said bobbin, said spindle being provided with at least one opening, said element projecting through said opening into engagement with said bobbin upon actuation of said rod.

4,074,646

VARIABLE FOIL KEEL AND SAIL BOAT

Jan William Dorfman, 173 Roxborough St. E.; Michael David Nisbet Carson, 39 Addington Ave., and George Angus Rolston, 140 Erskine Ave., Apt. 2804, all of Toronto, Ontario, Canada

Filed May 21, 1976, Ser. No. 689,174
Int. Cl.² B63B *3/38*
U.S. Cl. 114—39 **10 Claims**



1. A sailboat of the type having a hull and at least one underwater appendage, said appendage comprising:

a core portion, attached to said hull;

flexible skin portions attached on either side of said core portion, and being movable between a generally retracted inward position alongside said core, and an extended outwardly bulged position, the maximum extension of said skin portion extending along an axis lying in a generally upward and downward direction intermediate the fore and aft edges of the core, whereby to provide an appendage having a horizontal cross-section which may be outwardly bulged on one side and flatter on the other side;

a cylinder, a fluid medium adapted to be pumped into and released from said cylinder, a piston within said cylinder, two operating rods connected with said piston, extending from said cylinder on opposite sides of said core, said cylinder being located in said core, and said operating rods communicating with respective said skin portions on opposite sides of said core portion whereby said skin portions may be selectively bulged outwardly from the core portion and retracted inwardly towards the core portion.

4,074,647

SAILING RIG HAVING CAMBER ADJUSTMENTS

Richard D. Delaney, 12 Parkview Drive, Conneaut, Ohio 44030

Filed July 8, 1976, Ser. No. 703,414
Int. Cl.² B63H *9/04*
U.S. Cl. 114—102 **8 Claims**

1. A sail rig having a mast pole and a boom,

means on said mast pole pivotally connecting it to a vehicle to rotate about an axis,

said mast pole having a vertically extending first part connected to said vehicle,

and a generally forwardly extending second part fixed to said first part,

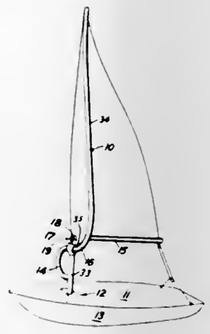
said second part curving from a generally horizontally extending direction upwardly and terminating at a mast head,

a boom pivotally connected to said mast pole at the pivot axis thereof to swing about said axis,

a sail,

connecting means connecting said sail to said boom and to said mast pole,

said mast pole being tubular,



said connecting means comprising groove means in one side thereof extending continuously from the top to the bottom of the second part,

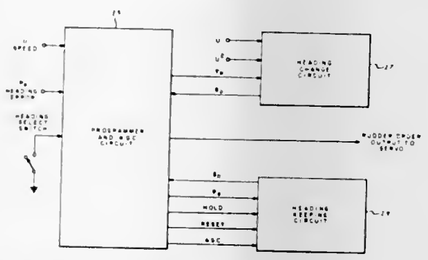
said sail having a bead thereon extending substantially the length of one side thereof slidably received in said groove.

4,074,648

ADAPTIVE AUTOPILOT FOR MARINE VESSELS

Robert E. Reid, Barboursville, and Charles R. Wesner, Crozet, both of Va., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Oct. 18, 1976, Ser. No. 733,637
Int. Cl.² B63H *25/04*
U.S. Cl. 114—144 RE **10 Claims**



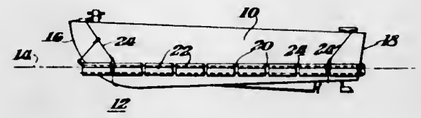
1. An adaptive autopilot for ships comprising means to receive signals indicative of the ship's speed and heading error, heading keeping means for producing a rudder error signal indicative of desired rudder position when the error signal is below a selected threshold, heading change means for producing a rudder order signal when the error signal exceeds said threshold, means for selecting either the heading keeping or heading change means in accordance with the magnitude of the error signal, means for automatically adjusting the magnitude of the rudder order signal produced by the heading change means in accordance with changes in the ship's speed, and means for automatically adjusting the magnitude of the rudder order signal produced by the heading keeping means in accordance with changes in ship's speed heading error signal and rudder order signal.

4,074,649

ICE BARRIER FOR BOATS

Robert L. Stranahan, 2403 Limestone Road, Wilmington, Del. 19808

Filed May 4, 1977, Ser. No. 793,720
Int. Cl.² B63B *59/02*
U.S. Cl. 114—219 **10 Claims**



1. An ice barrier for permitting the wet storage of boats during freezing weather comprising, in combination:

a member formed of a compressible material and having first and second opposite faces;

said first face being generally flat and adapted to contact a portion of a boat at its waterline;

said second face defining a horizontally disposed, notched region; and

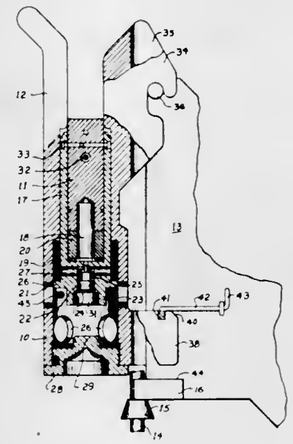
means to secure said member to a boat with said notched region at said waterline.

4,074,650

EXPENDABLE LIGHT-WEIGHT MINESWEEPING CUTTER

Richard C. Dyjak, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 12, 1963, Ser. No. 272,810
Int. Cl.² B63B *9/00*
U.S. Cl. 114—221 A **1 Claim**



1. In an underwater mine cable cutter of the cartridge-chisel type adapted to be pulled forwardly through the water by a sweep line provided with a cutter stop

a stabilizing fin having a front edge adapted to lie along a sweep line,

an abutment formed on said fin for engaging a cutter stop,

a frame member having an axis,

said frame member having a sweep line-receiving recess parallel to said axis

means for detachably connecting said frame member to said fin with the front edge of said fin closing the entrance to said recess,

said connecting means including shearable means the shearing of which releases said frame from said fin,

the abutment on said fin being spaced in said axial direction from a portion of said frame member by a distance sufficient to permit the shearing of said shearable means and thereafter be engaged by said frame member to resist further recoil thereof, and

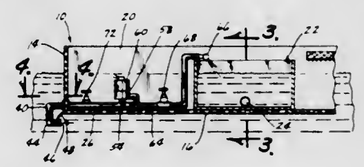
explosively driven cable cutting means so arranged in said frame member that recoil in the axial direction from a cable cutting explosion causes the shearing of said shearable means to release said frame member from said fin.

4,074,651

FORCED AERATING MEANS FOR INBOARD LIVE WELLS

Dell H. Arduser, Box 261, Osceola, Mo. 64776

Filed Aug. 4, 1976, Ser. No. 711,582
Int. Cl.² B63B *35/26*
U.S. Cl. 114—255 **6 Claims**



1. In combination,

a boat,

at least one live well within said boat,

a water pipe means having a discharge end positioned within said boat adjacent said well for supplying water thereto and an intake end positioned outwardly of said boat below the water line thereof and extending forwardly relative to the direction of travel of said boat with said forwardly extending portion of said intake end pivotally mounted to permit it to pivotally move upwardly if it strikes an obstruction,

a water aerator means on said discharge end,

a pump means in said boat positioned externally of said well and connected to said water pipe means for selectively pumping water from outside said boat through said aerator means,

said water pipe means including a pump by-pass pipe such that the movement of said boat through the water will cause water to be directed into said intake end, through said by-pass pipe to said water aerator means,

and means for powering said pump means.

4,074,652

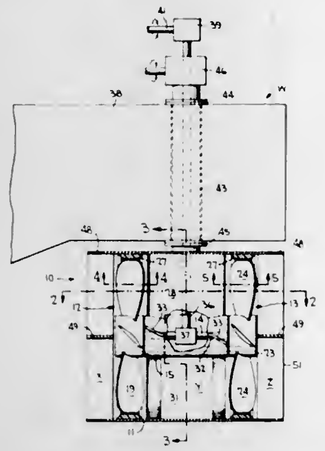
STEERING AND PROPULSION DEVICE FOR WATERCRAFT

William M. Jackson, 109 Hursey Ave., Pass Christian, Miss. 39571

Filed July 26, 1976, Ser. No. 708,426
Int. Cl.² B63H *5/14*
U.S. Cl. 115—35 **8 Claims**

1. A two-stage axial fluid flow steering and propulsion device capable of being mounted on a water vessel, comprising, an impeller shaft, a pair of spaced impellers mounted on said shaft for rotation therewith, an annular housing surrounding said impellers and defining a tube through which fluid may flow upon rotation of said impellers, a shroud structure in the form of a venturi-type ring surrounding each of said impellers thereby defining three separate pressure regions of positive pressure ahead of one of said impellers which pulls the fluid when rotating in one direction, a negative pressure between said impellers and a negative pressure behind the other of said impellers which pushes the fluid when rotating in said one direction, radially extending fluid deflection baffles disposed outwardly of said impellers and extending outwardly of opposite ends of said annular housing for deflecting the fluid to flow toward said impellers and through said tube when said impellers are rotating in said one direction or in a direction opposite

thereof, said housing being mounted for rotation about an axis intersecting with and perpendicular to the impeller shaft axis, impeller shaft rotation means including a drive shaft having an



axis lying perpendicular to the axis of said impeller shaft, and means for rotating said housing, whereby the device is capable of a wide range of steering maneuvers during rotation of said housing.

4,074,653
BIRD FRIGHTENER

Carleton R. Pember, 27331 Silveradd Canyon Road, Orange, Calif. 92667

Filed Dec. 27, 1976, Ser. No. 754,274
Int. Cl.² G08B *15/00*
U.S. Cl. 116—22 A **5 Claims**



1. A bird frightener that may be removably disposed adjacent a tree or bush that has fruit thereon to prevent the latter being eaten by birds, said bird frightener including:

a. a pole that has first and second ends, said pole of such length that when said first end is embedded in ground adjacent said tree or bush that said pole extends upwardly through said foilage for said second second end to be disposed thereabove;

b. a prime mover mounted on said second end, said prime mover including a driven member that is slowly rotated, said driven member having a cavity of noncircular transverse cross section extending downwardly therein;

c. a first clutch member that includes a depending member of non-circular transverse cross section that slidably and snugly engages said cavity;

d. a second clutch member axially aligned with said first clutch member and resting thereon;

e. a head assembly secured to said second clutch member, said head assembly including a plurality of circumferentially spaced pivotally movable tubular members capable of being disposed in outwardly, upwardly and downwardly extending positions;

f. a plurality of arms that extend outwardly, from said tubular members;

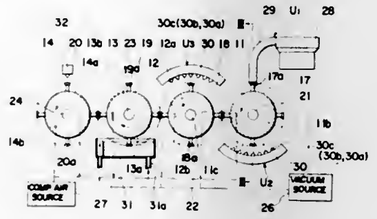
g. a plurality of streamers secured to said arms; and

h. cam means on which said tubular members rest when said head rotates, with said cam means imparting periodic up and down movement to said tubular members and arms as they rotate in said outwardly extending positions.

4,074,654
AUTOMATIC CLOSURE CLEANSING AND COATING MACHINE

Yukihide Noguchi; Takeshi Nishimura; Jotaro Kishimoto, and Yoshio Nishida, all of Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Nov. 18, 1976, Ser. No. 743,213
Claims priority, application Japan, Feb. 6, 1976, 51-12476
Int. Cl.² B05C *3/10*; B08B *3/02*
U.S. Cl. 118—73 **8 Claims**



1. For cleaning closure members each comprised of a closure body having first and second surfaces opposed to each other and a leg extending outwardly from and substantially at right angles to the first surface of said closure body, an automatic closure cleansing machine which comprises, in combination:

a. a support structure;

b. a first rotary carrier supported by said support structure for rotation in one direction, said machine having a supply station, a first cleaning station and a transfer station past which said rotary carrier rotates in sequence, said first rotary carrier having a plurality of receptacles arranged in at least one circular row coaxial with the axis of rotation of said first rotary carrier and in equally circumferentially spaced relation to each other, each receptacle having a cylindrical body having one end connected to the rotary carrier and the other end spaced a distance from a surface of the rotary carrier and having an inwardly extending recess complementary in shape to the shape of the leg on each of the closure members, at least some of said receptacles on said first rotary carrier successively receiving closure members during each rotation of the rotary carrier for transportation of said closure members from the supply station towards the transfer station past the first cleansing station;

c. means including a supply chute and disposed adjacent the first rotary carrier at the supply station for accommodating a batch of the closure members and for aligning the closure members in a predetermined posture and then feeding said closure members into said receptacles on said first rotary carrier through said chute;

d. a second rotary carrier supported by said support structure for rotation in a direction opposite to the direction of rotation of said first rotary carrier, said second rotary carrier being positioned adjacent the first rotary carrier and being movable past the transfer station, said machine having a second cleansing station and a release station past which said second rotary carrier rotates sequentially following rotation past said transfer station during each rotation thereof, said second rotary carrier having a plurality of receptacles arranged in at least one circular row coaxial with the axis of rotation of the second rotary carrier, said receptacles on said second rotary carrier being so spaced equally from each other that, during rotation of said first and second rotary carriers in the opposite directions to each other, the receptacles on said first and second rotary carriers can be successively aligned with the receptacles on the other of said first and second rotary carriers, each receptacle having a cylindrical body having one end connected to the rotary carrier and the other end spaced a distance from a surface of the rotary carrier and having an inwardly extending recess complementary in shape to the shape of the leg on each of the closure members, at least some of said receptacles on said second rotary carrier, as they are moved past said transfer station during rotation of said second rotary carrier, receiving the closure members from the corresponding receptacles on said first rotary carrier and, thereafter, transporting said closure towards the release station;

e. first means operatively coupled to said first rotary carrier for continuously driving said first rotary carrier in said one direction;

f. second means operatively coupled to said second rotary carrier for driving said second rotary carrier in said direction opposite to the direction of rotation of the first rotary carrier in synchronism with said first rotary carrier;

g. a vacuum supplying means;

h. an air supplying means;

i. first means for communicating said some of said receptacles on said first rotary carrier to said vacuum supplying means during rotation of said first rotary carrier from said supply station at least past said first cleansing station for sucking closure members toward said some of said receptacles on said first rotary carrier;

j. second means for communicating said some of the receptacles on the first rotary carrier to said air supplying means at said transfer station;

k. third means for communicating some of the receptacles on the second rotary carrier to said vacuum supplying means during rotation of said second rotary carrier from said transfer station at least past said second cleansing station for sucking closure members toward said some of said receptacles on said second rotary carrier from said first rotary carrier;

l. fourth means for communicating said some of the receptacles on the second rotary carrier to said air supplying means at said release station for releasing closure members which have been transported to said release station from the transfer station past the second cleansing station by said second rotary carrier;

m. said first and second means for communicating and said third and fourth means for communicating being operatively associated and operated simultaneously during each rotation of the first and second rotary carriers, respectively;

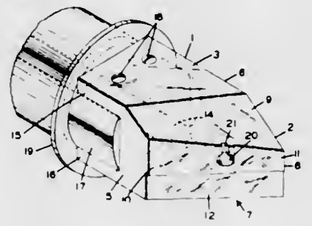
n. a first cleansing liquid applicator positioned adjacent the first rotary carrier at the first cleansing station for spraying a cleansing liquid under pressure against one of the surfaces of the closure body of each of the closure members; and

o. a second cleansing liquid applicator positioned adjacent the second rotary carrier at the second cleansing station for spraying a cleansing liquid under pressure against the other of the surfaces of the closure body of each of the closure members.

4,074,655
EDGE COATING APPLICATOR NOZZLE

William G. Gross, York; Henry A. Long, Jr., Columbia, and John R. Yamshak, Lancaster, all of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Oct. 18, 1976, Ser. No. 733,102
Int. Cl.² B05C *3/02*
U.S. Cl. 118—410 **8 Claims**



1. A one-piece applicator nozzle comprising:

(a) a body member having a flat bottom surface, side surfaces perpendicular to said bottom surface, and a flat top surface portion, said body further having a material discharge passageway formed therein and extending longitudinally through a portion thereof;

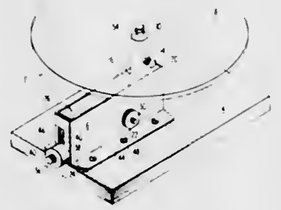
(b) a nose portion on said body member, said nose portion having a front face with a coating material reservoir extending inwardly therefrom in communication with said material discharge passageway, and a top surface extending upwardly at an angle from the face of said nose portion to the top surface portion of said body member, said front face of said nose portion further having a material discharge outlet formed therein and extending downwardly from the top surface of the nose portion in communication with said reservoir; and

(c) means integral with said body member for placing said material discharge passageway in communication with a material supply source.

4,074,656
CAKE DECORATOR'S TURNTABLE

Ray Haapala, Rte. 3, Box 76, Dassel, Minn. 55325

Filed Sept. 22, 1976, Ser. No. 725,647
Int. Cl.² B05C *11/14*
U.S. Cl. 118—502 **4 Claims**



1. A base

a chassis on said base,

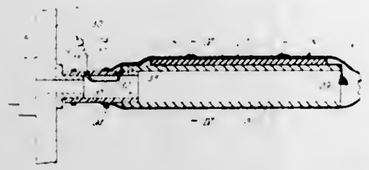
a rigid crank having two arms extending from a juncture thereof at substantially right angles to one another,

pivot means supporting the juncture of the crank arms on said chassis for rotation about a horizontal pivotal axis wherein one of said crank arms extends generally upwardly from said pivot means and the other arm extends generally laterally from said pivot means,

a normally horizontal disc-shape platform having a central spike projecting upwardly therefrom, bearing means rotatably mounting said platform on the free end of said one arm for rotation about the longitudinal axis of said one

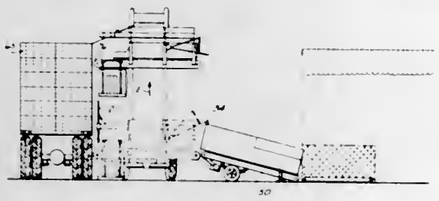
arm, and manually engageable means on the free end of said other arm, whereby said crank may be swung about said horizontal axis so as to tip said platform from the horizontal.

4,074,657
LURE
Ascanius John Senior, 1 Lavoni Street, Mosman, New South Wales, Australia, and John Bernard Heaps, Lakemba, Australia, assignors to Ascanius John Senior, Mosman, Australia
Filed June 15, 1976, Ser. No. 696,441
Claims priority, application Australia, July 4, 1975, 2234/75
Int. Cl.² A01K *15/00*
U.S. Cl. 119—29 **10 Claims**



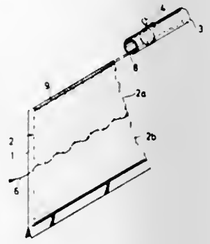
1. Greyhound conditioning apparatus, comprising a lure, an electrode on said lure, an electrical power source, and circuit means energised by said source and connected to said electrode whereby a greyhound attacking the lure receives from said electrode an electrical "fight-back" stimulus of sufficiently short time duration not to shock or frighten a greyhound but rather to stimulate the greyhound to attack the lure in the belief that said lure is alive.

4,074,658
TURKEY LOADER
Shmuel Mermelstein, 63-61 Yellowstone Blvd., Forrest Hills, N.Y. 11375, and Nathan Klugmann, Kibbutz Nachshon, Israel
Filed Sept. 10, 1976, Ser. No. 721,978
Int. Cl.² A01K *29/00*
U.S. Cl. 119—82 **6 Claims**



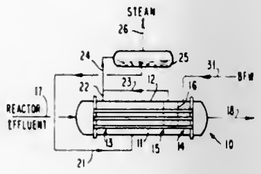
1. A loader for birds, particularly for the transfer of birds from a flock to a cage, comprising:
a support structure;
means on said support structure engageable by a forklift for elevating and displacing said support structure;
a generally horizontal conveyor on said support structure, said conveyor being flanked by a pair of guides and having an entry end and a discharge end;
an inlet gate at said entry end displaceable to permit birds to pass onto said conveyor;
a discharge gate at said discharge end shiftable to permit birds to pass from said conveyor;
a platform suspended from said structure at said discharge end adapted to accommodate an operator for guiding said birds off the discharge end of said conveyor; and means including
a hydraulic system removably connected with said support structure for positioning said conveyor and including control means at said platform for operation by the operator of said hydraulic system for vertically moving said support structure, said discharge gate being mounted upon said structure so as to swing into an open position in which it is inclined downwardly and forwardly in the direction of movement of said conveyor to discharge said birds therefrom and said inlet gate being closed upon vertical movement of said support structure.

4,074,659
CATTLE DUSTING BAG
Warwick Mowbray, Beenleigh; Richard Hart, West Pennant Hills, and William Cavey, Kyle Bay, all of Australia, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Oct. 12, 1976, Ser. No. 731,155
Claims priority, application Australia, Oct. 15, 1975, 3580/75
Int. Cl.² A01K *29/00*
U.S. Cl. 119—159 **2 Claims**



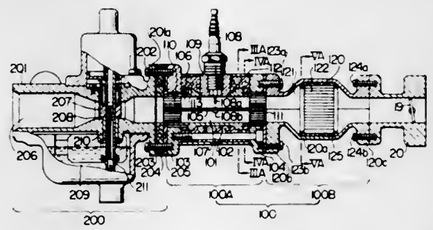
1. A cattle dusting bag comprising
a. an outer bag of thermoplastic material open at its lower end.
b. an inner bag consisting of a substantially rigid porous cloth, having a heavily sewn seam at its upper end, said inner bag being divided into an upper portion and a lower dispensing portion by readily removable transverse stitching, the said upper portion being lined or impregnated with an impervious material and containing the ectoparasiticidal dusting agent prior to use and
c. a slit metal pipe by means of which the dusting bag is to be suspended the heavily sewn seam of the inner bag within the upper end of the outer bag being received and retained with in the slit of the metal pipe.

4,074,660
WASTE HEAT RECOVERY FROM HIGH TEMPERATURE REACTION EFFLUENTS
Utah Tsao, Jersey City, N.J., assignor to The Lummus Company, Bloomfield, N.J.
Filed Nov. 24, 1975, Ser. No. 634,409
Int. Cl.² F22B *1/02*
U.S. Cl. 122—32 **9 Claims**



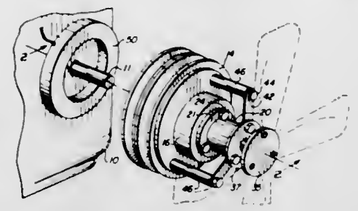
1. A process for cooling a high temperature reaction effluent to increase heat recovery therefrom, comprising:
introducing the effluent at a temperature of from about 600° F to about 2000° F into the inlet end of the tubes of a shell and tube heat exchanger, said heat exchanger shell being divided into first and second completely separate and distinct sections, said first section being at the inlet end of the exchanger whereby the effluent is introduced into the portion of the tubes in the first section and the second section being at the outlet end of the exchanger whereby the effluent is withdrawn from the portion of the tubes in the second section, each tube being a continuous tube which extends through the first and second section;
introducing and passing a first stream of water through the first section of the shell in an indirect heat transfer relationship with the effluent in the tubes to cool said effluent and heat said first stream of water; said first stream of water being at a pressure to generate steam therefrom as a result of said heating in the first section, said first stream being at a pressure of from about 80 to about 500 psig;
introducing and passing a second stream of water through the second section of the shell in an indirect heat transfer relationship with effluent in the tubes to further cool said effluent and heat said second stream of water;
withdrawing said second stream of water from the heat exchanger and re-introducing said withdrawn second stream into the heat exchanger in said first stream; and
withdrawing cooled effluent from the outlet end of said tubes, said cooled effluent being at a temperature of from about 200° F to about 300° F.

4,074,661
FUEL REFORMING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE
Masaaki Noguchi, Nagoya; Tsuchio Bunda, Okazaki, and Taro Tanaka, Chiryu, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan
Filed Feb. 11, 1976, Ser. No. 657,289
Claims priority, application Japan, Feb. 14, 1975, 50-19229
Int. Cl.² F02B *43/08*
U.S. Cl. 123—3 **10 Claims**



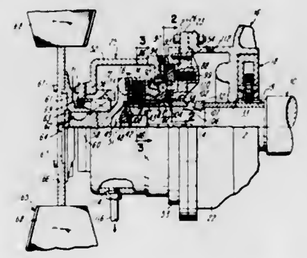
1. A fuel reforming system for converting a rich mixture of air and a fuel into a reformed gaseous mixture containing hydrogen and for feeding the reformed gaseous mixture into a combustion chamber of an internal combustion engine, comprising:
an air-valve type carburetor for producing a heterogeneous rich mixture of air and fuel;
means disposed downstream of said carburetor for defining an intake passage leading to a combustion chamber of an internal combustion engine;
means disposed in said intake passage directly downstream of said carburetor for dividing a part of said intake passage into first and a second sub-passages to introduce a relatively lean part of said heterogeneous rich mixture into said first sub-passage and introduce a relatively rich part of said heterogeneous rich mixture into said second sub-passage;
igniting means extending into said first sub-passage for igniting and burning said relatively lean part of said mixture to produce heat in said first sub-passage, said heat being transferred to said second sub-passage to heat said relatively rich part of said mixture flowing therethrough;
the burned gas from said first sub-passage and said relatively rich part of said mixture from said second sub-passage being mixed together downstream of said dividing means to facilitate atomization of said mixture;
catalyst means disposed in said intake passage downstream of said dividing means for converting the heated and atomized mixture into reformed gaseous mixture; and
a throttle valve disposed in said intake passage downstream of said catalyst means for varying the cross-sectional area of said intake passage.

4,074,662
COOLING FAN CONTROL
Kenneth K. Estes, 8248 E. Glenrosa Ave., Scottsdale, Ariz. 85251
Filed Dec. 29, 1976, Ser. No. 755,230
Int. Cl.² F16D *27/10, 43/25;* F01P *7/02*
U.S. Cl. 123—41.12 **8 Claims**



1. For use with a liquid cooled motor vehicle engine having a water pump with a shaft connected to a water pump drive pulley assembly, a cooling fan control system including in combination:
an extender element attached to the water pump drive pulley assembly for rotation therewith;
a cooling fan mounting hub;
bearing means for rotationally free mounting said fan mounting hub on said extender element;
clutch face means carried by the pulley assembly;
an armature movable mounted to said fan mounting hub by resilient biasing means for permitting movement of said armature in a direction parallel to the water pump shaft, said biasing means urging said armature away from said clutch face means;
an electromagnet coil fixedly mounted to the engine adjacent the water pump drive pulley assembly;
switching means coupling said coil with a source of electrical current for energizing said coil to create a magnetic force to attract said armature for frictional engagement with said clutch face means, thereby rotating said cooling fan mounting hub with said extender element.

4,074,663
INTERNAL COMBUSTION ENGINE AND COOLING FAN DRIVE SYSTEM
Halsey W. Cory, Fairfield, Ohio, assignor to Force Control Industries, Inc., Hamilton, Ohio
Filed Apr. 23, 1975, Ser. No. 570,646
Int. Cl.² F01P *7/02;* F16D *13/60*
U.S. Cl. 123—41.12 **7 Claims**



1. In an internal combustion engine including a crankshaft

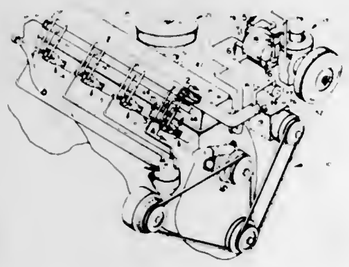
having a projecting end portion and a rotary fan for cooling the engine, an improved system for driving said fan with said crankshaft, comprising a set of interfitting annular clutch plates and annular clutch discs, a removable sleeve mounted on said end portion of said crankshaft in surrounding relation and supporting said clutch plates for rotation therewith, means for retaining said sleeve on said end portion of said crankshaft, a housing supported by said engine and enclosing said clutch plates and clutch discs, an output shaft supporting said fan, bearing means retained by said housing and supporting said output shaft and said fan for rotation on an axis aligned with the axis of said crankshaft, means on said output shaft for supporting said clutch discs for rotation therewith, said sleeve having means defining at least one fluid passage extending generally axially along said end portion of said crankshaft and into said clutch plates, means on said sleeve and defining a fluid outlet for said passage within said clutch plates, means on said sleeve and defining a fluid inlet for said passage spaced axially from said clutch plates, and actuator means for moving said clutch plates and discs between a clamped engaged position and a released position to control the rotation of said fan with respect to said crankshaft.

4,074,664

FUEL CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Ralph T. Rollins, Holladay, Utah, assignor to Astron Innovations, Inc., Salt Lake City, Utah

Filed Feb. 12, 1976, Ser. No. 657,352
Int. Cl.[2] F02M *31/10*
U.S. Cl. 123—75 B **5 Claims**



1. A fuel control system for internal combustion engines comprising

a stratified charge igniter having a housing with one end adapted to be screwed into the spark plug opening of an internal combustion engine, a bore through the housing, a secondary combustion chamber in the bore at the other end of the housing, a spark plug opening through the housing and opening into the secondary combustion chamber, a spark plug in the spark plug opening;

a fuel line adapter having a passage therethrough extending through the housing into the secondary combustion chamber, and a pressure responsive valve in the fuel line adapter, said valve allowing flow into the secondary combustion chamber but preventing flow therefrom through the fuel line adapter;

means including a water jacket for circulating liquid around at least part of the housing to cool the housing;

a secondary carburetor;

a fuel line interconnecting said secondary carburetor and the fuel line adapter, whereby an air-fuel mix is supplied to the secondary combustion chamber from the secondary carburetor through the fuel line;

means to heat the air-fuel mix said means comprising

a line surrounding the fuel line,

conduit means interconnecting the interior of the water jacket with the interior of said line surrounding the fuel line,

a pre-heater unit in the fuel line, said pre-heater unit including heated baffle means through which the air-fuel mix is passed, and

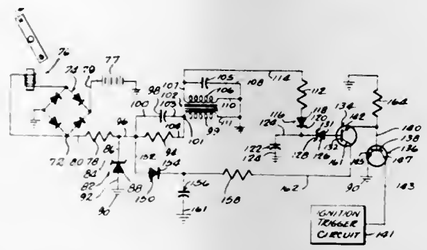
means coupling the interior of the water jacket to the pre-heating means, whereby liquid cooling the igniter is used to heat the baffle means.

4,074,665

ENGINE SPEED LIMITER

Bruce L. Patis, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Division of Ser. No. 831,007, June 6, 1969, abandoned. This application Oct. 19, 1971, Ser. No. 190,651
Int. Cl.[2] F02D *11/10*; **F02P** *1/00*
U.S. Cl. 123—102 **5 Claims**



1. Apparatus for interrupting ignition operation, said apparatus comprising an ignition trigger circuit, a first capacitor, a first resistor, a lead connecting one terminal of said first capacitor with a voltage generating device, a lead connecting the other terminal of said first capacitor with one side of said first resistor, a diode having an anode and a cathode, a lead connecting the anode of said diode to the other side of said first resistor, a second resistor, a lead connecting one side of said second resistor to the anode of said diode, a lead connecting the other side of said second resistor to ground, a zener diode having an anode and a cathode, a lead connecting the cathode of said zener diode with the cathode of said diode, a second capacitor, a lead connecting one terminal of said second capacitor with the cathode of said zener diode, a lead connecting the other terminal of said capacitor to ground, a third resistor, a lead connecting one side of said third resistor to the anode of said zener diode, a first transistor having a base, emitter and collector, a lead connecting the other side of said third resistor to the base of said first transistor, fourth and fifth resistors, a lead connecting the collector of said first transistor to one side of said fourth resistor, a battery, a lead connecting the other side of said fourth resistor to one side of said battery, a lead connecting the other side of said battery to ground, a lead connecting the emitter of said first transistor to said fifth resistor, a lead connecting the other side of said fifth resistor to ground, a second transistor having a base, a collector and an emitter, a lead connecting said base of said second transistor with said emitter of said first transistor, a lead connecting said emitter of said second transistor to ground, and a lead connecting said collector of said second transistor to said ignition trigger circuit.

4,074,666

CARBURETION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Sherman L. Pierce, P.O. Box 81, and Harold D. Pierce, P.O. Box 73, both of Birchwood, Tenn. 37308

Filed Sept. 17, 1975, Ser. No. 614,124
Int. Cl.[2] F02M *17/22*
U.S. Cl. 123—134 **5 Claims**

1. In combination with an internal combustion engine having a variable volume combustion chamber, a carburetion systems comprising:

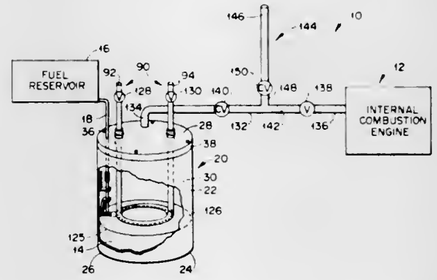
reservoir means containing a quantity of liquid fuel,

closed container means defining a chamber,

first conduit means providing fluid communication between said reservoir means and said container means,

means, comprising a vertically adjustable bracket frictionally engaging said first conduit and a float valve secured to the lower end of said first conduit, regulating the flow of fuel from said reservoir to said chamber to that quantity of liquid fuel that establishes an adjustable predetermined level of liquid fuel within said chamber,

air intake means providing fluid communication between ambient atmosphere external to said chamber and said chamber, and including diffuser means disposed within said chamber adjacent and above the surface of said fuel, said diffuser means being provided with a plurality of ports on that portion thereof that faces said surface of said liquid fuel whereby air passing through said air intake



means is diffused into said chamber adjacent the surface of said fuel and forms a combustible gaseous mixture with said fuel above the surface of said fuel in said chamber and whereby diffused air does not pass upwardly through liquid fuel,

sealed, slidably mounted means for adjusting the proximity of said diffuser means relative to said surface of said liquid fuel in said container means,

further conduit means connecting said chamber at a location above the level of said liquid fuel therein to said combustion chamber,

check valve means disposed in said further conduit means and establishing unidirectional fluid flow through said conduit means in the direction toward said internal combustion engine and away from said chamber, and

throttle means selectively operable to regulate the flow of combustible mixture through said further conduit means into said internal combustion engine.

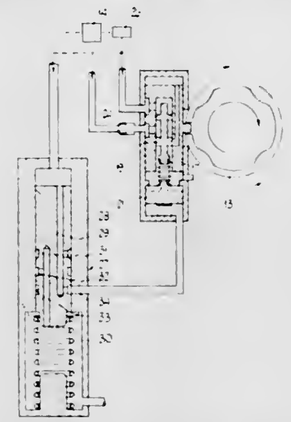
4,074,667

LIQUID FUEL INJECTION PUMPING APPARATUS

Robert Thomas John Skinner, High Wycombe, England, assignor to C.A.V. Limited, Birmingham, England

Continuation of Ser. No. 595,426, July 14, 1975, abandoned. This application Oct. 26, 1976, Ser. No. 735,524
Claims priority, application United Kingdom, July 19, 1974, 32019/74
Int. Cl.[2] F02M *59/20*
U.S. Cl. 123—139 AQ **3 Claims**

1. A liquid fuel injection pumping apparatus for supplying fuel to an internal combustion engine comprising an injection pump adapted to be driven in timed relationship with an associated engine, a fluid pressure operable member for controlling the timing of delivery of fuel to the associated engine, means for generating a fluid pressure responsive to an operating characteristic of the associated engine, conduit means through which said pressure is applied to said member, resilient means loading said member against the action of the fluid pressure, a pressure responsive piston forming an abutment for said resilient means, said piston being movable from a first to a second position when pressure is applied thereto as to vary the force exerted by said resilient means on said member, a pressure responsive valve for controlling the application of pressure to said piston, said valve comprising a valve cylinder, a valve element movable in said cylinder, a port in the wall of said valve cylinder, further conduit means for communicating the pressure at said port to said pressure responsive piston, resilient means biasing said valve element to one end of said cylinder, a pair of axially spaced grooves on said valve element, a pair of passages through which said grooves communicate with the



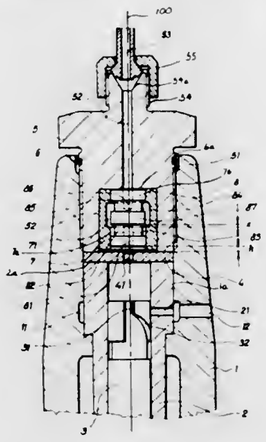
opposite ends of the valve cylinder respectively, passage means communicating the other end of said valve cylinder with the means generating said fluid pressure so that the valve element moves in response to variations in said fluid pressure, and further passage means through which said one end of the cylinder communicates with a drain, said valve element acting depending on its position, to place said port in communication with one or the other end of said valve cylinder.

4,074,668

DISCHARGE VALVE FOR INJECTION PUMPS OF INTERNAL COMBUSTION ENGINES

Jaromir Indra, Brno, Czechoslovakia, assignor to Vysoke uceni technicke, Brno, Czechoslovakia

Filed Feb. 9, 1976, Ser. No. 656,651
Claims priority, application Czechoslovakia, Feb. 14, 1975, 969/75
Int. Cl.[2] F02M *59/02*
U.S. Cl. 123—139 AF **8 Claims**



1. A piston-type injection pump for supplying fuel through a discharge conduit to an injector of an internal combustion

engine, the pump comprising, in combination a cylinder having a fuel supply port in a wall thereof, a piston supported for rotation and reciprocation in the cylinder to effect the pressure and suction strokes of the pump, the piston having a profiled peripheral edge cooperable with the fuel supply port in the cylinder during the piston movement for effecting a flow of fuel through the fuel supply port, the space between the piston and the associated end of the cylinder defining a first chamber; means associated with the cylinder and disposed downstream of the first chamber for defining a second chamber separated from but in fluid communication with the first chamber, said second chamber having upper, lower and side walls, a discharge channel, the downstream end of the second chamber communicating with the upstream end of the discharge channel; a relief piston being movably mounted in said second chamber between an upstream position in which the relief piston contacts the upper wall of said second chamber and a downstream position in which the relief piston is spaced a predetermined minimum distance from the lower wall of said second chamber, said side wall defining an annular space in said second chamber disposed between said relief piston and side wall, said side wall and relief piston defining a maximum flow-through area for the fuel therebetween when said relief piston is in said upstream position, said maximum flow-through area being substantially equal to the cross-sectional flow-through area of said discharge channel.

4,074,669

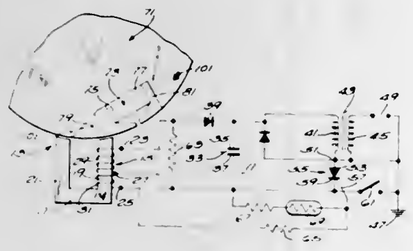
ROTOR CONTROLLED AUTOMATIC SPARK ADVANCE

David T. Cavil, Menomonee Falls, Wis.; Einar T. Hansen, Galesburg, Ill., and Henry J. Schmidt, Menomonee Falls, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Continuation of Ser. No. 551,087, Feb. 20, 1975, abandoned. This application Dec. 29, 1976, Ser. No. 755,179

Int. Cl.[2] F02D *3/06*

U.S. Cl. 123—148 CC **1 Claim**



1. A method of operating an internal combustion engine ignition system to permit normal engine operation in a desired direction of rotation and to prevent engine operation in the direction of rotation reverse to the desired direction, which ignition system includes a capacitor adapted to be charged, a switch operative to discharge the capacitor, and relatively rotatable magnet and core parts adapted to charge the capacitor and to operate the switch, the core part having thereon a coil and including first and second legs and the magnet part having arcuately spaced first and second pole shoes with the first pole shoe extending in spaced relation from the second pole shoe in the direction of desired rotation and having an arcuate length which is greater than the spacing of the first and second legs of the core, which method comprises the steps of rotating the magnet and core relative to each other to initially cause inflow of flux in one direction on the core to produce in the coil a first pulse which, when the engine is operating in the desired direction, is of the polarity which is ineffective to operate the switch and which, when the engine is operated in the reverse direction, is of the other polarity and of sufficient magnitude to operate the switch to discharge the capacitor so far in advance of top dead center so as to preclude continued reverse engine rotation, to thereafter cause outflow of flux in the opposite direction from the core to produce in the coil a second pulse which, when the engine is operating in the desired direction, is of the opposite polarity and of insufficient magnitude to operate the switch to cause discharge of the capacitor when the engine is operating at slow speed and of sufficient magnitude to operate the switch to discharge the capacitor when the engine is operating at high speed, to thereafter cause inflow of flux into the core so as to produce in the coil a third pulse which, when the engine is operating in the desired direction, is of the opposite polarity and is effective to operate the switch to discharge the capacitor when the engine is operating at slow speed, and to thereafter cause reversal of flux flow so as to produce in the coil a fourth pulse which, when the engine is operating in the desired direction, is of the polarity which is ineffective to operate the switch and which can be employed to charge the capacitor.

4,074,670

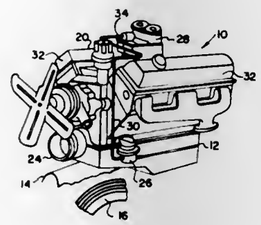
ENGINE EFFICIENCY SYSTEM

Charles Roberts, Howell, and Ernest DeMichele, Farmington Hills, both of Mich., assignors to Mectronic Inc., Detroit, Mich.

Filed Aug. 14, 1975, Ser. No. 604,792

Int. Cl.[2] F02N *7/00;* **F02B** *77/00*

U.S. Cl. 123—119 E **6 Claims**



1. In combination with an internal combustion engine having a fuel line and an electrical system including means generating an electrical induction field, an engine efficiency device comprising:

a pair of closely adjacent electrically conductive coils disposed on substantially parallel axes and located within said induction field, said coils comprising windings having their ends connected with each other, and

means mounting said device adjacent said fuel line, said means comprising a wire member electrically insulated from said coils.

4,074,671

THIN AND LOW SPECIFIC HEAT CERAMIC COATING AND METHOD FOR INCREASING OPERATING EFFICIENCY OF INTERNAL COMBUSTION ENGINES

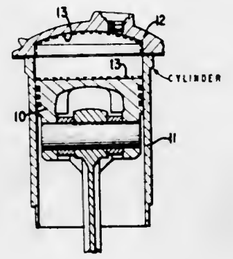
Simo A. O. Pennila, 66B River Bend Road, Stratford, Conn. 06497

Continuation of Ser. No. 519,664, Oct. 31, 1974, abandoned. This application July 26, 1976, Ser. No. 708,838

Int. Cl.[2] F02B *23/00;* **F16J** *1/04*

U.S. Cl. 123—191 A **2 Claims**

1. An internal combustion engine with a cycle including a compression stroke, a work stroke and an exhaust stroke, said engine having a coated internal wall surface of the combustion chamber thereof, said internal wall surface having a thin coating thereon of ceramic material, the exposed surface of said coating being able to increase and decrease its temperature very rapidly in response to temperature changes in the combustion chamber during said strokes, said coating having a thickness from 0.2 to 1 mil, said ceramic material forming said coating having a specific heat of less than 0.12 BTU/lb/° F at a temperature between 1200° and 2000° F., and said ceramic material also having a thermal conductivity of less than 11 BTU/HR/FT/° F at a temperature between 1200 and 2000° F. so that the temperature of the exposed surface of said thin coating during the work stroke is rapidly raised to a temperature close to the temperature of the hot gas in the combustion chamber, whereby due to the momentarily smaller temperature differences between the hot gas and the exposed surface of



said coating there is a reduced heat transfer from the hot gas inwardly into said internal wall surface for the remainder of the work stroke, and so that the temperature of the exposed surface of said thin coating after the work stroke rapidly cools during the exhaust and compression strokes thereby being again cool for the beginning of the next work stroke, thus reducing heat loss into the internal wall surface of the combustion chamber and increasing engine efficiency.

4,074,672

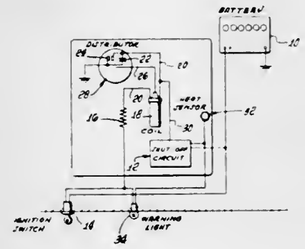
SHUTOFF APPARATUS FOR INTERNAL COMBUSTION ENGINES

Donn LaDue, Hollywood; Robert J. Winchurch, and Gary R. Scaife, both of Los Angeles, all of Calif., assignors to S & S Research and Electronics, Tarzana, Calif.

Filed Jan. 23, 1976, Ser. No. 651,850

Int. Cl.[2] F02B *77/08*

U.S. Cl. 123—198 DC **32 Claims**



16. A method of shunting an induction coil in an ignition system of an internal combustion engine, said method comprising:

closing a normally open switch in the ignition circuit, said switch providing a path to ground,

delaying the voltage buildup a predetermined amount after said switch is closed,

supplying the built up delayed voltage to a biased means,

supplying reduced voltage from the biased means to fire a gated switch in series with said normally open switch,

firing the gated switch to actuate means to close a switch operated by said last means, and

supplying negative voltage through the closed normally open switch and through the last means closed switch to the primary circuit of the induction coil to shunt the coil.

4,074,673

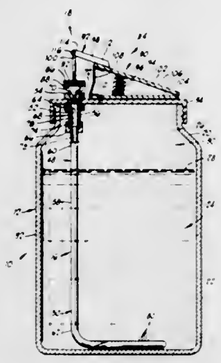
FLUID VAPOR INJECTOR

Jack L. Rushing, 5006 S. Blackwelder, Oklahoma City, Okla. 73119

Filed July 19, 1976, Ser. No. 706,750

Int. Cl.[2] F02D *19/00;* **F02M** *17/22*

U.S. Cl. 123—198 A **2 Claims**



1. A fluid vapor injector for injecting a fluid vapor into the intake manifold of an internal combustion engine, the injector comprising:

a reservoir for retaining a quantity of the fluid, the reservoir having an upper end, a lower end, and a vapor chamber defined therein generally between the upper level of the fluid and the upper end of the reservoir;

a fluid vapor conduit having one portion connected to the vapor chamber and another portion connected to the intake manifold, the fluid vapor conduit providing fluid communication between the vapor chamber and the intake manifold;

an aerator having an upper end extending through the upper end of the reservoir and a foraminous portion disposed in the fluid, the aerator providing fluid communication between the upper end thereof and the foraminous portion thereof; and

a valve assembly comprising:

a valve seat formed in the upper end of the aerator;

a bellows disposed generally above, and connected to, the upper end of the reservoir, the bellows comprising:

a base member connected to the upper end of the reservoir;

a hinged member pivotally connected to the base member, the hinged member being movable in one direction generally away from the base member and in one other direction generally toward the base member; and

a resilient diaphragm sealingly connected between the base member and the hinged member, the resilient diaphragm cooperating with the base member and the hinged member to define the interior of the bellows;

a biasing spring disposed in the interior of the bellows between the base member and the hinged member, the biasing spring biasing the hinged member in the one direction generally away from the base member;

means providing fluid communication between the interior of the bellows and the vapor chamber;

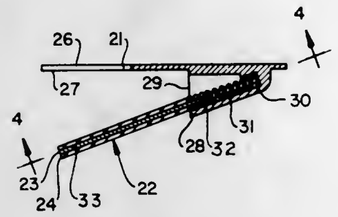
an actuator rod having a first end connected to the hinged member and a second end extending over the valve seat, the actuator rod moving with the hinged member; and

a valve stem pivotally connected to the second end of the actuator rod and depending generally downwardly toward the valve seat; and

a valve threaded onto the valve stem adjacent to and vertically above the valve seat, the valve moving with the actuator rod toward seating engagement with the valve seat as the hinged member moves toward the base member

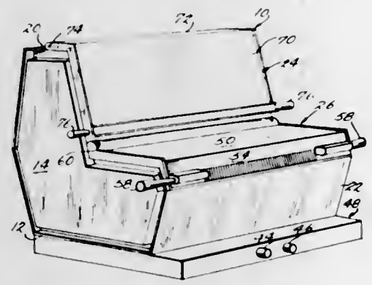
and away from seating engagement with the valve seat as the hinged member moves away from the base member, the position of the valve with respect to the valve seat determining the rate of flow of air through the aerator.

4,074,674
ARROW REST
Miroslav Andrew Simo, Riverside, Ill., assignor to New Archery Products Corporation, Riverside, Ill.
Filed Aug. 2, 1976, Ser. No. 710,647
Int. Cl.[2] F41D *11/00*
U.S. Cl. 124—41 A **19 Claims**



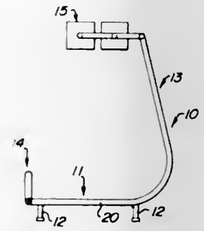
1. An arrow rest for attachment to an archery bow comprising:
mounting means to secure said arrow rest in desired position on a first side of a bow adjacent the shaft of an arrow when in position to be shot from a bow;
spring means extending outwardly from said first side of a bow when said arrow rest is attached to a bow, said spring means having a first end in fixed relation to said mounting means and the opposite second end movable means and the opposite second end movable in a first plane generally parallel to the plane of a bow and in a second plane generally at right angles to said first plane;
arrow support means having a first end in fixed relation to said second end of said spring means an an opposite second end adapted to provide the complete support to an arrow shaft, freely resting on the top thereof, in the vicinity of a bow; and
spring housing means immovably affixed to said mounting means for securement of said first end of said spring means and for providing movement restriction to said spring means.

4,074,675
COOKING DEVICE
Donald E. Dailey, Evansville, Ind., assignor to Arkla Industries, Inc., Evansville, Ind.
Filed Nov. 19, 1975, Ser. No. 633,393
Int. Cl.[2] A47J *37/00*
U.S. Cl. 126—41 R **11 Claims**



1. A cooking device comprising a hollow casing having top, bottom side, rear and front walls, said casing defining a first cooking space located in the lower front portion of the casing and defining a second cooking space disposed above and rearwardly of said first space and in communication with said front space, a front horizontal food-supporting structure disposed in said first space, a heat source disposed in said first cooking space directly below said front food-supporting structure and generally coextensive therewith, a rear horizontal food-supporting structure disposed in said second space at a location rearward and above said front structure, and door means forming at least a part of said front wall for providing access to said foodsupporting structures, said door means when closed including a lower forward portion which directs the heat and hot gases flowing through said first cooking space into said second space, said forward portion overlying and at least substantially coextensive with said front food-supporting structure, said door means further including an upper portion disposed rearwardly of and above said lower portion and in a generally upright plane in front of said rear food-supporting structure, and means defining a hot gas outlet in said casing located above said rear food-supporting structure.

4,074,676
WATER HEATER-FIREPLACE GRATE
Donald Richard Thomas, 206 Tule St., Montoursville, Pa. 17754
Filed May 28, 1976, Ser. No. 690,973
Int. Cl.[2] F24B *9/04*
U.S. Cl. 126—132 **6 Claims**



1. A water heater-fireplace grate comprising a plurality of forwardly and rearwardly extending generally horizontal bed pipes disposed in generally coplanar relation and providing a fuel supply bed, an ingress and egress pipe extending laterally across the forward ends of said bed pipes and in fluid communication with at least certain and less than all of the latter for feeding fluid thereto and in fluid communication with other of the bed pipes for receiving fluid therefrom, a plurality of rear pipes upstanding from the rear regions of said bed pipes, certain of said rear pipes being in fluid communication with said certain bed pipes to receive fluid therefrom and other of said rear pipes being in fluid communication with said other of said bed pipes to feed fluid thereto, and heat collection means extending from said rear pipes in spaced relation over said bed pipes, said heat collection means having fluid passageway means communicating between said certain rear pipes for passing fluid between said certain bed pipes, whereby fluid is adapted to be heated upon passage through said grate.

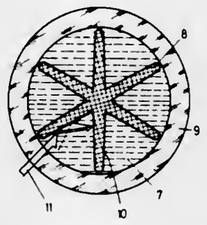
4,074,677
OVEN DOOR FULL FRONT VIEWING PANEL
Lawrence C. Lotz, Marion, Ohio, assignor to Whirlpool Corporation, Benton Harbor, Mich.
Filed June 16, 1976, Ser. No. 696,533
Int. Cl.[2] F23M *7/04*
U.S. Cl. 126—198 **17 Claims**

1. In an oven door provided with a liner having a window, and a front transparent panel having an edge portion, the improvement comprising: a frame having a rear portion adjacent the liner, a forward portion including a front flange defining a front window opening, and a retainer portion defining an inwardly opening recess rearwardly of said flange; retaining means for retaining the front panel in said frame including a plurality of resilient bumpers at spaced portions of the frame each having a clamping portion engaging the rear surface of said front panel edge portion, a plurality of retaining clips associated one each with said plurality of bumpers, each clip including a front portion engaging said bumper clamping portion, a positioning portion received in said frame recess to position said clip front portion suitably to effect a preselected



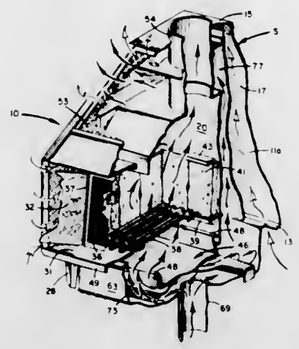
compression of said bumper clamping portion to clamp the front panel edge portion between said bumper clamping portion and said frame flange, and a securing portion; means for retaining said securing portion to prevent movement of said positioning portion inwardly from said frame recess and thereby effectively maintain the clamped mounting of the front panel to the frame; and securing means for removably securing said frame to said liner.

4,074,678
METHOD AND APPARATUS FOR HEATING A FLUID MEDIUM BY MEANS OF SOLAR ENERGY
Mario Posnansky, Pappelweg 4, 3072 Ostermundigen, Switzerland
Continuation-in-part of Ser. No. 537,677, Dec. 30, 1974, abandoned. This application June 17, 1976, Ser. No. 696,873
Claims priority, application Switzerland, Jan. 7, 1974, 113/74
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **6 Claims**



1. A receiver for concentrated solar radiation designed to heat a substantially transparent fluid, comprising
a tube permeable to solar light radiation,
an elongated body capable of absorbing solar radiation disposed within said tube,
said body including a series of vanes depending from a common axis, said vanes being disposed about said common axis in a star-like configuration, with inner edges thereof substantially adjacent to each other, so that adjoining vanes are separated by an angle of not more than 72°, and
said body having an outer surface area at least twice as great as the inner surface area of said tube, so that light radiation impinging on the outer surface thereof is being repeatedly reflected by the surface thereof for substantially complete absorption thereby.

4,074,679
FIREPLACE STOVE
John Frank Jensen, 5220 Ponder, Boise, Idaho 83702
Filed Nov. 3, 1975, Ser. No. 628,371
Int. Cl.[2] F24B *7/00*
U.S. Cl. 126—121 **6 Claims**



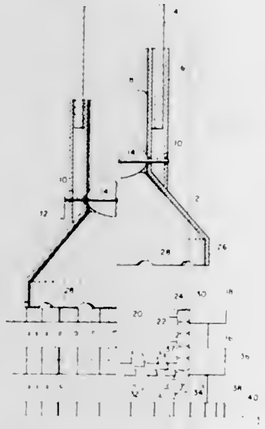
1. A freestanding fireplace stove for heating a space within a building structure comprising, in combination, a housing having a sidewall including a bottom edge and an upper portion defining an interior, a combustion enclosure having a sidewall defining an interior and a bottom end portion disposed within the interior of said housing, with the outer surface of said combustion enclosure sidewall in spaced-apart relationship with the inner surface of said housing sidewall to define a clearance space for providing a passage for air to be heated, partition means disposed within said clearance space arranged substantially parallel to said housing sidewall and said combustion enclosure sidewall in spaced relationship with both said enclosure sidewall and said housing sidewall for the transfer of radiant heat from said combustion enclosure sidewall to the air flowing within said clearance space, means for supporting said housing and said combustion enclosure on a supporting surface within the building structure, fuel combustion means disposed within said combustion enclosure adjacent said combustion enclosure bottom end portion, an access opening in said combustion enclosure, closure means for closing said access opening, air inlet means for admitting air to be heated into said clearance space, air outlet means for discharging heated air from said clearance space into the space to be heated in the building structure, conduit means connected to said combustion enclosure and extending through said housing side wall upper portion for removing combustion gases from the interior of said combustion enclosure.

4,074,680
TELESCOPING HOOD FIREPLACE
Marvin Sexton Gooding, P.O. 36D, R.R. #4, Tiffin, Ohio 44883
Filed July 9, 1976, Ser. No. 703,877
Int. Cl.[2] F24C *15/20*
U.S. Cl. 126—142 **16 Claims**

1. An improved fireplace comprising, in combination:
A. a fire support means operable for supporting a fire, including a fireplace base operable to be mounted upon a floor surface and air conduit means within said base for supplying ambient air to the bottom of said fireplace base, and;

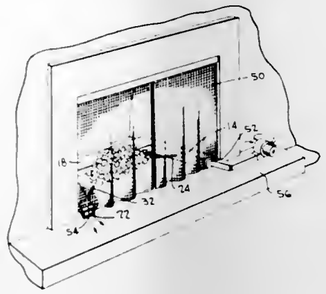
B. a stationary smokepipe operable to be mounted above and in substantial vertical alignment with said fire support means, said stationary smokepipe extending downwardly to a point spaced above an upper platform on said fireplace base, and;

C. a telescoping hood means, positioned for vertical movement upon the downward extension of said stationary smokepipe, said hood means further comprising an inner stackpipe, concentrically within, and an outer stackpipe, concentrically outside, said smoke pipe with a downwardly open hood extending from said inner stackpipe,



wherein said hood is in sealing engagement with bottom surfaces of said inner and outer stackpipes and defines an annular space between the inner and outer stack pipes which space is substantially occupied by the stationary smoke pipe to define a labyrinth seal while it is operable to be adjustably positioned between said upper platform and said point spaced thereabove, wherein said downwardly opening hood further includes a lower edge operable for engaging the upper platform on said fireplace base, and said lower edge includes at least one aperture operable to allow room air to enter within said hood when said hood is lowered upon said upper platform.

converging toward one another to provide air along said conduit base to maintain fuel on said conduit live whereby



starting of a fire in the fireplace is aided, smoking of the fuel is reduced and the fuel is completely burned.

4,074,681
FORCED AIR CIRCULATION HEATING UNIT FOR FIREPLACES
Isaac C. Whiteley, Redmond, Oreg., assignor to W-A Red Hot, Inc., Redmond, Oreg.
Filed Jan. 30, 1975, Ser. No. 545,402
Int. Cl.² F23H *13/00*
U.S. Cl. 126—164 **6 Claims**

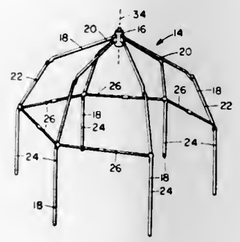
1. A forced air circulation heating unit for installation in a fireplace comprising

a generally U-shaped conduit formed of an inlet leg having an end defining an inlet for said conduit, and outlet leg having an end defining an outlet for said conduit, and a base joining said inlet and outlet legs, said conduit being adapted to be

positioned on the floor of the fireplace with said inlet and outlet disposed on opposite sides of the fireplace; fan means for blowing air through said conduit from said inlet to said outlet such that air forced through said conduit is heated by fuel burned in the fireplace to supply a flow of hot air from said outlet of said conduit; and jet means including a first tube extending from said inlet leg for directing a first stream of air along said inlet leg at said conduit base and a second tube extending from said outlet leg for directing a second stream of air along said outlet leg at said conduit base, said first and second streams of air

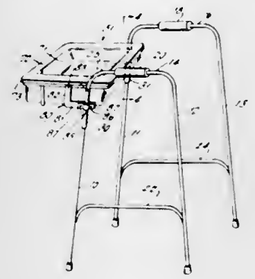
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4,074,682
COLLAPSIBLE TENT FRAME
Chong J. Yoon, 145 Conestoga St., Windsor, Conn. 06095
Filed Nov. 8, 1976, Ser. No. 739,932
Int. Cl.² A45F *1/16*
U.S. Cl. 135—4 R **10 Claims**



1. A tent frame readily changeable between a deployed condition and a compact collapsed condition, said tent frame comprising: a central hub having a central axis oriented vertically in said deployed condition of said frame, a plurality of legs spaced angularly of one another about said central axis, each of said legs including a plurality of sections pivotally connected to one another to enable said sections of each leg to be moved between a relatively spread condition and a relatively folded condition, said sections of each leg including an inboard section having an inboard end adjacent said hub and an outboard end remote from said hub, means connecting said inboard end of the inboard section of each of said legs to said hub for movement relative to said hub about a first pivot axis located in a plane perpendicular to said central axis and perpendicular to a radial line to said central axis, a central part carried by said hub and manually rotatable relative thereto, and a mechanism carried by said hub for simultaneously angularly moving all of said inboard sections of said legs relative to said hub about said first pivot axes in a deploying direction, in which said outboard ends of said inboard sections move away from said axis, in response to rotation of said central part in one direction and in a collapsing direction, in which said outboard ends of said inboard sections move toward said central axis, in response to rotation of said central part in the opposite direction.

4,074,683
WALKER WITH TRAY
Anthony J. Di Chiara, 10 St. Paul's Crescent, Garden City, N.Y. 11530
Filed June 7, 1976, Ser. No. 693,604
Int. Cl.² F16M *13/08;* **A45B** *3/00*
U.S. Cl. 135—67 **3 Claims**



1. A walker for infirm individuals and a tray cradle therefor; said walker comprising a pair of front legs and a pair of rear legs;

a horizontal bar connecting each front leg to a rear leg, the said front and rear leg and horizontal bar on each side forming a frame;

the said horizontal bar on each side providing a hand grip;

a crossbar interconnecting said front legs and forming said walker into a rectangular structure which may be entered from the rear by the infirm individual who may then grip said horizontal bars;

and a cradle supported between said front legs and extending substantially forward of said front legs and also extending above said crossbar;

said cradle being swingably supported between said front legs to stay level during use;

and a removable tray supported in said cradle;

said cross-bar extending adjacent the rear end of said cradle and forming a stop and support for said end of said cradle;

the support for said cradle comprising a bracket member secured to and extending forward of each front leg; a vertically directed slot in each bracket member having an opening substantially at the top of said bracket member;

a securing member extending in part, horizontally from each side of said cradle;

said securing member being receivable in and resting in said slot.

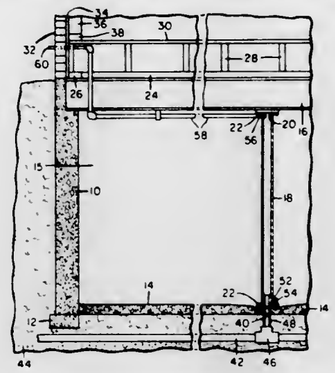
4,074,684
DRAIN SYSTEM FOR PROTECTING BUILDINGS AGAINST FLOODING AND METHOD
John W. Biesel, 3139 Taylor Drive, Jeffersonville, Ind. 47130
Filed Aug. 23, 1976, Ser. No. 716,543
Int. Cl.² E03F *1/00*
U.S. Cl. 137—1 **11 Claims**

9. A method for protecting a building against flooding caused by the overflow of a liquid from a liquid drain line into said building to which said drain line is connected, the steps of which comprise

providing means for draining a floor of a liquid,

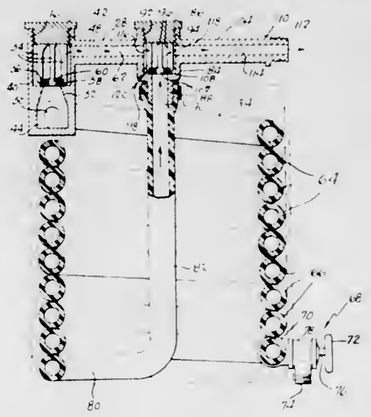
connecting in a watertight manner said floor draining means to a ceiling supporting column defining a hollow interior which rises a preselected distance above said floor draining means, and

venting said hollow interior at a preselected vertical distance above said floor draining means to permit said liquid to



recede from said hollow interior through said floor draining means as said overflow subsides.

4,074,685
APPARATUS FOR MIXING MEDICATION WITH WATER SUPPLY
Gilbert E. Dodd, Rte. 6, Boaz, Ala. 35957
Filed July 16, 1976, Ser. No. 706,114
Int. Cl.² F16K *19/00*
U.S. Cl. 137—101.11 **15 Claims**



1. Apparatus for mixing a first liquid with a second liquid which comprises:

means for containing a first liquid which comprises a multiple-loop coiled tubular conduit having an inlet end and an outlet end;

conduit means connected to said inlet end for providing a second liquid to be mixed with said first liquid;

means coupled to said outlet end of said containing means for combining said first and second liquids; and

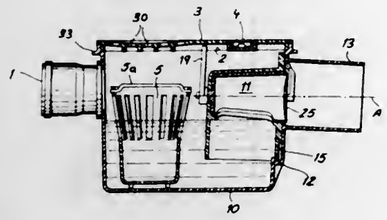
said second liquid comprising means in fluid communication with said containing means for driving said first liquid to said combining means.

4,074,686

MANUALLY CLOSABLE ANTI-BACKUP TRAP

Bernhard Kessel, Ingolstadter Str. 20, 8073 Kosching, Germany

Filed May 20, 1976, Ser. No. 688,282
Claims priority, application Germany, May 21, 1975, 2522426; May 21, 1975, 2522427
Int. Cl.² E03C *1/286, 1/288*
U.S. Cl. 137—247.19 **6 Claims**



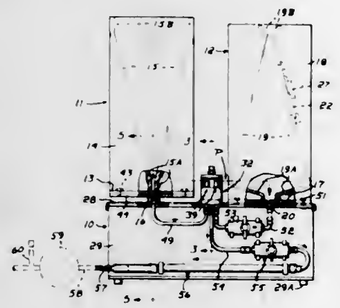
1. An anti-backup trap for a drain, comprising:
an upwardly open housing having a sidewall provided with an exit port for entering waste water;
a tubular insert in said housing adjacent said sidewall, said insert having a bottom inlet beneath the level of said exit port and a side outlet registering with said exit port;
a flap hinged to said insert for outward swinging to facilitate the outflow of water, said flap forming a check valve to prevent the return of water from said exit port to said housing; and
manually operable shutter means in said insert interposed between said inlet and said outlet, said shutter means being accessible through the top of said housing;
said insert being provided with an apertured partition curved about a substantially horizontal axis, said outlet being substantially centered on said axis, said shutter means comprising a tubular valve body with a peripheral wall conforming to the curvature of said partition, said body resting on said partition for rotation about said axis and having a peripheral opening alignable with an aperture of said partition in an unblocking position.

4,074,687

METHOD OF AND APPARATUS FOR USE IN GENERATING LIQUID CONCENTRATION GRADIENTS HYDROSTATICALLY

John E. Joyce, 22 Nelson Road, South Weymouth, Mass. 02190

Filed June 30, 1976, Ser. No. 701,173
Int. Cl.² G05D *11/03*
U.S. Cl. 137—266 **15 Claims**



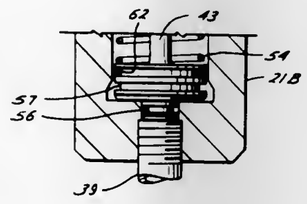
1. A hydrostatic liquid concentration gradient generator including first and second chambers open at their upper ends, the first for a first liquid and the second for a second liquid, said chambers including portions of the same volumetric capacity and of a cross section that decreases vertically in area in the same manner from a maximum at one end to a minimum at the other with the smallest cross sectional area of the first chamber portion and the largest cross sectional area of the second chamber portion the bottoms thereof, and a pressure regulator including an outlet and inlets, one inlet for each chamber and placed in communication with the bottom thereof and both inlets opening in the pressure regulator above the outlet thereof independently of each other and at the same level to establish a pressure reference plane, the inlet in communication with the second chamber and the outlet each including an on-off valve, and the second chamber positioned with the maximum cross sectional area of its tapering portion in said pressure reference plane.

4,074,688

PILOT VALVE

David E. Snyder, Longview, Tex., assignor to U. S. Industries, Inc., New York, N.Y.

Division of Ser. No. 663,272, March 3, 1976. This application May 23, 1977, Ser. No. 799,214
Int. Cl.² F16K *17/00*
U.S. Cl. 137—269 **1 Claim**



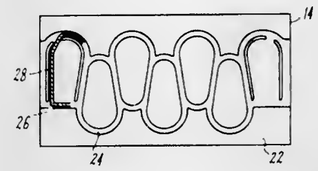
1. A valve, comprising a body having a bore extending longitudinally therein and lateral ports connecting with the bore at longitudinally spaced locations, a valving element longitudinally reciprocable within the bore between first and second positions, said valving element having longitudinally spaced seal rings thereabout sealably slidable within the bore for controlling the flow of a first fluid between the lateral ports in each of said positions, said body having a chamber at one end of the bore including a cylinder having an inner enlarged diameter portion, an outer reduced diameter portion disposed coaxially of the bore and a circumferential recess at the intersection of the enlarged and reduced portions, a piston longitudinally reciprocable within the cylinder between first and second positions, means connecting the valving element to the piston for longitudinal movement therewith between its first and second position, said piston including an enlarged diameter portion longitudinally reciprocable within the enlarged diameter cylinder portion and a reduced diameter portion longitudinally reciprocable within the reduced diameter cylinder portion, said reduced piston portion having a first groove thereabout to receive a first seal ring for sealably sliding within the reduced cylinder portion said body having a port therein connecting with the reduced cylinder portion on the outer side of the first seal ring thereabout, said enlarged piston portion having second and third longitudinally spaced grooves thereabout each to receive second and third seal rings, respectively, for sealably sliding within the enlarged cylinder portion, the third groove being so located that when the third seal ring is received therein, it remains sealably engaged with the enlarged cylinder portion during reciprocation of the piston between its first and second positions, whereby, in the absence of said first and second seal rings, the piston is urged from its second toward its first position by a force due to the pressure of the second fluid acting over the third seal ring, and the second groove being so located that when the second seal ring is received therein, it is disposed within said recess when the piston is in its second position, but moves into sealing engagement with the enlarged cylinder portion when the first seal ring moves out of sealing engagement with the reduced cylinder portion, whereby, in the absence of said third seal ring, the piston is initially urged from its second toward its first position by a force due to the pressure of the second fluid acting over the first seal ring and then by a force due to the pressure of said second fluid acting over the second seal ring.

4,074,689

SPOOL VALVE DISTRIBUTOR

Daniel Lenay, Puteaux, France, assignor to Societe Anonyme des Establissements Jouvenel & Cordier, Rueil-Malmaison, France

Filed Dec. 13, 1976, Ser. No. 750,111
Claims priority, application France, Jan. 26, 1976, 76 01958
Int. Cl.² F17B *1/08*
U.S. Cl. 137—270 **6 Claims**



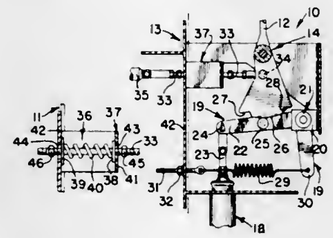
1. Spool-valve distributor of the type comprising a pair of control pistons operating in opposition to each other and two end covers provided with passage means for circulating the piston control fluid, wherein the assembling face of the body of said distributor comprises in a manner known per se grooves adapted to receive a seal interposed between the base member solid with the hydraulic or pneumatic device actuated by said distributor and the distributor body, some of said grooves being provided with lateral ribs, the positioning of said seal on one or the other side of said ribs permitting of sealing said distributor body with base members having different standards and dimensions.

4,074,690

PRE-ADJUSTED CONTROL MODULE FOR CONSTRUCTION VEHICLES

Stanley B. Adams, Yorkville; Frederick A. Carbaugh, East Aurora, and John R. Cryder, Joliet, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 8, 1976, Ser. No. 674,785
Int. Cl.² G05G *1/04, 13/00*
U.S. Cl. 137—344 **17 Claims**



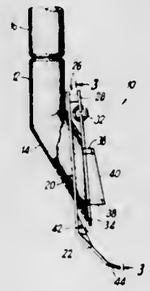
1. A control module adapted for preadjustment and mounting on a vehicle comprising
a bracket assembly adapted for attachment to a support structure of said vehicle,
a control lever,
pivot means pivotally mounting said control lever on said bracket assembly,
releasable holding means for selectively holding said control lever in at least one pivoted position thereof on said bracket assembly comprising a bellcrank pivotally mounted on said bracket assembly, follower means mounted on said bellcrank and notch means formed on said control lever and adapted to selectively engage said follower for holding said control lever in said pivoted position,
a control rod reciprocally mounted in said bracket assembly and having a first end thereof pivotally connected to said control lever and adapted to have a second end thereof connected to a control valve, and
pre-adjusted sensing means connected between said bracket assembly and said control rod for alerting an operator by feel upon approach of said pivoted position of said control lever.

4,074,691

OPEN SHROUD TRICKLE VALVE

Edward C. Luckenbach, Mountainside, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed July 1, 1976, Ser. No. 701,598
Int. Cl.² F16K *15/00*
U.S. Cl. 137—382 **6 Claims**



1. In a trickle valve comprising a conduit having a discharge opening and a hingedly mounted valve closure plate disposed with respect to said discharge opening for movement between opened and closed positions, wherein the improvement comprises:
(a) a baffle plate fixedly secured to and about said conduit at a location spaced rearwardly from said discharge opening, said baffle plate comprising a vertical portion and a lower deflector portion angularly disposed with respect to said vertical portion, said vertical portion extending transversely outward of said valve closure plate, and said deflector portion extending forward of said discharge opening for a predetermined distance.

4,074,692

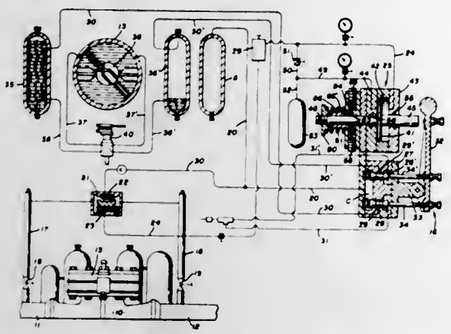
PIPELINE BREAK SHUTOFF CONTROL

Homer J. Shafer, 2300 Park Ave. West, Mansfield, Ohio 44906

Filed Oct. 15, 1971, Ser. No. 189,613
Int. Cl.² F16K *17/00*
U.S. Cl. 137—488 **4 Claims**

1. A pipeline control for operating the main valve in a pipeline in response to a predetermined pressure drop in a predetermined period of time, comprising a pressure movable element having a shaft, conduits connecting the pipeline to opposite sides of said element normally to hold it in neutral position, control means actuatable by movement of said element to operate said main valve, a pressure tank connected to one of said conduits to create a pressure differential on said element when a drop in pressure occurs in the pipeline, orifice means timing the rate of differential pressure increase on said element due to pressure drop in the pipeline, an equalizing valve to connect said conduits and restore balanced pressure to said

element, a cam surface on said shaft, a spring-biased detent radially engaging said cam surface for exerting a predetermined amount of restraining force on the movement of said



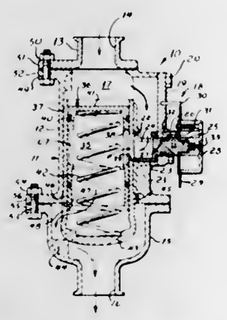
element by differential pressure on opposite sides thereof, and a timing relay to open said equalizing valve if said detent does not release said shaft in a predetermined period of time after initiation of a pressure differential on said element.

4,074,693

READILY DISASSEMBLEABLE FLUID FLOW RATE CONTROLLER

Willard A. Kates, Winnetka, Ill., assignor to The W. A. Kates Company, Deerfield, Ill.

Filed July 26, 1976, Ser. No. 708,708
Int. Cl.² G05D *7/01*
U.S. Cl. 137—454.6 **13 Claims**



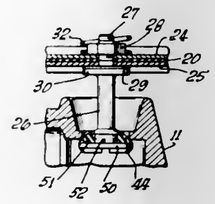
1. A readily disassembleable fluid flow rate controller comprising: a housing including a body defining a midportion and an outlet portion, a bonnet defining an inlet, and first readily removable securing means removably securing the body to the bonnet to define an internal control chamber, said body defining an inlet opening opening to the bonnet for receiving fluid delivered through said bonnet inlet into the bonnet, said body further defining an outlet opening; orifice means in said control chamber and having adjusting means for providing an adjustable size orifice to provide a selected fluid flow from said inlet opening; second readily removable securing means removably securing said orifice means to said housing for installation in and removal from said control chamber as a unit; third readily removable securing means for removably securing said outlet portion of the body to said midportion; and spring biased regulating means in said control chamber for maintaining a preselected pressure flow rate of the fluid passing from said orifice means to said outlet, said regulating means being arranged to be slidably installed in and removed from said body midportion as a unit, said regulating means being retained against slidable movement outwardly from said body by said outlet portion as an incident of said outlet portion being mounted to said midportion and being slidably removable as a unit from said body upon removal of said outlet portion from said midportion.

4,074,694

PRESSURE REGULATOR WITH SOFT VALVE SEAT

Walter S. Lee, Corona, Calif., assignor to Leemco, Inc., Corona, Calif.

Filed Apr. 9, 1976, Ser. No. 675,284
Int. Cl.² F16K *31/12*
U.S. Cl. 137—505.41 **1 Claim**



1. In a pressure regulator having a body with rigid valve seat in a gas flow path between an inlet and an outlet, a diaphragm mounted in said body defining first and second chambers, and a valve stem carried on said diaphragm for movement toward and away from said seat, the improvement comprising in combination:

a resilient annular valve insert; and

means for carrying said insert on said valve stem for engagement with said seat, with said stem having a rigid flange with an outside diameter greater than the diameter of the opening of said seat whereby said flange cannot pass through said seat opening and

with said means for carrying including an annular groove formed integral with said stem, with said insert fitting into said groove and stretched over a portion of said stem for insertion into said groove.

4,074,695

PRESSURE-RELIEF VALVE DEVICES

Walter Weirich, Dortmund, and Willy Kussel, Lunen, both of Germany, assignors to Gewerkschaft Eisenhutte Westphalia, Westphalia, Germany

Filed Feb. 17, 1976, Ser. No. 658,624
Claims priority, application Germany, Feb. 19, 1975, 2506928
Int. Cl.² F16K *31/12*
U.S. Cl. 137—508 **13 Claims**

1. A pressure-relief valve device comprising:

(a) a housing provided with conduit means for admitting hydraulic pressure fluid into the housing, and conduit means for discharging hydraulic pressure fluid from the housing;

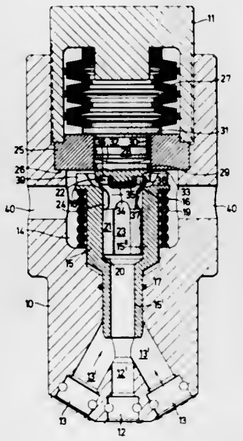
(b) a hollow member disposed in the housing and guided and sealed for displacement therein, the hollow member being provided with a valve seating surface;

(c) a valve closure member having a portion thereof guided by the hollow member for displacement therein, the valve closure member having a complementary sealing surface engageable on the seating surface of the hollow member to effect closure of the valve constituted by the two surfaces, the valve closure member having channel means communicating through the interior of the hollow member with the admitting conduit means of the housing to permit pressure fluid to reach the inlet side of the valve, and the valve having an outlet side which communicates with the discharging conduit means of the housing;

(d) stop means for limiting movement of the hollow member in one direction as the hollow member is displaced by the pressure of the fluid admitted by the admitting conduit means;

(e) plural spring means for providing a force to the valve to urge the two surfaces thereof together to thereby bias the valve into a closed condition, the plural spring means being composed of first spring means acting on the hollow member to bias the hollow member in said one direction, and second spring means acting on the valve closure member in the opposite direction;

(f) means for transmitting force from the second spring



means to the valve closure member utilizing a pair of surfaces at least one of which is non-planar so that the surfaces engage one another over a zone aligned centrally of the sealing surface of the valve closure member, said transmitting means including a thrust member in face-to-face contact with one end of the valve closure member remote from the guided portion thereof, said contact being over an extended area; and

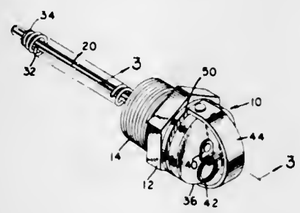
(g) guide means for guiding said thrust member for axial movement centrally of the sealing surface of the valve closure member.

4,074,696

PRESSURE RELIEF VALVE OPERATION SIGNAL

Robert F. Romanowski, Rochester, N.Y., assignor to Qualitrol Corporation, Fairport, N.Y.

Filed Oct. 26, 1976, Ser. No. 735,422
Int. Cl.² F16K *37/00*
U.S. Cl. 137—553 **2 Claims**



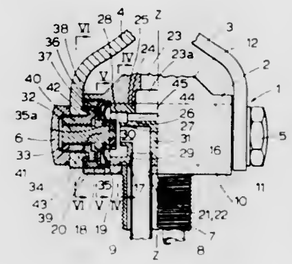
1. A pressure relief valve operation signal for use on a valve having a body portion adapted to be secured to a pressure vessel, a plunger which is spring biased into seating engagement with an end of the body portion to maintain pressure in the vessel, and a shield secured to an exterior portion of the plunger, said operation signal comprising a flexure element in the form of an elongated flat spring one end of which is secured to the shield the other end of the flexure element being provided with a stud having an end positionable in a peripheral groove formed in the body portion, said stud being maintained in said groove by engagement by the shield and being free to move out of said groove when the shield is moved with the plunger as the latter is unseated from the end of the body portion.

4,074,697

DUAL HANDLE MIXING FAUCET

Gustav Saether, Leksvik, Norway, assignor to Lyng Industrier A-S Leksvikarmatur, Leksvik, Norway

Filed June 28, 1976, Ser. No. 700,303
Claims priority, application Norway, July 4, 1975, 752426
Int. Cl.² F16K *19/00*
U.S. Cl. 137—606 **6 Claims**



1. A dual handle faucet for mixing and supplying hot and cold water, said faucet comprising:

a substantially symmetrical faucet casing having hot and cold water inlets and a mixed water outlet, said faucet casing having extending transversely therethrough a cylindrical bore;

a cylindrical valve seat body fixedly positioned and supported within said bore;

said valve seat body having adjacent each axial end thereof an annular axial sleeve-shaped end portion having an outer diameter less than the diameter of said valve seat body, the axial outer face of each said end portion forming a valve seat;

said valve seat body having therein two separate substantially L-shaped passages, each said L-shaped passage comprising a first outlet portion extending axially of said valve seat body through a respective said end portion thereof, and a second inlet portion extending radially outwardly from said first outlet portion through said valve seat body to the exterior thereof and joined to a respective of said hot and cold water inlets;

said valve seat body having therein a substantially T-shaped passage comprising a first axial portion extending axially through a portion of the axial length of said valve seat body at a position therein between the outer peripheral surface thereof and said axial end portions thereof, and a second radial portion extending radially outwardly from said first axial portion through said valve seat body to the exterior thereof and connected to said mixed water outlet;

a pair of valves mounted in said faucet casing, one each adjacent a respective of said valve seats; and

a pair of valve actuators, one each attached to a respective of said valves, each said valve actuator comprising a handle for selectively independently moving the respective said valve between a closed position contacting the respective valve seat and blocking fluid communication between the respective said L-shaped passage and said T-shaped passage, and an open position spaced from said respective valve seat and allowing fluid communication between said respective L-shaped passage and said T-shaped passage, said handles being arranged in cantilever fashion adjacent one another such that they may be simultaneously operated by hand, said handles having end portions and said faucet casing having an outlet portion configured such that said faucet casing outlet portion limits movement of

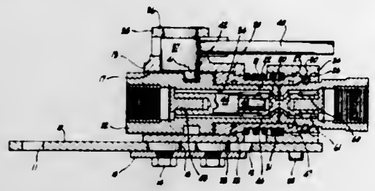
said handles in a direction to achieve movement of said valves to said closed positions thereof.

4,074,698

HYDRAULIC COUPLER

Willis S. Hobson, Columbus, and Elmer A. Graber, Seymour, both of Ind., assignors to Seymour Manufacturing Co., Inc., Seymour, Ind.

Filed July 26, 1976, Ser. No. 708,547
Int. Cl.[2] F16L *37/28, 29/00*
U.S. Cl. 137—614.06 **9 Claims**



1. An automatic coupling device for use in a fluid circuit, comprising:
   a. A mounting means,
   b. a body member movably mounted on the mounting means,
   c. a sleeve member movably mounted on the body member, the sleeve member having a bore,
   d. a coupler nipple detachably connected to the sleeve member, the nipple including a first valve means urged toward a closed position and being movable to an open position,
   e. releasable means between the mounting means and the sleeve member for releasably retaining the nipple on the sleeve member,
   f. a valve body means having a passage with an inlet end for connection to a fluid line, the valve body means being slidably mounted in the bore of the sleeve member, the valve body means being movable to a first position to preclude substantially relative movement of the sleeve member and body member for locking of the nipple in the releasable means, and being movable to a second position to allow relative movement of the sleeve member and body member for insertion of the nipple in the releasable means,
   g. cam means connected to the valve body means for sliding the valve body means in the bore of the sleeve means and for moving the valve body means between the first and second positions, and
   h. the valve body means including a second valve means urged to a closed position and being movable to an open position, the first and second valve means engaging and opening when the valve body means is in the first position and the nipple is attached, to form a fluid passageway through the valve body means and nipple, and disengaging and closing when the valve body means is moved to the second position, even when the nipple is attached.

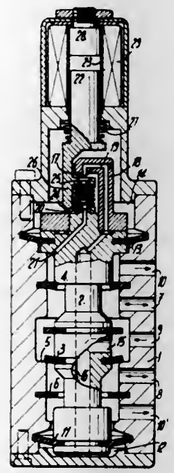
4,074,699

FLUID-ASSISTED ELECTROMAGNETIC CONTROL DEVICE

Harald Stampfli, Geneva, Switzerland, assignor to Lucifer S.A., Geneva, Switzerland

Filed Apr. 13, 1976, Ser. No. 676,414
Claims priority, application Switzerland, Apr. 29, 1975, 5513/75
Int. Cl.[2] F16K *31/365, 31/40*
U.S. Cl. 137—625.64 **4 Claims**

1. A fluid assisted electromagnetic control device comprising a hollow valve body, a movable valve element therein, an electromagnetic device having an armature mounted on said body, fluid pressure inlet, outlet and exhaust passages in said valve body, means on said movable valve element for controlling the flow of fluid under pressure to said inlet, outlet and exhaust passages, means on said movable valve element forming with the valve body a first working chamber at one end of said valve element and a second working chamber at the other end of said element, first nozzle means extending from a base on said movable valve element and extending into said first chamber and communicating with said exhaust passage, second nozzle means extending from a base on said movable valve element in said first chamber in alignment with and spaced from said first nozzle means and communicating with said



pressure inlet passage, an obturating member connected with said armature comprising two spaced supports, two plungers on said supports and biased into engagement therewith, said plungers being in alignment with and adapted to obturate said nozzles alternately, whereby upon movement of said armature in either direction, a plunger will engage a nozzle and obturate it, and upon further movement, the plunger will yield and the plunger support will engage the nozzle base to positively move the valve element, and means permanently connecting said second working chamber with said pressure inlet passage.

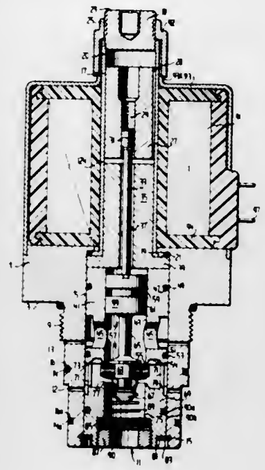
4,074,700

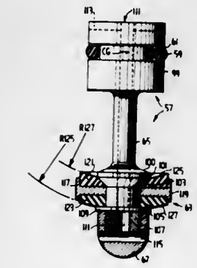
QUICK-ACTING VALVE ASSEMBLY

Thomas H. Engle, Cape Vincent, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Continuation of Ser. No. 484,188, June 28, 1974, abandoned. This application Sept. 23, 1975, Ser. No. 616,097
Int. Cl.[2] F16K *25/00, 31/06*
U.S. Cl. 137—625.27 **2 Claims**

1. A valve comprising:
   a valve body having a first central bore, said bore having an axial opening for admitting fluid under pressure and first and second radial openings for exhausting fluid under pressure, spaced axially from said axial opening and from each other;
   a first annular valve seat located in said first central bore between said axial opening and said first radial opening;
   a second annular valve seat located in said first central bore between said first radial opening and said second radial opening;
   a valve carrier piston slidably received in said first central bore;
   a valve washer assembly mounted on one end of said carrier piston for selective seating on said first or said second annular valve seat;
   a second central bore extending axially through said valve carrier piston and valve washer assembly;
   an adjustment nut threaded within said first central bore below said first annular valve seat and a spring captured between said adjustment nut and said valve washer assembly for biasing said valve washer assembly into contact with said second annular valve seat;
   means cooperating with said valve carrier piston for moving said valve washer assembly out of contact with said second annular valve seat and into contact with said first annular valve seat; and
   means for essentially eliminating the dynamic component of the fluid pressure in said second central bore, whereby static pressure alone is experienced at the other end of said carrier piston.



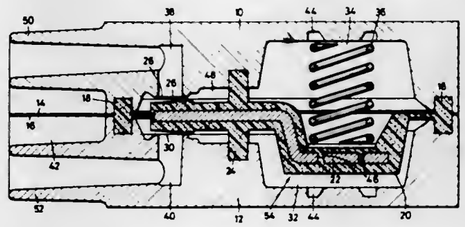


4,074,701

FLUIDIC SWITCH

Lothar Kemmler, Morfelden, Germany, assignor to Samson AG, Frankfurt, Germany

Filed July 8, 1976, Ser. No. 703,609
Claims priority, application Germany, July 8, 1975, 2530362
Int. Cl.[2] F15C *3/04*
U.S. Cl. 137—625.66 **7 Claims**



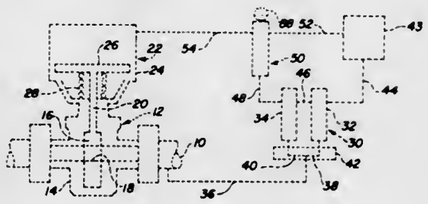
1. Fluidic switch for measuring, regulating or controlling apparatus, comprising: a switch housing having two housing halves separated along a plane of separation and each provided with internal grooves parallel to said plane of separation, two actuating chambers provided in the switch housing, actuating passages leading into said chambers, an actuating membrane separating said chambers and having at its circumferential margin a sealing bolster substantially parallel to said plane of separation; a switch valve chamber having fluid inlets and outlets; and an actuating lever extending from the actuating membrane into the switch valve chamber, said lever forming a plate valve body at the end of the membrane which extends into said switch valve chamber, and being fulcrumed about an axis parallel to said plane of separation on a resilient bridge-like or plate-like lead-through portion sealingly separating the actuating chambers from the switch valve chambers, said body being integrated as a rubber body with the actuating lever and clamped within said grooves in the housing halves, said sealing bolster forming said membrane margin and surrounding with clearance said valve body section of said actuating lever at that end of the lead-through portion farthest from said membrane, said sealing bolster having a chord-wise disposed cross member bordering the membrane and forming said lead-through portion, said cross member being higher in a direction perpendicular to said plane of separation of the housing halves than said sealing bolster, and having in the plane normal to the plane of separation of the housing convexly curved upper and lower edges each facing one of the housing halves, the height of said cross member being greatest in the area of the longitudinal center of the cross member and coinciding with the height of the sealing bolster adjacent the ends of the cross member.

4,074,702

CONTROL VALVE FOR BLEEDING FLUID ACTUATOR

Irwin M. Lewis, New Rochelle, N.Y., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Dec. 20, 1976, Ser. No. 752,056
Int. Cl.[2] F16K *31/00*
U.S. Cl. 137—625.66 **2 Claims**



1. A control valve structure for controlling fluid communication between a first fluid pressure source and a main valve actuator mechanism and being responsive through pilot valve means to a predetermined operating pressure range in a main flowline, said control valve structure comprising:
   an elongated housing having a central bore extending longitudinally thereof;
   a slide valve mounted within the bore for longitudinal movement and having a piston adjacent one end thereof mounted within an enlarged diameter portion of said bore forming a piston chamber, a first spring continuously urging the slide valve and piston to a seated position of the piston adjacent one end of the piston chamber, manual gripping means adjacent the other end of said slide valve to permit the slide valve to be gripped manually to move the piston to a raised operative position against said first spring adjacent the other opposite end of the piston chamber, said enlarged diameter portion being of a uniform continuous diameter and forming an abutment on which the piston seats under the urging of said first spring when

the fluid pressure is outside the predetermined operating range;

first port means including inlet and outlet ports in said housing for communicating fluid from a pressure source through the housing to the actuator mechanism;

second port means communicating with the piston chamber adjacent an inner face of the piston and responsive through the pilot valve means to fluid pressure in the main flowline outside the predetermined operating pressure range, said second port means communicating fluid pressure to the piston for maintaining the slide valve in a position normally permitting fluid pressure to be supplied through the control valve structure to the actuator mechanism when the pressure within the flowline is within the predetermined operating pressure range;

a vent in said housing communicating with the piston chamber adjacent the inner face of said piston;

said piston having an outer periphery slightly spaced from the inner circumferential wall defining the piston chamber so that fluid from the second port means passes between the piston and the circumferential wall upon any initial unseating of the piston from seated position to permit excess fluid pressure from said second port means to be vented around said piston and through said vent, said circumferential wall having an annular groove generally adjacent said opposite end of the piston chamber, an O-ring positioned in said annular groove and projecting inwardly of the circumferential wall a distance at least around 0.003 inch to contact the outer periphery of the piston in fluid-tight sealing relation when the piston is in said raised position thereby to prevent fluid from said second port means to by-pass said piston, said annular groove having a width greater than the diameter of said O-ring for loosely mounting said O-ring;

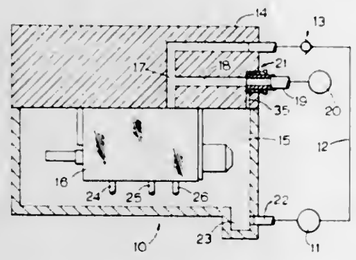
a manual detent normally depressible inwardly to engage the slide valve and hold the slide valve in a raised position against the bias of said spring, and a second spring continuously urging the detent outwardly whereby upon the reaching of a predetermined high pressure in said second port means the slide valve is moved out of engagement with the detent and the detent is released under the bias of said second spring.

4,074,703

ACCUMULATOR DRAIN

Duane R. Smith, Oswego, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 7, 1976, Ser. No. 720,860
Int. Cl.² F16K *51/00*
U.S. Cl. 137—798 **8 Claims**



1. In a hydraulic system having fluid control means, said fluid control means having a sump in fluid communication therewith, a source of high pressure fluid, and disconnectable conduit means communicating said source with said control means, the improvement comprising:

safety connecting means for connecting said conduit between said source and said control means, said connecting means including vent means for automatically venting said source to the sump upon partial disengagement of said connecting means.

4,074,704

PROCESS OF AND APPARATUS FOR SOLAR HEATING AND THE LIKE

Donald P. Gellert, Box 37, R.F.D. 1, Plymouth, N.H. 03264

Filed May 28, 1976, Ser. No. 691,092
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **33 Claims**



1. A process of concentrating radiation that comprises: impinging the radiation upon a plurality of successive staggered front surfaces of an array of prisms, each front surface being oriented at an acute angle to an adjacent plane extending along the length of the array at a rear surface of each prism; passing the radiation so impinged upon said front surfaces through the prisms and refracting the radiation at the rear surfaces of the prisms; directing the refracted radiation upon a collecting surface located at a predetermined region behind said plane; adjusting the said acute angle of orientation with reference to the refraction index of the prisms and within limits such that the refracted radiation is effectively concentrated to provide greater energy per collecting surface area than the radiation energy per unit area impinged upon the first-named surfaces, thereby amplifying the energy at the collecting surface; and absorbing the energy at the collecting surface.

17. Radiation-concentrating apparatus having, in combination, a substantially planar array of substantially parallelly mounted prisms extending along a predetermined plane at the rear surfaces of the prisms with successive staggered front prism surfaces exposed to impinging radiation; energy-absorbing means comprising a collecting surface disposed rearward of said plane; said prisms being selected with an acute included angle between said rear and front surfaces and a refractive index such as to concentrate the radiation impinged upon the front prism surfaces into a smaller area, after refraction at the rear surfaces of said prisms, upon the energy-absorbing means, thereby to amplify the energy from the radiation at said collecting surface; and means for utilizing the energy thus concentrated.

4,074,705

SOLAR COLLECTOR APPARATUS AND METHOD

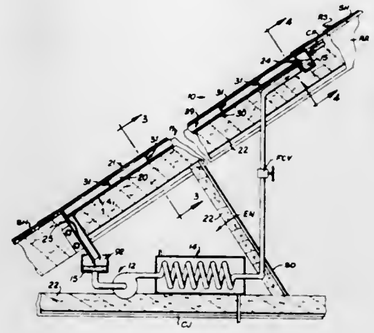
Glen P. Robinson, Jr., Atlanta; Samuel V. Shelton, Stone Mountain, and Samuel F. Hutchins, Lilburn, all of Ga., assignors to Scientific-Atlanta, Inc., Atlanta, Ga.

Filed Feb. 23, 1976, Ser. No. 660,249
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **27 Claims**

1. A solar collector system for solar radiation comprising:

a collector assembly defining a fluid flow channel therein inclined with respect to the horizontal at a prescribed inclination angle and further defining a solar radiation absorbing surface along the bottom of said fluid flow channel onto which the solar radiation is impressed, said collector assembly further including a cover forming one side of said fluid flow channel and capable of transmitting solar radiation therethrough into said fluid flow channel;

a heat transfer fluid for flowing down said fluid flow channel over said solar radiation absorbing surface under said cover, said heat transfer fluid having a fluid vapor pressure differential between the maximum and minimum temperatures to which said heat transfer fluid is exposed during flow down said fluid flow channel of less than about 0.3 psia; and,



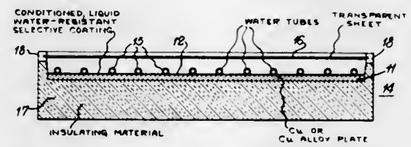
means for supplying said heat transfer fluid to the upper end of said channel for the flow of said heat transfer fluid along said channel over said solar radiation absorbing surface under the force of gravity to heat said transfer fluid.

4,074,706

SOLAR COLLECTOR HAVING SELECTIVE FILM OF IMPROVED STABILITY TO LIQUID WATER CONDENSATE

Juan Hajdu, Orange, and Raymond A. Sosnowski, Bridgeport, both of Conn., assignors to Enthone, Incorporated, West Haven, Conn.

Filed July 30, 1975, Ser. No. 600,344
Int. Cl.² F24J *3/02*; C23F *7/02, 17/00*
U.S. Cl. 126—271 **30 Claims**



1. A solar collector comprising a base of copper or copper alloy, and a stable, selective, solar heat energy-absorptive coating on the base, said selective solar heat energy-absorptive coating comprising a multiplicity of discrete projections of copper oxide, said selective, solar heat energy-absorptive coating having been rendered stable by contacting the selective, solar heat energy-absorptive coating on the base with a chromic acid solution comprising chromic anhydride ($Cr O_3$) and water for a time sufficient to impart to thee selective coating a stability such that its selectivity is not significantly reduced after contact with liquid water over a prolonged, cumulative, non-continuous time in excess of 1600 hours.

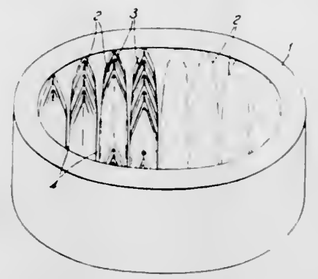
4,074,707

MELT-SPINNING GRID

Arthur Perelman, Harrogate, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 8, 1976, Ser. No. 664,736
Claims priority, application United Kingdom, Mar. 13, 1975, 10453/75
Int. Cl.² D01D *1/04*; F28D *21/00*
U.S. Cl. 126—343.5 A **3 Claims**

1. An improved melt grid for the melting of solid particulate polymer, which melt grid comprises a plurality of elongated aligned fins defining an upper receiving face and a lower effluent face connected by at least one first aperture of elongated cross-section, at least one second aperture longitudingly disposed within one of said fins intermediate the upper and lower faces providing a heat-receiving surface within the melt grid,



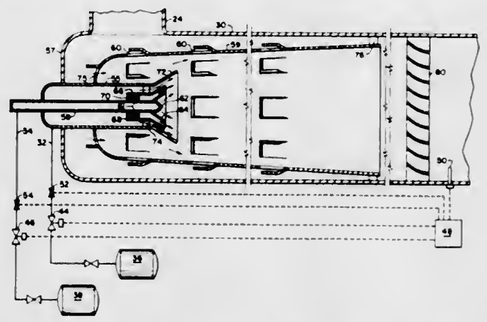
wherein the improvement comprises said first aperture is formed by opposed sides of two fins with at least one of said sides bearing a plurality of grooves running in a direction from said upper receiving face to said lower effluent face, and wherein said grooves have a width of at least 1 mm.

4,074,708

BURNING HYDROGEN AND OXYGEN TO SUPERHEAT STEAM

Frank William Hochmuth, Hudson, Canada, assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed June 7, 1976, Ser. No. 693,252
Int. Cl.² F24H *1/20*
U.S. Cl. 126—360 A **3 Claims**



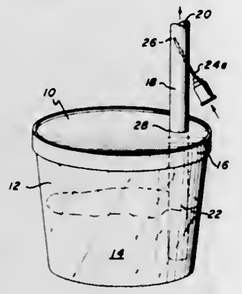
1. Apparatus for burning hydrogen and oxygen directly within a steam line, including a steam pipe through which steam is flowing, a burner housing positioned centrally within the pipe, there being an annular space between the pipe and the burner housing through which the steam flows, pipes within the housing through which oxygen and hydrogen are introduced, ignition means for igniting the hydrogen and oxygen, the burner housing containing a plurality of openings so that the cooling steam can flow along both sides thereof, some of the openings being located upstream of the ignition means, temperature sensing means positioned downstream of the burner housing for determining the proportionate amount of hydrogen to oxygen being supplied to the burner housing, means responsive to said temperature sensing means for controlling the proportionate amount of hydrogen to oxygen flowing to the burner housing, and diffuser means upstream of the temperature sensing means to cause turbulence and intermixing of the steam leaving the burner housing.

4,074,709

METHOD AND DEVICE FOR FACILITATING DOUBLE-CONTRAST STUDIES OF THE UPPER GASTROINTESTINAL TRACT

Leopold S. Kaplan, 8 Bradford Road, Edison, N.J. 08817

Filed Apr. 15, 1976, Ser. No. 677,242
Int. Cl.² A61B *1/12, 6/00*
U.S. Cl. 128—2 A **15 Claims**



1. A method for obtaining a gastric mucosal coating of the hollow organs in a human being's upper gastrointestinal tract with a contrast medium and gaseously distending said organs to enhance said coating and enable a double-contrast study of said tract to be performed, said method comprising the steps of providing an open-ended feed tube having first and second ends, providing a vent in said feed tube for the introduction of air; said vent comprising venting means intercommunicating with said feed tube means and being disposed at an angle less than 90° in a direction toward said second end of said feed tube such that air drawn through said venting means will intercept the flow of contrast medium through said feed tube within said feed tube at substantially said angle, said venting means further defining a vent opening having an inner diameter of from 0.020 inches to 0.050 inches, said vent opening being large enough to permit ingestion of sufficient air to effect a desired degree of distention of said organs and small enough to prevent interference with the flow of said fluid contrast medium through said feed tube; disposing said first end of said feed tube into said medium, and sucking on said second end of said feed tube to draw said medium through said feed tube while simultaneously drawing air through said venting means so that a mixture of air and said medium is ingested.

4,074,710

INTRATHORACIC PRESSURE BIOFEEDBACK METHOD

Brian L. Tiep, Monrovia, Calif., assignor to City of Hope National Medical Center, Duarte, Calif.

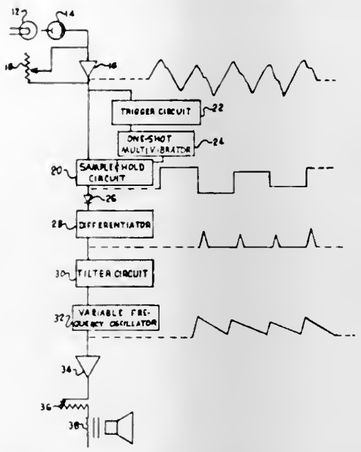
Filed May 28, 1976, Ser. No. 690,851
Int. Cl.² A61B *5/02*
U.S. Cl. 128—2.05 P **3 Claims**

1. A process for treating an individual having an obstructive lung disorder so that such an individual controls the manner in which his or her heart operates so as to control the individual's intrathoracic pressure which comprises the steps of:

monitoring the pulse of the individual so as to obtain a signal varying in accordance with the peak values of each pulse beat, and

using said signal to provide to the individual an output which is capable of being sensed by the individual and which corresponds to this signal; and

varying the heart activity of the individual by the individual in accordance with said output so as to have the individual's heart action and breathing achieve a desired intrathoracic pressure.

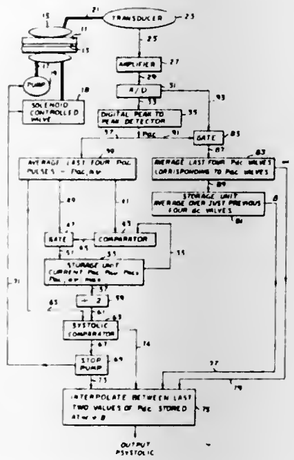


4,074,711

APPARATUS AND PROCESS FOR DETERMINING SYSTOLIC PRESSURE

William Trevor Link; Henry Ferdinand Rugge, both of Berkeley, and William David Jansen, Menlo Park, all of Calif., assignors to American Optical Corporation, Southbridge, Mass.

Continuation-in-part of Ser. No. 578,047, May 15, 1975, Pat. No. 4,009,709. This application Sept. 7, 1976, Ser. No. 720,712
Int. Cl.² A61B *5/02*
U.S. Cl. 128—2.05 A **7 Claims**



1. An apparatus for determining systolic pressure, comprising:

a pressure cuff attachable to a living test subject adjacent a blood vessel;

means for changing pressure in the cuff and thereby applying pressure to the subject;

means communicating with said cuff for measuring a quantity proportional to a time-dependent fluctuating component representative of the pulsatile pressure within the blood vessel, said means having a frequency response such that said quantity is proportional to the amplitude of said pulsatile pressure;

means for determining the maximum value attained by said quantity as the applied pressure is changed;

means for storing a representation of said maximum value;

means for determining when said quantity is substantially equal to about a particular fraction of said maximum value for an applied pressure greater than the pressure applied when said maximum value results, said particular fraction corresponding with that fraction of the total length of said blood vessel within said cuff which extends from its end proximal the blood supply to the location at which the cuff applies maximum pressure to its wall when the pressure applied to the cuff is between diastolic and systolic pressure; and

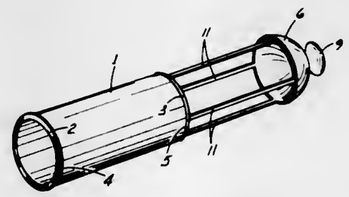
means for reading out applied pressure corresponding to said quantity being substantially equal to about said particular fraction of said maximum value, said read-out pressure corresponding to the systolic pressure of said subject.

4,074,712

PROPHYLACTIC ARTICLE

A. Francis Wright, 25961 Highland Road, Richmond Heights, Ohio 44143

Filed Sept. 27, 1976, Ser. No. 727,270
Int. Cl.² A61F *5/00*
U.S. Cl. 128—79 **3 Claims**



1. A prophylactic article of the class described, comprising a tubular body of flexible material, a cap and communicating reservoir member of like material, said cap and reservoir spaced from the tubular body to provide an open area therebetween, said cap forming means for covering only the tip of the glans for maximum exposure of the glans whilst maintaining the position of the reservoir, and means connecting the body and member to retain the maximum open area between the same, whilst maintaining the initial relationship thereof.

4,074,713

POLY(N-ACETYL-D-GLUCOSAMINE) PRODUCTS

Richard Carl Capozza, Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 558,525, March 14, 1975, Pat. No. 3,989,535, which is a division of Ser. No. 441,717, Feb. 11, 1974, abandoned. This application July 22, 1976, Ser. No. 707,914
Int. Cl.² A61F *5/04*
U.S. Cl. 128—92 C **2 Claims**

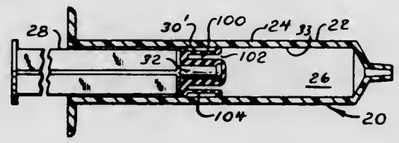
1. A bone pin for the fixture of severed bone ends during regeneration after a traumatic or surgical fracture consisting essentially of a pin of poly(N-acetyl-D-glucosamine) of a diameter to fit into the medullary canal of a fractured bone end, either of natural size, or as drilled to a larger size, and a length of at least three times its diameter, whereby the bone pin is adapted to be a drive or friction fit in each bone end. so that the bone ends are held in fixed relationship in juxtaposition during regeneration of the bone, and the poly(N-acetyl-D-glucosamine) bone pin is later absorbed by the body fluids, permitting regeneration of marrow in the medullary canal.

4,074,714

SYRINGE ASSEMBLY

William J. Binard; Anthony J. Ciarico, both of Cary; Leonard R. Anglada, Arlington Heights, and Bhupendra C. Patel, Elgin, all of Ill., assignors to The Kendall Company, Boston, Mass.

Division of Ser. No. 702,164, July 2, 1976, Pat. No. 4,030,497, which is a division of Ser. No. 627,982, Nov. 3, 1975, Pat. No. 4,000,741, which is a continuation-in-part of Ser. No. 509,757, Sept. 27, 1974, abandoned. This application Mar. 10, 1977, Ser. No. 776,147
Int. Cl.² A61M *5/22*
U.S. Cl. 128—218 P **2 Claims**



1. A syringe, comprising:

a barrel having a chamber for retaining fluid;

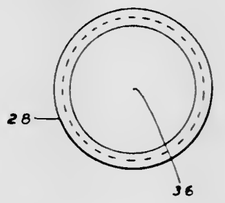
a plunger having one end received in and closing the chamber for pumping fluid out of the chamber, said one end of the plunger having a flexible plug facing the chamber, said plug having slot means defining a flexible sidewall having an enlarged outer portion circumferentially contacting an inner surface of the barrel, and having an intermediate portion of reduced thickness normally spaced from said barrel inner surface, said plug sidewall intermediate portion flexing and engaging against the inner surface of the syringe barrel responsive to pressure in the chamber above a predetermined amount to impede movement of the plunger into the chamber.

4,074,715

SYRINGE PLUNGER

Kenneth E. Geiger, Palisades Park, N.J., assignor to Becton, Dickinson and Company, Rutherford, N.J.

Filed Nov. 1, 1976, Ser. No. 737,525
Int. Cl.² A61M *5/00*
U.S. Cl. 128—218 P **6 Claims**



1. A plunger for a syringe assembly, which comprises;

a handle;

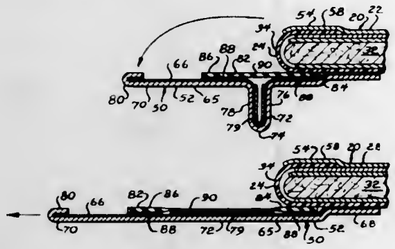
a piston interlock;

a shank joining said handle to the piston interlock;

said interlock including a bar extending distally from said shank; and

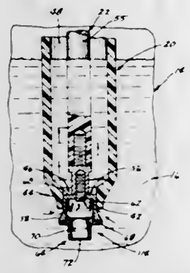
a piston, completely enmeshing and enclosing said bar and making full contact with the interlock, whereby said piston is immovably mounted on said interlock.

4,074,716
DIAPER WITH ELASTIC FASTENER TAB
Charles H. Schaar, Lake Zurich, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Jan. 3, 1977, Ser. No. 756,309
Int. Cl.[2] G61F *13/16*
U.S. Cl. 128—287 **22 Claims**



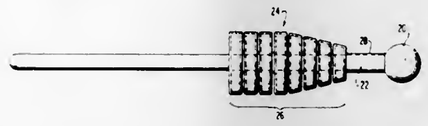
1. A disposable diaper, comprising:
an absorbent pad assembly having opposed surfaces, a pair of side edges, and a pair of end edges connecting the side edges; and
a tape fastener comprising, tape means having a first portion secured to one of said surfaces of the pad assembly, a securement portion for attachment to a spaced portion of the diaper, an extensible portion connecting said first and securement portions, and elastic means constraining expansion of said extensible portion.

4,074,717
CRYOGENIC PROBE
Robert R. Schulze, 4116 - 73rd Place, Des Moines, Iowa 50322, and Floyd R. Ladd, West Des Moines, Iowa, assignors to said Robert R. Schulze, by said Floyd R. Ladd
Filed Apr. 23, 1975, Ser. No. 570,723
Int. Cl.[2] A61B *17/36*
U.S. Cl. 128—303.1 **6 Claims**



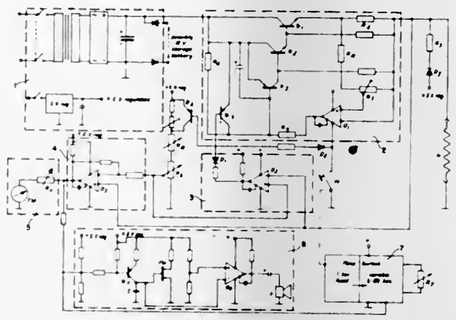
1. In combination with a container having a cryogenic liquid contained therein, said container having an open upper end,
a cryogenic probe comprising a housing having upper and lower ends and an interior compartment, a normally closed valve means movably mounted on the lower end of said housing communicating with said housing interior compartment and being selectively movable between open and closed positions relative to said housing so that the cryogenic liquid in said container will flow through said valve means into said housing interior compartment when said valve means is in its open position and the lower end of said housing is immersed in the cryogenic liquid; said valve means having a tip portion at the lower end thereof and an interior compartment formed therein above said tip portion which is in communication with said housing interior compartment so that the cryogenic liquid in the probe will be closely positioned adjacent said tip portion.

4,074,718
ELECTROSURGICAL INSTRUMENT
Charles F. Morrison, Jr., Boulder, Colo., assignor to Valleylab, Inc., Boulder, Colo.
Filed Mar. 17, 1976, Ser. No. 667,849
Int. Cl.[2] A61B *17/40*; A61N *3/06*
U.S. Cl. 128—303.14 **47 Claims**



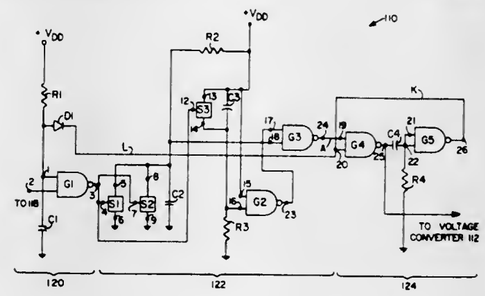
19. An electrosurgical instrument comprising
a support member;
at least one electrode mounted on support member, said electrode comprising (a) a substrate consisting essentially of a material having a figure of merit of at least 0.15 at room temperature where said figure of merit is the product of the thermal conductivity, the heat capacity and the density of said material in the metric system, and (b) an electrically resistive coating disposed on said substrate, the volume resistivity of said coating extending from about 10^{-4} to $10^{4}\Omega$-cm; and
means for connecting said electrode to a source of electrosurgical energy.

4,074,719
METHOD OF AND DEVICE FOR CAUSING BLOOD COAGULATION
Kurt Semm, Hegewischstrasse 4, 23 Kiel 1, Germany
Filed June 24, 1976, Ser. No. 699,305
Claims priority, application Germany, July 12, 1975, 2531261; Dec. 3, 1975, 2554336
Int. Cl.[2] A61B *17/38*; A61N *3/04*
U.S. Cl. 128—303.1 **23 Claims**



1. A device for causing blood coagulation, particularly for use in endoscopy, comprising
a support having an end portion;
an electrically operated thermo-element on said end portion;
current supplying means for supplying electrical current to said thermo-element to increasingly raise the temperature thereof in a predetermined gradient to a level at which it has a coagulation-causing temperature;
control means for maintaining said temperature steady when said level is reached;
visual indicating means for visually indicating the heating of said thermo-element to said level; and
audible indicating means responsive to the increasing heating of said thermo-element by producing a sound increasing in intensity in correspondence with the increasing heating gradient until said level is reached so as to indicate that the device is ready for use, and which thereafter continues at constant intensity.

4,074,720
CARDIAC PACER WITH RATE RUNAWAY PROTECTION
Franklin L. Malchman, King of Prussia; William J. Raddi, Philadelphia, both of Pa., and Susan Sharples, Cranbury, N.J., assignors to ESB Incorporated, Philadelphia, Pa.
Filed Apr. 7, 1976, Ser. No. 674,380
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—419 PG **8 Claims**



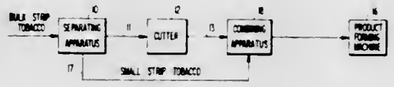
1. An oscillator system suitable for use with a cardiac pacer system, said oscillator system designed so that in the event its primary rate control system accelerates out of control, a secondary rate control system prevents the oscillator from producing signals at a rate greater than a predetermined high rate controlled by the secondary rate control system, said oscillator system comprising:
(a) cycle initiation means responsive to the output from said oscillator system for producing a timing initiation signal;
(b) primary timing circuit means, responsive to the timing initiation signal, for producing a first rate control signal a predetermined time period after receipt of the timing initiation signal;
(c) secondary timing circuit means, responsive to the timing initiation signal, for producing a second rate control signal a predetermined time period after receipt of the timing initiation signal, said predetermined time period normally being less than the predetermined time period for the primary rate control means;
(d) first gate means, responsive to the second rate control signal, for producing an output signal;
(e) second gate means, responsive to the first rate control signal and an output signal from the first gate means, for producing a command signal only upon receipt of both the control signal and said output signal; and
(f) means, responsive to the command signal from the second gate means, for producing an oscillator system output signal with a predetermined width, whereby rate runaway protection is provided because the maximum rate obtainable is restricted by the secondary timing circuit means in the event the primary timing circuit means fails to function properly and produces a first rate control signal before the second rate control signal is produced by the secondary timing circuit means.

4,074,721
BREAST PADS
Donald M. Smits; Patrick J. Daley, both of Green Bay, Wis., and Arnold J. Akerley, Westboro, Mass., assignors to The Kendall Company, Walpole, Mass.
Filed Dec. 27, 1976, Ser. No. 754,384
Int. Cl.[2] A41C *3/00*
U.S. Cl. 128—461 **3 Claims**



1. A cup-shaped breast pad having a first layer forming a body-contacting surface of nonwoven fabric characterized by rapid liquid transmission but low capillary spread of liquid;
a second layer of smaller diameter than said first layer, said second layer consisting of absorbent cellulose wadding characterized by a higher degree of capillary transfer of liquid than said first layer and being centrally disposed on said first layer and coextensive therewith;
a third layer of absorbent cellulose fluff coextensive with said second layer;
a fourth layer of absorbent cellulose wadding coextensive with said third layer;
and a fifth layer of liquid-impermeable material coextensive with said first layer;
said first layer and said fifth layer being adhesively united to each other around substantially the entire periphery of both layers.

4,074,722
SMOKABLE TOBACCO PRODUCTS AND MANUFACTURING METHODS THEREFOR
Earl E. Kohnhorst, Louisville, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.
Filed Apr. 23, 1976, Ser. No. 679,710
Int. Cl.[2] A24D *1/00*; A24L *5/00*
U.S. Cl. 131—8 R **36 Claims**

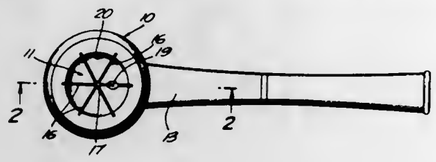


32. A smokable tobacco product comprised of cut tobacco and small strip tobacco wherein said small strip tobacco consists of bulk strip tobacco having a particle size with a short dimension not in excess of about 0.5 inch, an arithmetic mean size of at least 1.93 mm, and a particle shape wherein the mean ratio of the area to the perimeter squared is at least about 0.049, the small strip tobacco having an inclusion level in the tobacco product no less than 2% by weight of the total tobacco in the product.

4,074,723
PIPE
William J. Palenscar, 3788 Highland Drive, Carlsbad, Calif. 92008
Continuation-in-part of Ser. No. 588,605, June 20, 1975, abandoned. This application Oct. 29, 1976, Ser. No. 736,866
Int. Cl.[2] A24F *5/04*
U.S. Cl. 131—198 R **7 Claims**

1. A pipe, a combination of:

(a) a bowl having a side wall and a curved bottom forming a tobacco chamber;
(b) a plurality of air passages in said side wall and said bottom, said air passages extending from the top portion of the tobacco chamber to the bottom thereof, said air passages each having a rectangular cross-sectional shape to have passage side walls and a bottom wall with the width of each passage being sufficiently narrow to prevent tobacco particles from entering said air passage, said passage side walls intersecting said bowl side wall at essentially

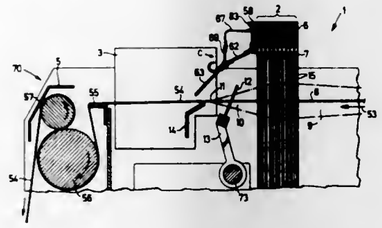


right angles to form sharp corners so that tobacco is prevented from entering said air passage, said air passages intersecting each other at the bottom of said tobacco chamber to form a junction, and
(c) a stem extending laterally from said bowl and having a stem opening extending longitudinally therein, said stem opening being connected to one of said air passages near the area of the tobacco chamber bottom to form a connection, said connection being spaced apart from said air passage junction.

4,074,724
TOBACCO SMOKE FILTER RODS HAVING FIBERS BONDED WITH WATER AND GLYCOL BONDING DISPERSIONS
Gerald P. Morie, and Cephas H. Sloan, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.
Division of Ser. No. 573,228, April 30, 1975, Pat. No. 4,022,740, which is a continuation-in-part of Ser. No. 498,349, Aug. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 411,117, Oct. 30, 1973, abandoned. This application Nov. 5, 1976, Ser. No. 739,372
Int. Cl.² A24F *13/06*; D02G *3/00*
U.S. Cl. 131—267 **8 Claims**

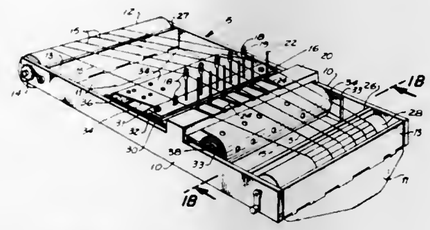
1. Tobacco smoke filter rods made with fibers selected from cellulose acetate, poly(ethylene terephthalate) and poly(hexamethylene adipamide) bonded with a water and glycol bonding dispersion, the bonding dispersion being non-tacky and being effective for forming a bond between fibers with the bond being dispersible by water, the bonding dispersion comprising water present in the amount of about 0.1–20% by weight and at least one high boiling glycol present in the amount of about 40–94.9% by weight selected from 1,2-propanediol, 1,3-propanediol, 1,4-butanediol, 1,2-butanediol, and 1,3-butanediol; and water and glycol dispersible polymers present in the amount of about 5–40% by weight selected from polyesters of combinations of isophthalic acid, and the sodium, potassium, or lithium salt of sulfoisophthalic acid reacted with diethylene glycol or triethylene glycol; from terephthalic acid and the sodium, potassium or lithium salt of sulfoisophthalic acid reacted with diethylene glycol or triethyleneglycol.

4,074,725
COVER FOR A WEAVING MACHINE
Hartmann Bader, Winterthur, and Ulrich Bolleter, Seuzach, both of Switzerland, assignors to Sulzer Brothers, Ltd., Winterthur, Switzerland
Filed June 3, 1976, Ser. No. 692,277
Claims priority, application Switzerland, June 5, 1975, 7236/75
Int. Cl.² D03D *49/00*; D03J *1/00*
U.S. Cl. 139—1 R **9 Claims**



1. In combination with a weaving machine having a plurality of shafts for forming a shed of warp yarns disposed in a weaving plane, a reed, a sley for driving said reed and a breast beam at a cloth end;
a protective sound-insulating cover without side and rear walls disposed over said reed and said weaving plane and extending from near said shafts towards said cloth end at most as far as said breast beam, said cover being spaced from said shafts without covering said shafts.

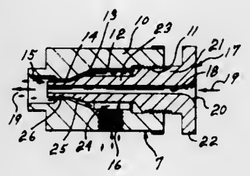
4,074,726
VERSATILE HAND LOOM
Ramsay L. Harris, 1175 W. Baseline Road, Claremont, Calif. 91711
Filed Feb. 26, 1976, Ser. No. 661,692
Int. Cl.² D03D *29/00*
U.S. Cl. 139—29 **10 Claims**



1. A loom assembly comprising:
a base member including at least two essentially parallel longitudinal side members;
a warp roller rotatably secured at one end of said base between said side members;
a take-up roller rotatably secured at the other end of said base between said side members;
said rollers being rotatable in the same direction, thereby being adapted to carry warp thread from the first roller to the second;
a warp bar arranged intermediate said rollers and between said side members, said warp bar having a plurality of heddles slidably mounted thereon for vertical, alternate reciprocation and when having warp thread therein, the rising of one heddle and the falling of an adjacent heddle providing alternate warp threads in spaced relation to form a shed;
a shuttle board arranged between said side members adjacent said warp bar in the direction of the take-up roller, said shuttle board having a plurality of upright reeds

thereon to align the warp threads as they travel from the warp roller through the heddles to the take-up roller;
shuttle means for moving a weft thread solely by gravitational forces in reciprocal motion on the surface of said shuttle board across the path of said warp threads in a transverse direction as said warp threads advance;
means for selectively moving a preprogrammed pattern member in association with the advancement of said warp threads, said pattern member cooperating with said heddle members to determine the relative position of each warp thread in said heddle member in conformance with preselected instructions contained upon said pattern member;
said base member, take-up and warp rollers, warp bar, shuttle board and shuttle means together being movable in a vertical plane away from said pattern movement means which nests among them to permit ready insertion or removal of preprogrammed pattern members in said pattern movement means and
in addition, means to maintain over width of the web formed by the weaving of warp and weft threads comprising selvedge holders arranged over the extreme right and left warps, and temples arranged to hold said selvedge holders apart to the desired width.

4,074,727
LIQUID SUPPLY SYSTEM AND NOZZLE FOR JET WEAVING LOOMS
Clyde Chi Kai Kwok, Montreal, and Joseph Rene Cornellier, Knowlton, both of Canada, assignors to Joseph Rene Cornellier, Knowlton, Canada
Filed May 27, 1976, Ser. No. 690,660
Int. Cl.² D03D *47/30*
U.S. Cl. 139—435 **17 Claims**



1. In a jet weaving loom, the improvement comprising a liquid supply system and a nozzle for propelling a weft yarn across the open shed of warp yarn, said nozzle comprising a weft yarn passage, an annular liquid passage, and a front outlet surrounding the weft yarn passage, said liquid passage having an inlet in communication with a back chamber, said back chamber feeding into and merging with a first conical forwardly tapering passage portion which in turn feeds into and merges with a forwardly tapering terminal portion, a remote-controlled valve having a liquid outlet connected to the liquid passage inlet of the nozzle, said valve having a liquid inlet, means to supply liquid at substantially constant low pressure to said liquid inlet of said valve, pulse generating means connected to said valve to supply a pulse to the latter of predetermined duration and open said valve only during the time of said pulse, and signalling means to cause operation of said pulse generating means, actuated by the beating or harness motion of said loom, whereby said valve operates in synchronism with said motion.

4,074,728
APPARATUS FOR SELECTIVELY INSERTING WEFT YARNS INTO THE SHED OF A WEAVING LOOM
Yukio Mizuno, Kodaira; Takeshi Kikuchi, Mitaka, and Shuichi Kojima, Tokyo, all of Japan, assignors to Nissan Motor Company, Limited, Japan
Filed Oct. 1, 1976, Ser. No. 728,540
Claims priority, application Japan, Oct. 5, 1975, 50-136162[U]
Int. Cl.² D03D *47/34*
U.S. Cl. 139—435 **9 Claims**

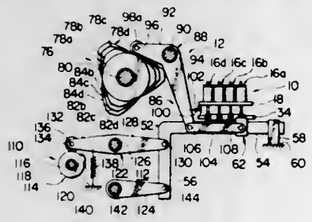


1. An apparatus for selectively inserting weft yarns into the shed in a weaving loom, comprising, in combination, a weft insertion unit including a plurality of weft shooting members each movable into a position aligned in use with a shed of a loom, weft selector cam means including at least one lobular cam rotatable about a fixed axis and formed with a plurality of cam lobe portions substantially equiangularly spaced apart from each other across bottom portions about said axis and having substantially equal radii from the axis, said bottom portions having from said axis substantially equal radii smaller than said radii of said cam lobe portions, a link mechanism operatively connecting said cam to said weft insertion unit for moving one of said weft shooting members into the position aligned with said shed when engaging one of said cam lobe portions and another weft shooting member into said position when engaging one of said bottom portions of said cam, cam actuating means operative to drive said cam to turn in a predetermined direction about said axis thereof from an angular position having one of its cam lobe portions engaged by said link mechanism into an angular position having one of its bottom portions engaged by the link mechanism or from the latter angular position into the former in each cycle of operation of the loom, weft selector signal supply means storing signals representative of a predetermined schedule in accordance with which the weft yarns are to be selectively inserted into said shed, locking means responsive to the signals delivered from said signal supply means for locking said cam actuating means in a condition inoperative to drive said cam in response to one signal from the signal supply means and releasing the cam actuating means from the inoperative condition in response to another signal from the signal supply means, cam retaining means engageable with said cam means for holding said cam in any of said angular positions of the cam when said locking means is in locking engagement with said cam actuating means, and the cam retaining means being disengaged from the cam when the cam is being rotated from one of the angular positions thereof into another.

4,074,729
APPARATUS FOR SELECTIVELY DETAINING AND RELEASING WEFT YARNS IN WEAVING LOOM
Yukio Mizuno, Kodaira, Japan, assignor to Nissan Motor Company, Limited, Japan
Filed Oct. 1, 1976, Ser. No. 728,888
Claims priority, application Japan, Oct. 5, 1975, 50-120037
Int. Cl.² D03D *47/34*
U.S. Cl. 139—450 **18 Claims**

1. An apparatus for selectively detaining and releasing a

plurality of weft yarns to be drawn off into the shed of a weaving loom including control means incorporating a predetermined schedule for weft selection, comprising in combination (1) a weft retaining mechanism comprising a plurality of weft pinch-off units arranged in a row and each having a first condition operative to detain a weft yarn leading from a yarn package and a second condition allowing the weft yarn to be drawn off through the weft pinch-off unit; and weft release levers respectively in engagement with said weft pinch-off units and each rotatable about a fixed axis between first and second angular positions holding the associated weft pinch-off unit in said first and second conditions thereof, (2) a weft selector mechanism for selecting out of said plurality of weft yarns a weft yarn to be drawn off into the weaving shed under the control of said control means, the selector mechanism comprising weft selector cam means operatively connected to said control means for being driven in accordance with said predetermined schedule; weft selector link means in engagement with said cam means; lever actuating means movable with said link means between positions respectively engageable with said weft release levers, said cam means being movable between angular positions respectively holding the link means in said positions thereof; and a guide member for guiding said



lever actuating means to move between said positions thereof relative to the guide member, said guide member and said lever actuating means being movable together between first positions operative to hold each of the weft release levers in the first angular position thereof when the particular weft release lever is being engaged by said lever actuating means and second positions allowing each of the weft release levers to turn into the second angular position thereof when the particular weft release lever is being engaged by the lever actuating means, and (3) a weft release control mechanism comprising weft release control cam means rotatable about a fixed axis and having first and second angular positions for driving said particular release lever into said first and second angular positions, respectively, thereof; and weft release control link means being in engagement with said weft release control cam means and movably connected to said guide member for converting the rotational motion of said weft release control cam means into substantially linear motion and transmitting the linear motion to said lever actuating means through said guide member so that the particular weft release lever being engaged by said lever actuating means is moved into the first and second angular positions thereof in response to the first and second angular positions of said weft release control cam means.

4,074,730

WEFT-YARN DRAWING-OFF AND LENGTH-MEASURING APPARATUS OF WEAVING LOOM HAVING WEFT SELECTOR MEANS

Yukio Mizuno, Kodaira, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Sept. 10, 1976, Ser. No. 722,082

Claims priority, application Japan, Sept. 22, 1975, 50-128926; Oct. 5, 1975, 50-120036

Int. Cl.² D03D *47/36*

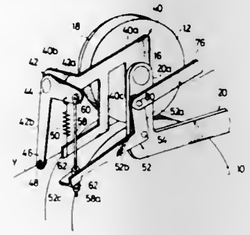
U.S. Cl. 139—452 **7 Claims**

1. - A weft-yarn drawing-off and length-measuring apparatus of a weaving loom including program-controlled weft selector means adapted to deliver a weft-change signal in accordance with a predetermined schedule, comprising:

a detachable length-measuring roller rotatable about a fixed axis, means for rotatably mounting said length-measuring roller and for mounting it removable and exchangeable with another length-measuring roller having a different diameter;

a pressing roller rotatable about an axis parallel with the fixed axis of rotation of the length-measuring roller and movable relative to the fixed axis;

a roller support mechanism including a parallelogrammic four-bar linkage for constraining said pressing roller to move substantially perpendicularly to the axis of rotation of the length-measuring roller, and biasing means for urging said four-bar linkage in a direction to hold said pressing roller in contact with the length-measuring roller, the length-measuring roller and the pressing roller being operable to pass therebetween a weft yarn when held in rolling contact with each other;



a weft guide mechanism movable with the axis of rotation of said pressing roller and having a first condition of operation for holding the weft yarn in an operative position generally perpendicularly aligned with the line of contact between the length-measuring roller and the pressing roller and a second condition of operation for holding the weft yarn out of said operative position; and

a control mechanism operatively connected to said weft selector means and including an elongated member pivotally connected to said weft guide mechanism and movable in response to said weft-change signal from said weft selector means for driving the weft guide mechanism into said first condition in the presence of said signal and into said second condition in the absence of said signal.

4,074,731

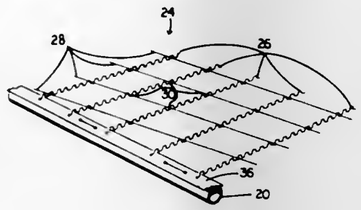
COMPLIANT MESH STRUCTURE AND METHOD OF MAKING SAME

John S. Archer, Palos Vardes Peninsula, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Division of Ser. No. 484,635, July 1, 1974, Pat. No. 3,982,248. This application Dec. 29, 1975, Ser. No. 644,985

Int. Cl.² B21F *27/10*

U.S. Cl. 140—112 **2 Claims**



1. The method of fabricating a wire mesh of the character described comprising the steps of:

selecting first wires which are preformed to a spring-like configuration which renders the wires resiliently compliant in their endwise directions and second wires;

placing said second wires in spaced side-by-side relation; and

joining said first wires to said second wires to form a mesh wherein said first wires are disposed in crossing relation to and spaced along said first wires by placing each first wire in crossing relation to said second wires, exerting a tension load on the first wire to stretch the latter wire, and joining the latter wire to the second wires at the wire crossing points while the first wire is under said tension load.

4,074,732

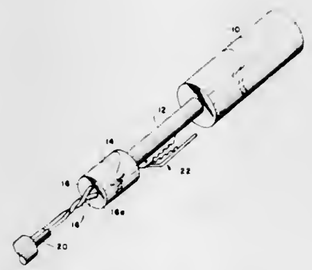
WIRE CUTTING, STRIPPING AND TWISTING TOOL

Kenneth A. Wilkens, R.D. No. 2 Box 546, Andover, N.J. 07821

Filed Jan. 5, 1977, Ser. No. 756,898

Int. Cl.² B21F *15/04*

U.S. Cl. 140—120 **1 Claim**



1. A hand-held wire cutting and twisting tool comprising:

a. a generally cylindrical handle member;

b. a head member generally aligned concentrically with the axis of said handle member and spaced therefrom;

c. a face on said head member in a plane generally normal to the axis of said handle member;

d. a generally cylindrical shank concentric with said handle member connecting said handle member to said head member;

e. at least two blind holes normal to said face and parallel to the axis of said handle member, each of said at least two blind holes being symmetrically offset from the axis of said handle member;

f. each of said at least two blind holes being adapted to the insertion therein of the stripped end of one wire to be twisted;

g. said at least two blind holes, in combination with said head member, shank and handle member, being operative to twist together the stripped ends of at least two wires inserted therein when the wires are held and the handle member rotated about its axis;

h. a fixed cutting and stripping blade rigidly attached to said shank;

i. a moveable cutting and stripping blade pivotally attached at one of its ends in operatively opposed relationship to said fixed cutting and stripping blade;

j. a handle on the second end of said moveable cutting and stripping blade;

k. opposed scissors blade means on said fixed and moveable cutting and stripping blades for cutting through said wires; and

l. at least one semicircular stripping notch in each of said fixed and moveable cutting and stripping blades, said stripping notches facing each other and together forming a generally circular hole with a sharpened perimeter, said generally circular hole being slightly larger in diameter than the diameter of a wire conductor to be stripped.

4,074,733

FLEXIBLE LEAD CHLORIDE CATHODE CONSTRUCTION

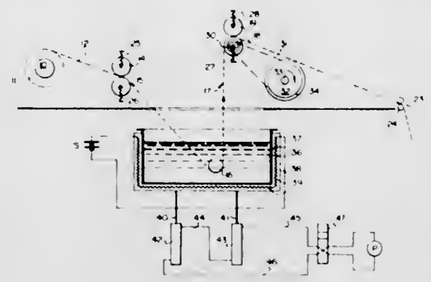
Thomas J. Gray, Armdale, and Jan Wojtowicz, Dartmouth, both of Canada, assignors to The Minister of National Defence of Her Majesty's Canadian Government, Ottawa, Canada

Filed June 8, 1976, Ser. No. 693,835

Claims priority, application Canada, June 16, 1975, 229399

Int. Cl.² H01M *7/00*

U.S. Cl. 141—32 **6 Claims**



1. Apparatus for the manufacture of flexible electrode material, which comprises:

a container for a bath of molten coating material;

means for heating and melting the coating material in the container;

first guide means for guiding a strip-shaped mesh on a path of travel extending downwardly from the first guide means;

second guide means for guiding the mesh beneath the surface of the bath;

third guide means for guiding the mesh upwardly from the second guide means and out of the bath;

means for raising and lowering the container to and from an elevated position in which the second guide means is immersed in the bath; and

drive means for advancing the mesh past the first, second and third guide means.

4,074,734

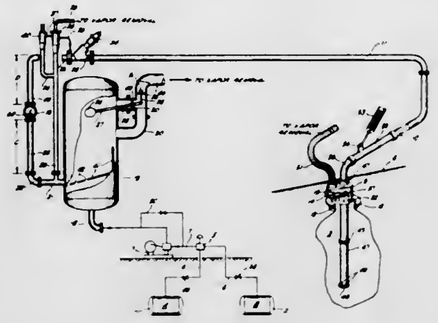
LIQUID DELIVERY SYSTEM

Gerard Anthony De Beau, Buena Park, and Harold Arnold Price, Orange, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed July 20, 1976, Ser. No. 707,034

Int. Cl.² B65B *3/18*

U.S. Cl. 141—44 **3 Claims**

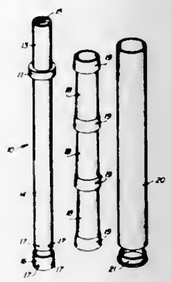


1. An apparatus comprising:

(1) a plurality of storage vessels for separately storing a plurality of liquids; and

(2) a liquid delivery system for transferring into a receiving vessel accurately measured amounts of any one of said stored liquids without the transferred liquid becoming contaminated in said system with a significant amount of a previously transferred liquid, said liquid delivery system comprising:
(a) a positive displacement pump;
(b) valving means, in liquid communication with said pump and each of said storage vessels, for directing the flow of a liquid in any one of said storage vessels into said pump;
(c) degassing means for removing entrained gases from a flowing liquid comprising (1) a holding vessel through which said flowing liquid is passed and in which entrained gases in said flowing liquid are gathered and (2) means, integral with said holding vessel, for discharging gas gathered in said holding vessel in response to the presence of accumulated gas contained therein;
(d) a first liquid transfer means connecting said pump and the intake of said holding vessel;
(e) a liquid metering means for accurately measuring the amount of a liquid passing through a fluid communication path within said liquid metering means, said fluid communication path (1) comprising the intake and discharge openings of said liquid metering means and (2) being constructed such that a draining liquid may freely pass through said fluid communication path without any significant amount thereof becoming entrapped therein;
(f) a second liquid transfer means connecting the discharge of said holding vessel and said intake opening of said liquid metering means;
(g) a control valve;
(h) a third liquid transfer means connecting said discharge opening of said liquid metering means with the intake opening of said control valve;
(i) means for opening said control valve when liquid is at the high point of that portion of said liquid delivery system consisting of said second and third liquid transfer means, said liquid metering means, said intake opening of said control valve, and the discharge portion of said holding vessel and for closing said control valve in response to the detection of entrained gas in liquids flowing through said second liquid transfer means, said means comprising:
(1) a gas communication passageway for discharging gases from said high point;
(2) a liquid collector line connected to said portion of said liquid delivery system, said liquid collector line extending upwardly from its connection to said portion of said liquid delivery system to a height at least equivalent to said high point;
(3) a valve, positioned in said gas communication passageway, said valve being responsive to a float situated within said liquid collector line such that said valve closes when liquid rises up said liquid collector line to a level equivalent with said high point; and
(4) means, responsive to the level of liquid in said liquid collector line, for opening said control valve when said liquid level is equivalent to said high point and for closing said control valve when said liquid level is below said high point, said means comprising detecting means, attached to said liquid collector line, for detecting when liquid is present in said liquid collector line at a height equivalent to said high point;
(j) a fourth liquid transfer means, connected to the discharge of said control valve, for delivering essentially all liquid passing through said control valve into a receiving vessel; and
(k) siphon-breaking means for draining all liquid entrapped in said fourth liquid transfer means into said receiving vessel when said control valve is closed, said siphon-breaking means comprising:
(1) an air inlet passageway connected to that portion of said liquid delivery system consisting of said discharge of said control valve and said fourth liquid transfer means;
(2) a valve situated in said air inlet passageway; and
(3) means, integral with said valve, for opening said valve when a negative pressure exerted by entrapped liquid in said fourth liquid transfer means is detected, said means including means for detecting said negative pressure.

4,074,735
GROUTING TUBE
William E. McCabe; Howard W. McCabe, and Edwin L. McCabe, all of Idaho Falls, Idaho, assignors to McCabe Brothers Drilling, Inc., Idaho Falls, Idaho
Filed Sept. 10, 1976, Ser. No. 722,261
Int. Cl.² B65B *3/04*
U.S. Cl. 141—311 R **5 Claims**

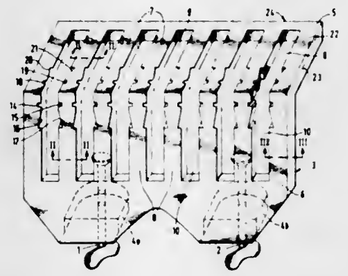


1. A grouting tube for preventing backflow of grout around said tube during grouting operations, comprising in combination:
an inner tube for carrying grouting material having a reverse threaded portion on the external circumference of said tube a distance from a first end thereof;
nut means disposed about said inner tube having reverse threads for engaging said threaded portion of said inner tube;
annular retaining ring means for mounting on said second end of said inner tube;
mounting means for said annular retaining ring means on said inner tube second end, said mounting means arranged to separate upon application of a pre-determined force thereagainst;
a series of alternating multiple annular, flexible cap means and frusto-conical rigid tube means slidingly disposed along the length of said inner tube from said nut means to said annular retaining ring with said tube means spacing said multiple annular cap means predetermined distances apart from each other; and, whereby said cap means prevents backflow of grout around said inner tube
external sheath means slidingly disposed about and concentric with said cap means and said frusto-conical rigid tube means whereby said sheath means facilitates the placement of said grouting tube in a grout hole.

4,074,736
MILLING GAUGE
Robert Wolff, 1 M Kiesacker, (5446) Engeln, Germany
Filed Mar. 24, 1977, Ser. No. 780,972
Claims priority, application Germany, May 15, 1976, 2621746; Sept. 24, 1976, 2642924
Int. Cl.² B27F *1/08*
U.S. Cl. 144—78 **7 Claims**

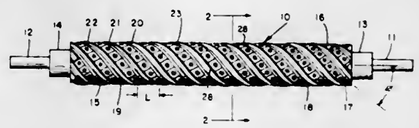
1. A milling gauge for milling dovetail grooves in boards that are to be dovetailed together at right angles by means of a milling cutter hand machine comprising:

a gauge body having a comb-like body portion provided with parallel slits and prongs;
a guide piece which is attachable to the milling cutter hand machine and is to introduce into said slits of the comb-like body portion;



said gauge body being clamped together with one board to a workbench;
counter guides on said gauge body which serve as spacing means for said guide piece; and,
said comb-like body portion has two comb-like guide plates which are oriented at right angles to one another;

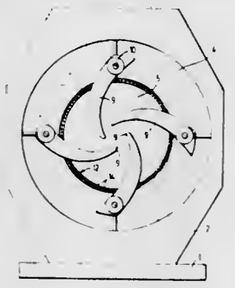
4,074,737
WOOD PLANER CUTTERHEAD DESIGN FOR REDUCED NOISE LEVEL
John S. Stewart, P.O. Box 5670, Greensboro, N.C. 27403
Filed Sept. 2, 1975, Ser. No. 609,291
Int. Cl.² B27C *1/00*
U.S. Cl. 144—117 R **9 Claims**



1. A wood planer cutterhead for reducing noise level comprising: a rotatable shaft, a cylindrical cutterhead mounted on said shaft, a series of helically mounted cutting blades mounted on said cutterhead, said cutting blades being spaced circumferentially on said cutterhead and positioned to simultaneously engage a surface to be cut to reduct noise level, the spacing between said cutting blades being in accordance with the formula $L=\pi D\cot\phi/N$ in which L is the linear distance between adjacent helical cutting blades, D is the cutterhead diameter, N is the number of cutting blades and ϕ is the helix angle, and the ratio of W/L, in which W is the width of the workpiece, is greater than 1.

4,074,738
ARRANGEMENT FOR A ROTOR BARKING MACHINE
Veikko Lennart Valo, Hiidensalmi, 08100 Lohja 10, Finland
Filed Mar. 22, 1977, Ser. No. 780,152
Claims priority, application Finland, Apr. 2, 1976, 760896
Int. Cl.² B27L *1/00*
U.S. Cl. 144—208 E **3 Claims**

1. An arrangement for a rotor barking machine comprising a hollow rotor rotatably mounted in a frame, barking members pivotally journalled on the rotor and directed toward the centre of a rotor, a cutting member supported by the frame and extending close to the plane of rotation of the barking members for cutting-off of back strips, and means for feeding a tree to be barked longitudinally through the hollow rotor, said cutting member comprising a non-rotating tubular portion extending into the opening in the hollow rotor, the end edge of said portion extending from the inside of the opening in the hollow



rotor close to the plane of rotation of the barking members and being formed with cutting means.

4,074,739
GOLF CLUB AND GOLF ACCESSORY CARRIER
John H. Rodeghier, 255 S. Oak St., Orange, Calif. 92667
Filed Feb. 17, 1977, Ser. No. 769,316
Int. Cl.² A63B *55/00*
U.S. Cl. 150—1.5 B **5 Claims**



1. A carrier for golf clubs and golf accessories for use on a par-three golf course, said carrier including:
a. first and second equally sized elongate panels only, each of said panels having first and second end edges, and first and second side surfaces, said first side surfaces being at least partially flat and in abutting contact, said second surfaces at least partially defined by a plurality of longitudinal, laterally spaced corrugations, and each of said corrugations cooperating with a part of said flat side surface oppositely disposed thereto to define an elongate cavity in which one of said golf club shafts may be removably disposed, with said cavities laterally offset from one another to removably support said golf clubs in offset positions from one another;
b. first means for holding said first and second panels and at least portions of said first side surfaces thereof in abutting contact;
c. second means that are laterally aligned and project outwardly in opposite directions from portions of said first side surfaces and formed integral with said first and second panels, said second means cooperating to define an elongate box in which a plurality of golf balls may be carried;
d. third means for removably closing said box to maintain said golf balls therein;
e. first and second laterally aligned legs pivotally supported from said first and second panels intermediate said first and second end edges thereof, said legs when in a first position extending longitudinally relative to said first and

second panels and adjacent thereto, said first and second legs when in a second position extending outwardly from said first and second panels in angularly disposed positions to support said carrier above the ground surface when said first end edges rest on the latter; and

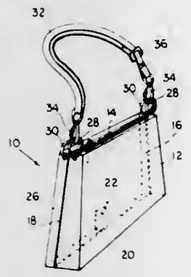
f. fourth means extending outwardly from said first and second panels that cooperate to define a handle for carrying said carrier.

4,074,740

COMBINATION POCKETBOOK AND CUSHION

Margaret Anderson, D-11 Wilshire Lane, Oakdale, L.I., N.Y. 11769

Filed Mar. 11, 1977, Ser. No. 776,531
Int. Cl.[2] A45C *3/06*
U.S. Cl. 150—35 **5 Claims**



1. A combination pocketbook and cushion construction comprising:

a pocketbook having a flap pivotably connected to one side thereof,

a ring on opposite edges of said pocketbook

a cushion

a pair of rings connected to opposite edges of said cushion

means on the bottom edges of said flap and said cushion for connecting said flap to said cushion, and

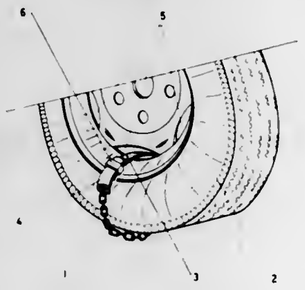
a carrying handle for said pocketbook and cushion including fastening means connected to opposite ends of the handle for connecting said handle to said rings on both said pocketbook and said cushion.

4,074,741

ANTI-SKID TIRE CHAIN

Clifton Ross Moore, and John Greydon Moore, both of Suite 215 Duke Towers, Halifax, Nova Scotia, Canada

Filed July 15, 1975, Ser. No. 579,611
Int. Cl.[2] B60C *27/02*
U.S. Cl. 152—237 **9 Claims**



1. An anti skid device adapted to be mounted on a tire and comprising, in combination:

a single strand of link chain;

a first strip of flexible material removably connected, at one end thereof, to one end of said link chain;

a second strip of flexible material removably connected, at one end thereof, to the other end of said link chain;

said first and second strips being of unequal length;

said first strip comprising, on a first surface thereof, a first set of serrations and a second set of serrations, said sets extending in the longitudinal direction of said first flexible strip and being separated by first engagement means extending longitudinally along said first surface of said first flexible strip, between said sets of serrations;

said second strip comprising, on a first surface thereof, a first set of serrations and a second set of serrations, said sets extending in the longitudinal direction of said second flexible strip and being separated by second engagement means extending longitudinally along said first surface of said second flexible strip, between said sets of serrations;

said second strip being adapted, in operation, to overlie said first strip such that the first surface of the first strip faces the first surface of the second strip;

whereby the serrations of said first strip interlock with the serrations of said second strip to thereby prevent movement of one strip relative to the other strip in the longitudinal directions of the strips;

and whereby said first engagement means matingly engages said second engagement means to prevent lateral movement of the strips relative to one another;

said first strip, in operation, lying adjacent said tire with the second surface thereof facing said tire, said second surface of said first strip comprising ridges extending transversely thereof at regular intervals in the longitudinal direction of said first strip;

whereby movement of said device along said tire is prevented;

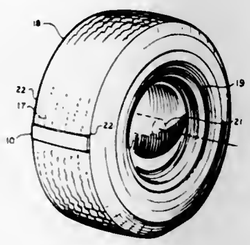
and clasp means fitting over the interlocked first and second flexible strips whereby to further prevent relative movement between said first and second strips.

4,074,742

INDICATOR FOR TIRE WEAR PATTERNS

Kenneth Donald Chamblin, 4219 Arcturus Ave., Lompoc, Calif. 93436

Filed Sept. 27, 1976, Ser. No. 727,297
Int. Cl.[2] B60C *11/00*
U.S. Cl. 152—330 A **6 Claims**



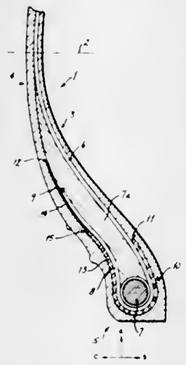
6. For use on a vehicle tire to determine wear patterns, an adhesive strip having multilayers of different colors and having a thickness on the order of several thousandths of an inch and for adhering transversely to the tread of a tire, said strip readily revealing tread wear patterns of the tire prior to adverse tire tread wear upon differential wear of parts of the strip to reveal different colors whereby said strip results in a strip having a bulk so small that the roundness of the tire is maintained and bumping avoided, and the strip mass being so small that wheel balance is substantially maintained.

4,074,743

RADIAL TIRE WITH BEAD REINFORCING ELEMENTS

Sjirk van der Burg, Embourg, Belgium; Karl A. Grosch, Roetgen (Rott), Germany, and Marcel J. Bertrand, Grivegnee-Liege, Belgium, assignors to Uniroyal, AG, Aachen, Germany

Filed Oct. 9, 1975, Ser. No. 620,971
Claims priority, application Germany, Nov. 25, 1974, 2455709
Int. Cl.[2] B60C *9/00*
U.S. Cl. 152—355 **5 Claims**



1. In a motor vehicle pneumatic tire having an inner wall portion and an outer wall portion with a bead ring disposed therebetween and a radial carcass having a turn-up portion folded about the bead ring from the inner wall portion toward the outer wall portion for termination in a turn-up edge, a bead reinforcement folded about the bead ring and the carcass ply turn-up portion from the inner wall portion to the outer wall portion and having a first terminal edge at the inner wall portion and a second terminal edge at the outer wall portion extending beyond the turn-up edge of the carcass ply turn-up portion, said bead reinforcement further including a main ply portion of predetermined thickness having a first cord material, said main ply portion extending from the first terminal edge to an intermediate edge at the outside wall portion between the bead ring and the turn-up edge of said carcass ply with cord ends of said first cord material being at said intermediate edge, and a terminal ply portion of lesser thickness than said main ply portion and having a second cord material of lesser stiffness than said first cord material, said terminal ply portion abutting against the intermediate edge of said main ply portion and extending from said intermediate edge to said second terminal edge thereby covering at least a portion of the intermediate edge to shield the cord ends in said edge portion from the outer wall portion of said tire, and wherein a filler strip is disposed at the abutting main and terminal ply portions of said bead reinforcement such that the thickness of the filler strip and the terminal ply portion are substantially equivalent to the thickness of the main ply portion to provide a substantially continuous transition between the main and terminal ply portions of the bead reinforcement along the radial carcass at the area of abutment.

4,074,744

AUTOMATIC APPARATUS FOR PRODUCING MOLDS USING CHEMICALLY BONDED SANDS

Ronald A. Cina, and Albert D. Kluge, both of Lansing, Mich., assignors to Roberts Corporation, Lansing, Mich.

Filed Jan. 31, 1977, Ser. No. 763,813
Int. Cl.[2] B22C *15/28*
U.S. Cl. 164—187 **5 Claims**

1. An automatic mold machine for producing molds using chemically bonded sands comprising:

a mold machine frame;

blow head means provided at the uppermost portion of said frame;

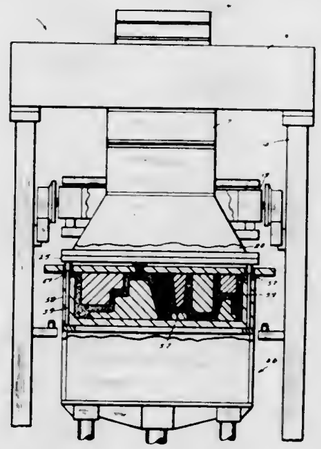
bulk sand delivery means in association with said frame;

carriage means provided on said frame, said carriage means adapted to selectively shuttle between and below said blow head means and said bulk sand delivery means;

a sand magazine positioned on said carriage means, said sand magazine adapted for selectively positioning below said blow head means and said bulk sand delivery means upon selective corresponding movement of said carriage means;

a gas catalyst manifold positioned on said carriage means adjacent said sand magazine, said gas catalyst manifold adapted to be in an idle position when said sand magazine is positioned below said blow head means, said gas catalyst manifold movable to a gassing position below said blow head means upon corresponding movement of said sand magazine to its fill position beneath said bulk sand delivery means;

a pattern clamp table provided in spaced-apart register below said blow head means, said pattern clamp table having a pattern tooling stack positioned thereon, said



pattern clamp table adapted to selectively clamp said pattern tooling stack against said sand magazine and said blow head means during the mold blow operation and to selectively clamp said pattern tooling stack against said gas catalyst manifold during a mold squeeze and gas catalyst operation;

mold squeeze compression assembly means in association with said pattern tooling stack and said clamp table so as to permit selectively maintaining said blow head means and said clamp table in non-compressive relationship during the blow operation and permitting compression of the blown sand mold after the blow operation and before the gassing operation through a compressive relationship between said clamp table and said gas catalyst manifold; and

mold ejection assembly means provided in association with said frame, said mold ejection assembly means adapted to remove the cured sand mold from the automatic mold machine.

4,074,745

STARTER BAR FOR GUIDING AND EXTRACTING CAST STRANDS OF VARIOUS THICKNESSES

Werner Scheurecker, and Alois Scheinecker, both of Linz, Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Jan. 7, 1977, Ser. No. 757,466
Claims priority, application Austria, Jan. 16, 1976, 266/76
Int. Cl.[2] B22D *11/08*
U.S. Cl. 164—446 **5 Claims**

1. In a starter bar for guiding and extracting cast strands of

various thicknesses in continuous casting plants with arcuate guiding paths that support the cast strands at opposite sides thereof, the starter bar being formed by link bodies pivotally connected to one another about common axes so as to be arranged one behind the other and having a thickness corresponding to the slightest thickness of the cast strands, the improvement comprising exchangeable articulation locking pieces provided between individual ones of said link bodies for adjustably limiting the pivotal motion between connected link bodies about the common axes so as to assure guiding of the starter bar between the guiding paths without play.

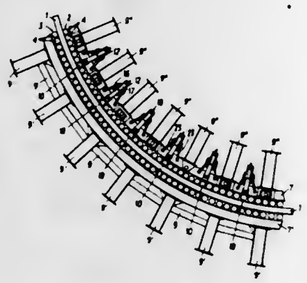


4,074,746

SUPPORTING AND GUIDING STAND FOR CONTINUOUSLY CAST STRANDS

Werner Scheurecker, Linz, and Franz Kagerhuber, Traun, both of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Nov. 3, 1976, Ser. No. 738,362
Claims priority, application Austria, Nov. 12, 1975, 8601/75
Int. Cl.[2] B22D *11/12*
U.S. Cl. 164—442 **9 Claims**



1. In an arc-shaped supporting and guiding stand for continuously cast strands of the type including supporting rollers forming oppositely arranged roller paths to support the strand and uninterrupted longitudinal carriers formed in one piece for accommodating said supporting rollers, the improvement comprising:

transverse carriers arranged along the uninterrupted longitudinal carriers parallel to the axes of the supporting rollers at a distance from one another and outside a space defined by the oppositely arranged roller paths;

supporting brackets connected to said transverse carriers and being arranged laterally of the longitudinal carriers;

driven rollers journaled on said transverse carriers via said supporting brackets; and

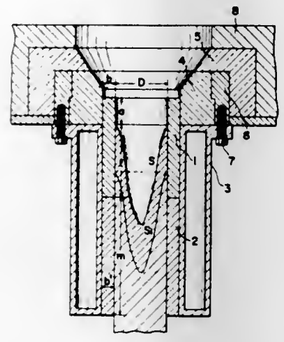
adjustment means provided for moving said supporting bracket so as to adjust said driven rollers to the strand or to a starter bar passed between the oppositely arranged roller paths in a direction toward or way from the respective oppositely arranged roller path.

4,074,747

CONTINUOUS CASTING MOLD FOR METALS

Hirohiko Takahashi, Tokyo; Yoshinao Otsuka, Toyama; Yuichiro Sato, Toyama, and Yoshiki Tsukamoto, Toyama, all of Japan, assignors to Taiheiyo Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 19, 1976, Ser. No. 715,657
Claims priority, application Japan, Oct. 21, 1975, 50-125904
Int. Cl.[2] B22D *11/04*; B22C *1/00*
U.S. Cl. 164—443 **5 Claims**



1. A continuous casting mold for metals having a large difference between the melting temperature and the solidifying temperature thereof, said casting mold being an open mold having an inlet end and an outlet end and said inlet end being directly connected to a pouring basin, comprising a 1st stage die portion of refractory material other than graphite, a 2nd stage die portion of a graphite type refractory material, and a water-cooling jacket, said 1st stage die portion being in the water-cooling jacket at the inlet side for a length longer than one drawing length and said 1st stage die portion in the water-cooling jacket at the inlet side extending beyond the back end of said water-cooling jacket into the pouring basin side for a length longer than the thickness of said 1st stage die portion, and said 2nd stage die portion being in the mold at the outlet side thereof and having a length of 1–4 times the length of said 1st stage die portion.

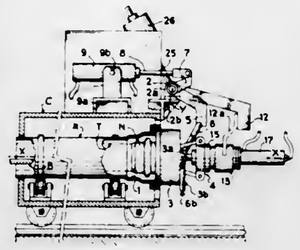
4,074,748

CENTRIFUGAL CASTING MACHINE HAVING A DEVICE FOR AXIALLY PLACING AND MAINTAINING A CORE IN POSITION

Robert Paul Négre, Fumel, France, assignor to Pont-A-Mousson S.A., Nancy, France

Filed Oct. 31, 1975, Ser. No. 627,816
Claims priority, application France, June 16, 1975, 75 18770
Int. Cl.[2] B22D *13/10*
U.S. Cl. 164—292 **10 Claims**

1. A centrifugal casting machine comprising a housing, an open-ended pouring mould mounted to rotate in the housing about an axis, and a device for axially placing and maintaining a core against the open end of the mould, said device comprising a hollow thrust element, first support means carrying the thrust element and movably mounted relative to the housing so as to permit moving the thrust element between an operative position in which position the hollow thrust element maintains the core against the open end of the mould and allows the inside of the mould to be seen and a withdrawn position in which withdrawn position the thrust element is located laterally to one side of the open end of the mould to allow unhindered access to the open end of the mould, a releasable mechanism capable of engaging the core and holding the core against the thrust element when the the thrust element is in said withdrawn position and while the thrust element moves from said withdrawn position to said operative position, means mounted relative to the housing and connected to the first support means for shifting the thrust element between said operative withdrawn position and said withdrawn position, second support means carrying the releasable mechanism and movably mounted relative to the housing and independent of and movable independently of the first support means and transversely of the mould axis so as to permit moving the releasable mechanism between a first position in which position it holds the core



against the thrust element in the operative position of the thrust element and a second position in which second position the mechanism is located laterally to one side of the open end of the mould to allow unhindered access to the open end of the mould and through the hollow thrust element when the thrust element is in said operative position, and returning means connected to the second support means for returning the releasable mechanism to said second position, the releasable mechanism being capable of being disengaged from the core when the thrust element is in said operative position and capable of being thereafter moved by said returning means acting on said second support means from said first position to said second position while the thrust element remains in said operative first position, the mechanism being capable, in moving from said second position to said first position, of following the movement of the thrust element from said withdrawn position to said operative position of the thrust element.

4,074,749

CASTING MACHINE WITH MOLD TILTING DISCHARGE MEANS

Akira Otani, Kobubunji, Japan, assignor to Tanabe Kokoki Co., Ltd., Itoigawa, Japan

Continuation of Ser. No. 695,136, June 11, 1976, abandoned.
This application Jan. 13, 1977, Ser. No. 759,098
Claims priority, application Japan, June 13, 1975, 50-71566
Int. Cl.[2] B22D *5/02, 29/00*
U.S. Cl. 164—326 **10 Claims**

1. A casting machine comprising:

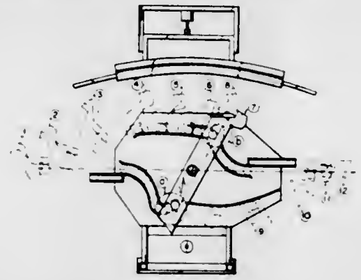
a truck;

means for driving said truck in an advancing direction;

a plurality of molds carried by said truck, said molds being aligned in the advancing direction and being rotatable about axes extending perpendicular to the advancing direction, each mold having a rearwardly extending lip which overlaps the forward edge of the next succeeding mold when the molds are horizontally arranged;

arms connected to each of said molds for rotation therewith, said arms having first and second guide rollers which in relation to the advancing direction of said truck, are spaced respectively forwardly and rearwardly of the rotational axis of the mold to which the arm is connected;

guide means adjacent to the path of travel of said truck in the advancing direction for cooperating with said rollers to control the rotational attitude of said molds, said guide means having horizontal sections which maintain said molds horizontally, and curved sections which rotate said molds about said axes in order to discharge the contents thereof at a casting discharge position, said curved sections including curved upper and lower tracks, said first guide rollers being engageable with said lower tracks and said second guide rollers being engageable with said upper



tracks, said curved upper and lower tracks being mounted on a support movable in a direction transverse to the advancing direction of said truck;

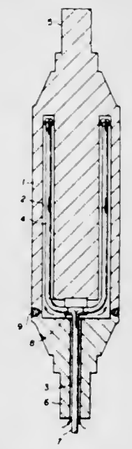
and, means for shifting said support between an operative position at which said upper and lower tracks are aligned with the horizontal sections of said guide means, and an inoperative position at which the said upper and lower tracks are not engaged by the rollers on said arms during movement of said truck.

4,074,750

INTERNALLY COOLED ROLL

Marcel Beghin, Lille, France, assignor to Fives-Cail Babcock, Paris, France

Filed Mar. 25, 1976, Ser. No. 670,128
Claims priority, application France, Mar. 28, 1975, 75 09836
Int. Cl.[2] F28F *5/02*
U.S. Cl. 165—89 **9 Claims**



1. An internally cooled roll comprising

(1) a cylindrical body having an axis and two coaxial trunnions, one of the trunnions constituting an integral piece with the body and the other trunnion being affixed thereto, the body defining in the interior thereof

(2) a longitudinal conduit extending in the direction of the axis for circulating a cooling fluid therethrough, the conduit being closed to an end on the side of the one trunnion,

(2) a tubular conduit disposed in the longitudinal conduit and extending over most of the length of the longitudinal conduit whereby the tubular conduit is surrounded by the longitudinal conduit, and

(3) means for supplying the cooling fluid to one of the conduits and removing the fluid from the other conduit, the fluid flowing through the conduits in opposite directions, said means including

(a) a fluid collector element connected to the tubular conduit and passing through the other trunnion.

4,074,751

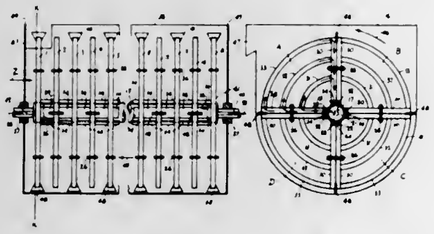
MULTIFLOW ROTARY HEAT EXCHANGER ELEMENT

Joseph Christophe Victor Ducasse, Martinez, Calif., assignor to Unice Machine Company, San Francisco, Calif.

Continuation of Ser. No. 518,163, Oct. 25, 1974, abandoned. This application Mar. 3, 1976, Ser. No. 663,224

Int. Cl.[2] F28F *5/04*

U.S. Cl. 165—92 **15 Claims**



1. A multiflow rotary heat exchanger element comprising:

a rotatably mounted longitudinal shaft;

a plurality of coil sets fixedly positioned to said shaft at spaced intervals along the length thereof;

each of said coil sets being formed of an equal plurality of separate equally configured coils, each of said coils of each set being in the form of a circular sector, each of said coils having extending therethrough a fluid passage including first and second radial portions joining at least one circumferential portion, all of said coils of each said coil set being arranged substantially in a plane transverse to the longitudinal axis of said shaft;

a plurality, equal to said plurality of coils in each said coil set, of separate fluid conduit means for supplying plural separate streams of fluid from a first end of said element to a second end thereof, said fluid conduit means being entirely fluid isolated from each other;

each said fluid conduit means including the fluid passage of a selected one only of said coils of each of said coils sets, and a plurality of separate channels, one each of said channels connecting the fluid passage of the said selected coil of one of said coil sets with the fluid passage of the said selected coil of the next successive coil set, said channels serially connecting said fluid passages of said selected coils from said first end of said element to said second end thereof;

fluid inlet means extending into a first end of said shaft, said fluid inlet means communicating with the first radial portion of each of said fluid passages of the coils of the coil set adjacent said first end of said shaft;

fluid outlet means extending from a second end of said shaft, said fluid outlet means communicating with the second radial portion of each of said fluid passages of the coils of the coil set adjacent said second end of said shaft;

the separate channels of each of said separate fluid conduits connecting the second radial portion of the fluid passage of the respective selected coil of each coil set with the first radial portion of the fluid passage of the respective selected coil of the next downstream coil set, taken in the direction of flow of fluid from said first end of said shaft to said second end thereof; and

said coils in the form of circular sectors being positioned such that corresponding sectors of each of said coil sets are aligned longitudinally of said shaft, the adjacent selected and connected coils of each of said separate fluid conduits being sequentially circumferentially displaced with respect to each other, and the circumferential displacement of said selected and connected coils being in a direction opposite to the direction of rotation of said shaft.

4,074,752

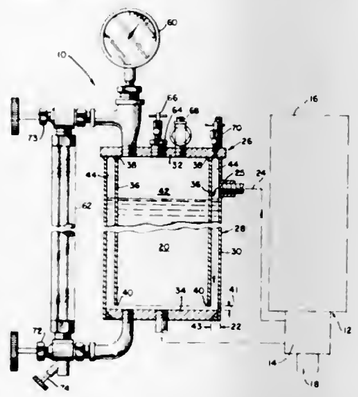
LUBRICANT COOLING APPARATUS

Seymour Schlosberg, East Brunswick, N.J., assignor to R. Gelb & Sons, Inc., Union, N.J.

Filed Dec. 22, 1975, Ser. No. 643,480

Int. Cl.[2] F01M *5/00;* **F28F** *27/00*

U.S. Cl. 165—96 **24 Claims**



1. An apparatus for circulating and cooling a liquid medium utilized for lubricating an external device, comprising a housing having means defining an internal lubricant reservoir and including at least one peripheral outer sidewall, axially spaced upper and lower end wall portions, a cooling chamber disposed about at least a portion of the internal reservoir and within the housing, said means defining said reservoir being formed such that said chamber is in fluidic communicating relation with the internal reservoir said chambers being formed at least in part by said outer peripheral sidewall such that heat is transferable from within said cooling chamber to an atmosphere outside of the housing, lubricant return means connected to an upper portion of said peripheral sidewall and operatively communicating with said cooling chamber for directing relatively hot lubricating liquid from an external device to said cooling chamber, lubricant feed means operatively connected to a lower portion of said housing to enable relatively cooled lubricating liquid flowing downwardly within said cooling chamber to return to an external device to provide further lubrication thereof, and means for introducing a gaseous medium under relatively elevated pressures into said reservoir to raise the lubricating liquid in the cooling chamber to a level sufficient to enable adequate heat transfer to take place from the lubricating liquid returning to said cooling chamber from an external device, said lubricating liquid being circulated by natural convection in a closed liquid system.

4,074,753

HEAT TRANSFER IN POOL BOILING

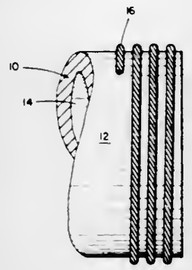
Karl V. Schmittle, and Keith E. Starner, both of York, Pa., assignors to Borg-Warner Corporation, Chicago, Ill.

Division of Ser. No. 538,234, Jan. 2, 1975, abandoned. This application July 23, 1976, Ser. No. 707,974

Int. Cl.[2] F28F *13/02, 1/36*

U.S. Cl. 165—184 **2 Claims**

1. In a heat exchanger adapted for use in a pool boiling application wherein a relatively low boiling point liquid is caused to boil on the outside surface of a plurality of heat exchange tubes totally immersed in said liquid, each said tube comprising an elongated, tubular metal substrate and a length



of fibrous, multifilament funicular material spirally wound on the outside surface of said substrate, the spacing between adjacent turns being approximately 0.01 inch, said funicular material having an outer diameter between 0.01 and 0.02 inches.

4,074,754

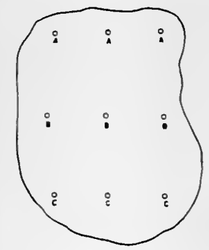
METHOD FOR PRODUCING GEOTHERMAL ENERGY AND MINERALS

Lawrence D. Christian, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Sept. 27, 1976, Ser. No. 727,210

Int. Cl.[2] E21B *43/00. 43/24*

U.S. Cl. 166—245 **12 Claims**



1. A method for producing geothermal energy and/or minerals from subterranean high temperature, high salinity brine reservoirs comprising the steps of:

injecting fresh or low salinity water into said reservoir and into contact with said reservoir brine;

halting said injection of said fresh or low salinity water; and

producing said injected water from said reservoir, said reservoir heat heating said injected water in said reservoir.

4,074,755

ION EXCHANGE CONTROLLED CHEMICALLY AIDED WATERFLOOD PROCESS

Harold J. Hill; Joseph Reisberg; Fred G. Helfferich; Larry W. Lake, all of Houston, and Gary A. Pope, Austin, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 21, 1977, Ser. No. 779,663

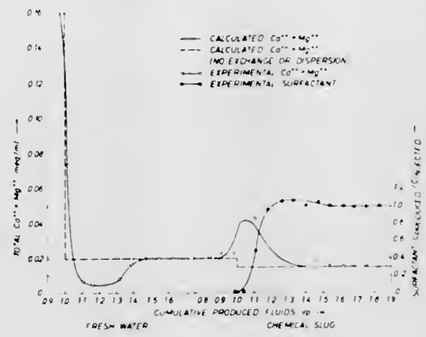
Int. Cl.[2] E21B *43/22*

U.S. Cl. 166—252 **3 Claims**

1. In an oil recovery process in which liquids are successively injected into an oil-containing reservoir, where the injected liquids include at least an aqueous-drive liquid and a chemical slug that contains at least one aqueous surfactant or thickened aqueous liquid for which a specific cationic composition is selected, and where the reservoir into which the liquids are injected has a significant ion-exchange capacity and contains an aqueous liquid having a cationic composition differing in proportion or type of monovalent or divalent cation, from the cationic composition selected for at least one aqueous liquid component of the chemical slug, and where each injected liquid contacts and displaces an aqueous liquid and/or oil within the reservoir, the improvement which comprises:

determining a ratio of concentrations of effectively predominant cations within the aqueous liquid in the reservoir at the time the oil recovery process is initiated, which ratio is at least substantially equivalent to the ratio of concentration of the effectively predominant monovalent cation to the square root of concentration of the effectively predominant divalent cation;

compounding each aqueous liquid to be injected so that the



ionic composition of the compounded liquid provides properties selected for that liquid and the cationic composition of the compounded liquid provides a ratio of concentrations of the effectively predominant cations which ratio value substantially matches that of such a ratio within the liquid to be contacted and displaced by the compounded liquid within the reservoir; and

injecting the compounded liquids into the reservoir so that their cationic compositions minimize the amount by which the cationic compositions selected for the aqueous liquid components of the chemical slug are changed by an exchange of ions between those liquids and the reservoir rocks.

4,074,756

APPARATUS AND METHOD FOR WELL REPAIR OPERATIONS

Claude E. Cooke, Jr., Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Jan. 17, 1977, Ser. No. 759,941

Int. Cl.[2] E21B *33/13. 43/119. 47/06*

U.S. Cl. 166—253 **15 Claims**

1. An apparatus adapted to be lowered into a well for locating and perforating into a flow channel located outside the well casing which comprises:

temperature sensing means adapted to measure a temperature distribution around the circumference of said casing at a given vertical depth, thereby detecting said flow channel;

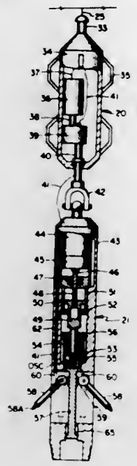
a perforating gun directly attached to, and having a fixed angular orientation with respect to said temperature detecting means; and

means for firing said gun with said gun oriented generally in the direction of said flow channel.

9. An apparatus adapted to be lowered into a cased well for perforating into a flow channel behind casing, the apparatus comprising:

a rotatable temperature sensing assembly including at least two diametrically arranged probes for detecting temperature differences on the wall of said casing at diametrically opposite locations at about the same vertical depth in said

well, thereby indicating the circumferential direction of said channel; and



a perforating gun attached directly to, and aligned with, one of said probes such that the firing pattern of said gun is in the outward, circumferential direction of said one probe.

4,074,757

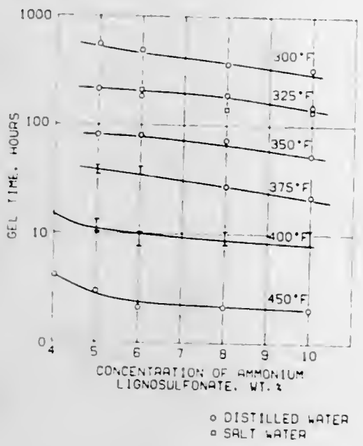
METHOD USING LIGNOSULFONATES FOR HIGH-TEMPERATURE PLUGGING

Betty J. Felber; Dwight L. Dauben, and Richard E. Marrs, all of Tulsa, Okla., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 710,963, Aug. 2, 1977, abandoned, which is a continuation-in-part of Ser. No. 592,849, July 3, 1975, abandoned. This application May 9, 1977, Ser. No. 795,341

Int. Cl.² E21B *33/138, 43/24*

U.S. Cl. 166—261 **12 Claims**



12. A method for plugging permeable zones of a wellbore at temperatures in excess of 250° F involving the steps of introducing in the permeable zone to be plugged an aqueous gel-forming solution of a water-soluble lignosulfonate containing from about 2 to about 20 weight percent reducing sugars wherein said solution is capable of gelation at temperatures in excess of 250° F, with a characteristic gel time from about 1 to about 2000 hours, and said solution being in an amount sufficient to flow into said permeable zone, and allowing said solution to set in said permeable zone to form a gel therein, thereby plugging said permeable zone.

4,074,758

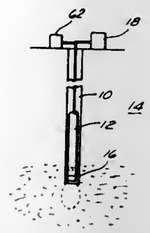
EXTRACTION METHOD AND APPARATUS

Harold W. Scott, Ridgefield, Conn., assignor to Oil Recovery Corporation, New Haven, Conn.

Filed Sept. 3, 1974, Ser. No. 502,661

Int. Cl.² E21B *43/25*

U.S. Cl. 166—249 **9 Claims**



1. A method of recovering oil from a well hole in oil bearing soil comprising: generating an electrohydraulic shock wave in a liquid in said well hole by capacitor discharge means, said means including a spark gap apparatus; directing the generated shock wave outwardly through the liquid from the well hole and into the bearing soil to cause oil in said soil to be separated therefrom by reducing the tension which exists between said oil and said soil; and removing said separated oil through the well hole.

4,074,759

OIL RECOVERY PROCESS USING A POLYMER SLUG WITH TAPERED SURFACTANT CONCENTRATION

Issam S. Bousaid, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Sept. 20, 1976, Ser. No. 724,678

Int. Cl.² E21B *43/22*

U.S. Cl. 166—273 **8 Claims**

1. A method of recovering oil from a subterranean oil-bearing formation having in communication therewith at least one injection well and at least one production well comprising:

a. injecting into the formation via the injection well a slug comprising an aqueous polymer solution containing a small amount of a surfactant,

b. injecting water into the formation via the injection well; and

c. recovering oil from the formation via the said production well and wherein the concentration of the surfactant in the said slug is increased as the slug is injected into the said formation, and wherein the water injected in step (b) contains a small amount of a solubilizing agent selected from the group consisting of:

a. a compound of the formula:

$$R-\underset{\underset{R''}{|}}{N}-R'O(CH_2CH_2O)_mA$$

wherein R is alkyl of from 1 to about 16 carbon atoms; wherein R' is alkylene of from 2 to 4 inclusive carbon atoms; *m* is an integer of from 4 to about 60, A is selected from the group consisting of hydrogen, sodium, potassium and the ammonium ion and wherein R'' is selected from the group consisting of hydrogen, alkyl of from 1 to about 16 carbon atoms and

$$-R'O(CH_2CH_2O)_m\ A;$$

b. a sulfated compound of the formula:

$$R-\underset{\underset{R''}{|}}{N}-R'O(CH_2CH_2O)_mSO_3A$$

wherein R, R', *m* and A have the same meaning as in (a) above, and R'' is selected from the group consisting of hydrogen, alkyl

of from 1 to about 16 carbon atoms and

$$-R'O(CH_2CH_2O)_m\ SO_3\ A,$$

and

c. a sulfonated compound of the formula:

$$R-\underset{\underset{R''}{|}}{N}-R'O(CH_2CH_2O)_nCH_2CH_2SO_3A$$

wherein R, R' and A have the same meaning as in (a) above; wherein *n* is an integer of from about 4 to about 60 and R'' is selected from the group consisting of hydrogen, alkyl of from 1 to about 16 carbon atoms and

$$-R'O(CH_2CH_2O)_n\ CH_2CH_2SO_3\ A.$$

4,074,760

METHOD FOR FORMING A CONSOLIDATED GRAVEL PACK

Claude T. Copeland, Tulsa, and Vernon G. Constien, Owasso, both of Okla., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 1, 1976, Ser. No. 737,813

Int. Cl.² E21B *43/04*

U.S. Cl. 166—276 **21 Claims**

1. A method of forming a permeably consolidated particulate mass in communication with a permeable subterranean formation which comprises:

(a) forming a pumpable slurry by mixing together in a sequence and respective quantities effective to form a pumpable slurry which can be cured to form a permeable but consolidated particulate mass;

an epoxy resin-solvent mixture, a curing agent, a coupling agent, an aqueous carrier liquid, a particulate, and a surfactant selected from the group consisting of quaternary ammonium salts corresponding to the formula

$$\left[\begin{array}{c} R_1 \\ | \\ R_4-N-R_2 \\ | \\ R_3 \end{array}\right] X$$

wherein: R_1 and R_3 are each independently lower alkyl, hydroxy substituted lower alkyl, or polyoxyethylene alkyl of the formula $-(CH_2CH_2O)_nH$ wherein *n* is 2 or 3; R_2 is an 8- through 18-carbon hydrocarbon chain; R_4 is an aliphatic hydrocarbon chain or an alkyl aryl group, containing 7 to 18 carbon atoms; and X is fluorine, chlorine, bromine, or iodine;

(b) introducing said slurry through a well bore and into communication with said permeable formation; and

(c) curing said slurry in place to form a consolidated permeable mass.

4,074,761

DRILLING TOOL

James D. Mott, Houston, Tex., assignor to Hydril Company

Filed Dec. 27, 1971, Ser. No. 212,260

Int. Cl.² E21B *43/00, 41/00*

U.S. Cl. 166—315 **29 Claims**

18. A method of operating a safety valve connected in a well tubing for controlling flow of fluid in an undesired direction through the bore of a well tubing, including the steps of:

sensing the pressure in the bore of the well tubing for enabling flow in the desired direction through the bore;

sensing the pressure adjacent the exterior of the safety valve;

comparing the pressure in the bore with the pressure adjacent the exterior of the safety valve to determine the pressure differential;

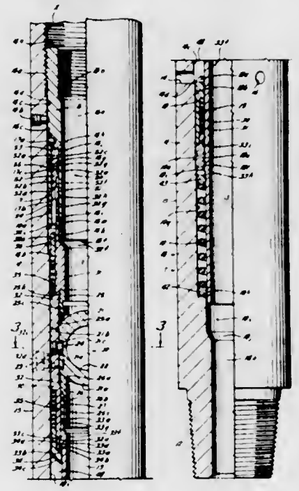
rotating a flow blocking member for opening the safety valve to enable flow of fluid through the bore of the tubing when the pressure in the bore of the tubing exceeds the pressure adjacent the exterior of the safety valve by a predetermined value;

spacing the rotatable flow blocking portion of the safety valve from a safety valve seat prior to the step of rotating open the flow blocking portion of the safety valve; and moving the flow blocking member back into engagement with the seat when the flow blocking member is rotated open.

27. A ball-type valve tool apparatus for use in wells, including:

a tubular member having a bore therethrough;

a seat disposed in said bore;



a ball-type valve member disposed in said bore and having an opening therethrough, said ball-type valve member rotatable to and from an open position for enabling flow of fluid through said bore and said opening and a closed position in sealing engagement with said seat for blocking flow of fluid through said bore of said tubular member;

means operably connected with said ball-type valve member for rotating said ball-type valve member to and from the open and closed positions; and

means for spacing said ball-type valve member from said seat prior to commencing to effect rotation of said ball-type valve member to the open position to equalize the fluid pressure in said bore about said ball-type valve member.

4,074,762

WIRELINE RUNNING TOOL

William H. Parker, Hurst, Tex., and Lawrence Hart, College Station, both of Tex., assignors to Del Norte Technology, Inc., Euless, Tex.

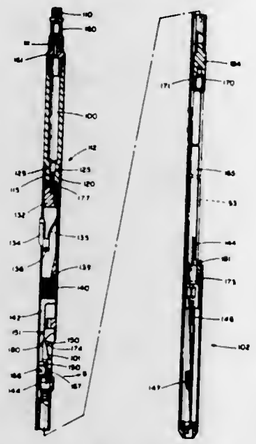
Filed Nov. 15, 1976, Ser. No. 741,855

Int. Cl.² E21B *7/06, 43/00*

U.S. Cl. 166—315 **19 Claims**

1. A wireline running tool comprising a pressurized pneumatic power source, a kickover means, and a module holding assembly, guide means on said tool for detecting an index mechanism adjacent said tool, means responsive to said guide

means for releasing the pressurized gas of said power source to operate said kickover means, and means responsive to opera-



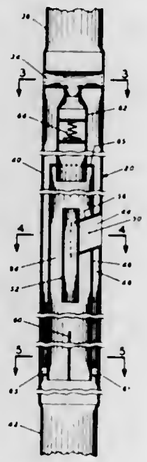
tion of said kickover means for deflecting said module into a holding position.

4,074,763

BOTTOM-HOLE GAS-LIQUID SEPARATOR

Robert A. Stevens, Calgary, Canada, assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 17, 1976, Ser. No. 751,790
Int. Cl.[2] E21B *43/02*
U.S. Cl. 166—325 **3 Claims**



1. A bottom-hole gas-liquid separator comprising:
an elongated outer tubular member having an outer diameter suitable for running in a well to a position for producing fluids therefrom, plug means closing off the lower end of said outer tubular member;
an outlet for gas formed in the wall of said outer tubular member near the upper portion thereof;
coupling means on the upper end of said outer tubular member for connecting said outer tubular member to a production string for producing liquid from a well;
an outer inlet for fluid in the wall of said outer tubular member intermediate the ends thereof and substantially below said outlet for gas;
an intermediate tubular member smaller than said outer tubular member connected interiorly of said outer tubular member in concentric relationship therewith and extending at least three times it outer diameter above said inlet and six times its outer diameter below said inlet and forming an outer annular chamber with said outer tubular member;
an inner inlet for fluid in the wall of said intermediate tubular member below said outer inlet;
an inner tubular member arranged concentrically inside of said intermediate tubular member and forming an inner annular chamber therewith adjacent said outer inlet and said inner inlet, said inner tubular member extending from just above said inner inlet to no more than 20 diameters below said inner inlet;
conduit means connecting said outer inlet and said inner inlet and providing the only flow path for fluids from said outer inlet through said outer annular chamber into said intermediate tubular member through said inner inlet, said conduit means arranged to divert flow of fluids downwardly and tangentially into said inner annular chamber;
p1 a baffle plate connected in the lower end of said intermediate tubular member for stopping the vortex flow of fluids to prevent gas from being drawn down with the liquid
and gas conduit means spaced above and apart from the inner tubular member connecting the upper end of said intermediate tubular member to said cutlet for gas.

4,074,764

TILLER

Edward W. Enters, Fredonia, Wis., assignor to Gilson Brothers Company, Plymouth, Wis.

Filed Feb. 23, 1976, Ser. No. 660,128
Int. Cl.[2] A01B *33/02*
U.S. Cl. 172—42 **8 Claims**



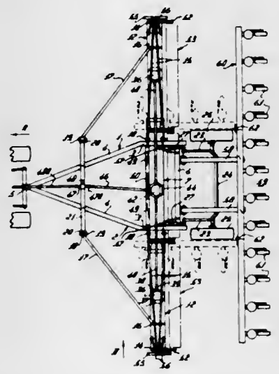
4. A tiller comprising, in combination,
a frame having a vertically extending handle portion and, as a one-piece structure including said handle portion, a forked end including a generally horizontal leg and a generally vertical leg,
an engine including a flange located above said horizontal leg,
a gear box operatively connected to and driven by said engine, said gear box including a flange located above said horizontal leg,
a tine assembly operatively connected to and supported by said gear box and driven through said gear box,
connecting means comprising bolt means extending through and connecting said engine flange, said gear box flange, and said horizontal leg in mutual engagement, so that the load of said engine, gear box, and tine assembly is supported on said horizontal leg,
said forked end having a planar web portion arranged in a vertical plane,
said web portion and horizontal and vertical legs being in one-piece and said web portion forming the juncture between said horizontal and vertical legs and also forming a vertical planar extension making up a portion of said horizontal leg,
and wheel means connected to said vertical leg.
8. A tiller comprising, in combination,
first and second frame sections each having, as a one-piece structure, a vertically extending handle portion and a forked end, said handle portion including a generally vertical planar portion,
said forked end including a generally horizontal leg, a generally vertical leg and a planar web portion forming the juncture between said horizontal and vertical legs and also forming a vertical planar extension of said horizontal and vertical legs,
said planar handle, vertical leg, horizontal leg and web portions being coplanar,
said frame sections being horizontally spaced relative to each other,
an engine,
a gear box operatively connected to said engine and driven thereby,
a tine assembly operatively connected to and supported by said gear box and driven through said gear box,
means connecting said engine and gear box to said horizontal legs and generally centered relative to said horizontal legs in a horizontal plane for supporting the load of said engine, gear box, and tine assembly on said horizontal legs,
and wheels connected to said vertical legs.

4,074,765

SOIL CULTIVATING IMPLEMENTS

Cornelis van der Lely, 7 Bruschenrain, Zug, Switzerland

Filed May 20, 1976, Ser. No. 688,343
Claims priority, application Netherlands, May 23, 1975, 7506058
Int. Cl.[2] A01B *33/06, 33/16*
U.S. Cl. 172—59 **11 Claims**



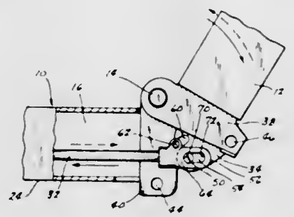
8. A soil cultivating implement comprising a frame and a group or rotatable soil working members journalled in an elongated central portion of said frame, an elongated outer portion pivoted at each lateral side of said central portion and respective further groups of rotatable soil working members being journalled in the outer portions, said soil working members and further soil working members being rotatable about corresponding upwardly extending axes defined by respective shafts and said shafts being positioned in a row that extends transverse to the direction of travel, driving means engaging said soil working members and further members, two beams of said frame extending in the general direction of travel and said beams having rear portions that extend substantially parallel to one another and forward convergent portions that comprise coupling means, said rear portions being connected to the central frame portion and positioned above same, each outer portion being pivoted to the rear beam portions with spaced apart pivots, the axes of said pivots extending in the direction of travel and said outer portion being pivotable to an upward tilted transport position about said axes, respective supports connected to the outer frame portions intermediate the lengths thereof, each support extending forwardly to a pivot connection with the remainder of said frame and said connection having a pivot axis in line with said first mentioned pivot axis, said driving means comprising a gear box on said central portion and a corresponding transmission shaft that extends from said box, laterally to respective gear means of each further group of soil working members, said transmission shaft being displaceable upwardly with the corresponding outer portion in the latter's transport position.

4,074,766

FLOATING FOLDING TOOL BAR HAVING A LOCK MEANS

Henry K. Orthman, Lexington, Nebr., assignor to Orthman Manufacturing Inc., Lexington, Nebr.

Filed May 24, 1976, Ser. No. 689,384
Int. Cl.[2] A01B *49/00*
U.S. Cl. 172—311 **4 Claims**



1. An agricultural implement comprising,
a tool bar including a main frame and at least one wing section, said wing section being pivotally movable between extended and angular positions,
a lost motion hinge pivotally interconnecting said wing section and said main frame whereby said wing section is free to pivot through a predetermined angle when in said extended position,
a hydraulic cylinder connected at one end to said main frame and pivotally connected at its opposite end to said wing section at a point remote from the pivotal axis of said hinge,
said wing section including an ear connected to said cylinder and having a slot opening towards said cylinder, and
a pin on said cylinder positioned to move into said slot when said wing section is moved substantially out of said extended position towards said angular position thereby limiting free pivotal movement of said wing section independently of said cylinder.

4,074,767

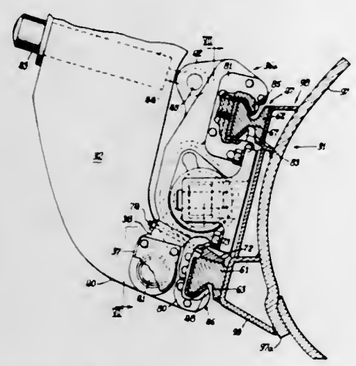
MOTOR GRADER SUPPORT STRUCTURE AND SIDE SHIFT MECHANISM

Carroll Richard Cole, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 14, 1976, Ser. No. 696,163
Int. Cl.[2] E02F *3/76*
U.S. Cl. 172—781 **23 Claims**

1. In a motor grader which has a circle with a pair of integral, depending blade support arms at its rearward portion, an improved support means for mounting a grader blade assembly on said arms for endwise movement, said improved means comprising, in combination:
a unitary bearing housing structure comprising a transverse structural member which is entirely between the blade support arms and has a generally upright bearing housing integrally connected thereto at each of its ends between the support arms;
pivot means operatively associated with said housings inde-

pendently of and spaced from said structural member, said pivot means mountin$_6$ said structure on said support arms and forward of the arms, said housings having open upper jaws and open lower jaws extending entirely across them;



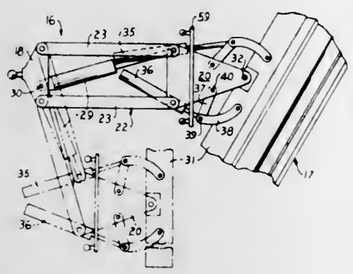
and substantially parallel upper and lower support rails on the rear of the blade assembly which extend through said jaws and are slidable therein, said jaws and support rails having slidably interengaging surfaces to retain the support rails in the jaws.

4,074,768

BLADE SUPPORT AND CONTROL ARRANGEMENT FOR A MOTOR GRADER

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 30, 1976, Ser. No. 719,003
Int. Cl.^{2} E02F *3/76*
U.S. Cl. 172—796 **17 Claims**



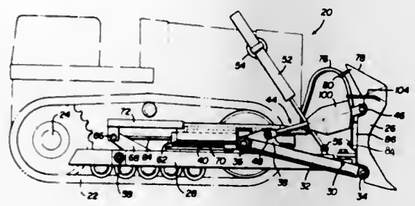
1. A construction vehicle comprising
a forwardly extending frame,
first bracket means universally connected to said frame,
second bracket means,
linkage means pivotally interconnected between said first and second bracket means for maintaining said first and second bracket means at least substantially parallel relative to each other upon movement of said second bracket means relative to said first bracket means,
first actuating means pivotally interconnected between said first and second bracket means for moving said second bracket means relative to said first bracket means,
a work tool assembly pivotally mounted on said second bracket means, and
a second actuating means pivotally interconnected between said second bracket means and said work tool assembly for pivoting said work tool assembly relative to said second bracket means.

4,074,769

BULLDOZER BLADE CONTROL

Claude M. Frisbee, Bettendorf, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Apr. 28, 1976, Ser. No. 680,817
Int. Cl.^{2} E02F *3/76*
U.S. Cl. 172—804 **8 Claims**



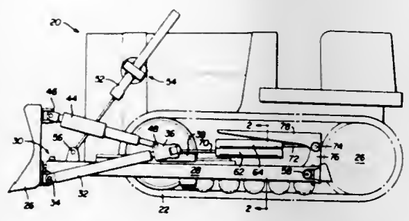
1. A vehicle having a U-shaped frame extending around the forward end of said vehicle, a transverse blade pivotally mounted adjacent its center on the forward end of said frame for angling movement about a vertical axis, a piston cylinder on opposed sides of said vehicle each having a rearwardly extending piston rod pivotally connected to said frame and a forwardly extensible cylinder spaced from said blade and each cylinder operably connected to said blade on opposed sides by a strut means, and a hydraulic control means having flexible lines extending from the lower front of said vehicle to the back of said blade adjacent the center of said blade in a downwardly opening flexible arch, said lines received in a channel-shaped shroud extending across the rear of said blade, said lines then extending in opposite directions along the back of said blade within said shroud and then back to said cylinders of said hydraulic piston-cylinders, said control means extending one cylinder while retracting the opposed cylinder to angle said blade about a vertical axis.

4,074,770

ANGLE CONTROL FOR DOZER BLADE

Claude M. Frisbee, Bettendorf, Iowa, assignor to J. I. Case Company, Racine, Wis.

Continuation-in-part of Ser. No. 670,606, March 26, 1976, abandoned. This application June 2, 1977, Ser. No. 802,769
Int. Cl.^{2} E02F *3/76*
U.S. Cl. 172—804 **6 Claims**



1. In a vehicle having a U-shaped frame surrounding the forward end of said vehicle and a transverse scraper blade pivotally mounted on a vertical axis adjacent its midportion to the forward end of said frame, each side of said blade operably connected to said frame by a structural means permitting angling of said blade about said vertical axis, the improvement comprising: an angle control on each side of said vehicle, each of said angle controls comprising a pair of fluid operated piston-cylinders each having a pair of rigidly interconnected overlapping fluid cylinders and each cylinder having an extensible piston rod, said fluid cylinders vertically stacked above the side portions of said U-shaped frame with said piston rods extending in opposite directions, one piston rod of each pair extending rearwardly and operably connected to said frame and the opposed piston rod of each pair connected to said

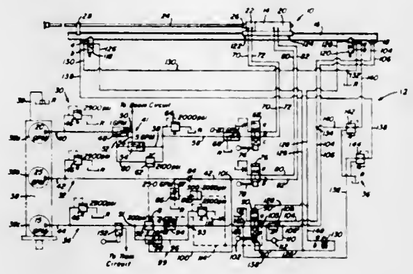
structural means by a universal connection, and a fluid control including a source of fluid under pressure, a flow line from said source to a valve, and a pair of branch lines from the valve to the cylinders on each side of said vehicle, one branch line being interconnected with the head end of both cylinders on one side of the vehicle and with the rod end of both cylinders on the opposed side of said vehicle, and the other branch line being interconnected with the rod end of both cylinders on said one side of said vehicle and with the head end of both cylinders on said opposed side of said vehicle, such that operation of said fluid control means extends both piston rods of one pair of piston-cylinders while simultaneously retracting the piston rods of the opposed pair of piston-cylinders with the vertically stacked fluid cylinders and piston rods extensible and retractable within the vertical projection of said frame side portions to angle said blade about said vertical axis and said frame protecting said fluid-cylinders.

4,074,771

ROCK DRILL

Ward D. Morrison, South Acworth, N.H., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Mar. 25, 1976, Ser. No. 670,262
Int. Cl.^{2} B23Q *5/00*
U.S. Cl. 173—6 **19 Claims**



1. In a drilling apparatus adapted to drill earth formations and including a powered drill means and powered means for moving such drill means into biased engagement with such an earth formation; the improvement comprising: first motive means for simultaneously actuating such drill means and such means for moving; second motive means for selectively actuating such drill means to supplement said first mentioned actuating of such drill means; and control means cooperable with said second motive means to control said selective actuating in response to selected magnitudes of such biasing.

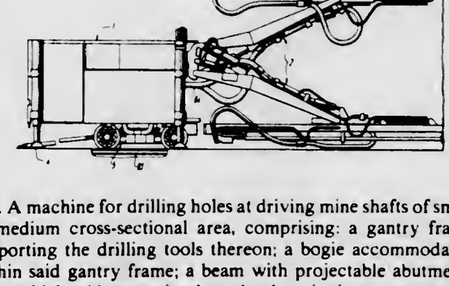
4,074,772

TORQUING TOOL CONTROL CIRCUIT

Gregg N. Jonsson, Batavia, Ill., assignor to Thor Power Tool Company, Aurora, Ill.

Filed Mar. 4, 1976, Ser. No. 663,678
Int. Cl.^{2} B23Q *5/00*
U.S. Cl. 173—12 **19 Claims**

1. A control circuit for a torqueing tool, said tool including a torque measuring device, said circuit comprising:
a. a peak and hold circuit producing a signal representative of the highest value of measured torque,
b. means for operating said tool in a pulse mode in which the tool is turned on when the measured torque is below a selected threshold value and turned off when said torque is above said threshold value,
c. means for integrating from an initial output value to a final value at a selected rate,
d. means for detecting an increase in the peak and hold signal to reset said integrator means to said initial output value, and



e. means comparing the output of said integrator means with a selectable comparator threshold for stopping said operating means.

4,074,773

HOLE DRILLING MACHINE

Vladimir Konstantinovich Grigoriev, 1 Streletsky pereulok, 3, kv. 24, Moscow; Viktor Dmitrievich Chugunov, Solnechnogorsky raion, stantsia Povarovo, poselok 2, dom 4, kv. 13, Moskovskaya oblast; Mikhail Nikolaevich Kudryakov, ulitsa Zholtovskogo, 27, kv. 10, Moscow; Alexandr Moiseevich Tsipkis, Ananievsky pereulok, 4/2, kv.121, Moscow; Vladimir Germogenovich Yakovlev, proezd Kirova, 6a, kv. 7, Moscow; Alexandr Samoilovich Averbukh, ulitsa Krasikova, 16, korpus 1, kv. 52, Moscow; Jury Ilich Scherbakov, Pushkinsky raion, stantsia Tarasovskaya, ulitsa B. Tarasovskaya, 39, Moskovskaya oblast; Natalia Dmitrievna Yakobson, Chernomorsky bulvar, 7, korpus 4, kv. 233, Moscow; Vyacheslav Fedorovich Semikozov, Vishnyakovskaya ulitsa, 6, korpus 5, kv. 29, both of Moscow; Viktor Vladimirovich Medvedev, prospekt Lenina, 23/40, kv. 110; Valery Vasilievich Yartsev, prospekt Lenina, 23/40, kv. 109, both of Nizhny Tagil; July Davydovich Kaganov, Yartsevskaya ulitsa, 28, korpus 1, kv. 66, Moscow; Vladimir Ivanovich Kuznetsov, ulitsa Kantemirovskaya, 5, korpus 2, kv. 320, Moscow, and Alexandr Iosifovich Sinelnikov, Oxkaya ulitsa, 36, korpus 2, kv. 47, Moscow, all of U.S.S.R.

Filed June 7, 1976, Ser. No. 693,285
Int. Cl.^{2} E21C *11/02*
U.S. Cl. 173—23 **7 Claims**

1. A machine for drilling holes at driving mine shafts of small to medium cross-sectional area, comprising: a gantry frame supporting the drilling tools thereon; a bogie accommodated within said gantry frame; a beam with projectable abutments upon which said gantry is adapted to bear in the transportation position of the drilling machine being mounted on said bogie along the longitudinal geometrical axis thereof for motion in a transverse direction with respect to the longitudinal geometric axis of said bogie; a mechanism for effecting the transverse motion of said beam; jacks mounted on said gantry frame, and bearing upon the ground in the drilling position and in the gantry position of the drilling machine; means for lifting the jacks off the ground in the transportation position of the drilling machine, said gantry frame being supported by said projectable abutments of said beam; a mechanism for lifting said

bogie, said mechanism being mounted on said bogie; and means for flexibly connecting said bogie to said gantry frame.

4,074,774

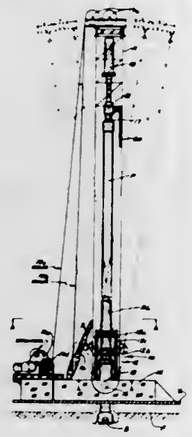
DRILLING ASSEMBLY

Cicero C. Brown, deceased, late of Houston, Tex., by Joe R. Brown, executor, P.O. Box 19236, Houston, Tex. 77024

Filed May 19, 1975, Ser. No. 578,677

Int. Cl.[2] E21B *7/00*

U.S. Cl. 173—44 **12 Claims**



1. A drilling assembly for forming an inclined borehole comprising:

a. drilling snubber means having a gripping head and a drilling head movable relative to each other for moving a pipe means gripped by one of said heads along the longitudinal axis of said pipe means, said snubber means including means for rotating said pipe means about its longitudinal axis;

b. mast means extending above said drilling snubber means;

c. anchoring means carried in said mast means for attachment to said pipe means including:

i. gripping means movable radially between a first configuration for gripping engagement with said pipe means and a second configuration for release of said pipe means; and

ii. swivel means for providing structural support between said mast means and said pipe means while said pipe means is rotated;

d. restraining means for preventing said anchoring means from counter-rotating when said pipe means is being rotated about its longitudinal axis, said restraining means further including means for maintaining said anchoring means at a predetermined lateral position relative to said mast means when said mast means is inclined away from the vertical; and

e. pivot control means for inclining said mast means, gripping heads and pipe means to form inclined bore holes.

4,074,775

POWER SWIVEL

William T. Lee, Harvey, La., assignor to Fishing Tools, Inc.

Continuation of Ser. No. 552,810, Feb. 25, 1975, abandoned. This application May 20, 1976, Ser. No. 688,464

Int. Cl.[2] E21B *3/06*

U.S. Cl. 173—79 **5 Claims**

1. A power swivel assembly, comprising:

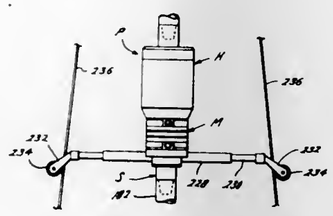
a housing have a non-rotating axial housing passageway therein for receiving working fluid under pressure and passing working fluid through at least a portion of said housing;

a stem assembly mounted for rotational movement with respect to said housing and having a stem assembly bore therethrough in fluid communication with said housing passageway for receiving working fluid under pressure from said housing passagewy and passing working fluid through said stem assembly;

an internal washpipe extending from a portion of said housing passageway into a portion of said stem assembly bore permitting sealable fluid communication of working fluid between said non-rotating housing passageway and said rotating stem assembly bore;

first seal means between said washpipe and said housing;

second seal means between said washpipe and said stem assembly;



hollow bore motor means having a central bore and mounted with said housing and receiving said stem assembly through said central bore;

said motor means having rotor means with a rotor bore forming at least a portion of said central bore of said motor means, said motor means being powered by motor fluid reacting on said rotor means thereof;

said rotor means having internal drive connection means on the inner surface of said rotor bore; and

said stem assembly having external driving means on the external surface of said stem assembly in rotational driving engagement with said internal drive connection means on the inner surface of said rotor bore, whereby said motor means is directly connected with said stem assembly.

4,074,776

DIESEL PILE-DRIVING RAM

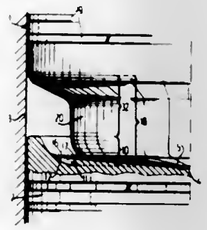
Hans Günther Schnell, Hamburg, Germany, assignor to Van Kooten B.V., Naarden, Netherlands

Filed Dec. 5, 1975, Ser. No. 637,985

Claims priority, application Netherlands, Dec. 10, 1974, 7416086

Int. Cl.[2] E02D *7/12*

U.S. Cl. 173—137 **3 Claims**



1. A diesel pile-driving ram comprising at least one combustion cylinder, a striker extending into the combustion cylinder, a piston housed in the combustion cylinder said striker and piston having generally complementary impact surfaces which mate with one another; and a fuel injector for supplying fuel between the impact surfaces of the piston and the striker, said striker and piston having peripheral surface portions adjacent their respective impact surfaces and being spaced from said cylinder to define a compression space in the cylinder when the striking surfaces of the piston and the striker are engaged, said compression space including at least one annular main combustion chamber and at least one annular precombustion chamber communicating with the former, said precombustion chamber being generally smaller than said main combustion chamber and located immediately adjacent the impact surfaces of the striker and piston to receive fuel sprayed from said impact surfaces upon impact of the striker and piston, said precombustion chamber communicating with the main combustion chamber through an annular passage of short length in an axial direction.

4,074,777

PNEUMATIC IMPACT TOOL

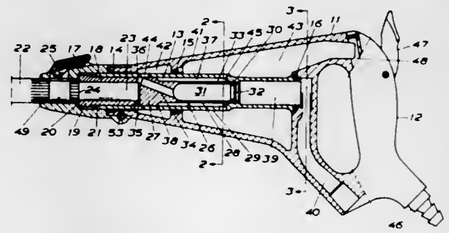
Sture Roland Andersson, Saltsjo-Duvnas, and Heino Elmessaar, Lidingo, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Continuation of Ser. No. 601,160, Aug. 1, 1975, abandoned. This application Mar. 11, 1977, Ser. No. 776,741

Claims priority, application Sweden, Aug. 8, 1974, 7410147

Int. Cl.[2] B25D *9/06*

U.S. Cl. 173—138 **12 Claims**



1. Pneumatic impact tool for driving a working implement having a shank portion, comprising:

a cylinder having a front opening for receiving the shank portion of a working implement such that said working implement is movable axially relative to said cylinder;

a differential hammer piston reciprocably powered in said cylinder, said hammer piston having a large piston area facing the impact direction; and

a small piston area facing the reverse direction;

said hammer cylinder comprising a rear, continuously pressurized drive chamber for imparting a substantially uniform forward directed driving force on said small, reverse direction facing piston area; and a forward, intermittently pressurized drive chamber for imparting a periodically acting, backward directed driving force on said large, impact direction facing piston area; and

said cylinder including means for retaining said working implement so that said working implement receives the entire reaction force resulting from said periodically acting, backward directed driving force imparted by said forward drive chamber of said cylinder, whereby said cylinder is prevented from being influenced by said periodically acting force.

4,074,778

SQUARE HOLE DRILL

Roger J. Morrell, Bloomington; Jerome A. Gunn, St. Paul, and Gerald D. Gore, White Bear Lake, all of Minn., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed July 14, 1976, Ser. No. 705,361

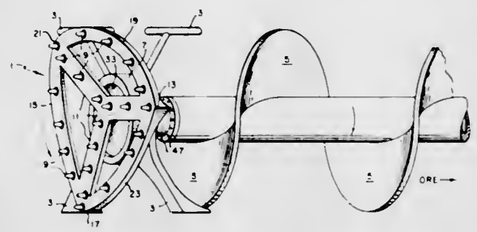
Int. Cl.[2] E21C *13/04, 1/14;* **E02D** *17/14*

U.S. Cl. 175—91 **9 Claims**

1. A square hole drill system comprising:

(a) a rotatable cutterhead having drill cutting surfaces about at least part of its periphery and facing towards the surface to be cut, said periphery being configured so that its outer most cutting surfaces would outline the apexes of a Reuleaux triangle;

(b) a gear drive operatively connected to said cutterhead to cause its rotation, said drive train having a stationary first gear which continuously meshes with a second gear that



rotates around said first gear in a direction opposite to said cutterhead rotation, said second gear being rotated by an output shaft at one side attached to move in unison with said cutterhead; and

(c) an eccentric drive connected to the other side of said second gear to cause it to move around the first gear.

4,074,779

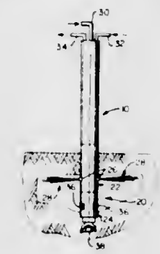
BACKWASHING SYSTEM FOR SLURRY PICK-UP USED IN HYDRAULIC BOREHOLE MINING DEVICES

John B. Cheung, and Earll M. Murman, both of Kent, Wash., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed May 9, 1977, Ser. No. 794,898

Int. Cl.[2] E21B *39/00, 21/00*

U.S. Cl. 175—314 **6 Claims**



1. In a hydraulic borehole mining device having oppositely directed cutting jets, a slurry pick-up and transport system including a plurality of particle inlets through which particles of the material cut by said jets are picked up, a like plurality of screens covering respective ones of said inlets for limiting the size of the particles picked up, slurry jet pump means for serving in pumping input fluid through said device such that said particles are drawn into the device through said inlets and entrained into said fluid to form a slurry which is transported out of said device, and including a valve means, located upstream of said inlets, for, in a first, open position thereof, permitting transporting of said slurry out of said device and for, in a second, closed position thereof, blocking the flow of said slurry and causing said inlet fluid to reverse the flow thereof out through said screens to provide cleaning of said screens.

4,074,780

EARTH AUGER

Robert E. Gilbert, 166 High St., Buffalo, Wyo. 82834

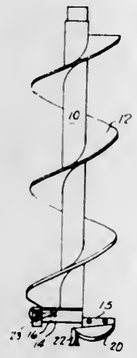
Filed July 28, 1976, Ser. No. 709,293

Int. Cl.[2] E21C *1/14;* **E02D** *7/14;* **E21B** *9/06*

U.S. Cl. 175—392 **3 Claims**

1. An earth auger comprising a shaft, a continuous flight element extending upwardly along and coaxial with said shaft,

said flight element terminating at its lower extremity in a stabilizing plate whose upper portion has a flange which supports undercutting tooth element at the outer extend of said flange remote from said shaft, said stabilizing plate terminating at a position diametrically opposed from and lower than said tooth



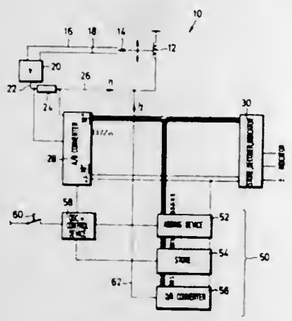
element having means thereon for fastening a stabilizer pilot drill means, said last named means comprising a continuous curved blade element of radial extent and a pilot drill disposed on the inner portion of said blade axially aligned with said shaft but remote therefrom to provide a space between said pilot drill and said shaft.

4,074,781

ELECTROMAGNETICALLY COMPENSATING WEIGHING OR DYNAMOMETER APPARATUS

Franz Josef Melcher, Ellierode, Germany, assignor to Sartorius-Werke GmbH (und. vorm. Gottinger Praezisionswagenfabrik GmbH), Gottingen, Germany

Filed June 17, 1976, Ser. No. 697,260
Claims priority, application Germany, June 24, 1975, 2528141
Int. Cl.² G01G *7/02, 23/16*
U.S. Cl. 177—212 **9 Claims**



1. An electromagnetically compensating weighing or dynamometer apparatus comprising: a coil provided in a working gap of a magnet, said coil being operatively associated with a movable part of the apparatus and being deflected under action of a force out of a preadjusted position of equilibrium in relation to said magnet;

a compensation circuit which includes a position indicator coupled to said coil, a power amplifier responsive to position of said indicator, and said coil and which, when a deflection occurs, allows a compensation current proportional to the amplitude of the deflection to flow through said coil;

an analog-digital (A/D) converter coupled to said compensating circuit and responsive to an output therefrom and having its output coupled to a digitally operating measurement indicator; and

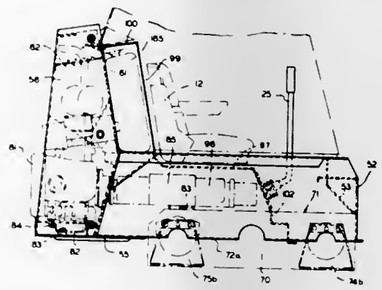
a taring arrangement which includes, connected in series, a store and a digital-analog (D/A) converter, an input of said store being coupled to an output of said A/D converter which is coupled with said measurement indicator, and an output of said D/A converter being connected to said coil, forming a taring circuit having its output coupled in parallel to that portion of said compensation circuit exclusive of said compensation coil.

4,074,782

HYDRAULIC SYSTEM OF A SKID STEER LOADER

James J. Bauer, Lisbon, N. Dak., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Feb. 2, 1976, Ser. No. 654,259
Int. Cl.² B62D *11/04*
U.S. Cl. 180—6.48 **1 Claim**



1. In a skid steer vehicle, vehicle drive means comprising an engine mounted in the rear of the vehicle, a variable displacement pump driven by said engine, said variable displacement pump being characterized by a series of revolving pistons and cylinders, said pistons being displaced by an inclinable swash plate, a hydraulic pump for driving implements associated with the vehicle juxtapositioned forward of the variable displacement pump and axially aligned therewith, said drive means including an output shaft associated with the variable displacement pump and an output shaft associated with the implement pump, the respective shafts axially aligned, and internal connecting means between the variable displacement pump and the hydraulic implement pump comprising a passage between the respective pumps concentric with the axial shafts of the pumps, the passage providing an internal means for the flow of excess hydraulic fluid from the variable displacement pump to the implement pump, to supply the implement pump with inlet fluid.

4,074,783

WATER DRIVE SYSTEM FOR A CENTER PIVOT IRRIGATION UNIT OR THE LIKE

Kenneth E. Arndt, Columbus; Lonnie E. Otto, Jr., Lindsay, and David A. Siekmeier, Columbus, all of Nebr., assignors to Lindsay Manufacturing Company, Lindsay, Nebr.

Filed July 19, 1976, Ser. No. 706,475
Int. Cl.² B05B *3/12*
U.S. Cl. 180—14 R **9 Claims**



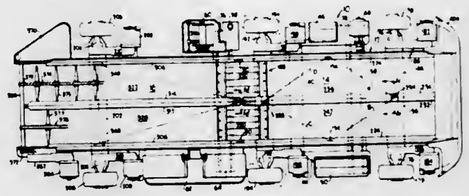
1. In a water drive system for an overhead mobile (a center pivot) irrigation unit, a string of pipe extending over the field to be irrigated (outwardly from a center pivot) and supported at intervals by wheeled towers, a drive on each one of the towers responsive to the pressure of the water in the pipe including a flexible bellows on the tower constructed to expand and contract in a defined direction, a water line between the string of pipe and the bellows to supply water thereto, a valve in the line at each tower for independently controlling the water supply, a control for operating the valve so that the water will be cyclically supplied to and exhausted from the bellows, and a linkage responsive to expansion and contraction of the bellows for rotating at least one wheel of the tower.

4,074,784

ARTICULATED HAULAGE VEHICLE

Arthur L. Lee, and Arthur B. Coval, both of Columbus, Ohio, assignors to FMC Corporation, Chicago, Ill.

Division of Ser. No. 347,646, April 4, 1973. This application Aug. 14, 1974, Ser. No. 497,294
Int. Cl.² B62D *61/10*
U.S. Cl. 180—24 **9 Claims**



1. An articulated haulage vehicle comprising,

a frame member having a front section and a rear section, each of said sections having a front portion and a rear portion,

means connecting said frame member front section to said frame member rear section to permit articulation therebetween,

a pair of driven and steerable rear wheels mounted on opposite sides of said frame member rear section adjacent the rear portion of said frame member rear section,

a pair of intermediate wheels mounted on opposite sides of said frame member rear section adjacent the front portion of said rear section,

a pair of driven and steerable front wheels mounted on opposite sides of said frame member front section adjacent the front end portion of said frame member front section,

a body member having a longitudinally extending haulage compartment therein, said body member mounted on said frame member rear section,

said body member having a floor portion with a pair of side walls extending upwardly therefrom,

a boom member having a longitudinal haulage compartment therein, said boom member mounted on said frame member front section,

said boom member having a floor portion with a pair of spaced side walls extending upwardly therefrom,

said boom member floor portions include a rear edge portion,

a transverse support member secured to said frame member rear section adjacent the front portion of said frame member rear section,

a boom member connecting means extending upwardly from said transverse support member,

said boom member having a connecting member extending rearwardly therefrom, said connecting member positioned in overlying relation with said upwardly extending boom member connecting means,

flexible means connecting said boom member to said body member to permit articulation therebetween and forming an elongated longitudinal haulage compartment, and

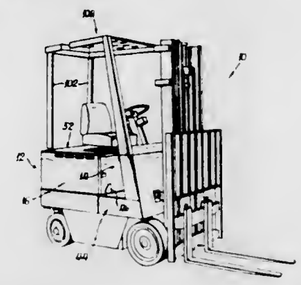
endless conveyor means extending along the surfaces of said boom member floor portion and said body member floor portion, said endless conveyor means arranged to convey material in said elongated longitudinal haulage compartment.

4,074,785

BATTERY ENCLOSURE

Frank V. Masevice, Mentor, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Apr. 5, 1976, Ser. No. 673,505
Int. Cl.² B60R *18/02*
U.S. Cl. 180—68.5 **9 Claims**



1. An enclosure for a battery of a vehicle or the like comprising:

a plurality of side panels;

a top panel supportable by the side panels and on which a load may be placed;

means for selectively limiting lifting of an edge portion of the so-supported top panel relative to one of the side panels comprising a pivotal member secured to said one of the side panels and pivotable to a first position wherein a portion of the pivotal member and a portion of said side panel are disposed on either side of the edge portion of the so-supported top panel in close proximity thereto, whereby said edge portion of the top panel is limited from lifting relative to said side panel, and pivotable to a second position removed from said so-supported top panel to allow lifting of said edge portion of the so-supported top panel from said side panel; and

means for selectively securing the pivotal member in said first position thereof; wherein the means for selectively securing the pivotal member in said first position thereof comprise a projecting member secured to said one side panel and projecting through an aperture provided in the pivotal member with the pivotal member in said first position, and means for selectively securing the pivotal member relative to the projecting member of the pivotal member in said first position; and

wherein the means for selectively securing the pivotal member relative to the projecting member comprise a slide member slidably mounted on the pivotal member and slidable to seat in a recess in the projecting member with the projecting member disposed through the aperture provided in the pivotal member to secure the pivotal member in the first position thereof, and slidable to be removed from said recess to allow pivoting of the pivotal member to the second position thereof.

4,074,786

SELF LOCKING COMPARTMENT FOR TRACTOR

Jerauld D. Joubert, Argusville, N. Dak., assignor to Steiger Tractor Inc., Fargo, N. Dak.

Filed Aug. 10, 1976, Ser. No. 713,105
Int. Cl.² B60R *18/02, 3/00*
U.S. Cl. 180—68.5 **11 Claims**

1. A tractor having a tractor frame,

a driver's cab and an engine supported on said frame,

said driver's cab having an access door movable between open and closed positions,

a plurality of wheels supporting said frame, at least some of which are connected to said engine in driven relation thereto,

one of said wheels being located beneath and adjacent said access door,

a plurality of fenders each extending at least partially over one of said wheels including said one wheel beneath said access door and having an upper portion spaced from the wheel over which it extends,



an accessory compartment secured beneath said upper portion of said fender in the space over said wheel,

and said upper portion of said fender including a cover part overlying said compartment and hinged to a fixed part of said fender for upward swinging movement to enable access to said compartment,

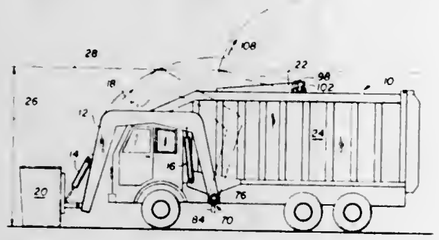
said cover part extending beneath the lower edge of said cab access door when said door is closed so that said cover part can not be swung upwardly to open position while said door is closed.

4,074,787

SAFETY DEVICE FOR A FORK-LIFT EQUIPPED REFUSE VEHICLE

Richard I. Cunningham, Pittsburgh, and Daniel E. Day, Watsontown, both of Pa., assignors to Lenmar Industries, Inc., Pittsburgh, Pa.

Filed July 7, 1976, Ser. No. 703,214
Int. Cl.[2] B60T 7/12
U.S. Cl. 180—82 B **4 Claims**



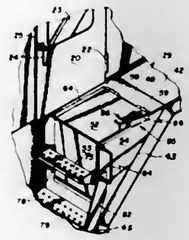
1. A safety device for a vehicle having a fork lift movable on a rotatable shaft to an elevated operative position; and a braking system including a pressure fluid chamber, a parking brake applying member within said chamber, a spring urging said member in a brake applying direction, and means for maintaining a pressure within said chamber for maintaining said member in a brake released condition, said safety device comprising a fork lift position-indicating projection mounted on said rotatable shaft of said fork lift so as to be operatively arranged to have a path of pivotal transversing movement incident to movement of said fork lift into said elevated operative position thereof, an elongated conduit in communication at one end with the aforesaid pressure fluid chamber and operatively arranged to have its opposite end located adjacent said path of pivotal traversing movement of said position-indicating projection, and a normally closed valve disposed in sealing relation in said opposite conduit end and located in said path of said pivotal traverse movement so as to be urged from its normally closed condition into an open condition upon being contacted by said position-indicating projection, whereby said vehicle parking brakes are automatically applied whenever said vehicle fork lift assumes said elevated operative position to thereby prevent vehicle movement with said fork lift in said operative position.

4,074,788

TRACTOR DOOR LATCH

Jerauld D. Joubert, Argusville, N. Dak., assignor to Steiger Tractor Inc., Fargo, N. Dak.

Filed Aug. 9, 1976, Ser. No. 712,856
Int. Cl.[2] E05C 3/04
U.S. Cl. 180—89.12 **9 Claims**



1. In combination:

a tractor having a tractor frame, a driver's cab and an engine supported on said frame, said driver's cab having an access door movable between open and closed positions, a plurality of wheels supporting said frame, at least some of which are connected to said engine in driven relation thereto, one of said wheels being located beneath and adjacent said access door, a plurality of fenders each extending at least partially over one of said wheels including one fender extending over said one wheel beneath said access door, said fender having a width substantially as great as the width of the access door, and a yieldable latch for said door, said latch comprising;

a latching member pivotally mounted on said one fender adjacent the outer edge thereof and having an upper surface, and

means yieldably biasing said latching member upwardly so as to cause said upper surface to move against the under side of said door when said door is opened by at least a predetermined amount, the upper surface of said latching member movable into engagement with the under side of said door having an intermediate latching portion coacting with said door to maintain the same in a substantially open position and a further portion movable downwardly against said biasing means to a position in which said door can be moved to a further open position to permit free access to the portion of the fender on which said latching member is located.

4,074,789

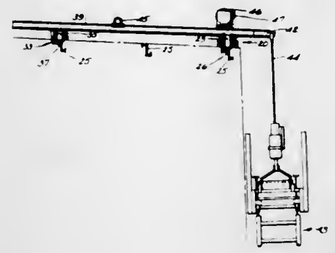
MOBILE ROLLING SUPPORT SYSTEM FOR SCAFFOLDING USED IN BUILDING CONSTRUCTION

Daniel E. Warren, Centerville, and Donald M. Taylor, Hamilton, both of Ohio, assignors to Armco Steel Corporation, Middletown, Ohio

Filed Feb. 13, 1976, Ser. No. 657,980
Int. Cl.[2] E04G 3/10, 3/14
U.S. Cl. 182—37 **17 Claims**

1. A mobile rolling support system for scaffolding used in building construction prior to installation of roof panels, including a rolling support comprising: frame structure rigidly

connecting two outriggers together, one being the leading outrigger and the other being a trailing outrigger, each outrigger having at least one near-side traveling wheel to ride on an exposed structural roof member adjacent the side (or end) of a building and at least one far-side force roller extending beneath a parallel exposed structural roof member removed from said building side (or end), said outriggers being parallel to one another and adapted to extend across and ride on said parallel exposed structural roof members; said near-side traveling wheels bearing down on their exposed structural roof member



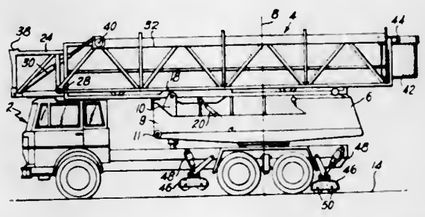
and exerting substantial downward pressure thereon and the said far-side force rollers bearing against the underside of said parallel exposed structural roof member to exert substantial uplift pressure thereagainst; remote controlled motor means on said frame structure to drive a said at least one near-side traveling wheel; and support means extending from said rolling support and to which support means scaffold structure may be attached; whereby said motor means may be actuated from time to time to move said rolling support along said exposed structural roof members so that the scaffolding structure is moved along the side (or end) of said building.

4,074,790

VEHICLE-BORNE INSPECTION AND MAINTENANCE APPARATUS

Daciano Colbachini, and Romeo Chiarotto, both of piazza Costello nr. 16, Padua, Italy

Filed Sept. 13, 1976, Ser. No. 722,608
Claims priority, application Italy, Feb. 27, 1976, 41536/76
Int. Cl.[2] E04G 1/36, 3/10
U.S. Cl. 182—63 **5 Claims**



1. A vehicle-borne inspection and maintenance apparatus comprising

a vehicle having a turret rotatable thereon about a generally vertical axis;

a first elongated frame member pivotally mounted at one edge of said turret for pivotal movement in a vertical plane from a horizontal position over said turret to a vertical position outwardly of one end of said turret;

a second frame member slidably movable longitudinally of said first frame member when in said vertical position;

a third frame member pivotally carried by said second frame member, at the lower end thereof, for pivotal movement about the longitudinal axis of said first member; and

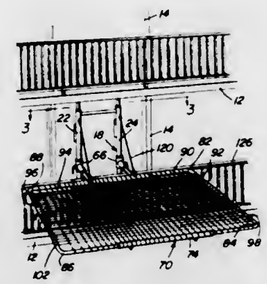
an elongated scaffold member extending laterally from said third frame member at the lower end thereof and below the level of said vehicle.

4,074,791

EMERGENCY FIRE NET

Johnny K. Inman, 1205 Clearview Drive, Atlanta, Ga. 30319

Filed Mar. 16, 1976, Ser. No. 667,377
Int. Cl.[2] A62B 1/22
U.S. Cl. 182—138 **6 Claims**



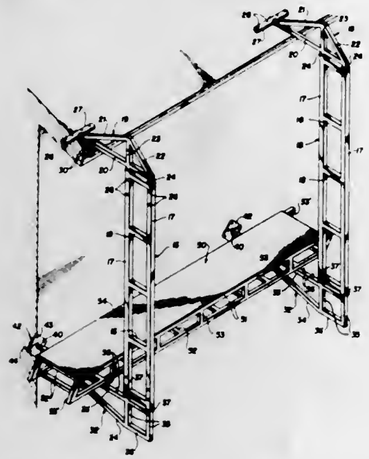
1. In combination, a generally planar upright mounting structure including a pair of parallel tubular uprights and upper and lower brace members extending and secured between the upper and lower ends of said uprights, relatively inverted upper and lower U-shaped members each including parallel legs and a bight portion extending between and connecting one pair of corresponding ends of the legs thereof, said U-shaped members having their legs telescopingly engaged within the upper and lower ends of said uprights, positioning means interconnected between said U-shaped members and said tubular members for adjustably extending the former relative to the latter, a pair of collars mounted on said uprights between said brace members for adjustable positioning along said uprights and including means operative to releasably lock said collars in adjusted positions along said uprights between said upper and lower brace members, a generally horizontal support frame pivotally supported from said collars and projecting outwardly from one side of said mounting structure with said frame swingable relative to said mounting structure about an axis paralleling a path extending between said collars between a first operative horizontal position disposed generally normal to said mounting structure and an inoperative vertical position closely adjacent and generally paralleling said mounting structure, said frame being generally rectangular in configuration and longitudinally and transversely extendable and retractable in directions extending along and transverse to said axis, respectively, a flexible catch structure secured across said frame, means operative to releasably secure said frame in said operative position, brace structure connected between said mounting structure and an outer portion of said frame releasably bracing said frame in said operative position against downward swinging of the outer portion of said frame relative to said mounting structure, one of said uprights including upper and lower leg members supported from the upper and lower ends thereof and projecting horizontally outwardly from the side of said one upright remote from the other upright, the outer ends of said leg members including supporting wheel means journaled therefrom, said frame, when extended longitudinally, projecting outwardly beyond the free ends of said leg members and, when longtiudinally retracted, terminating inwardly of the free ends of said legs, said collars being shiftable along said tubular uprights to positions closely adjacent the lower ends thereof, whereby when said U-shaped members are retracted relative to said uprights and said frame is swung to said inoperative position, said mounting structure may be positioned with said wheel means lowermost and rolled over a horizontal support surface with said frame and mounting structure disposed in closely superposed registry with each other.

4,074,792

PORTABLE HANGING SCAFFOLD

Alonzo N. Zaugg, Rte. 2, Box 226, Rigby, Idaho 83442, and Richard W. Ellis, Box 13, Ririe, Idaho 83443

Filed May 11, 1977, Ser. No. 795,938
Int. Cl.[2] E04G *3/10*
U.S. Cl. 182—150 12 Claims



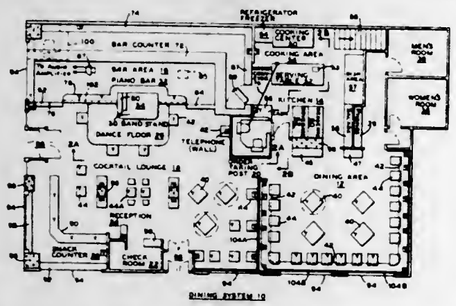
1. A hanging scaffold comprising a pair of end vertical frames each having a pair of vertical open ended tubular members, upper and lower pairs of horizontal support arms each having pairs of spaced vertical extension bars adapted for adjustable telescopic engagement within said tubular members, means to releasably lock the extension bars in selected adjusted positions within the tubular members to establish the overall vertical height of the scaffold, the upper pair of horizontal support arms being engageable with a building structure to suspend the scaffold thereon and lower pair of support arms adapted to engage a wall of a building structure, a walkway formed as a separate unit and adapted to rest bodily on said lower pair of support arms, and selectively engageable plural interlocking means on the walkway and pair of lower support arms enabling the walkway to be adjusted longitudinally and laterally on the pair of lower support arms.

4,074,793

RESTAURANT DINING SYSTEM

Seymour C. Yuter, 407 Cedar Drive West, Briarcliff Manor, N.Y. 10510

Filed July 9, 1976, Ser. No. 703,952
Int. Cl.[2] E04H *3/04*
U.S. Cl. 186—1 R 35 Claims



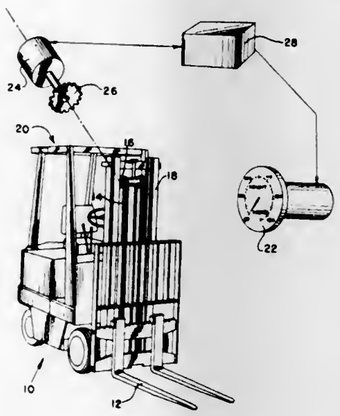
32. A food or drink service system comprising:
(a) a table area having a plurality of separate tables;
(b) a preparation area for preparing food or drinks;
(c) an order-taking post physically separate from said preparation area and in two way visual communication with tables in said table area; and
(d) an electrical audio signal communication system for taking oral orders from people at tables in said table area comprising (1) a plurality of audio transmitter-receivers each positioned near a person at one of said tables in said table area and (2) an audio transmitterreceiver at said order-taking post;
(e) whereby a person at said order-taking post can both see and communicate by electrical audio signal transmission with a person at a table, who can see the order-taking person, to initiate and physically record an order for transmission to the preparation area.

4,074,794

HEIGHT INDICATOR AND CONTROL FOR FORK LIFT TRUCKS

Rolland D. Scholl, Peoria, Ill., assignor to Towmotor Corporation, Mentor, Ohio

Filed Oct. 31, 1975, Ser. No. 627,828
Int. Cl.[2] G05D *3/08*
U.S. Cl. 187—29 A 4 Claims



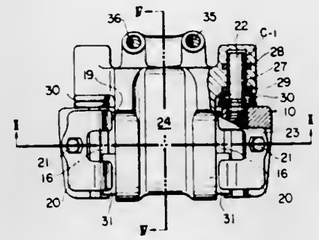
1. Height control apparatus for fork lift trucks, comprising:
a. signal-generating means operatively associated with the fork lifting mechanism of said fork lift truck to provide an electrical signal representative of actual fork height;
b. presettable height selection means for producing a height selection signal;
c. comparator means connected to said signal-generating means and said height selection means for comparing said actual fork height signal and said height selection signal;
d. fork control means on said fork lift truck for raising and lowering said forks, said fork control means being normally biased into a fork stopping position but being releasably holdable in raising or lowering positions by locking means;
e. electromagnetic means associated with said fork control means for releasing said locking means; and,
f. means connecting said comparator means and said electromagnetic means for actuating said electromagnetic means to release said locking means when the actual height of said forks correspond to the height selected by said height selection means.

4,074,795

CALIPER MOUNTING ARRANGEMENT FOR A DISC BRAKE

Toshio Kondo, Chiryu; Masakazu Ishikawa, Toyota; Masayoshi Katagiri, Toyota, and Jiro Kizaki, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Sept. 18, 1975, Ser. No. 614,629
Claims priority, application Japan, Oct. 1, 1974, 49-113630
Int. Cl.[2] F16D *65/02*
U.S. Cl. 188—73.3 4 Claims



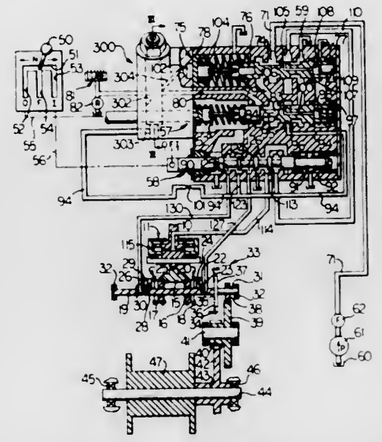
1. A disc brake comprising;
a friction disc secured to a rotational portion of a vehicle wheel assembly to rotate therewith,
a stationary member secured to a fixed portion of the vehicle wheel assembly,
a movable member movably mounted on said stationary member for movement in the direction of the rotational axis of said friction disc,
fluidly operated brake actuating means mounted within said movable member,
a first brake pad assembly slidingly fitted on said stationary member for shifting in the direction of the rotational axis of said friction disc to be applied to one face of said friction disc by said brake actuating means during the braking operation whereby torque is transmitted from said first pad directly to said stationary member,
a second brake pad assembly carried by said movable member to be brought into contact with the opposite face of said friction disc under reaction force derived from said first pad assembly whereby torque is transmitted from said second pad assembly to said stationary member through said movable member,
a pair of parallel pins extending from said stationary member in the direction of the rotational axis of said friction disc,
a pair of bores provided in said movable member diametrically larger than said pins to receive said pins in spaced relationship between the internal face of said bores and the face of said pins,
at least one elastic ring surrounding each pin so as to fill the annular space formed between said pins and said bores,
a first guiding means provided on said movable member, and
a second guiding means including a pair of lugs radially extending from said stationary member, a pair of arms extending from said lugs parallel with the rotational axis of said disc, and a pair of parallel guide rails provided on said arms for cooperation with said first guiding means, said first guiding means and said guide rails on said arms being spaced apart by the resilient force of said elastic rings when said disc brake is in a non-braking condition and said first guiding means being in sliding contact with one of said guide rails when said disc brake is in a braking condition by deformation of said elastic rings whereby the torque from said second brake pad is transmitted to said one guide rail and said pins of said stationary member through said movable member.

4,074,796

ADJUSTABLE SEQUENCE VALVE FOR TOWING WINCH HYDRAULIC CONTROLS

Richard F. Hoehn, Pekin; Hugh C. Morris, Morton; Henry T. Therkildsen, and Bertwin E. Behrends, both of East Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 2, 1976, Ser. No. 654,484
Int. Cl.[2] F16D *67/02*
U.S. Cl. 192—3.57 4 Claims



1. A control for a winch system, said winch system having a cable drum, drive means for rotating said drum, a winch input means, means including first and second fluid pressure actuated clutch means for coupling said winch input means to said drive means to rotate said drum in one direction when said first clutch means is actuated and to rotate said drum in the opposite direction when the second clutch means is actuated, power input means and a third fluid pressure actuated clutch means for coupling said power input means to said winch input means when said third clutch means is actuated, said control comprising:
a. a source of fluid under pressure;
b. means for adjustably reducing the pressure of fluid from said source and for applying the reduced pressure fluid to said first and second clutch means;
c. means including a normally closed valve for applying pressure fluid from said source to said third clutch means when said valve is open; and
d. means responsive to the pressure level of said reduced pressure fluid including a manually positionable member having first and second positions for opening said valve when said manually positionable member is in its first position and said pressure level exceeds a predetermined low level and for opening said valve when said manually positionable member is in its second position and said pressure level exceeds a predetermined high level.

4,074,797

SINGLE STATION, PLURAL FUNCTION PRINTER

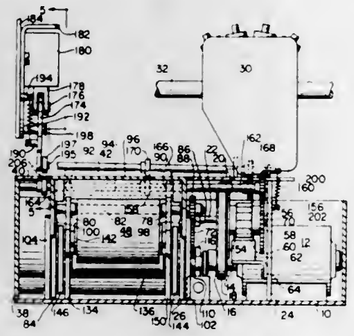
Kim R. Lewis, Lansing, and William H. Corbett, Ithaca, both of N.Y., assignors to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 638,796, Dec. 8, 1975, abandoned. This application Feb. 7, 1977, Ser. No. 766,292
Int. Cl.[2] B41J *15/22*
U.S. Cl. 197—1 R 4 Claims

1. Mechanism for driving a plurality of record materials across a stationary platen and past a single printing station for printing on different combinations of record materials, comprising
drive means,
driven means including a clutch assembly connected with said drive means for intermittent operation,

first drive roller means including a first shaft and connected with said clutch assembly and operable to advance first record material past said printing station in one direction, second drive roller means including a second shaft parallel with said first shaft and connectable with said driven means and operable to advance second record material past said printing station in said one direction, the first record material being wider than the second record material and the first drive roller means having rollers spaced wider than the width of the second record material for driving the first record material independent from the second record material,

electromagnetic actuating means for selectively connecting



said second drive roller means with said driven means for driving said second drive roller means with said first drive roller means to advance the respective first and second record materials in said one direction,

third drive roller means operable to advance third record material past said printing station in a direction opposite said one direction, said third drive roller means including a third shaft having one end thereof connected with said driven means, and

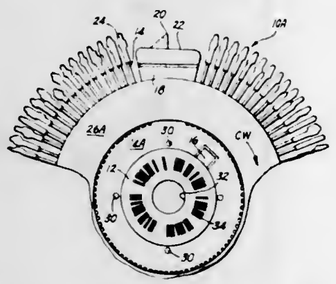
electromagnetic actuating means for swingably moving the other end of said third shaft from an inclined attitude to a position parallel with and spaced from said first shaft to engage said third drive roller means with said third record material.

4,074,798

ENCODED PRINT WHEEL SYSTEM

Michael A. Berger, Richardson, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 1, 1976, Ser. No. 719,630
Int. Cl.² B41J *1/30*
U.S. Cl. 197—53 **21 Claims**



1. An electronic printing system having a serial impact printer, an electronic processor, and means for inputting data to be printed, comprising:

a print element connected to said impact printer and having a plurality of characters arrayed thereon, said element having a read only memory containing coded information associated with selected parameters of said characters, said read only memory containing an index position designating a start characters, said read only memory containing an index position designating a start of message;

means for reading the coded information contained in said memory and for converting said coded information into a set of signals;

means for providing at least one complete revolution of the print element with respect to the index position prior to inputting data to the printer for subsequent printing, whereby said coded information is read by said code reading means; and

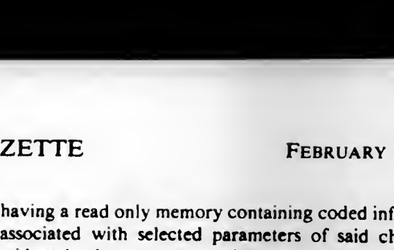
a read/write memory means operatively connected to said reading means and to said electronic processor for receiving and storing said set of signals, whereby said stored signals are provided in said printing system immediately after each character is selected without the delays associated with waiting for a character to reach a print position for printing each character in accordance therewith.

4,074,799

RIBBON CARTRIDGE HAVING SLACK PREVENTING MEANS

Yukio Hishida, Nagoya; Tomoyoshi Watanabe, Chiryu; Takanobu Hirayama, Chita, and Hideo Asakura, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed July 13, 1976, Ser. No. 704,801
Claims priority, application Japan, July 17, 1975, 50-87719; July 17, 1975, 50-87720
Int. Cl.² B41J *33/14*
U.S. Cl. 197—151 **6 Claims**



1. A ribbon cartridge having slack preventing means, for a typewriter provided with ribbon drive means, said ribbon cartridge including a pair of ribbon housings rigidly connected to each other, each of said housings having an aperture, a pair of spools rotatably supported within said housings, said spools being operably connectable to said ribbon drive means, and a ribbon wound on said spools at the both ends thereof, a portion of said ribbon being exposed to the outside of said housings through said apertures when said ribbon is fed from one spool to the other; the improvement comprising:

a. a pair of hold members rotatably supported in said housings;

b. a holding portion on each of said hold members, said holding portion being movable across a ribbon passage within each of said housings, and co-operating with one portion of the housing for holding said ribbon;

c. a pair of spring members for biasing respective hold members toward said one portion of the housing; and

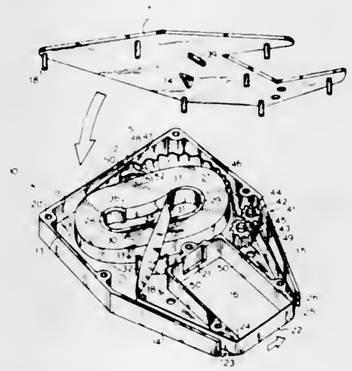
d. a pair of retract members provided in the typewriter, respectively having a cam edge to be engagable with one of said hold members for retracting said holding portions from said ribbon passage against the biasing force of said spring members, when the ribbon cartridge is installed in the typewriter, so that when said ribbon cartridge has been removed from the typewriter, said ribbon is free from slackening in the portion which is exposed to the outside of said housings by the ribbon holding action of said hold members.

4,074,800

ENDLESS PRINTER RIBBON CARTRIDGE APPARATUS

James M. Steinke, Longwood, Fla., assignor to TRW Inc., Los Angeles, Calif.

Filed Apr. 4, 1977, Ser. No. 784,078
Int. Cl.² B41J *33/10*
U.S. Cl. 197—168 **9 Claims**



1. An endless printer ribbon cartridge comprising in combination:

a housing having a bottom and a plurality of sides, and formed to include a pair of protruding arms;

a top cover attached to said housing;

ribbon wrapping means fixedly attached to said housing bottom and having a pair of arcuate wrapping members for wrapping an endless ribbon around;

an endless ribbon having a partially wrapped portion wrapped around said pair of arcuate wrapping members for a plurality of turns so as to leave a space therebetween;

a ribbon guide fixedly attached to said ribbon wrapping means between said partially wrapped portion of said endless ribbon for guiding said ribbon from between said pair of arcuate wrapping members over said partially wrapped portion of said endless ribbon;

ribbon drive means located in said housing and engaging said ribbon for driving said ribbon over a predetermined path from between said ribbon wrapping means wrapping members over a predetermined ribbon path between said protruding arms and onto the outside of said partially wrapped ribbon on said ribbon wrapping means whereby an endless ribbon cartridge is formed; and

a ribbon straightening member having a plurality of lips thereon, one said lip being spaced a predetermined distance from one said housing side for metering ribbon onto said partially wrapped ribbon and for straightening said ribbon and a second said lip located adjacent to and pressing against said partially wrapped ribbon portion for maintaining said wrapped portion in a tight wrap.

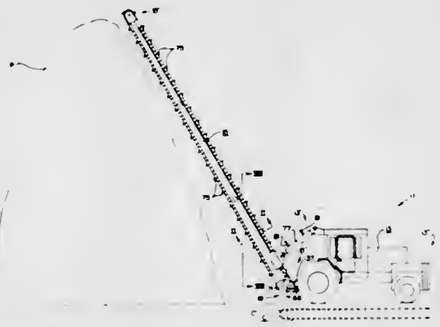
4,074,801

BULK MATERIAL RECLAIMING APPARATUS

James T. Monk, Louisville; James L. Hailey, Noxapater, and Tonnie M. Boyles, Louisville, all of Miss., assignors to Taylor Machine Works, Inc., Louisville, Miss.

Filed Oct. 4, 1976, Ser. No. 729,104
Int. Cl.² B65G *65/28*
U.S. Cl. 198—304 **4 Claims**

1. Apparatus for reclaiming bulk material from a pile of such material, said apparatus comprising: a self-propelled wheeled vehicle; elongated boom means including a first elongated substantially boxlike member having fore and aft ends, a second elongated substantially boxlike member having fore and aft ends, and means for joining said first and second boxlike members together in a spaced-apart side-by-side relationship; pivot means for pivotally mounting said aft ends of said first and second boxlike members to said wheeled vehicle; endless belt-like means movably positioned about said boom means, said endless belt-like means including a first endless chain member movably positioned about said first boxlike member of said boom means and a second endless chain member movably positioned about said second boxlike member of said boom means, each of said first and second endless chain members including a plurality of roller members; guide means attached to said boom means for guiding said endless belt means lengthwise around said boom means, said guide means including a plurality of substantially C-shaped members mounted on the upper and lower edges of said first and second boxlike members of said boom means and being inwardly directed, each of said C-shaped members having an outwardly-directed opening therethrough adjacent the lowermost portion thereof for allowing passage therethrough of the bulk material being reclaimed by said apparatus thereby alleviating any trappage within said guide means of any of the bulk material, each of



said C-shaped members mounted on the upper edges of said first and second boxlike members having a downwardly and outwardly angled bottom portion for allowing bulk material to pass through said opening thereof aided by the force of gravity, said roller members of said first and second endless chain members traveling within said C-shaped members of said guide means so that said first and second endless chain members are guided lengthwise around said first and second boxlike members respectively; drive means operatively coupled to said endless belt-like means for selectively causing said endless belt-like means to move along said boom means, said pivot means and said drive means being coaxially aligned with one another; and blade means attached to said endless belt-like means for moving with said endless belt-like means to reclaim bulk material from a pile of such material when said boom means is positioned against such a pile, said blade means including a plurality of substantially platelike blade members, each of said blade members being attached to said first and second endless chain members and extending transversely of and outwardly past said first and second boxlike members of said boom means for effecting a cave-off of the bulk material in the pile as bulk material is reclaimed from the pile.

4,074,802

CONCRETE RECEIVER AND PLACER FOR ROAD PAVING

Michael I. Hudis, Milwaukee, Wis., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Aug. 23, 1976, Ser. No. 716,391
Int. Cl.² B65G *41/00*
U.S. Cl. 198—315 **12 Claims**

1. A belt placer comprising powered ground traction means, a frame having spaced cross-members connecting the tractions means, a belt conveyor extending paralled to and between said

cross-members, said belt conveyor having a lower loading end and an upper discharge end, first support arms pivotally carried by the frame and pivotally connected to the discharge end of the conveyor and second support arms having support



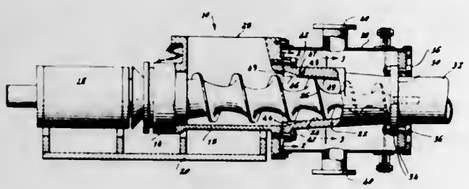
rollers supporting the loading end of the conveyor, said conveyor including two straight supporting runners which are translated on the rollers by the first support arms, and power means for moving said arms and variously positioning said conveyor.

4,074,803

SCREW CONVEYOR HAVING STOPPER BAR MEANS

Ture Eric Kollberg, Port Chester, N.Y., assignor to American Defibrator, Inc., Minneapolis, Minn.

Filed Apr. 23, 1976, Ser. No. 679,657
Int. Cl.² B65G *33/14*
U.S. Cl. 198—670 **6 Claims**



1. In a screw conveyor for pulp manufacturing equipment, including feed screw means rotationally mounted within a casing defining a chamber for receiving the pulp material, a throat member connected to and extending longitudinally from said casing and having a conical bore tapering from its inlet end at the material receiving chamber towards a discharge end and being provided with a plurality of longitudinal grooves, the feed screw means extending into said bore to gently and progressively compress the material while it is being advanced therethrough by the rotation of the screw means, the improvement which enhances feeding of the pulp material while preventing the same from turning with the feed screw and thereby prevents clogging, said improvement comprising:

a. a flared peripheral portion (**44**) at the inlet end of said throat member defining a flare bore (**43**) merging with the tapered bore of the throat member; and

b. a plurality of elongate stopper bar means having a wedge profile seated in said flare bore (**43**) adjacent to and overlapping the longitudinal grooves in the throat member.

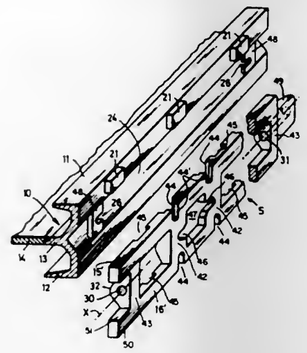
4,074,804

SCRAPER-CHAIN CONVEYORS

Dieter Gründken, Lunen, and Helmut Temme, Waltrop, both of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Wethmar bei Lunen, Germany

Filed Apr. 5, 1976, Ser. No. 673,486
Claims priority, application Germany, Apr. 12, 1975, 2516082; July 17, 1975, 2531861
Int. Cl.² B65G *19/28*
U.S. Cl. 198—735 **11 Claims**

1. A channel section for a scraper-chain conveyor comprising: side walls having V-shaped notches extending longitudinally along the exterior surfaces thereof; a floor plate extending between and connecting said side walls; an elongate structure mounted on the exterior surface of at least one of the side walls, said structure extending over substantially the entire length of the side wall and being substantially co-planar with the upper and lower surfaces thereof, said structure having vertically spaced upper and lower stiffening members interconnected at longitudinally spaced locations by first holding members extending transversely therebetween, the V-shaped notch in the exterior surface of the side wall being accessible through the spaces between said upper and lower stiffening members and said first holding members, said first holding members being engaged within the elongate V-shaped notch extending along the side wall and having slotted recesses therein for accommodating the heads of bolts used for securing an attachment, said first holding members being substantially co-planar with the exterior sides of said stiffening members; connectors attached to the opposite ends of the side wall, said connectors having complimentary inter-engageable projec-



tions and recesses for connecting one channel section to another, said connectors extending over the entire height of the side walls and being substantially co-planar with the exterior sides of said stiffening members, said connectors having bores for receiving connecting bolts used to secure adjacent channel sections together; and, second holding members provided adjacent to said connectors, said second holding members having slotted recesses serving to receive the heads of bolts and being engaged in the V-shaped notch on the side wall, said second holding members being smaller than said first holding members and having a maximum height substantially the same as the maximum width of the V-shaped notch and a width such that the outermost sides are substantially co-planar with the exterior of the side wall to thereby permit connecting bolts to be located in the connectors.

4,074,805

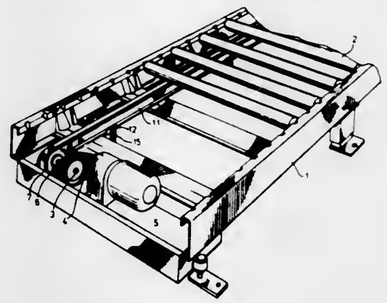
INSTALLATION EQUIPMENT WITH A DRIVING MECHANISM

Hermanus J. A. Bodewes, Uden, Netherlands, assignor to Rapistan Incorporated, Grand Rapids, Mich.

Filed Oct. 12, 1976, Ser. No. 731,824
Claims priority, application Netherlands, Dec. 8, 1975, 7514253
Int. Cl.² B65G *13/02*
U.S. Cl. 198—790 **9 Claims**

1. An endless propelling means for a power driven conveyor, said propelling means having an endless chain and an elastic strip, said chain having a plurality of links each having an opening extending through the chain, said elastic strip having an elongated body, a plurality of anchor elements integral with and projecting from one face thereof and seated in openings in said links, said anchor elements each having an enlarged head and a reduced shank, said shank being of a size to be snugly received in one of said openings; said anchor elements

being spaced apart twice the length of one of said chain links whereby only alternate ones of said openings are occupied by



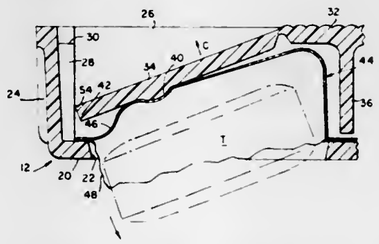
said anchor elements to permit the teeth of a sprocket to mesh with said chain.

4,074,806

TABLET DISPENSING CONTAINER

Gerald J. Ardito, Old Westbury, N.Y., assignor to Deena Packaging Industries, Inc., Ridgewood, N.Y.

Filed Feb. 18, 1977, Ser. No. 770,010
Int. Cl.² B65D *83/04, 85/56, 47/04;* G07F *11/00*
U.S. Cl. 206—531 **5 Claims**



1. An integral thermoplastic tablet dispensing container which comprises:

a body member including a bottom wall, side walls and end walls, said bottom wall being formed with a plurality of preselectedly spaced slots, said side walls being formed with a plurality of preselectedly spaced columns;

a cover member hingeably connected to said body, said cover member formed with a T-shaped top member having preselectedly spaced laterally extending tablet dispensing elements correspondingly positioned with respect to said slots formed in said bottom wall of said body member, said tablet dispensing elements resting on said column in a closed position of said container; and

means for locking said cover member to said body member.

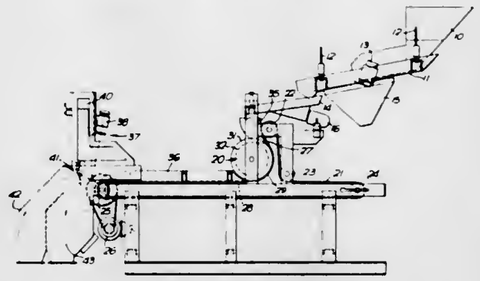
4,074,807

APPARATUS FOR FEEDING OBJECTS TO A POINT OF USE

Anthony John Goulds, London, England, assignor to Gunson's (Mineral & Automation) Limited, London, England

Filed June 17, 1976, Ser. No. 697,246
Claims priority, application United Kingdom, June 27, 1975, 27295/75
Int. Cl.² B07C *9/00, 1/02*
U.S. Cl. 209—73 **3 Claims**

1. Apparatus for feeding objects to a point of use comprising a drum, means for feeding objects to the drum, an endless belt which is disposed closelyadjacent to and in contact with a portion of the drum, and which has a vertically extending and a horizontally extending run upstream and downstream respectively of the drum, and means for driving the belt and the drum in unison, the drum having a plurality of parallel, circumferentially extending grooves which are arranged longitudinally of the said horizontally extending run and through which the objects may freely pass longitudinally and the objects in the



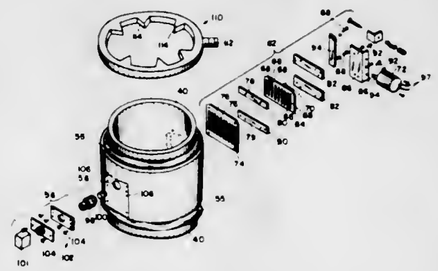
grooves being centrifugally forced against the belt in parallel rows as the belt moves between the vertical and horizontal runs thereof, whereby objects which have been fed to the vertically extending run enter the grooves, are positioned by centrifugal force on the belt in parallel lines of objects which travel towards the point of use.

4,074,808

SORTING APPARATUS

Robert M. Gillespie, Grand Rapids, and John R. Ricks, Grand Ledge, both of Mich., assignors to Cypro Corporation, Grand Rapids, Mich.

Filed Apr. 30, 1976, Ser. No. 681,411
Int. Cl.² B07C *5/342*
U.S. Cl. 209—73 **17 Claims**



1. A sorting apparatus comprising a chamber including open ends through which articles to be sorted are individually passed for optically sorting the articles;

means for illuminating said chamber;

light reflecting background means positioned on the side of said chamber and forming an adjustable reference standard of reflectivity, said reflecting means including a first member having alternately spaced stripes of different light reflecting characteristics, a second member positioned over said first member and having a series of spaced slots formed therein, said slots corresponding generally to alternate spaced stripes formed on said first member, and means for moving one of said first and second members with respect to the other of said members to adjust the reflectivity of said background means by selectively exposing said segments through said apertures to establish a predetermined background level; and

detection means positioned on said chamber opposite said background means to receive light reflected from said background means to establish a reference level and including, lens means focusing said detection means on objects passing through said chamber approximately mid-

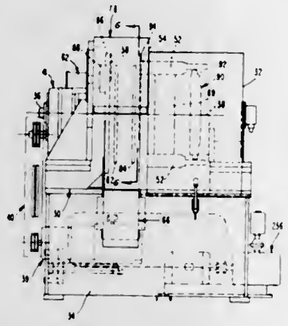
way between said detection means and said background means whereby a change in detected light level from said reference level is indicative of a property of an article to be sorted for effecting sorting of the article.

4,074,809

APPARATUS AND METHODS FOR INSPECTION OF CAN BODIES BY USE OF LIGHT

Danny Leon McMillin, Golden, and Larry Mason Dugan, Boulder, both of Colo., assignors to Coors Container Company, Golden, Colo.

Filed July 19, 1976, Ser. No. 706,478
Int. Cl.[2] B07C 5/344
U.S. Cl. 209—75 **57 Claims**



1. A machine for continuous testing of one piece can body members having a sidewall portion, and a bottom wall portion at one end defining a container cavity, and an opening at the other end, and a formed flange portion at the other end surrounding the opening for subsequent association with a can closure member; the machine being adapted for testing the can body member for defects including pin holes in the sidewall portion and the bottom wall portion, and unwanted deformation and cracks in the flange portion, and comprising:

frame and housing means for supporting and housing the machine components;

horizontally extending rotatable shaft means rotatably supported by said frame and housing means and providing a central axis of rotation;

motor means for causing continuous rotation of said rotatable shaft means;

can body member transfer wheel means mounted on said shaft means for rotation therewith and for carrying can body members in a circular path thereabout;

a plurality of pocket means circumferentially spaced about the outer periphery of said transfer wheel means for receiving a can body member in each pocket means and for transferring each can body member along said circular path during a portion of each revolution of said transfer wheel means, each of said pocket means being carried generally upwardly during 180° and generally downwardly 180° during each revolution of said transfer wheel means;

in-feed means mounted on said frame and housing means for loading one can body member in each of said pocket means during the last 90° of the generally upward movement of said pocket means during each revolution of said transfer wheel means;

light applying means for applying light to the exterior surfaces of each can body member in each of said pocket means, the light applying means being non-rotatably mounted relative to said transfer wheel means and located to provide a continuous light zone during the first 90° of the generally downward movement of said pocket means during each revolution of said transfer wheel means;

discharge chute means for receiving defective can body members from said transfer wheel means during the last 90° of the generally downward movement of said pocket means during each revolution of said transfer wheel means;

unloading chute means located generally beneath said transfer wheel means for receiving non-defective can body members from said transfer wheel means during the last part of the last 90° of the generally downward movement and/or the first part of the first 90° of the generally upward movement of said pocket means during each revolution of said transfer wheel means;

extendable and retractable means mounted on said shaft means for rotation therewith and being associated with each of said pocket means for axially moving a can body member in each of said pocket means between a first retracted position and a second extended position during a portion of each revolution of said transfer wheel means;

releasable holding means associated with each of said extendable and retractable means for abutting and releasable holding engagement with the bottom wall portion of a can body member in each of said pocket means during a portion of each revolution of said transfer wheel means;

sealing means mounted on said shaft means for rotation therewith and being associated with each of said pocket means and each of said extendable and retractable means for sealable engagement with the flange portion of non-defective can body members carried in each of said pocket means and releasably held by said holding means, the holding means being operative to effect holding engagement with the bottom wall of said can body member and the extendable and retractable means being operative from the first retracted position to the second extended position to effect sealable engagement of the flange portion of each can body member with the associated sealing means prior to movement of each can body member to said light zone;

light detection means non-rotatably mounted relative to said transfer wheel means and being located for successive axial alignment with each of said pocket means and the opening in the can body member carried thereby opposite said sealing means in the light zone for receiving light only from said light applying means through the can body member and between the flange portion and the sealing means and for generating a control signal upon receipt of light therefrom;

said extendable and retractable means being operative from the second extended position to the first retracted position to retract each can body member from sealable association with said sealing means after downward movement beyond said light detection means prior to reaching said discharge chute means during each revolution of said transfer wheel means;

defective can body member release control means effective in response to said control signal from said light detection means for releasing each defective can body member after beginning the first part of the last 90° of the generally downward movement of said transfer wheel means and before reaching said discharge chute means during each revolution of said transfer wheel means and for enabling downward discharge of defective can body members into said discharge chute means by centrifugal force of said transfer wheel and force of gravity; and

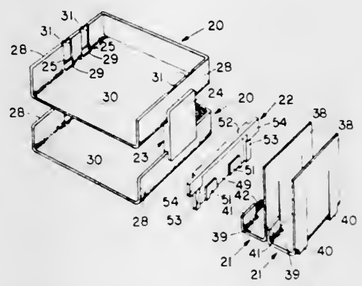
non-defective can member release control means effective as each non-defective can body member approaches said unloading chute means for releasing each non-defective can body member and for enabling discharge of non-defective can body members into said unloading chute means by centrifugal force and force of gravity during each revolution of said transfer wheel means.

4,074,810

COMBINATION TIERED LETTER TRAY AND VERTICAL FILE

David A. Juergens, and Greg P. Terek, both of Winchester, Va., assignors to Rubbermaid Commercial Products Inc., Winchester, Va.

Filed Sept. 27, 1976, Ser. No. 727,227
Int. Cl.[2] A47F 7/00
U.S. Cl. 211—11 **9 Claims**



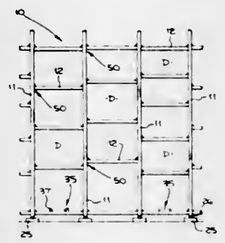
1. A combination tiered letter tray and vertical file comprising at least two tiered U-shaped trays each having a bottom wall and side walls with equally spaced-apart slots at the intersections thereof, riser plate members supporting the upper tray on the lower tray and having a bottom groove detachably engaged over the side wall of the lower tray and upper tabs detachably engaged in the slots of the upper tray, and a vertical file comprising at least one L-shaped trough having a bottom wall and side wall with spaced-apart slots at the intersection thereof and spaced-apart upright tabs at the opposite edge of its bottom wall, the upright tabs of said trough being spaced apart the same distance as the slots in the trays and detachably engaged in the slots at one side of said lower tray and the slots of said trough being spaced apart the same distance so as selectively to receive the upright tabs of a like trough in laterally adjoining relation.

4,074,811

MULTI-LEVEL KNOCK-DOWN FRAMEWORK STRUCTURE FOR SUPPORTING A PLURALITY OF OBJECTS

Andrew M. Filak, 4108 Seahorse Lane, Portuguese Bend, Calif. 90274

Filed Oct. 15, 1975, Ser. No. 622,725
Int. Cl.[2] A47B 43/00
U.S. Cl. 211—191 **13 Claims**



1. A multi-level portable knock-down framework structure for supporting a plurality of objects of varying shapes, sizes and weights in individual compartments comprising:

a first plurality of spaced upright support members;

a second plurality of spaced support members, said first plurality of support members removably interconnecting said upright members forming a generally rectangular framework having a front, back and interconnected sides with a plurality of vertical generally rectangularly shaped rows disposed within said framework, each of said rows having an upright member at each corner thereof and divided into a plurality of vertically spaced compartments, each of said compartments having generally horizontally extending support members interconnected to said upright members separating one compartment from another, two of said last-mentioned support members associated with each compartment lying substantially in the same horizontal plane and providing a compartment having a front and a back, said two of said support members forming the front and back of each of said compartments;

adjusting means associated with both said upright members and said two of said horizontally extending members for vertically adjusting all of said two of said horizontally extending members at predetermined locations along said upright members;

object support means removably mounted on at least some of both of said two of said horizontally extending support members forming the front and back of each of said compartments, said adjusting means including said upright support members having at least one generally T-shaped slot opening outwardly thereof and extending substantially the entire length thereof along one side thereof, said horizontally extending members being secured to said upright support members by non-biased tension bolts having heads movable along said slot, said heads and said slots including retaining means thereon for retaining said horizontally extending members at various locations along said slots in said upright support members, said retaining means including said T-shaped slot having relatively flat inner walls and relatively flat side walls extending generally perpendicular to said inner walls, said walls retaining means further including said heads having a pair of oppositely opposed surfaces interconnected by a pair of oppositely opposed straight surfaces, and said head being undercut forming flattened portions extending from a point at the outer periphery of the underside of the head of each of said bolts to a point adjacent the shank of each of said bolts forming an abutting shoulder thereat so that, when said bolts are disposed in said T-shaped slots, said heads are cammed about said camming surfaces with said camming surfaces abutting against the inner walls of the cross-leg of said T-shaped slots and said flattened portions abut against the flat inner walls of the leg of said T-shaped slots with the shoulders abutting against the perpendicular portions of said slots; and

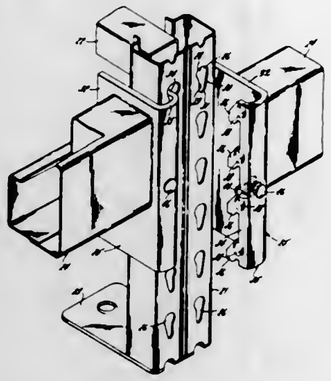
interconnecting means removably interconnecting both of said two of said horizontally extending support members to said upright members, said interconnecting means including a generally flat flange having a generally U-shaped bracket extending from one face of said flange, one of the legs of said bracket being substantially shorter than the other, the ends of each of said two of said horizontally extending support members connected to said upright members having blocks press-fit in each end therein, each of said ends being insertable within said bracket and abutting against the face thereof from which said bracket extends, the opposite face of said flange being secured to an upright member, and securing means associated with said blocks, said ends of said horizontally extending support members, and said bracket for fixedly securing said last-mentioned ends in said brackets.

4,074,812

PALLET RACK

Leroy F. Skubic, LaPorte; Lucius B. Donkle, Jr., Michigan City, and Donald L. Groth, LaPorte, all of Ind., assignors to The Paltier Corporation, Michigan City, Ind.

Filed Dec. 11, 1975, Ser. No. 640,022
Int. Cl.² A47F 5/10
U.S. Cl. 211—192 **6 Claims**



1. In a vertically adjustable pallet rack having at least four rectangularly spaced vertical support posts and pairs of spaced horizontal shelf beams mounted between corresponding pairs of said posts, each said post having a front wall and rearwardly extending side walls facing each other, the combination comprising:

a. a post-to-beam connector fixed to the end of each horizontal shelf beam, said connector having a first wall attached to the shelf beam;

b. a second wall laterally spaced from said first wall;

a bridge wall connecting said first and second walls;

d. means defining two vertically disposed series of keyhole shaped apertures in the front wall of each post, said series being spaced from each other and from the side walls of the post,

e. each said aperture having a relatively wide upper portion of generally circular shape and a narrower lower portion defined by a vertical side adjacent the central portion of said post and an inclined side tapering downwardly to an arcuate bottom wall portion connecting said vertical and inclined sides;

f. at least two vertically spaced hooks defined in said second wall of said connector for engagement with the apertures of the post, said hooks lying in a common plane;

g. each said hook having a throat and a bulbous projection above said throat adapted to engage the vertical wall of the aperture while said throat engages the arcuate bottom wall portion of the aperture at a point spaced vertically below said bulbous projection on the opposite side of said hook therefrom above the bottom of the aperture in a direction generally normal to said arcuate bottom wall portion; and

h. said first wall of said connector defining a clearance space with respect to the side of said post when said connector is attached to said post.

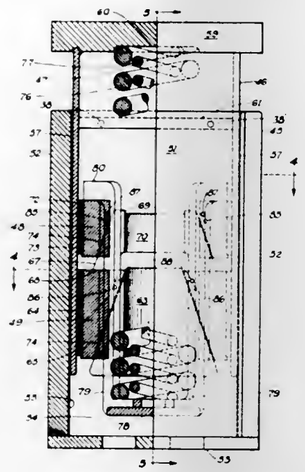
4,074,813

TELESCOPIC DRAFT GEAR

David G. Anderson, Chesterton, Ind., assignor to Miner Enterprises, Inc., Chicago, Ill.

Filed Oct. 15, 1976, Ser. No. 732,910
Int. Cl.² B61G 11/14
U.S. Cl. 213—24 **12 Claims**

10. In a railway draft gear including a housing having inner wall means defining a cavity therein extending along a longitudinal axis and having an open end and a substantially closed end, a plunger extending at least partially into the cavity and mounted for reciprocal movement with respect to the housing as forces are applied to the two spaced ends of the plunger and housing respectively, and a device, including friction elements and spring elements, within the cavity for resiliently and frictionally resisting forces acting on the draft gear to force the plunger into the housing, said draft gear being characterized by:



said plunger being guided in said housing for movement along said longitudinal axis both at a location adjacent the open end of the cavity and at a location adjacent the closed end of the cavity thereby reducing the tendency of the plunger to cock with respect to the housing, that is, to become misaligned with respect to said axis; and

said friction elements being at least in part positioned adjacent the closed end of the cavity.

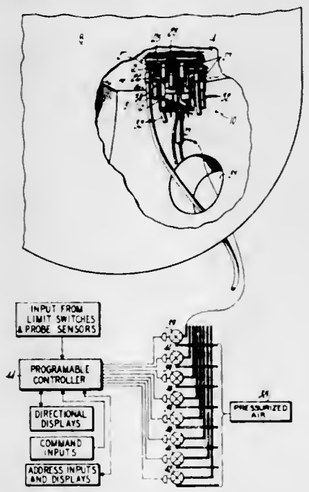
4,074,814

METHOD AND APPARATUS FOR CONTROLLING SURFACE TRAVERSING DEVICE

David Eugene Cooper, Rossville, Ga.; Leon Clyde Hendee, III, Chattanooga, Tenn.; Walter Guy Hill, Jr., Rossville, Ga.; Adam Leshem, West Hartford, and Martin Lewis Marugg, Enfield, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Mar. 26, 1976, Ser. No. 670,806
Int. Cl.² B25J 9/00
U.S. Cl. 214—1 BB **25 Claims**

13. For use in traversing the surface of a member, the member having an ordered array of openings therein aligned and uniformly spaced in plural evenly spaced parallel lines and plural evenly spaced parallel rows respectively parallel to the *x* and *y* axes of a Cartesian coordinate system, each opening having a separate address in the Cartesian coordinate system, in combination, a surface traversing apparatus including first and second interconnected stepping arms, the first and second stepping arms extending transversely of one another at the angle defined by the intersection of the *x* and *y* axes of the Cartesian coordinate system and each being selectively longitudinally reciprocable to at least two positions, the distance between the respective at least two positions of the first and second stepping arms corresponding respectively with an integer multiple of the spacing along the respective axis between adjacent lines and adjacent rows of member openings respectively, signal controlled drive means connected to the first and second stepping arms to selectively step either or both of the first and second stepping arms transversely of the other each to a respective selected one of the respective at least two positions, first and second anchor means connected to the first and second stepping arms respectively, each of the first and second anchor means being selectively insertable into and alternately retractable from member openings for respectively engaging and disengaging the respective first and second stepping arms with the member, signal controlled drive means connected to the first and second anchor means for selectively engaging and alternately disengaging either of the first and second stepping arms with the member; and control apparatus for controlling the movement of the surface traversing apparatus comprising means for sensing the positions of the first and second stepping arms relative to one another and generating signals indicative thereof, means providing a multiplicity of alternately selectable executory move control routines, each move control routine being responsive to the signals indicative of the relative positioning of the first and second stepping arms for generating a respective particular sequence of control signals for controlling operation of the stepping arm drive means and the anchor means drive means such that the surface traversing apparatus is moved an increment in a respective one



of a multiplicity of different directions within the Cartesian coordinate system, each move increment advancing the surface traversing apparatus reference point relatively from a present member opening to at least the next adjacent member opening in the direction of movement by sequentially at least disengaging a particular one of the first and second stepping arms with respect to the member, driving at least one of the first and second stepping arms to a respective one of its at least two positions to move the disengaged particular stepping arm and normally re-engaging the disengaged particular one of the stepping arms with respect to the member, a first one of the move directions being parallel to one of the axes of the Cartesian coordinate system, a second one of the move directions being parallel to the other axis of the Cartesian system and a third one of the move directions extending diagonally of the axes of the Cartesian coordinate system, and means for selectably connecting the stepping arms drive means and the anchor means drive means with the sequenced control signals of a selected one of the executory move control routines.

4,074,815

TURN-OVER COOLING BED FOR BAR-SHAPED ROLLED MATERIAL, PARTICULARLY BILLETS

Karlheinz Varwig, Mulheim, Germany, assignor to DeMag Aktiengesellschaft, Duisburg, Germany

Filed Feb. 13, 1976, Ser. No. 657,857
Claims priority, application Germany, Feb. 18, 1975, 2506703
Int. Cl.² G65G 7/00
U.S. Cl. 214—1 QG **2 Claims**

1. A cooling bed for simultaneously conveying and turning hot semi-soft straight-edged rolled material such as billets while maintaining continuous non-tumbling support thereof, the improvement comprising:

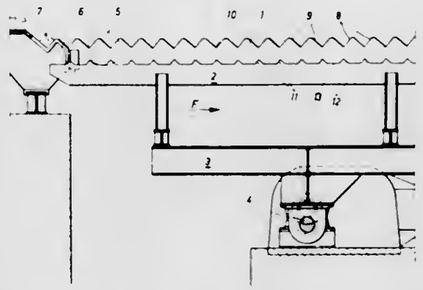
(a) a stationary rake with teeth;

(b) a movable rake with teeth;

(c) means connected to said movable rake for moving said movable rake parallel to the longitudinal axis of said stationary rake; characterized by

(d) said moving means moving said movable rake in a closed circular path;

(e) the angle of inclination from horizontal of the rising flanks and falling flanks of the teeth of said movable and stationary rakes being the same;



(f) the angle of said rising flanks of said teeth being steeper than said falling flanks;

(g) the flanks of adjacent teeth in said stationary rake forming angles of about 90 degrees with each other;

(h) said teeth in said movable rake being spaced from each other to form horizontal bearing surfaces at the base of said teeth; and

(i) said horizontal bearing surfaces being wider than the straight edges of the rolled material to be conveyed and turned;

(j) said horizontal bearing surfaces, together with said teeth in said movable and stationary rakes, providing continuous non-tumbling support of said semi-soft rolled material.

4,074,816

CHARGE METERING APPARATUS FOR SHAFT FURNACES

Edouard Legille, Luxembourg, Luxembourg, assignor to S.A. des Anciens Etablissements Paul Wurth, Luxembourg, Luxembourg

Filed Mar. 6, 1973, Ser. No. 339,118
Claims priority, application Luxembourg, Mar. 6, 1972, 64910
Int. Cl.² B65G 69/00
U.S. Cl. 214—2 **12 Claims**

1. Apparatus for use in the delivery of materials to the interior of a shaft furnace, said furnace having a vertical axis and operating with a high counter-pressure, said apparatus comprising:

at least one storage hopper for providing intermediate storage for a charge of material to be delivered to the furnace, said storage hopper having a supply port and a discharge port;

weighing means associated with said storage hopper;

means pivotally supporting said storage hopper on said weighing means;

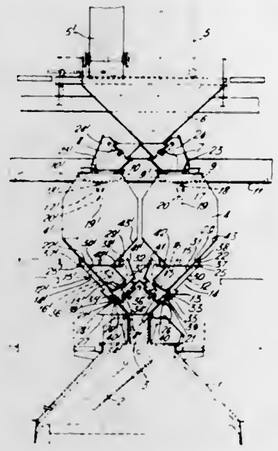
means defining a discharge channel for said storage hopper;

first flexible coupling means connecting the first end of said discharge channel defining means to said storage hopper;

means for delivering material discharged from said storage hopper through said discharge channel defining means to the furnace, said delivering means including material flow control valve means, said delivering means being mounted on the furnace; and

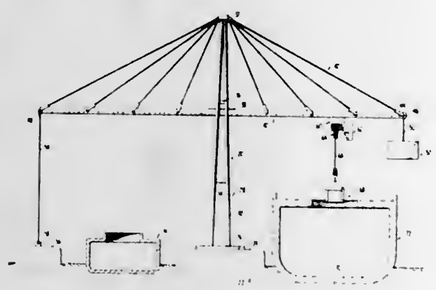
second flexible coupling means for connecting the second end of said channel defining means to said delivering

means, said first and second flexible coupling means and said supporting means cooperating to define a suspension for said hopper which converts differential displacements



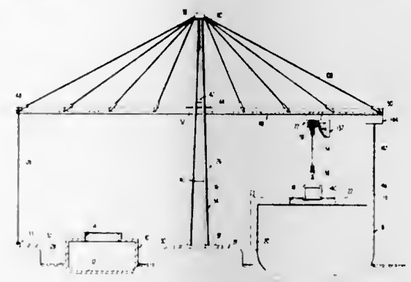
between said hopper and the furnace to angular displacements which do not significantly degrade the accuracy of measurements provided by said weighing means.

4,074,817
BARGE CABLE CRANE
Louis F. Ray, P.O. Box 14702, Baton Rouge, La. 70808
Filed Mar. 22, 1976, Ser. No. 668,996
Int. Cl.[2] B63B *27/00;* B66C *23/52*
U.S. Cl. 214—13 **5 Claims**



4. A waterborne crane comprising:
a crane barge having a tower extending vertically therefrom;
a horizontal gantry mounted at an intermediate point thereof on the tower;
cargo transfer means mounted on said gantry for horizontal movement between the opposite ends of said gantry through said intermediate point, and including a hoist mechanism;
a first counterweight suspended from one end of the gantry; and
a buoyant counterweight barge and a flexible cable connecting the other end of the gantry to said buoyant counterweight barge so that said buoyant counterweight barge provides a counterbalance effect on said waterborne crane through a tension force on said flexible cable when said cargo transfer means is located on one side of said intermediate point, said first counterweight being effective to provide a counterbalance effect on said waterborne crane when said cargo transfer means is on the other side of said intermediate point, said cargo transfer means when located on said other side being effective to relieve said tension force in said flexible cable thereby rendering said buoyant counterweight barge ineffective.

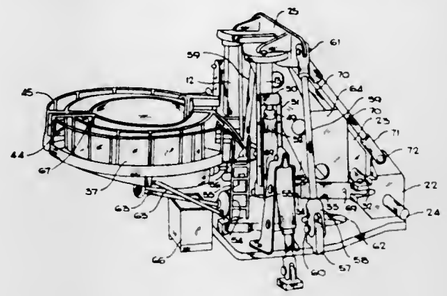
4,074,818
LOADING/UNLOADING CRANE WITH BUOYANT COUNTERWEIGHT SYSTEM
Louis F. Ray, P.O. Box 14702, Baton Rouge, La. 70808
Filed Mar. 5, 1976, Ser. No. 664,119
Int. Cl.[2] B63B *27/00;* B66C *23/52*
U.S. Cl. 214—13 **5 Claims**



1. A loading/unloading crane assembly for transfer of cargo from a loaded first floating vessel to a second floating vessel, the crane assembly comprising:
a floating crane barge;
a column assembly extending vertically from the crane barge, the column assembly including a top portion, and a base;
a horizontal boom, connected at an intermediate point thereof to the column assembly between the top portion and the base, and having opposite outer extremities on either side of the column assembly;
means securing the boom to the top portion of the column at longitudinally spaced locations;
a floating counterweight barge secured to the boom adjacent one outer extremity thereof by a first cable of fixed length;
the first loaded vessel being located between the crane barge and the counterweight barge;
a second cable of adjustable length securing the opposite outer extremity of the boom to the second vessel; and
movable trolley means on the boom, including a vertically movable hoist cable with cargo engagement means, for withdrawal of cargo from the loaded first vessel, movement through said intermediate point, and placement of the cargo in the second vessel, the cable of adjustable length being lengthened as the second vessel takes on cargo.

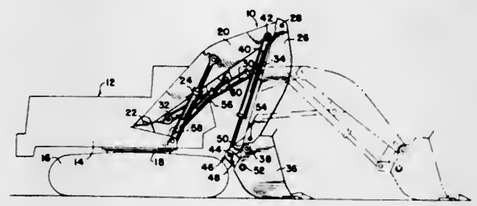
4,074,819
ELEVATABLE TWO-PART SCAFFOLD FOR PICKING FRUIT
Abel S. Labourre, 8290 Berg St., Roseville, Calif. 95678
Filed Mar. 31, 1976, Ser. No. 672,247
Int. Cl.[2] E04G *1/18*
U.S. Cl. 214—83.1 **13 Claims**

1. A scaffold for picking fruit from a tree comprising:
a support base;
a pair of movable generally semi-circular hopper assemblies mounted on said base;
hopper assembly moving means associated with said base for moving both of said hopper assemblies thorugh a generally horizontal plane from a first open position whereby said assemblies may be brought into a position encircling a tree to a second closed position completely encircling said tree;
fruit receiving means associated with each of said hopper assemblies for receiving fruit picked from said tree consisting of a continuous bin disposed along the inner side surfaces of said assemblies and extending substantially 360° around said tree when said assemblies are in said closed position;
walk means associated with each of said hopper assemblies



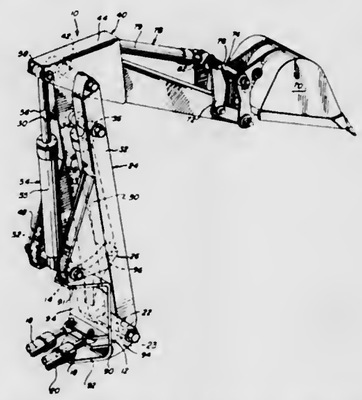
adjacent said fruit receiving means for permitting a picker to walk substantially 360° around said tree and pick fruit therefrom; and means for independently elevating each of said hopper assemblies along a vertical hopper assembly support member pivotally attached to said base.

4,074,820
SHOVEL LINKAGE FOR A HYDRAULIC EXCAVATOR
Stephen H. Gill, Aurora; Harvey A. Knell, Joliet, and Joseph M. Tucker, III, Aurora, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Continuation of Ser. No. 522,204, Nov. 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 283,621, Aug. 24, 1972, Pat. No. 3,862,697. This application May 25, 1976, Ser. No. 689,780
Int. Cl.[2] E02F *3/32*
U.S. Cl. 214—138 R **8 Claims**



1. A hydraulic excavator, comprising:
a vehicle having a mobile carriage and a rotary platform supported for rotation about a vertical axis on said carriage;
a boom having an inner and outer end, pivotally supported at said inner end of said rotary platform adjacent said vertical axis for movement about a horizontal axis;
a pair of boom lift cylinders pivotally mounted at one end to said rotary platform forward of and slightly below the connection of said boom thereto, and said cylinders being connected at the other end to said boom approximately midway between the ends thereof;
a stick having an inner end and an outer end and pivotally connected at the inner end to the outer end of said boom;
a stick cylinder pivotally connected at one end to said boom adjacent the inner end thereof and connected at the other end to said stick;
a bucket pivotally connected to the outer end of said stick and opening outwardly away from said vehicle; and
bucket cylinder means pivotally connected at one end directly to said boom adjacent to the outer end thereof and connected at the other end to tilt linkage for tiling said bucket with respect to said stick, said tilt linkage being arranged for applying a forward force to said bucket, said bucket cylinder means together with said stick forming opposite sides of substantially a parallelogram and the force applied by the bucket cylinder means directly creating a moment about the connection of the stick to the boom, the connection of said bucket cylinder means to said boom being spaced inward from the connection of the stick to the end of the boom so that the moment about the pivotal connection of the stick to the boom when the bucket cylinder means are being extended tends to directly pivot the stick outward from the vehicle, the direct connection of said bucket cylinder means to said boom being spaced from the connection of said stick to said boom a distance substantially equal to the distance between the connection of said bucket to said stick and the connection of said bucket cylinder means to said bucket tilt linkage.

4,074,821
OVERCENTER BACKHOE
Elton B. Long, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.
Continuation-in-part of Ser. No. 576,625, May 12, 1975, abandoned. This application Oct. 7, 1976, Ser. No. 730,598
Int. Cl.[2] E02F *3/32*
U.S. Cl. 214—138 R **6 Claims**



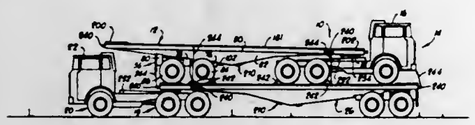
1. In a backhoe arrangement, a vertically extending elongated support attachment having a mounting portion thereon defining upper and lower horizontal pivot axes, an elongated boom comprising two transversely spaced rectangular hollow boom sections and having a sleeve extending therebetween at one end, said sleeve defining a rigid interconnection between said hollow boom sections, and being pivoted on said lower pivot axis through a neutral intermediate position wherein said boom sections extend substantially vertically so that said upper pivot axis is located in a space between said sections, a pair of aligned sleeves secured to respective boom sections intermediate opposite ends with a shaft extending through said sleeves, a double-acting boom cylinder assembly including a cylinder pivotally mounted on said upper pivot axis a piston rod pivoted on said shaft to extend in said space between said boom sections, said boom cylinder assembly being extendable and retractable to effect pivotal movement of said boom and said cylinder assembly on said lower pivot axis to either side of said neutral intermediate position, and a material handling unit having a portion received between said opposite ends with a bearing member defined in said portion, and shaft means received in said bearing means or rigidly interconnecting the opposite ends of said boom sections and pivotally mounting said material handling unit on said opposite ends of said boom section.

4,074,822

METHOD AND APPARATUS FOR TRANSPORTING ONE VEHICLE BY ANOTHER

Finis Lavell Chisum, Rte. 5, Woodcrest Heights, Claremore, Okla. 74017

Continuation-in-part of Ser. No. 336,869, Feb. 28, 1973. This application June 14, 1976, Ser. No. 695,374
Int. Cl.[2] B60P *3/00*
U.S. Cl. 214—152 **2 Claims**



1. A method for transporting one vehicle having an operator's cab and a load bed on another similar vehicle having an operator's cab and a load bed comprising the steps of:

shortening the wheel base of said one vehicle and simultaneously

raising the rear end of the load bed of said one vehicle; and

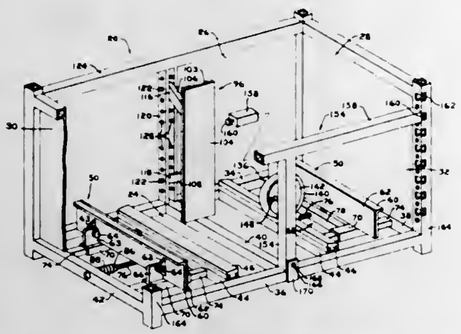
loading said one vehicle onto the load bed of the other vehicle with said one vehicle in a shortened wheel base status in which the wheels of said one vehicle rest upon the load bed of said other vehicle and the rear end of the load bed of said one vehicle extends over the operator's cab of said other vehicle.

4,074,823

FRONT RESTRAINT DEVICE FOR SHIPPING BINS

Walter E. Pater, New Kensington, and James R. Rowley, Freeport, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 639,727, Dec. 11, 1975, Pat. No. 4,010,848, which is a division of Ser. No. 488,851, July 15, 1974, Pat. No. 3,963,122. This application Oct. 22, 1976, Ser. No. 734,850
Int. Cl.[2] B65G *57/16;* **B65D** *85/48*
U.S. Cl. 214—152 **4 Claims**



1. In a method of containing sheets in a shipping rack of the type having a back wall secured to a base wherein the method includes the step of loading the sheets on the base tilted toward the back wall, the improvement comprising:

providing a rigid member having a threaded shaft operatively connected to biasing means;

securing the rigid member on the rack spaced from outermost loaded sheet;

rotating the shaft to move the shaft into engagement with the outermost sheet; while

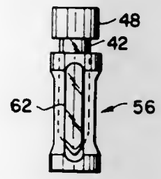
compressing the biasing means by way of the shaft as the shaft is rotated.

4,074,824

CONTAINER FOR STORAGE AND SHIPMENT OF CHEMICAL STANDARDS, RADIOACTIVE ISOTOPES AND THE LIKE

James Constantine Kontes, Vineland, N.J., assignor to Kontes Glass Company, Vineland, N.J.

Filed Dec. 3, 1975, Ser. No. 637,397
Int. Cl.[2] B65D *15/24*
U.S. Cl. 215—365 **9 Claims**



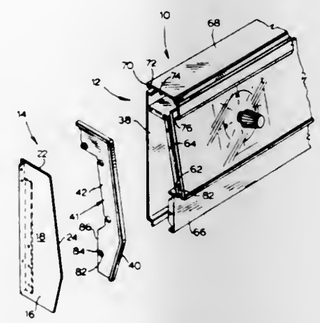
1. A composite container particularly suited for storage and shipment of chemical standards, radio-active materials in the nature of isotopes, and the like, comprising an inner thin walled hollow transparent glass vial having a smooth surfaced interior terminating in a significantly pointed interior bottom, said vial having a likewise pointed exterior bottom, the wall of said vial having a substantially uniform wall thickness throughout its length, an outer cover constituting a protective safety shield and vial holder, said vial being inserted in said outer cover and retained therein, said outer cover surrounding said inner vial and extending below the pointed bottom exterior of said vial, with said bottom exterior being thereby spaced upward from the bottom of said outer cover thereby providing protection for said pointed end and a means of standing said vial upright and providing support to the overall composite container in this position said outer cover having a plurality of longitudinally extended openings through the side wall thereof terminating short of the upper and lower ends thereof to permit visibility of contents in said inner vial, the lower end of at least one said opening extending below the pointed bottom exterior of said inner vial.

4,074,825

END CAP ASSEMBLY FOR AN APPLIANCE CONTROL PANEL

David G. Smith, Weston, Canada, assignor to GSW Limited/-Limitee, Toronto, Canada

Filed Nov. 16, 1976, Ser. No. 742,374
Int. Cl.[2] B65D *7/00, 7/42*
U.S. Cl. 220—4 R **6 Claims**



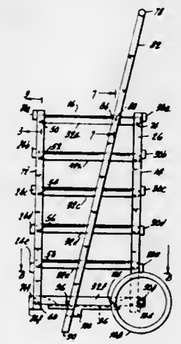
1. An end cap assembly for an appliance control panel assembly comprising a sheet metal end cap having attached thereto a molded plastic trim plate, said sheet metal end cap having an outer and inner surface and at least one edge, said trim plate having a broad planar portion overlying the inner surface of said sheet metal end cap adjacent to and along the length of said at least one edge, said trim plate being molded at its periphery with an overturned edge along the edge of the trim plate corresponding to the at least one edge of the sheet metal end cap to provide a channel adapted to receive and envelop said at least one edge and a plurality of spaced apart pins having enlarged head portions secured to the inner surface of said sheet metal end cap for holding said trim plate on said sheet metal end cap in a manner so as to position said at least one edge in said channel, said broad planar portion of the trim plate being provided with a plurality of apertures in register with said plurality of pins, the size of each aperture being slightly greater than the size of a corresponding pin head portion, the periphery of the apertures engaging the pin head portions to hold the at least one edge of said sheet metal end cap in said channel when said trim plate is attached.

4,074,826

COLLAPSIBLE CONTAINER

Dov Lewanoni, 1187 E. 8th St., Brooklyn, N.Y. 11230

Filed June 10, 1976, Ser. No. 694,899
Int. Cl.[2] B65D *7/24, 7/20*
U.S. Cl. 220—6 **4 Claims**



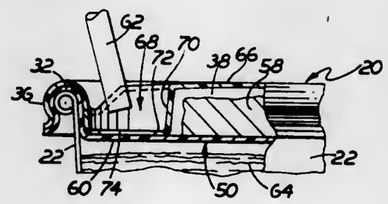
1. A collapsible container comprising a plurality of channel members, means for mounting said channel members, a plurality of interconnecting members of substantially convex construction, said channel members or said interconnecting members having pairs of aligned openings therein the other of said members having pairs of stub axles integrally formed therewith, said interconnecting members being compressible so that said stub axles are received within said pairs of aligned openings to pivotally interconnect said interconnecting members between two opposed channel members.

4,074,827

MULTI-PURPOSE CLOSURE FOR CONTAINERS

Jacob Labe, III, 421 Ashbourne Road, Elkins Park, Pa. 19117

Filed Aug. 31, 1976, Ser. No. 719,303
Int. Cl.[2] B65D *77/20*
U.S. Cl. 220—23 **2 Claims**



1. A closure for a container, said container having a flanged mouth, said closure comprising a base member and a cover member releasably secured together for repeatable releasable securement as a unit on the mouth of said container, said base member having a central portion and a peripheral flange, said flange being configured to snap-fit over the flanged mouth of the container, said cover member having a central portion and a recessed peripheral flanged portion for receipt of the peripheral flange of the base member, said cover member being disposed over said base member with the central portions of said members being spaced apart and defining a cavity therebetween for receipt of an article, the releasable securement of said cover member and base member being effected by the receipt of the peripheral flange of the base member within the recessed flanged portion of the cover member, said cover member being replaceably removable from said base member to provide ready access to said cavity without removing the base member from said container, said closure including means enabling a straw to be extended therethrough and into said container, said means comprises an opening in said cover member and an aligned opening in said base member, through which aligned openings the straw can be inserted into the container when said cover member and base member are connected together, said opening in said base member comprising a cross-cut slit and wherein the opening in said cover member is a circular hole and wherein the central portion of the cover member contiguous with said hole is in the form of a disc-like depression including a flanged portion abutting the central portion of the base member contiguous with said slit.--

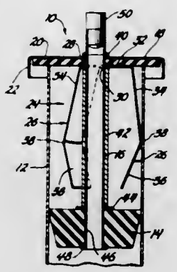
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4,074,828

SEALING PLUG ASSEMBLY

Walter E. Haines, Bloomfield Hills, and Mason E. Richardson, Warren, both of Mich., assignors to Estan Manufacturing Company, Troy, Mich.

Filed Dec. 16, 1976, Ser. No. 751,012
Int. Cl.[2] B65D *43/08, 51/18;* **F16L** *55/10*
U.S. Cl. 220—254 **8 Claims**



1. A sealing plug assembly for closing and sealing a cylindrical tubular member comprising: a frustum-shaped sealing plug, a support member supporting said sealing plug for complete insertion into the tubular member, a cap member supported by said support member for closing the end of the tubular member and for limiting the amount of travel of said sealing plug into the tubular member, said cap member being spaced apart from said sealing plug, and locating means for squarely locating said sealing plug in said tubular member to maintain the desired orientation of said sealing plug in said tubular member by resisting lateral movement of said support member, said locating means including a plurality of spring arms supported by said support member between said sealing plug and said cap member for engaging the walls of the tubular member.

4,074,829

VENDING MACHINE HAVING EJECTOR ASSIST MEMBER

Gerry A. Lee, Des Moines, Iowa, assignor to Fawn Engineering Corporation, Des Moines, Iowa

Filed Oct. 4, 1976, Ser. No. 729,189
Int. Cl.[2] B65G *59/06*
U.S. Cl. 221—238 **13 Claims**



1. A vending apparatus comprising:
a frame; a platform connected to said frame; means for holding a plurality of items to be dispensed, said holding means being connected to said frame and disposed above said platform; a discharge opening disposed rearwardly of said platform; a pull rod slidably disposed below said platform and having a first position and a second position; means pivotally attached to said pull rod for selectively ejecting one of said items from said holding means, said ejector means having a first pivotal position for passing under said items and a second pivotal position for engaging one of said items thereby causing the said one item to be moved from the holding means; the improvement comprising:
a base member attached to said platform;
an ejector assist member reciprocally attached to said base member and movable between a first position and a second position;
biasing means for biasing said ejector assist member to said first position thereof;
locking means for selectively holding said ejector assist member in said second position thereof;
means for moving said ejector assist member from the first to the second position thereof when said pull rod is moved from the first to the second position thereof;
means for releasing said locking means when said pull rod is moved from the second to the first position thereof; and
means attached to said ejector assist member for engaging and following said item being dispensed when said locking means is released and said ejector assist member is moving from the second to the first position thereof and for holding the rear end of the next item to be dispensed upwardly with respect to the front end thereof to prevent more than one item from being dispensed at one time.

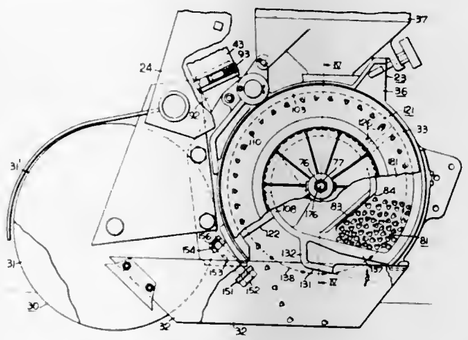
4,074,830

COMPRESSED AIR SEED PLANTER

Charles E. Adams, Mill Creek; Harold E. Quackenbush, La Porte; Paul H. Harrer, La Porte; Le Roy Langford, La Porte, all of Ind., and Alvin L. Cleek, Wauwatosa, Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sept. 23, 1974, Ser. No. 508,672
Int. Cl.[2] A01C *7/04*
U.S. Cl. 221—266 **1 Claim**

1. An air planter unit comprising.
a housing having
a seed receiving cavity,
a first flat axial facing arcuate sealing surface,
a second flat axially facing sealing surface extending from one circumferential end of said first sealing surface radially inwardly, said sealing surfaces at least partially circumscribing said cavity,
a seed passageway connected at one end to said cavity and adapted at its other end for connection to a seed hopper,
an air passageway connected at one end to said cavity and adapted at its other end for connection to a source of pressurized air, and
an open seed drop portion at its lower end,
a vertically disposed seed planting disc rotatably mounted on said planter unit on a horizontal transverse axis in substantially concentric relation to said first sealing surface and having
a substantially flat annular sealing surface on one axial side of said disc in sealing engagement with said sealing surfaces on said housing whereby said disc is disposed in enclosing relation to said cavity,
a plurality of circumferentially spaced seed receiving pockets formed in said one axial side, said pockets being



disposed on the radially inner side of said first sealing surface on said housing and said second sealing surface on said housing extending radially inwardly to a point at the radially inner side of said pockets, and
wall means defining a small axial opening through the bottom of each of said pockets permitting escape of air from said cavity, said pockets and openings being proportioned to hold seed in said pockets under influence of pressurized air in said cavity, said pockets being out of communication with said cavity as the rotating disc brings them to said seed drop portion of said housing whereby said seed in each pocket is free to fall to the soil by gravity as said disc is rotated to bring the pockets into said drop portion, and
a resilient sealing pad in sealing engagement with said disc disposed between the radially inner end of said second sealing surface and said first sealing surface near the other circumferential end of the latter.

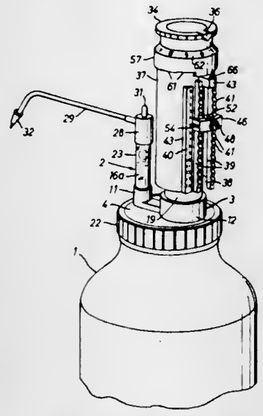
4,074,831

LIQUID METERING DEVICE WITH ADJUSTABLE STOPS

William John Roach, 12933 Lakeshore North, Auburn, Calif. 95603

Filed Feb. 12, 1976, Ser. No. 657,544
Int. Cl.[2] G01F *11/06*
U.S. Cl. 222—43 **13 Claims**

1. Dispensing apparatus for releasable attachment to the mouth of a liquid reservoir comprising a housing defining an inlet aperture, an outlet aperture and a proportioning aperture, said apertures being in communication with one another within said housing, means for securing said housing to said reservoir so that said inlet aperture is directed into said reservoir mouth and said outlet and proportioning apertures are directed away from said reservoir mouth, a non-return inlet valve connected to said inlet aperture, a non-return delivery valve connected to said outlet aperture and syringe means in communication with said proportioning aperture, wherein said syringe means comprise an open-ended stationary barrel connected to said housing over said proportioning aperture, a plunger displaceable in said barrel to draw liquid past said inlet valve through said inlet aperture and through said proportioning aperture into said barrel on a forward stroke and to discharge said liquid through said proportioning aperture and through said outlet aperture past said delivery valve on a return stroke, and con-



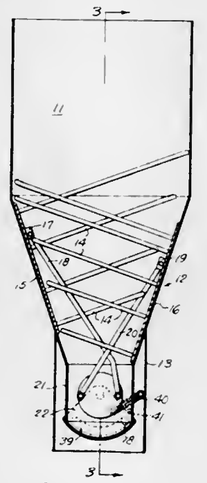
trol means for limiting displacement of said plunger, said control means comprising co-operating abutments associated with said plunger and barrel, wherein said abutments comprise two adjustable abutments, means for adjusting one of said adjustable abutments to change the length of stroke of the plunger in discrete steps for providing a coarse setting, and means for adjusting the other of said adjustable abutments to change the length of stroke of the plunger in discrete finer steps for providing a fine setting.

4,074,832

FOOD DISPENSER HAVING DOOR ACTUATED AGITATORS

John J. McCarthy, 10540 Dolecetto Drive, Rancho Cordova, Calif. 95670

Filed Sept. 14, 1976, Ser. No. 723,177
Int. Cl.[2] B67D *3/00*; G01F *13/00*
U.S. Cl. 222—245 **7 Claims**



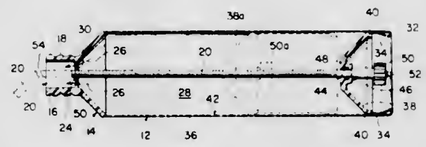
1. A dry food dispenser which assures that the food has a substantially uniform consistancy comprising, a storage hopper, a mixer section connected to said storage hopper, and a discharge chamber remote from said storage hopper but connected to said mixer section, said discharge chamber including a swingable door remote from said mixing section which allows the food to be dispensed when opened, said swingable door being pivotally mounted on said discharge chamber through axles, said axles being further connected to a pair of discs disposed within said discharge chamber so that when said swingable door is rotated, said discs also rotate, a pair of shafts interconnecting said discs disposed diametrically opposite to each other so that when said discs rotate said shafts translate in an opposite vertical sence, and means disposed on said shafts to agitate the dry food within said mixer section to assure that the dry food will have a uniform consistancy and is not clotted.

4,074,833

DISPENSING CONTAINER

Joseph H. Otto, Sr., 3934 Alabama Ave. S., St. Louis Park, Minn. 55416

Filed Aug. 24, 1976, Ser. No. 717,160
Int. Cl.[2] G01F *11/00*
U.S. Cl. 222—390 **4 Claims**



1. A dispensing container comprising a hollow cylindrical body portion having a first and second end, a closable dispensing opening disposed at the first end of the cylindrical body portion, a cylindrical plate disposed within the cylindrical body portion having marginal edges disposed in slidable touching engagement with the interior surface of the cylindrical body portion, the inner edges of the cylindrical body portion at the second end disposed and folded inwardly of the cylindrical body portion and fixedly secured to the marginal edges of the plate, a rod having a threaded portion threadedly engaging the first end of the cylindrical body portion, sealing means sealing an unthreaded portion of the rod passing through an opening in the plate, portions of the rod being exposed upon passing through the dispensing opening when the plate is urged towards the dispensing opening, and a knob fixedly secured to the end of the rod externally of the cylindrical plate.

4,074,834

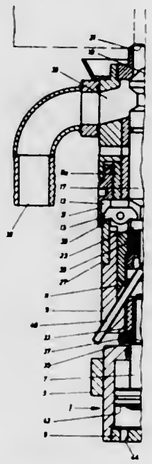
CASTING HEAD WITH TOGGLE LEVER ACTUATED VALVE

Alois Joseph Suter, Im Holeeletten 29, Basel, Switzerland

Filed Sept. 29, 1976, Ser. No. 727,847
Claims priority, application Switzerland, Sept. 29, 1975, 12579/75
Int. Cl.[2] B29F *1/03*
U.S. Cl. 222—504 **9 Claims**

1. A casting head for cooperation with a mold in which hardenable synthetic resins can be cast under a high temperature, the mold having an inlet for the resins, the head comprising: a stationary part (1) and a part (2) movable with respect to said stationary part; at least one hydraulic cylinder (4, 5, 6) in said stationary part to change the relative position of a portion of said movable part with respect to said stationary part, between a closed rest position and a casting position, said cylinder having a double-acting piston rod (7) connected with said movable part; a housing in said movable part with bottom (9) and top (10) parts; said top housing part having therein an opening passage (19) for the resins, that leads toward the inlet of the mold, and an outlet opening (21) for the resins, which latter opening can be brought into close contact with the inlet of the mold; at least one toggle lever (14, 15) movably jour-

naled within and pivotable in said bottom housing part; a lengthwise movable closure rod (17) in said movable part; a closure head (18) carried by the outer end of said closure rod, acting on said opening passage which is open in the casting



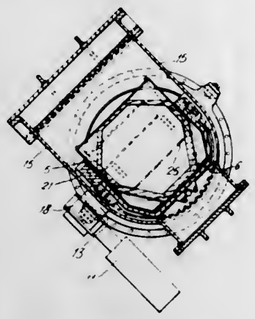
position and leads to said outlet opening; and spring means (25) for biasing said closure rod and said closure head for closing said opening passage when the pressure applied to said cylinder has been released.

4,074,835

FURNACE CHARGER WITH DISCHARGE CHANNEL HAVING APPROXIMATE OVAL CROSS-SECTION

Edouard Legille, Luxembourg, and Rene N. Mahr, Howald-Hesperange, both of Luxembourg, assignors to S.A. des Anciens Etablissements Paul Wurth, Luxembourg, Luxembourg

Filed Mar. 6, 1973, Ser. No. 339,296
Claims priority, application Luxembourg, Mar. 6, 1972, 64909
Int. Cl.[2] F27B *11/12*; B65D *87/28*
U.S. Cl. 222—558 **9 Claims**



1. In apparatus for use in the charging of a furnace, the charging apparatus including a storage hopper from which materials will be released for delivery into the furnace, the improvement comprising:

discharge channel defining means, said channel defining means including a plurality of straight wall portions, said straight wall portions cooperating to form a tubular element having a longitudinal axis and being open at its opposite ends, said tubular element having a cross-sectional shape when viewed along said longitudinal axis which approximates an oval, said approximately oval cross-section having a major axis and a transverse minor axis, said channel defining means being connected at a first upstream end to the storage hopper;

a movable throttle valve member juxtapositioned to the second downstream end of said channel defining means, said valve member having a leading edge portion and being supported for movement of said leading edge portion along a path transverse to a plane including the longitudinal axis of said tubular element and extending through the major axis of said approximately oval shaped tubular element whereby said valve member will cooperate with the second end of said channel defining means to form an adjustable discharge opening to vary the flow rate through said channel defining means, said discharge channel flow rate being variable about a valve member position intermediate the full open and full closed positions and directly with the size of said discharge opening and as a function of composition and average grain size of the material flowing through the channel, there being a different valve position required to obtain a preselected average flow rate for different combinations of material composition and average grain size;

means for delivering material passed by said throttle valve member to the interior of the furnace;

substantially hermetic casing means at least in part surrounding said discharge channel defining means and said throttle valve member;

sealing valve means positioned within said hermetic casing means intermediate said throttle valve and said means for delivering material into the furnace, said sealing valve means cooperating with said casing means to permit said throttle valve member and the intermediate storage hopper to be isolated from the conditions existing within the furnace;

actuator means; and

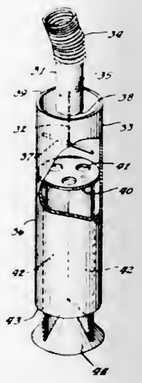
means coupling said actuator means to said throttle valve member to cause the repositioning of said valve member leading edge portion to vary the discharge opening defined by the second end of said channel defining means tubular element and said valve member.

4,074,836

APPARATUS FOR DISTRIBUTING SOLID PARTICLES INTO A VERTICAL VESSEL

Karl A. Muller, Jr., Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sept. 22, 1976, Ser. No. 725,518
Int. Cl.[2] B67D *3/00*
U.S. Cl. 222—564 **4 Claims**



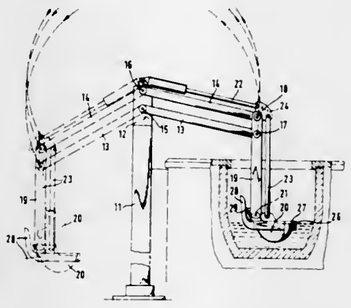
1. In an improved apparatus for distributing solid particles into a vertical vessel when said solid particles are being loaded into said vessel, which apparatus comprises a distributing means for distributing said solid particles into said vertical vessel, said distributing means having an inlet for said solid particles at its top, the improvement which comprises a particle entry duct having an inlet end at its top and an outlet end at its bottom and a flexible connecting means for connecting said particle entry duct to said distributing means, the top of said connecting means being attached to said particle entry duct at a point along the axis of said particle entry duct and the bottom of said connecting means being attached to the distributing means at a point where the center of gravity of the distributing means is located in a manner such that the periphery of the bottom of said particle entry duct is positioned within the periphery of the top of said distributing means, the length of said connecting means being such that the bottom of said particle entry duct is on the same level or below the top of said distributing means.

4,074,837

AUTOMATICALLY OPERATING CASTING LADLE APPARATUS

Werner Engel, Ringstrasse 13, 3502 Vellmar 2, Germany

Filed Dec. 15, 1976, Ser. No. 750,930
Claims priority, application Germany, Dec. 15, 1975, 2556447
Int. Cl.[2] B22D *39/00*
U.S. Cl. 222—629 **10 Claims**



1. In an automatically operating casting ladle apparatus for the delivery of a measured quantity of molten metal to a die-casting machine, mold or the like, and comprising:

a fixed frame,

at least one swivel arm pivotably mounted at one end to said fixed frame,

a supporting arm pivotably mounted at one end to the other end of said at least one swivel arm,

a casting ladle mounted to the other end of said supporting arm,

auxiliary means for keeping said casting ladle in a constant vertical position during swiveling movements of the swivel arm, and

a control linkage mechanism for tilting the ladle,

the improvement wherein:

said at least one swivel arm comprises two parallel, equal length lever arms, each lever arm being pivotably connected at one end to said fixed frame and extending in spaced parallel position with respect to each other and each being pivoted at their other end to said supporting arm,

a drive cylinder disposed in the vicinity of said fixed frame, and

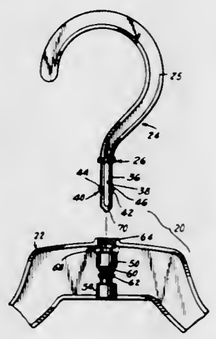
said control linkage mechanism comprises a pair of control members, one of said control members lying parallel to said lever arms, being operatively connected at one end to a drive cylinder and being operatively connected at its opposite end to one end of the second control member and extending parallel to the supporting arm for said ladle and being operatively coupled at its end remote from said first control member, to said casting ladle.

4,074,838

GARMENT HANGER CONSTRUCTION

William Blasnik, Demarest, N.J., and David Halpert, Melville, N.Y., assignors to Lerner Manufacturing, Inc., Melville, N.Y.

Filed Mar. 11, 1977, Ser. No. 777,238
Int. Cl.[2] A47J *51/098*
U.S. Cl. 223—85 **12 Claims**



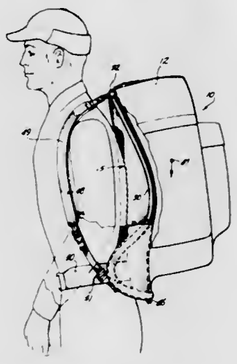
1. A garment hanger construction comprising a hook member, said hook member having an elongated shaft supporting a first operative locking means and a first operative swivel means, and a hanger body including receiving means for receiving said shaft, said receiving means including second operative locking means constructed and arranged to cooperatively define a first locked position with said first operative locking means disposed on said shaft and further including second operative swivel means for cooperatively defining a second swivel position with said first operative swivel means disposed on said shaft for permitting said hook member to freely rotate at said second swivel position and for preventing said hook member from being longitudinally displaced as it is freely rotated at said second swivel position, said shaft being coordinately displaceable in said receiving means along the lengthwise extent thereof between said first locked position and said second swivel position.

4,074,839

INTERNAL FRAME BACKPACK

Thomas E. Wood, and Calvin T. Wood, both of 3863 42nd NE., Seattle, Wash. 98105

Filed May 10, 1976, Ser. No. 684,566
Int. Cl.[2] A45F *3/08*
U.S. Cl. 224—8 R **9 Claims**



1. An internal frame backpack including:

a sack having a compartment for holding goods to be carried;

an envelope of substantially fixed length disposed on the front of said sack, the peripheral edges thereof being closed, said envelope including a tensioned front wall positionable against the back of a wearer and a second rear wall spaced rearward of and fixedly joined along its entire peripheral edge to said first front wall;

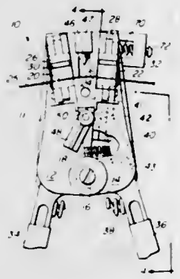
tubular internal frame means positioned within said closed envelope under compression, said internal frame means being longitudinally resilient and including a curved portion adapted to contact the rear wall of said envelope and being formed between spaced end portions, said end portions making contact, substantially along their entire length with the longitudinally opposed closed peripheral edges of said envelope whereby said internal frame means cooperates with said peripheral edges to tension the front wall of said envelope to maintain said front wall spaced forward of said rear wall and tending to bias said front wall against deflection by contact with the back of the wearer.

4,074,840

HAND-HELD TOOL FOR OPTICAL FIBER WAVEGUIDE END PREPARATION

John E. Fulenwider, Concord; Carl Belmonte, Somerville, and Mark L. Dakss, Sudbury, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Mar. 18, 1977, Ser. No. 778,885
Int. Cl.² B26F *3/00*
U.S. Cl. 225—96.5 **4 Claims**



1. A hand-held tool for the preparation of optical fiber waveguide ends comprising:

a pair of jaw members coupled for separating rotational movement about a pivot axis;

means for biasing the jaw members in a comparatively unseparated position;

first and second fiber-supporting surfaces respectively located on a different one of the jaw members for receiving and supporting an optical fiber waveguide generally circumferentially about the pivot axis;

a third fiber-supporting surface interjacent the first and second surfaces and generally aligned therewith;

a pair of spaced-apart handle members adapted for movement by a squeezing human hand;

fiber clamping means responsive to the movement of the handle members for exerting a waveguide-securing force against the fiber supporting surfaces and for exerting a jaw member-separating force in response to further movement of the handle members, thereby inducing a tensile stress along the waveguide; and

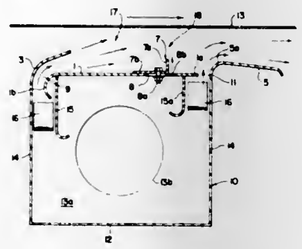
a descendable cutting blade manually releasable from a position above the third fiber-supporting surface for contacting the portion of the fiber waveguide thereon to produce a microcrack in the waveguide periphery, whereby the induced tensile stress in the waveguide coupled with the circumferential support thereof causes a diametric propagation of the crack across the waveguide to produce an appropriately prepared fiber end.

4,074,841

METHOD AND APPARATUS FOR FLOATATION CONVEYANCE OF STRIP MATERIALS

Carl Kramer, Am Chorusberg 8, Aachen; Heinrich Stein, Roermonder Str. 138b, Aachen-Laurensberg, and Hans Joachim Gerhardt, Ruhrstr. 12, Loevenich, all of Germany

Filed Dec. 9, 1976, Ser. No. 749,109
Claims priority, application Germany, Dec. 15, 1975, 2556442
Int. Cl.² B65H *17/32*
U.S. Cl. 226—97 **3 Claims**



1. In apparatus for jet floatation conveyance of strip materials, the improvement in floatation means comprising: a plenum adapted to receive a pressurized gas therein; said plenum having a pair of spaced apart side members; a top flat member spaced intermediate said side members and spaced apart therefrom to define a pair of nozzles therebetween; one edge of said top member being curved downwardly; the top edge of the side member adjacent said top member curved edge extending upwardly and curved inwardly to project over said top member at an acute angle thereto to define an aperture parallel to and greater than the width of the adjacent nozzle; a spoiler exterior of said plenum between said nozzles; the top edge of the other of said side members being curved outwardly away from said top plate and then extending to form an acute angle with said other side portion, and a pair of plates secured to the underside of said top member and projecting downwardly therefrom and parallel to said nozzles; the bottom edges of said plates being curved inwardly.

4,074,842

DEVICE FOR INSERTING NAIL-LIKE FASTENERS AT DIFFICULTLY ACCESSIBLE POINTS

Jean Ollivier, 89 avenue des Beaumes, and Marc Combette, 116 rue des Moulins, both of Valence, France (26000)

Filed Dec. 10, 1976, Ser. No. 749,580
Claims priority, application France, Dec. 9, 1975, 75 37630
Int. Cl.² B25C *1/14*
U.S. Cl. 227—8 **5 Claims**

1. A power-actuated fastener-driving tool comprising:

(a) a barrel assembly having a muzzle end adapted to receive a fastener to be driven into a supporting surface;

(b) a casing member connected to said barrel assembly;

(c) firing pin means mounted in said casing member for percussive firing of a power charge chambered in the tool, said firing pin means being movable between a cocked position and a fired position;

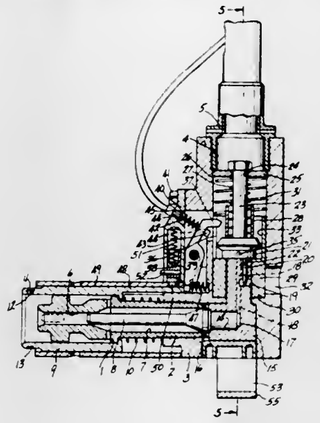
(d) first spring means engaging said firing pin means to bias the latter toward said fired position;

(e) an elongated extension member connected to said casing member and extending in a direction substantially perpendicular to the axis of said barrel member to facilitate positioning of the tool in difficultly accessible places;

(f) an operating member mounted on said casing member and projecting externally therefrom in a direction diametrically opposite from said extension member, said operating member being reciprocably movable, with respect to said casing member, through a cocking stroke and return upon successive application and release of pressure to a free end of said operating member;

(g) second spring means operably connected to said operating member for biasing the latter through said return stroke;

(h) said operating member being operably connected to said firing pin means for causing movement of the latter to said cocked position upon movement of said operating member through said cocking stroke;



(i) first sear means releasably engaging said firing pin means to hold the latter in said cocked position; and

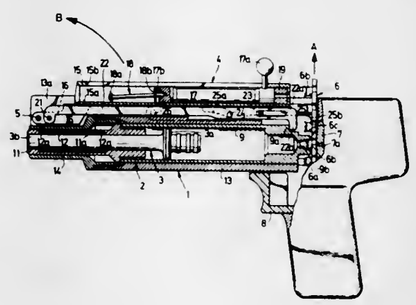
(j) actuating means connected to said first sear means and mounted on said extension member for manual operation thereof, whereupon said actuating means is operable to disengage said first sear means from said firing pin means.

4,074,843

FASTENING ELEMENT FEEDING DEVICE FOR AN EXPLOSIVE POWDER DRIVEN SETTING GUN

Helmut Oesterle, Nofels, Austria, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Dec. 20, 1976, Ser. No. 752,096
Claims priority, application Germany, Dec. 22, 1975, 2557847
Int. Cl.² B25C *1/14*
U.S. Cl. 227—8 **14 Claims**



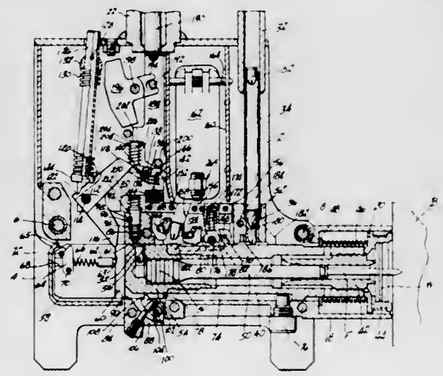
1. An explosive powder driven setting gun for driving fastening elements having a pointed end and an oppositely directed head end, such as nails and the like, into a hard receiving material, including a gun housing, an axially extending barrel mounted in said housing, said barrel having a muzzle end from which the fastening elements are driven into the receiving material and a rearward end, and a feeding device for supplying fastening elements into the barrel, said feeding device being pivotally mounted on said housing, wherein the improvement comprises that said feeding device is pivotally displaceable between a first position for inserting fastening elements into the feeding device and a second position for inserting fastening elements from the feeding device through the muzzle end of the barrel into the barrel, said feeding device including a tubular member having an open end through which fastening elements can be inserted into the tubular member and displaced from the tubular member, and an ejector in said tubular member for displacing a fastening element from the tubular member into the barrel.

4,074,844

GRAVITY FEED HOT TOP TOOL

Elmer Raleigh Hodil, Jr., Branford, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Jan. 17, 1977, Ser. No. 760,059
Int. Cl.² B25C *1/14*
U.S. Cl. 227—8 **18 Claims**



1. A powder-actuated tool comprising:

a. a housing;

b. a barrel assembly mounted in said housing for reciprocal sliding movement with respect to said housing from a rearwardmost battery position to a forward loading position and return;

c. means forming a firing chamber in said barrel assembly, said firing chamber having a substantially vertical axis;

d. means carried by said housing forming a substantially vertical passage adapted to receive and hold a stack of a plurality of cartridges disposed end to end in said passage, said passage being positioned forward of said firing chamber when said barrel assembly is in its battery position; and

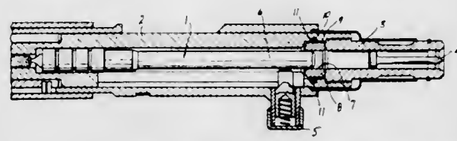
e. stop means on said housing for stopping forward movement of said barrel assembly to align said firing chamber and said passage to enable a cartridge to drop by gravity from said gravity into said firing chamber when said barrel assembly is in said loading position.

4,074,845

DEVICE FOR MAINTAINING IN POSITION THE PISTON OF A FASTENER TOOL

Marc Combette, 116 Rue des Moulins, and Jean Ollivier, 89 Ave. des Beaumes, both of Valence (Drome), France

Filed Sept. 16, 1976, Ser. No. 723,846
Claims priority, application France, Sept. 16, 1975, 75 28401
Int. Cl.² B25C *1/18*
U.S. Cl. 227—10 **5 Claims**



1. A device for releasably maintaining the position of a piston in a power-actuated fastener tool, said device comprising means forming a ring in a barrel of the tool, said ring

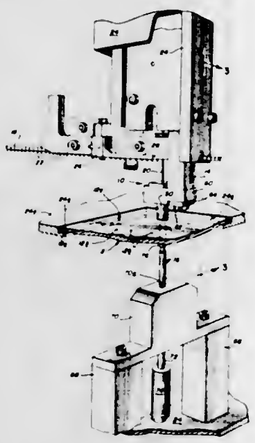
having a bore through which a forward end of said piston continuously extends, the axis of said bore being off-center with respect to the axis of said barrel, and said piston and said barrel being substantially coaxial, and resilient means sandwiched between an outer surface on said ring and an inner wall of said barrel, said resilient means being compressed by reason of said piston extending through said ring bore to cause said ring to exert a frictional retaining force on said piston.

4,074,846

FLOATING EYELET INSERTING TOOL

Alto Stoiber, Elgin, Ill., assignor to Hammond Corporation, Chicago, Ill.

Filed Dec. 24, 1975, Ser. No. 644,297
Int. Cl.² B21J *15/10*
U.S. Cl. 227—51 **7 Claims**



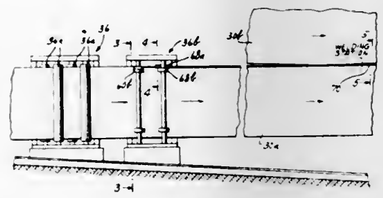
1. Apparatus for inserting and staking rivets in a flexible sheet having at least one rivet receiving opening comprising: a chassis; reciprocable punch means movable relative to said chassis for inserting one of said rivets into said opening in said flexible sheet; anvil means reciprocably mounted on said chassis opposite said punch means and in axial alignment therewith for staking said inserted rivet; means mounted on said chassis for supporting said sheet between said punch means and said anvil means; first holding means, suspended upon said punch means and operable to move bidirectionally relative thereto, for supporting said sheet in the area adjacent said opening; resilient members connected to said punch means and said first holding means for regulating bidirectional movement of said first holding means relative to said punch means; second holding means yieldably extending from and coaxially mounted upon said anvil means for supporting said sheet in the area adjacent said opening; said first and second holding means being axially aligned and engageable with said sheet; a support plane defined as a plane perpendicular to the direction of movement of said punch means and disposed between said punch and anvil means; and said first and second holding means accommodating variations in the position of said flexible sheet in the area adjacent said opening such as variations due to warpage of the flexible sheet relative to said support plane by clamping about said rivet receiving opening in said sheet during insertion and staking of said rivet.

4,074,847

WELDED STORAGE TANK CONSTRUCTION INCLUDING A STRUCTURAL FIN

Myron L. McFatter, League City, Tex., assignor to Anchortank, Inc., Seabrook, Tex.

Filed Sept. 20, 1976, Ser. No. 725,114
Int. Cl.² B23K *31/02*
U.S. Cl. 228—145 **4 Claims**



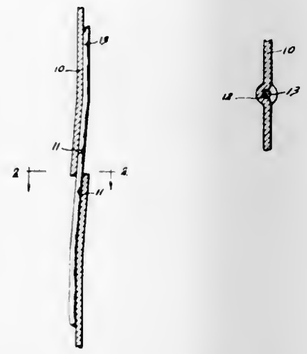
1. In a method of producing a large diameter storage tank from strip metal, comprising feeding the strip metal to a support assembly arranged circularly on a base and which supports the strip vertically in a helical path, the improvement comprising bending only the upper edge of the strip fed to the support assembly into substantially a right-angled bend, aligning said bent upper edge with the unbent lower edge of the helical turn immediately thereabove, and welding together said two aligned edges.

4,074,848

METHOD OF SEALING

Edward F. Groh, Naperville, Ill., and Dale A. Cassidy, Valapariso, Ind., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 27, 1977, Ser. No. 763,167
Int. Cl.² B23K *1/00*
U.S. Cl. 228—173 C **2 Claims**



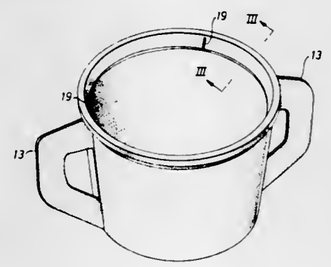
1. A method of penetrating thin sheet metal with a thermocouple lead and sealing the thermocouple lead into the sheet metal comprising drawing complementary longitudinally angled, laterally rounded grooves terminating at their base ends in a common plane in both sides of the thin material with shearing occuring in the plane of the base ends to form a round opening substantially perpendicular to the plane of the sheet metal, passing a thermocouple lead through this opening and sealing the opening with silver solder which simultaneously bonds the thermocouple lead to the sheet metal.

4,074,849

BLANK FOR FORMING A RECEPTACLE HAVING OPPOSITE HANDLES

Sven Davidsson; Nils Bertil Christensson, and Per Hugo Axelsson, all of Lund, Sweden, assignors to AB Akerlund & Rausing, Lund, Sweden

Filed Feb. 11, 1977, Ser. No. 767,818
Claims priority, application Sweden, Apr. 21, 1976, 7604564
Int. Cl.² B65D *3/06, 5/46*
U.S. Cl. 229—1.5 B **9 Claims**



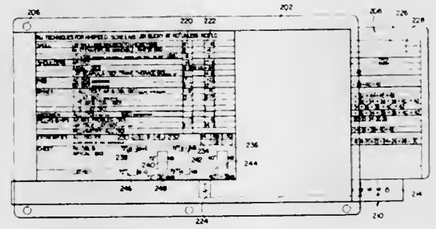
1. A blank for forming a receptacle comprising:
a substantially circular bottom member,
a pair of side members each connected to portions of said bottom member, such that when said blank is formed into a receptacle, said bottom member forms the bottom wall of said receptacle, and said side members cooperate to form the sidewall of said receptacle, and
each of said side members including on only one end thereof one extension member, said extension members being formed on opposite ends of said respective side members such that they cooperate to form diametrically opposed handle means on the sidewall of said formed receptacle.

4,074,850

X-RAY COMPUTER

Brice L. Kratzer, 4203 E. Jackson, Elkhart, Ind. 46514

Filed Feb. 12, 1974, Ser. No. 441,870
Int. Cl.² G06G *1/00*
U.S. Cl. 235—89 R **9 Claims**



1. A manually operable computer for determining a set of exposure settings of an X-ray machine, comprising:
a base member, a first scale member, a second scale member and means for supporting said members for movement relative to each other;
said base member having thereon
(a) a body chart including identifying indicia for at least one body part of a subject to be X-rayed, said indicia including indexing means, and
(b) a correction factor index in predetermined fixed relation to said indexing means;
said first scale member having thereon
(a) a thickness chart including at least one thickness scale having values representing a plurality of thicknesses of said one body part, each of said values being registrable with said indexing means and
(b) a current and time chart in predetermined fixed relation to said thickness chart including at least one current and time scale having values representing current and time exposure settings; and
said second scale member having thereon,
(a) a voltage scale in parallel relation with said current and time scale having values representing voltage exposure settings, each of said current and time scale values and said voltage scale values being disposed on said first and second members, respectively, such that for any setting of said first and second members said current and time values and said voltage values will be in juxtaposed relation to form sets of exposure settings, and
(b) a correction factor scale in predetermined fixed relation to said voltage scale having values indicative of X-ray exposure correction factors
whereby upon registration of the body part indexing means with the thickness value of the body part to be X-rayed and upon registration of the correction factor index with the appropriate correction factor value, the first and second members will be set relative to the base member thereby setting the voltage scale relative to the current and time scale whereupon the sets of exposure settings will be formed each of which will produce substantially constant density radiographs of the body part X-rayed.

4,074,851

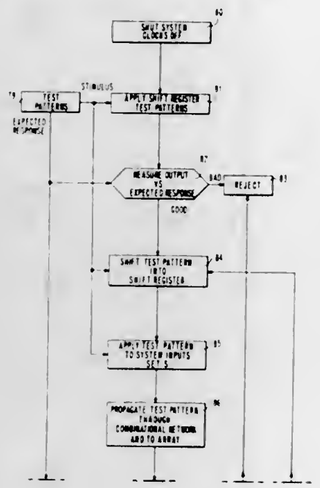
METHOD OF LEVEL SENSITIVE TESTING A FUNCTIONAL LOGIC SYSTEM WITH EMBEDDED ARRAY

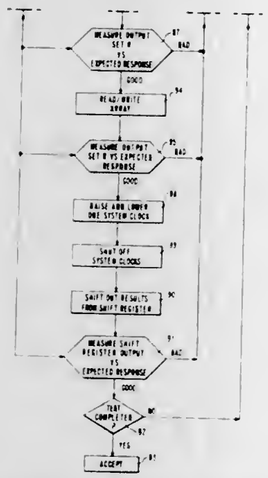
Edward Baxter Eichelberger, Purdy Station, N.Y.; Eugen Igor Muehldorf, Potomac, Md.; Ronald Gene Walther, Vestel, N.Y., and Thomas Walter Williams, Longmont, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1976, Ser. No. 701,054
Int. Cl.² G06F *11/00*
U.S. Cl. 235—302 **26 Claims**

1. A method of level sensitive testing a single sided delay dependent embedded array logic unit, said unit including combinational network circuit means having primary input terminals and primary output terminals, said combinational network circuit means including at least a first combinational network and a second combinational network, means including array circuit means interconnecting said first and second combinational networks and sequential circuit means interconnected with said combinational circuit means said sequential circuit means having access for scanning data into said sequential circuit means independent of said primary input terminals and primary output terminals, said method including the steps of:
(a) scanning in a test pattern, via said scanning access into said sequential circuit means;
(b) applying the same test pattern, via said primary input terminals, to the combinational network circuit means to

provide a primary output at said primary output terminals; and





(c) comparing said primary output with a known expected response for an indication as to the merit or lack of merit of the unit.

4,074,852

SYMBOL DECODING METHOD AND MEANS

Robert D. Wescott, and John B. Christie, both of Ithaca, N.Y., assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 6, 1976, Ser. No. 748,252
Int. Cl.[2] G06K *7/10;* **G08C** *9/06*
U.S. Cl. 235—463 **32 Claims**

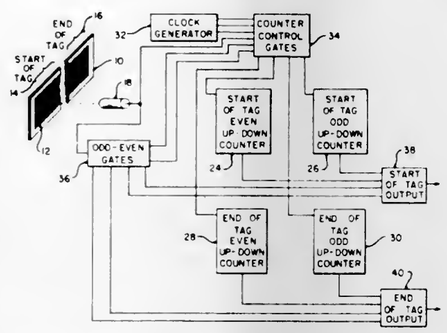
1. Symbol decoding means comprising

scanning means for scanning a surface upon which coded data has been placed and generating a signal representative of the information scanned;

means for generating a plurality of clock signals of different frequencies with the relationship of the frequencies based upon the relationship of a plurality of components of a code symbol to be identified;

counting means; and

means for applying the various frequencies to the counting means in accordance with the relationship of the different components of a symbol being scanned;



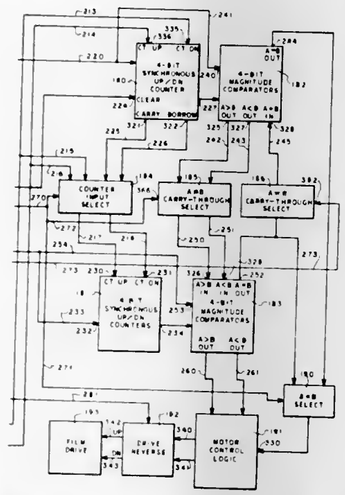
whereby the condition of the counting means at the end of a scan of data provides an indication of whether or not the data scanned is the symbol.

4,074,853

DUAL FUNCTION PROBE

John R. Flint, Barrington, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Nov. 3, 1976, Ser. No. 738,421
Int. Cl.[2] G06K *13/26, 19/06;* **G03B** *23/12*
U.S. Cl. 235—477 **9 Claims**



1. In an information retrieval system of the type which automatically locates preselected information bearing elements for inspection wherein the system includes drive means for driving the elements in first and second directions, wherein the information bearing elements are consecutively numbered for identification and comprise a first set of elements having increasing identification number when driven in the first direction and a second set of elements having increasing identification numbers when driven in the second direction, wherein each element is associated with a corresponding identifiable marker with the markers associated with the first set of elements comprising a first set of markers and the markers associated with the second set of elements being spaced from the first set of markers and comprising a second set of markers, and wherein the system includes a counting means for counting the elements for maintaining the location of the elements as the elements are driven, the improvement of a marker sensing system for sensing the first and second sets of markers and for properly controlling the drive means and the counting means comprising:

a marker sensor for sensing the first and second sets of markers and for providing up counting pulses and down counting pulses as the elements are driven;

a marker sensor detector for detecting which set of markers is being sensed; and

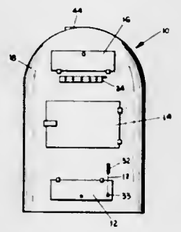
first interface means coupled to said detector and selectively coupling said marker sensor to the counting means responsive to said detector for applying the up counting pulses to the counting means when said sensing means is sensing the first set of markers and as the elements are driven in the first direction, for applying the down counting pulses to the counting means when said sensing means is sensing the first set of markers and as the elements are driven in the second direction, for applying the up counting pulses to the counting means when said sensing means is sensing the second set of markers and as the elements are driven in the second direction and for applying the down counting pulses to the counting means when said sensing means is sensing the second set of markers and as the elements are driven in the first direction.

4,074,854

HEATING APPARATUS

Egbert B. Kamper, Rudyard, Mich., assignor to Kamper's Woodfire Co., Inc., Rudyard, Mich.

Filed June 28, 1976, Ser. No. 700,687
Int. Cl.[2] F24D *5/04*
U.S. Cl. 236—11 **8 Claims**



1. A heating apparatus comprising:

a firebox having at least a partial nonporous bottom section on which combustible materials may be positioned,

venting means in a front portion of the firebox for feeding combustion air into the front portion of the firebox;

a flue connected to the rear upper portion of the firebox for withdrawing gases of combustion from the firebox;

an ash pit located under the firebox and in communication with the firebox for receiving ashes from the firebox;

a casing enclosing the firebox and ash pit;

the flue extending to a front portion of the casing and back rearwardly to a rear portion of the casing where it exits therefrom;

a door means on a front portion of the casing for providing access to the interior of the flue;

a nonporous sheet pivotably mounted within the firebox above the door so that the sheet hangs in a vertical manner and partially blocks access to the front side of the firebox when in the vertical position;

intake means for supplying air into the casing to be heated;

withdrawing means for withdrawing heated air from the casing; and

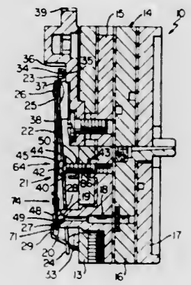
the casing being of sufficient size to permit passage of air from the intake means and to circulate around the firebox and flue and pass out through the withdrawing means.

4,074,855

ADJUSTABLE BIMETAL CONSTRUCTION AND METHOD OF MAKING THE SAME

Harold G. Brakebill, Richmond, Va.; Jay L. Lewis, and Clarence M. Asbill, III, both of Knoxville, Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed May 26, 1976, Ser. No. 690,070
Int. Cl.[2] G01K *5/62*
U.S. Cl. 236—87 **15 Claims**



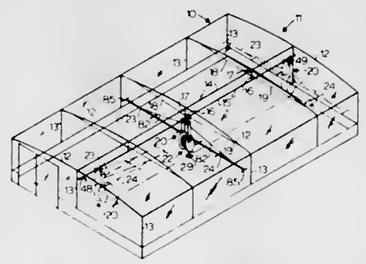
1. An adjustable bimetal construction adapted to provide an adjustable throttling range and comprising a frame means, a first bimetal member having opposed ends one of which is operatively interconnected to said frame means while the other end is movable relative to said frame means, a second bimetal member having opposed ends one of which is operatively interconnected to said frame means while the other end thereof is movable relative to said frame means, and adjustable means operatively interconnecting said other ends of said bimetal members together to provide a combined bimetal action at said other ends, said first bimetal member being thicker than said second bimetal member, said first bimetal member being substantially U-shaped with the yoke portion thereof defining said one end thereof and the free ends of the legs thereof defining said other end thereof, said second bimetal member being an elongated length with said one end thereof being secured to said yoke portion and with said other end thereof extending beyond said legs while the body portion of said second bimetal member is intermediate said legs.

4,074,856

GREENHOUSE WATERING APPARATUS

David Williams; Brian A. Lentz, and Harold E. Le Veque, all of Salinas, Calif., assignors to Union Carbide Corporation, New York, N.Y.

Filed Aug. 5, 1976, Ser. No. 712,075
Int. Cl.[2] B05B *3/18*
U.S. Cl. 239—1 **39 Claims**



1. A greenhouse watering apparatus, including in combination:

a horizontally disposed support member,

suspension means secured to an upper end portion only of said support member for suspending it from above, as from the roof of a greenhouse,

a carriage having yoke means at its upper end with trolley wheels resting on and rolling on two opposite upper surface portions of said support member in such a way that said suspension means does not interfere with back-and-forth movement of said carriage,

drive means supported by said carriage for driving said carriage to achieve back-and-forth movement of said carriage along said support member,

a hose reel rotatably mounted on said carriage and having a central pipe with an inlet fitting,

a hose having one end secured to said inlet fitting and so mounted on said reel as to be maximally reeled when said carriage is located centrally between the ends of said support member and minimally reeled when said carriage is at either said end, said hose having a second, input end,

a slip clutch,

power transmission means connecting said reel to said drive means through said slip clutch, to keep a substantially constant tension on said hose so that said reel is driven to reel said hose when the carriage moves from either end toward the center and so that said hose unreels in a straight line under tension while the clutch slips as the carriage moves from the center toward either end,

a pair of boom-conduit means supported by said carriage, one on each side of said reel in a plane perpendicular to said support member, each boom-conduit means having a liquid conduit connected to said reel's central pipe through a rotating coupling means, and

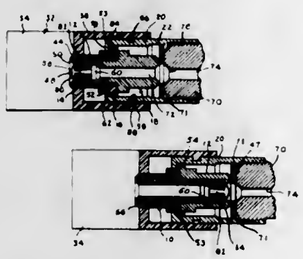
a series of spray nozzles for each said liquid conduit.

4,074,857

REVERSIBLE SPRAY TIP

Oliver J. Calder, 1205 E. Madison, Orange, Calif. 92667

Continuation of Ser. No. 622,633, Oct. 15, 1975, abandoned.
This application Feb. 4, 1977, Ser. No. 765,809
Int. Cl.² B05B *15/02, 15/04*
U.S. Cl. 239—119 **5 Claims**



1. A spray tip assembly for reversible mounting in a spray gun that comprises:

(1) a cylindrical barrel housing having a forward end bearing at least one chordal flat, first and second outer rims of successively greater diameters at its opposite end to provide a large diameter rear face, and a bevelled aperture in its forward end opening to a larger diameter axial counterbore;

(2) a spray tip member received in said counterbore with its discharge end having a transverse spray discharge slot projecting through said aperture and aligned to said chordal flat;

(3) a cylindrical plug member having a first end of the diameter of said counterbore and received in a press fit therein, an outer medial rim of a diameter and width of said first rim, and an opposite end of a length equal to said forward end of said barrel housing; and

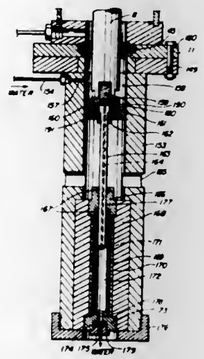
(4) an annular sealing member; said sealing member received in said counterbore and compressed between the received end of said plug member and the rear face of said spray tip member with the medial rim of said plug member butted against the rear face of said barrel housing.

4,074,858

HIGH PRESSURE PULSED WATER JET APPARATUS AND PROCESS

David J. Burns, Waterloo; Udo H. Mohaupt, Cambridge, both of Canada, and Gene G. Yie, Chicago, Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Nov. 1, 1976, Ser. No. 737,716
Int. Cl.² B05B *1/08*
U.S. Cl. 239—172 **12 Claims**



1. A high pressure pulsed water jet apparatus operable in a vertical, horizontal or angled position comprising:

a cylindrical high pressure chamber having a nozzle in communication therewith at one end and a substantially watertight plug at the other end;

a cylindrical low pressure chamber having one end adjacent said other end of said high pressure chamber and the other end of said low pressure chamber adapted for receiving in substantially watertight relation one end of a power piston rod providing the output of a thrust generator means having a substantially flat thrust pattern;

a coupler piston coupled to said power piston rod adapted for substantially watertight reciprocal movement within said low pressure chamber;

a cylindrical ram coupled to said coupler piston and having a liquid passage therethrough along its long axis adapted to reciprocate within said high pressure chamber and through said plug in substantially watertight relation, a check valve preventing intake of water to said passage at one end maintained within said high pressure chamber, the other end of said liquid passage in communication with the volume between said coupler piston and said other end of said low pressure chamber; and

pressure means for maintaining liquid in said other end of said low pressure chamber.

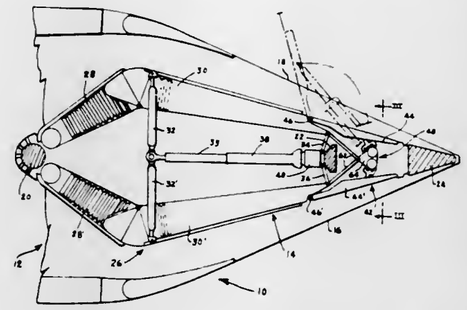
4,074,859

DEFORMABLE PLUG FOR AN AIRCRAFT ENGINE EXHAUST NOZZLE

Richard M. Lowman, Jr., Hartsville, S.C., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 10, 1976, Ser. No. 740,517
Int. Cl.² B64C *15/00*
U.S. Cl. 239—265.33 **6 Claims**

1. In an engine exhaust nozzle system having an exhaust passageway made up of a pair of exhaust passageway fairing extensions, the improvement therein comprising a deformable plug fixedly positioned within the central portion of said exhaust passageway, said plug having a forward fairing and a rearward fairing, said forward fairing comprising a plurality of panels adjustably mounted with respect to said exhaust passageway, said rearward fairing comprising a pair of flaps pivotally secured to said forward fairing, means operatively connected to said forward fairing for moving said panels to a plurality of positions, means operatively connected to said rearward fairing for moving said flaps to a plurality of positions, said rearward fairing movement means being in the form of dual ball rod and clevis rod assemblies, each of said assemblies being connected to respective flaps of said rearward fairing and a gear drive assembly operatively connected to



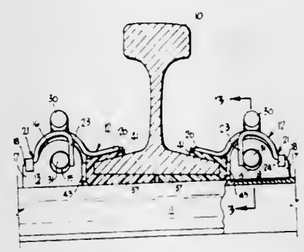
each of said ball rod and clevis rod assemblies for moving said assemblies in a scissor-like fashion thereby extending or retracting said flaps, and said forward fairing moving means and said rearward fairing moving means being interconnected whereby upon movement of said forward fairing simultaneous movement of said rearward fairing movement means takes place.

4,074,860

SPRING RAIL CLAMP

Albert Edward Rex, 38 Halifax Street, Adelaide, South Australia, Australia

Filed Sept. 8, 1976, Ser. No. 721,274
Claims priority, application Australia, Apr. 6, 1976, 5511/76; Apr. 15, 1976, 5617/76
Int. Cl.² E01B *9/04, 9/62*
U.S. Cl. 238—349 **8 Claims**



8. A method of securing a pair of rails to a tie comprising stud welding two pairs of shoulder lugs to the tie in such postion that they locate said rails with respect to the tie when rails are positioned between the lugs of the respective pairs, each shoulder having a bearing surface extending in a direction away from the foot of the rail to be located thereby, each shoulder by having and an aperture extending therethrough in a direction parallel to the longitudinal direction of said rails, positioning lower portions of a pair of rail insulating pads on the tie, each said pad having a pair of upwardly extending webs each with a return portion, positioning rails on respective said lower portions and said return portions on the respective upper surfaces of the foot of the rails,

engaging said respective plate-like clips over said respective lugs, said clips having toes positioned on respective said pad return portions and heels positioned on said shoulder lug upper surfaces,

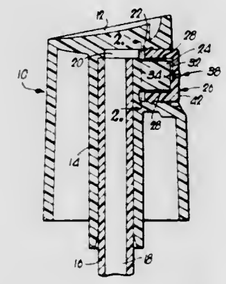
and positioning one leg of a U-shaped pin through the aperture of each respective shoulder lug, and the other leg over the respective plate like clip to bear downwardly thereon and thereby apply downward pressure on the respective rail foot.

4,074,861

SPRAY PATTERN CONTROL STRUCTURE AND METHOD

Wallace F. Magers, Leawood, Kans., and James M. Jegen, Lee's Summit, Mo., assignors to Realex Corporation, Kansas City, Mo.

Filed June 18, 1976, Ser. No. 697,346
Int. Cl.² B05B *1/34*
U.S. Cl. 239—492 **1 Claim**



1. In a fine mist sprayer having a discharge orifice provided with a hole, a fluid exit at one end of the hole, a fluid entrance at the opposite end of the hole, and a continuous annular wall extending between said entrance and said exit, said sprayer further having an exposed outer face departing from said exit in transverse relationship to the longitudinal axis of the orifice and means for propelling one or more swirling streams of liquid particles along said wall from the entrance toward the exit, the improvement comprising:

a uniformly smooth, flawless, annular surface flaring outwardly toward said face from said wall devoid of a line of intersection with the latter for launching the swirling particles from said wall at substantially random points along said surface, whereby to produce a substantially circular spray pattern having uniform particle distribution throughout,

said launching surface defining a curve generated from a tangent point on said wall and extending through a greater than 90° arc so as to project outwardly beyond said face in the nature of a rim around said hole.

4,074,862

ADJUSTABLE FLOW AIR INSUFFLATION NOZZLE

Pierre Jardinier, Gournay sur Marne; Jack Simonnot, Ozoire la Ferriere, and Robert Lecerf, Neuilly sur Marne, all of France, assignors to Societe d'Etudes et de Recherches de Ventilation et d'Aeraulique, Gournay sur Marne, France

Filed July 16, 1976, Ser. No. 705,941
Claims priority, application France, July 23, 1975, 75 23022
Int. Cl.² F24F *13/06*
U.S. Cl. 239—515 **10 Claims**

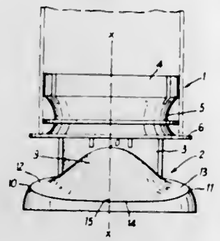
1. An insufflation nozzle for air to be used in room ventilation, air conditioning and like systems, the nozzle having a plane of symmetry and comprising in combination:

a sleeve having an outlet orifice and an inlet which is symmetrical about an axis of the nozzle;

a deflector disposed to face said outlet orifice of said sleeve and extending transversely with respect to said axis; and

linking means between said deflector and said sleeve so as to permit a translational movement of these two components relative to one another in a direction parallel to said axis for allowing volume flow rate of air to be varied including a screen which is symmetrically disposed with respect to said plane of symmetry for the purpose of shutting off

passage of air between said sleeve and said deflector in a specific, given angular sector, a surface of said deflector being directed toward said sleeve and having, at least in the vicinity of its edges adjacent said screen, planar portions which are inclined relative to said axis, and having a spacing relative to said outlet orifice of said sleeve which



increases along a direction extending away from said screen;

whereby air flow spreads out in an angular sector, the horizontal included angle of which becomes larger as the flow rate of air increases for a given pressure upstream from the screen and the air escapes from the nozzle along an initial path substantially normal to the axis of the sleeve.

4,074,863

PORTABLE OPEN FIREPLACE BLOWING APPLIANCE

Mary Evelyn Davis, 12319 Charles Road, Silver Spring, Md. 20906

Filed Feb. 21, 1975, Ser. No. 551,546
Int. Cl.² F23L 9/06
U.S. Cl. 239—589 **1 Claim**



1. A portable open fireplace blower comprising:

an open rigid straight line tubular body portion of substantial length and uniform diameter formed of heat resistant metal;

an end cap rivetedly secured at one end of said body portion having in a planar end section a centrally located orifice between 1/32 of an inch and 3/32 of an inch through which a jet of air is blown after placing the mouth of the user at the other end to blow, said cap having the same inside diameter as the outside diameter of said tubular body portion and the inside diameter of said tubular body being at least 6 times the diameter of said centrally located orifice;

a mouthpiece connector having an end opening whose inner diameter is substantially the same as that of said tubular body portion and is non-adhesively secured at the end of said body portion opposite said cap and orifice;

said mouthpiece connector including a tapered portion extending from the end of the tubular body and an end portion of substantially smaller diameter than said tubular body attached to the tapered portion; a mouthpiece mounted on the end portion of said connector;

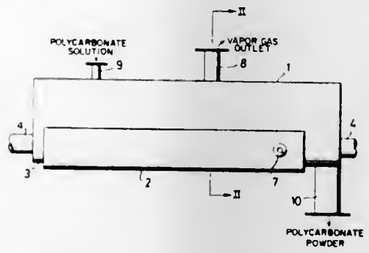
and said centrally located orifice being on the common central longitudinal axis of said body portion and said mouthpiece whereby a long column of air in said body portion under mouth pressure of the user exits as a fine single air jet along said common axis to permit accurate impingement of the air on a burning coal.

4,074,864

METHOD FOR PRODUCING POLYCARBONATE POWDER FROM A POLYCARBONATE SOLUTION

Yoshihiro Narita, Sodegaura; Shigeaki Mochizuki; Shigeru Kakimoto, both of Tokuyama; Norio Komori, Sodegaura; Kiyoshi Watanabe, Sodegaura, and Hideji Shiota, Sodegaura, all of Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 618,427, Oct. 1, 1975, abandoned. This application Apr. 27, 1977, Ser. No. 791,521
Claims priority, application Japan, Oct. 5, 1974, 49-114851
Int. Cl.² B02C 13/10
U.S. Cl. 241—23 **8 Claims**



1. A process for the continuous production of polycarbonate powder from a polycarbonate solution in a processing zone defined by an elongated part-cylindrical barrel member having two elongated shafts therein, the longitudinal axes of said shafts being substantially parallel, said shafts being rotatable about their longitudinal axes and being oriented generally axially of the barrel member, the process comprising:

a. feeding a polycarbonate solution to an inlet at an end portion of said elongated barrel member, said barrel member having an outlet at the end thereof opposite the inlet;

b. rotating said shafts toward each other about their longitudinal axes and forcing the polycarbonate solution toward the outlet by first intermeshing spiral blades mounted on said shafts, said first spiral blades being located on said shafts so that they are located at the portion of said barrel at least adjacent said inlet, said first spiral blades being arranged on said shafts to force the polycarbonate solution received at the inlet toward the outlet end of the barrel with a predetermined extrusion power;

transferring the polycarbonate solution from the first spiral blades to a set of second intermeshing spiral blades mounted on said shafts downstream of the first spiral blades, and set of second spiral blades including a first subset and a second subset;

d. heating and mixing the polycarbonate solution by the set of second spiral blades by producing a limited "to and fro" movement of the polycarbonate solution by means of the set of second spiral blades as the polycarbonate solution is moved toward the barrel outlet under the extrusion power provided by said first spiral blades, a first portion of the first subset of the set of second spiral blades feeding the polycarbonate forward toward the barrel outlet and a first portion of the second subset of the set of second spiral blades feeding the polycarbonate backward toward the barrel inlet to forcedly mix the polycarbonate solution fed into the barrel member and to evaporate and drive off said solvent in said polycarbonate solution under the influence of said heating to thereby concentrate said polycarbonate solution;

e. heating and kneading said concentrated polycarbonate solution in the barrel member by at least second portions of said first and second subsets of spiral blades downstream of said first portions to further evaporate and drive off said solvent in said polycarbonate solution and to form polycarbonate powder particles at least in the vicinity of the outlet of the barrel member;

f. heating and grinding the polycarbonate powder by at least

third portions of said first and second subset spiral blades downstream of said second portion and in the vicinity of said outlet of said barrel member to further reduce the particle size of the polycarbonate powder particles and to dry reduced size polycarbonate powder particles; and then

g. discharging the ground reduced size polycarbonate powder particles from the outlet of the barrel member under the extrusion power provided by said first spiral blades which provides continuous movement of the materials through the processing zone in said barrel member.

4,074,865

METHOD OF RECOVERING PLATINUM GROUP METAL VALUES FROM A USED WASHCOATED CATALYST

Alan Gibbon, London, England, assignor to Johnson, Matthey & Co., Limited, London, England

Filed Sept. 6, 1974, Ser. No. 504,670
Claims priority, application United Kingdom, Sept. 11, 1973, 42680/73
Int. Cl.² B07B 4/00; C01G 55/00; C22B 11/00; B02C 23/08
U.S. Cl. 241—24 **6 Claims**

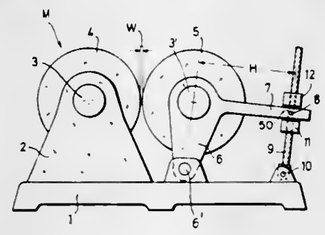
1. A method of recovering platinum group metal values from a used washcoated catalyst comprising a catalyst support having a catalytic washcoat thereon including platinum group metal, said method comprising grinding the catalyst to obtain fines which are less than 10 μm and tails which are greater than 10 μm, at least 40–55% of the ground catalyst being −400 mesh and the fines containing most of the platinum group metal values, and separating the fines from the tails using a cut point of 10 μm.

4,074,866

RELEASABLE COMPRESSION DEVICE FOR USE WITH A CRUSHING MILL OR THE LIKE

Heinz Meder, Forsbach, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed Sept. 3, 1976, Ser. No. 720,369
Claims priority, application Germany, Sept. 10, 1975, 2540269
Int. Cl.² B02C 4/32
U.S. Cl. 241—30 **15 Claims**



1. A crushing mill having a releasable compression device to allow the non-destructive passage of foreign matter through said mill comprising:

a mill body having a base carrying a fixed upright;

a first roller rotatably carried by said fixed upright;

a second roller rotatably carried by an L-shaped support frame having a substantially vertical arm portion pivotally attached to said base to allow adjustment of a nip formed between said rollers;

a substantially horizntal arm portion having a vertical aperture in the end thereof carried by said support frame;

a threaded rod disposed in said aperture and having a bottom end pivotably attached to said base;

an upper and lower threaded nut carried on said rod and positioned above and below said arm of said support frame;

roatational socket means carried by said threaded rod between said arm and said upper and lower nuts to provide a sliding fit between said rod and said aperture;

a compression means carried between said rotational socket means and said lower nut to produce a compression joint between said nuts and said arm; and

pressure means connected to said compression means to supply a selective pressure to said compression means;

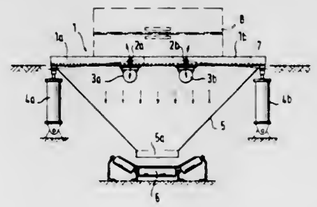
whereby a maximum and minimum dimensional limit of said nip is fixed by said upper and said lower nut and said second roller can adjust between said limits as a function of said selected pressure.

4,074,867

METHOD AND APPARATUS FOR COMMINUTING SAND CLODS

Hermann Jacob, Fachenfelderweg 115, 2105 Seevetal 3, Germany

Filed May 20, 1976, Ser. No. 688,291
Claims priority, application Germany, May 23, 1975, 2522940
Int. Cl.² B02C 19/00
U.S. Cl. 241—30 **11 Claims**



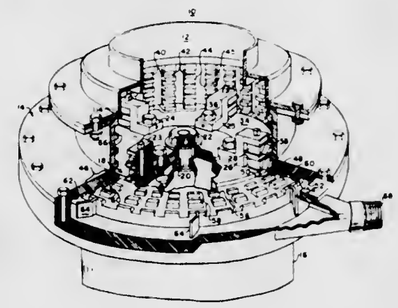
1. A method for removing form sand from a casting box and for comminuting any sand clods formed by the sand removed from the box, comprising the steps of placing a casting box having an open side with the sand and the cast product therein with the open side of the box on a planar substantially horizontally extending upper surface of a grate; subjecting said grate to vibrations until the sand becomes disconnected from the casting box wall and falls partly through the grate; removing the casting box and the cast product from the grate while leaving any remaining sand clods thereon; and subjecting said grate again to vibrations while changing the planar horizontally extending upper grate surface to a surface extending upwardly inclined from a center line of said grate.

4,074,868

FOOD PROCESSING SYSTEM

Donald F. Link, Huntsville, Ala., assignor to Recovery Systems, Inc., Charleston, S.C.

Filed Feb. 7, 1977, Ser. No. 766,132
Int. Cl.² B02C 13/16
U.S. Cl. 241—46 R **5 Claims**



1. A food processor comprising a pulverizer, in turn comprising:

a stator member comprising:

a vertically oriented interior surface, the top end of which forms an input opening to said pulverizer, and said surface having a plurality of vertically and circumferentially spaced lands and grooves, and

a first circular plate extending around and radially outward from a lower end of said interior cylindrical surface, and having a lower, generally horizontal, surface comprising a plurality of concentrically and circumferentially spaced lands;

a motor and rotor member driven therefrom, and said rotor member comprising a second circular plate positioned for rotation about a vertical axis concentric with said cylindrical surface of said stator member, and further comprising:

at least one hammer rotably attached to said second circular plate for horizontal pivotal movement about a vertical axis, said hammer being positioned to pass within a groove formed between said lands of said cylindrical surface of said stator member, and

a plurality of concentrically and circumferentially spaced lands and grooves in said second circular plate and positioned for mating rotation between said lands of said first circular plate of said stator member; and

collection means including an annular passageway generally outboard of said circular plates for collecting pulverized material passing outboard and between said circular plates and for providing said material as a confined output flow.

4,074,869

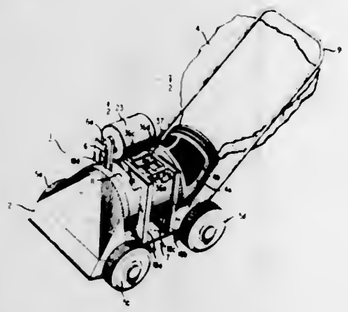
MACHINE FOR SHREDDING LEAVES AND GARDEN DEBRIS

Walter G. Johnson, 39 Pitt Road, Boonton, N.J. 07005

Filed Mar. 11, 1977, Ser. No. 776,648

Int. Cl.[2] B02C *18/24*

U.S. Cl. 241—55 **8 Claims**



1. A device for shredding garden debris which comprises in combination:

a housing frame having intake, exhaust and collecting means for said debris,

a main shaft journalled for rotation in said housing frame,

means comprising a motor for driving said main shaft to rotate about its principal axis,

a first rotor fixed for rotation by said main shaft and having a plurality of cutting blades each shaped to include a leading edge and a trailing edge transversely disposed to the principal axis of said main shaft,

a second rotor axially aligned ahead of said first rotor and having a plurality of cutting blades each shaped to include a leading edge and a trailing edge transversely disposed to the principal axis of said main shaft, said rotors being constructed and arranged to provide between them a substantial axial flow of air and debris from said intake to said exhaust means,

the trailing edges of the blades of said second rotor being slightly spaced apart in an axial direction in cutting relation from the leading edges of the blades of said first rotor,

gear reducing means connected to said main shaft and coupled to drive said second rotor at a rotational rate which is substantially less than the rotational rate of said first rotor.

4,074,870

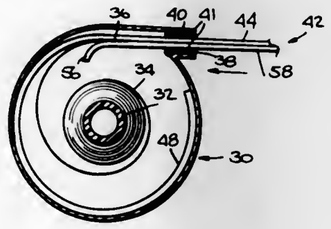
FILM RETRIEVAL DEVICE

Marshall Kaufman, 413 W. 56th St., New York, N.Y. 10019

Filed July 22, 1976, Ser. No. 707,654

Int. Cl.[2] B25B *9/00;* **G03B** *1/02*

U.S. Cl. 242—1 **10 Claims**



7. A method of retrieving a free end of a convolutely wound film from inside a cylindrical cassette through an exit opening in a circumferential wall on said cassette, comprising:

(a) inserting a two-part retrieval device into the cassette through the exit opening, said retrieval device having an upper and lower component which slidingly engage each other in a longitudinal direction, said upper component having an anterior tongue portion and said lower component having a curled, anterior tongue portion;

(b) arranging the components with the cassette so that the upper component lies adjacent most of the interior cylindrical wall of the cassette, while the curled anterior tongue portion of the lower component forms a film-receiving channel with the upper component adjacent the exit opening;

(c) rotating the protruding hub of the cassette counterclockwise until the end of the film leader passes the end of the curled, anterior tongue portion;

(d) rotating the protruding hub clockwise until said hub can no longer be turned; and

(e) then withdrawing the upper and lower components while simultaneoulsy turning the protruding hub clockwise.

4,074,871

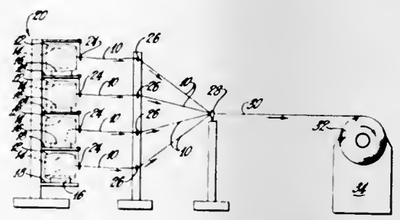
METHOD AND APPARATUS FOR HANDLING STRANDS

David V. Stotler, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 28, 1976, Ser. No. 736,675

Int. Cl.[2] B65H *63/02, 63/00*

U.S. Cl. 242—42 **8 Claims**



1. The method of producing combined strand of the type in which feeder strands from a plurality of feeder packages are gathered into a combined strand, wherein the improvement comprises:

sensing the cessation of passage of a strand from any of said feeder packages into said combined strand; and,

introducing an auxiliary strand into fixed engagement with said combined strand or a feeder strand responsive to said sensing.

4,074,872

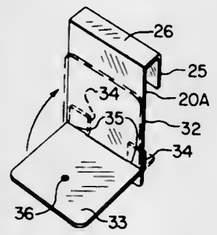
EMERGENCY BATHROOM TISSUE HOLDER

Robert Marshall, Jr., 731 S. Cascade Drive, Woodburn, Oreg. 97071

Filed Dec. 20, 1976, Ser. No. 752,208

Int. Cl.[2] B65H *19/00*

U.S. Cl. 242—55.54 **6 Claims**



1. An emergency bathroom tissue holder comprising an L-shaped bracket having a vertical leg with transverse slots and a horizontal leg outstanding from the lower end of said vertical leg, a vertical upstanding pin on said horizontal leg for holding a roll of paper on said horizontal leg, a hook on the upper end of said vertical leg for hanging the holder on the upper edge of the wall of a toilet tank, and a hinge connecting said horizontal leg to said vertical leg, said hinge comprising a pair of right angle tongues on said horizontal leg having pivotal movement in said slots in said vertical leg.

4,074,873

TENSION SERVO APPARATUS

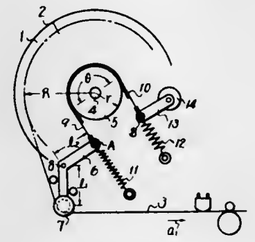
Hideaki Hayashi, and Susumu Kakuta, both of Mitaka, Japan, assignors to Nippon Columbia Kabushikikaisha, Tokyo, Japan

Filed Dec. 6, 1976, Ser. No. 747,980

Claims priority, application Japan, Dec. 10, 1975, 50-147772; May 26, 1976, 51-59995

Int. Cl.[2] B65H *25/22*

U.S. Cl. 242—75.43 **13 Claims**



1. A mechanical tension servo apparatus for maintaining the tension of a reel-transported tape substantially constant comprising:

means for mounting said reel for rotation,

a rotary member connected to said means and conjointly rotatable with said reel;

brake means including a brake element engageable with said rotary member and resilient biasing means for exerting a selected force thereon

tension detecting means for detecting the tension of a tape being transported from said reel;

means for regulating said biasing means to vary the force of said brake element against said rotary member in accordance with changes in the force applied to said tape tension detecting means, whereby

the biasing force is decreased in response to an increase in tape tension and is increased in response to a decrease in tape tension.

4,074,874

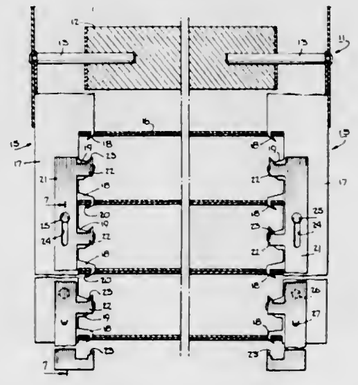
LOCK PLATE FOR AN ARM OF A PILE FABRIC REEL FRAME

Theodore P. Kessler, Rancocas, N.J., assignor to Timron, Inc., Moorestown, N.J.

Filed Jan. 15, 1976, Ser. No. 649,335

Int. Cl.[2] B65D *85/67;* **B65H** *75/02*

U.S. Cl. 242—77.1 **16 Claims**



1. An end frame for a pile fabric reel comprising:

a plurality of hook-containing sections disposed in a radiating manner for impaling of a pile fabric thereon; and

a lock plate movably mounted on each said hook-containing section to retain an impaled pile fabric thereon, each said lock plate including a plurality of spaced projections, at least some of said projections being movable between a first position spaced from a respective one of said hooks of said one hook-containing section and a second position closer to said one hook to retain impaled fabric therebetween.

4,074,875

TEXTILE CARRIER

Jules P. Fratturo, Greenville, S.C., assignor to Textube Corporation, Greer, S.C.

Filed May 21, 1976, Ser. No. 688,733

Int. Cl.[2] B65H *75/30, 75/10*

U.S. Cl. 242—118.3 **6 Claims**

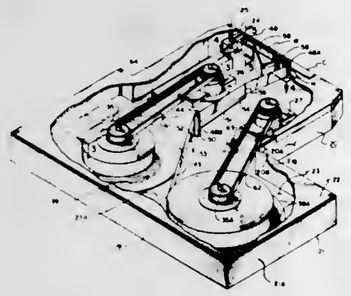
2. A textile carrier comprising a barrel, said barrel having an outside wall surface tapering inwardly from lower to upper end thereof and an inside wall surface correspondingly tapering inwardly from lower to upper end whereby the wall of said barrel is of generally uniform thickness throughout its length, and spindle positioning means comprising a plurality of spaced ribs on said inside wall surface extending longitudinally of said barrel and originating at a predetermined distance from said lower end, each of said ribs having a first portion tapering inwardly from said inside wall surface and thereafter a second portion extending generally parallel to the longitudinal axis of said barrel to a point of termination flush with said inside wall

surface at a predetermined distance below the upper end of the barrel, whereby said positioning means closely surround a



spindle to be received in said barrel to stabilize said textile carrier thereon during a wnding operation.

4,074,876
LONG-PLAY VIDEO TAPE CASSETTE
Dennis R. Gourley, Salt Lake City, Utah, assignor to Film Cassette Inc., Salt Lake City, Utah
Filed Jan. 19, 1976, Ser. No. 650,413
Int. Cl.[2] G11B *23/10*
U.S. Cl. 242—199 **8 Claims**

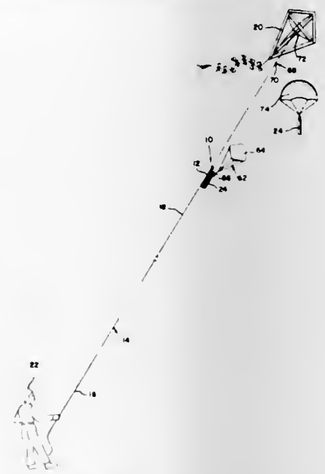


1. For a video tape player having a planar surface and an inwardly directed rectangular slot disposed normal to said surface, a long-play video tape cassette including, in combination, a housing having an enlarged portion and a lateral essentially rectangular tongue extending therefrom and provided with a tape sensing window, said enlarged portion and said lateral tongue having proximate, planar, outer surfaces forming essentially a 90° inside angle, whereby said planar surface of said enlarged portion may be disposed parallel to and proximate said housing and said planar surface thereof; a pair of video tape reels journalled in said enlarged portion for operative movement; first means mounted in said lateral tongue for driving said reels; and second means for routing the video tape of said reels up to and past said window, said reels being provided video tape.

4,074,877
AERIAL DEVICE
Godfrey B. Hayenga, 4667 Alhambra Drive, Fremont, Calif. 94536
Filed Nov. 10, 1976, Ser. No. 740,422
Int. Cl.[2] A63H *27/08*
U.S. Cl. 244—155 R **8 Claims**

1. An aerial device in combination with an object transportable along a line elevated above a surface, the improvement comprising:

a. support means intended for releasably gripping the object, said support means being born by the elevated line, said support means comprising a first member engaging the object toward one end thereof; a second member engaging the object toward the other end thereof, said second member including confining means for restricting the distance between said first member and said second member, said first and second members acting in concert by said engagements to effect the intended support of the object;



and spring means for urging gripping engagement of the object by said first and second members, said urging engagement of said spring means guided by said confining means, said spring means allowing disengagement of the object by said first and second members;

b. traveling means intended for carrying the object along the elevated line;

c. trigger means for initiating the release of said support means gripping the object, thereby overcoming the spring force of said spring means urging engagment of the object by said first and second members.

4,074,878
PROGRAMMED FLAP SYSTEM FOR AN AIRCRAFT HAVING WINGS
Irving R. Sherman, 31 Redlands Road, West Roxbury, Mass. 02132
Division of Ser. No. 589,188, June 23, 1975. This application Aug. 18, 1976, Ser. No. 715,234
Int. Cl.[2] G05D *1/12*
U.S. Cl. 244—183 **10 Claims**

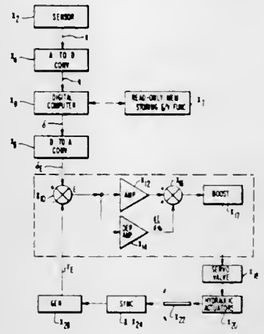
1. A programmed flap system for take-off and landing comprising,

an aircraft having wings,

means for sending the velocity of movement of the aircraft through the air,

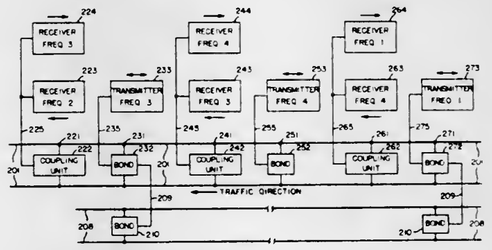
flap means on each wing, each providing at least one rearwardly convergent air compressor channel having an entrance opening and an exit opening which channel increases the exit velocity or through-flowing air relative to the entrance velocity thereof according to channel characteristics, means for varying the area of the entrance opening of said channels, programmed control means for operating the last-named means according to a program based upon channel characteristics which commands at lift-off an entrance opening for said channels which is of

larger area than the average entrance opening during the preceding take-off ground run while limiting the exit



velocity of said air subsequent to lift-off to less than sonic velocity.

4,074,879
TRACK SIGNALLING SYSTEM
Gary E. Clark, Henrietta; Klaus H. Frielinghaus, and Barry L. Smith, both of Rochester, all of N.Y., assignors to General Signal Corporation, Rochester, N.Y.
Filed Nov. 29, 1976, Ser. No. 745,703
Int. Cl.[2] B61L *21/06*
U.S. Cl. 246—37 **7 Claims**



1. In a track circuit signalling system comprising in combination:

(a) a two rail track divided into a plurality of contiguous track circuits separated by boundary markers;

(b) individual transmitter means, coupled to said track at alternate boundary markers by first coupling means bridged across said two rail track, for applying signals across said track at a carrier frequency and with the carrier frequency of each transmitter means differing from the carrier frequency of the nearest adjacent transmitter means on either side; and

(c) one pair of individual receivers each coupled across said track at intermediate boundary markers by an individual second coupling means bridged across said two rail track with one receiver adapted to respond to track signals from the adjacent transmitter means on one side of the receiver pair and the other receiver of each receiver pair adapted to respond to track signals from the adjacent transmitter means on the other side of the receiver pair; and wherein

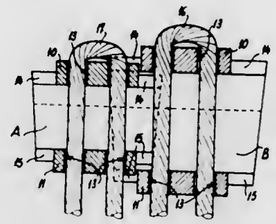
(d) each said second coupling means comprises:

(1) a series tuned circuit with each pair of second coupling means coupled in parallel;

(2) an impedance matching transformer for producing an output signal is response to signals received from said track; and with

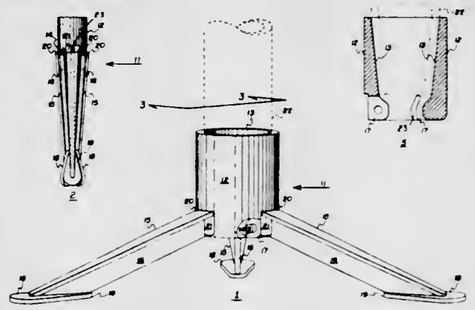
(3) the output of the transformers of each pair of second coupling means coupled in series to provide a pair of output terminals.

4,074,880
CLIMBING WEDGE
Ludger Simond, Les Bossons, Chamonix, Haute-Savoie, France
Filed Jan. 12, 1977, Ser. No. 758,853
Int. Cl.[2] A47G *29/00*
U.S. Cl. 248—1 **4 Claims**



1. A climbing wedge having the general shape of a hollow prism and having fitting means thereon for preventing rotation and jamming into one another when two or more of said wedges of the same shape but different dimensions are fitted together, wherein said wedge has two opposite parallel faces and wherein said fitting means comprises at least one boss on each of said two opposite parallel faces, each of said bosses having two openings for allowing rope to pass through, said fitting means further comprising two recesses on each of said two opposite parallel faces, said recesses on each said face being situated one on each side of said boss, extending from the end side of said face toward said boss, whereby two wedges of the same shape but different dimensions may be fitted together by virtue of the two opposite bosses of the wedge with smaller dimensions penetrating into the two corresponding recesses in the wedge with larger dimensions, without the necessity of removing any ropes passing through the openings in said bosses of said wedges.

4,074,881
TRIPOD ASSEMBLY
Gardner Lloyd Bickford, Palos Verdes Estates, Calif., assignor to James R. Vickery, La Mesa, Calif.
Filed June 23, 1976, Ser. No. 698,967
Int. Cl.[2] F16M *11/20*
U.S. Cl. 248—188.7 **1 Claim**



1. A tripod assembly for receiving and carrying a load bearing standard, comprising

a bearing ring having an inner diameter dimensioned for receiving a load bearing standard and being generally cylindrical in shape;

hinge extensions extending downwardly and inwardly from said bearing ring, said hinge extensions including radially extending slots therethrough, each said slot including a substantially flat surfaced recess extending perpendicu-

larly relative to said slot, each said flat surfaced recess extending as a cord across said generally cylindrical bearing ring and being outwardly of one of said slots; and

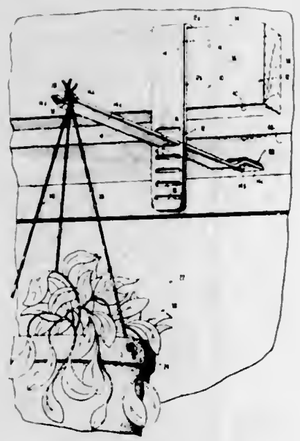
three legs rotatably carried by said hinge extensions, each said leg including a vertically oriented portion extending into one of said slots and a horizontally oriented flat portion above said vertically oriented portion outwardly from said slot and dimensioned for abutment with one of said substantially flat surfaced recess when said leg is rotated in an extended position.

4,074,882

FLOWER POT SUPPORT HOLDER

John H. Anderson, 308 Canal St., R.F.D. No. 3, Brattleboro, Vt. 05301

Filed Oct. 5, 1976, Ser. No. 729,631
Int. Cl.² A47F *5/00*
U.S. Cl. 248—208 **2 Claims**



1. A height and laterally adjustable flower pot holder comprising:

a first elongated strip forming a unitary bracket member of inverted L-shaped configuration including a horizontal base portion,

a vertical depending hanger portion at right angles thereto and integral therewith,

said base portion terminating at an end remote from said depending hanger portion in at least one integral lip portion extending parallel to and generally in the direction of said depending hanger portion and thereby forming with said base and said depending hanger portion a hook for hooking the upper end of said bracket member over a horizontal window trim board or the like,

a second elongated strip member defining a hanger bar and being of a width less than that of the first strip member,

said first strip member including a plurality of vertically spaced horizontal, elongated slots within the lower end thereof of a width and height slightly larger than the width and thickness of said second strip member, said second strip member being longitudinally adjustably, insertably carried within a given slot of said first strip member with a first portion projecting rearwardly beneath said window frame and contacting the bottom of said frame and a second portion projecting horizontally outwardly of said first strip portion, and

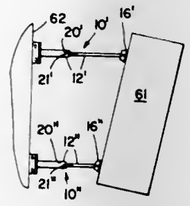
means for suspending a flower pot from the outboard end of said second portion of said second strip member, such that said second strip member is inserted within a given slot of said first strip member dependent on the vertical height of the horizontal window trim board and said second strip member is adjusted longitudinally within a selected slot to adjust the distance between the suspended flower pot and the horizontal window trim board to thereby permit suspending of various size flower pots.

4,074,883

SPEAKER MOUNTING SYSTEM

George W. Daly, Mill Valley, and Joseph R. Rucker, San Francisco, both of Calif., assignors to Mastermount Corporation, Petaluma, Calif.

Filed Mar. 31, 1976, Ser. No. 672,176
Int. Cl.² A47F *5/00*
U.S. Cl. 248—286 **4 Claims**



1. A device for mounting a speaker cabinet having at least one planar surface for mounting to at least one planar structural support surface comprising:

a telescoping strut including two mutually extensible and rotatable members;

means for releasably positively fixing the relative extension and rotational position of said members;

a flange fixed to one end of the telescoping strut, said flange having at least one planar surface including a two dimensional array of apertures for receiving a plurality of fasteners to mount the strut to said at least one planar structural support surface;

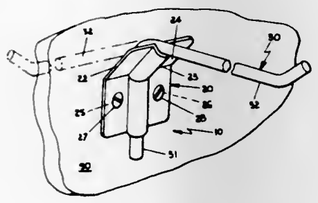
a bracket pivotably mounted to the other end of the strut having a first planar surface including a two dimensional array of apertures for receiving a plurality of fasteners to mount the strut to said at least one planar surface of said speaker cabinet; and a second planar surface having a pivot hole and a plurality of mounting holes disposed in an arc about said pivot hole and a pair of bolts through said pivot hole and a selected one of said mounting holes, respectively, to positively releasably mount said bracket to the end of said member at a selected one of a plurality of angular orientations.

4,074,884

PIVOTED LOCKING WALL BRACKET

Alex Joseph Antoszewski, Michigan City, Ind., assignor to Leigh Products, Inc., Coopersville, Mich.

Filed Aug. 30, 1976, Ser. No. 718,904
Int. Cl.² F16M *13/00*
U.S. Cl. 248—289 R **11 Claims**



1. In a bracket having a hook and a base plate adapted to be mounted to a vertical surface, said hook having an outwardly extending arm and a vertically extending leg; said base plate having an outwardly offset portion forming a channel in the back face thereof for receiving the leg of said hook, the improvement in said bracket comprising:

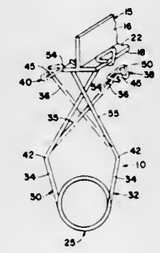
a segment of the metal forming said offset portion being removed, said removed portion being spaced from the top of said base plate; said base plate being bent outwardly to an inclined position about a line normal to the axis of said channel and extending laterally through the area of the removed portion to form an inclined pocket for seating said hook at the juncture of its arm and leg portions.

4,074,885

CEILING SUPPORT CLIP

Walter L. Hacker, Jr., 2221 Patty Lane, Green Bay, Wis. 54304

Filed Nov. 2, 1976, Ser. No. 738,018
Int. Cl.² B42F *13/00*; A44B *21/00*
U.S. Cl. 248—317 **3 Claims**



1. A ceiling support clip formed of wire and adapted to be removably secured to a ceiling post, comprising:

a. a spring loop at one end of the clip,

b. a pair of arms diverging forwardly from said loop to provide finger grips, each said arm including a lower section extending outwardly from said loop, and an upper section being extended in forwardly converging relation and crossing adjacent the front end thereof; and said upper sections of said arms being compressed to open said jaws with said upper sections formed into a V-shaped configuration above the crossing therebetween,

c. gripping jaws formed on said front ends of said upper sections and including a gripping element extending in a plane substantially normal to the plane of said arms and adapted to move towards and away from each other as said arms are compressed and released to engage the ceiling post and suspend the support clip therefrom, said jaw including a bridge section extending angularly from said front end to one end of said gripping element and a tail section extending angularly from the other end of said gripping element and terminating in a free end,

d. said gripping element, bridge section, and tail section all extend in a substantially horizontal plane relative to the vertical axis of the clip, and

e. said respective bridge sections of each said arm extend in substantially parallel spaced relationship to each other, with said respective tail sections of each said arm extending in substantially parallel spaced relationship to each other, and said gripping elements extending in substantially parallel spaced relationship to each other such that each said jaw forms a substantially triangular configuration.

4,074,886

HEIGHT ADJUSTMENT MECHANISM FOR A VEHICLE SEAT

Brian Yates, Bozeat, England, assignor to UOP Inc., Des Plaines, Ill.

Filed Mar. 7, 1977, Ser. No. 775,077
Int. Cl.² F16M *11/24*
U.S. Cl. 248—394 **6 Claims**

1. A vehicle seat comprising,

a seat frame,

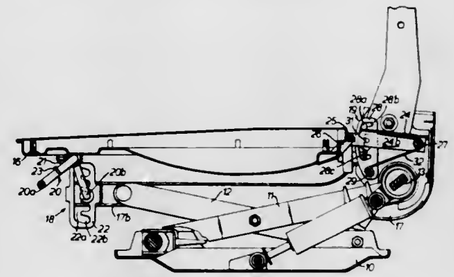
a seat cushion frame,

two cushion-height adjustment mechanisms mounted on the seat frame at the front and back of the seat respectively and supporting the front and back of the seat cushion frame for independent movement upwards and downwards with respect to the seat frame,

one of said height adjustment mechanisms comprising

hinge means pivoted to the seat frame and to the seat cushion frame respectively on horizontally-spaced parallel pivots extending laterally of the seat, to allow the cushion frame to be raised or lowered pivotally,

a spring mounted on the seat frame and biassing the hinge means upwardly,



two co-operating locking means comprising a pin, and a rack having teeth spaced apart vertically to receive the pin therebetween in vertically downward load-supporting relationship,

means mounting one of said locking means on the seat frame,

means mounting the other of said locking means on the hinge means and cushion frame assembly,

one of the mounting means being a pivot on which the associated locking means is supported, and

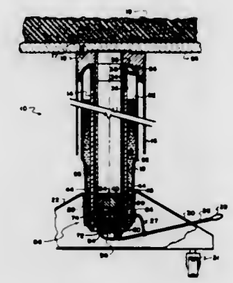
biassing means acting on the pivotally supporting locking means to urge the two locking means into mutual engagement.

4,074,887

POWER UNIT FOR A MEDICAL OR LIKE STOOL

Dean H. Hale, 2424 N. Main St., Logan, Utah 84321

Filed Sept. 20, 1976, Ser. No. 724,889
Int. Cl.² F16M *11/00*
U.S. Cl. 248—404 **4 Claims**



1. A power unit for advancing and retracting an object comprising:

hollow cylindrical ram means comprising means at one end of the hollow ram means adapted to be connected to said object and closure means entirely closing the other end of the ram means, said ram means being relatively reciprocable between extended and retracted positions;

elongated hollow reservoir forming means co-axially and, when in the retracted position, substantially co-extensive with the ram means, the reservoir means comprising a generally elongated annular reservoir cavity defined by a cylindrical inner wall juxtaposed and relatively reciproca-

ble in respect to the ram means, and a generally cylindrical U-shaped outer wall spaced from said inner wall, the respective ends of the inner and outer walls being integrally connected to each other, said inner wall comprising port means adjacent one end thereof, the outer wall conically converging at one end thereof, the reservoir cavity containing liquid and pressurized gas acting upon and selectively displacing the liquid through the port means;

valve means disposed in its entirety within said cylindrical inner wall adjacent the port means, and a space intermediate the closure means and the valve means contained within the inner wall selectively accommodating flow of said liquid therethrough to selectively extend and retract the ram between desired locations.

4,074,888

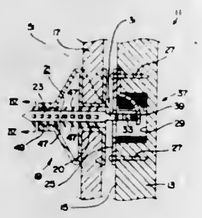
APPARATUS FOR LOCKABLY MOUNTING PICTURE FRAMES AND THE LIKE

George H. Garner, 6528 Palomino, Arlington, Tenn. 38002

Continuation-in-part of Ser. No. 513,245, Oct. 9, 1974, abandoned. This application Mar. 11, 1976, Ser. No. 666,180

Int. Cl.[2] A47F *7/14*

U.S. Cl. 248—475 R **4 Claims**



1. Apparatus for mounting a portable object having a back side to a fixed surface, said apparatus comprising at least one anchoring socket means fixedly attached to said fixed surface, a pin member received in each of said socket means with a portion thereof grippingly engaging said socket means whereby outward movement of said pin member is precluded, at least one platelike element fixedly attached to the back side of the portable object, guide means for locating the optimum position of said platelike element on the back side of the portable object, said guide means including a thin, rigid body portion having a top edge for being aligned with the top or bottom edge of the portable object and having a side edge for being aligned with one of the side edges of the portable object and having an aperture therethrough for allowing a mark to be made therethrough with a pencil or the like on the back side of the portable object when said body portion is positioned on the back side of the portable object with said top edge aligned with the top or bottom edge of the portable object and with said side edge aligned with one of the side optimum of the portable object, said mark corresponding to the optmum position of the center of said platelike element, and lock means for removably locking said platelike element to said pin member with said lock means being hidden from view and being substantially inaccessible without special tools to obscure the structure thereof whereby unwarranted removal of the object from the fixed surface is minimized.

4,074,889

ROTARY VALVE

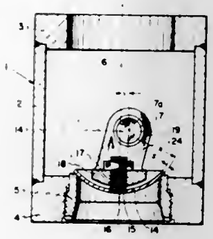
Hans O. Engel, Hanau, Germany, assignor to Honeywell G.m.b.H., Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 636,107, Nov. 28, 1975, abandoned. This application Jan. 31, 1977, Ser. No. 764,412

Claims priority, application Germany, Feb. 28, 1975, 2508755

Int. Cl.[2] F16K *1/18*

U.S. Cl. 251—298 **13 Claims**



1. A rotary control valve, comprising

a housing,

a ring seat mounted in said housing,

a plug member,

an actuating bracket disposed in said housing,

means for supporting said bracket in said housing so that it can rotate about an axis that is orthogonal and offset with respect to the axis of said ring seat, and

an adjustable rigid connecting means extending between said plug and said bracket for rigidly connecting said plug in any one of a number of different spaced apart positions with respect to said bracket, said rigid connecting means including a rigid member having ends which are rigidly secured, respectively, to said bracket and to said plug in a manner to permit the adjustment of said plug to that one of said positions at which the rotation of said bracket tilts said plug into and out of fluid tight engagement with said ring seat without bending or deformation of said bracket or said rigid member, and without relative movement between said bracket and said plug.

4,074,890

MULTI-STAGE HYDRAULIC STRETCHER FOR ELONGATED FASTENERS

Georges Boudet, Saint-Cyr-sur-Loire; Jacques Charpentier, Tours; René Vinel, Bourg-la-Reine; Jean-Claude Desmoulins, Conflans-Sainte-Honorine, and Emmanuel de Blic, Tours, all of France, assignors to SKF Compagnie d'Applications Mecaniques, Clamart, France

Filed Oct. 26, 1976, Ser. No. 735,780

Claims priority, application France, Oct. 27, 1975, 75 32764

Int. Cl.[2] E21B *19/00*

U.S. Cl. 254—29 A **6 Claims**

1. An hydraulic device for an elongated fastener which is to be pre-stressed, said device comprising:

a. an upper stage comprising:

an upper portion contacting a traction means mounted on one end of said fastener;

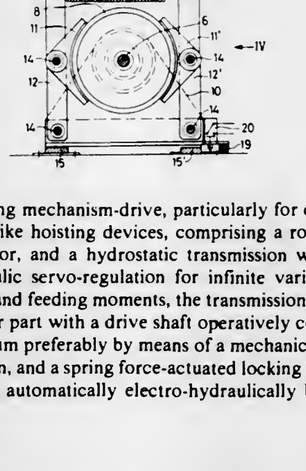
an upper piston defining a central bore through which a portion of the fastener passes and comprising a first part forming an upper guide skirt and a second part of larger diameter forming an upper head, and

an upper chamber provided with a shoulder encircling said upper guide skirt;

b. at least one intermediate stage comprising an intermediate piston defining a central bore through which a portion of the fastener passes and comprising a first part forming an intermediate guide skirt and a second part of larger diameter forming an intermediate head contacting the upper guide skirt of said upper piston, the thickness of said intermediate guide skirt being less than the thickness of said upper guide skirt; and

an intermediate chamber provided with the shoulder encircling said intermediate guide skirt;

c. a lower stage comprising a lower piston defining a central bore through which a portion of the fastener passes, and comprising a first part forming a lower guide skirt and a second part of larger diameter forming a lower head, and



a lower chamber provided with a shoulder encircling said lower guide skirt; and

d. means for introducing an hydraulic fluid under pressure into said chambers near said shoulders;

whereby the deformations due to the compressive forces of each piston on the next upper piston and to the radial pressure from the hydraulic fluid of the guide skirts of the various pistons are substantially equalized.

4,074,891

WINDING MECHANISM-DRIVE, PARTICULARLY FOR CONSTRUCTION CRANES OR LIKE HOISTING DEVICES

Kaspar Ritter, Kirchbeim, Techk, Germany, assignor to KOPAT Gesellschaft fur Konstruktion, Entwicklung und Patentverwertung m.b.H. & Co. KG, Boll Kreis Goppingen, Germany

Filed Dec. 18, 1975, Ser. No. 641,737

Claims priority, application Germany, Dec. 20, 1974, 2460463

Int. Cl.[2] B66D *1/30*

U.S. Cl. 254—150 FH **6 Claims**

1. In a winding mechanism-drive, particularly for construction cranes or like hoisting devices, comprising a rotary current-electromotor, and a hydrostatic transmission with electronic - hydraulic servo-regulation for infinite variations of feeding speeds and feeding moments, the transmission having a hydraulic motor part with a drive shaft operatively connected with a cable drum preferably by means of a mechanical reduction transmission, and a spring force-actuated locking brake for the cable drum automatically electro-hydraulically being released in a balanced condition between load moment and drive moment, the improvement comprising

a locking brake including a quasi- stationary part, said quasi-stationary part being slightly-limitedly pivotally mounted about an axis concentric to the drive shaft of the hydraulic motor part, bearing means concentric with said drive shaft for pivotally mounting said quasi-stationary part,

release circuit means for releasing said locking brake,

an electric switch means electrically connected in said release circuit means and mechanically operatively connected with said quasi-stationary part of said locking brake for actuation of said release circuit means for the automatic release of said locking brake only upon a minimum predetermined pivotal movement of said quasi-stationary part of said locking brake in a direction of lifting.

4,074,892

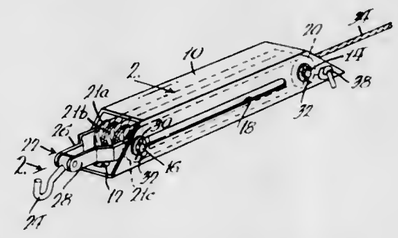
PLURAL BEARING AND SHEAVE ASSEMBLY

Peter O. Harken, Pewaukee, Wis., assignor to Vanguard, Inc., Pewaukee, Wis.

Filed Sept. 20, 1976, Ser. No. 724,327

Int. Cl.[2] B66D *3/04*

U.S. Cl. 254—188 **10 Claims**



1. A plural rotating assembly comprising shaft means, a plurality of rotatable members around said shaft means and being spaced therefrom, ball bearing means associated with each of said rotatable members and providing bearing support between respective rotatable members and said shaft means, said ball bearing means of a first rotatable member being exposed at one side of said member, an adjacent rotatable member at said one side having a surface in bearing contact with the ball bearing means of said first member with said first and adjacent members being otherwise spaced from each other.

10. A method for assembling a plurality of ball bearing supported rotatable members on a shaft comprising the steps of first providing a plurality of rotatable members having an annular body and an axially inwardly projecting circular web on one side thereof defining an open recess with said body, and; second, irrespective of order, placing a set of balls in said open recess and threading said rotatable member on said shaft, and third, threading an additional rotatable member onto said shaft in accordance with said second step with the web of said second member facing the set of balls of said first member.

4,074,893

FENCE

George E. Coltrin, El Monte, Calif., assignor to Adams & Coltrin, Inc., Industry, Calif.

Filed Mar. 8, 1976, Ser. No. 664,824

Int. Cl.[2] E04H *17/16*

U.S. Cl. 256—21 **12 Claims**

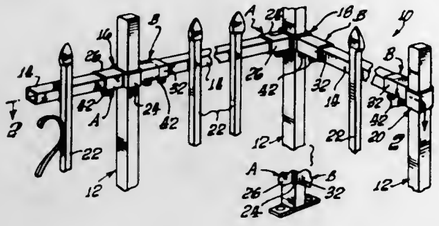
1. A fence comprising:

a plurality of upright posts arranged in a row,

a rail extending between each pair of adjacent posts and having a length less than the spacing between the respective posts,

first coupling means connecting one end of each rail to the adjacent post comprising a collar slidable on the respec-

tive post, and a first coupling sleeve on said collar slidably receiving said one rail end in its endwise direction, and second coupling means connecting the other end of each rail to the adjacent post comprising a collar slidable on the



respective post, a radially projecting lug on the latter collar coaxially aligned with said other rail end, and a second coupling sleeve slidable on and disposed in bridging relation to said lug and latter rail end.

4,074,894

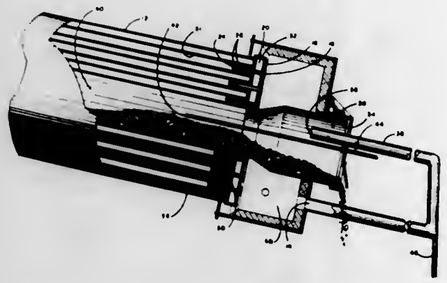
ASPHALT-AGGREGATE RECYCLE

Robert L. Mendenhall, 1770 Industrial Road, Las Vegas, Nev. 89102

Division of Ser. No. 488,518, July 15, 1974, Pat. No. 4,000,000, which is a continuation-in-part of Ser. No. 286,613, Sept. 5, 1972, abandoned, and a continuation-in-part of Ser. No. 360,464, May 15, 1973, Pat. No. 3,845,941. This application Aug. 30, 1976, Ser. No. 697,322

Int. Cl.² B28C *1/22*

U.S. Cl. 366—7 **1 Claim**



1. In a process for preparing an asphalt-aggregate composition from used aggregate-asphalt compositions introduced into an input end of a heated mixing chamber and gradually heated and mixed while being directed to an output end of said chamber, the improvement comprising venting a gaseous mixture of combustible hydrocarbon volatiles and moisture given off by said heated asphalt at the output end of said chamber through a cooling passageway to condense said moisture, removing said condensed moistures from said passageway, and directing said combustible hydrocarbon volatiles into a combustion chamber for heating said mixing chamber.

4,074,895

TORCH AND CUTOFF TABLE ARRANGEMENT

Alfred J. Capriotti, Falls Township, Bucks County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 603,836, Aug. 11, 1975, abandoned. This application Jan. 28, 1977, Ser. No. 763,445

Int. Cl.² B23K *7/00*

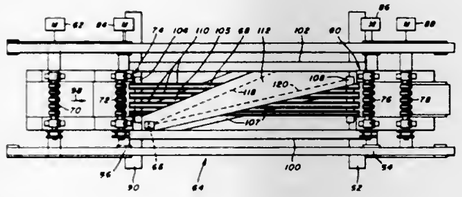
U.S. Cl. 266—50 **12 Claims**

1. A torch and cutoff table arrangement for selectively cutting a workpiece moving in a given direction across the cutting table, the workpiece having a given rate of movement established between a maximum rate and a minimum rate, said cutoff table apparatus including:

means for moving the workpiece toward the cutting table, said moving means having both a minimum and a maximum velocity;

means for removing the workpiece from the cutting table;

means for cutting the workpiece, said cutting means being movable in a direction normal to said given direction and being simultaneously movable at the same rate and direction as the workpiece, the cutting means having an established maximum speed and an established minimum speed; and



fixed support means defining the cutting table, said support means having means defining a void in the support means configured of a size and shape which is substantially equal to that area defined by the permutations of the maximum and minimum speeds of the workpiece and the cutting means, no portion of said fixed support means extending within said void or below said voided area, thereby preventing the cutting of said support means or the build-up thereupon of slag or waste product from the cutting operation.

4,074,896

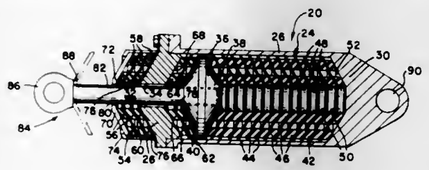
CUSHION COMPRESSION STRUTS FOR BULLDOZER BLADES

Larry G. Eftefield, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 29, 1976, Ser. No. 671,640

Int. Cl.² B60G *11/22*

U.S. Cl. 267—139 **7 Claims**



1. Apparatus for cushioning shock impact to a bulldozer blade or the like, comprising:

cylinder means comprising a cylinder body and first and second end portions secured relative thereto;

rod means extending through the first end portion and movable relative to the cylinder means in one and the other directions;

piston means secured to the rod means within the cylinder means between the first and second end portion thereof;

first cushioning means positioned within the cylinder means between the piston means and second end portions; and

second cushioning means positioned outwardly of the first end portion and adjacent the rod means, the first and second cushioning means providing that movement of the rod means in one direction relative to the cylinder means is resisted initially by the first cushioning means, and subsequently by the first and second cushioning means.

4,074,897

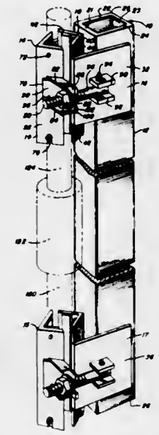
REINFORCING BAR ALIGNER AND CLAMP

Frederick H. Behn, St. Petersburg, Fla., assignor to Construction Innovations, Inc., Rolling Meadows, Ill.

Filed Nov. 4, 1976, Ser. No. 738,879

Int. Cl.² B25B *1/20*

U.S. Cl. 269—43 **2 Claims**



1. A reinforcing bar aligner and clamp for holding reinforcing bars substantially vertical during splicing, comprising: a first clamp adapted for releasable connection to a fixed lower reinforcing bar, said first clamp having a first inner V-jaw, a first outer jaw and a first latch selectively connectable between said first inner V-jaw and said first outer jaw, said first inner V-jaw having a first inner jaw plate and a second inner jaw plate formed integral with and perpendicular to said first inner jaw plate, said first outer jaw being rotatable about a pivot toward and away from said first inner V-jaw, said first inner V-jaw and said first outer jaw each having a first shim pin aperture and a first shim slot, said first latch having a first threaded rod having a first rotatable threaded connector connected thereto which is selectively pivotable into engagement with said first outer jaw to hold said lower reinforcing bar in fixed engagement with said first clamp; a first plurality of elongated rectangular removable shims, each elongated rectangular removable shim of said first plurality having a shim pin fitted into one of said first shim pin apertures and a threaded shim connector fitted to one of said first shim slots; a first pair of rectangular mounting plates rigidly connected to said first clamp; a square cross-section elongated support art rigidly connected to said first pair of rectangular mounting plates at a first end; a second pair of rectangular mounting plates rigidly connected to said square cross-section elongated support arm adjacent a second end of said square cross-section elongated support arm; and a second clamp rigidly connected to said second pair of mounting plates, said second clamp having a second inner V-jaw, a second outer jaw and a second latch selectively connectable between said second inner V-jaw and said second outer jaw, said second inner V-jaw having a first inner jaw plate and a second inner jaw plate formed integral with said perpendicular to said first inner jaw plate, said second outer jaw being rotatable about a second pivot toward and away from said second inner V-jaw, said second inner V-jaw and said second outer jaw each having a second shim pin aperture and a second shim slot, said second latch having a second threaded rod having a second rotatable threaded connector connected thereto which is selectively pivotable into engagement with said second outer jaw to hold an upper reinforcing bar substantially vertical in fixed substantially abutting end-to-end proximity with said lower reinforcing bar, said second clamp being identical to, and collinear with, said first clamp, said second clamp being separated from said first clamp by a center-to-center distance greater than 0.05 of a length of the longer of said upper and lower reinforcing bars; and a second plurality of elongated rectangular removable shims, each elongated rectangular removable shim of said second plurality having a shim pin fitted into one of said second shim pin apertures and a threaded shim connector fitted to one of said second shim slots.

4,074,898

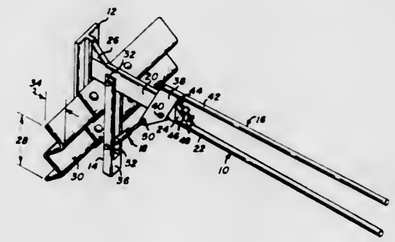
METAL BEAM GUARD RAIL ASSEMBLING CLAMP

Charles G. Samuelson, 1136 Riverside Drive, Rio Dell, Calif. 95562

Filed Mar. 11, 1977, Ser. No. 776,595

Int. Cl.² B25B *1/14*

U.S. Cl. 269—228 **5 Claims**



1. A clamp for compressing guard rail sections comprising:

a fixed jaw;

a first handle rigidly attached to said fixed jaw;

a movable jaw pivotally attached to said first handle and facing said fixed jaw, said first and second jaws defining a clamping aperture therebetween;

an elongated lever member pivotally attached at its midpoint to said first handle;

a second handle pivotally attached to one end of said lever member; and

an elongated linkage member having one end pivotally attached to a midpoint of said movable jaw, and its other end pivotally attached to the other end of said lever member, the length of said linkage member and the portion of said lever member extending from its pivotal attachment point to its said other end being selected to provide an overcenter locking means to lock said movable jaw in a predetermined closed position relative to said fixed jaw.

4,074,899

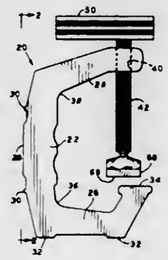
C-CLAMP

Samuel A. Hochstetler, P.O. Box 97, Topeka, Ind. 46571

Continuation of Ser. No. 675,978, April 12, 1976, abandoned. This application May 16, 1977, Ser. No. 797,070

Int. Cl.² B23Q *3/00*

U.S. Cl. 269—249 **23 Claims**



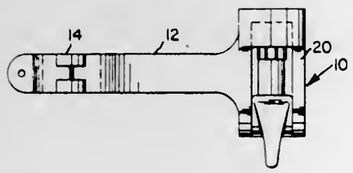
1. A C-clamp comprising:

a C-frame having a base section;

a first jaw extending from one end of the base section and a second jaw extending from the other end of the base

section to define a jaw opening; a first clamp pad affixed to the free end of said first jaw and facing in the general direction of the free end of said second jaw; an elongate pressure screw threadedly mounted in the free end of said second jaw and movable in a longitudinal direction toward and away from said first clamp pad upon threaded rotation of said screw relative to said second jaw; said screw having at one end a polygonal head member having two substantially parallel sides; an elongate handle having a pair of spaced, opposed, parallel walls depending from a base to define a channel-shaped cross-section for slidably receiving said head member; said parallel sides of said head member being in close sliding engagement with the inner surfaces of said walls; said pressure screw having a second clamp pad mounted at the opposite end thereof in facing relation to said first clamp pad.

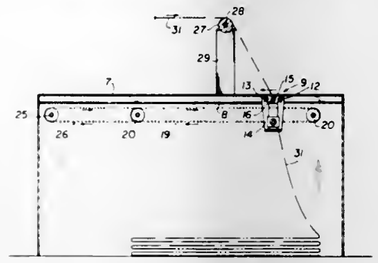
4,074,900
DENTAL AMALGAM CAPSULE HOLDER
Frederick H. Drury, Winterburn, Canada, assignor to Weatherford Oil Tool Company, Ltd., Edmonton, Canada
Filed Jan. 11, 1977, Ser. No. 758,511
Claims priority, application Canada, Nov. 3, 1976, 264839
Int. Cl.² B25B *5/04*
U.S. Cl. 269—254 R **11 Claims**



1. A capsule holder for use on a vibrator comprising a body having first locating means for receiving a first end of a capsule while spring means associated with said locating means maintains an outwards force on said first end of the capsule, said locating means allowing pivotal movement of the capsule during its insertion therein, said body having pivot means displaced from said first locating means and carrying second locating means for the second end of the capsule, said second locating means being pivotable from a first position in which the ends of a capsule may be inserted between said two locating means with little compression of the spring means, through a dead center position in which the ends of the capsule are aligned with said pivot means, and to a second position in which the spring means hold the capsule firmly against the second locating means which latter means are prevented from moving beyond said second position.

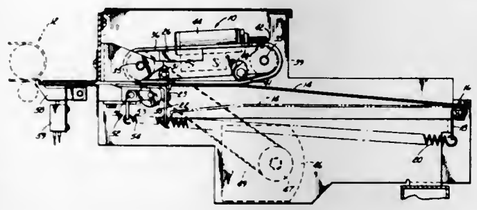
4,074,901
FOLDER FOR WEB MATERIALS
Frank Catallo, 84 Wheatley Road, Old Westbury, N.Y. 11568
Filed Mar. 31, 1977, Ser. No. 783,171
Int. Cl.² B65H *45/20*
U.S. Cl. 270—79 **5 Claims**

1. A folder for a continually advancing fabric web and including a pair of horizontal longitudinally extending spaced parallel frame members each provided with a pair of vertically spaced upper and lower flanges, the flanges of one of said frame members being opposed to the flanges of the other thereof, a transverse guide roll assembly pivotally and reciprocably supported at each end by said lower flanges and including a pair of spaced parallel rotatable guide rolls, each of said guide rolls being mounted upon a shaft having each end extending into the space between the upper and lower flanges of its associated frame member, a drive roller affixed to the extending end of each said guide roll shaft and having a diameter to fit with clearance between the said associated upper and lower flanges; means for bodily reciprocating said guide roll assembly along the flanges of said frame members; and means associated with said reciprocating means for oscillating said guide roll assembly in one direction about its said pivotal support during one direction of bodily reciprocation of said guide roll assembly and for oscillating said guide roll assembly in an opposite direction during the opposite direction of bodily reciprocation of said guide roll assembly, whereby to cause said guide rolls to be frictionally driven in the same opposed directions regardless of the direction of bodily reciprocation of said guide roll assembly by alternating contact of said drive rollers with said upper and lower flanges; said means for bodily reciprocating said guide roll assembly and said oscillating



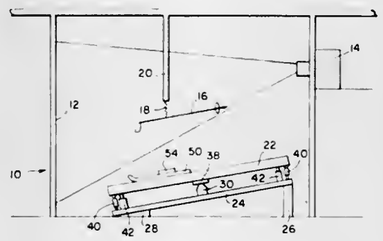
means together comprising a pair of constantly driven endless traverse chains each provided with a laterally projecting stub axle affixed to a link thereof, and a pair of rock yoke and slide connections extending between the shafts of said guide rolls and said stub axles, said rock yokes each being provided with a freely rotatable roller engageable with an associated lower flange for pivotally supporting the associated end of said guide roll assembly, the axes of the shafts of said guide rolls lying in a horizontal plane above that containing the axis of said rock yoke rollers when said rock yokes are in a vertical dead center position, each of said rock yoke rollers being located intermediate the associated shaft rollers and disposed with its lower edge below the lower edges of said shaft rollers.

4,074,902
SHEET FEEDER
Wilburn F. Bradbury, Northbrook, Ill., assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio
Filed July 23, 1976, Ser. No. 708,053
Int. Cl.² B65H *3/04*
U.S. Cl. 271—34 **2 Claims**



1. A sheet feeder, comprising:
a sheet supply support bed;
a sheet separating belt means comprised of two spaced drums and at least one endless belt of high friction characteristics reeved about the drums;
first power means to drive said drums and belt in a direction to move a bottom run of said belt the direction of feed;
a document support bed extending adjacent said bottom run in an angular relationship normally out of document feed contact with said belt;
a retard roller having a one-way clutch, said roller mounted in contact with said belt between said drums, said clutch permitting rotation only in a counter-feed direction;
a pressure foot positioned within the loop of the belt between the drums with a second power means to press the belt into contact with said bed by distending the belt; and
control means for distending the belt prior to full drive of the belt by said first power means to thereby stretch the belt in a reverse drive direction by a small increment prior to the belt drive and thereby increment the retard roller, whereby a fresh retard surface is brought into service with each sheet feed cycle.

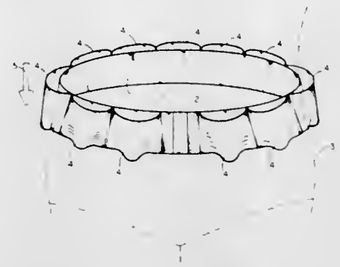
4,074,903
SNOW SKIING SIMULATION APPARATUS
Alphonzo Diez de Aux, Suite 4, 1646 Victoria Park Ave., Scarborough, Ontario, Canada (M1R-1P7)
Filed July 8, 1976, Ser. No. 721,273
Int. Cl.² A63G *31/16*
U.S. Cl. 272—16 **8 Claims**



1. Snow ski simulation apparatus comprising:
a sloping platform for supporting a skier,
means for projecting an image of a ski slope in front of said platform, and
means connected to said platform for simulating the traverse of the ski slope image projected in front of said platform, said simulation means including means for reciprocably mounting the boots of a skier supported on said platform, said reciprocal mounting means including
a harness for a pair of boots,
a base plate on said platform below each of said harnesses, each of said harnesses including stop means for limiting the reciprocal movement of said harnesses relative to said base plate,
a plurality of ball bearings mounted on each of said base plates, and
means on said boot harnesses reciprocally receiving said ball bearings,
means for rotatably mounting each of said base plates, said base plate rotation mounting means including a ball and socket universal joint, the ball of said joint being connected to said base plate, and the socket being on said platform, said socket being formed in the top of a cylinder, said cylinder including a chamber filled with hydraulic fluid and a fixed piston therein, said cylinder being reciprocal relative to said piston against the force of said fluid.

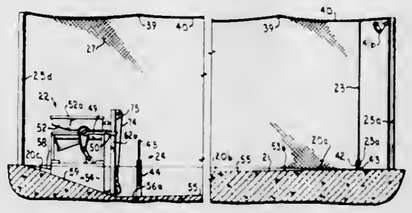
4,074,904
SWIMMING WORKOUT SUIT
Agostino Arcidiacono, 8838 La Jolla Scenic Drive, La Jolla, Calif. 92037
Filed Oct. 4, 1976, Ser. No. 729,105
Int. Cl.² A63B *21/00*
U.S. Cl. 272—116 **2 Claims**

1. A swimming workout suit comprising in combination:
a primary belt shaped surface;
a secondary belt shaped surface substantially of the same width and longer than said primary surface;
said secondary surface flatly joined to said primary surface at selected intervals forming a plurality of open ended substantially semi-cylindrical vanes in a integral structure;
said vanes formed by the outer wall of said primary surface and by the inner wall of said secondary surface;
said vanes disposed around said suit and oriented in the direction of the swimmer motion;
said walls forming a fixed size inlet aperture at one end of said vane and an adjustable size outlet aperture at the other end of said same vane;



said adjustable aperture provided with means to match and adhere selected portions of the terminal border of said secondary surface with that of the primary surface and thereby selectively control the water flow through said vane and the resistance provided by said vane;
means associated with said belt shaped suit primary surface ends to secure said suit around a swimmer body.

4,074,905
BASEBALL BATTING CAGES
Thaine High, 1810 W. 23rd St., Lawrence, Kans. 66044
Filed July 15, 1976, Ser. No. 705,410
Int. Cl.² A63B *69/00*
U.S. Cl. 273—26 D **5 Claims**



1. A limited area batting cage comprising, in combination, a substantially rectangular playing area and surface having a length substantially greater than 61 feet and a width substantially greater than 10 feet,
a home plate zone positioned adjacent one end of the area and also substantially centrally thereof,
a ball pitching machine having an elevated ball storage hopper and a ball throwing arm associated therewith adjacent the other end of the area,
said pitching machine positioned with its throwing arm aligned substantially along the central, longitudinal axis of said rectangular playing area, whereby a ball thrown by the machine moves substantially longitudinally axially of the area and to the center of the home plate zone,
at least the periphery of the said playing area, in its entirety, horizontal and level,
the said rectangular playing area and surface framed by vertical screening at the periphery thereof on all four sides, the rectangular playing area thus having two end wall and two side wall screens,
a ceiling screen roofing the entire enclosed area and surface,

a pitched ball-receiving screen positioned behind home plate,

the playing area and surface being downwardly sloped from the longitudinal sides toward said central longitudinal axis and sloped substantially uniformly from a point well back of the center of the home plate zone to closely adjacent the front of the pitching machine in such manner that a transverse vertical section through the playing area and surface between the home plate zone and pitching machine will give a substantial V-shaped cross-sectional profile with the depth and slope of the V increasing going toward the pitching machine from the home plate zone,

the pitching machine elevated on a pedestal block which is level with the horizontal periphery of the playing area,

the playing area to the sides of the pitching machine and any of said playing area existing to the rear of the pitching machine and the block mounting same being recessed, sloped and configured so that all balls reaching the playing area zone past the front of the pitching machine and block supporting same will be gravity returned to the front of the block and pitching machine, and

an automatic ball pickup and return device positioned in front of the pitching machine for picking up played balls and returning them to the pitching machine ball storage hopper.

4,074,906

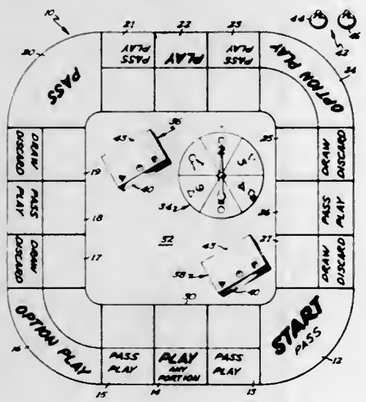
GAME AND APPARATUS

David L. Magiera, Bloomington, Minn., assignor to Wicks & Nemer, P.A., Minneapolis, Minn.

Continuation-in-part of Ser. No. 573,019, April 30, 1975, abandoned. This application Aug. 30, 1976, Ser. No. 718,948

Int. Cl.² A63F *3/00, 5/00*

U.S. Cl. 273—243 **21 Claims**



1. Game apparatus for playing by at least two persons comprising, in combination: a plurality of game cards, with the game cards having a first portion and a second portion, with the first portion being separate from the second portion, with the first portion having a first numerical value associated therewith, and with the second portion having a second numerical value associated therewith; means for separately identifying the first portion from the second portion of the game cards; game card playing chance taking apparatus for randomly determining the play of the game cards; and chance taking apparatus for randomly identifying either the first or second portion of the game cards by indicating the corresponding identifying means.

4,074,907

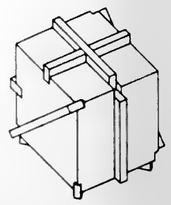
INTERFITTING GAME BOARD AND PLAYING PIECES

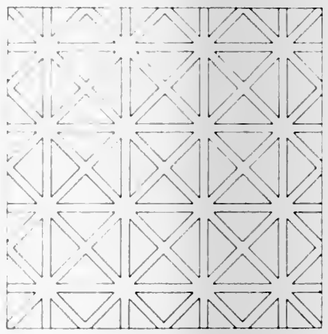
James David Curtis, Santa Rosa, Calif., assignor to James David Curtis, Santa Rosa, Calif.

Filed July 19, 1976, Ser. No. 698,100

Int. Cl.² A63F *3/00*

U.S. Cl. 273—282 **1 Claim**





1. A game comprising a playing board,

evenly spaced vertical, horizontal and diagonal grooves in said playing board, said diagonal grooves arranged such that they intersect at right angles in the center of squares formed by said vertical and horizontal grooves,

a plurality of identical pairs of cubical playing pieces,

each edge of said cubical playing pieces having a length not greater than the length of the edges of the squares formed by said horizontal and vertical grooves,

a plurality of different patterns of raised strips, each of said patterns being matable with said grooves of said playing board,

each face of said cubical playing pieces having one of said plurality of patterns of raised strips provided thereon.

4,074,908

DOUBLE ACTING DYNAMIC SEAL WITH E-SHAPED SPRING AND L-SHAPED SEALS

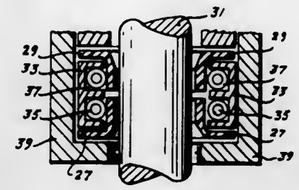
Stanley E. Spencer, Palos Verdes Estates, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 9, 1977, Ser. No. 776,039

Int. Cl.² B65D *53/00*

U.S. Cl. 277—44 **3 Claims**

1. A double acting dynamic piston seal assembly for use with a cryogenic pump and the like, said seal assembly comprising a seal holder, a piston movable through said seal holder, two L-shaped seals positioned around said piston with their vertical legs adjacent the piston, said L-shaped seals having the free end of each vertical leg adjacent the other and the horizontal legs extending outwardly away from said piston, an E-shaped spring retainer positioned between the outwardly extending horizontal legs of said L-shaped seals and said seal holder, the legs of said E-shaped spring retainer extending inwardly toward said piston and engaging the horizontal legs of said L-shaped seals, and a pair of wound spring seal expanders positioned between the inwardly extending legs of said E-shaped spring retainer and between the vertical legs of said



L-shaped seals and the upright portion of said E-shaped spring retainer thereby providing a piston seal assembly capable of sealing under the required high pressure conditions.

4,074,909

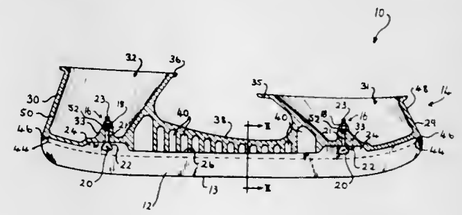
ICE SKATE

Hugh E. Baikie, Chateauguay Center, Canada, assignor to Kenbudge Holdings Limited, Montreal, Canada

Filed Aug. 18, 1976, Ser. No. 715,617

Int. Cl.² A63C *1/02*

U.S. Cl. 280—11.12 **21 Claims**



1. An ice skate comprising:

a. an elongated blade having an ice-engaging edge and an upper edge opposite the ice-engaging edge;

b. a superstructure made of plastic material for holding the blade, said superstructure defining a groove for receiving said upper edge of the blade;

c. a plurality of bolts for attaching the blade to the superstructure, each bolt having an enlarged head;

d. a plurality of recesses in the blade defined by said upper edge for receiving and retaining said enlarged heads of the bolts;

e. means for retaining said bolts under tension in said superstructure when said upper edge is located in said groove, whereby said blade is firmly held in said groove by said bolts; and

f. wherein the ends of said bolts remote from said heads are threaded, and said retaining means comprise threaded nuts which can be screwed onto said ends and which can be tightened against said superstructure to hold said bolts in place under tension.

4,074,910

DISC BRAKE APPARATUS SUITABLE FOR BICYCLES

Neil R. Hoffman, Mequon, and Johannes H. Jansen, Milwaukee, both of Wis., assignors to Brake Engineering, Inc., Milwaukee, Wis.

Division of Ser. No. 683,484, May 5, 1976, Pat. No. 4,036,328, which is a division of Ser. No. 606,711, Aug. 21, 1975, Pat. No. 3,985,391. This application Apr. 14, 1977, Ser. No. 787,354

Int. Cl.² B62L *1/00*

U.S. Cl. 280—289 R **7 Claims**

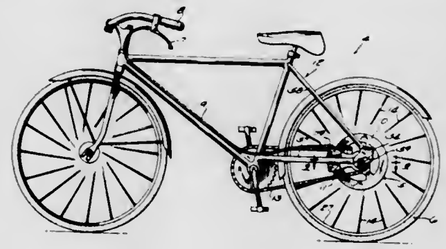
1. A disc brake caliper assembly for a wheel of a vehicle such as a bicycle, said wheel being journaled on a non-rotating shaft, and said vehicle having a frame and having cooperating attachment means on its frame and on said shaft, on one end portion thereof, for releasably fixing said shaft in relation to the frame, said caliper assembly being of the type comprising a body that carries a pair of opposing brake pads, one of which can be actuated towards the other against bias to cause the brake pads to clampingly engage a rotor that rotates with the wheel, said caliper assembly being characterized by:

A. a substantially cup-shaped adapter

1. having a hole in its end wall through which said end portion of the shaft can pass with a close fit,

2. the end wall of said adapter having inner and outer surfaces clampingly engageable by said attachment means to confine the adapter against movement relative to the shaft, and

3. the side wall of said adapter having a cylindrical exter-



nal surface and having an inside diameter and an axial length such as to be spaced from rotating parts of the wheel adjacent to said attachment means; and

B. the body

1. having a bore near one end thereof in which said adapter is received with a sliding fit, and

2. having near its other end opposing bumpers that extend in directions parallel to the axis of said bore and are spaced apart a distance to snugly embrace a part on said frame so that they can cooperate with said part in confining the body against rotational movement about said adapter while permitting the body to have limited movement in said directions for engagement of both brake pads against the rotor under mutual reaction forces.

4,074,911

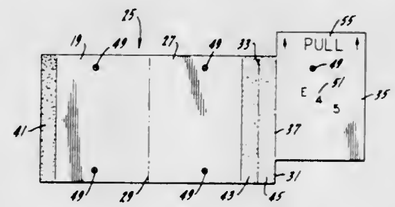
TAMPER PROOF LOTTERY TICKET

Charles J. Stipek, Jr., Riverside, Ill., assignor to Bates Printing Specialties, Inc., Cicero, Ill.

Filed May 24, 1976, Ser. No. 689,094

Int. Cl.² B42D *15/00*

U.S. Cl. 283—6 **4 Claims**



1. An elongated foldable, one piece paper blank for a ticket usable in a lottery, game of chance and the like, including:

a first panel of rectangular configuration,

a second panel of rectangular configuration connected to one end edge of the first panel by a fold line,

said second panel having substantially the same dimensions as said first panel,

a third panel of rectangular configuration connected to the opposite end edge of said second panel by a fold line,

said third panel having a length less than that of said first or second panels,

a fourth panel of rectangular configuration connected to the opposite end edge of said third panel by an easily breakable interrupted cut line,

said fourth panel having approximately the same width as said first, second and third panels and a length greater than that of said third panel but less than that of either said first and second panels with said fourth panel being offset laterally relative to said first, second and third panels,

said third and fourth panels being foldable about said fold line between said second and third panels to position the third and fourth panels against said second panel with a portion of said fourth panel extending laterally of said second panel,

said first panel being foldable about its fold line with said second panel to extend over said second and said folded third and fourth panels, and

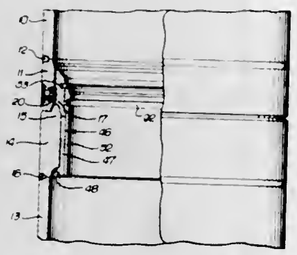
adhesive means permanently fastening said third panel to said second panel and said first panel to said third panel.

4,074,912

RELEASABLE RIGID PILE CONNECTOR APPARATUS

Bernard H. Van Bilderbeek, Ventura, Calif.; John E. Maingot, Houston, Tex., and James M. Walker, Oxnard, Calif., assignors to Vetco Offshore Industries, Inc., Ventura, Calif.

Filed Sept. 20, 1976, Ser. No. 724,635
Int. Cl.² F16L *37/00*
U.S. Cl. 285—39 **11 Claims**



1. A connector comprising a tubular pin structure, a tubular box structure, one of said structures including first and second sections, means releasably securing said sections to each other, the other of said structures and said first section having abutting transverse surfaces, means for connecting said second section and said other of said structures to each other to apply a compressive preload to said box structure and pin structure, and means for releasing said securing means to permit said second section and said other of said structures to be released from said first section.

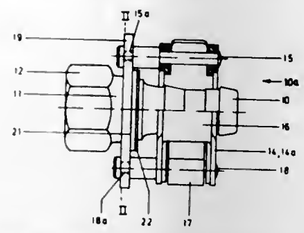
4,074,913

DEVICE FOR RELEASABLE FASTENING OF TUBE OR PIPE ENDS

Karl Weinhold, Im Jagdfeld 43, 4040 Neuss, Germany

Filed May 27, 1976, Ser. No. 690,727
Claims priority, application Germany, May 27, 1975, 2523338
Int. Cl.² F16L *33/12*
U.S. Cl. 285—114 **13 Claims**

1. A device for releasable fastening of tube or pipe ends comprising two shell parts, a pivot bolt connecting said two shell parts at one end of said two shell parts, a locking arrangement for connecting said two shell parts at the other end of said two shell parts, a further pivot bolt hinging said locking arrangement, a connecting tube arrangement associated with said two shell parts and for connection to said tube or pipe end, holding means on said two shell parts for holding said tube or pipe end in connection with said connecting tube arrangement when said locking arrangement is actuated and a mounting plate defining a circular central opening for locating said mounting plate around said connecting tube arrangement, said mounting plate including a slot extending from said central opening with a circular path along part of its length with a radius of curvature centered in said circular central opening,



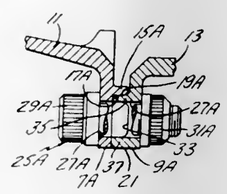
said slot receiving one of said pivot bolts, said mounting plate further including an outwardly open recess in a region opposite to said part of said slot with said circular path and for receiving the other of said pivot bolts.

4,074,914

HIGH PRESSURE LIGHTWEIGHT FLANGES

Rudolph J. Novotny, Stuart, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed July 28, 1975, Ser. No. 599,919
Int. Cl.² F16L *23/00*
U.S. Cl. 285—405 **6 Claims**



1. A flange construction comprising a first member, said first member having a first radially extending annular flange on one end thereof, a second member, said second member having a second radially extending annular flange on one end thereof, said first radially extending annular flange having an annular axially extending outer surface located inwardly from the outer edge of said flange, said second radially extending annular flange having an annular axially extending flange means located radially outwardly of said outer surface, said annular axially extending flange means of said second flange having an annular axially extending inner surface, said outer surface and inner surface being formed to have an interference or "snap" engagement fit, said annular axially extending flange means comprising two axially extending flanges both of which are located radially outwardly of said outer surface, said two axially extending flanges having a length so that the ends of the two axially extending flanges will engage said first flange, means for clamping said first flange to said second flange so that a clamping force extends along a longitudinal line passing through the mating outer surface and inner surface.

4,074,915

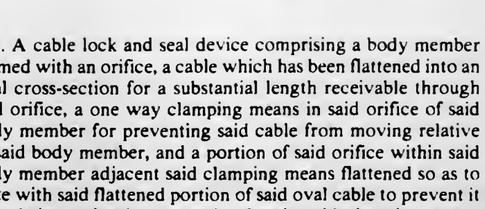
SAFETY DOOR LATCH MECHANISM

Harry E. Saffer, 219 Allen St., Michigan City, Ind. 46360

Filed Oct. 4, 1976, Ser. No. 728,946
Int. Cl.² E05C *17/36*
U.S. Cl. 292—262 **9 Claims**

1. In a vehicle door assembly having a safety latch mechanism, said assembly comprising a door having inner and outer sides, a frame for said door, hinged means pivotally connecting said door to said frame, latch means comprising an elongated male element on said frame and having an end portion mating with female elements on said door, manually operable latch release door handle means connected to said female elements to disengage same from said male element on said frame to allow pivotally movement of said door relative to said frame, the improvement comprising:

sleeve mounting means attached to said frame for normally receiving an end portion of said male element distal to said latch means; connecting means extending through said sleeve means and between an end of said male element



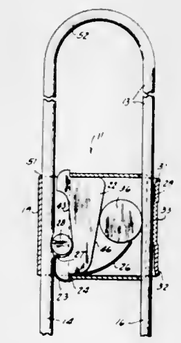
normally received in said sleeve means and said frame for permitting displacement of said male element out of said sleeve means only a predetermined distance; releaseable retaining means carried by said sleeve means and male element for retaining the end portion of said male element therein and for releasing the end of said male element responsive to a predetermined torque applied to said latch means so that under abnormal stress said door will open relative to said frame only a predetermined amount when said male element is released from said sleeve mounting means.

4,074,916

FLAG SEAL INCLUDING FLATTENED SIDE-WALL AND OVAL CABLE

Robert Schindler, Angola, Ind., assignor to Brammall, Inc., Angola, Ind.

Filed Feb. 18, 1976, Ser. No. 658,905
Int. Cl.² G09F *3/00*; F16G *11/04*
U.S. Cl. 292—307 R **1 Claim**



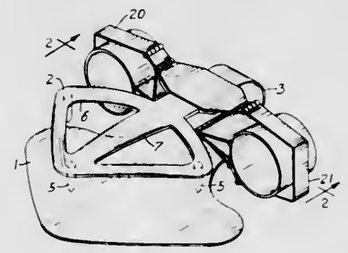
1. A cable lock and seal device comprising a body member formed with an orifice, a cable which has been flattened into an oval cross-section for a substantial length receivable through said orifice, a one way clamping means in said orifice of said body member for preventing said cable from moving relative to said body member, and a portion of said orifice within said body member adjacent said clamping means flattened so as to mate with said flattened portion of said oval cable to prevent it from being twisted or turned, wherein said clamping means comprises a cam member with an inclined surface and a disc which rides on said inclined surface and engages said flattened portion of said oval cross-sectional cable, and spring means urging said disc up said inclined surface, wherein said body member has a second orifice and said cam member has a second inclined surface, and a second disc which rides on said second inclined surface, and wherein one end of said cable in receivable into said second orifice and is locked to said body member by said second disc.

4,074,917

PASTRY SERVING IMPLEMENT

Arthur Federico, 4 Explorer Road, Brigantine, N.J. 08203

Filed Aug. 5, 1976, Ser. No. 712,029
Int. Cl.² A47J *43/28*
U.S. Cl. 294—7 **2 Claims**



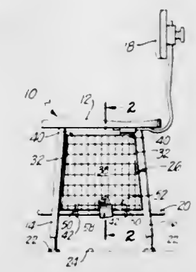
1. A utensil for serving pastry and the like comprising a peel blade adapted to be introduced beneath the pastry for supporting the same and a gripping blade movable relatively to each other about a common axis, substantially U-shaped resilient yielding means integral with the blades tending to bias the blades away from each other, manually actuatable means for manipulating the utensil and linkage interconnecting said manually actuatable means and said blades for moving said blades toward each other in opposition to the bias of said yielding means in response to the actuation of said manually actuatable means, said linkage being responsive to relative movement of said manually actuatable means in substantial parallelism with said common axis, and said manually actuatable means comprise spaced elements movable toward and away from each other relatively to said peel blade to move the gripping blade toward and away from the peel blade.

4,074,918

CHAIR AND DETACHABLE LOCKER

Bernard Kotzin, Jr., 7411 Flight Ave., Los Angeles, Calif. 90045

Filed Mar. 16, 1977, Ser. No. 777,969
Int. Cl.² A47C *7/62*
U.S. Cl. 297—192 **5 Claims**



1. In the combination of a chair having four legs which are spaced from one another, a seat supported by the legs, and an article support located beneath said seat of said chair the improvement which comprises:

said article support consisting of an elongated locker having a top, a bottom, two side walls, a closed end, an open end, and a door capable of being manipulated between open

and closed positions located at said open end for providing access to the interior of said locker and for closing off the interior of said locker,

said article support being located beneath said seat and between said legs of said chair so that one of said side walls is adjacent to a set of two of said legs and the other of said side walls is adjacent to a set consisting of the other two of said legs and being located so that said door is accessible,

at least one member secured to said chair and extending between said sets of legs beneath the bottom of said locker,

a locking arm means having first and second ends, said first end being pivotally mounted on said locker remote from said open end and fitting around said member so that said second end is located in proximity to said door, and

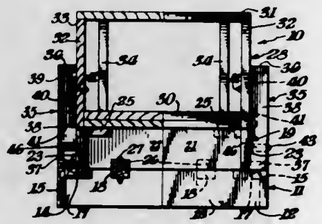
cooperating securing means on said arm structure and on said door for use in securing said door and said locking arm means to one another so as to prevent removal of said locker from said chair and so as to prevent said door from being opened when said securing means are secured to one another.

4,074,919

CHAIR FRAME FURNITURE UNIT

William R. Watts, Rte. No. 1, Box 320-1, Millsboro, Del. 19966

Filed Aug. 27, 1975, Ser. No. 608,047
Int. Cl.[2] A47C *15/00*
U.S. Cl. 297—233 **5 Claims**



1. A chair frame unit adaptable to provide sectional furniture comprising;

a. a base of substantial thickness adapted to support a seat section frame, a back frame, and at least one arm frame, and function as legs to provide high rigidity and strength to the unit, said base comprising a front beam, a rear beam, and two side beams arranged in a rectangular array rigidly connected at each of four corners; said base having lower peripheral edges adapted to engage a supporting surface substantially in their entirety;

b. a seat section frame of substantial thickness arranged and adapted to rest upon the base and rigidly and detachably affixed to the base and further adapted to support seat cushioning means, said seat section comprising a front beam, back beam, and two side beams, at least one of the seat section side beams being disposed inwardly with respect to the base side beam below it in an amount sufficient to allow an arm frame to rest atop the base and be in substantial vertical alignment with the side beam of said base while being arranged adjacent to and against the inwardly disposed seat section side beam;

c. a back frame adapted to receive back cushioning means and further adapted to rest on top of said seat section rear beam with the exterior portions of said back frame being in substantial vertical alignment with the exterior portion of the seat section side beams, said back frame comprising a bottom member, a top member, and two side members rigidly connected to each other at their corners to form a rectangular array, said back frame being rigidly and detachably affixed to the seat section frame and an arm frame; and

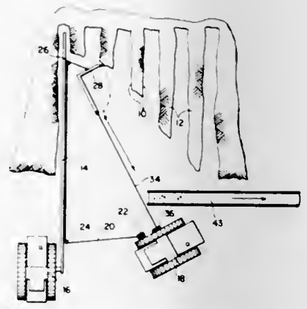
d. at least one arm frame comprised of a top member, bottom member, and two end members rigidly affixed to each other at corners to provide a rectangular array, said arm frame being adapted and disposed to rest atop the base in substantial vertical alignment with the exterior portion of the side beam of the base located below the arm frame and against the exterior portion of the adjacent side beam of the seat section frame, said arm frame being rigidly and detachably affixed to the seat section frame and the back frame.

4,074,920

MINING APPARATUS AND METHOD FOR AN AUGERED SEAM

James V. Joyce, Box E, Andover, N.Y. 14806

Filed Aug. 10, 1976, Ser. No. 713,245
Int. Cl.[2] E21C *27/30, 41/00*
U.S. Cl. 299—18 **15 Claims**



13. A method of mining coal or the like comprising inserting first elongated support means into an auger hole in a coal seam, said auger hole having an open end and a blind end, retracting coal recovery means into the auger hole by means of first cable means operatively connected to said first support means, and pulling said coal recovery means out of the auger hole along a path of travel independent of the disposition of said first elongated support means by means of second cable means mounted to second support means disposed outside of said auger hole to recover coal therefrom.

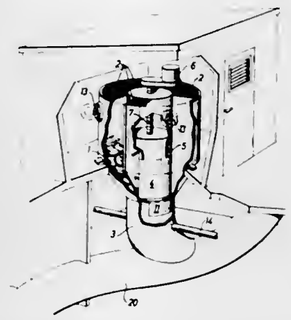
4,074,921

DEVICE FOR EMPTYING WASTE MATERIAL FROM WASTE-STORAGE CONTAINERS

Sergio de Feudis, Nacka, Sweden, assignor to AB Svenska Flaktfabriken, Nacka, Sweden

Continuation of Ser. No. 582,884, June 2, 1975, abandoned. This application Nov. 29, 1976, Ser. No. 745,811
Claims priority, application Sweden, June 5, 1974, 7407391
Int. Cl.[2] B65G *53/14, 53/46*
U.S. Cl. 302—39 **8 Claims**

1. In a system for receiving and collecting solid household waste material and for discharging the solid waste material into a pneumatic conveyor duct the improved construction which comprises a waste-storage container for the solid waste having a vertical side wall portion provided with an outlet port and having a bottom wall portion which is inclined downwardly toward said port; wall means, including said side wall portion and port, forming a valve chamber, said valve chamber having a lower end connected by a branch duct to the pneumatic conveyor duct; a valve body vertically displaceable in said valve chamber between a lower, closed position in which said port is closed by said valve body and an upper, open position in which said port is open and in which solid waste material in



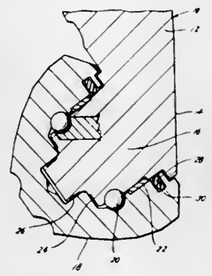
the container passes through the port into the valve chamber and then downwardly into the pneumatic conveyor duct.

4,074,922

DRILL BIT

Henry W. Murdoch, Houston, Tex., assignor to Reed Tool Company, Houston, Tex.

Continuation-in-part of Ser. No. 604,264, Aug. 13, 1975, Pat. No. 3,990,751. This application June 11, 1976, Ser. No. 695,505
The portion of the term of this patent subsequent to Nov. 9, 1993, has been disclaimed.
Int. Cl.[2] F16C *19/00*
U.S. Cl. 308—8.2 **10 Claims**



1. A drill bit, comprising

a body having a journal extending therefrom,

a roller cutter,

bearing means for rotatively mounting said roller cutter on said journal,

at least part of said bearing means including

a hard tough metal sleeve having a Rockwell C hardness of at least 35 positioned around said journal within said roller cutter, and

a metal coating on said sleeve having lubricating properties positioned between said sleeve and said journal and between said sleeve and said roller cutter,

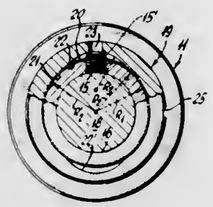
said metal coating imparting sufficient lubricity to said sleeve to prevent galling of said roller cutter and said journal.

4,074,923

LOCKING MECHANISM FOR SECURING A BEARING RING OR THE LIKE TO A SHAFT

Ralph S. Howe, Jr., New Britain, Conn., assignor to Textron, Inc., Providence, R.I.

Filed Dec. 20, 1976, Ser. No. 752,835
Int. Cl.[2] F16C *35/06*
U.S. Cl. 308—236 **19 Claims**



1. A unit-handling collar and locking device for locking the collar to a shaft or the like, comprising an annular collar body having a shaft-mounting bore and a threaded radial bore, a set screw in the threaded bore, said set screw being of length exceeding the radial extent of the threaded bore; whereby when said screw is set to clamp said body in assembled relation to a shaft in the shaft-mounting bore, the outer end of said screw projects radially beyond the threaded bore; and a locking ring circumferentially spanning said body and set screw, axial-retaining means coacting between said ring and body for retaining said ring in at least some measure of overlap with said screw, said ring having a cylindrical bore portion sized for rotational support on the radially adjacent region of said body, said last-mentioned bore being locally recessed to radially clear said set screw at a location of angular registry therewith, said ring having a radial tool-access opening externally providing tool access to said set screw when said ring is in said angularly-registered location, and the local recess of the ring bore having a set-screw engageable cam surface for enabling said set screw to ride up to engagement with the cylindrical portion of the ring bore upon relative rotation of said ring and body.

4,074,924

ELECTRICAL CONTACT SYSTEM

Maurice G. N. G. Lebecque, 83-904, Clarke Road, Port Moody, British Columbia, Canada (V3H 1L7)

Filed Oct. 29, 1976, Ser. No. 736,759
Int. Cl.[2] B60L *5/36;* B60M *1/30*
U.S. Cl. 339—20 **11 Claims**



1. An electrical contact system that comprises a power bed consisting of a base plate including at least two electrically conducting layers insulated from each other and a plurality of discrete embossments, formed on the base plate, and arranged in spaced rows, each embossment in each row being spaced from its neighbours in that row by about the same space as between the rows, each embossment being spaced from its neighbours to define with the base plate channels between the embossments;

first electrical contacts at a first part of each channel in electrical contact with a first electrically conducting layer in the base plate channel;

second electrical contacts at a second part of each channel in electrical contact with a second electrically conducting layer in the base plate;

an insulator between the first and second contacts;

means to conduct a supply of electricity to the electrically conducting layers of the base plate; and

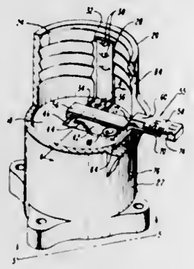
a collector having first electrical contacts to contact said first electrical contacts of the channels and second electrical contacts to contact said second electrical contacts of the channel, said collector being movable along the channels.

4,074,925

SAFETY SOCKET FOR LAMPS AND THE LIKE

Manning I. Rose, 2301 Glenheath, Dayton, Ohio 45440

Filed July 26, 1976, Ser. No. 708,353
Int. Cl.² H01R *13/44*
U.S. Cl. 339—44 R **5 Claims**



1. In a safety socket of the type having a housing with wall means defining a load receiving portion having an opening at one end for passage of the base of a light bulb or the like load, a base contact at the bottom of said load receiving portion and confronting said opening for engaging one terminal of said load and a shell contact for engaging a second terminal of said load, and means for connecting one of said base and shell contacts to a source line and the other of said base and shell contacts to a source return line, the improvement wherein said socket further includes:

means defining in said wall means an aperture opening to said load receiving portion;

insulator means supported by said housing near said aperture for movement from a first position in which said insulator means extends through said aperture into said load receiving portion and overlies said one of said contacts to prevent an object extended into said load receiving portion through said opening from engaging said one of said contacts and thereby being electrically connected to said source, to a second position in which said insulator means is ineffective to prevent an object extended through said opening from engaging said one of said contacts;

a reset member at least partially external to said housing for receiving a force independent of the movement of said load applied externally of said housing for moving said insulator means from said first position to said second position; and

load responsive means for moving said insulator means from said second position to said first position upon removal of said load from said load receiving portion.

4,074,926

HIGH VOLTAGE ELECTRICAL CONNECTOR

Roy M. Broad, San Carlos, Calif., assignor to The Scott & Fetzer Company, Cleveland, Ohio

Continuation of Ser. No. 577,065, May 13, 1975, abandoned, which is a continuation-in-part of Ser. No. 470,943, May 17, 1974, abandoned. This application Sept. 27, 1976, Ser. No. 727,136
Int. Cl.² H01R *13/52*
U.S. Cl. 339—60 R **6 Claims**

1. A universal electrical connector particularly adaptable for terminus applications of high voltage cables having a central conductor covered by an insulative layer comprising:

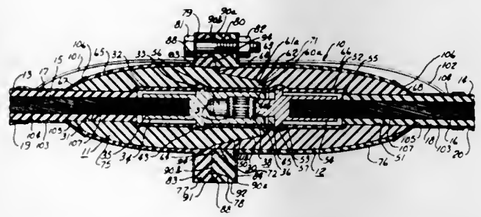
two resilient body portions, one being a plug member and the other being a mating socket member,

each of said body portions provided with a central bore,

an inner semiconductive liner provided in a portion of each of said bores having an annular recess provided therein,

a female contact insertable in said plug bore and a male contact insertable in said socket bore,

each of said contacts provided with an annular shoulder positioned in corresponding of said annular recesses,



said members each provided with two concentric frustoconical mating surfaces, the slant height of the first innermost of such mating surfaces being shorter than the second of such mating surfaces, said first surfaces constituting a nonlocking taper and said second surfaces constituting a holding taper,

an outer resilient semiconductive layer for the full length of said body portions,

a resilient semiconductive perimetral flange integral with its respective outer semiconductive layer, and

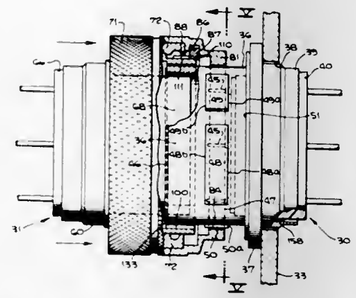
means to releasably secure said flanges together upon interengagement of said plug socket members.

4,074,927

ELECTRICAL CONNECTOR WITH INSERT MEMBER RETAINING MEANS

David J. Ball, Pacific Palisades, Calif., assignor to Automation Industries, Inc., Los Angeles, Calif.

Filed July 26, 1976, Ser. No. 708,477
Int. Cl.² H01R *13/54*
U.S. Cl. 339—89 M **15 Claims**



1. In an electrical connector having cooperable mating and unmating plug and receptacle means, each provided with an insert member of dielectric material carrying electrical contact elements and axially positioned within a shell with reference to a selected mating relationship, the combination of:

means for retaining at least one of said insert members against axial displacement in one direction including

a compressible insert ring member having external thread means of one configuration;

said one of said shells having internal thread means of a second different configuration;

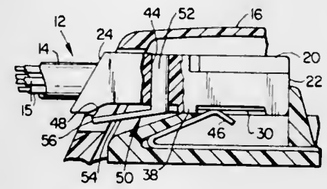
said ring member being linearly pressure driven in a direction opposite to said one direction whereby said external and internal thread means are pressure interlocked at angularly spaced intersections of said external and internal thread means.

4,074,928

ELECTRICAL CONNECTOR HAVING RELEASABLY RETAINED LATCH TAB ASSEMBLY

James J. Johnston, Old Saybrook, Conn., assignor to Automatic Equipment Development Corporation, West Haven, Conn.

Filed Dec. 9, 1976, Ser. No. 749,088
Int. Cl.² H01R *13/54*
U.S. Cl. 339—91 R **13 Claims**



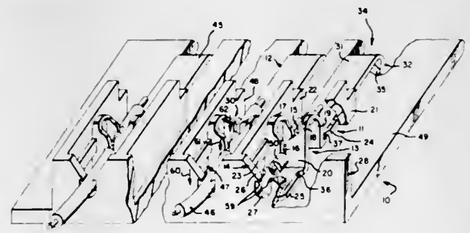
1. A latch tab assembly for replacing a broken latching tab on a plug device of a type which cooperates in plugging relation with a receptacle to electrically connect an elongated flexible conductor attached to the plug device with an internal contacting component within the receptacle, the plug device having a body including a plugging end, the latching tab in its undamaged condition being connected at one end to the body adjacent an associated surface thereof and extending outwardly therefrom in inclined relation to the associated surface and in a direction away from said plugging end for releasably retaining the body in the receptacle, the body having a pair axially parallel and transversely spaced apart holes opening through the associated surface, said latch tab assembly comprising a unitary structure made from resilient plastic material and including a pair of generally parallel mounting posts for respective positioning in the holes, and a retaining tab integrally connected at one end to each of said mounting posts for flexure about an axis of flexure extending generally transversely of said posts, said retaining tab having a free end opposite said one end and extending generally longitudinally outwardly from the associated surface in inclined relation thereto and in a direction of away from the plugging end when said mounting posts are positioned in the holes to retain the latch tab assembly in assembled relation with the plug device.

4,074,929

CABLE CARD EDGE CONNECTOR

Paul Robert Krider, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 29, 1973, Ser. No. 392,728
Int. Cl.² H01R *9/08*
U.S. Cl. 339—97 R **3 Claims**



1. A card edge connector comprising:

a plurality of contact means;

a housing means having a flat bed with a front edge and a rear edge, and constructed to retain said plurality of contact means in a side-by-side parallel relationship with each other in said housing means;

each of said contact means constructed to receive and retain a conductor and comprising:

a U-shaped element with the two legs of the U having a width dimension normal to the plane of the U and with a first slot formed longitudinally in the width dimension of a first of said two legs of the U and a second slot formed longitudinally in the width dimension of the second of said two legs, and further with a slot formed across the trough of said U joining together said first and second slots;

said first slot having a width calculated to cut through the insulation of a conductor inserted therein and to press into the conductive portion of said conductor with sufficient force to make good electrical contact therewith;

said second slot having a width calculated to cut into the insulation only of a conductor inserted therein;

each of said contacts further comprising a strip-like element which extends to the rear edge of said flat bed and is secured at said rear edge to said flat bed;

the said housing means comprises means defining a plurality of first partitions mounted upon said flat bed and positioned between said contact means;

said housing means further comprising a plurality of second partitions substantially perpendicular to the retained conductors and mounted upon said flat bed adjacent said U-shaped element and having a plurality of conductor trapping slots therein, with each conductor trapping slot being substantially aligned with the first and second slots of a given U-shaped element to enable a conductor to be inserted into said first and second slots and also into said conductor trapping slot in substantially parallel directions of motion;

each of said conductor trapping slots having its inner edge formed to facilitate insertion of a conductor therein and to impede the extraction of a conductor therefrom;

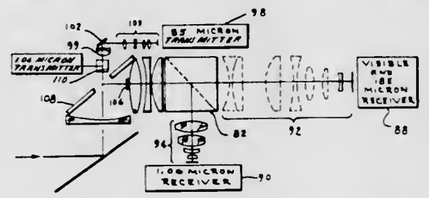
said first slot in each of said U-shaped elements being positioned between said second slot in each of said U-shaped elements and the said conductor trapping locking slot aligned therewith.

4,074,930

COAXIAL OPTICAL SYSTEM

Gary J. Folsom, and Francis J. Kaisler, both of Ellicott City, Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 28, 1976, Ser. No. 652,956
Int. Cl.² G02B *27/00*
U.S. Cl. 350—33 **5 Claims**



1. A coaxial optical system for transmitter and receiver optical systems utilizing a common aperture and optical elements comprising: an enclosure; a first image receiving means for receiving radiation of designated wavelengths located along an axis within the enclosure; a second image receiving means for receiving radiation of designated wavelengths different from said first image receiving means located along an axis at an angle thereto, within the enclosure; means for generating radiation compatable with said second image receiving

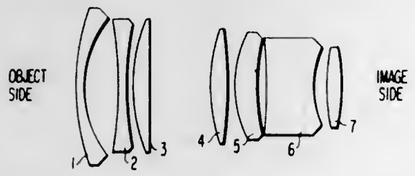
means located along an axis transverse to the axis thereof, within said enclosure; a first lens system including an aperture for collecting radiation and focusing an image at said first image receiving means; means located in said lens system for obscuring an area along the axis thereof; a second lens system including a beam splitting means located along the axis of the second image receiving means and adapted to cooperate with said first lens system whereby radiation transmitted and received utilizes the area of obscuration in the said first lens system.

4,074,931

VARIABLE FOCAL LENGTH LENS SYSTEM

Sadao Okudaira, Ranzan, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 15, 1976, Ser. No. 649,383
Claims priority, application Japan, Jan. 18, 1975, 50-8264
Int. Cl.² G02B *15/14*
U.S. Cl. 350—184 **3 Claims**



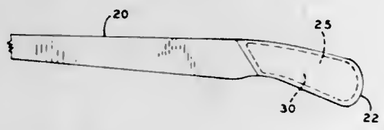
1. A highly efficient variable focal length lens system composed of seven lenses divided in two groups, the first group nearest the object consisting of three lenses forming a negative lens and the second group nearest the image consisting of the remaining four lenses and forming a positive lens, said first group of said lenses including in succession in the direction from the object to the image a first lens L1 in the form of a negative meniscus lens concave to the image side of said lens system, a second negative lens L2 of which both surfaces are concave, and a third lens L3 in the form of a positive double convex lens with the more convex surface directed toward the object, said second group of said lenses including in succession in the direction from the object to the image a fourth lens L4 in the form of a positive double convex lens, a fifth lens L5 in the form of a positive meniscus lens concave to the image, a sixth lens L6 in the form of a thick negative lens, and a seventh lens L7 in the form of a positive lens, the spacing between said first group and said second group being variable.

4,074,932

EYEGLASSES HAVING SHAPEABLE WEIGHTED TEMPLES

William E. Thill, 5151 N. Palm, Suite 410, Fresno, Calif. 93704

Filed Mar. 29, 1976, Ser. No. 671,577
Int. Cl.² G02C *5/14*
U.S. Cl. 351—111 **8 Claims**



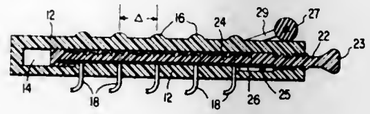
1. In eyeglasses having a pair of ocular pieces; a bridge interconnecting the pieces; and temples rearwardly extended from the ocular pieces, said temples comprising a weighting material, and a relatively lighter material encapsulating the weighting material, the weighting material having a substantially higher specific gravity than the encapsulating material and a melting point above normal atmospheric temperatures and the encapsulating material being ductile at said melting point but substantially rigid at normal atmospheric temperatures.

4,074,933

MICRO INFORMATION INDEXING READER

George J. Yevick, Leonia, N.J., assignor to The Izon Corporation, Stamford, Conn.

Filed Aug. 13, 1976, Ser. No. 714,223
Int. Cl.² G03B *21/14*; G02B *27/00*
U.S. Cl. 353—27 R **17 Claims**



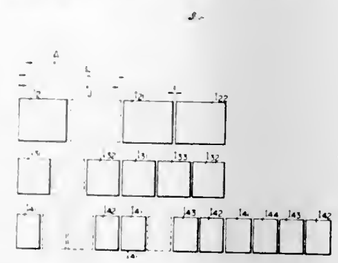
1. A micro intelligence reader including,
a. a relatively thin container being open at one edge for the reception of a carrier of micro intelligence,
b. a microfiche carrier carrying micro intelligence and received within the container,
c. means for directing illuminating light to a plurality of distributed points over the bottom wall of the container to thereby illuminate the micro intelligence,
d. means for indexing the micro intelligence carrier with respect to the container,
e. the top wall of the container carrying projection lenses, light from the illumination directing means passing through the micro intelligence on the microfiche carrier and through the projection lenses and adapted to fall on a projection screen for viewing.

4,074,934

ELECTROSTATOGRAPHIC IMAGING METHOD AND APPARATUS FOR MULTIPLE COPIES

Toyokazu Satomi, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Feb. 26, 1976, Ser. No. 661,579
Claims priority, application Japan, Mar. 17, 1975, 50-32011
Int. Cl.² G03G *15/04*
U.S. Cl. 355—14 **8 Claims**



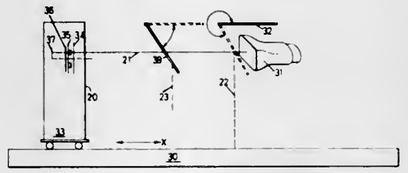
1. A method of forming N identical images on N identical respective sections of an endless continuously moving surface of a photoconductive member of circumference L utilizing imaging means, each of the N sections being having a length L/N, all of the N identical images being completely formed prior to development and transfer thereof, the method comprising the steps of alternatingly:
(a) energizing the imaging means as one of the N sections passes thereby; and
(b) de-energizing the imaging means as K of the N sections passes thereby, K being selected in dependence on N in such a manner that the N images will be formed on the N sections respectively only once during M movements of the surface of the photoconductive member past the imaging means, N, K and M being integers, a value of N being greater than one, whereby after steps (a) and (b) the N identical images are simultaneously developed and transferred a plurality of times.

4,074,935

ALTERNATIVE CAMERA ARRANGEMENT

Harry Arthue Hele Spence-Bate, 115 Cheam Plate, Morley, Australia (6062)

Filed July 14, 1975, Ser. No. 595,867
Claims priority, application Australia, July 17, 1974, 8236/74
Int. Cl.² G03B *27/44, 27/76, 27/70, 27/32*
U.S. Cl. 355—46 **2 Claims**



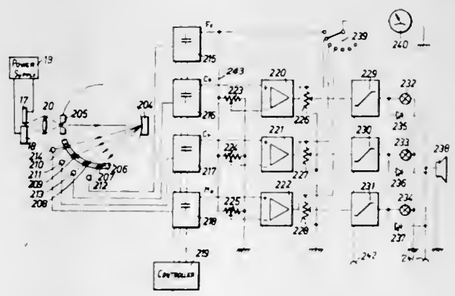
1. An image recording device comprising a camera head including a photographic film, a lens and a shutter; an optical projection means adapted to receive information for transmission to said camera head disposed along the optical axis of said camera head; a horizontally disposed table adapted to hold documents for copying, said camera head and said table fixedly oriented so that the optical axis of the camera head intersects the document axis at a 20° angle; a fully reflecting mirror disposed between said camera head and said projection means at the intersection of said optical axis and said document axis and oriented so as to merge said axes; means to move said mirror along the optical axis of said camera head thereby altering the reduction ratio of said camera; and means to remove said mirror from the optical axis whereby information received by said optical projection means may be transmitted to the camera head for recordation when the mirror is removed from the optical axis and a document image may be transmitted to the camera head for recordation when the mirror is in place in the optical axis.

4,074,936

METHOD AND APPARATUS FOR ANALYZING A COMPOSITION OF AN ALLOY

Ulrich Grisar, and Wilhelm Berstermann, both of Georgsmarienhutte, Germany, assignors to Klockner-Werke AG, Duisburg, Germany

Filed Mar. 10, 1976, Ser. No. 665,774
Claims priority, application Germany, Mar. 26, 1975, 2513266
Int. Cl.² G01J *3/36, 3/30*
U.S. Cl. 356—81 **15 Claims**



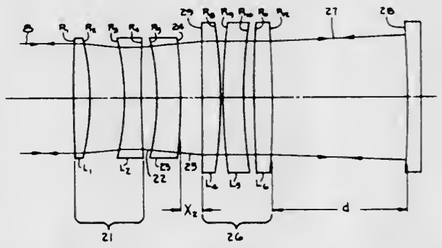
1. A method of testing an alloy formed of a basis metal and a plurality of alloying elements by comparison with a given test piece, said method comprising the steps of:
generating from said alloy a diffraction spectrum having a basis line corresponding to said basis metal and alloy lines corresponding to each of said alloying elements;
forming a plurality of electrical signals each corresponding to a respective one of said lines and each having a signal level corresponding to the intensity of the respective line;
integrating each of said signals;
simultaneously comparing each of the integrated alloy signals with an adjustable portion of the integrated basis signal and generating a plurality of difference signals; and
simultaneously evaluating all of said difference signals.

4,074,937

OPTICAL MEASURING DEVICE

Carl A. Zanoni, Middletown, Conn., assignor to Zygo Corporation, Middlefield, Conn.

Filed Feb. 9, 1976, Ser. No. 656,177
Int. Cl.² G01B *9/02, 11/26*
U.S. Cl. 356—109 **3 Claims**



1. In an optical measuring device in which a beam of collimated light is decollimated by a decollimating system, is then passed through a partially transmissive, partially reflective, non-refractive spherical reference surface, and the transmitted wavefront is reflected back from a test surface through said reference surface for comparison with the wavefront originally reflected from said reference surface, the improvement which comprises mounting said reference surface in fixed relationship to said decollimating system on the same side of said decollimating system as said test surface, and placing between said reference surface and said test surface a collimating lens system whose distance from the reference surface can be varied to obtain a test wavefront whose radius of curvature can be varied to match the test surface, from diverging for a convave test surface of long radius of curvature, to infinity for a flat test surface, to converging for a convex test surface of long radius of curvature.

4,074,938

OPTICAL DIMENSION MEASURING DEVICE EMPLOYING AN ELONGATED FOCUSED BEAM

Francis M. Taylor, Xenia, Ohio, assignor to Systems Research Laboratories, Inc., Dayton, Ohio

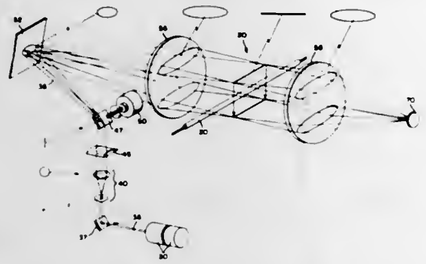
Filed Sept. 27, 1976, Ser. No. 726,991
Int. Cl.² G01B *11/10*
U.S. Cl. 356—160 **3 Claims**

1. In an optical apparatus for continuously measuring the diameter of a cylindrical article moving axially through a zone of measurement of the type including means for generating a beam of collimated light; means, including a mirror, for causing said beam to be scanned repeatedly across the zone of measurement; and photodetector means responsive to the light passing through the zone of measurement and to the scanning means for determining the diameter of the cylindrical article; the improvement comprising
a beam expander positioned between the light generating means and the scanning means for expanding said beam to

a diameter substantially greater than the maximum dimension of any anticipated foreign objects located outside the zone of measurement;

an anamorphic lens for focusing the expanded beam in a first plane on the scanning mirror while leaving said beam in a second, orthogonal, plane collimated;

a first scan lens having the focus on one side thereof on said scanning mirror and the focus on the other side thereof in said zone of measurement whereby said beam in said



second plane is focused to a fine line of light in the zone of measurement while said beam in said first plane is projected through said zone of measurement as an elongated, collimated beam having its long dimension parallel to the cylindrical axis of the article and greater than the size of any anticipated foreign objects both within and without the zone of measurement; and

a second scan lens for collecting the light passing through said zone of measurement and for directing said light onto said photodetector means.

4,074,939

APPARATUS FOR INVESTIGATING FAST CHEMICAL REACTIONS BY OPTICAL DETECTION

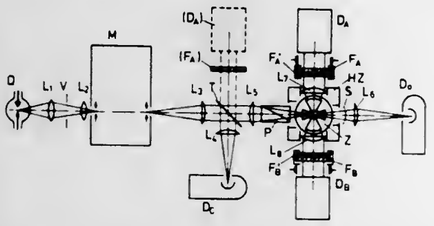
Carl-Roland Rabl, Gottingen, Germany, assignor to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V., Gottingen, Germany

Division of Ser. No. 487,592, July 11, 1974, Pat. No. 3,972,627. This application May 13, 1976, Ser. No. 686,023

Claims priority, application Germany, Dec. 19, 1973, 2363180

Int. Cl.² G01N *21/24*

U.S. Cl. 356—206 **18 Claims**



1. An apparatus for investigating the course of fast chemical reactions by optical detection, said reactions being initiated in chemical system by an external perturbation, said apparatus comprising a sample cell forming a chamber for holding a liquid sample of said chemical system, means performing said perturbation, monochromatic illumination means, at least one light path transversing said sample cell, and opto-electronic detection means including at least two photodetectors operatively connected to a signal processing unit, the improvement wherein said signal processing unit comprises input amplifiers and means for adjusting and balancing of normalized signals, a first main amplifier performing a subtraction of said normalized signals and a second main amplifier performing a summation of said normalized signals, further comprising a divider circuit wherein said first main amplifier is connected to the numerator input and said second main amplifier is connected to the denominator input of said divider, said first main amplifier having at least two selectable gain factors one of which gives a numerator-denominator gain ratio of the order of one and the other one being considerably larger, said unit also comprising means for selecting one output of said main amplifiers and said divider circuit, said selected output being connected to a zero-correction circuit which is electronically controlled by said perturbating means, the output of said zero-correction circuit being connected to signal averaging and recording means.

4,074,940

SAMPLE CELL FOR USE IN THE OPTICAL ANALYSIS OF LIQUIDS

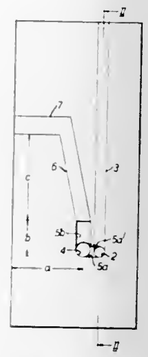
Cecil Sidney Charles Tarbet, Cambridge, England, assignor to Cecil Instruments Manufacturing Limited, Cambridge, England

Filed Mar. 26, 1976, Ser. No. 670,559

Claims priority, application United Kingdom, Mar. 27, 1975, 12980/75; Nov. 7, 1975, 46141/75

Int. Cl.² G01N *1/10*

U.S. Cl. 356—246 **12 Claims**



1. A liquid sample cell for discrete sampling which comprises a body formed with internal surfaces defining liquid flow passages, said internal surfaces including portions specifically defining:

a. a generally horizontal sample bore

b. an inlet bore meeting said sample bore at the midpoint of the latter

c. a pair of exit ducts each communicating with a corresponding end of said sample bore

d. a reservoir bore interconnecting said two exit ducts, and

e. a common outlet duct communicating with said exit ducts at respective points located downstream of their connections to said reservoir bore.

4,074,941

CAM OPERATED TOGGLE FOR SECURING A LIGHT FIXTURE OR THE LIKE TO A TUBE

Edward R. Jablonski, South Milwaukee, Wis., assignor to Appleton Electric Company, Chicago, Ill.

Filed July 12, 1976, Ser. No. 704,226

Int. Cl.² F16B *21/00*

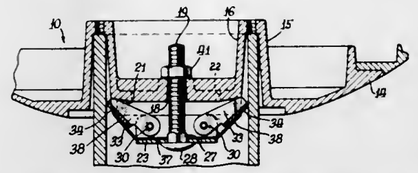
U.S. Cl. 403—260 **1 Claim**

1. In an apparatus for affixing a body to the end of a tube having a uniform cross-section formed about an axis wherein the body includes a hub which extends into the tube from said end and has a distal end within said tube, and said apparatus includes a draw bolt means extending through said hub generally parallel to said axis, said draw bolt means having head means within the tube beyond said hub and means on the opposite side of the hub from said head means to draw said

head means towards said hub, and a device between said hub and said head means for engaging said tube in response to said head means being so drawn towards said hub, the improvement wherein said device comprises:

a rigid support centrally positioned within said tube and extending to opposite sides of said axis, said support being engaged by said head means so that as said head means is drawn toward said hub said support is moved correspondingly, said support being of generally "U" shaped configuration in cross-section and comprising a base and two sides integral with the base, said sides extending from the base towards the hub and at opposite sides of said axis;

a pair of engaging arms each having a distal end and a proximal end, each arm including two sides and an integral connecting plate, the sides of the arm being in juxtaposition to the sides of the base respectively and pivotally connected thereto, the connecting plate extending approximately to the distal end of the arm and having an outer edge at the distal end, the arms being of a length such that the distance between the pivotal connections plus the



length of each arm from the pivotal connection to the distal end of each arm is greater than the inside dimension of the tube normal to the axis in the direction corresponding to the measurement between the pivotal connections, said arms extending upwardly and outwardly to contact the hub and the inside of the tube, whereby as the head of the draw bolt means draws said support towards the hub the hub cams the arms outwardly so that the said outer edges of the plates are forced against the inside of the tube to engage the tube; and

a spring having a base and arms at the respective ends thereof, said spring base being on the side of the support base adjacent the hubs and the spring arms extending at an angle to contact the arm plates respectively to hold the arms against the hub and, prior to the head of the draw bolt means being so drawn, to hold the arms in a position such that the distance between the distal ends of the arms is less than said inside dimension of the tube, the distal ends of the spring arms being closer to said axis than are the distal ends of the engaging arms.

4,074,942

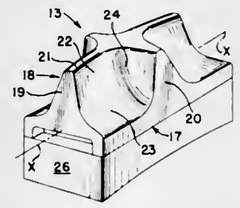
COMPACTOR WHEEL WITH CROSS-SHAPED TIPS

Thomas E. Cochran, Yorkville, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 4, 1976, Ser. No. 729,526

Int. Cl.² E01C *19/26*

U.S. Cl. 404—121 **12 Claims**



1. A compactor wheel having a plurality of sets of circumferentially and laterally spaced separate tips secured on an uninterrupted periphery thereof, each set of tips being circumferentially aligned about said compactor wheel with a leading edge of a compactor tip of one of said sets being substantially aligned in a transverse direction relative to a trailing edge of a compactor tip of an adjacent set of compactor tips, each tip having a major longitudinal axis extending in a circumferential direction on said wheel and comprising a body portion, and a generally cross-shaped tip portion secured in upstanding relationship on said body portion and including a first tip portion extending in the direction of said axis and a second tip portion, having a length substantially less than the length of said first tip portion, extending transversely relative to said first tip portion and disposed between the ends thereof, outer surfaces formed on each lateral side of said first tip portion disposed on each side of said second tip portion being tapered downwardly and outwardly towards said body portion and means defining a concavity on said outer surfaces below said taper and merging therewith.

4,074,943

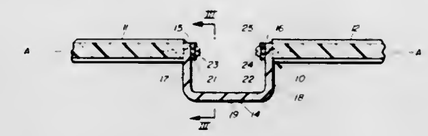
WATERPROOF JOINT

Bernard Szugda, P.O. Box 159, Southbridge, Mass. 01550

Filed Nov. 12, 1976, Ser. No. 741,205

Int. Cl.² F16B *1/100*

U.S. Cl. 403—174 **6 Claims**



1. Waterproof joint comprising:

(a) a first elongated waterstop formed of an elastomer material and having a planar end force surface extending at a right angle to the length,

(b) a second elongated waterstop formed of an elastomer material and having a planar surface, the two waterstops being generally in the same plane with the surfaces in parallel, spaced relationship,

(c) a junction member of U-shaped conformation formed of an elastomer material, the junction member having one leg fastened to one end surface and the other leg fastened to the other end surface, and

(d) a metal plate lying along the surface of each leg which is opposite the surface of the leg that lies against the corresponding end surface, there being self-tapping screws extending through the plate and the junction member into the end of the waterstop.

4,074,944

DISPENSING DEVICE

Octavio Marques Xavier, 25206 York Circle, Laguna Hills, Calif. 92653

Filed Nov. 8, 1976, Ser. No. 739,467

Int. Cl.² B43K *5/06*

U.S. Cl. 401—182 **8 Claims**

1. A device for dispensing a fluid material comprising:

a hollow housing, said housing having a chamber therein adapted to contain a supply of the material;

brush bristles connected to said housing;

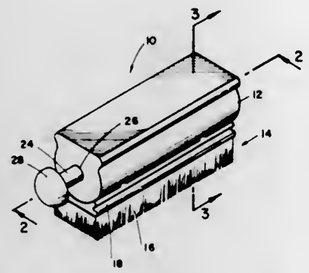
a reciprocal rod within said housing, one end of said rod having an annular cavity therein, said one end having an inwardly extending flange thereon;

a plurality of telescopic cylindrical members adapted to be positioned within said cavity when unexpanded, each of said cylindrical members having a detent on the outer surface thereof, at least the outer member of said cylindrical members having one end with an outwardly extending flange and the other end with an inwardly extending flange;

a piston positioned within said housing, said piston forming

a movable wall of said chamber, said piston adapted to be shifted longitudinally within said housing by reciprocal movement of said rod;

a discharge passage connecting said chamber to said bristles; and



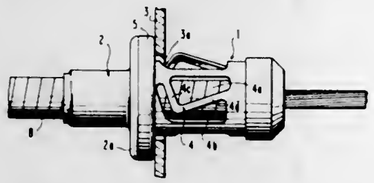
a valve for opening and closing said discharge passage, whereby the fluid material can be selectively dispensed to said bristles.

4,074,945

CABLE FASTENER ASSEMBLY

James R. Kraus, Hagerstown, Md., and Howard C. Murphy, Williamsport, Pa., assignors to Pennsylvania Wire Rope Corporation, Williamsport, Pa.

Filed May 6, 1976, Ser. No. 683,789
Int. Cl.² F16B *9/00*
U.S. Cl. 403—197 **5 Claims**



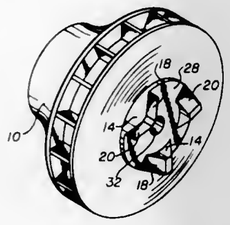
1. A cable fastener for mounting a sheathed cable extending through an aperture in a wall comprising, a latch clip adapted to be positioned on one side of said wall, a collar adapted to be positioned on the opposite side of the wall, one end of said latch clip being connected to said collar, said latch clip having a substantially cylindrical body portion and resilient finger means integrally connected thereto, said resilient finger means each having diverging portions extending tangentially to the latch clip body portion and inclined toward opposite end planes of said cylindrical body so that when inserting the fastener in a wall aperture the peripheral edge of the wall aperture progressively engages certain inclined portions of the resilient finger means causing the finger means to be cammed radially inwardly circumferentially around the cylindrical body portion until other inclined portions of the resilient finger means pass through said aperture whereupon the resilient finger means spring radially outwardly causing said other inclined portions of the resilient finger means to engage the peripheral edge of the wall aperture to secure the fastener within said aperture, whereby the fastener assembly is adapted for mounting in walls of various thicknesses and is prevented from rotating within the wall aperture.

4,074,946

SHAFT-ROTOR COUPLING

Judson S. Swearingen, 2235 Carmelina Ave., Los Angeles, Calif. 90064

Filed July 28, 1976, Ser. No. 709,382
Int. Cl.² B25G *3/02*
U.S. Cl. 403—364 **11 Claims**



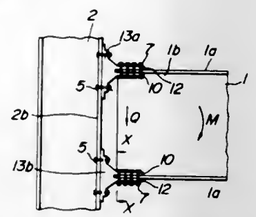
1. A coupling for joining two rotary elements and aligning and maintaining their axes in accurate alignment with each other and the joint between elements tight under conditions under which one element expands or contracts relative to the other, said coupling comprising a plurality of axially extending, circumferentially spaced teeth on one of said elements facing the other, three mating recesses on the other element positioned to receive said teeth, and means for securing said elements tightly together with said teeth firmly seated in said recesses, said teeth being in the form of wedges directed axially with plane tangentially exposed wedge zooming surfaces, each such wedge forming surfaces and each recess surface coacting therewith having its elements parallel to a single radial line perpendicular to said axis, and a pair of mutually adjacent plane surfaces on the same element being oppositely inclined relative to the axis.

4,074,947

FITTINGS FOR CONNECTING COLUMNS AND BEAMS

Naomasa Matake; Tadayoshi Yoshimura, both of Kitakyushu, and Kuniaki Sato, Hiratsuka, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Aug. 5, 1975, Ser. No. 602,099
Claims priority, application Japan, Aug. 12, 1974, 49-91572; Aug. 12, 1974, 49-91573; Jan. 24, 1975, 50-9707
Int. Cl.² F16B *7/18*
U.S. Cl. 403—406 **9 Claims**



1. Fittings for connecting H-shaped beams and columns of a steel frame construction, each fitting comprising an L-shaped outer fitting member including a column side plate formed with holes for bolts for connecting it to the column and a beam side plate formed with holes for bolts for connecting it to an outside of a flange of the beam, said column side plate successively increasing its thickness from a free end to a portion connected to the beam side plate; and an L-shaped inner fitting member including a column side plate formed with holes for bolts for connecting it to the column and a beam side plate formed with holes for bolts for connecting it to an inside of said flange of the beam, said column side plate successively increasing its thickness from a free end to a portion connected to the beam side plate, thereby embracing said flange of said beam between said beam side plates of said outer and inner fitting members.

4,074,948

PAVEMENT MAT AND PROCESS

Guy C. Heater, Jr., 4 Suydam Drive, Melville, N.Y. 11746

Filed May 7, 1976, Ser. No. 684,275
Int. Cl.² E01C *5/22*
U.S. Cl. 404—75 **7 Claims**



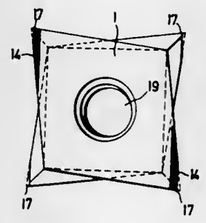
4. A process for the surfacing of a pavement comprising delivering a plurality of adhesive backed pavement mats on a first vehicle to a road surface, said road surface selected from at least one member of the group consisting of bituminous, concrete and metal surfaces, said plurality of mats being stacked one on top of the other, bottom surface to wear surface placing one end of the top mat in said plurality on said road surface so that said adhesive back is in contact with said road and securing said end so placed by a second wheeled vehicle, said second wheeled vehicle being sufficiently heavy to bond said adhesive back to said road when said second vehicle is wheeled over said mat, moving said first vehicle forward until said mat is pulled off of said first vehicle, wheeling said second vehicle over said mat to bond said mat to said road surface, repeating said process until each mat of said plurality is applied to said road, said pavement mat comprising a fibrous mat impregnated with a mixture of bituminous material and aggregate, said mat having a wear surface and bottom surface, a bituminous adhesive layer extending along said bottom surface, a particulate inorganic release coating on said adhesive layer for preventing said mats from adhering to one another when stacked one on top of the other, bottom surface to wear surface, said release coating being forced into said adhesive surface by pressure applied to said wear surface when said mat is in place on a road surface.

4,074,949

CUTTING TOOL

Walter Hochmuth, Nuremberg, and Hans Peter Hollfelder, Furth, Bay, both of Germany, assignors to Robert Zapp, Werkzeug-und Maschinenfabrik GmbH, Stuttgart, Germany

Filed Sept. 19, 1975, Ser. No. 615,073
Int. Cl.² B26D *1/00*
U.S. Cl. 407—114 **12 Claims**



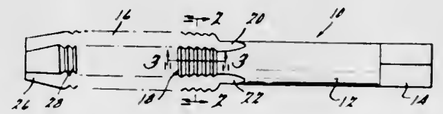
1. A cutting tool arrangement for metal cutting comprising, in combination, a base body having parallel base surfaces and grooves machined into the side surfaces for forming cutting edges, said cutting tool being insertable into recesses of a tool holder and having a center bore; said base body having rhombic-shaped cross-sections parallel to said base surfaces and having V-shaped sides formed by relief surfaces intersecting in a line between said parallel base surfaces, said parallel base surfaces of said base body being rhombic-shaped with vertices, said line extending along one side of said base body, said line extending from one vertex of one parallel base surface to a predetermined vertex on the opposite parallel base surface, said predetermined vertex lying diagonally opposite said one vertex, said predetermined vertex lying also opposite a vertex on said one base surface adjacent to said one vertex, said line extending along one side intersecting at both ends with lines on adjacent sides, said lines being interconnected in sequence and forming a rhombus in a plane inclined to the planes of said parallel base surfaces, said lines forming base edges of said grooves.

4,074,950

LOCKING THREAD FORMING TAP

Horace D. Holmes, 28576 Green Willow, Farmington Hills, Mich. 48024

Filed Oct. 4, 1976, Ser. No. 729,207
Int. Cl.² B23G *5/06*
U.S. Cl. 408—220 **2 Claims**



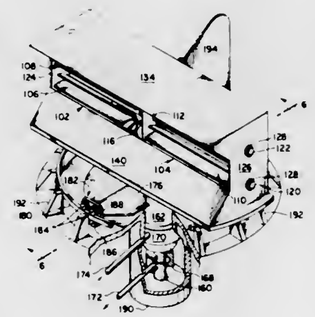
1. In a thread forming tap, a shank section, a body section extending longitudinally from the shank section having axially disposed grooves therein, a helical thread on the body section having dissimilar angularly disposed flanks extending from a pilot portion to a final thread-cutting portion representing the final configuration of the thread to be formed by said tap, one said flank in said final thread cutting portion lying at an angle relative to the longitudinal axis of the tap which is substantially greater than 35°, the opposing flank facing the shank section in said final thread-cutting portion forming a ramp of substantially less slope than that of said first flank and being arranged at an angle of approximately 25° - 35° relative to the axis of said tap.

4,074,951

WIND POWER CONVERTER

Gerald E. Hudson, 229 15th St. West, Billings, Mont. 59102

Continuation-in-part of Ser. No. 576,189, May 9, 1975, abandoned. This application Jan. 31, 1977, Ser. No. 764,397
Int. Cl.² F03D *3/04*
U.S. Cl. 415—2 **10 Claims**



1. A wind power converter comprising:

a pair of rotatable turbines with elongated blades disposed within a rotatable housing on axially parallel shafts, the curvature of the blades of one turbine being opposite to

the curvature of the blades of the second turbine so that wind passing between said turbines will rotate the turbines in opposite directions;

said housing including shaft-supporting sections at the ends of said turbines, lateral sections connecting said end sections, a pair of wind deflectors disposed between said end sections and extending from adjacent edges of said lateral sections toward the midpoint between said turbines and terminating approximately the same distance from each other as the distance between said turbine shafts, and a pivotally mounted vertically disposed vane extending from a portion of said housing opposite to said wind deflectors;

said rotatable housing being supported on a vertically disposed central shaft and on a plurality of beams radiating from said central shaft with the free end of each beam having at least one pair of flanged wheels engaging a peripheral annular track with one wheel of each pair in contact with the top of said track and the other wheel of each pair in contact with the bottom of said track;

means for synchronizing the rotation of said turbines;

fluid pumping means operatively connected to said turbines mounted on said rotatable housing adjacent the top of said central shaft;

conduit means within said central shaft communicating with said pumping means and adapted to be connected to remote power-consuming devices for extracting power from said wind power converter; and

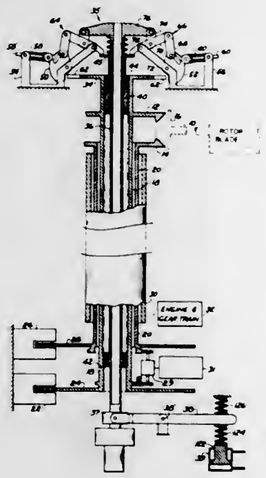
thrust bearings disposed on portions of said central shaft.

4,074,952

LOCKING CONTROL AND OVERTRAVEL SAFETY STOP SYSTEM FOR VARIABLE LENGTH ROTOR BLADES

Evan A. Fradenburgh, Fairfield, and Jay M. Yarm, Milford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed June 28, 1976, Ser. No. 700,455
Int. Cl.[2] B64C *11/28*
U.S. Cl. 416—87 **14 Claims**



1. A locking and overtravel safety stop system for variable length rotor blades of a rotor assembly, the rotor blades being mounted on a rotatable main rotor shaft and being adjustable in length upon actuation of adjusting means for changing the length of the rotor blades, the locking system including:

a rotatable extension shaft coaxial with said main rotor shaft and coupled to said adjusting means;

a rotatable retraction shaft coaxial with said main rotor shaft and coupled to said adjusting means;

A lock shaft coaxial with said extension and retraction shafts, said lock shaft being rotatable and translatable;

locking means operable in response to translation of said lock shaft to a locking position to lock said adjusting means relative to said rotor assembly;

actuating means for selectively translating said lock shaft;

traveling nut means mounted on one of said extension or retraction shafts for translational movement along said one shaft commensurate with length adjustments of said rotor blades as a function of relative rotation between said one shaft and the main rotor shaft;

first overtravel means for engagement by said traveling nut means in one direction of travel thereof to prevent overtravel of said rotor blades in a first direction; and

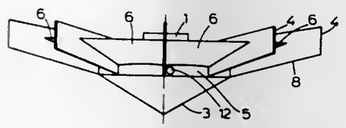
second overtravel means for engagement by said traveling nut means in a direction of travel thereof opposite to said one direction to prevent overtravel of said rotor blades in a second direction.

4,074,953

SURFACE AERATOR

Antonius Wilhelmus Hermanus Budde, Ermelo, and Johannes Bernardus Maria Wiggers, Hoevelaken, both of Netherlands, assignors to Ingenieursbureau Dwars, Heederik en Verhey B.V., Amersfoort, Netherlands

Filed Nov. 2, 1976, Ser. No. 738,174
Claims priority, application Netherlands, May 31, 1976, 7605875
Int. Cl.[2] B01F *3/04*
U.S. Cl. 416—183 **8 Claims**



1. A surface aerator apparatus employing a central vertical shaft coupled to drive means; substantially vertical blades being mounted on a lower end of the shaft; an upwardly expanding, smooth conically shaped member disposed underneath, and coaxially with, said shaft; wherein: said conically shaped member having its greatest radius appreciably greater than the radius of said shaft, but appreciably smaller than the radius of said apparatus at outside edges of said blades, said conically shaped member being further defined at an upper edge by an adjoining overhead vertical cylinder; said blades being successively linked by outwardly and upwardly inclined flat connecting plates, being upwardly staggered with respect to said conically shaped member; each of said blades being fitted to said shaft, while lower edge portions of said blades located outside said conically shaped member being proximate thereto at the location of the greatest radius thereof; and said plates being disposed to extend both inside and outside said vertical cylinder and being affixed to said cylinder.

4,074,954

COMPRESSOR

William Walter Roberts, Yardley, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 27, 1976, Ser. No. 662,183
Int. Cl.[2] F04C *19/00*
U.S. Cl. 418—68 **16 Claims**

1. A compressor which comprises:

(i) a casing,

(ii) a rotor journalled for rotation inside the casing,

(iii) a gill ring comprising a plurality of closely spaced stationary vanes positioned around the periphery of the rotor for directing incoming fluid to be compressed into a rotating annulus of working fluid within the gill ring for entrainment in the ring of working fluid,

(iv) a fluid inlet communicating with the space outside the gill ring, and



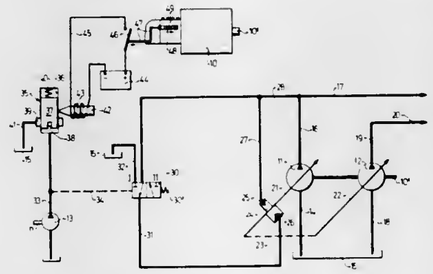
(v) a fluid outlet communicating with the space inside the gill ring.

4,074,955

PUMPING ARRANGEMENT CONTROL DEVICE

Gerhard Nonnemacher, Korntal; Emil Knodel, Stuttgart; Walter Robeller, Boblingen, and Paul Bosch, Ludwigsburg, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 9, 1976, Ser. No. 656,582
Claims priority, application Germany, Feb. 12, 1975, 2505779
Int. Cl.[2] F04B *49/00, 1/26;* F16B *31/02*
U.S. Cl. 417—218 **20 Claims**



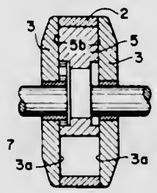
1. In an arrangement for pumping fluids, a combination comprising pumping means for pumping a fluid at a variable output rate, including at least one variable-output pump having an adjusting element adapted to control the output rate of said pump; adjusting means for adjusting the output rate of said pumping means, including displacing means for displacing said adjusting element between low-output and high-output positions thereof; driving means for driving said pumping means at varying speeds; first generating means for generating a first signal indicative of power input to said driving means; second generating means for generating a second signal proportionate to the speed of said driving means, including an auxiliary pump driven by said driving means and operative for discharging control fluid at a rate proportionate to the speed of said driving means, a discharge conduit communicating with said auxiliary pump, and a throttle valve in said discharge conduit having a valve housing and a valve member mounted in said valve housing for displacement between an extended and a retracted position through a plurality of intermediate positions in which said throttle valve has different flow-through cross-sectional areas for passage of the control fluid therethrough, biasing means urging said valve member toward said extended position thereof, and means for admitting the control fluid in said discharge conduit upstream of said throttle valve to the latter to act on said valve member against the action of said biasing means; and control means for controlling said adjusting means in dependence on said first and second signals, including arresting means for arresting said valve member in any of said positions thereof when said first signal reaches a predetermined value to thereby change the proportionality characteristic of said second generating means by maintaining the respective flow-through cross-sectional area of said throttle valve, and a control slide displaceable between a first position in which said displacing means displaces said adjusting element toward said low-output position and a second position in which said displacing means displaces said adjusting element toward said high-output position, said control slide being responsive to changes in said second signal.

4,074,956

SULPHUR AND NITROGEN TREATED IRON BASED ROTOR FOR ROTARY PISTON ENGINE

Masayuki Maruyama, Kashiwazaki; Yoshitugu Hamada, and Ryoichi Yamauchi, both of Nagahama, all of Japan, assignors to Riken Piston Ring Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 9, 1976, Ser. No. 694,450
Claims priority, application Japan, Nov. 29, 1975, 50-142629
Int. Cl.[2] F01C *21/00*
U.S. Cl. 418—178 **6 Claims**



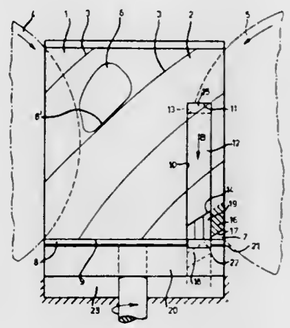
1. A rotary piston engine comprising a casing which includes a center housing and a pair of side housings secured to the opposite sides of the center housing, and a rotor disposed in said casing for rotation, said side housings being made of high silicon aluminum alloy, said rotor being made of iron based material and having opposite side surfaces which are arranged to face the inside surfaces of the side housings, said rotor having surface layers rich in sulphur and nitrogen on the side surfaces thereof.

4,074,957

SCREW COMPRESSORS

Robert John Clarke, Longfield; Guy Francis Hundy, Gravesend, both of England, and Bernard Zimmern, Neuilly, France, assignors to Monovis B. V., Amsterdam, Netherlands

Filed Aug. 9, 1976, Ser. No. 713,093
Claims priority, application United Kingdom, Aug. 21, 1975, 34749/75
Int. Cl.[2] F01C *1/08*
U.S. Cl. 418—195 **1 Claim**



1. Positive displacement rotary machine comprising a screw rotatable about an axis and having surface grooves formed

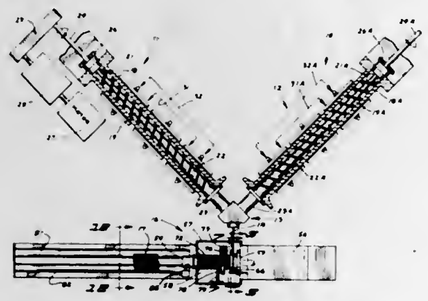
therein which are inclined relative to that axis, the lands, serving to separate the grooves one from another, making sealing engagement with a surrounding casing whereby each groove defines, during at least a part of the rotation of the screw within the casing, a chamber, at least one gate rotor having teeth which intermesh with the grooves of the screw, each tooth being successively in sealing relationship with a groove as the intermeshing screw/rotor(s) rotate, the volume of any chamber defined by a groove and limited by a rotor tooth changing from a maximum to a minimum as the screw and rotor(s) rotate, at least a high pressure port in the casing adjacent to a high pressure end of the screw and communicating with each chamber when the volume thereof is at, or adjacent to, its minimum volume and at least a low pressure port at the low pressure end of the screw, characterized in that an unloading valve is disposed in the casing in spaced relation to the gaterotor in the high pressure side of said casing, said valve including a valve port which extends beyond the high pressure end of the screw, such high pressure end being in sealing contact with a radially extending portion of the casing, the port being provided with a movable closure member which in one limiting position obturates the one end of said valve port remote from the high pressure end of the screw while leaving a region of said valve port open at said high pressure end and connected to said high pressure port end, and in another limiting position passes beyond the high pressure end of the screw and leaves open the end of the valve port which is remote from the high pressure end of the screw and is connected by ducts to said low pressure port, said high pressure port in the casing being located between said unloading valve and said gaterotor.

4,074,958

APPARATUS FOR MAKING A COIL SPRING OBJECT

Lester V. Molenaar, Box 777, West Highway 40, Willmar, Minn. 56201

Filed Oct. 8, 1976, Ser. No. 730,801
Int. Cl.[2] B29C *17/00*
U.S. Cl. 425—71 **27 Claims**



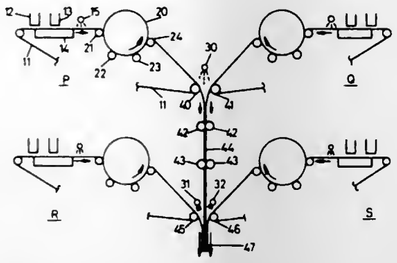
1. An apparatus for making a coil spring object comprising: a die having a pair of inlet passages and an outlet opening, a pair of extruder means operatively associated with the die for heating and moving plastic material through the inlet passages and outlet opening of the die whereby the plastic material moves from the die in the form of an elongated continuous ribbon product, a cylindrical mandrel located adjacent the die, said mandrel having a first outer surface for carrying the ribbon product as it is moved from the die, means connected to said mandrel for rotating the mandrel, means operatively associated with said mandrel for cooling the ribbon product carried by the mandrel, a stationary head having an annular collar surrounding the mandrel at said first outer surface, a separator surrounding the mandrel adjacent the head wherein ribbon product is carried on the first outer surface of the mandrel between the separator and the annular collar of the stationary head as it is moved from the die, said separator having spaced edges defining a radially outwardly directed slot providing a passage open to the mandrel for accommodating the ribbon product moved in a circular path by the rotating mandrel, said mandrel having a second outer surface on the side of the separator opposite the stationary head for receipt of ribbon product moved from the separator, said second outer surface having a diameter less than that of the first center surface to prevent binding on the mandrel by the ribbon product as it cools, a spacer wheel located adjacent the mandrel, said wheel having a plurality of spaced ribs engageable with the mandrel, adjacent ribs being spaced apart to accommodate a turn of the product, roller means operatively associated with said mandrel for holding the mandrel, means operatively associated with said mandrel to cut a turn of the product to form the coil spring object, and means downstream of said mandrel for supporting the coil spring object moving from the mandrel.

4,074,959

APPARATUS FOR FORMING MULTI-PLY FIBROUS SHEETS

Harold George Curry, Hambrook; Brian William Attwood, Hanham near Bristol, and Derek Graham Walter White, Bristol, all of England, assignors to Karl Kroyer St. Anne's Limited, Bristol, England

Continuation of Ser. No. 489,053, July 16, 1974, abandoned, which is a division of Ser. No. 390,244, Aug. 21, 1973, Pat. No. 3,905,864. This application Sept. 30, 1976, Ser. No. 728,282
Claims priority, application United Kingdom, Sept. 9, 1972, 41960/72
Int. Cl.[2] B29J *5/00*
U.S. Cl. 425—81.1 **3 Claims**



1. Apparatus for forming a multi-ply sheet of paper or paperboard comprising:

means for dry-laying a first web including essentially cellulosic fibers by depositing dry fibers in an air stream onto a movable forming surface,

means for applying adhesive or binder to the said dry fibers of the first web, means for adding water to the first web to moisten the same to permit consolidation thereof, means including a pair of rolls defining therebetween a press nip through which the first web passes for simultaneously heating the web to a temperature of at least 150° F and pressing the web to a pressure of at least 50 pounds per square inch, whereby the combination of heat, moisture, binder and pressure cause the first web to consolidate by activation of the adhesive or binder into a consolidated self-sustaining sheet of paper or paperboard,

means for dry-laying a second web including essentially cellulosic fibers by depositing dry fibers in an air stream onto a movable forming surface,

means for applying adhesive or binder to the said dry fibers of the second web, means for adding water to the second web to moisten the same to permit consolidation thereof, means including a pair of rolls defining therebetween a press nip through which the second web passes for simultaneously heating the web to a temperature of at least 150° F and pressing the web to a pressure of at least 50 pounds per square inch, whereby the combination of heat, moisture, binder and pressure cause the second web to consolidate by activation of the adhesive or binder into a consolidated self-sustaining sheet of paper or paperboard,

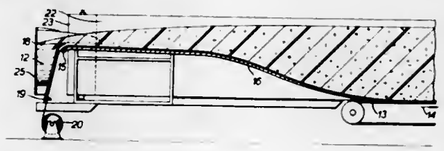
and means for combining the consolidated self-sustaining first web and the consolidated self-sustaining second web to form a multi-ply sheet of paper or paperboard.

4,074,960

MANUFACTURE OF POLYMERIC FOAM

Edward Dockray, Holcombe Brook, and Denis Killen, New Mills, both of England, assignors to Unifoam A.G., Glarus, Switzerland

Filed Nov. 1, 1976, Ser. No. 737,402
Claims priority, application United Kingdom, Nov. 7, 1975, 46274/75
Int. Cl.[2] B29D *27/00*
U.S. Cl. 425—89 **21 Claims**



1. Apparatus for producing a continuous strand of polymeric foam from a mixture of liquid foam reactants, comprising

(a) a trough in which the liquid foam reactants may expand upwardly;

(b) means operatively assrested with said trough for supplying liquid foam reactants to the bottom of said trough;

(c) weir means arranged adjacent the upper portion of said trough for receicing in overflowing relation the foam that rises by expansion in said trough;

(d) open-topped channel shaped conveyor means for continuously conveying expanding foam away from said weir means while the foam completes its expansion process, said open-topped channel shaped conveyor means comprising a bottom wall, and separate side walls which join and form a seal with said bottom wall downstream of the weir means;

(e) guide means operably associated with the trough to keep partially expanding foam flowing over the weir means onto the bottom of the channel shaped conveyor out of contact with the side walls thereof until said seal between the bottom and side walls of said conveyor has been formed; and

(f) conveyor width adjustment means operable to alter the width of the bottom of the channel shaped conveyor and to move its side walls correspondingly in synchronism with width alterations of said bottom while still maintaining the seal between the bottom and side walls of the channel shaped conveyor during width changes, whereby foam of varying widths may be produced without stopping the production run.

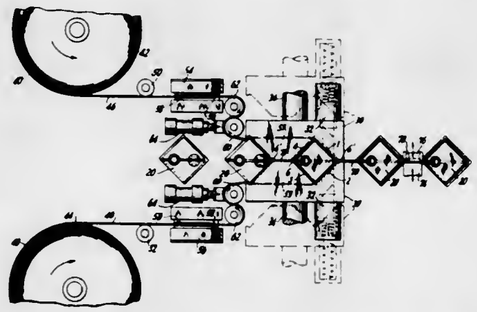
4,074,961

APPARATUS FOR PRODUCING CONTAINERS

Wilhelm Reil, Bensheim-Auerbach, Germany, assignor to Altstadter Verpackungs-Vertriebs GmbH, Pfungstadt, Germany

Continuation-in-part of Ser. No. 575,170, May 7, 1975, and a continuation-in-part of Ser. No. 602,223, Aug. 6, 1975, said Ser. No. 575,170, is a continuation of Ser. No. 499,155, Aug. 21, 1975, abandoned, said Ser. No. 602,223, is a continuation of Ser. No. 333,723, Feb. 20, 1973, abandoned. This application Apr. 9, 1976, Ser. No. 675,275
Claims priority, application Germany, Mar. 2, 1972, 2210013
Int. Cl.[2] B29F *1/10*
U.S. Cl. 425—112 **16 Claims**

1. Apparatus for injection molding containers from thermoplastic material comprising central die means including a plurality of individual central die members and motive means moving said central die members intermittently one behind the other along a given path, side die means including a pair of side die members flanking said central die means and including means moving said side die members transversely to said given path of said central die members into and out of operative engagement with said central die means, said central die means and said side die means being configured to form therebetween when in operative engagement with each other a die cavity within which thermoplastic material may be injected to form said containers, means for supplying into said die cavity a base material about which thermoplastic material may be injection molded to form said containers, said base material supply means being operative to supply said base material in the form of two separate sheets from opposite sides of said central die means, means operable to inject into said die cavity a thermoplastic material, said motive means operating to move said



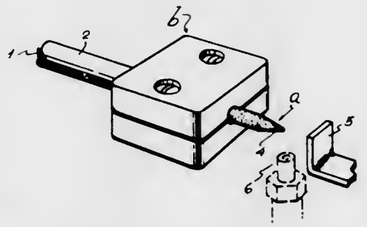
central die members in succession from one side of said side die members to between said side die members and to the opposite side of said side die members, said central and side die means forming a die cavity configured to receive injected thermoplastic material to form a seal between said separate sheets of base material at a point rearwardly of a given central die member when said given central die member is in engagement between said side die members, the next succeeding central die member being positioned to engage said sheets of base material to pull said sheets from said supply means thereof as said next succeeding central die member moves to between said side die members, and means operable to inject formed containers from about said central die means when said side die means are out of operative engagement with said central die means.

4,074,962

ELECTRODE CONSTRUCTION FOR A PIEZOELECTRIC LIGHTER

Ernesto A. Vainer, Buenos Aires, Argentina, assignor to Manufactura de Articulos para el Hogar "Aurora" S.A. Industrial, Comercial, Inmobiliaria y Financiera, Argentina

Filed Nov. 3, 1975, Ser. No. 628,527
Int. Cl.[2] F23Q *2/28, 3/01*
U.S. Cl. 431—255 **2 Claims**



1. In a portable piezoelectric type lighter having a pressurized fluid fuel deposit therein, an exit orifice for permitting the release of said fluid, a pair of electrodes, said electrodes connected to a piezoelectric ignition unit for developing an electric potential between said electrodes when said ignition unit is actuated, and a gap separating the pair of electrodes by a

predetermined distance, an improved electrode construction comprising:

at least one of said electrodes being elongated and formed of silicon carbide, said silicon carbide electrode having a pair of tapered ends;

a conductor connected to a positive pole of said piezoelectric ignition unit having one of said ends of said silicon carbide electrode connected to said conductor, the other end of said silicon carbide facing said other electrode to form a gap therebetween; and

a fastening means of electrically insulating material for covering the connected portions of said conductor and said silicon carbide electrode, said fastening means includes at least two complimentary pieces adapted to fit together and form an inner canal therein for receiving the connecting ends of said conductor and said silicon carbide electrode.

4,074,963

KILN

William J. Walsh, Dubuque, Iowa, assignor to Sybron Corporation, Rochester, N.Y.

Filed Aug. 16, 1976, Ser. No. 714,380

Int. Cl.² F27D *1/18*

U.S. Cl. 432—250 **3 Claims**

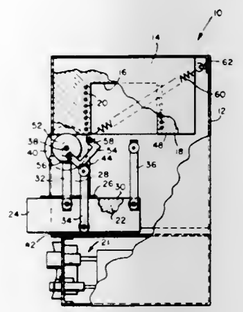
1. A kiln, furnace or the like comprising:

a. a frame;

b. an oven body in said frame, said oven body enclosing a firing chamber which opens through the bottom of said body;

c. a door for closing said opening including a hearth plate portion for supporting articles to be heated in said firing chamber when said door is in a closed position;

d. at least two parallel links on each side of said door, each link having a first end pivoted to said frame and a second end pivoted to said door to form a parallel motion linkage



for maintaining said door horizontally oriented as said door moves from a closed position to an open position; and

e. said first end of each link being located below said second end by a distance of about one-half the vertical height of said chamber when said door is in a closed position.

4,074,964

METHOD OF COLORING HAIR USING A PRESSURE SENSITIVE ADHESIVE

H. David Wells, 201 178th Drive, North Miami Beach, Fla. 33160

Filed Sept. 7, 1976, Ser. No. 720,553

Int. Cl.² A61K *7/13;* **G02B** *27/00*

U.S. Cl. 8—10.2 **4 Claims**

1. A method of coloring hair comprising, separating the hair of a subject's scalp to define a plurality of individual sectors, separated by part lines; applying tape means along the length of each of said part lines, said tape means providing a pressure-sensitive adhesive on the inner surface thereof contacting said part lines and on its outer surface; separating at least one discrete lock of hair from the area within one of said sectors and laying the same on a thin, flexible, liquid impervious sheet sized to lengthwisely span and to overlie at least a portion of the outer surface of at least two adjacent lengths of said tape means; applying a coloring solution to said discrete lock of hair and rolling said lock in said sheet toward the root ends thereof to form a pocket of hair and coloring solution, and pressing opposed end portions of said packet into engagement with said outer surface pressure-sensitive adhesive of said two adjacent lengths of tape means for securing purposes.

4,074,965

STABLE MONOAZO DYESTUFF

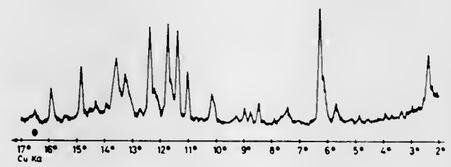
Hubert Kruse, Kelkheim, Taunus, and Karl Sommer, Konigstein, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 7, 1976, Ser. No. 684,088

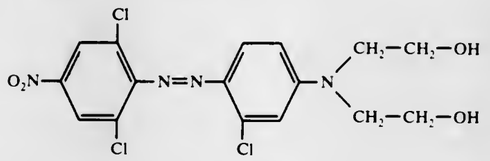
Claims priority, application Germany, May 9, 1975, 2520577

Int. Cl.² C09B *27/00;* **C07C** *107/00*

U.S. Cl. 8—41 R **4 Claims**



1. The modification being stable under dyeing conditions of the dyestuff of the formula



characterized by an X-ray diffraction diagram with characteristic reflexes at the following glance angles θ with the relative intensities as given below:

[o]	2.45	6.30	10.07	11.00	11.35	11.70	12.36	13.55	14.80	15.85
	63	100	30	48	83	88	86	59	52	34

4,074,966

STABLE CONCENTRATED LIQUID PREPARATION OF A PAPER DYE OF THE DISAZO CLASS

Roger Lacroix, Huningue, France, and Roland Haberli, Wurenlingen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

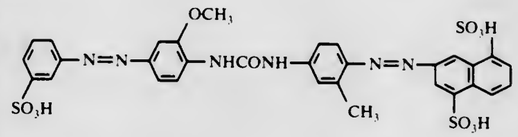
Filed June 30, 1976, Ser. No. 701,458

Claims priority, application Switzerland, July 3, 1975, 8677/75

Int. Cl.² C09B *67/00, 31/02*

U.S. Cl. 8—41 R **5 Claims**

1. Stable concentrated liquid preparation of a paper dye of the disazo class, which preparation contains 20 to 40 per cent by weight of the dye of the formula



or an alkali salt thereof, dissolved in 10 to 30 per cent by weight of water and 40 to 60 per cent by weight of a tetraalkylene glycol.

4,074,967

DYESTUFF PREPARATIONS FOR DYEING AND PRINTING NATURAL AND SYNTHETIC POLYAMIDE FIBRE MATERIALS

Hermann Fuchs, Kelkheim, Taunus; Gustav Kapaun, Neuenhain, Taunus, and Fritz Meininger, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

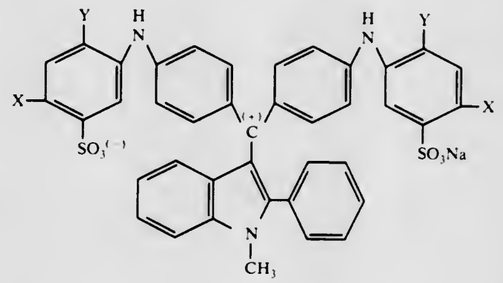
Filed Nov. 22, 1974, Ser. No. 526,389

Claims priority, application Germany, Nov. 24, 1973, 2358586

Int. Cl.² C09B *11/00;* **D06P** *3/24*

U.S. Cl. 8—54 **1 Claim**

1. A highly water-soluble composition for the dyeing or printing of native or synthetic polyamide fibres essentially of (a) 10 to 99 parts by weight of at least one dyestuff of the formula



in which X represents hydroxy, methyl, ethyl, methoxy or ethoxy, and Y represents hydrogen or methyl, and (b) 0.5 to 90 parts by weight of an auxiliary agent of the group consisting of a polyglycol of an average molecular weight from 3000 to 20,000, a polyglycolether (containing 15 to 30 ether groups) of a fatty alcohol of 8 to 20 carbon atoms, an alkali metal salt of a dialkylnaphthalene sulfonic acid (alkyl C_1 - C_6), a methyltauride of a saturated or unsaturated fatty acid of 8 to 20 carbon atoms, and an isethionate of a saturated or unsaturated fatty acid of 8 to 20 carbon atoms, and mixtures thereof.

4,074,968

RETANNING AND FATLIQUORING AGENT

Stanley A. Lipowski, Livingston, N.J.; Joseph W. Dehn, Jr., Great Neck, N.Y., and Clinton E. Retzsch, Morris Township, Morris County, N.J., assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Apr. 15, 1976, Ser. No. 677,494
Int. Cl.[2] C14C *3/20, 9/02*
U.S. Cl. 8—94.22 **22 Claims**

1. A retanning and fatliquoring agent comprising a sulfonated condensation product of

(a) one mole of a hydroxy component selected from the group consisting of phenol and a lower alkyl phenol having at least one alkyl of from one to two carbon atoms and at least one reactive hydrogen in the 2-, 4- or 6-position of the alkyl phenol,

(b) from about 0.05 to about 1.5 mole of an unsaturated oil having an iodine value of over 60, and

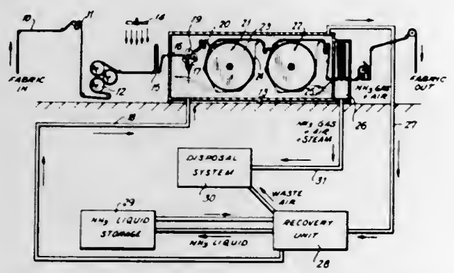
(c) from about 0.4 to about 1.0 mole of a formaldehyde liberating composition wherein the SO_3 content of the sulfonated condensation product is from about 0.3 to about 1.5 mole of SO_3 per mole of hydroxy component.

4,074,969

PROCESS FOR RECOVERY AND REUSE OF AMMONIA IN A LIQUID AMMONIA FABRIC TREATING SYSTEM

Jackson Lawrence, Troy, N.Y., assignor to Cluett, Peabody & Co., Inc., New York, N.Y.

Continuation-in-part of Ser. No. 490,202, July 19, 1974, abandoned. This application Apr. 21, 1976, Ser. No. 679,059
Int. Cl.[2] D06M *1/24;* F25J *3/00*
U.S. Cl. 8—125 **13 Claims**



1. In a continuous process for recycling gaseous effluents, comprised principally of gaseous ammonia, air, and water vapor, derived from the continuous treatment, with substantially anhydrous liquid ammonia, of a moving cellulosic-containing web of material, and wherein the moving web is continuously exposed in a confined treatment zone to said liquid ammonia at near-atmospheric pressure, and said web is thereafter heated in said zone to vaporize and remove said liquid ammonia from said web, the improvement characterized by

(a) continuously withdrawing said gaseous effluent from said zone,

(b) continuously removing a portion but less than all of the water vapor fraction from said gaseous treating zone effluent,

(c) continuously introducing said withdrawn gaseous effluent into a body of substantially anhydrous liquid ammonia maintained at about atmospheric pressure to cool said gaseous ammonia and to condense water vapor from said gaseous ammonia,

(d) thereafter compressing and condensing the gaseous ammonia,

(e) continuously withdrawing substantially anhydrous liquid ammonia, together with condensed water, from said body and supplying the withdrawn liquid to said treatment zone for said exposing step, and

(f) continuously replenishing said body of substantially anhydrous liquid ammonia with anhydrous liquid ammonia from said compressing and condensing step.

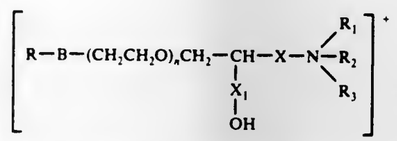
4,074,970

DYEING OF SYNTHETIC FIBERS WITH CATIONIC DYES IN THE PRESENCE OF CATIONIC ASSISTANTS CONTAINING HYDROXYL AND CYCLIC MOIETIES

Robert Feigin, West Orange, N.J., assignor to Sybron Corporation, Rochester, N.Y.

Filed Nov. 15, 1976, Ser. No. 741,703
Int. Cl.[2] C09B *67/00;* D06P *1/41, 1/642*
U.S. Cl. 8—169 **9 Claims**

1. A process for coloring cationic-dyeable fibers in the presence of compounds having the structure:



where R is selected from the group of aliphatic hydrocarbons containing about 8 to 22 carbon atoms, mono- and di-alkylbenzenes where the alkyl chains contain about 8 to 12 carbon atoms each,

B is selected from the group of $—CH_2—$, oxygen atom and sulfur atom

n is a number ranging from zero to about 4

R_1, R_2, R_3 contain at least cyclic or heterocyclic structure and together contain no more than one hydroxyl group

A is a water-solubilizing anion

x = $(CH_2)_a$ and X_1 = (CH_2)

a = 0 or 1 and b = 0 or 1

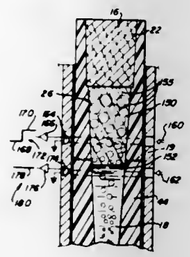
and a + b = 1.

4,074,971

APPARATUS AND METHOD FOR THE PHARMACOLOGICAL MANIPULATION OF THE COAGULATION MECHANISM IN BLOOD AND FOR SIGNALLING THE EVENT OF BLOOD COAGULATION

Walter Jacob Braun; John Henry Altshuler, both of Englewood, and Peter Whitfield Cherry, Boulder, all of Colo., assignors to HemoTec, Inc., Englewood, Colo.

Filed Jan. 16, 1976, Ser. No. 649,649
Int. Cl.[2] G01N *33/16*
U.S. Cl. 23—230 B **51 Claims**



34. A method for detecting the coagulation of body fluids including blood comprising the steps of:

injecting gas into the body fluid so that bubbles are formed above the surface of the fluid,

generating a signal upon the presence of bubbles above the surface of the fluid indicative that gas is being injected,

collecting the fluid from the bubbles above the surface of the fluid only when the body fluid coagulates, and

generating a detection signal in response to a predetermined

drop in the surface level of the fluid occurring due to said collection.

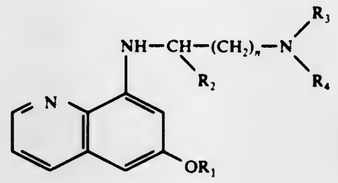
4,074,972

UREA ASSAY

Jerry W. Denney, Carmel, Ind., assignor to American Monitor Corporation, Indianapolis, Ind.

Filed Nov. 10, 1976, Ser. No. 740,612
Int. Cl.[2] G01N *33/16*
U.S. Cl. 23—230 B **4 Claims**

1. A process for the quantitation of urea in a fluid sample, in which the sample is reacted with an acidic solution of o-phthalaldehyde and an acidic solution of a chromogenic compound having the following general structure:



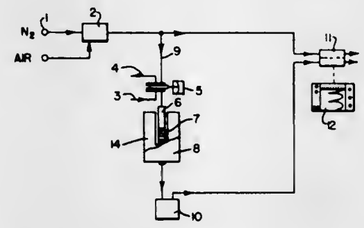
where R_1 is —H or $—CH_3$ and where R_2 is $—CH_3$ or $—C_2H_5$ or —H and where R_3 and R_4 are —H or $—CH_3$ and where *n* is 1, 2, or 3.

4,074,973

METHOD AND APPARATUS FOR DETERMINING TOTAL OXYGEN DEMAND OF COMBUSTIBLE MATERIALS IN AQUEOUS DISPERSION

Hiroyuki Igaki; Yoshiki Shibata, and Masao Saruyama, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 638,361, Feb. 8, 1975. This application Mar. 22, 1976, Ser. No. 669,272
Int. Cl.[2] G01N *31/12*
U.S. Cl. 23—230 PC **7 Claims**



1. A method for measuring the total oxygen demand of a combustible material in an aqueous dispersion containing halide of alkali metals or alkaline earth metals which comprises:

(a) flowing a feed gas stream of an inert gas containing oxygen at an essentially constant rate through a combustion conduit heated at a combustion supporting temperature and within the combustion conduit, flowing the feed gas stream through a combustion catalyst bed,

(b) flowing the effluent gas from the catalyst bed into a decomposing bed containing a decomposing agent heated at a temperature to decompose sodium hypochlorite or hydrogen hypochlorite substantially instantly by action of the decomposing agent,

(c) flowing the effluent gas from the decomposing agent bed into a continuous quantitative detector for gaseous oxygen to produce an electric signal which varies with the oxygen content of the effluent gas, and

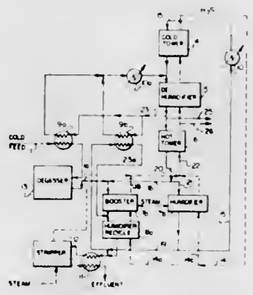
(d) while continuing the above procedure, injecting a small amount of an aqueous dispersion containing combustible material into the combustion conduit upstream from the catalyst bed whereby an electrical signal correlative with the total oxygen demand of an aqueous dispersion is produced.

4,074,974

DUAL TEMPERATURE ISOTOPE EXCHANGE APPARATUS USING HOT FEED WITH LIQUID RECYCLE FROM THE HUMIDIFIER

Gerard J. C. A. Pauluis, Brussels, Belgium, assignor to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Mar. 17, 1976, Ser. No. 667,725
Claims priority, application Canada, Mar. 21, 1975, 222776
Int. Cl.[2] B01D *59/33;* C01B *5/02*
U.S. Cl. 23—270 R **2 Claims**



1. A dual temperature deuterium extraction apparatus comprising:

a. a hot and cold tower with liquid water and hydrogen sulphide gas streams passing in countercurrent deuterium exchange relation therein;

b. a dehumidifier between hot and cold towers through which gas from the hot tower passes to the cold tower and liquid from the cold tower passes to the hot tower,

c. a by-pass humidifier section,

d. a humidifier recycle section,

e. a booster humidifier section,

f. means for taking gas from the cold tower and passing a portion through the by-pass humidifier to the hot tower and the remaining portion through the humidifier recycle section and the booster humidifier section in series to the hot tower,

g. means for taking a liquid output from the hot tower and passing a portion through the by-pass humidifier and the remaining portion through the booster humidifier section and the humidifier recycle section in series,

h. a gas stripper having a steam injection inlet,

i. means for taking the liquid output from the humidifier recycle section and passing it through the said stripper via a first heat exchanger and out of the system as effluent,

j. means for taking gas from the stripper and passing the gas to the hot tower,

k. means for taking a cold liquid input feed, passing it through a second heat exchanger and injecting it into the top of the booster humidifier section,

l. means for taking a portion of the liquid leaving the dehumidifier and passing a portion of this through the said second heat exchanger to heat the cold liquid feed and the remaining portion through a third heat exchanger and returning both portions to the liquid input of the dehumidifier,

m. means for taking a liquid output from the by-pass humidifier section, recycling a portion to the top of the cold tower and passing the remaining portion through the said third heat exchanger and back to the top of the humidifier recycle section,

n. means for taking an output of gas or liquid or both en-

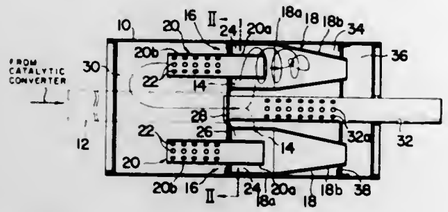
riched in deuterium from a location in the apparatus between the cold and hot towers.

4,074,975

COMBINATION EXHAUST-GAS CLEANER AND MUFFLER FOR AN AUTOMOBILE ENGINE

Naomi Tokura, Yokosuka; Kenji Masaki, Yokohama, and Hatuo Nagaisi, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Continuation-in-part of Ser. No. 466,879, May 3, 1974, abandoned. This application Dec. 23, 1975, Ser. No. 643,702
Claims priority, application Japan, May 7, 1973, 48-53449[U]; June 18, 1973, 48-719380[U]
Int. Cl.² B01J *8/00;* **F01N** *3/15;* **B01D** *45/12, 51/02*
U.S. Cl. 23—288 F **21 Claims**



1. A combined assembly of an exhaust-gas cleaner and a muffler, which assembly is to be connected to an exhaust port of a catalytic converter of an internal combustion engine system for removing dust particles discharged from the catalytic converter and simultaneously dampening of noises borne by exhaust gases dicharged from the combustion engine, the assembly comprising:

an exhaust gas inlet tube located immediately downstream of and in communication with the catalytic converter so that a stream of exhaust gases entraining dust particles is admitted into said exhaust inlet tube from the catalytic converter;

two identical centrifugal separators located downstream of said exhaust inlet tube for imparting centrifugal force to the stream of said exhaust gases being passed from said exhaust inlet tube into the centrifugal separators and thereby separating the dust particles from the exhaust gases, said centrifugal separators being arranged parallel to each other and aligned in the same direction, each said separators including a gas inlet opening which is in fluid communication with the exhaust inlet tube for admitting the stream of the exhaust gases thereinto from the exhaust inlet tube and a respective dust discharge opening for discharging from the centrifugal separator the dust particles separated from the exhaust gases in the separator and a respective gas discharge opening for discharging from the centrifugal separator the stream of the exhaust gases cleaned of the dust particles;

a single resonance-type silencer dust collection chamber in fluid communication with both of said centrifugal separators through the corresponding said dust discharge opening for depositing therein the dust particles discharged from said centrifugal separators;

a first silencer chamber location downstream of said centrifugal separators and in fluid communication therewith via said gas discharge openings for dampening noises borne by the exhaust gases;

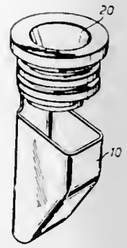
an exhaust outlet tube located downstream of and in fluid communication with said centrifugal separators via said first silencer chamber so that the stream of exhaust gases cleaned of the dust particles and discharged from both of said gas discharge openings of said centrifugal separators is admitted into said exhaust outlet tube and finally discharged into the open air; and at least one additional silencer chamber in fluid communication with said exhaust outlet tube and downstream of said first silencer chamber for dampening noises borne by the exhaust gases.

4,074,976

LEVELING DEVICES FOR USE IN HIGH SPEED LIQUID SAMPLING SYSTEMS

Stephen G. M. Gower, 14 Hamilton Avenue, Pyrford, Surrey, GU22 8RS; Cyril R. Morris, 6 Millan Close, New Haw, Weybridge, Surrey, KT15 3NB, and Ernest Wright, Beriswood, Sheerwater Avenue, Woodham, Weybridge, Surrey, KT15 3DS, all of England

Filed Sept. 1, 1976, Ser. No. 719,632
Int. Cl.² B01D *21/26;* **B01L** *3/00;* **B65D** *23/12*
U.S. Cl. 23—292 **9 Claims**



1. A sample leveling device for use in a liquid sampling tube having an upper, open end and a lower, closed end, comprising in combination; an insert cup having an upper, open end and a lower, closed end, said lower end being offset from the centerline of the upper, open end of the insert cup, said insert being adapted for retention in the upper portion of said sampling tube in a spaced relationship from the walls of said tube and having support means at the upper end thereof; and a plug-cap adapted to frictionally engage and locate within the upper, open end of said sampling tube, said plug-cap engaging said support means on said insert cup, whereby said insert cup is retained in the upper end of said sampling tube in a spaced relationship from the walls of said tube when said plug-cap is inserted in said tube.

4,074,977

CHARCOAL BRIQUET SYSTEM

Philip N. Dunham, Fortune Rock, Biddeford, Maine 04005; John N. Tillyer, Center Street, and Armand Martin, Simpson Road, both of Saco, Maine, 04072

Filed June 11, 1976, Ser. No. 695,007
Int. Cl.² C10L *11/00*
U.S. Cl. 44—38 **8 Claims**

1. A charcoal briquet system comprising in combination

a. a quantity of charcoal briquets, and

b. a pad of easily ignitable material of a size sufficient to pile a number of briquets thereon,

c. said pad being formed of a soft, thin, flexible cellulosic material at least partially coated with wax and conformable to the contour of a pile of said briquets.

4. A system according to claim 1 wherein said pad is coated with wax about the margins thereof, the center portion and corners of said pad being substantially wax free.

6. A system according to claim 4 wherein the edges of said pad are corrugated.

4,074,978

COMBINATION OF ASPHALTENES WITH FLOW IMPROVER POLYMERS TO IMPROVE THE FLOW PROPERTIES OF HIGH BOILING FUEL OILS

Jerome Panzer, Roselle Park, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Oct. 12, 1973, Ser. No. 405,919
Int. Cl.² C10L *1/18*
U.S. Cl. 44—62 **7 Claims**

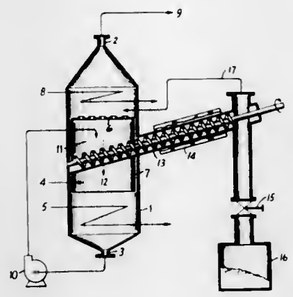
1. A petroleum fuel oil composition comprising a heavy waxy fuel oil selected from the group consisting of atmospheric residua, vacuum gas oil, vacuum bottoms, blends of said oils, and blends of said oils with middle distillate fuels, which are deficient in an asphaltene component wherein at least 20 weight percent of said composition boils above 600° F., containing a pour point improving amount of an oil-soluble polymeric flow improver consisting of a copolymer of behenyl fumarate and vinyl acetate in about equal molar proportions, the behenyl fumarate having been prepared by esterifying fumaric acid with a behenyl alcohol containing about 65 wt. % C_{22} alcohol, about 15 wt. % C_{20} alcohol and about 15 wt. % C_{18} alcohol, all of said alcohols being straight chain alcohols, said copolymer having a number average molecular weight within the range from about 1000 to 100,000, which oil composition has been improved with respect to its responsiveness to said flow improver by adding an amount of asphaltene sufficient to increase the asphaltene content of said oil by 0.05 to 10 weight percent.

4,074,979

THERMAL DECOMPOSITION APPARATUS

Shingo Kurisu; Toshiya Oyamoto, both of Mihara; Setumi Ochiai, Fukuyama; Hiromu Miyamoto, Onomichi, and Katsuaki Makino, Mihara, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 571,988, April 28, 1975, abandoned, which is a continuation of Ser. No. 391,017, Aug. 28, 1973, abandoned. This application Dec. 5, 1975, Ser. No. 637,979
Int. Cl.² C10J *3/20*
U.S. Cl. 48—111 **4 Claims**



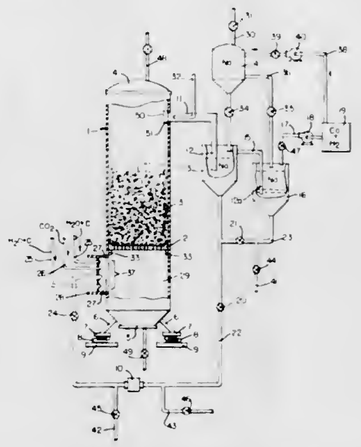
1. Thermal decomposition apparatus for converting waste materials into gaseous products having a predetermined maximum boiling point comprising furnace means having an upper part and a lower part, supply means for introducing waste materials into said furnace means, gas product exhaust means located at the upper part of said furnace, residue discharge means located at the lower part of said furnace, heating means located at the lower part of said furnace for heating said waste materials in said furnace to evolve a gas by thermal decomposition of said waste materials thereby to create gas flow upwardly within said furnace means, cooling means located at the upper part of said furnace arranged to have upwardly flowing gas passed thereacross to change the temperature of said gas in accordance with the temperature of said cooling means, control means for adjusting the temperature of said cooling means to maintain the temperature of gas flowing thereacross at a level not higher than a predetermined maximum temperature level thereby to effect condensation at said cooling means of the components of said gas having a boiling point above said maximum temperature level, temperature sensing means for sensing the temperature of gas flowing across said cooling means, said control means being responsive to said temperature sensing means to maintain the temperature of said cooling means at a level commensurate with the desired predetermined maximum temperature level of gas flowing thereacross, tray means extending across said furnace between said cooling means and said heating means to receive therein condensed liquid dropping from said cooling means, said tray means including means defining orifices therethrough for enabling gas flow through said tray means to cause said gas flow to be brought into contact with said liquid received within said tray means and downflow tubes extending from said tray means to direct liquid flow from said tray means downwardly toward said heating means thereby to bring said downwardly flowing liquid into contact with said heating means to effect vaporization thereof, densifier means located between said heating means and said tray means to remove from said furnace solid residue deposited on said densifier means, and recycling means for removing material from said residue discharge means of said furnace means and delivering said removed material onto said densifier means, with adjustment of the temperature of said cooling means operating to control the temperature of gas flowing through said gas exhaust means thereby to condense out of said gas any constituents having a boiling point higher than said predetermined maximum temperature level to prevent entry of such higher boiling point constituents into said exhaust means, said apparatus thereby operating to prevent clogging thereof by solidification of the decomposition product passing through the exhaust means of said apparatus.

4,074,980

PROCESS FOR PRODUCTION OF CARBON MONOXIDE AND HYDROGEN

Eugene Wainer, Shaker Heights, Ohio, assignor to Horizons Research Incorporated, Cleveland, Ohio

Filed July 2, 1976, Ser. No. 702,003
Int. Cl.² C10J *3/54*
U.S. Cl. 48—197 R **10 Claims**



1. A process for the manufacture of a gaseous mixture of hydrogen and carbon monoxide which comprises:

spraying a first stream consisting of hot molten alkali metal selected from the group consisting of Na, K, and mixtures of Na and K in which such hot molten alkali stream is maintained during spraying at a temperature of 350° C, into a first reaction chamber;

spraying one additional stream of a mixture of CO_2, H_2O, and C in which the temperature of the stream is about 350° C into the same first reaction chamber in such a way that

said first stream and said additional stream commingle and react immediately on entering said first reaction chamber, producing primarily an atomized mixture of alkali carbonate and alkali hydroxide containing minor amounts of carbon monoxide and hydrogen;

providing a fluidizable bed of light weight iron balls supporting particulate material selected from the group consisting of metallic iron, nickel, cobalt, manganese, oxides of said metals, alloys of said metals and mixtures of said metals, their oxides and their alloys, in a second reaction chamber maintained at a temperature not exceeding 850° C, adjacent to said first reaction chamber and in direct communication with said first reaction chamber;

immediately conducting the sprayed materials and their reaction products in atomized and gaseous form from said first reaction chamber into said bed of particulate material in said second reaction chamber while said bed is maintained in fluidizable condition as a consequence of a gas passage and formation while the bed is being vibrated, maintaining the second reaction chamber at a temperature in the range of 650° to 850° C, thereby reducing the alkali hydroxide and alkali carbonates from said first chamber reaction products as a consequence of reaction of alkali carbonates and alkali hydroxides with said particulate material to produce alkali metal gas as a consequence of maintaining a pressure below 0.5 atmosphere in the second reaction chamber and a mixture of hydrogen and carbon monoxide; and

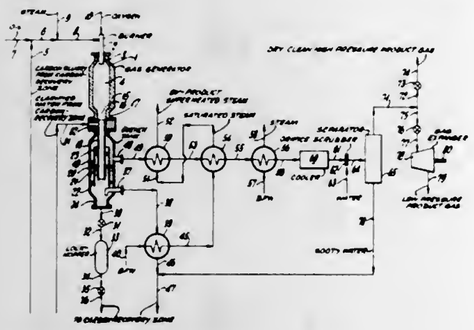
separately recovering the regenerated alkali metals and the hydrogen and carbon monoxide products of said reactions.

4,074,981

PARTIAL OXIDATION PROCESS

William L. Slater, La Habra, Calif., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 10, 1976, Ser. No. 749,658
Int. Cl.² C10J *1/00*
U.S. Cl. 48—197 R **8 Claims**



8. In a continuous process for producing reducing gas, synthesis gas, or fuel gas by the partial oxidation of a hydrocarbonaceous fuel with a free-oxygen containing gas, optionally with a temperature moderator, in the reaction zone of a free-flow noncatalytic gas generator at a temperature in the range of about 1500° to 3500° F. and a pressure in the range of about 1 to 250 atmospheres; and cooling and cleaning the effluent gas stream from the reaction zone by direct contact with water in a quench zone thereby producing a dispersion of particulate carbon and quench water; the improvement comprising:

(1) cooling the process gas stream leaving said quench zone by passing said process gas stream serially through first and second heat exchange zones in indirect heat exchange with a coolant;

(2) cooling at least a portion of the particulate carbon-quench water dispersion from said quench zone in a third heat exchange zone in indirect heat exchange with a stream of boiler feed water; and

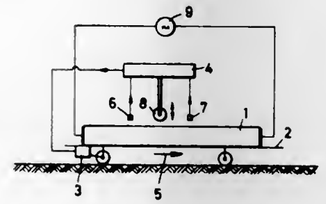
(3) passing the heated boiler feed water leaving said third heat exchange zone in (2) through said second heat exchange zone in (1) as said coolant, whereby said boiler feed water is converted into a stream of saturated steam; and (4) passing said stream of saturated steam from (3) through said first heat exchange zone in (1) as said coolant, whereby said saturated steam is converted into superheated steam.

4,074,982

PROCESS AND MEANS FOR GRINDING OUT FAULTS IN THE SURFACE OF A WORK PIECE

Heinz Koch, Sprockhovel; Manfred Pawlowicz, and Bernhard Brams, both of Schermbeck-Damm, all of Germany, assignors to Fried Krupp Huttenwerke AG, Bochum, Germany

Filed Feb. 16, 1977, Ser. No. 769,003
Claims priority, application Germany, Feb. 20, 1976, 2606853
Int. Cl.² B24B *7/02, 1/00*
U.S. Cl. 51—92 R **10 Claims**



6. An apparatus for grinding out faults on the surface of ferromagnetic material comprising:

a grinding device placeable on the workpiece;

magnetizing means placeable in the vicinity of said workpiece for magnetizing the latter;

transport means for operatively moving the workpiece in one direction, the latter being placeable on said transport means, and for returning it in a direction opposite to the first direction; and

control means, including first and second sensing elements, the latter elements being located ahead and in back of said grinding device, respectively, as seen in the operative direction of movement of the workpiece, the first sensing element controlling the placement of said grinding device on the workpiece, said second sensing element controlling the return movement of said transport means upon sensing a fault, in order that the fault on the workpiece can be ground and is subsequently detectable by said first sensing element.

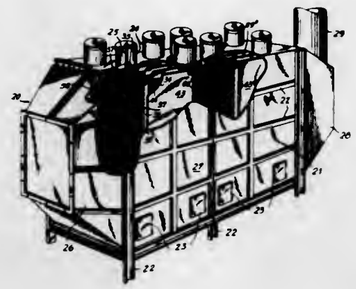
4,074,983

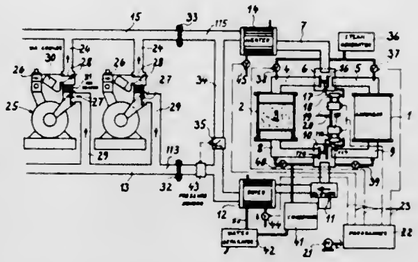
WET ELECTROSTATIC PRECIPITATORS

Even Bakke, New Providence, N.J., assignor to United States Filter Corporation, New York, N.Y.

Division of Ser. No. 329,269, Feb. 2, 1973, Pat. No. 3,958,960.
This application Jan. 14, 1976, Ser. No. 648,839
Int. Cl.² B03C *3/74*
U.S. Cl. 55—118 **7 Claims**

1. A wet electrostatic precipitator comprising, in combination, a housing having inlet and outlet openings and defining a substantially horizontal flow path between said inlet and outlet openings; at least one electrostatic field section in said housing in said horizontal flow path including a plurality of collection plates, a plurality of discharge electrodes in spaced relation with said collection plates and means applying an electric potential between said collection plates and said electrodes; said housing directing a gaseous medium, containing material to be precipitated, from said inlet opening along with substantially horizontal flow path extending through said electrostatic field section for substantially precipitation of said material by said at least one electrostatic field section; means directing continuous sprays of washing liquid against said collection plates; and an electrostatic mist eliminator section in said substantially horizontal flow path in said housing intermediate the last of said at least one electrostatic field section and said outlet opening, said mist eliminator section being free from continuous sprays of washing liquid and including further discharge electrodes, further collection plates positioned in spaced relation with said further discharge electrodes along said horizontal flow path intermediate said further discharge electrodes and said outlet opening, and means applying an electric charge potential between said further discharge electrodes and said further collection plates to establish an electrostatic barrier barring passage of very small drops of liquid therethrough, said further collection plates being formed of a first group of relatively narrow and elongated transverse baffles extending transverse to said horizontal flow path and arranged in spaced relation along at least two rows, said rows being spaced along said horizontal flow path, with the baffles of each of two adjacent rows arranged in alignment with the spaces between the baffles of the other of the two adjacent rows, said precipitator including still further collection plates formed of a second group of relatively narrow and elongated transverse baffles extending transverse to the horizontal flow path and positioned along said horizontal flow path intermediate said last of said at least one electrostatic field section and said further discharge electrodes, said second group of transverse baffles being arranged in spaced relation along at least two rows, said rows being spaced along said horizontal flow path, with the baffles of each of two adjacent rows arranged in alignment with the spaces between the baffles of the other of the two adjacent rows.





4,074,984

SOLVENT-RECOVERY SYSTEM

Heinrich Führing, Augsburg, Germany, assignor to Böwe Böhler & Weber Maschinenfabrik, Augsburg, Germany

Filed May 21, 1976, Ser. No. 688,894
Claims priority, application Germany, May 24, 1975, 2523079
Int. Cl.² B01D *53/04*
U.S. Cl. 55—163 **11 Claims**

1. A system for recovering organic solvent from a plant which includes a plurality of treatment units intermittently using such solvent during a working phase followed by a recovery phase, each treatment unit being provided with a treatment vessel and with individual switchover means establishing a closed circuit through said vessel during said working phase, said closed circuit including equipment for heating and drying the air circulating therethrough, and for connecting said vessel between an inlet manifold and an outlet manifold in said recovery phase, each treatment unit being further provided with individual circulation means for driving the solvent through said closed circuit in said working phase, said system comprising:

an incoming duct connected to said outlet manifold for receiving solvent-laden air from any treatment unit of said plant during the recovery phase thereof;

an outgoing duct connected to said inlet manifold for the delivery of substantially clean air to any treatment unit of said plant during the recovery phase thereof;

conduit means forming an air-circulating path with said ducts, said path including blower means for generating a continuous airflow traversing any treatment unit thereof which is in its recovery phase;

air-heating means at an upstream location in said path;

air-drying means at a downstream location in said path;

a pair of substantially identical adsorbers for solvent entrained by said airflow;

a regenerating circuit for said adsorbers including a source of steam;

a programmer independent of said switchover means of any treatment unit establishing a recurrent operating cycle divided into alternate active and inactive half-cycles for each adsorber;

first valve means controlled by said programmer for alternately connecting said adsorbers in said path, between said upstream and downstream locations, during respective active half-cycles thereof;

second valve means controlled by said programmer for periodically connecting each adsorber, during its inactive half-cycles, in said regenerating circuit for the retrieval of solvent accumulated in preceding half-cycles; and

third valve means under the joint control of said treatment units for establishing a bypass path for said airflow from an outlet of said air-drying means to an inlet of said air-heating means whenever none of said treatment units is in its recovery phase, said bypass closing a loop through said air-heating means, the active adsorber, said air-drying means and said blower means independently of said manifolds.

4,074,985

AIR FILTER

Raymond Zeno Willas, 4343 N. Oak Park Ave., Chicago, Ill. 60634

Filed May 4, 1976, Ser. No. 683,026
Int. Cl.² B01D *46/24*
U.S. Cl. 55—498 **4 Claims**

1. An air filter assembly which can be readily disassembled to permit the filtering element thereof to be removed for washing or replacement, said filter assembly being mounted within an air filter housing, and comprising

an annular substantially rigid foraminous support having a substantially constant height,

an elongated flexible filtering element having opposite ends and a height substantially the same as the height of said foraminous support, said filtering element having a substantially uniform thickness defined by outside and inside substantially regular surfaces, the length of said elongated filter element being substantially equal to the circumference of said foraminous support,

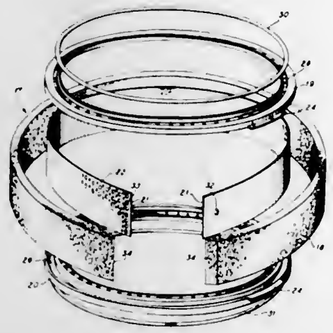
said filtering element being freely wrapped around said

foraminous support and being readily separable therefrom,

upper and lower integrally molded mounting rings which are of a like construction and are interchangeable, said upper and lower mounting rings each having an exterior side and an interior side relative to said foraminous support and filtering element,

an annular seating groove on the interior side of said upper and lower mounting rings,

a continuous sealing trench inwardly of said annular seating groove which is located on the interior side of each mounting ring, and an O-ring member positioned by O-ring supports radially crossing said sealing trench a predetermined distance below the top of said mounting ring so that the O-ring member projects above the mounting ring when in place, said O-rings sealingly engaging said air filter housing enclosing said air filter assembly,



the continuous top portions and the continuous bottom portions of said foraminous support and wrappped filtering element being snugly and removably seated in said annular seating grooves of said upper and lower mounting rings respectively,

whereby said upper and lower mounting rings are readily separable from said filtering element and said filtering element is readily separable from said foraminous support permitting said filterng element to be removed for washing or replacement.

4,074,986

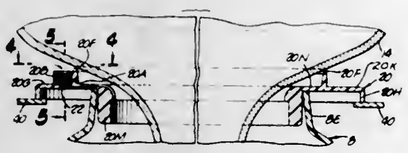
VALVED WATER CONTAINER WITH SEAL

Carl E. Frahm, and Shirley E. Frahm, both of 1428 Oak Meadow Road, Arcadia, Calif. 91006

Continuation of Ser. No. 680,071, April 26, 1976, abandoned, which is a continuation of Ser. No. 494,464, Aug. 5, 1974, abandoned. This application Mar. 14, 1977, Ser. No. 777,357

Int. Cl.² B01D *46/10*

U.S. Cl. 55—502 **8 Claims**



1. An arrangement including a reservoir, said reservoir having a mouth portion, a mounting means for said reservoir, said mounting means including a flat surface adjacent to and spaced from said mouth portion of said reservoir so as to define an opening between said flat surface and said mouth portion, a replacement container for placement in an inverted position on said reservoir, an element for positioning between said flat surface of said mounting means and said container to close said opening, with said element serving the functions of mounting said container, closing said opening, and sealing and venting said reservoir, said element being annular and having a generally horizontally disposed base portion and having an inner opening generally of the size and shape of the mouth of said reservoir, a first relatively heavy sealing and mounting portion extending downwardly from said base portion for entering and snugly engaging an inner wall portion of said mouth portion to provide not only a firm support for the water container but also as a seal, a second relatively thin, flexible and tapered sealing ring portion on said base portion positioned outwardly of said first portion and extending upwardly from said base portion and being the sole means to engage said container, said second portion having a vent apertured portion extending therethrough, a third portion near the periphery of said base portion and extending downwardly therefrom for sealing contacting said flat surface of said mounting means for said reservoir, said second portion being located between said first portion and said third portion, said base portion having at least a part of its horizontal extension between said first and third portions of relatively thin cross section constructed and arranged such that the weight of the container acting on said second portion tends to flex said base portion to urge the first and third portions into sealing engagement with the reservoir mouth and the mounting means flat surface, respectively.

4,074,987

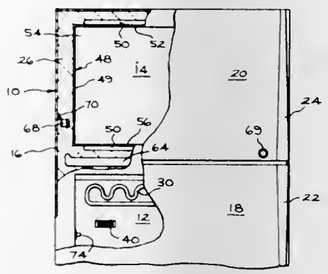
DEFROST SENSING SYSTEM FOR FREEZER COMPARTMENT

Edward B. Krulewich, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 3, 1977, Ser. No. 756,232

Int. Cl.² F25D *21/08*

U.S. Cl. 62—128 **10 Claims**



1. A refrigerator comprising a box-like liner defining both a freezer compartment and evaporator upon which frost collects, thermal insulating material surrounding the liner, and an outer refrigerator case, a frost sensing means interposed within the insulation in outer-spaced relation from the side of the liner and arranged adjacent the bottom, said frost sensing means being thermally sensitive at a preselected high temperature of the insulation at the completion of a defrost cycle.

4,074,988

GLASS FIBER COATING METHOD

George E. Eilerman, and Albert E. Tamosauskas, both of Pittsburgh, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 637,341, Dec. 3, 1975, abandoned, which is a continuation of Ser. No. 512,648, Oct. 7, 1974, abandoned, which is a continuation-in-part of Ser. No. 384,876, Aug. 2, 1973, abandoned. This application May 27, 1977, Ser. No. 801,171

Int. Cl.² C03C *25/02*

U.S. Cl. 65—3 C **4 Claims**

1. In the method of preparing glass fiber strand for reinforcing elastomeric compositions comprising drawing glass fibers from molten cones of glass, applying to the fibers as they are being drawn an aqueous coating and sizing composition containing a substantial quantity of water, an elastomeric latex, and a rubber adhesive, gathering the fibers into strands, and drying the strands to thereby provide glass fiber strands having a weight gain of between 15 and 40 percent by weight of said sizing and coating composition, based upon the weight of the dry glass, the improvement wherein said rubber adhesive consists essentially of a condensation reaction product of a polycarboxylic acid, or an anhydride, or a polyanhydride, or a tricarboxylic monoanhydride, each combined with a polyfunctional amine, said condensation reaction product having a low molecular weight to provide solubility of said condensation reaction product in aqueous ammonia, and ammonia in said aqueous coating and sizing composition in sufficient quantity to solubilize said condensation product.

4,074,989

METHOD OF PREPARING ANHYDROUS BORIC ACID-CONTAINING GLASS BATCH

Stanley F. Brzozowski, Coraopolis, and Joseph E. Cooper, Brackenridge, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 8, 1976, Ser. No. 739,883

The portion of the term of this patent subsequent to Feb. 21, 1995, has been disclaimed.

Int. Cl.² C03B *5/16*

U.S. Cl. 65—27 **5 Claims**

1. A method of preparing an anhydrous boric acid-containing glass fiber forming glass batch having a substantial amount of alumina therein comprising introducing anhydrous boric acid-containing batch ingredients into a pelletizing zone, agglomerating the ingredients with sufficient water to produce pellets containing about 10–25 percent free water by weight, heating the pellets at a temperature of at least 450° F. (232.2° C.) and drying the pellets at that temperature for a period of time sufficient to thereby prevent disintegration thereof and produce hard, nondusting pellets.

4,074,990

METHOD OF PREPARING COLEMANITE-CONTAINING GLASS BATCH

Stanley F. Brzozowski, Coraopolis, and Joseph E. Cooper, Brackenridge, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 8, 1976, Ser. No. 739,884

The portion of the term of this patent subsequent to Feb. 21, 1995, has been disclaimed.

Int. Cl.² C03B *5/16*

U.S. Cl. 65—27 **8 Claims**

1. A method of preparing a colemanite-containing glass fiber forming glass batch comprising introducing colemanite-containing batch ingredients into a pelletizing zone, agglomerating the ingredients with sufficient water to produce pellets containing about 5 to 20 percent by weight free water, heating the pellets at a temperature not greater than 770° F. (410° C.) and drying the pellets at that temperature for a period of time sufficient to thereby prevent disintegration thereof and form hard, non-dusting pellets.

4,074,991

METHOD OF PREPARING BORIC ACID-CONTAINING GLASS BATCH

Stanley F. Brzozowski, Coraopolis, and Joseph E. Cooper, Brackenridge, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

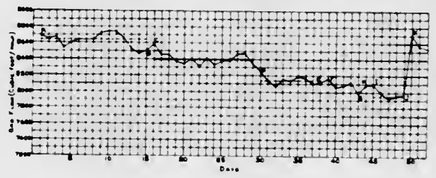
Filed Nov. 8, 1976, Ser. No. 739,885

The portion of the term of this patent subsequent to Feb. 21, 1995, has been disclaimed.

Int. Cl.² C03B *5/16*

U.S. Cl. 65—27 **6 Claims**

1. A method of preparing a boric acid-containing glass fiber forming glass batch having a substantial amount of alumina therein comprising introducing boric acid-containing batch ingredients into a pelletizing zone, agglomerating the ingredients with sufficient water to produce pellets containing about 5 to 22 percent by weight free water, heating the pellets at a



temperature of at least 220° F. (104.4° C.) and drying the pellets at that temperature for a period of time sufficient to thereby prevent disintegration thereof and produce hard, nondusting pellets.

4,074,992

SODIUM ION-EXCHANGE ON SURFACE OF BETA-SPODUMENE

Raymond O. Voss, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 365,117, May 5, 1964, abandoned. This application Dec. 18, 1968, Ser. No. 784,635

Int. Cl.² C03C *3/22, 21/00*

U.S. Cl. 65—30 E **5 Claims**

1. A method for making a unitary glass-ceramic article of high strength wherein the crystal content thereof constitutes at least 50% by weight of the article with a surface compressive stress layer and an interior portion which comprises contacting a glass-ceramic article consisting essentially of Li_2O, Al_2O_3, and SiO_2, wherein the crystal phase therein consists essentially of beta-spodumene solid solution, at a temperature above 200° C. with a source of exchangeable sodium ions for a period of time sufficient to replace at least part of the lithium ions of said beta-spodumene solid solution in a surface layer of the article with a corresponding amount of sodium ions, said replacement not changing the essential crystal structure of the beta-spodumene solid solution crystals but thereby effecting a compressively stressed surface layer on the article.

4. A unitary glass-ceramic article of high strength wherein the crystal content thereof constitutes at least 50% by weight of the article with a surface compressive stress layer and an interior portion consisting essentially of Li_2O, Al_2O_3, and SiO_2, wherein the crystals of said interior portion consist essentially of beta-spodumene solid solution and the crystals of said surface compressive stress layer consist essentially of beta-spodumene solid solution, the crystal structure of said latter crystals being essentially unchanged but in at least a portion of which the proportion of lithium ions is less with a corresponding increase in an amount of sodium ions.

4,074,993

POTASSIUM ION-EXCHANGE ON SURFACE OF BETA-SPODUMENE

Roger G. Ackerman, Corning, and Bruce R. Karstetter, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 365,177, May 5, 1964, abandoned. This application Mar. 18, 1968, Ser. No. 714,013
Int. Cl.[2] C03C *3/22, 21/00*
U.S. Cl. 65—30 E **4 Claims**

1. A method for producing a unitary glass-ceramic article of high strength wherein the crystal content thereof constitutes at least 50% by weight of the article with a surface compressive stress layer and an interior portion which comprises contacting a glass-ceramic article consisting essentially of Li_2O, Al_2O_3, and SiO_2, wherein the crystal phase therein consists essentially of beta-spodumene at a temperature between about 550°–800° C. with a source of potassium ions for a period of time sufficient to replace at least part of the lithium ions of said beta-spodumene in a surface layer of the article with a corresponding amount of potassium ions, said replacement not changing the essential crystal structure of the beta-spodumene crystals to thereby effect a compressively stressed surface layer on the article.

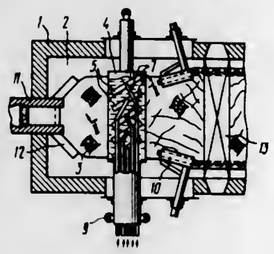
4. A unitary glass-ceramic article of high strength wherein the crystal content thereof constitutes at least 50% by weight of the article with a surface compressive stress layer and an interior portion consisting essentially of Li_2O, Al_2O_3, and SiO_2, wherein the crystals of said interior portion consist essentially of beta-spodumene and the crystals of said surface compressive stress layer consist essentially of beta-spodumene, the crystal structure of said latter crystals being essentially unchanged but in at least a portion of which the proportion of lithium ions is less with a corresponding increase in an amount of potassium ions.

4,074,994

PROCESS AND APPARATUS FOR THE MANUFACTURE OF ORNAMENTAL SHEET GLASS

Mark Leonovich Glikman, ploschad Kommunarnaya, 11, kv. 45; Zakhar Isaevich Sapunar, ulitsa Mezhdunarodnaya, 26, kv. 13; Albert Vladimirovich Avrus, ulitsa Zagorodneva, 15, kv. 77; Vladilen Alexandrovich Gorokhovsky, ulitsa Lomonosova, 3, kv. 9; Evgeny Borisovich Fainberg, Oktyabrsky poselok, 8 Linia, 32; Vladimir Alexandrovich Ivanov, ulitsa Zagorodneva, 15, kv. 81; Tatyana Leonidovna Shirkevich, ulitsa Lampovaya, 4, kv. 24, and Vadim Mikhailovich Sizov, ulitsa Lomonosova, 11, kv. 4, all of Saratov, U.S.S.R.

Filed Aug. 16, 1976, Ser. No. 714,763
Int. Cl.[2] C03B *18/02*
U.S. Cl. 65—44 **14 Claims**



1. A process for the manufacture of ornamental sheet glass comprising continuously forming a glass strip on the surface of molten metal, concurrently treating the glass surface in plastic state with a reactant comprising a substance which is capable of forming a surface layer having a viscosity which is substantially greater than the viscosity of the basic glass mass in a quantity sufficient to form such a more viscous surface layer and immediately deforming the glass strip treated with said reactant in such a manner as to form rips in the resultant surface layer of the glass, the combination of rips defining an ornamental pattern of glass.

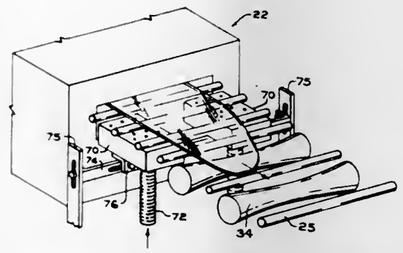
12. An apparatus for the manufacture of ornamental sheet glass comprising: a bath containing molten metal; elongated conduits having nozzles arranged in an overlapping pattern over said bath for feeding a reactant to the upper surface of a glass strip which is formed on the surface of molten metal, said reactant comprising a substance which is capable of forming a surface layer having a viscosity which is substantially greater than the viscosity of said glass strip; a system for feeding the reactant to said conduits provided for each of said conduits; a hollow casing filled with a cooling medium, said casing accommodating all said conduits leading to said conduits; driven endless tracks provided downstream of said casing in the direction of flow of said glass strip in contact with said strip, and means for moving said tracks at a different speed than said glass strip thus deforming the same to produce rips in the upper surface layer.

4,074,995

METHOD OF SHAPING GLASS SHEETS BY THE ROLL FORMING METHOD

Robert G. Frank, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 20, 1976, Ser. No. 752,379
Int. Cl.[2] C03B *29/04*
U.S. Cl. 65—104 **8 Claims**



1. In the method of shaping a series of glass sheets wherein each sheet in succession is conveyed through a furnace and heated therein to a softened condition sufficient for bending, then conveyed beyond the furnace in a longitudinal direction on conveyor means providing substantially horizontal support for the sheet into a bending zone where a set of lower rotating forming rolls having concave axial curvatures transverse to the direction of glass travel rise to lift the sheet above said conveyor means into rolling engagement with a set of upper rotating forming rolls having complementary convex axial curvatures transverse to the direction of glass travel, thereby imparting a curvature to the sheet, and wherein initial contact between a longitudinal side edge portion of the sheet and the lower forming rolls while central portions of the sheet remain out of contact with the lower forming rolls produces a localized bending force sufficient to cause kinking of the longitudinal side edge portion,

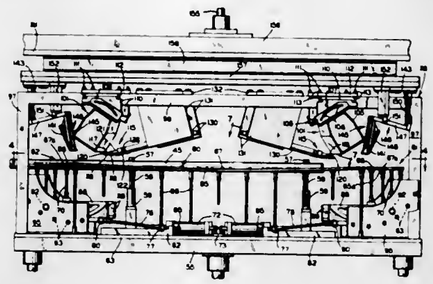
the improvement comprising differentially applying a superficial stream of cooling fluid onto said longitudinal side edge portion of the sheet after the sheet leaves the furnace and before the sheet is contacted by the lower forming rolls so as to cool the longitudinal side edge portion to a greater extent than said central portions of the sheet to a sufficient degree to impart resistance to kinking in the longitudinal side edge portion.

4,074,996

METHOD OF AND APPARATUS FOR BENDING GLASS SHEETS

Floyd T. Hagedorn, Oregon; Donald D. Rahrig, and Robert G. Revells, both of Toledo, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed July 28, 1976, Ser. No. 709,332
Int. Cl.[2] C03B *23/02*
U.S. Cl. 65—106 **25 Claims**



1. A method of bending a glass sheet comprising: heating a glass sheet substantially to the softening point thereof, supporting said heat-softened sheet on a press member having a shaping surface, superheating the heat-softened sheet along a line about which it is desired to sharply bend the sheet, and holding said sheet adjacent said line against said shaping surface while applying a bending moment to a portion of the glass sheet to bend such portion about said line.

10. Apparatus for bending glass sheets comprising: means for heating a glass sheet substantially to the softening point thereof, means for superheating the heat-softened sheet substantially above the softening point thereof along a line about which it is desired to sharply bend the sheet, means including a shaping surface for bending said sheet, means for holding the major portion of said sheet against said shaping surface, said bending means including means engageable with a portion of said glass sheet for applying a bending moment thereto to bend such portion about said line relative to said held major portion of said sheet.

4,074,997

PLANT PLUG

Merrill Cohen, 3418 Edcrest Road, Baltimore, Md. 21207

Filed June 17, 1976, Ser. No. 697,028
Int. Cl.[2] C05F *11/02*
U.S. Cl. 71—24 **4 Claims**

1. A weighted water-retaining, non-rigid, open-cell, substantially homogeneous polyurethane-foam/soil composition comprising moisture and a plant food enriched admixture of loam, clay, peat moss and builders' sand integrally incorporated as filler in sufficient water-cured hydrophilic-polyurethane-prepolymer foam to sustain the composition as an integral solid which has a sufficiently-high average density to preclude its floating in water.

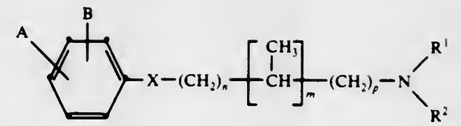
4,074,998

METHOD OF CONTROLLING AQUATIC WEEDS

William B. Lacefield, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 719,308, Aug. 31, 1976, abandoned. This application Mar. 31, 1977, Ser. No. 783,124
Int. Cl.[2] A01N *9/24*
U.S. Cl. 71—66 **9 Claims**

1. A method of destroying aquatic weeds in water which comprises contacting the weeds with an herbicidally-effective amount of a compound of the formula



wherein
A is hydrogen, bromo, or chloro;
B is cyclohexyl, benzyl, or phenyl;
X is oxygen or sulfur;
m is 0 or 1;
when $m = 0$, $n + p$ is 2 through 10; and
when $m = 1$, $n = p = 1$, or $n = 2$, $p = 0$;
R^1, when taken alone, is hydrogen, C_1-C_5 alkyl, or $—CH_2CH_2OH$;
R^2, when taken alone, is hydrogen, C_1-C_5 alkyl, C_3 alkenyl, cyclohexyl, $—CH_2CH_2OH$, $—(CH_2)_3OCH_3$, 1-adamantyl, or phenyl;
R^1 and R^2, when taken together with the nitrogen atom to which they are attached, form morpholino, 2-methylpiperidino, 4-(2-hydroxyethyl)piperazino, or pyrrolidino; and
the acid addition salts thereof.

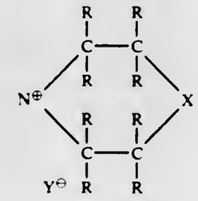
4,074,999

USE OF CYCLIC THIAZINES AS MICROBIOCIDES

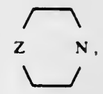
Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 119,387, Feb. 26, 1971, Pat. No. 3,770,732. This application May 29, 1973, Ser. No. 364,747
Int. Cl.[2] A01N *9/22*
U.S. Cl. 71—67 **10 Claims**

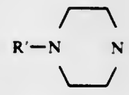
1. The process of inhibiting and controlling the growth of microbiological organisms selected from the group consisting of bacteria, fungi, algae and protozoa in aqueous or petroleum hydrocarbon media which comprises adding to said media a microbiocidal quantity of a quaternary bicyclic compound of the formula



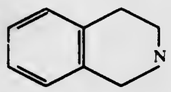
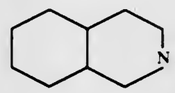
where N is



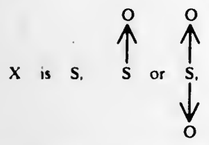
where Z is O,S, S←O or O←S→O, or



where R′ is lower alkyl, or hydroxyloweralkyl,

 or 

-continued



Y is a halide, sulfate, phosphate, nitrate, perchlorate or methane sulfonate, ethyl sulfonate or benzyl sulfonate, and the R's are hydrogen or lower alkyl.

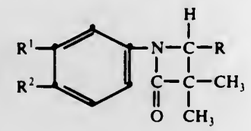
4,075,000

HERBICIDAL USE OF 4-AMINO-3,3-DIMETHYL-1-PHENYL-2-AZETIDINONES

Riaz F. Abdulla, Greenfield, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed May 27, 1975, Ser. No. 581,017
Int. Cl.² A01N 9/22
U.S. Cl. 71—88 **7 Claims**

1. A method of reducing the vigor of unwanted herbaceous plants which comprises contacting the plants with an herbicidally-effective amount of a compound of the formula



wherein
R represents
dimethylamino,
diethylamino, or
morpholino;
R^1 and R^2 independently represent
hydrogen,
methyl,
chloro,
fluoro,
methoxy,
methylthio, or
trifluoromethyl;
provided that both R^1 and R^2 do not represent hydrogen, and that neither R^1 nor R^2 represents hydrogen when R represents morpholino.

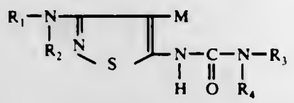
4,075,001

3-AMINOISOTHIAZOLE DERIVATIVES AS HERBICIDES

Loren Kenneth Gibbons, Medina, N.Y., assignor to FMC Corporation, Philadelphia, Pa.

Filed June 18, 1976, Ser. No. 697,449
Int. Cl.² C07D 275/02; A01N 9/12
U.S. Cl. 71—90 **17 Claims**

1. A substituted isothiazolylurea of the formula



in which R_1 and R_2 are alkyl, or taken together form a tetramethylene radical; R_3 is alkyl; R_4 is alkyl or hydrogen; M is cyano or carbamoyl.

16. An herbicidal composition comprising an herbicidally effective amount of a compound of claim 1 in admixture with an extender.

17. A method of preventing and destroying undesired plant growth which comprises applying to the locus to be protected an herbicidally effective amount of a compound of claim 1.

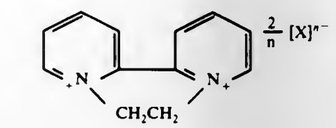
4,075,002

HERBICIDAL COMPOSITIONS HAVING IMPROVED STABILITY

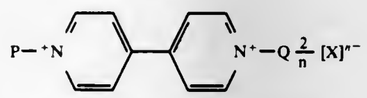
Nigel Wyndham Drewe, Maidstone; Roger John Parker, Tonbridge, and Tharwat Fouad Tadros, Wokingham, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jan. 15, 1973, Ser. No. 323,396
Claims priority, application United Kingdom, Jan. 28, 1972, 4042/72
Int. Cl.² A01N 9/22
U.S. Cl. 71—92 **8 Claims**

1. A herbicidal composition having improved storage characteristics, comprising an effective amount of a solid herbicide dispersed in an aqueous solution of a herbicidal bipyridylium quaternary salt selected from the group consisting of compounds of the formula:

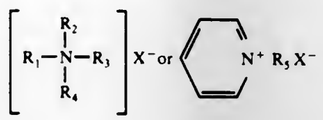


and



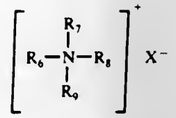
wherein P and Q are selected from the group consisting of alkyl radicals of 1 to 4 carbon atoms and alkyl radicals of 1 to 4 carbon atoms substituted by a radical selected from the group consisting of hydroxyl, halogen, carboxyl, alkoxy, alkylcarbonyl, carbamoyl or N-substituted carbamoyl; $[X]^{n-}$ represents an anion and n is a integer from 1 to 4 inclusive, the solid herbicide having an average particle size not exceeding 50 microns; and a dispersing agent selected from the group consisting of (A)

(i) quaternary ammonium salts of the formula:



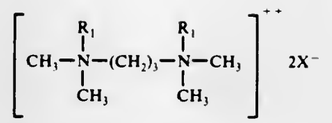
wherein R_1 and R_5 are aliphatic, preferably alkyl groups of from 8 to 18 carbon atoms and R_2, R_3 and R_4 are aliphatic, preferably alkyl, groups of less than 8 carbon atoms, R_2 may also be a benzyl group, and Y is an anion

(ii) quaternary salts of the formula:



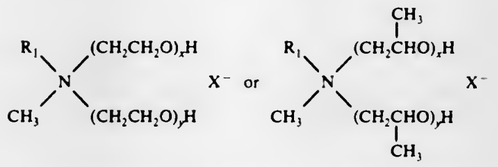
wherein R_6 and R_7 are aliphatic, preferably alkyl, groups of from 8 to 18 carbon atoms, R_8 and R_9 are aliphatic, preferably alkyl groups of less than 8 carbon atoms, and X is a anion

(iii) quaternary salts of formula:



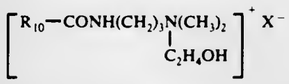
wherein R_1 and X are as defined in clause (i) above

(iv) quaternary salts of the formula:



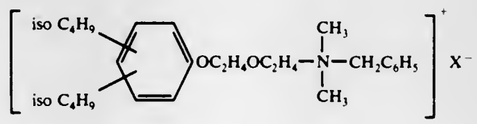
wherein R_1 and X^- are defined as in clause 1 above, and x and y each represent an integer from 2 to 23 inclusive;

(v) quaternary salts of formula:



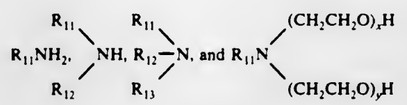
wherein R_{10} is an aliphatic, preferably alkyl group of 8 to 18 carbon atoms and X is an anion;

(vi) quaternary salts of formula:



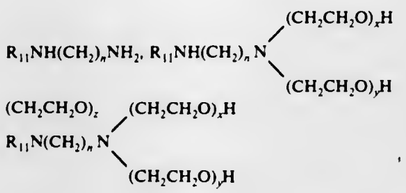
wherein X is an anion; and (B)

(i) acid addition salts of amines of the formula:



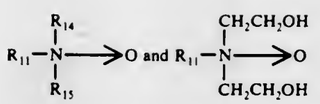
wherein R_{11}, R_{12}, and R_{13} represent saturated or unsaturated aliphatic groups of from 8 to 18 carbon atoms, or represent mixtures of such saturated or unsaturated aliphatic groups and x and y each represent an integer of from 2 to 23;

(ii) acid addition salts of diamines of formula:



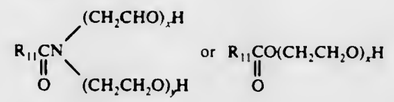
wherein R_{11}, x and y are defined as in clause (i) above, n is 2 or 3, and z is an integer of from 2 to 23

(iii) acid addition salts of amine oxides of formula:



wherein R_{11} is defined as in clause (i) above and R_{14} and R_{15} are aliphatic, preferably alkyl, groups of less than 8 carbon atoms;

(iv) compounds of formula:



wherein R_{11}, x and y are defined as in clause (i) above.

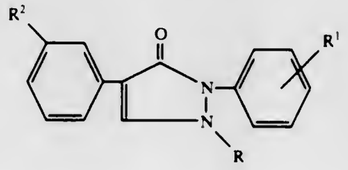
4,075,003

NOVEL HERBICIDAL METHOD UTILIZING 1,4-DIPHENYL-3-PYRAZOLIN-5-ONES

James Richard Beck, and Robert Peter Gajewski, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 639,744, Dec. 11, 1975, abandoned. This application Sept. 20, 1976, Ser. No. 724,502
Int. Cl.² A01N 9/22
U.S. Cl. 71—92 **12 Claims**

1. A method of reducing the vigor of weeds which comprises contacting the weeds with an herbicidally-effective amount of a compound of the formula



wherein
R represents C_1-C_3 alkyl;
R^1 and R^2 independently represent hydrogen, chloro, fluoro, bromo, methyl or trifluoromethyl, provided that R^1 and R^2 do not simultaneously represent hydrogen;
and provided that R^1 may not be bromo or chloro in the 4-position.

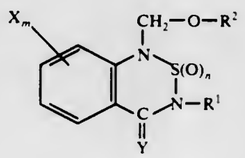
4,075,004

2,1,3-BENZOTHIADIAZINES

Gerhard Hamprecht, Mannheim; Ulrich Schirmer, Heidelberg; Bruno Wuerzer, Limburgerhof, and Guenter Retzlaff, Roemerberg, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Oct. 18, 1976, Ser. No. 733,524
Claims priority, application Germany, Nov. 27, 1975, 2553209
Int. Cl.² C07D 285/16; A01N 9/14
U.S. Cl. 71—91 **3 Claims**

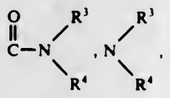
2. A process for controlling the growth of unwanted plants, wherein the soil or the plants are treated with a compound of the formula



V.

where R^1 is hydrogen, alkyl of from 1 to 7 carbon atoms, lower haloalkyl, cycloalkyl of from 3 to 7 carbon atoms, lower alkenyl, lower alkynyl, lower alkoxyalkyl, lower alkylmercaptoalkyl, phenyl, halogen-substituted phenyl or methyl-substituted phenyl;

R^2 is hydrogen, alkyl of from 1 to 20 carbon atoms, lower haloalkyl, cycloalkyl of from 3 to 7 carbon atoms, lower alkenyl, lower alkynyl, lower haloalkenyl, lower haloalkynyl, lower alkoxyalkyl, lower alkylmercaptoalkyl, lower alkylcarbamoylalkyl, lower dialkylcarbamoylalkyl, lower alkoxycarboalkyl, lower alkoxycarboalkenyl, lower alkylketone or benzyl, with the proviso that R^1 and R^2 cannot simultaneously denote hydrogen; and each X is independently halogen, NO_2, lower alkyl, halo lower alkyl, cycloalkyl of from 3 to 7 carbon atoms, phenyl halogen substituted phenyl, methyl-substituted phenyl, SCN, CO_2R^3,



NH_2, $Y''R^4$, SO_2R^3, SO_2OR^3,



CCl_3, CF_3,



or $Y'CF_2C(Z)_$, m denotes one of the integers 0, 1, 2, 3 and 4, and n denotes one of the integers 1 and 2, R^3 denoting lower alkyl, R^4 denoting lower alkyl or hydrogen, each Y, Y' and Y'' independently denoting oxygen or sulfur, and each Z independently denoting hydrogen, fluoro, bromo or chloro.

4,075,005

HERBICIDAL COMPOSITIONS

David Alan Knowles, Tonbridge, and Clive Gilroy Robson, Staplehurst, both of England, assignors to Imperial Chemical Industries Limited, London, England

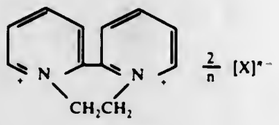
Filed Dec. 27, 1976, Ser. No. 757,912

Claims priority, application United Kingdom, Jan. 20, 1976, 2174/76

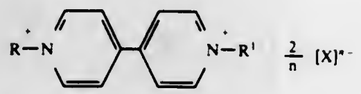
Int. Cl.² A01N *9/22*

U.S. Cl. 71—94 **7 Claims**

1. A concentrated herbicidal composition, comprising an aqueous solution having a pH not greater than 5, of a herbicidally effective amount of a salt of a herbicidal bipyridylium quaternary cation selected from the group consisting of compounds of the formula:



or



wherein R and R^1 are selected independently from the group consisting of alkyl radicals of from 1 to 4 carbon atoms and alkyl radicals of from 1 to 4 carbon atoms substituted by a radical selected from the group consisting of hydroxy, halogen, carboxyl, lower alkoxy, lower alkylcarbonyl, lower alkoxycarbonyl, carbamoyl or N-lower alkyl substituted carbamoyl; $[X]^{n-}$ represents an anion and n is an integer of from 1 to 4 inclusive; together with an odourant having an unpleasant smell and comprising an alkyl carboxyl acid of the formula RCOOH wherein R is a straight or branched chain alkyl group containing from three to five carbon atoms, said odourant being present in amount sufficient to warn that the composition is not a beverage suitable for drinking.

4,075,006

S-ARYL N-ALKYNYLTHIOLCARBAMATES

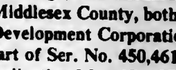
Jay K. Rinehart, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 30, 1976, Ser. No. 710,057

Int. Cl.² A01N *9/12;* **C07C** *155/08*

U.S. Cl. 71—100 **18 Claims**

1. A composition represented by the general formula:



wherein:

Ar is an aryl selected from the group consisting of phenyl, 4-chlorophenyl, 4-bromophenyl, 4-fluorophenyl, 3,4-dichlorophenyl, 4-nitrophenyl, 3-alkoxyphenyl in which the alkoxy has from one to four carbon atoms, 4-alkoxyphenyl in which the alkoxyphenyl has from one to four carbon atoms, 3-alkylphenyl in which the alkyl has from one to four carbon atoms, and 4-alkylphenyl in which the alkyl has from one to four carbon atoms, and

R is an alkynyl selected from the group consisting of 2-propynyl, 2-butynyl, 3-butynyl, 2-pentynyl, 3-pentynyl, 4-pentynyl, 1-methylprop-2-ynyl, 1-ethylprop-2-ynyl, 1-methylbut-2-ynyl, and 1,1-dimethylprop-2-ynyl.

4,075,007

N-CHLORO-CHLOROACETAMIDES AS HERBICIDES

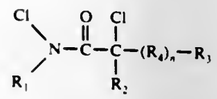
Sol J. Barer, Plainsborough, and Richard F. Stockel, Bridgewater Township, Middlesex County, both of N.J., assignors to National Patent Development Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 450,461, March 12, 1974, abandoned. This application May 17, 1974, Ser. No. 471,062

Int. Cl.² A01N *9/20*

U.S. Cl. 71—118 **27 Claims**

1. A process for destroying undesired vegetation comprising treating the growing medium containing the vegetation with a herbicidally effective amount of an N-chloro compound of the formula



where R_1 is hydrogen or alkyl of 1 to 6 carbon atoms, R_4 is alkylene or chloroalkylene of 1 to 5 carbon atoms, n is 0 or 1, R_2 and R_3 are hydrogen, chlorine, alkyl of 1 to 4 carbon atoms, aralkyl of up to 8 carbon atoms or aryl of up to 8 carbon atoms.

4,075,008

METHOD FOR THE RECLAMATION OF ZINC FROM GALVANIZING BATHS

Ralph William Leonard, Pittsburgh, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Apr. 4, 1977, Ser. No. 784,004

Int. Cl.² C22B *19/30*

U.S. Cl. 75—86 **5 Claims**

1. In the liquation process for the recovery of Zn entrained in dross removed from Zn base melts, the improvement for recovering said entrained Zn in a form essentially uncontaminated by high melting point, intermetallic compounds, said improvement comprising,

pouring molten dross into a mold for the formation of a dross ingot,

cooling the molten dross to a temperature below about 420° C and sufficient to form a substantially solid ingot therefrom,

on a permeable support and in the absence of detrimental agitation, reheating said solid ingot to a temperature of 420° to 700° C to melt-out said uncontaminated Zn therefrom.

4,075,009

NICKEL BASE BRAZING ALLOY

Marvin J. Stern, Seattle, Wash., assignor to Alloy Metals, Inc., Troy, Mich.

Filed Apr. 30, 1976, Ser. No. 681,957

Int. Cl.² C22C *19/03*

U.S. Cl. 75—170 **10 Claims**

1. A low temperature brazing alloy particularly suitable for brazing carbon and low alloy steels, nickel alloys, copper alloys and stainless steels, consisting essentially of, by weight,

manganese: 19 to 23%
silicon: 5 to 8%
copper: 4 to 6%
boron: 0.6 to 1.8%
rare earth: 0.01 to 0.2%
tantalum: 0 to 3%
molybdenum: 0 to 3%
columbium: 0 to 3%,
tungsten: 0 to 3%
aluminum: 0 to 3%
carbon: up to 0.06%
nickel: Balance

4,075,010

DISPERSION STRENGTHENED FERRITIC ALLOY FOR USE IN LIQUID-METAL FAST BREEDER REACTORS (LMFBRS)

John Joseph Fischer, Suffern, N.Y., assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Feb. 5, 1976, Ser. No. 655,463

Int. Cl.² B22F *3/00*

U.S. Cl. 75—235 **17 Claims**

1. As a powder metallurgy article of manufacture, a structural element of a LMFB reactor comprising a wrought dispersion-strengthened, heat resistant ferritic alloy having a composition consisting essentially of, by weight, about 13% to about 25% chromium, about 0.2% to less than 2% titanium, up to about 2% molybdenum, up to about 2% aluminum, a small but effective amount for improved strength up to about 1.5% yttria and the balance, except for incidental elements and impurities, essentially iron, said wrought ferritic element being characterized substantially throughout by composition uniformity and by a high degree of dispersion uniformity.

9. A structural element of a nuclear reactor comprising a wrought dispersion-strengthened, heat resistant ferritic alloy having a composition consisting essentially of, by weight, about 13% up to less than about 16% chromium, about 0.2% to about 1.5% titanium, up to about 1% Mo, a small but effective amount for improved strength up to about 0.75% of a refractory stable compound selected from the group metal oxide, metal nitride and metal carbide, and the balance, except for incidental elements and impurities, essentially iron, said element being prepared as a powder metallurgy product by the steps comprising a) mechanically alloying a mixture of fine powder containing components of said alloy in amounts proportional to give said composition, b) consolidating the resultant mechanically alloyed powder and effecting at least 25% reduction in area; thereby producing a dispersion-strengthened heat resistant ferritic alloy having a 100-hour stress-rupture life at 650° C of at least 40 ksi.

4,075,011

ELECTROSTATIC POWDER COATING METHOD

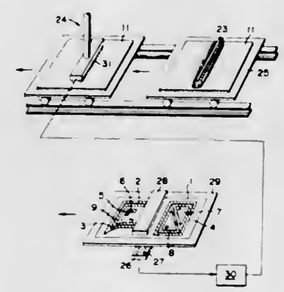
Masakazu Iwasa, Tokyo; Kazuo Horikawa, Asaka, and Seiji Matsumoto, Asaka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 12, 1974, Ser. No. 532,226

Claims priority, application Japan, Dec. 12, 1973, 48-139865

Int. Cl.² G03G *13/22*

U.S. Cl. 96—1 R **11 Claims**



1. A method of selectively applying electrostatic coating powder to a plate in a pattern to form an uncoated area on the plate on the surface of which marking lines are to be printed by an electrophotographic print marking process comprising the steps of, providing an optical original having recorded thereon both marking information in a linear form and non-coating information in a form corresponding to areas on a plate to remain uncoated with the electrostatic coating powder, said marking information and said non-coating information on said optical original having different spectral transmittance or reflectance, electrophotographically printing on the plate marking lines corresponding to said marking information using said optical original comprising the steps of uniformly applying photoconductive powder on the plate, uniformly charging the photoconductive powder applied on the plate, exposing portions of the charged photoconductive powder on the plate to imagewise light in accordance with the marking information on said optical original to neutralize the charge of the exposed portions of the photoconductive powder on the plate, and removing the exposed portions of the photoconductive powder from the plate, the charge of which has been neutralized, from the surface of the plate, and fixing the unexposed portions of the photoconductive powder, uniformly applying a layer of electrostatically charged coating powder on the plate, detecting the non-coating information on said optical original with photodetecting means to provide an output signal, selectively removing portions of said layer of coating powder from the plate by air flow by controlling a powder removal means with the output signal of the photo detecting means to form said uncoated areas on the plate corresponding to the non-coating information carried by the optical original and fixing the remaining portions of the layer of coating powder on the plate to the surface thereof.

4,075,012

INTRACHAIN CHARGE TRANSFER COMPLEXES USE IN ELECTROPHOTOGRAPHIC IMAGING

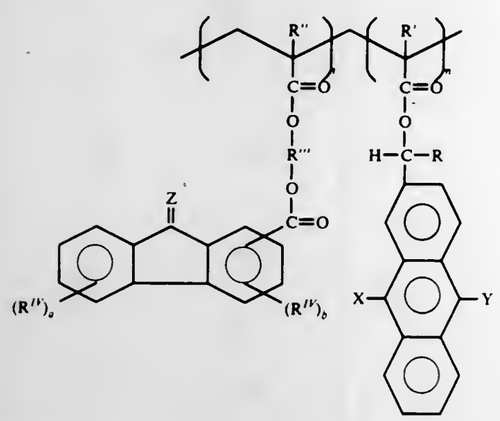
Sam R. Turner, Webster, and Milan Stolka, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 596,532, July 16, 1975, Pat. No. 4,013,623. This application Aug. 20, 1976, Ser. No. 716,309

Int. Cl.[2] G03G *1/00*

U.S. Cl. 96—1 PC 12 Claims

1. The electrophotographic imaging member comprising a photoconductive insulating layer containing a copolymer of the formula



wherein

R is hydrogen or alkyl of 1-6 carbon atoms;
R′ is hydrogen or methyl;
R″ is hydrogen or methyl;
R‴ is alkyl of 1-10 carbon atoms;
R⁗ is selected from the group consisting of $-NO_2$, halogen, $-CN$ and $-CF_3$;
X and Y are independently selected from the group consisting of hydrogen, chlorine, bromine, alkyl of 1-4 carbon atoms and phenyl;
Z is oxygen or dicyanomethylene;
a and *b* are in the range of from 0-4;
n is in the range of from about 5 to about 95 percent of the total number of structural units of the copolymer; and
m is in the range of from about 5 to about 95 percent of the total number of structural units of the copolymer.

4,075,013

ELECTROPHOTOCHEMICAL PREPARATION OF SELENIUM PHOTOCONDUCTIVE MEMBERS

Anthony T. Ward, 934 Little Pond Way, Webster, N.Y. 14580; Aleksandar Damjanovic, 809 Harbor Square, Rochester, N.Y. 14617, and Michael L. Hair, 2367 Bennington Gate, Oakville, Ontario, Canada (L6J 5N7)

Filed Sept. 13, 1976, Ser. No. 722,914

Int. Cl.[2] G03G *5/04*

U.S. Cl. 96—1.5 R 7 Claims

1. A method for forming an electrophotographic imaging member comprising a conducting substrate, a layer of amorphous selenium having a periodically varying thickness and a layer of a charge carrier transport material capable of transporting at least one species of charge carrier comprising:

a. cathodically depositing a layer of amorphous selenium on a conducting substrate from a selenious acid electrolyte while simultaneously illuminating said substrate with a periodic spatially modulated pattern of electromagnetic radiation within the absorption band of selenium whereby said selenium layer has a periodically varying thickness which corresponds to said periodic spatially modulated pattern; and

b. overcoating said selenium layer with a layer of a charge carrier transport material which is capable of transporting at least one species of charge carrier.

4,075,014

COLOR PICTURE DEVELOPMENT PROCESS

Wolfgang Gerhardt, Lutjenmoor, Germany, assignor to Tetenal Photowerk Walter Grabig, Schutzenwall, Germany

Continuation-in-part of Ser. No. 361,425, May 18, 1973, abandoned. This application Feb. 12, 1976, Ser. No. 657,486

Claims priority, application Germany, Mar. 17, 1973, 2313310

Int. Cl.[2] G03C *7/16, 5/32, 5/30*

U.S. Cl. 96—22 8 Claims

1. A color-positive process for producing a color surface picture using an image exposed color paper having diffusion-resistant and protected color couplers or plastic-coated or plastic-uncoated color paper of color negatives, the steps comprising:

color developing the picture at a temperature in the range of from about 20° C to about 50° C with a paraphenylene diamine developer having added thereto a development accelerator having the formula:

wherein R_1 and R_2 are H, CH_3, or CH_2-CH_3 and *n* is in the range of 1 to 4;

bleach fixing and stabilizing the picture in a solution including ethylene-diamine tetraacetic acid iron-sodium complex, ammonium thiosulfate and sodium sulfite, said solution having a pH of from about 5.5 to about 6.0, said process being carried out without any intermediate step of washing or a stop-fixing bath; and thereafter, washing the picture.

4,075,015

LIGHT SENSITIVE MASS AND PROCESS FOR ITS PRODUCTION

Josef Vinkovic, Tagerwilen, and Eugen Werner, Kreuzligen, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Aug. 16, 1976, Ser. No. 714,896

Claims priority, application Switzerland, Aug. 14, 1975, 010576/75

Int. Cl.[2] G03C *5/00, 1/52, 1/58*

U.S. Cl. 96—35.1 28 Claims

1. A process for the production of a light-sensitive material which comprises applying a light sensitive composition containing (a) a film former, which consists of 20 to 90 percent by weight of a vinyl pyrrolidone-vinyl acetate copolymer or a polyvinyl pyrrolidone or both and 10 to 80 percent by weight of an aryl sulfone amide formaldehyde resin, and (b) at least one sensitizer, the weight ratio of said film former to said sensitizer being between 1:1 and 10:1, said sensitizer being selected from the group consisting of a tanning diazo compound, a phenyl diazo compound, a 1,3-diphenyl triazo compound, 4,4′-diazidostilbene, 4,4′-diazidostilbene-2,2′- disulfonic acid, 4,4′-diazidostilbene-3,3′-disulfonic acid, a UV-hardenable short oil alkyd resin and 1,3-di-p-tolyl-3-methyl triazene, and said sensitizer being dissolved in (c) an organic solvent, to a carrier in the form of a layer, and drying said light sensitive layer applied to said carrier.

4,075,016

POSITIVE-WORKING PHOTOGRAPHIC PROCESS AND RADIATION ELEMENTS UTILIZING A CHALCOGENIDE OF ARSENIC IMAGING COMPOUND AND A NOBLE PLATING METAL

Atanas Tzvetanov Burov; Penka Atanassova Simidchieva, and Konstantin Nikolaev Kolev, all of Sofia, Bulgaria, assignors to Ziafop pri Ban, Sofia, Bulgaria

Filed Jan. 6, 1976, Ser. No. 646,934

Claims priority, application Bulgaria, Jan. 7, 1975, 2867

Int. Cl.[2] G03C *5/24, 1/48*

U.S. Cl. 96—48 PD 37 Claims

1. A method for the production of a direct positive metal image which comprises exposing an element comprising a thin radiation sensitive layer of an amorphous chalcogenide of arsenic adhering to a carrier therefor to radiation through a photomask to form a latent positive image, the radiation being such as to render chalcogenide impinged on thereby incapable of reducing a noble metal salt to form a deposit of the noble metal and immersing the element in a solution of a noble metal salt to deposit said noble metal in non-irradiated areas to obtain thereby a direct image rendered visible by means of said noble metal.

27. A radiation sensitive element for use in the production of a direct positive metal image when exposed to radiation through a photomask and immersed in water, which comprises a substrate having adhering thereto a thin radiation sensitive layer of an amorphous chalcogenide of arsenic which is covered in turn by a layer of a water permeable organic material and by a layer of a water-soluble organic polymer containing a noble metal salt, the radiation sensitive layer being accessible to radiation from one or both sides thereof.

4,075,017

PHOTOTHERMOGRAPHIC MATERIAL CONTAINING A COMBINATION OF ENERGY-SENSITIVE ORGANIC DYES AND PROCESS OF FORMING A POSITIVE OR NEGATIVE IMAGE WITH THE MATERIAL

Charles A. Goffe, deceased, late of Brockport, N.Y., by Patricia Anne Goffe, executrix, and Donald W. Heseltine, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 24, 1976, Ser. No. 689,325

Int. Cl.[2] G03C *5/24, 3/26*

U.S. Cl. 96—48 HD 45 Claims

1. A non-silver halide photothermographic element comprising a support having thereon a layer comprising

a) an oxidation-reduction image-forming combination comprising

i) a non-radiation sensitive reducing agent and

ii) an organic acid silver salt oxidizing agent,

b) a binder, and

c) a combination of energy-sensitive organic dyes which upon exposure to actinic radiation catalyze the reduction of the silver compound to metallic silver said combination comprising

(i) a photosensitive reducing agent precursor having an o-nitro substituted aryl group joined through a methine chain linkage to a basic heterocyclic nucleus containing an electron-donating nitrogen, oxygen or sulfur atom, and

(ii) a photosensitive dye containing a heterocyclic nitrogen atom which is substituted by a member selected from the group consisting of an alkoxy group and an acyloxy group.

4,075,018

MOTION PICTURE FILM, SOUNDTRACK AND METHOD FOR PRODUCTION THEREOF

Peter Anderson Custer, Newtown, Bucks County, Pa. 18940

Continuation-in-part of Ser. No. 375,812, July 2, 1973, Pat. No. 3,926,633. This application June 9, 1975, Ser. No. 585,164

Int. Cl.[2] G03C *5/14, 1/76, 1/84*

U.S. Cl. 96—39 26 Claims

1. A method for making an unexposed film containing a visual or photographic image portion and a sound image portion which comprises:

1. forming the film by coating a flexible transparent base with at least one silver halide-containing photographic image-forming layer;

2. adding to the film a screening or blocking layer which absorbs the radiation of at least a given portion of the light spectrum and which is optically transparent after the development of the film;

3. adding to the film a separate silver halide-containing optical soundtrack image-forming layer overlying at least a portion of said photographic layer, whereby the soundtrack images will overlie the photographic images;

4. said soundtrack image forming layer containing:

a. from 0 to a relatively small amount of a sensitizing material effective to sensitize said soundtrack image-forming layer to the said given portion of the light spectrum as is absorbed in the screening or blocking layer; and

b. a relatively small amount of a material which fluoresces under UV light;

5. the said screening or blocking layer being interposed between the said photographic and soundtrack layers.

4,075,019

HIGH GAIN COBALT(III)COMPLEX COMPOSITION AND ELEMENT

Thap DoMinh, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 461,172, April 15, 1974, abandoned. This application Oct. 30, 1975, Ser. No. 627,416

Int. Cl.[2] G03C *1/72*

U.S. Cl. 96—88 9 Claims

1. An image-forming element exhibiting upon exposure on internal gain and comprising a support and, as a coating thereon, a radiation-sensitive layer comprised of, in admixture,

a cobalt(III)complex which is a hexa-ammine cobalt(III), penta-ammine cobalt(III), bis(ethylenediamine) cobalt(III), tris(ethylenediamine cobalt(III), bis(propylene) cobalt(III), tris(propylene) cobalt(III), bis(dimethylglyoxime) cobalt(III), cobalt(III) acetylacetonate or bis(2,2′-bipyridyl) cobalt(III) complex and

a compound containing a conjugated π-bonding system capable of forming a tridentate chelate with cobalt(III), said compound being a 1-(2-pyridyl, 2-quinolinly, 2-thiazolyl, 2-benzothiazolyl, 2-oxazolyl or 2-benzoxazolyl) formazan dye; a 1-(2-pyridyl, 2-quinolinyl, 2-thiazolyl, 2-benzothiazolyl, 2-oxazolyl or 2-benzoxazolyl)-azo-2-(phenol or naphthol); 2-pyridinecarboxylaldehyde-(2-pyridyl, 2-quinolinyl, 2-thiazolyl, 2-benzothiazolyl, 2-oxazolyl or 2-benzoxazolyl) hydrazone; or 1-(2-pyridyl, 2-quinolinyl, 2-thiazolyl, 2-benzothiazolyl, 2-oxazolyl or 2-benzoxazolyl)-dithiooxamide;

less than 50 mole percent of any acid anions of said coating being those having pKa values greater than 3.5.

4,075,020
PROCESS FOR THE PREPARATION OF SILVER HALIDE EMULSIONS

Wilhelm Saleck, Schildgen, and Harald von Rintelen, Leverkusen, both of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed July 22, 1976, Ser. No. 707,812
Claims priority, application Germany, July 30, 1975, 2534011
Int. Cl.² G03C *1/02, 1/28*
U.S. Cl. 96—94 R **5 Claims**

1. A process of producing a silver halide emulsion comprising the step of precipitating silver halide by reacting an aqueous solution of a silver salt with an aqueous halide solution in the presence of a hydrophilic binder, wherein the improvement comprises

a. reacting from 5 to 30% of the total amount of soluble silver salt with a soluble chloride composition to form silver halide particles comprising silver chloride having a first solubility product, and

b. precipitating onto said particles further silver halide and simultaneously converting at least part of the silver chloride particles to a silver bromide selected from the group consisting of silver bromide, silver iodobromide, silver chlorobromide and silver chloroiodobromide having a second solubility product which is lower than said first solubility product when the solubility products of the respective halides are determined at the same constant temperature, by reacting in the presence of said silver chloride particles the residual amount of soluble silver salt with a composition selected from the group consisting of soluble chlorides, bromides and iodides containing the halide that forms the silver bromide having a second solubility product wherein, in the precipitation medium at least transitorily during said precipitation the quantity of the halide which forms the silver bromide with the second solubility product is less than equivalent to the quantity of silver ions by at least 5% and the total concentration of the added halide ions is greater than the total concentration of added silver ions by at least 5%,

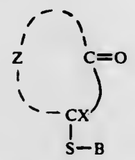
such that the silver bromide comprises from 40 - 100 mol% of the silver halide and the silver chloride comprises from 0 - 60 mol% of silver halide and the silver iodide comprises 0 -15 mol % of the silver halide.

4,075,021
PHOTOSENSITIVE MATERIAL FOR COLOR PHOTOGRAPHY

Shoji Kikuchi; Takaya Endo; Teruo Kagami, and Ryosuke Sato, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

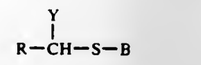
Filed Oct. 23, 1975, Ser. No. 625,043
Claims priority, application Japan, Oct. 25, 1974, 49-123105
Int. Cl.² G03C *1/06, 5/32, 7/16*
U.S. Cl. 96—95 **17 Claims**

1. A silver halide photosensitive material for color photography comprising a bleach-promoting substance releasing compound upon reacting with an oxidation product of a color developing agent, said bleach-promoting substance-releasing compound being represented by the following general formulas:



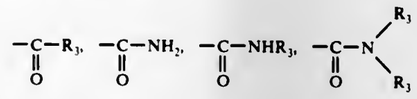
I

wherein Z is a group of non-metallic atoms necessary for forming a 5-, 6- or 7-membered saturated or unsaturated carbon ring or nitrogen, oxygen, or sulfur containing heterocyclic ring wherein said carbon ring and said carbon ring and said heterocyclic ring may be substituted with at least one member selected from the group consisting of alkyl, aryl, alkoxy, aryloxy, halogen and a group-SB, in which ring the two substituents can form a condensed ring, X is hydrogen or halogen, and B is a group capable of forming, together with the sulphur atom, a heterocyclic mercapto compound selected from the group consisting of 1H-2-mercaptotetrazole, 3-mercapto-1,2,4-triazole, 3-mercapto-4-phenyl-5-amino-1,2,4-triazole, mercapto imidazoline, mercapto pyrimidine, mercapto purine, mercapto quinolidine and 2-mercapto-5-amino-1,4,5-thiadiazole, or:



II

wherein Y is a halogen or a group $-OR_1$ or $-COOR_2$ in which R_1 is alkyl, aryl, acyl or heterocyclic group, R_2 is alkyl, R is a group



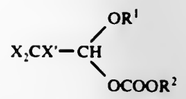
or $-COOR_4$ in which R_3 is alkyl, aryl, or a heterocyclic group with the proviso that in the case of a group having two R_3s, two R_3s can jointly form a nitrogen-containing ring and R_4 is alkyl, and B is as defined in the general formula I.

4,075,022
AQUEOUS DISPERSIONS OF PHOTOGRAPHIC INGREDIENTS

Leo August Van Wignsberghe, deceased, late of 's-Gravenwezel, Belgium, by Agnes Maria Zinzen, heir, Fazantenlaan 13, B 2232 's-Gravenwezel, Belgium; Raphael Karel Van Poucke, Ringlaan 22, B 2600 Berchem, Belgium, and Jaak Pieter Van Vugt, Esmoreitlaan 3, B 2050 Antwerpen, Belgium

Filed Apr. 5, 1976, Ser. No. 673,370
Claims priority, application United Kingdom, Apr. 3, 1975, 13784/75
Int. Cl.² G03C *1/40, 1/02*
U.S. Cl. 96—100 R **25 Claims**

10. Method of forming a hydrophilic colloid composition wherein a carbonate of the formula:



wherein:

X represents a halogen atom

X' represents a hydrogen atom or a halogen atom, and each of R^1 and R^2 represents an alkyl group or an aryl group, is added to an aqueous solution of the hydrophilic colloid.

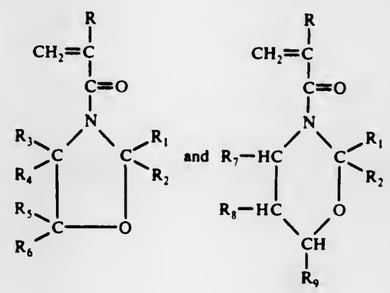
15. Method according to claim 10, wherein a photographic ingredient is also added to the aqueous solution of hydrophilic colloid.

4,075,023
POLYMERIZABLE UNSATURATED OXAZOLIDINES AND TETRAHYDRO-1,3-OXAZINES AND POLYMERS THEREOF

Jan Josef Priem, Mortsel, and Walter Frans De Winter, Berchem, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Dec. 19, 1972, Ser. No. 316,511
Claims priority, application United Kingdom, Dec. 20, 1971, 59034/71
Int. Cl.² G03C *1/72*
U.S. Cl. 96—114 **4 Claims**

1. A gelatin layer comprising gelatin and up to 50% by weight of the amount of dry gelatin present of a homopolymer of a vinyl monomer corresponding to one of the general formulae:



and

wherein:

R represents hydrogen or methyl,

R_1 is a C_1–C_4 alkyl group and R_2 is a C_1–C_4 alkyl group or a phenyl group, each of R_3, R_4, R_5 and R_6 represents a hydrogen atom, a methyl group, or an ethyl group, and

each of R_7, R_8 and R_9 represents a hydrogen atom or a methyl group.

4,075,024
COLORED GLASSES AND METHOD

William H. Armistead, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Aug. 19, 1976, Ser. No. 715,989
Int. Cl.² C03C *3/10, 3/08*
U.S. Cl. 106—53 **4 Claims**

1. A colored glass article composed of a borosilicate glass having a composition consisting essentially, in weight percent as calculated from the batch, of about 5–21% B_2O_3, 35–75% SiO_2, 5–50% total of bivalent metal oxides selected in amounts not exceeding the indicated proportion from the group consisting of up to 50% PbO, 15% ZnO, and 5% BaO, 0.5–1.5% of a silver compound, 1–4% Sb_2O_3, 0–9% Na_2O, 0–2% F, and 0–1% P_2O_5, said glass comprising in at least a portion thereof a separated, glassy, boron-rich phase and a coloring metallic silver phase associated with said separated glassy, boron-rich phase, said glass article exhibiting at least one absorption color selected from the group consisting of orange, red, purple, blue, green, and mixtures thereof.

4,075,025
METHOD OF FORMING A POTASSIUM ALUMINOBOROSILICATE FRIT

David Rostoker, Monroeville, Pa., assignor to Pittsburgh Corning Corporation, Pittsburgh, Pa.

Filed May 10, 1976, Ser. No. 685,054
Int. Cl.² C03C *3/08*
U.S. Cl. 106—54 **1 Claim**

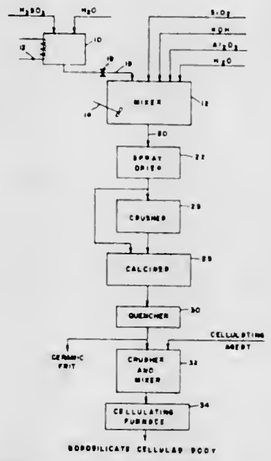
1. A method of forming a potassium aluminoborosilicate frit comprising,

forming an aqueous boric acid solution,

separately forming an aqueous slurry of potassium hydroxide, colloidal, high surface area, alpha monohydrate alumina particles, and amorphous, high surface area, colloidal, precipitated hydrated silica particles, said potassium hydroxide being added in a sufficient amount to provide a pH of about 10 for said aqueous slurry, and subjecting said slurry to high shear mixing,

mixing the boric acid solution with said aqueous slurry whereby said boric acid is absorbed on to the surface of the colloidal particles,

thereafter adding additional amorphous, high surface area, precipitated hydrated silica until said slurry contains about 22% by weight solids,



spray drying said slurry at a rate which enables forming substantially spherical agglomerates of the solid particles in said slurry and retaining the boric oxide on said particles,

calcining said agglomerates at a temperature sufficient to fuse said agglomerates,

rapidly quenching said fused agglomerates to prevent substantial divitrification of said fused agglomerates,

crushing said fused agglomerates to form a potassium aluminoborosilicate frit of a preselected size.

4,075,026
MORTARS AND CONCRETES CONTAINING PRETREATED AGGREGATE FILLERS

Edward H. Cumpston, Jr., 43 Monument Ave., Old Bennington, Vt. 05201

Filed Jan. 6, 1977, Ser. No. 757,231
Int. Cl.² C04B *7/02*
U.S. Cl. 106—97 **43 Claims**

1. A concrete or mortar composition comprising a cement, an aggregate filler and water wherein at least a portion of said aggregate filler is pretreated prior to being added to the composition by sequential acidization and de-acidization.

4,075,027
CONSOLIDATION OF PARTICULATE MATERIALS

Kenneth George Knill, Ripley; Michael Kendal Bowler, Duffield, and Peter Hambleton, Belper, all of England, assignors to Charcon Products Limited, Hulland Ward, England

Filed Feb. 11, 1976, Ser. No. 657,188
Claims priority, application United Kingdom, Feb. 14, 1975, 6246/75
Int. Cl.² C04B *7/02*
U.S. Cl. 106—99 **20 Claims**

5. A briquette comprising a consolidated mass consisting of a homogeneous mixture of metallic particles, at least 0.5% by weight of a fibrous material and at least 5.0% by weight of cement.

4,075,028

COMPOSITION FOR TREATING CELLULOSE-CONTAINING FIBROUS MATERIALS AND METHOD OF PRODUCING COMPOSITION FOR TREATING CELLULOSE-CONTAINING MATERIALS

Vladimir Alexandrovich Amosov, Nevsky prospekt, 96, kv. 122; Alexandr Evgenievich Guschin, Kovensky pereulok, 13, kv. 18; Jury Nikolaevich Efremov, Svetlanovsky prospekt, 99/2, kv. 42, and Rudolf Evgenievich Smirnov, ulitsa Tverskaya, 20, kv. 142, all of Leningrad, U.S.S.R.

Filed Apr. 22, 1976, Ser. No. 679,483
Int. Cl.² C08L *1/08;* C09J *3/04*
U.S. Cl. 106—186 **8 Claims**

1. A composition for treating cellulose-containing fibrous materials containing cellulose with no less than 13 wt.% of hemicelluloses in the form of a gel in an aqueous solution of at least one compound selected from the group consisting of carbamide, thiocarbamide, alkyl-substituted derivatives of carbamide, and alkyl-substituted derivatives of thiocarbamide.

4,075,029

INORGANIC PIGMENT COMPRISING A SOLID SOLUTION OF DIFFERING SPINELS

James W. Nuss, Rocky River, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

Filed Aug. 20, 1976, Ser. No. 716,343
Int. Cl.² C09C *1/00;* C01G *1/02*
U.S. Cl. 106—288 B **44 Claims**

1. A multiple spinel inorganic pigment comprising a first spinel crystal structure and spinel-forming metal oxides of at least a second spinel, said first and spinel-forming oxides being combined as a solid solution comprising a cubic spinel crystal structure of said first spinel and containing dissolved witin said structure the spinel-forming metal oxides of said at least second spinel, said first spinel corresponding to one of the following formulas, and said spinel-forming metal oxides being present in proportions inter se to correspond to a different one of the following formulas:

$A^{+2}B_2^{+3}O_4$,
$A_2^{+2}B^{+4}O_4$,
$A^{+1}B_5^{+3}O_8$,
$A_4^{+1}B_5^{+4}O_{12}$, or
$A_2^{+1}B^{+2}C_3^{+4}O_8$,

in which A, B and C are ions of metals having a valence indicated by the associated exponents, and in which each of A, B and C of the spine-forming metal oxides has an ionic radius no greater than about 1.1 angstroms, said first spinel and said at least second spinel being present in all proportions forming a single phase solid solution.

4,075,030

HIGH BULKING CLAY PIGMENTS AND METHODS OF MAKING THE SAME

Wayne M. Bundy, Westfield; Joseph P. Berberich, Barnegat, and David Sastre, Elizabeth, all of N.J., assignors to Yara Engineering Corporation, Elizabeth, N.J.

Continuation-in-part of Ser. No. 591,851, June 30, 1975, abandoned. This application Aug. 1, 1977, Ser. No. 820,856
Int. Cl.² C04B *31/26*
U.S. Cl. 106—288 B **9 Claims**

1. A method of producing a high bulking kaolinite of improved opacity comprising the steps of:

a. adding to a kaolinite slurry a selective flocculant for ultrafine particles and thereafter sufficient sulfuric acid in the presence of about 0.1% to about 0.7% fine mica below 150 mesh in size to recover from the kaolinite a flocculated ultrafine particle kaolinite fraction admixed with the mica, and

b. collecting and drying the selectively flocculated fine particle kaolinite and mica mixture as a dry pigment material.

4,075,031

TiO_2 PIGMENT COATED WITH DENSE SILICA AND POROUS ALUMINA/SILICA

Alvin Allen, Claymont, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 30, 1976, Ser. No. 728,413
The portion of the term of this patent subsequent to July 29, 1992, has been disclaimed.
Int. Cl.² C09C *1/36*
U.S. Cl. 106—300 **10 Claims**

1. Coated TiO_2 pigment consisting essentially of a core of pigmentary TiO_2, a dense inner coating of from 1% to 10% by weight of dense amorphous silica, calculated as SiO_2 and based on said pigmentary TiO_2, and from 0% to 5% by weight of alumina, calculated as Al_2O_3 and based on said pigmentary TiO_2, and a porous outer coating of porous silica and alumina, said porous silica being present in an amount from 0.5% to 15% by weight, calculated as SiO_2 and based on said pigmentary TiO_2, said alumina being present in an amount from 0% to 15% by weight, calculated as Al_2O_3 and based on said pigmentary TiO_2, wherein the total amount of alumina is at least 0.5% by weight, calculated as Al_2O_3 and based on said pigmentary TiO_2, wherein said dense amorphous silica and said porous silica and alumina substantially continuously coat said pigmentary TiO_2.

4,075,032

ANTIMONY OXIDE PIGMENT AND PROCESS OF MANUFACTURE

David Charles Thomas, Oklahoma City, Okla., assignor to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed Apr. 18, 1977, Ser. No. 788,158
Int. Cl.² C09C *1/00*
U.S. Cl. 106—303 **28 Claims**

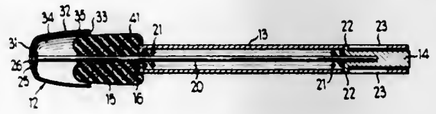
1. A coated antimony oxide pigment comprising:
an antimony oxide pigment;
a first coating comprising at least one member selected from the group of titania, predominately amorphous alumina or silica, on the antimony oxide pigment; and
a second coating comprising at least one member selected from the group of alumina, predominately boehmite alumina, or silica on the antimony oxide pigment over the first coating.

4,075,033

WIPING MATERIAL AND HOLDER

Michael A. Knox, 320 W. Normal Parkway, Chicago, Ill. 60621, and Mary Powers, P.O. Box 588, Cedar Falls, Iowa 50613

Filed Aug. 9, 1976, Ser. No. 712,653
Int. Cl.² A47K *10/16;* A61M *35/00;* B08B *1/00*
U.S. Cl. 134—6 **11 Claims**



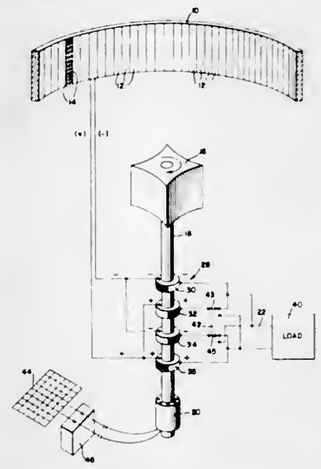
1. A method of treating a surface which comprises:
(A) placing in proximity to each other a cup-shaped web of at least two layers of substantially non-resilient flexible material and a grasping means connected to one end of an elongated handle means said grasping means having a resilient surface contacting said web;
(B) retaining with said grasping means said web at a fixed orientation relative to handle means;
(C) moving said handle means with said web retained by said grasping means so as to contact said surface with said web; and
(D) subsequent to the step of contacting said surface with said web, disengaging said web from said grasping means without manually touching the outside of said web.

4,075,034

SOLAR CONVERTER

David M. Butler, 46 Farragut Road, Annapolis, Md. 21403

Filed Feb. 8, 1977, Ser. No. 766,576
Int. Cl.² H01L *31/02*
U.S. Cl. 136—89 PC **12 Claims**



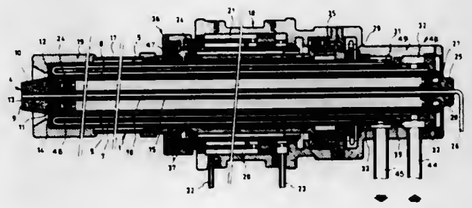
1. A solar energy converter for producing variable amplitude energy waveforms directly from solar energy comprising
a solar bank having an array of photo-voltaic segments, each segment including a variable number of photo-voltaic cells and being adapted to produce a weighted voltage output proportional to the number of photo-voltaic cells when activated by solar energy;
means for reflecting concentrated solar light onto said solar bank;
means for scanning said reflecting means across said solar bank; and
circuit means for connecting the output of said solar bank to a load.

4,075,035

TEMPERATURE DETECTING DEVICE FOR A FURNACE

Jean-Louis Trevedy, Metz, France, assignor to Institut de Recherches de la Siderurgie Francaise (IRSID), St. Germain-en-Laye-Cedex, France

Filed Dec. 24, 1975, Ser. No. 644,324
Claims priority, application France, Jan. 17, 1975, 75 01378
Int. Cl.² G01K *1/08;* H01V *1/30*
U.S. Cl. 136—210 **7 Claims**



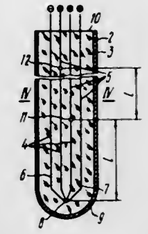
1. A device for detecting the temperature in a furnace wherein heat rediation is produced, which comprises
a. a tubular casing having an axis and formed by a double wall concentrically surrounding the axis, the double wall defining an elongated chamber,
b. a longitudinal tubular element disposed in the chamber and dividing the chamber into two concentric compartments for the circulation of a cooling fluid therethrough,
c. a support tube disposed coaxially in the tubular casing and in contact with the double wall thereof,
d. a centering ring at one end of the support tube,
e. a thermally conductive, refractory tip disposed on the centering ring and projecting from the casing, the tip defining an axial bore,
f. a guide tube disposed within the support tube and extending along the casing, the guide tube being maintained by the centering ring in alignment with the bore of the tip and enabling a thermocouple with a heat sensitive element adjacent the tip to be introduced and received therein,
g. clearing means surrounding the casing and comprising an annular striker assembly mounted on the casing, and
h. a mechanism for axially reciprocating the striker element.

4,075,036

PROFILED MULTIELECTRODE THERMOCOUPLE

Boris Vasilievich Lysikov, Universitetsky prospekt, 21, korpus 1, kv. 8; Jury Nikolaevich Shabanov, Sakhalinskaya ulitsa, 6, korpus 1, kv. 217; Jury Viktorovich Rybakov, ulitsa Gancharova, 7, kv. 58, all of Moscow, and Valentina Ivanovna Svetlova, stantsia Malakhovka, ulitsa Turgeneva, 43, Maskovskaya oblast, all of U.S.S.R.

Filed Sept. 10, 1975, Ser. No. 611,845
Claims priority, application U.S.S.R., Sept. 10, 1974, 2058145
Int. Cl.² H01V *1/00;* G01K *7/04*
U.S. Cl. 136—225 **10 Claims**

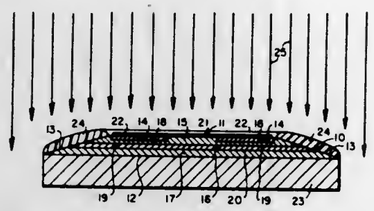


1. A profiled multielectrode thermocouple comprising a flexible protective shell having a free or probe end; first thermoelectrode means of one polarity constructed as a bundle of thermoelectrodes of different lengths and insulated from one another, the longest thermoelectrode of said one polarity extending through said shell to a remote point proximate to said probe end, and the other thermoelectrodes of said one polarity having shorter lengths and connected to said longest thermoelectrode at said remote point and extending from said remote point to different intermediate points along the length of said shell; and second thermoelectrode means comprising at least two thermoelectrodes of different lengths and of opposite polarity arranged in said shell each of which is connected to another one of said thermoelectrodes of said one polarity, said longest thermoelectrode of said one polarity being connected to the longest thermoelectrode of said other polarity at said remote point to form a first working junction, each connection of an associated pair of thermoelectrodes of opposite polarities at an intermediate point forming an intermediate working junction, said working junctions at said remote and intermediate points being spaced from each other at substantially uniform distances along the length of said protective shell.

4,075,037
TAILORING OF RECOVERY CHARGE IN POWER DIODES AND THYRISTORS BY IRRADIATION

Krishan S. Tarneja; Joseph E. Johnson, and John Bartko, all of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 17, 1976, Ser. No. 687,278
Int. Cl.² H01L *21/263*
U.S. Cl. 148—1.5 **10 Claims**



1. A method of tailoring the recovery charge of a device of a type of diode or thyristor comprising the steps of:

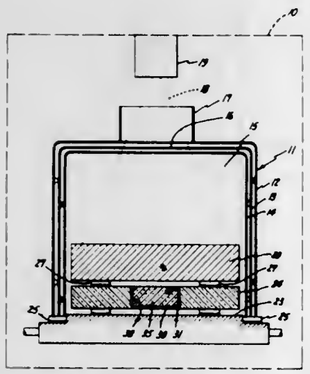
A. positioning a junction diode or thyristor semiconductor body with a major surface thereof to be exposed to a radiation source;

B. thereafter irradiating said semiconductor body with the radiation source to a dosage between about 1×10^{12} and 8×10^{12} electrons/cm² to reduce the recovery charge of the device.

4,075,038
DEEP DIODE DEVICES AND METHOD AND APPARATUS

Thomas R. Anthony, and Harvey E. Cline, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 411,001, Oct. 30, 1973, abandoned. This application Feb. 24, 1975, Ser. No. 552,154
Int. Cl.² H01L *29/04, 7/00*
U.S. Cl. 148—1.5 **6 Claims**

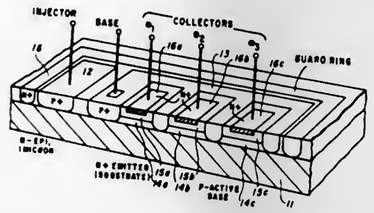


1. The method of making a semiconductor device comprising a body of semiconductive material having a first type conductivity in the form of a wafer having substantially planar top and bottom surfaces and a plurality of separate spaced recrystallized regions of semiconductive material having a second type conductivity extending in straight lines from the top surface to the bottom surface of the body, which comprises the steps of providing in contact with one of said surfaces of the body a plurality of separate deposits of a solid metallic material with which the semiconductive material of the body will form a solution of melting point temperature below that of the semiconductive material of the body, heating the solid metallic material to a predetermined elevated temperature and forming a liquid solution of the semiconductive material of the body at each of the deposit sites, establishing and maintaining a selected finite temperature gradient in a direction normal to the said top and bottom surfaces through the body, and coextensively in time establishing and maintaining a zero temperature gradient through the body in a direction normal to the direction of the said selected finite temperature gradient, and migrating the resulting liquid solution bodies through the body in straight lines from one planar surface to the other and thereby forming in situ separate spaced recrystallized regions having a second type conductivity and having a constant uniform level of impurity concentration throughout their lengths as determined by the solid solubility limit of the metallic material in the semiconductive material of the body at the said predetermined temperature.

4,075,039
INTEGRATED LOGIC CIRCUIT AND METHOD OF FABRICATION

Benjamin Johnston Sloan, Jr., Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 588,255, June 19, 1975. This application Aug. 30, 1976, Ser. No. 719,024
Int. Cl.² H01L *21/26*
U.S. Cl. 148—1.5 **4 Claims**



1. A method for the fabrication of an integrated semiconductor injection logic device comprising the steps of:

a. forming a monocrystalline epitaxial layer of N type conductivity and a thickness of about 1–2 microns having a resistivity of about 0.3–2 ohm centimeter on an N type monocrystalline silicon substrate having a resistivity of 0.005–0.05 ohm centimeter;

b. forming on said surface layer an N type guard ring of low resistivity completely surrounding a portion of said surface layer;

c. selectively exposing said portion to a beam of boron ions having an energy of 400 to 600 KEV and a dosage of about 10^{13} ions/cm² thereby forming a band of P type material below the surface of said epitaxial layer;

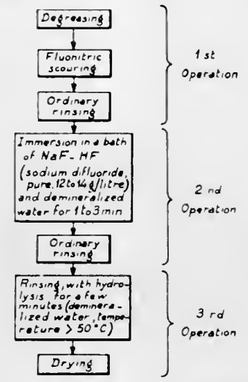
d. selectively forming first and second P type regions having a sheet resistance of 25 to 50 ohms per square in said epitaxial layer, spaced apart sufficiently close at the surface to form the emitter and collector respectively of a lateral bipolar transistor, said collector having a repeated pattern of segments which extend through the thickness of said epitaxial layer to define and separate a plurality of epitaxial regions, including a like plurality of segments of said previously implanted P type band below the surface of said epitaxial layer; and

e. forming ohmic contacts to said emitter and collector respectively of said lateral bipolar transistor and forming ohmic contacts to each of the repeated segments defined by said collector to complete the device.

4,075,040
TITANIUM AND TITANIUM ALLOY SURFACE PREPARATION METHOD FOR SUBSEQUENT BONDING

Roland Villain, Feucherolles, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed July 15, 1976, Ser. No. 705,480
Claims priority, application France, Mar. 15, 1976, 76 07375
Int. Cl.² C23F *7/06*
U.S. Cl. 148—6.14 R **14 Claims**

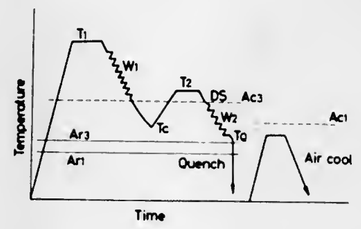


1. A method of surface treatment of articles containing titanium or its alloys preparatory to bonding with adhesives, comprising the steps of: 1) degreasing and scouring the surface of said articles; 2) immersing said degreased and scoured article in an aqueous acidic bath consisting essentially of from 0.16 to 0.23 mole per liter of fluorides of metals selected from the group consisting of the alkali metals and the alkaline earth metals; and 3) hydrolysing of the resulting surface coating in demineralized water at a temperature of at least 50° C. for a time sufficient to obtain a layer of substantially pure anatase containing superficial OH sites for said adhesive.

4,075,041
COMBINED MECHANICAL AND THERMAL PROCESSING METHOD FOR PRODUCTION OF SEAMLESS STEEL PIPE

Masakatsu Ueno; Osamu Kato, both of Kitakyushu; Nobuyuki Kawauchi, Shiki, and Kametaro Itoh, Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Oct. 20, 1976, Ser. No. 734,369
Claims priority, application Japan, June 14, 1976, 51-69613
Int. Cl.² C21D *9/08*
U.S. Cl. 148—12.4 **7 Claims**



1. A process for producing a seamless steel pipe comprising the steps of:

a. primary hot working a bloom into a mother tube with an intermediate cross-section comparatively nearer to that of the finished pipe product;

b. removing scale from the outside surface of said mother tube while being entirely austenitized;

c. secondary hot working said mother tube into a pipe of final dimensions with a degree of work applied thereto, measured in terms of equivalent strain ($\bar{\epsilon}$) as expressed by the following formula, of not less than $\bar{\epsilon} = 0.02$,

$$\bar{\epsilon} = \sqrt{2/3}\,\sqrt{(\epsilon_1 - \epsilon_2)^2 + (\epsilon_2 - \epsilon_3)^2 + (\epsilon_3 - \epsilon_1)^2}$$

wherein

$\epsilon_1 = ln(l_2/l_1)$

$\epsilon_2 = ln(t_2/t_1)$

$\epsilon_3 = ln[(2r_2 - t_2)/(2r_1 - t_1)]$

in which l_1, t_1 and r_1 are the length, thickness and radius of the mother tube respectively, and l_2, t_2 and r_2 are the length, thickness and radius of the pipe of final dimensions respectively; and

d. directly quenching said pipe of final dimensions.

4,075,042
SAMARIUM-COBALT MAGNET WITH GRAIN GROWTH INHIBITED $SmCo_5$ CRYSTALS

Dilip K. Das, Bedford, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 416,700, Nov. 16, 1973, abandoned, which is a continuation of Ser. No. 131,777, April 6, 1971, abandoned, which is a continuation-in-part of Ser. No. 778,041, Nov. 22, 1968, abandoned. This application May 9, 1977, Ser. No. 794,879
Int. Cl.² H01F *1/02*
U.S. Cl. 148—103 **10 Claims**

1. A rare earth-cobalt magnet of a rare earth designated by the symbol R comprising a shaped sintered structure of fine particles of rare earth and cobalt corresponding to the mixture of RCo_5 and R_2Co_7, said structure having an energy product greater than the actual energy product of RCo_5 or R_2Co_7, each taken alone, wherein R is a rare earth selected from the group consisting of samarium, cerium, praesodymium and lanthanum, and consisting essentially of grains of RCo_5 of single domain size and at least partially surrounded by crystallized R_2Co_7.

4,075,043
LIQUID PHASE EPITAXY METHOD OF GROWING A JUNCTION BETWEEN TWO SEMICONDUCTIVE MATERIALS UTILIZING AN INTERRUPTED GROWTH TECHNIQUE

John Elwood Clarke; Austin M. Andrews, II; Edward R. Gertner, all of Newbury Park; Joseph T. Longo, and John G. Pasko, both of Thousand Oaks, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 1, 1976, Ser. No. 719,559
Int. Cl.² H01L *21/368, 21/76*
U.S. Cl. 148—171 **5 Claims**

1. A method of obtaining a heterojunction comprising the following continuous series of steps:

providing a substrate of $(Pb_{1-x}Sn_x)Te$;

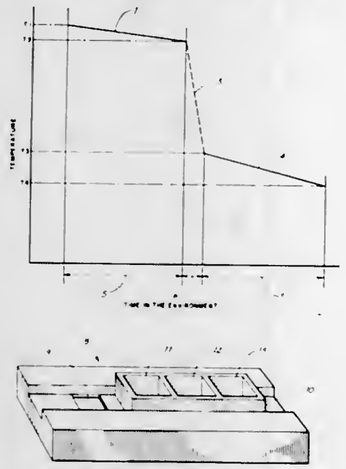
placing a first growth environment comprising a melt of Pb, Sn, and Te in contact with said substrate;

growing in situ by liquid phase epitaxy technique a first layer comprising $(Pb_{1-x}Sn_x)Te$ on said substrate from a first temperature to a lower second temperature;

removing said first environment to discontinue said growing of a first layer

changing said second temperature to a lower third temperature;

placing a second growth environment comprising a melt of Pb and Te in contact with said first layer; and



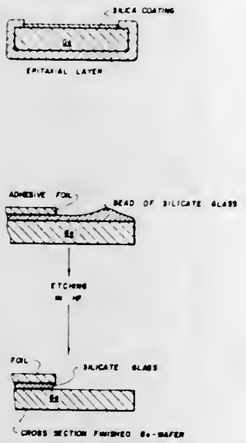
growing in situ by liquid phase epitaxy technique a second layer comprising PbTe on said first layer from said third temperature to a lower fourth temperature.

4,075,044

METHOD OF PRODUCING A SILICEOUS COVER LAYER ON A SEMICONDUCTOR ELEMENT BY CENTRIFUGAL COATING UTILIZING A MIXTURE OF SILICA EMULSIONS

Hans Jäger, Bad Homburg, and Emil Seipp, Eschborn, both of Germany, assignors to S.A. Metallurgie Hoboken-Overpelt N.V., Belgium

Filed Feb. 11, 1976, Ser. No. 657,317
Claims priority, application Germany, Feb. 15, 1975, 2506457
Int. Cl.² H01L *21/20, 21/31, 21/316*
U.S. Cl. 148—175 **7 Claims**



1. A method of coating a semiconductor wafer with a siliceous cover layer having a peripheral bead formation substantially free from cracking at elevated temperatures wherein the temperature coefficient of said cover layer is approximately equal to the temperature coefficient of the semiconductor wafer, which comprises forming a combined emulsion by mixing together a first emulsion of a non-doped, pure silica emulsion and a second emulsion of a heavily-doped silica emulsion coating a test wafer with said combined emulsion, distributing the combined emulsion so-formed over the wafer by centrifugal force at a speed from 3000 to 11,00 rpm, controlling the thickness of the peripheral bead between about 0.5 to 1 μm, and the thickness of the rest of the cover layer between about 0.15 to 0.3 μm, hardening the resultant layer for at least 10 minutes at a temperature of about 300° C, thereafter subjecting the hardened cover layer to thermal treatment at temperatures in excess of 300° C, at which the so-treated layer is to be employed later and then examining said layer microscopically for crack formation in the area of the peripheral bead and selecting the optimum mixture of said first and second emulsions, thereby adjusting the ratio of the first and second emulsions that they produce a combined emulsion having a temperature coefficient substantially identical with the temperature coefficient of the semi-conductor wafer, coating device wafers with said optimum mixture of emulsions, distributing said optimum mixture of combined emulsions over the wafers by centrifugal force at a speed from 3000 to 11,000 rpm. and drying heating the so-coated wafers to harden the coating of siliceous cover layer on said wafers.

4,075,045

METHOD FOR FABRICATING FET ONE-DEVICE MEMORY CELLS WITH TWO LAYERS OF POLYCRYSTALLINE SILICON AND FABRICATION OF INTEGRATED CIRCUITS CONTAINING ARRAYS OF THE MEMORY CELLS CHARGE STORAGE CAPACITORS UTILIZING FIVE BASIC PATTERN DELIBERATING STEPS

Vincent L. Rideout, Mohegan Lake, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 9, 1976, Ser. No. 656,756
Int. Cl.² H01L *21/22, 21/31, 29/78*
U.S. Cl. 148—187 **25 Claims**

1. A method for fabricating an integrated circuit array of FET one-device memory cells having oxide isolation between cells, and each cell of the array having a doped bit line; polysilicon-gate FET self-aligned to source and drain regions; a metallic-type high-electrically conductive word line; a self-registering connection between the gate and the word line; and a charge storge capacitor with a polysilicon upper electrode and a doped silicon lower electrode beneath the polysilicon upper electrode, the lower electrode being doped opposite in conductivity type to the substrate doping, which comprises:

(A) providing a semiconductive substrate of a first conductive type containing active impurities of a first conductive type;

(B) providing and delineating predetermined oxide isolation regions above or recessed into the substrate to provide insulating field oxide regions between memory cells of the array;

(C) providing an insulator for the FET gates;

(D) depositing a layer of polycrystalline silicon above the gate insulator;

(E) then delineating the layer of polycrystalline silicon employing an oxidation barrier layer to provide the predetermined polycrystalline silicon gate regions of the FETs;

(F) thermally diffusing or ion implanting active impurities of a second and opposite conductive type into preselected regions of the semiconductive substrate to provide doped bit lines (FET drains); connection regions (FET sources); and lower silicon electrodes of the storage capacitors, above which electrodes, are to be subsequently delineated polycrystalline silicon upper electrodes of the storage capacitors;

(G) providing an insulator for the storage capacitors;

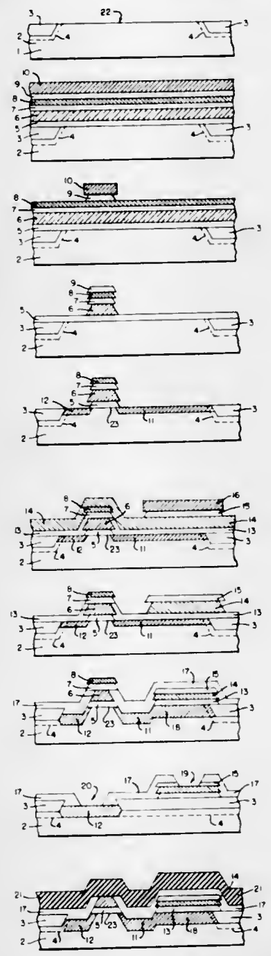
(H) then depositing a second and subsequent layer of polycrystalline silicon above the insulator for the storage capacitors;

(I) then delineating the second and subsequent layer of doped polycrystalline silicon to provide predetermined upper electrode regions above the corresponding doped lower silicon electrodes or the storage capacitors;

(J) thermally growing a silicon dioxide insulating layer over regions of the structure but not over the polycrystalline silicon FET gates which are still protected by an oxidation barrier layer;

(K) removing the oxidation barrier layer from over the FET gates by use of an etchant;

(L) delineating contact holes to polycrystalline silicon upper capacitor electrodes; and to doped sources and drains in circuits peripheral to the array of memory cells;



(M) depositing and delineating a metallic-type high-conductivity electrical interconnection pattern that makes electrical connection to the polycrystalline silicon FET gates in the array of memory cells; to polycrystalline silicon upper capacitor electrodes; and to FET gates, sources, and drains in circuits peripheral to the array of memory cells.

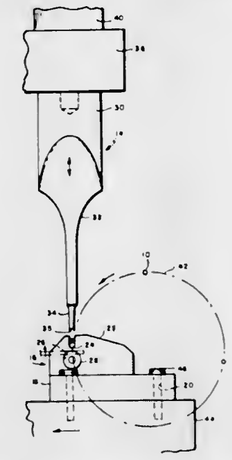
4,075,046

TIPPED LACE

Harold B. MacDonald, Hudson, Mass., assignor to Thomas Taylor & Sons, Inc., Hudson, Mass.

Filed Oct. 12, 1976, Ser. No. 731,778
Int. Cl.² B32B *31/20*
U.S. Cl. 156—73.1 **6 Claims**

1. A method of rigidifying a portion of a flexible length of fibrous material embodying a material which may be made rigid and hard by pressure and heating comprising subjecting the portion to be made rigid while confined within a die of predetermined cross section desirably to be imparted to the portion to be rigidified to sonic vibrations in a plane diametral to the axis of the portion and simultaneously to reciprocation in a plane at right angles to said diametral plane to cause the constituent fibers to soften and become bonded to each other.

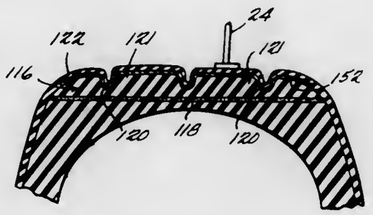


4,075,047

TIRE RETREADING SYSTEM

Edwin T. Brodie, and Donaldee Brewer, both of Muscatine, Iowa, assignors to Bandag Incorporated, Muscatine, Iowa

Filed Oct. 14, 1975, Ser. No. 622,419
Int. Cl.² B29H *17/36, 17/37*
U.S. Cl. 156—96 **12 Claims**



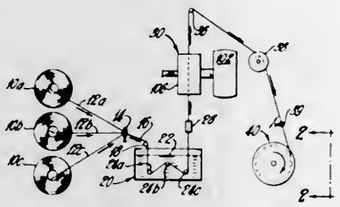
1. In a method of bonding a precured profiled tread strip to a tire casing by means of a self-vulcanizing bonding material interposed between the tire and the tread strip, said method comprising applying a flexible impermeable cover over the tread strip and tire assembly to form a sealed space between the cover and the assembly, exhausting air from the space and pressing the cover against the tread strip, the improvement comprising interposing between the tread strip and the cover a thin flexible perforated film of synthetic polymeric non-stick stretchable material having lubricating properties, said film thereby facilitating sliding of the flexible cover against the surface of the tread strip so as to aid in exhausting air from the space between the cover and the assembly.

4,075,048

METHOD FOR PRODUCING A BEAD FOR A PNEUMATIC TIRE

Daniel C. Lupton; Donn R. Vermilion, and James L. Bucher, all of Newark, Ohio assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 31, 1975, Ser. No. 627,802
Int. Cl.² B29H *17/32*
U.S. Cl. 156—136 6 Claims



1. The method of producing a bead member for a pneumatic tire having a carcass comprising:

applying an elastomeric material to a bundle of filaments to form a coated bundle;

drying the elastomeric material;

winding the coated bundle upon a heated mandrel to form a toroidally shaped bead member, the mandrel being heated sufficient to initiate curing of the elastomeric material; and

before incorporating the bead member in the tire, heating the bead member to further cure the elastomeric material so that the bead member retains the same geometric characteristics during incorporation into the tire as the bead member possessed before incorporation into the tire.

4,075,049

METHOD OF PREPARING RETROREFLECTIVE SHEETING

William A. Wood, Newtown, Pa., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sept. 1, 1976, Ser. No. 719,647
Int. Cl.² B44C *1/00*; B32B *31/20*; B31F *1/00*
U.S. Cl. 156—220 9 Claims



1. A method of preparing retroreflective sheeting comprising the steps of:

a. temporarily adhering a monolayer of glass spheres of substantially uniform diameter to a release sheet;

b. covering the exposed surfaces of the glass spheres with a light reflecting material to form a light reflecting layer on said monolayer of glass spheres;

c. imparting a grid pattern to the monolayer of glass spheres on the light reflecting layer thereof such that the depth of the grid pattern is at least the radius of the glass spheres remaining in said monolayer;

d. applying a sphere binder layer over said grid pattern imposed on the monolayer of glass spheres, said sphere binder layer having sufficient plastic flow to adhere to the light reflecting layer on said monolayer of spheres but not to the opposing surfaces of said spheres;

e. removing said release sheet to leave a distributed sphere covered sheet; and

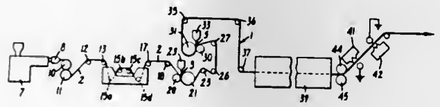
f. pressure consolidating said distributed sphere covered sheet against a clear, protective overlay film, said overlay film bonding to said sphere binder layer in the grooves defined by the grid pattern.

4,075,050

METHOD OF MAKING SYNTHETIC PAPER

Masanori Takashi, Ami, and Mitsuo Yoshiyasu, Ibaraki, both of Japan, assignors to Mitsubishi Petrochemical Company Limited, Japan

Continuation of Ser. No. 349,961, April 11, 1973, abandoned, which is a division of Ser. No. 197,757, Nov. 11, 1971, abandoned, which is a continuation-in-part of Ser. No. 809,629, March 21, 1969, abandoned. This application Dec. 17, 1975, Ser. No. 641,820
Claims priority, application Japan, Mar. 26, 1968, 43-19204
The portion of the term of this patent subsequent to Mar. 26, 1991, has been disclaimed.
Int. Cl.² B29C *17/02*
U.S. Cl. 156—229 4 Claims



1. A method of producing a synthetic paper-like laminate comprising, providing a base film layer made of a thermoplastic resin, uniaxially orienting the base film layer, laminating on said base film layer a paper-like film layer made of a thermoplastic resin having more than 25% and no more than 65% by weight of particles of a fine inorganic filler substantially uniformly distributed therein thereby to form a laminate, the weight percentage of said inorganic filler being dependent on the weight of the resin plus the filler, stretching while in a heated state the laminate in a transverse direction to biaxially orient the base film layer and uniaxially orient the paper-like film layer including stretching the laminate in the transverse direction from 7 to 16 times greater than the original transverse dimension of said films in the last-mentioned direction to develop microvoids having a void proportion of from 10% to 65% in said paper-like film layer in conjunction with said particles of filler distributed internally in the paper-like layer as comminicating and independent microvoids to develop fibrous-like portions of the resin thereof among the microvoids interiorly of said paper-like film layer to define therein a cellular, fibrous structure, said stretching including developing of microvoids open to the surface of said paper-like film layer free of said base film layer and distributed throughout said surface, ceasing said stretching, and setting said resin after stretching maintaining the internal microvoids including the last-mentioned microvoids open to said surface upon cessation of said stretching.

4,075,051

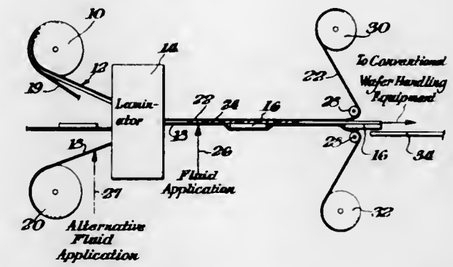
METHOD OF TRIMMING PHOTORESIST FILM

Paul Charles Brzozowski, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 29, 1976, Ser. No. 745,682
Int. Cl.² G03C *1/90*
U.S. Cl. 156—236 6 Claims

1. In a method of applying a photoresist film supported by a coversheet to a substrate by laminating one side of said film to said substrate and trimming said film along the edges of said substrate, the improvement of:

applying a film weakening agent to those portions of the substrate side of said film that are unprotected by said substrate, and



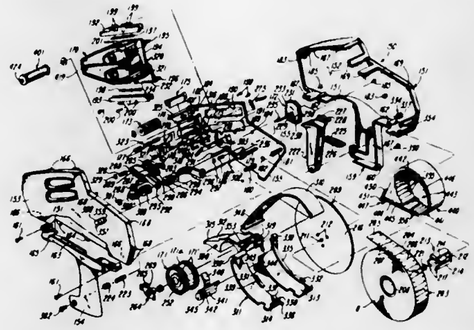
separating said coversheet from said film in the region of said substrate in either order.

4,075,052

APPARATUS FOR PRINTING AND APPLYING PRESSURE SENSITIVE LABELS

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 476,744, June 5, 1974, Pat. No. 3,957,562, which is a continuation-in-part of Ser. No. 380,445, July 18, 1973, abandoned, which is a continuation-in-part of Ser. No. 312,454, Dec. 6, 1972, Pat. No. 3,968,745, which is a continuation-in-part of Ser. No. 208,035, Dec. 8, 1971, abandoned. This application Feb. 17, 1976, Ser. No. 658,431
Int. Cl.² B32B *31/00*
U.S. Cl. 156—384 25 Claims



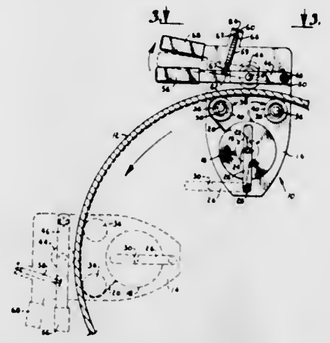
1. Apparatus for printing on a web of record members, comprising: a platen, a print head cooperable with the platen to print the web of record members, the print head having a gear section, a gear in meshing contact with the gear section, a feed wheel having a plurality of teeth at its outer periphery and rotatable in one direction for advancing the web, a ratchet wheel drivingly coupled to the feed wheel, means for adjusting the postion of the feed wheel relative to the ratchet wheel, a rolling-contact type one-way clutch for mounting the feed wheel and for preventing rotation of the feed wheel in the opposite direction, and a pawl driven by the gear for advancing the web into printing cooperation with the print head and the platen.

4,075,053

MASKING TAPE APPLICATOR FOR PIPE

Franklin Montague Adams, Forest Hill, Australia, assignor to Price International, Inc., Sharjan, United Arab Emirates

Filed June 25, 1976, Ser. No. 699,626
Int. Cl.² B65H *81/00*
U.S. Cl. 156—391 1 Claim



1. A device for applying tape to the inside surface of a pipe, said device comprising:

a frame;

a pair of tape applicator rollers rotatably mounted on said frame at spaced apart locations theron and adapted to roll in a generally circumferential direction along the inside pipe surface in a manner to press a strip of tape thereagainst;

tape support means on said frame for supporting a roll of tape and dispensing tape from the roll in a strip, said tape support means being located approximately on an imaginary perpendicular bisector of a straight line extending between said applicator rollers and being disposed within the pipe when said applicator rollers are applied to the inside surface thereof;

a guide roller rotatably mounted on said frame and adapted to roll along the outside pipe surface in opposition to said applicator and guide rollers; and

resilient means for urging said applicator and quide rollers generally toward one another to maintain the rollers in rolling contact with the pipe as said frame moves around same.

4,075,054

APPARATUS FOR FORMING BEADED RADIAL PLY TIRE

Charles C. Sons, Jr., Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 27, 1976, Ser. No. 735,924
Int. Cl.² B29H *17/06*
U.S. Cl. 156—414 7 Claims

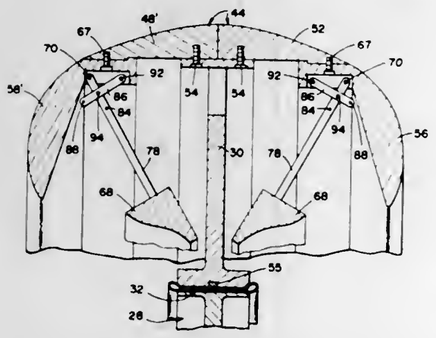
1. A disassemblable core for forming a beaded radial ply tire having an annular tread region, and plies which extend about bead regions of the tire and include first end portions that are doubled back at the bead regions and terminate at inner portions of side walls of the tire, comprising:

a. a plurality of arcuate beams positioned together edge-to-edge to form a circular support ring having a central axis;

b. a plurality of mold pieces supported on said circular support ring and positioned together edge-to-edge to form an inner mold for the annular tread region of the tire, one of said mold pieces being a key piece and another of said mold pieces being adjacent said one mold piece; said one mold piece having an edge angled to match an edge of said other mold piece so that said one mold piece is removable towards said central axis in the absence of said support ring;

c. first means for releasably securing said mold pieces to said arcuate beams;

d. a first plurality and a second plurality of pairs of side panels, said side panels of, respectively, said first plurality and said second plurality of pairs being positioned together edge-to-edge to form an inner mold face for one of the side walls of the tire, said side panels of one of said pairs being adjacent said side panels of another of said pairs, one side panel of said one pair being a key panel and having an edge angled to match an edge of one side panel of said other pair so that said one side panel of said one pair is removable generally toward said central axis in the absence of said support ring, said side panels being shaped



to receive folded back second end portions of a tire line during formation of the tire;

e. second means for releasably securing said first and said second plurality of side panels to said mold pieces; and

f. a plurality of means, each pivotally attached to one of said side panels, for providing the bead regions with the plies, said bead region providing means having means extending from said side panels and pivotable to a first position to form a mold for receiving bead wedge portions and pivotable away from the bead wedge portions to a second position so that said first end portions of said plies can be doubled back over the bead wedge portions and said second end portions of the liner can be folded over the first end portions of the plies.

4,075,055

METHOD AND APPARATUS FOR FORMING AN ELONGATED SILICON CRYSTALLINE BODY USING A <110>{211}ORIENTATED SEED CRYSTAL

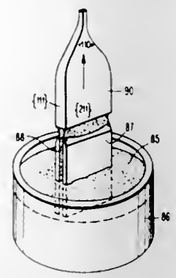
Theodore Frank Ciszek, Salt Point, and Guenter Herbert Schwuttke, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 16, 1976, Ser. No. 677,580
Int. Cl.² B01J *17/18;* C01B *33/02*
U.S. Cl. 156—608 **4 Claims**

1. Method for growing an elongated silicon crystalline body comprising:

establishing a molten film of silicon overlying the top surface of a carbon containing capillary die;

growing and pulling said body from the film by using a <110> direction, {211} face plane, {111} edge plane, oriented silicon seed crystal whereby said pulling being in the <110> direction with {211} face plane and {111} edge plane which results in twinning along the <110> direction perpendicular to the {211} face plane, and parallel to the {111} edge plane of said body and which allows



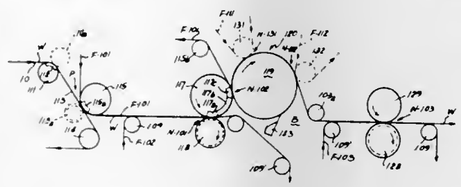
any carbon impurities to be incorporated into said body so as to prevent significant nucleation of additional defects.

4,075,056

PRESS SECTION STRUCTURE

Donald E. Ely, Roscoe, Ill., and Arnold J. Schmitt, Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.

Continuation of Ser. No. 497,722, Aug. 15, 1974, abandoned, which is a continuation of Ser. No. 407,574, Oct. 18, 1973, abandoned, which is a continuation-in-part of Ser. No. 115,235, Feb. 16, 1971, abandoned. This application Mar. 8, 1977, Ser. No. 775,572
Int. Cl.² D21F *3/04, 3/08*
U.S. Cl. 162—305 **6 Claims**



1. A press mechanism for removing water from a traveling fibrous web formed on a forming section of a machine comprising in combination:

first and second rolls defining a first press nip therebetween;

a third press roll forming a second nip with the first roll;

a fourth press roll forming a third nip with the third press roll;

a web carrying first felt receiving the web from the forming section and passing through the first nip following the first roll and thereafter passing through the second nip separating from the web after the second nip with the web following the third roll after said second nip to pass through the third nip;

a second felt passing through the first nip on the side of the web opposite said first felt so that the web is initially dewatered in both directions; and

a third felt passing through said third nip with the web, said web passing sequentially through said first, second, and third nips being supported continually between nips.

4,075,057

NON-EQUILIBRIUM RADIATION NUCLEAR REACTOR

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of Karlheinz Thom, Gaithersburg, Md., and Richard T. Schneider, Gainesville, Fla.

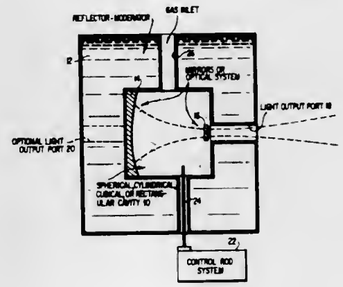
Filed Mar. 21, 1975, Ser. No. 560,891
Int. Cl.² G21C *1/22*
U.S. Cl. 176—39 **18 Claims**

1. A gaseous core nuclear reactor operating at wide ranges of temperature and pressure generating output power primarily in the form of non-equilibrium electromagnetic energy, comprising:

a centrally located reaction chamber,

reflector-moderator means surrounding said reaction chamber,

fuel inlet means in said reflector-moderator for admitting a gaseous fissile fuel to said reaction chamber for providing an optically thin fissioning medium in said reaction chamber,



control means cooperating with said reaction chamber for controlling the reaction rate therein;

power output means mounted in said reflector-moderator for permitting said non-equilibrium electromagnetic energy to be transmitted from said reaction chamber to the exterior of said reactor, said power output means comprising at least one optically transparent window; and

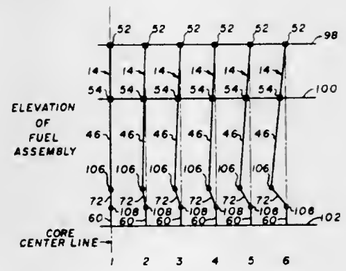
means for maintaining the temperature of such reaction chamber between 100° and 3000° F.

4,075,058

ARTICULATED FUEL ASSEMBLY

Richard Croissant Noyes, Hartford, China /Taiwan, assignor to Combustion Engineering, Inc., Windsor, Conn.

Division of Ser. No. 296,737, Oct. 11, 1972, abandoned. This application Mar. 8, 1976, Ser. No. 665,018
Int. Cl.² G21C *7/30*
U.S. Cl. 176—21 **4 Claims**



1. A nuclear reactor comprising:

(a) a reactor vessel having a nuclear core therewithin;

(b) a plurality of fuel assemblies for said nuclear core each of which includes:

1. a plurality of longitudinally extending fuel elements; and

2. an elongated hollow housing surrounding said plurality of fuel elements;

(c) means for supporting said fuel assembly in said nuclear core, said means being restrained against movement and axially spaced from the lower end of said fuel assembly housings;

(d) clamping means for clamping the upper ends of said fuel assembly housings in said nuclear core to restrain the upper ends of said housings against lateral movement; and

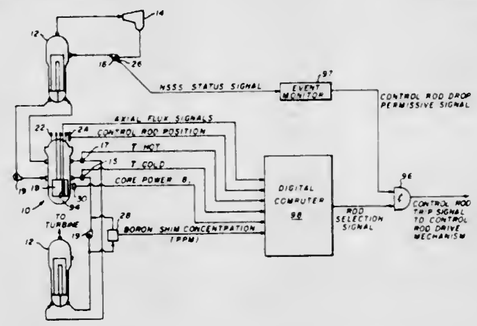
(e) means for inserting negative reactivity comprising a double articulating connector for each of said fuel assemblies for connecting the lower end of said fuel assembly housings to said support means, each of said double articulating connectors permitting articulating movement at both its upper and lower ends so as to allow lateral movement of the lower end of said housing relative to said restrained upper end of said housing and said restrained support means.

4,075,059

REACTOR POWER REDUCTION SYSTEM AND METHOD

Stephen James Bruno, Medway, Mass.; Stephen Alfred Dunn, Enfield, and Marvin Raber, West Hartford, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 28, 1976, Ser. No. 681,101
Int. Cl.² G21C *7/06, 7/00*
U.S. Cl. 176—22 **11 Claims**



1. An improved control method for maintaining the operation of a nuclear reactor system in response to an event which requires an immediate but less than complete power reduction called an accelerated power reduction, said reactor being of the type which has a reactor core cooled by a coolant circulated therethrough and control rods for movement into said core and said reactor further being of the type which is normally controlled by the insertion and withdrawal of a series of regulating rods into and out of said reactor core following a predetermined regulation sequence, wherein said improved method including the step of rapidly decreasing reactor power without causing the product of the radial peaking factor of said reactor core and the power of said reactor core to increase on the occurrence of an event which require an accelerated power reduction by rapidly inserting into said reactor core a portion of said regulating rods selected from said predetermined regulation sequence.

4,075,060

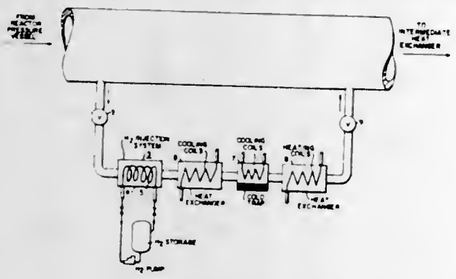
METHOD FOR REMOVING FISSION PRODUCTS FROM A NUCLEAR REACTOR COOLANT

Richard P. Colburn, Youngwood, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 261,476, June 9, 1972, now Defensive Publication No. T921,014. This application July 31, 1974, Ser. No. 493,368
Int. Cl.² G21C *19/32;* G21F *9/04*
U.S. Cl. 176—37 **14 Claims**

1. A method for removing fission products from a liquid metal reactor coolant of a nuclear reactor, said method comprising the steps of diverting a portion of said reactor coolant from a main stream of said nuclear reactor to a bypass system, adding hydrogen to said bypassed reactor coolant, then lower-

ing the temperature of said bypassed reactor coolant, precipitating said fission products from said bypassed reactor coolant



and reintroducing said bypassed reactor coolant into said main stream without the precipitates.

4,075,061

METHOD FOR PRODUCING CEPHALOSPORINS

Ian D. Fleming, Chalfont St. Peter; Michael K. Turner, Wembley, and Stephen J. Brewer, High Wycombe, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

Filed Feb. 15, 1977, Ser. No. 768,945

Claims priority, application United Kingdom, Feb. 19, 1976, 6623/76

Int. Cl.² C12D *9/00*

U.S. Cl. 195—29 **12 Claims**

1. A process for the preparation of a 3-carbamoyloxymethyl cephalosporin which comprises incubatively contacting a 3-hydroxymethyl cephalosporin with a carbamoyl compound selected from the group consisting of carbamoyl phosphate, carbamoyl aspartate and carbamoyl oxamate or a precursor therefor selected from the group consisting of citrulline, and a mixture of ATP, bicarbonate and either ammonia or glutamine in the presence of an enzyme showing the desired O-transcarbamoylase activity derived from a microbial source.

4,075,062

THROW-IN TYPE COLORIMETER

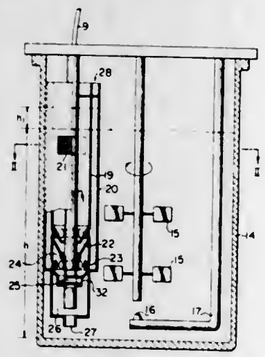
Takehiko Shibata, Wako; Tadahiko Ando, Tokyo; Tokuji Kitsunai, Asaka; Norio Kamiyama, Kawagoe, and Yoshifumi Oikawa, Asaka, all of Japan, assignors to Rikagaku Kenkyusho, Japan

Filed June 8, 1976, Ser. No. 693,758

Claims priority, application Japan, June 11, 1975, 50-70387

Int. Cl.² C12K *1/00*; G01N *21/26*

U.S. Cl. 195—103.5 R **6 Claims**



4. A method of cultivation in which a thrown-in type colorimeter is provided in an aerobic fermentation culture tank and the optical density of the culture solution is measured in a measuring chamber so as to carry out cultivation while constantly observing the degree of growth of the microbes in said tank, which comprises the steps of introducing said culture solution into a defoaming device located in said culture tank, said defoaming device comprising a two-cylinder structure consisting of an inner cylinder and an outer cylinder, both opened at the top, said structure having a solution inlet opening into the inner cylinder and positioned in opposition to the solution flow in said culture tank, allowing the culture solution to flow into the inner cylinder by virtue of the liquid level difference obtained from the rise of the liquid level caused by impingement of the solution flow in the tank against the colorimeter, letting the air bubbles contained in the culture solution escape upwardly from the solution which in turn flows down in the inner cylinder, then reversing said downward solution flow in its direction by a first flow reversing passage provided at the lower end of said two-cylinder structure whereby the solution flows upwardly and then again reversing the direction of flow by a second flow reversing passage whereby the solution flows downwardly to thereby drive the fine air bubbles out of the culture solution flowing in the outer cylinder, with the resultant bubble-free culture solution being then caused to flow down in the outer cylinder and then guiding the culture solution into the measuring chamber where absorbance of the culture solution is measured continuously while discharging the measured solution into the tank, thereby to allow continuous determination of the optical density of the test solution.

4,075,063

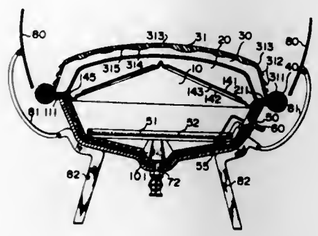
SOLAR POWERED DISTILLING DEVICE

Yaw Jenn Tsay, and Kuo-Chuan Lin, both of No. 10, Lane 177, Pei Hsing St., Chia I, Chia, China/Taiwan

Filed Feb. 17, 1976, Ser. No. 658,692

Int. Cl.² B01D *3/00*

U.S. Cl. 202—234 **15 Claims**



1. A distilling device powered by solar energy comprising:
a tray for defining a vaporization chamber;
a transparent cover on said tray;
a transparent condensation plate mounted on said tray;
a transparent corrugated partition mounted on said tray between said tray and said condensation plate so that a top side of said partition defines a condensation chamber with a bottom side of said condensation plate and a bottom side of said partition defines a vaporization chamber with said tray, said condensation plate being mounted between said partition and said cover so that a top side of said condensation plate defines a cooling air chamber with a bottom side of said cover, said partition having a multiplicity of holes defined therein, that portion of said tray forming said vaporization chamber with said partition having attached thereto a layer of insulating material;
fluid inlet means on said tray for conducting fluid to be vaporized into said vaporization chamber;
a plurality of differential focal length solar energy focusing lenses on said cover focusing solar energy through said cooling air and condensation chambers and said partition and said condensation plate onto the fluid located in said vaporization chamber to form vapor which passes through the holes in said partition from said vaporization chamber into said condensation chamber, said leases having a plurality of different focal lengths to focus solar energy at different levels in said vaporization chamber, thereby focusing solar energy into, on and above water in said vaporization chamber;
air inlet means on said cover for conducting cooling air into said cooling air chamber to contact said condensation plate one side for maintaining said plate at a temperature below the condensation temperature of the fluid in said vaporization chamber so that vapor formed in said vaporization chamber is condensed into condensate upon contact with said plate other side;
a condensate collecting means connected to said tray for collecting the condensate formed on said condensation plate; and
outlet means connected to said condensate collecting means for withdrawing the collected condensate from said condensate collecting means.

4,075,064

PROCESS FOR THE MARKING ON METAL OR THE LIKE SURFACES

Iwao Otsu, and Motohisa Watanabe, both of c/o Kawaguchiko Seimitsu Company Limited, 6663-2, Funatsu, Kawaguchiko, Minamitsuru, Yamanashi, Japan (401-03)

Filed Sept. 30, 1976, Ser. No. 728,057

Claims priority, application Japan, Oct. 1, 1975, 50-118657

Int. Cl.² C25D *5/02, 5/34*

U.S. Cl. 204—18 R **6 Claims**

1. Process for the marking of small metallic pieces comprising the steps of:
preparing a smooth metal stock sheet comprising the steps of punching out a smooth metal sheet to form small metallic piece stocks, degreasing said stocks with an organic solvent, placing the degreased stock in a barrel containing fresh water and gravel, rotating the barrel at a slow speed for removing excess fillets from the stocks, removing the stocks from the barrel, and then drying the stocks in a hot air stream;
printing characters or a like fine pattern of 1–10 microns thickness on the stock by an ink transferring step or screen printing step by providing a color printing ink paste having a resisting or impulsing characteristic to a plating bath liquid to be used;
baking the printed pattern; and
plating chemically or electrochemically an anticorrosive metal layer on the surface of said stock, with the exception of the area of said printed pattern so that the printed pattern has a substantially smaller height from the stock than the plated metal layer and presents a sharp contrast to the plated metal layer, said printed pattern being protected by the metal layer from wear caused by contact.

4,075,065

GOLD PLATING BATH AND PROCESS

Alexander Korbelak, Southbury, Conn., and John King, Anaheim, Calif., assignors to Handy & Harman, New York, N.Y.

Continuation-in-part of Ser. No. 593,423, July 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 375,616, July 2, 1973, Pat. No. 3,893,896. This application June 18, 1976, Ser. No. 697,687

Int. Cl.² C25D *3/62*

U.S. Cl. 204—43 G **4 Claims**

1. An acidic electrolytic bath for electrodeposition of gold comprising:
a. an alkali gold cyanide in an amount ranging from 0.1 to 50 grams per liter;
b. zirconium oxychloride in an amount ranging from 5 to 250 grams per liter;
c. a weak polyfunctional water-soluble aliphatic carboxylic acid in an amount ranging from 5 to 500 grams per liter;
d. a non-depositing metallic compound in an amount ranging from 5 to 250 grams per liter;
e. a metallic hardener in an amount ranging from 0.01 to 15 grams of metal ion per liter; and
f. water.

2. An acidic electrolytic bath for electrodeposition of gold comprising:
a. an alkali gold cyanide in an amount ranging from 0.1 to 50 grams per liter;
b. vanadyl sulphate in an amount ranging from 5 to 250 grams per liter;
c. a weak polyfunctional water-soluble aliphatic carboxylic acid in an amount ranging from 5 to 500 grams per liter;
d. a non-depositing metallic compound in an amount ranging from 5 to 250 grams per liter;
e. a metallic hardener in an amount ranging from 0.01 to 15 grams of metal ion per liter; and
f. water.

4,075,066

ELECTROPLATING ZINC, AMMONIA-FREE ACID ZINC PLATING BATH THEREFOR AND ADDITIVE COMPOSITION THEREFOR

William Edward Eckles, Cleveland Heights, and Valerie Canaris, Parma, both of Ohio, assignors to R. O. Hull & Company, Inc., Cleveland, Ohio

Filed Jan. 27, 1977, Ser. No. 762,883

Int. Cl.² C25D *3/22*

U.S. Cl. 204—55 R **44 Claims**

1. An ammonia-free aqueous acid zinc electroplating bath comprising zinc ions, chloride ions, at least one polyoxyalkylated naphthol, at least one aromatic carboxylic acid or bath-soluble salt thereof, and at least one anionic aromatic sulfonic acid or bath-soluble salt thereof.

37. An additive composition for an aqueous acidic zinc electroplating bath comprising a mixture of:
(a) at least one polyoxyalkylated naphthol,
(b) at least one aromatic carboxylic acid or bath-soluble salt thereof, and
(c) at least one anionic aromatic sulfonic acid or bath-soluble salt thereof.

4,075,067

PRODUCTION OF ALUMINIUM

Kaloo Raj Kumar Bhilotra, Arvida, Canada, assignor to Alcan Research and Development Limited, Montreal, Canada

Filed Feb. 20, 1976, Ser. No. 659,773

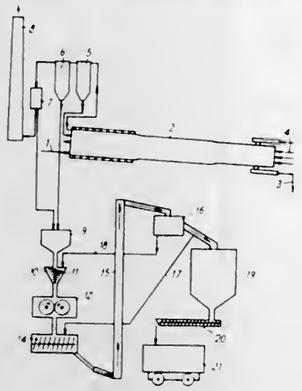
Claims priority, application United Kingdom, Feb. 25, 1975, 7918/75

Int. Cl.² C25C *3/06*

U.S. Cl. 204—67 **12 Claims**

1. A method for the production of aluminium by the electrolytic reduction of alumina, including the steps of
(a) feeding alumina to an electrolytic reduction cell and
(b) passing direct electric current through said cell for reducing the alumina; wherein the improvement comprises
(c) the feeding step comprising feeding, to said cell, alumina comprising calcined alumina particles and from 2 - 50% by weight of granules formed of compacted alumina particles, said particles being particles collected from the exhaust gases issuing from a calcination furnace incident to

calcination of alumina trihydrate therein and having a major proportion by weight of particles of a size less than



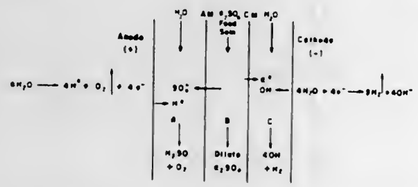
44 microns, said granules having a size in the range of 5000 - 150 microns.

4,075,068

PROCESS FOR THE RECOVERY OF ALUMINUM FROM ALUNITE

Kent W. Loest, Broomfield, and John T. Schaefer, Boulder, both of Colo., assignors to Southwire Company, Carrollton, Ga.; National Steel Corporation, Pittsburgh, Pa. and Earth Sciences, Inc., Golden, Colo.

Filed July 12, 1976, Ser. No. 704,512
Int. Cl.² C01D *1/06*
U.S. Cl. 204—93 **8 Claims**



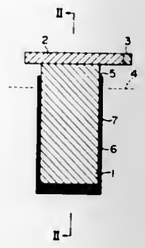
1. A process for producing potassium hydroxide from potassium sulfate by electrodialysis in a single frame electrodialysis cell, said frame comprising: in successive positions, an anode compartment, an intermediate compartment and a cathode compartment, an anion permselective membrane between the anodic and the intermediate compartments, a cation ermselective membrane between the intermediate and cathodic compartments, the arrangement forming anodic and cathodic compartments and an intermediate compartment, which process comprises: adding water to the anodic compartment, potassium sulfate to the intermediate compartment, water to the cathodic compartment, and applying a direct current electrical potential across the solutions to produce potassium hydroxide in the cathodic compartment, sulfuric acid in the anodic compartment and dilute potassium sulfate solution in the intermediate compartment.

4,075,069

PROCESSES FOR PREVENTING THE GENERATION OF A MIST OF ELECTROLYTE AND FOR RECOVERING GENERATED GASES IN ELECTROWINNING METAL RECOVERY, AND ELECTRODES FOR USE IN SAID PROCESSES

Yukio Shinohara, Tokyo, and Kuniki Ueno, Hino, both of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed Mar. 22, 1976, Ser. No. 669,104
Claims priority, application Japan, Apr. 10, 1975, 50-43516; Apr. 10, 1975, 50-43517
Int. Cl.² C25C *1/12*
U.S. Cl. 204—106 **7 Claims**



1. A process for preventing the generation of a mist of electrolyte in the electrowinning metal recovery which is carried out by using an aqueous solution of a metal salt as the electrolyte and insoluble electrode plates to deposit the metal on a cathode without substantially reducing current efficiency, characterized in that the electrode plate(s) is provided with an inert woven fabric screen having an opening of about 5 to about 0.04 mm. in such a manner that the woven fabric screen is in parallel with and close to the electrode plate(s), and the woven fabric screen is extended in such a manner that the upper end of the woven fabric screen is above the level of electrolyte.

4,075,070

ELECTRODE MATERIAL

Donald W. Du Bois, and William B. Darlington, both of Corpus Christi, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed June 9, 1976, Ser. No. 694,506
Int. Cl.² C25B *1/02, 1/14, 11/10*
U.S. Cl. 204—129 **4 Claims**

1. In a method of electrolysis where an electrical current is passed from an anode through an aqueous electrolyte to a metal cathode whereby to evolve hydrogen at a surface of said metal cathode, the improvement wherein the surface of the metal cathode is an alloy of titanium and a rare earth metal.

4,075,071

METHOD FOR THE TREATMENT OF ESSENTIAL OILS AND WOOD PARTICLES CONTAINING ESSENTIAL OILS

Robert N. Kirschbaum, 1706 Edison St., Brush, Colo. 80723

Filed June 16, 1977, Ser. No. 807,257
Int. Cl.² C25B *3/00*
U.S. Cl. 204—136 **17 Claims**

1. The method for the treatment of an essential oil to convert a substantial portion thereof to wood sugars, including the steps of:

a. introducing the oil into an electrolyte solution;

b. immersing a metal anode and a cathode spaced therefrom into the solution; and

c. passing an electrical current through the solution until a substantial portion of the oil is converted to wood sugars.

4,075,072

LASER CHEMISTRY SYNTHESIS OF NF_4BF_4

James A. Merritt, Pulaski, Tenn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 18, 1977, Ser. No. 770,156
Int. Cl.² B01J *1/10*
U.S. Cl. 204—157.1 R **7 Claims**

1. A process for producing NF_4BF_4 comprising placing the gases NF_3, BF_3 and a gaseous compound that gives up fluorine when subjected to laser energy in a reaction container at room temperature and subjecting the gases to a CO_2 laser source for irradiating the reaction chamber and producing NF_4BF_4 as a precipitate.

4,075,073

METHOD FOR THE PREPARATION OF BIS(PERFLUORO-T BUTYL) PEROXIDE

Madeline S. Toy, Palo Alto, and Roger S. Stringham, Woodside, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 23, 1977, Ser. No. 771,858
Int. Cl.² B01J *1/10*
U.S. Cl. 204—158 R **2 Claims**

1. A method for preparing bis(perfluoro-t-butyl) peroxide which comprises the steps of (A) forming a reaction mixture of (1) perfluoro-t-butyl hypofluorite and (2) tetrafluorohydrazine; (B) subjecting said mixture of reactants to photolysis for a period of time and at a temperature sufficient to effect a reaction therebetween; and (C) separating the resultant reaction products.

4,075,074

METHOD FOR PREPARING BENZO[C]CINNOLINE AND ITS DERIVATIVES

Akira Yabe, Fujisawa, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Mar. 14, 1977, Ser. No. 777,419
Claims priority, application Japan, June 7, 1976, 51-066258
Int. Cl.² B01J *1/10*
U.S. Cl. 204—158 R **9 Claims**

1. Method for preparing benzo[C]cinnoline or its derivative which comprises irradiating a compound selected from 2,2'-diazidobiphenyl and its derivatives with light in a low-temperature rigid solvent.

4,075,075

PROCESS FOR PREPARING NOVEL SYNTHETIC FIBERS

Ichiro Sakurada, Kyoto; Toshio Okada, Kadoma, and Yutaka Hirano, Kurashiki, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Continuation of Ser. No. 135,451, April 19, 1971, abandoned. This application June 18, 1974, Ser. No. 480,414
Claims priority, application Japan, Apr. 22, 1970, 45-33798; Apr. 22, 1970, 45-33799
Int. Cl.² C08F *8/00*
U.S. Cl. 204—159.17 **6 Claims**

1. A process for preparing synthetic fibers comprising

polymerizing by means of an ionizing radiation acrylonitrile or a mixture of acrylonitrile and a monomer or monomers copolymerizable with acrylonitrile wherein acrylonitrile is present as the major component in a solid vinyl chloride resin matrix

in the presence of a mixture of a liquid hydrocarbon having a small swelling and solvent function selected from the group consisting of ligroin and petroleum benzine and water, each of which substantially acts as a medium for polymerization, so as to provide a polymer blend of the solid vinyl chloride resin matrix and an acrylonitrile polymer matrix-polymerized therein, the total amount of the matrix-polymerized acrylonitrile component being at least about 23% by weight based on the total amount of said polymer blend,

dissolving the polymer blend thus obtained in a solvent to prepare a spinning dope and

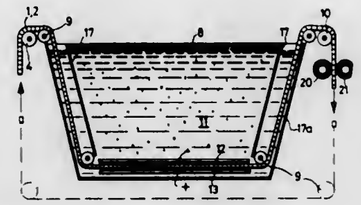
spinning said dope to form a fiber.

4,075,076

WATER TREATMENT APPARATUS

Kurt Xylander, Goethestrasse 9, 6234 Hattersheim, Germany

Division of Ser. No. 487,193, July 10, 1974, Pat. No. 3,920,530.
This application Sept. 30, 1975, Ser. No. 618,047
Claims priority, application Germany, June 24, 1974, 2430244
Int. Cl.² B03D *1/00*; C02B *1/82*
U.S. Cl. 204—206 **16 Claims**



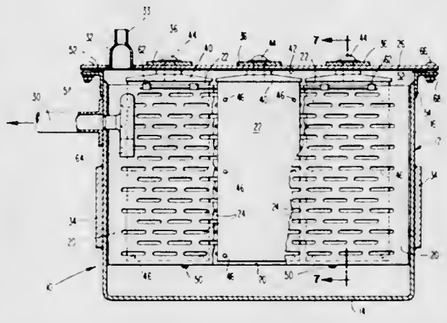
1. Water purification apparatus for purifying dirty water, comprising, in combination: a tank having a first opening for introducing dirty water adjacent one side of said tank, a second opening for removing clean water adjacent an opposite side of said tank, and baffle means extending down on two sides within said tank to separate said openings from a central area at the top of said tank; an endless belt having a plurality of electrodes, said endless belt being trained behind said baffles and through said tank to extend across said tank below said central area near the bottom of said tank; and means for electrically energizing electrodes of said endless belt as they pass below said central area, whereby gas bubbles created by electrolysis from the energization of said electrodes cause solids suspended in the dirty water to be floated to said central area at the top of said tank.

4,075,077

ELECTROLYTIC CELL

Jimmie Ray Hodges, Benton, Ky., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed May 16, 1977, Ser. No. 796,946
Int. Cl.² B01K *3/00*
U.S. Cl. 204—269 **12 Claims**



1. An electrolytic cell for producing alkali metal chlorates from alkali metal chloride brine, comprising:

(a) an electrically conductive tank including a top electrically insulated from a lower portion of the tank;

(b) a plurality of pairs of perforate cathodes within said tank,

each cathode of a pair spaced from and parallel to its paired cathode mate, vertical margins of said cathodes welded to vertical walls of said tank lower portion, perforations through each cathode forming a plurality of horizontal slots;

(c) a plurality of imperforate anodes electrically connected to and suspended from said tank top, resident between cathode mates forming said cathode pairs, at least one anode resident between cathode mates of each cathode pair, each anode spaced apart from the two cathode mates of the associated cathode pair, said cathodes and anodes thereby forming a cathode-anode-cathode-cathode-anode-cathode-cathode-anode-cathode pattern;

(d) means for applying a DC voltage between said insulated tank top and said tank lower portion;

(e) means for introducing alkali metal chloride brine into said tank, below said anodes and cathodes; and

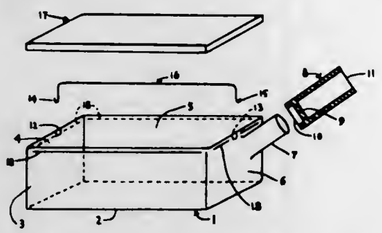
(f) means for withdrawing, from said tank, alkali metal chloride-chlorate liquor produced by electrolysis of said brine.

4,075,078

SURVIVAL KIT CONTAINER

Joe H. Nickell, c/o J. Wendell Nickell P.O. Box 67, West Liberty, Ky. 41472

Filed Jan. 6, 1977, Ser. No. 757,340
Int. Cl.² A45C *11/20*
U.S. Cl. 206—546 **3 Claims**



1. A survival kit container comprising a box-like body member having an open side and a closed side, with a pour spout extending at an upward angle from one endwall, said spout being fitted with a threaded tube having a partition closer to one end, the distance to the other end being the length of said spout, whereby said tube when threaded onto said spout serves as a screw-cap, and whereby the opposite end of said tube may alternately be threaded onto said spout for said tube to function as an extension handle when said body member is utilized as a skillet for cooking.

4,075,079

PROCESS FOR THE PRODUCTION OF HYDROCARBONS FROM COAL

Robert J. Lang, Baytown, Tex., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed June 9, 1976, Ser. No. 694,410
Int. Cl.² C10G *1/04*; C10B *57/04*
U.S. Cl. 208—8 **11 Claims**

1. A process for the production of liquid hydrocarbons from carbonaceous solids containing volatilizable hydrocarbons which comprises contacting said carbonaceous solids with gaseous hydrogen and a hydrogen-donor solvent under coal liquefaction conditions in a liquefaction zone; recovering liquefaction products from said liquefaction zone; separating said liquefaction products into a gaseous stream, a liquid hydrocarbon stream, and a heavy liquefaction bottoms product; pyrolyzing said liquefaction bottoms product and fresh carbonaceous solids containing volatilizable hydrocarbons in a pyrolysis unti operated at a temperature in excess of about 900° F.; and recovering gases, liquid hydrocarbons, and coke from said pyrolysis unit.

4,075,080

COAL LIQUEFACTION PROCESS WITH REMOVAL OF AGGLOMERATED INSOLUBLES

Everett Gorin, Pittsburgh, Pa., assignor to Continental Oil Company, Ponca City, Okla.

Filed Feb. 18, 1976, Ser. No. 659,180
Int. Cl.² C10G *1/04*
U.S. Cl. 208—8 **2 Claims**

1. In a coal liquefaction process employing a liquefaction solvent wherein a product is recovered which contains a solution of coal liquefaction products in said liquefaction solvent as a first component, and as a second component, the undissolved solids suspended in said first component; and wherein said second component is agglomerated in an agglomeration zone by the use of a precipitating solvent, the IMPROVEMENT whereby the agglomerates of the second component formed in said agglomeration zone are separated from the first component substantially free of the desired coal liquefaction product, which improvement comprises:

a. conducting the mixture of said first component and agglomerated second component from said agglomeration zone to an upper settling zone from which a solids-free liquid is recovered, said upper settling zone freely communicating with a lower washing and settling zone which is smaller in cross-section than said upper zone;

b. circulating a wash solvent upwardly through said lower zone and said upper zone at such a flow rate in said lower zone as to establish and maintain a downwardly moving ebullated bed of solids in said lower zone, whereby agglomerates descending from said upper zone through said lower zone are continuously washed by said wash solvent; and

c. withdrawing agglomerates from the bottom of said lower zone.

4,075,081

FLUIDIZED BED HYDRORETORTING OF OIL SHALE

Armand A. Gregoli, Tulsa, Okla., assignor to Cities Service Company, Tulsa, Okla.

Continuation-in-part of Ser. No. 605,117, Aug. 15, 1975, abandoned. This application July 20, 1977, Ser. No. 817,403
Int. Cl.² C10G *1/02*
U.S. Cl. 208—11 R **5 Claims**

1. A process for extracting oil from oil shale comprising

(a) crushing the shale to a particle size of from about 10 μ to about 300 μ,

(b) mixing the crushed shale with a hydrocarbon liquid to give a pumpable slurry and heating at least one of the reactor feed component streams,

(c) introducing the slurry, along with a hydrogencontaining gas, into an up-flow, fluidized bed reactor, at a superficial fluid (liquid plus gas) velocity sufficient to move the reaction mixture of gases, liquids, and solids upwardly through the reactor,

(d) hydroretorting the oil shale at a reactor temperature of from about 600° to about 900°, at a reactor pressure of from about 500 to about 3000 psi., at a space velocity between about 0.2 and about 2.0 of tons of fresh shale feed/hr./volume of reactor,

(e) removing the reaction mixture from the reactor as total overhead effluent, and

(f) separating the reactor effluent into two or more component streams.

4,075,082

PROCESS FOR HYDRODESULFURIZATION AND LIQUEFACTION OF CARBONACEOUS STOCKS USING SUSPENDED CATALYST

Louis C. Doelp, Glen Mills; Lee Friedman, Bala Cynwyd, and Maurice M. Mitchell, Wallingford, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 594,883, July 10, 1975, Pat. No. 3,975,259. This application Aug. 13, 1976, Ser. No. 714,035
Int. Cl.² C10G *1/08*
U.S. Cl. 208—10 **10 Claims**

1. A process for desulfurizing and liquefying coal or a similar solid, sulfur-containing carbonaceous material which process comprises:

a. forming, in a liquid hydrocarbon, a combined suspension of the solid carbonaceous material in the form of particles having a major dimension in the range from about 0.1 to about 200 microns and a finely divided hydroyenation catatlyst consisting essentially of particles having a major dimension less than about 10 microns,

b. reacting the combined suspension with hydrogen under hydrogenating conditions of temperature, pressure and a weight hourly space velocity (residence time) from about 200 to about 50,000 kg. of suspension per kg. of the catalyst per hour to produce a hydrogen-treated material containing the catalyst,

c. fractionating the hydrogen-treated material to separate a normally gaseous fraction from liquid materials containing solids, and

d. recovering the liquid containing the solids as product of reduced sulfur content.

4,075,083

METHOD FOR DESTRUCTIVE DISTILLATION OF HYDROCARBONACEOUS MATERIALS

Maurice W. Putman, 8346 E. Valley Vista, Scottsdale, Ariz. 85253

Filed June 11, 1976, Ser. No. 695,061
Int. Cl.² C10G *1/02*
U.S. Cl. 208—11 R **6 Claims**

1. An improved method for recovering useful liquid products from distillation and combustion products produced by destructive distillation of oil shale and other particulate hydrocarbonaceous material within a gas combustion type of retort and recycling the product gases for use in the retort, the improvement comprising the steps of:

a. removing the distillation and combustion products from the retort at a temperature in the range of 110° F to 200° F in the form of a stream containing oil mist, condensible oil vapors, combustible and noncombustible gases;

b. recovering oil droplets from the oil mist containing stream by passing the stream removed in step a through at least one high velocity cyclone separator;

c. removing condensible hydrocarbons from the stream from which the oil droplets were removed in step b by passage thereof through an absorption column countercurrent to the flow of an absorption oil therethrough;

d. recovering the condensible hydrocarbons from said absorption oil by passage thereof through a desorber;

e. adding a measured amount of air to a portion of the stream from which the condensible hydrocarbons were removed in step c; and

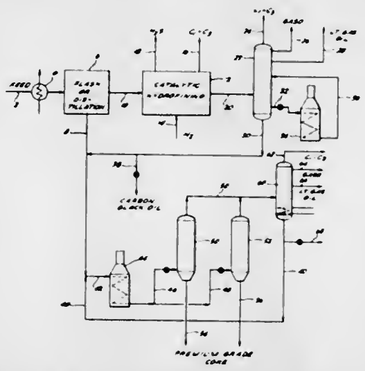
f. directing the stream to which air was added in step e to one end of the retort for flow therethrough countercurrent to the flow of the oil shale and other particulate hydrocarbonaceous materials.

4,075,084

MANUFACTURE OF LOW-SULFUR NEEDLE COKE

Milan Skripek, Fullerton, and John H. Duir, Yorba Linda, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Feb. 17, 1977, Ser. No. 769,421
Int. Cl.² C10B *57/02*; C10G *9/14*
U.S. Cl. 208—93 **18 Claims**



1. A process for the manufacture of needle coke containing less than about 1 weight-percent sulfur from an aromatic mineral oil feedstock having an API gravity between about −6° and +15°, boiling predominantly above about 600° F and containing about 6.5 - 9 weight-percent hydrogen and more than about 0.7 weight-percent sulfur, which comprises:

1. fractionally distilling said feedstock so as to separate a major overhead fraction from a minor bottoms fraction, any asphaltenes present in said feedstock being concentrated in said bottoms fraction;

2. subjecting said overhead fraction to catalytic hydrofining at a temperature correlated with hydrogen pressure and space velocity so as to effect at least about 50% desulfurization of said fraction without raising the hydrogen content of the 500° F+ hydrofiner effluent above about 10.5 weight-percent;

3. recovering from step (2) a heavy hydrofined fraction boiling predominantly above 600° F and blending the same with at least a portion of said minor bottoms fraction so as to form a coking feedstock containing less than about 5 weight-percent asphaltenes; and

4. subjecting said coking feedstock to delayed thermal coking at a temperature correlated with pressure so as to give a needle coke and a coker distillate.

4,075,085

PROCESS FOR TREATING ARSENIC-CONTAINING HYDROCARBON FEEDSTOCKS

Dean Arthur Young, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

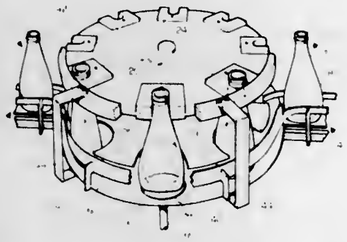
Filed Sept. 20, 1976, Ser. No. 724,560
Int. Cl.² C10G *29/04*
U.S. Cl. 208—253 **18 Claims**

1. A process comprising

(a) heating at a temperature of at least 300° F a liquid solution comprising (1) a hydrocarbon feedstock containing at least 2 ppmw arsenic, said hydrocarbon feedstock being a synthetic crude, or fraction thereof, obtained from oil shale, solid coal, or tar sands, and (2) an oil-soluble additive comprising one or more nickel, copper, or cobalt components, said heating being carried out for a time sufficient to convert at least some of the arsenic in said solution to arsenic components selected from the class consisting of those extractable in water and those that exist as an undissolved solid at 100°-250° F;

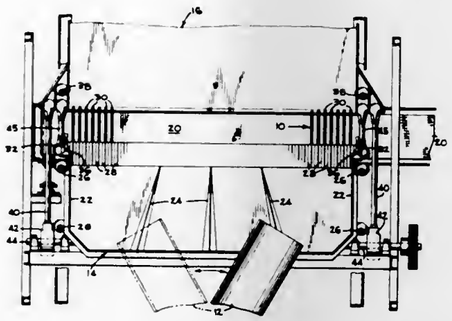
(b) separating at least some of said arsenic components from said solution; and
(c) withdrawing from step (b) a purified oil containing arsenic in a concentration less than that of the feedstock.

4,075,086
GLASS CONTAINER HANDLING
Samuel W. Marsh, III, Alton, and Keith E. Zumwalt, Sr., Hartford, both of Ill., assignors to Owens-Illinois, Inc., Toledo, Ohio
Continuation of Ser. No. 565,205, April 4, 1975, abandoned. This application Aug. 5, 1976, Ser. No. 711,942
Int. Cl.² B65G *29/00*
U.S. Cl. 209—73 4 Claims



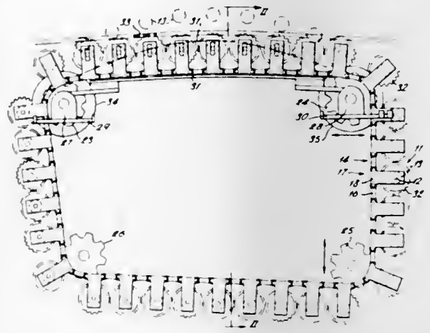
1. In an apparatus for the inspection of glass containers which removes glass containers one at a time from a continually moving conveyor, wherein said glass containers are indexed through a plurality of inspection stations and acceptable glass containers are returned to an output conveyor for removal, the improvement in said apparatus to allow inspection of glass containers having a finish portion, an elongated neck portion and a flattened main body portion which comprises, in combination:
an upper starwheel;
a plurality of spaced-apart neck holders that are open at their peripheral edges to engage substantially 180° of the circumferences of the neck portion of said glass containers, said neck holders being carried by said upper starwheel and having a height that is at least one-half the height of said neck portion;
a lower starwheel, vertically spaced apart from said upper starwheel, said lower starwheel having a plurality of open pockets formed in the periphery thereof to accept the flattened main body portion of said glass containers, said open pockets being generally in vertical alignment with said neck holders;
a fixed slide plate upon which said glass containers ride during indexing;
a circular spinner pad at at least one of the inspection stations for spinning a glass container positioned thereon;
a lower guide rail positioned to prevent escape of said main body portion of said glass containers from said open pockets in said lower starwheel;
an upper guide rail positioned in contact with said neck portion of said glass containers, said upper guide rail having a height that is at least one-half the height of said neck portion; and
said upper and lower guide rails confining the containers to the area of the pockets in the starwheels but permitting rotation of the containers so confined about their vertical axes.

4,075,087
CONTINUOUS GRADER FOR FRUITS OR THE LIKE
Alfred W. Gerrans, San Jose, Calif., assignor to Sunsweet Growers, Inc., Stockton, Calif.
Continuation of Ser. No. 366,624, June 4, 1973, abandoned. This application Oct. 14, 1975, Ser. No. 622,407
Int. Cl.² B07B *1/15*
U.S. Cl. 209—99 8 Claims



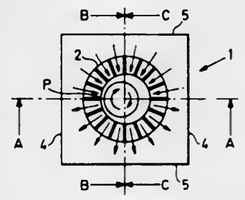
1. A continuous grader for fruits or the like which comprises,
means forming substantially a planar surface arranged to conduct fruit thereacross in substantially a single layer,
a plurality of laterally spaced fingers arranged to receive fruits from said planar surface and to conduct fruits above a predetermined size in rows between said fingers, undersized fruit dropping between the fingers so as to be continuously separated from the lager fruits during their advance, the closest surfaces of adjacent fingers constituting substantially linear edges, and
a plurality of V-troughs interposed between said planar surface and said fingers to orient the fruits passing therebetween.

4,075,088
APPARATUS FOR GRADING OBJECTS ACCORDING TO SIZE
Douglas Charles McRae, Penicuik, and Philip Scott Hutchison, Currie, both of Scotland, assignors to National Research Development Corporation, London, England
Filed June 9, 1976, Ser. No. 694,383
Claims priority, application United Kingdom, June 13, 1975, 25399/75
Int. Cl.² B07C *5/04*
U.S. Cl. 209—106 12 Claims



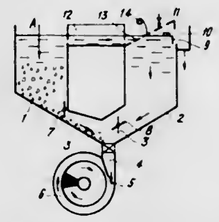
1. Apparatus for grading objects according to size, which comprises:
a plurality of spaced apart grading members forming a grading array for grading objects by allowing objects smaller than the spacing between adjacent grading members to pass between adjacent grading members while retaining on the grading members objects larger than the spacing between adjacent grading members;
support means for the grading members, said support means comprising elongated base means capable of assuming different degrees of curvature along its length, and mounting elements for mounting said grading members on said elongated base means; and
means for selectively varying the curvature of said elongated base means for giving a degree of curvature selectable from a range of different curvatures;
said mounting elements being secured on said elongated base means at spaced intervals along the length of the elongated base means, said spaced intervals remaining constant during operation of the apparatus, and said grading members being mounted on outstanding portions of said mounting elements at positions spaced from said elongated base means in directions normal to the length of the elongated base means, whereby variation of the curvature of said elongated base means causes said outstanding portions of said mounting elements to fan out or to close up so that said grading members spread apart or come towards each other in order to selectively vary the grading spacing between adjacent grading members.

4,075,089
FLOTATION CELL WITH ECCENTRIC ROTOR AND STATOR
Kaarlo Matti Juhani Saari, Vanha-Ulvila, and Aarno Iisakki Kalliokoski, Ulvila, both of Finland, assignors to Outokumpu Oy, Helsinki, Finland
Filed Jan. 10, 1977, Ser. No. 757,951
Claims priority, application Finland, Jan. 13, 1976, 760066
Int. Cl.² B03D *1/24*
U.S. Cl. 209—169 2 Claims



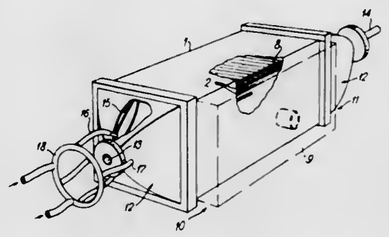
1. A flotation cell for separating by flotation a material from a mixture of the material in a liquid vehicle, comprising a vessel for the mixture provided with at least one upper edge for discharge of substantial amounts of the material thereover, a fixed annular stator provided in the bottom of said vessel and having radial passages therethrough, the axis of said stator being substantially parallel with the vertical axis of said vessel, a rotor disposed within said annular stator for impelling the mixture, the axis of said rotor being substantially parallel with the axis of said stator and spaced therefrom so that one side of said rotor is spaced from the inner surface of said annular stator a greater distance than the opposed side of said rotor and means for rotating said rotor whereby the mixture of the material in the liquid vehicle flows inwardly through the radial passages on that side of said stator where the distance between said rotor and said stator increases in the direction of rotation of said rotor and flows outwardly through the radial passages on the opposed side of said stator thus providing a flow of the mixture across the top of said vessel in substantially one direction toward the discharge edge of said vessel.

4,075,090
APPARATUS FOR GRAVITY COLLECTING AND HANDLING OF PRODUCTS FROM TANKS FILLED WITH LIQUID FOR DEWATERING DEVICES
Antoni Jedo, Gliwice, and Waclaw Jachna, Tychy, both of Poland, assignors to Centralny Osrodek Projektowo-Konstrukcyjny Maszyn Gorniczych "Komag", Gliwice, Poland
Filed July 30, 1976, Ser. No. 710,243
Claims priority, application Poland, Aug. 2, 1975, 182522
Int. Cl.² B03B *11/00*
U.S. Cl. 209—173 7 Claims



1. Apparatus for gravity collection and handling of granular products comprising a feeding tank for receiving liquid containing granular materials to be separated therefrom, said feeding tank having a lower outlet, at least one equalizing tank having a lower outlet, a communicating passage connecting said feeding tank and said equalizing tank, a second passage connecting the outlets of said tanks, at least one discharge conduit connected to said second passage, a dewatering device having an inlet nozzle connected to said discharge conduit, a restrictor disposed at said outlet of the feeding tank for controlling flow therefrom, regulating means at the outlet of the equalizing tank for regulating discharge therefrom, said equalizing tank having an overflow crest located at a level at least as high as that of the liquid in the feeding tank.

4,075,091
METHOD FOR EFFECTING HEAT OR MASS TRANSFER
Brian John Bellhouse, Wendlebury, near Bicester, England, assignor to National Research Development Corporation, London, England
Continuation of Ser. No. 371,986, June 21, 1973, abandoned. This application Apr. 29, 1975, Ser. No. 572,826
Claims priority, application United Kingdom, June 28, 1972, 30288/72; Mar. 29, 1973, 15117/73
Int. Cl.² B01D *13/00*; A61M *1/03*
U.S. Cl. 210—19 6 Claims



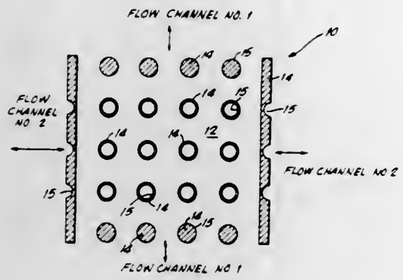
1. A method for effecting heat or mass transfer between blood and a fluid through a transfer membrane, in which oneof said fluids is passed in pulsatile flow through a conduit at least partly defined by the membrane to give rise to substantially non-turbulent rotatory secondary fluid flow pattern in each of successive hollows in the membrane, the rotatory flow having components of motion parallel and components of motion perpendicular to the general direction of flow in the conduit.

4,075,092

HIGH SURFACE AREA PERMEABLE MATERIAL

Eugene W. White; William M. Hanusiak, both of State College, Pa., and Rodney A. White, Torrance, Calif., assignors to Research Corporation, New York, N.Y.

Filed Aug. 10, 1976, Ser. No. 713,258
Int. Cl.[2] B01D *3/00*
U.S. Cl. 210—22 R 30 Claims



1. An integral three-dimensional structure providing a plurality of separate interpenetrating, three-dimensional domains or channels, each of said domains or channels being a closed system of connected porosity or permeability with multiple interconnections only with respect to its respective domain or channel, each of said domains or channels being interpenetrating within said structure.

4,075,093

PROCESS OF SEPARATING CITRIC ACID AND/OR ISOCITRIC ACID OR THEIR SALTS FROM AQUEOUS SOLUTIONS

Axel Walch; Albrecht Klimmek, both of Frankfurt am Main, and Klaus Wollmann, Eschbofen, all of Germany, assignors to Joh. A. Benckiser GmbH, Ludwigshafen (Rhine), Germany

Filed Oct. 23, 1975, Ser. No. 625,140
Claims priority, application Germany, Oct. 25, 1974, 2450670
Int. Cl.[2] B01D *13/00*
U.S. Cl. 210—23 H 15 Claims

1. A process of separating a material selected from citric acid, isocitric acid, their salts, and mixtures of such materials, present in an aqueous starting solution, especially a fermentation solution, from impurities comprising other organic compounds or inorganic salts in said solution, comprising the step of contacting the starting solution with a permselective membrane comprising

a. a polymer containing chemically bound acid groups in a proportion such that the swelling power of the polymer is between about 5% and about 25%, by volume, or

b. a polymer containing chemically bound basic groups in a proportion such that the swelling power of the polymer is between about 3% and about 15%, by volume,

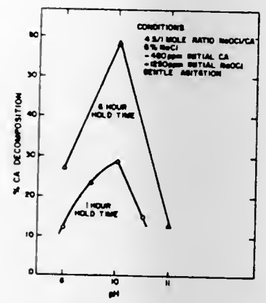
at a pH-value between about 0.1 and about 8.0 and under a pressure between about 5 bars and about 100 bars for the acidic polymers (a) and at a pH-value between about 1.0 and 3.0 and under a pressure between about 30 bars and about 100 bars for the basic polymers (b) whereby a permeate solution and a retention solution result on opposite sides of said membrane, one of said resulting solutions having a substantially higher ratio of said material to said impurities than in said starting solution.

4,075,094

SODIUM HYPOCHLORITE TREATMENT FOR REMOVAL OF CYANURATE COMPOUNDS FROM AQUEOUS WASTE STREAMS

Ronald H. Carlson, Willingboro, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed July 9, 1976, Ser. No. 704,051
Int. Cl.[2] C02B *1/36*
U.S. Cl. 210—62 26 Claims



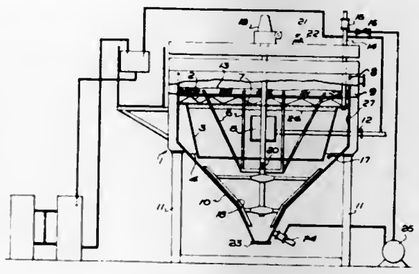
1. A process of eliminating dissolved cyanurate compounds from waste liquors containing triazines such as cyanuric acid, ammelide, and chlorinated isocyanurates comprising adjusting the pH of said waste liquors within the range of 8 to 12, and adding thereto at a temperature below 55° C sufficient sodium hypochlorite to oxidize a major portion of said cyanurate compounds to nitrogen, carbon dioxide and sodium chloride.

4,075,095

TREATMENT OF EFFLUENT

Derek Parnaby, Bridge End Ferryhill Station, Durham, England

Filed June 14, 1976, Ser. No. 695,459
Int. Cl.[2] B01D *23/24*
U.S. Cl. 210—82 9 Claims



1. A sand settler filter comprising

a scum tank (1) having an upper part and a bottom (10);

a scum trough (9) mounted on the tank and a weir (8) carried by the upper part of the scum trough (9) to locate the weir (8) between the scum trough (9) and the upper part of the tank (1);

a perforate support (2) forming a filter bed carried across the scum tank (1) below said weir (8) and a filter medium (13) located on the support (2);

means (3) within the tank defining a ballast chamber having a lower opening (4) extending into the remaining portion of the tank (1) below the support (21)

an effluent feed (5) located below said perforate support (2) to feel effluent to the filter, back pressure sensing means (27) responsive to pressure in said ballast chamber;

and valve means (15, 23, 24) forming valved outlets from the tank controlled by said sensing means to open the outlet when a predetermined back pressure is sensed and including a valved gas outlet (15) communicating with the upper region of the ballast chamber responsive to the pressure therein sensed by the sensing means (27).

7. Method of treatment of effluent in a scum tank (1) having an upper part and a bottom (10);

a scum trough (9) mounted on the tank and a weir (8) carried by the upper part of the scum trough (9) to locate the weir (8) between the scum trough (9) and the upper part of the tank (1);

a perforate support (2) forming a filter bed carried across the scum tank below said weir (8) and a filter medium (13) located on the support (2);

means (3) within the tank and defining a ballast chamber having a lower opening (4) extending into the remaining portion of the tank (1) below said support (2);

comprising the steps of

distributing effluent from the effluent feed within the tank;

allowing the effluent to percolate the support and filter bed, to settle sludge below in the tank and cause treated liquor to rise to the weir for subsequent discharge from the scum trough (9);

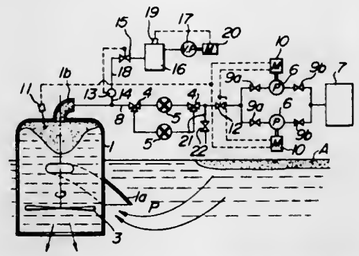
and purging scum at the perforate support (2) and backwashing the filter bed by dropping the level of effluent in the tank.

4,075,096

SUCTION DEVICE FOR AN OIL SEPARATION TANK

Hiroshi Kawakami, Kamakura; Yukio Tsukagawa, and Isao Nagaoka, both of Yokohama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Sept. 16, 1976, Ser. No. 723,865
Claims priority, application Japan, Sept. 18, 1975, 50-127279
Int. Cl.[2] B01D *21/24*
U.S. Cl. 210—96 R 3 Claims



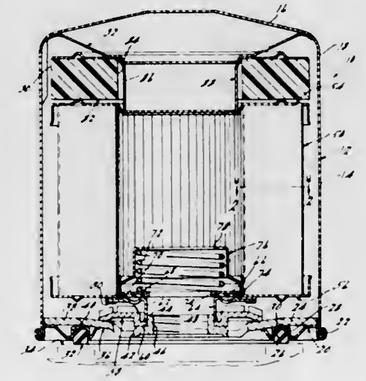
1. In a suction device for an oil separation tank, the tank being mounted on a floating body and closed at its upper part and opened at its lower part and including a socket opened below water level for receiving an upward flow of floating oil which has been drawn into water, the improvement comprising, a suction inlet provided at the top of said oil separation tank; said suction inlet being connected through a conduit to strainer means, liquid pump means and a storage tank in succession; a motor driving said liquid pump means; an oil detector provided in the upper part of said oil separation tank and electrically coupled to said motor so as to control energization and deenergization of said motor in response to the presence and absence of oil in said oil separation tank; an electromagnetic valve connected to said conduit and upstream of said liquid pump means; said electromagnetic valve coupled to said motor to be opened and closed in response to the energization and deenergization of said motor; said conduit including a branch downstream of said oil separation tank; a full water detector coupled to said branch; said full water detector connected through an air conduit to a second electromagnetic valve, a vacuum vessel and a vacuum pump in succession; said full water detector electrically connected to said second electromagnetic valve to control its opening and closing; a second motor for driving said vacuum pump; and said vacuum vessel including a vacuum switch which serves to control energization and deenergization of said second motor.

4,075,097

OIL FILTER WITH OIL IMPROVING DISSOLVING BODY

George A. Paul, Midland, Mich., assignor to Monroe Auto Equipment Company, Monroe, Mich.

Filed Apr. 1, 1975, Ser. No. 564,111
Int. Cl.[2] B01D *35/00*; C10M *7/10*
U.S. Cl. 210—168 16 Claims



1. An oil filter for an engine having a circulating oil lubrication system,

said filter including an enclosure having a generally cylindrically-shaped side wall and having an annular ring-shaped filter element located concentrically therein,

a base plate at one end of said enclosure having a generally centrally located oil outlet opening and at least one oil inlet opening spaced radially from said outlet opening,

said filter being of the spin-on type and adapted to have said base plate mounted on a support structure having a mounting element threadably receivable within said outlet opening of said base plate,

a first oil passage within said enclosure and located between the inner periphery of the side wall of said enclosure and the adjacent portion of the outer periphery of said filter element communicating said oil inlet opening with the entire axial length of said adjacent portion of the outer periphery of said filter element,

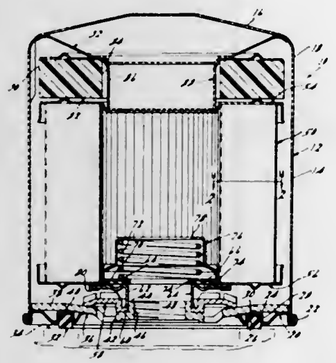
a second oil passage within said enclosure communicating the inner periphery of said filter element with said oil outlet opening, an annular body located at a position at the opposite end of said enclosure from said base plate and being substantially axially aligned with said filter element, said body being fabricated of a material having oil improver properties and which is capable of going into solution in the oil when the oil comes in contact therewith, said position of said body being such that oil must flow axially along the entire length of the outer periphery of said filter element before said oil reaches said annular body, with the result that said body is located where relatively limited amount of oil movement occurs, whereby said polymer body will be substantially unaffected by the mechanical movement of oil within said enclosure and will dissolve into the oil at a relatively uniform rate over the normal service life of the oil and thereby assure against over and underdosing of the improver properties being replenished into the oil in said system by dissolution of said polymer.

4,075,098

MASKING ELEMENTS FOR DISSOLVING OIL IMPROVING BODY IN AN OIL FILTER

George A. Paul, Midland; Robert W. Hegel; Michael R. Bethell, both of Monroe; Charles L. Branham, La Salle, and Allan D. Utter, Trenton, all of Mich., assignors to Monroe Auto Equipment Company, Monroe, Mich.

Continuation-in-part of Ser. No. 564,111, April 1, 1975. This application Nov. 7, 1975, Ser. No. 630,038
Int. Cl.[2] B01D *35/00*; C10M *7/10*
U.S. Cl. 210—168 7 Claims



1. A spin-on type oil filter for an engine having a circulating oil lubrication system,

said filter including an enclosure having a filter element therein and oil inlet and outlet ports communicable with the lubrication system of the engine, whereby oil may flow from the lubrication system through said filter element and back into the lubrication system,

an oil soluble, relatively solid body disposed within said enclosure and having oil improver properties,

said body comprising a generally flat, annular member arranged concentrically within said enclosure at a position generally axially aligned with said filter element and at the opposite end thereof from said inlet and outlet ports,

means defining a fluid flow path along which oil flows within said enclosure between said filter element and said ports, and

a masking element independent of said enclosure and arranged at a position therein between a preselected surface portion of said annular member and a portion of said flow path so as to limit the disturbance of the concentration gradient between the oil and the member by the mechanical movement of the oil along said flow path, whereby said body will dissolve into the oil at a preselected rate over the service life of the oil,

said element comprising a generally radially disposed portion located directly adjacent the upper side of said member, and a generally axially disposed portion extending axially downwardly along the axially outermost part of said member.

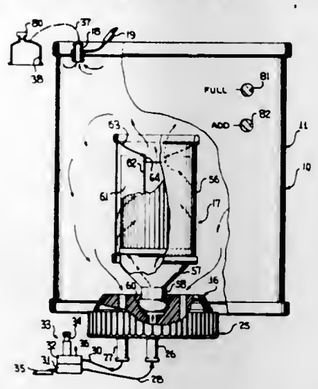
4,075,099

INTEGRAL OIL SUPPLY AND FILTER

Peter G. Pelton, Carol Stream; Alan A. Grubman, Glenview, and Gary Hasegawa, Morton Grove, all of Ill., assignors to The Continental Group, Inc., New York, N.Y.

Filed Sept. 2, 1975, Ser. No. 602,074
Int. Cl.[2] F01M *1/02*
U.S. Cl. 210—168 10 Claims

1. A new article of manufacture comprising a disposable oil unit for a dry sump lubricating system, said oil unit including a disposable container of a construction suitable for transporting oil, said container being of a size to be the primary oil storage area for an intended machine, a fitting carried by said container, said fitting defining an inlet passage for directing oil into said container, a filter, said filter being small in size as compared to said container, coupling means coupling said filter to said fitting for receiving oil through said inlet passage, said filter having a discharge opening into said container, and means for delivering oil from said container for passage through a unit to be lubricated, said means for delivering oil



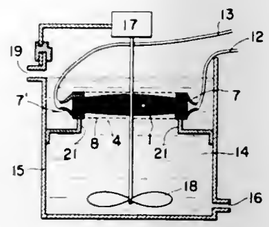
from said unit including said fitting defining an outlet passage, said fitting having an end face remote from said container, said inlet passage being generally centrally located and said end face having projecting therefrom a first sealing ring, said end face having a second sealing ring projecting therefrom surrounding said fist sealing ring, and said outlet passage being disposed between said sealing rings.

4,075,100

DIALYSIS UNIT AND DIALYSIS APPARATUS EMPLOYING THE DIALYSIS UNIT

Tadaaki Furuta; Kenji Inagaki, both of Fuji; Yoshiyuki Mizoguchi, Ohita; Noboru Fujikawa, Tokyo, and Naoya Kominami, Fuji, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 2, 1975, Ser. No. 637,102
Claims priority, application Japan, Dec. 4, 1974, 49-138979; Dec. 30, 1974, 50-1125; Feb. 24, 1975, 50-22620; Feb. 25, 1975, 50-23064; Mar. 8, 1975, 50-28407
Int. Cl.[2] B01D *13/00, 21/24, 35/00*
U.S. Cl. 210—266 9 Claims



1. A liquid dialysis unit comprising:

a protective casing having a plurality of openings for introducing and discharging a dialyzate, said openings being substantially uniformly distributed all over the casing; and

a bundle of semi-permeable hollow fibers substantially equal in length, both end portions of the bundle of fibers being gathered and bonded in liquid-tight connection to form fixation blocks, respectively, both terminals of the bundle being opened to form an inlet and an outlet for the liquid, respectively, said bundle being supported within the protective casing at at least two supporting points; said semi-permeable hollow fibers being supported and arranged to have a relaxation rate of 3 to 30% at a position between any two adjacent supporting points; and said protective

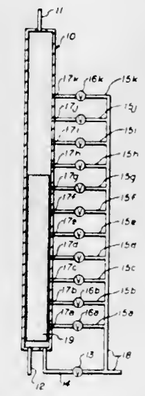
casing having a diameter 1.5 to 6 times as large as the close package diameter of the bundle.

4,075,101

APPARATUSES FOR FLUIDIZING A FILTER MEDIA PLUG

Matthew H. Fuller, Richmond, Va., and William R. Deever, Beaumont, Tex., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 600,259, July 30, 1975, abandoned. This application June 17, 1976, Ser. No. 697,293
Int. Cl.[2] B01D *23/24*
U.S. Cl. 210—275 13 Claims



1. In a rapidly fluidizing granular media filter having a plug of filter media therein which is required to be rapidly broken up and fluidized, the filter comprising,

(a) chamber means having an inlet means for supplying a filter influent in the top thereof and an outlet means for discharging effluent from the bottom thereof in which a filter media plug is formed,

(b) first plug-breaking-up means mounted on said chamber means at a predetermined distance above the bottom of said plug for ejecting a horizontal high pressure liquid jet at said plug for contacting and breaking up the lower portion of said plug,

(c) a multiplicity of successive plug-breaking-up means for said vertical chamber means, each plug-breaking-up means being positioned a predetermined distance above the previous plug-breaking-up means to the top of said plug for rapidly breaking up and fluidizing said filter media plug, and

(d) all of said plug-breaking-up means are mounted equal distances apart.

4,075,102

LIQUID PROCESSING MEDIA BED DRAIN SYSTEM

Charles Robert Ferrin, Tulsa, Okla., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed May 13, 1976, Ser. No. 685,955
Int. Cl.[2] B01D *29/42*
U.S. Cl. 210—277 5 Claims

1. A fluid processing unit, including,

a vessel in which fluid is processed by being passed through granular media;

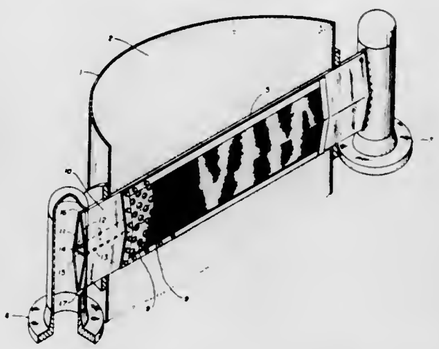
a bed of granular media mounted in the vessel so as to provide horizontal and parallel faces vertically spaced from each other through which fluid to be processed is passed into the bed for processing,

inlet conduits mounted through the wall of the vessel and positioned relative to the upper and lower faces of the bed so as to direct fluid to be processed through each face at the same time;

a source of fluid to be processed by the bed of granular media;

a pump connected between the source and inlet connections to deliver fluid to be processed to the bed faces and through both bed faces and into the bed;

a drain structure mounted in the vessel and intermediate the bed faces and within the bed and extending horizontally across the bed and comprising;



an elongated chamber orientated to extend horizontally across the bed, and having a chamber thickness substantially smaller than its vertical width to thereby provide a relatively small profile to the vertical movement of the media bed within the vessel, said elongated chamber having spaced holes in its wall through which fluid processed by the bed is received into the chamber;

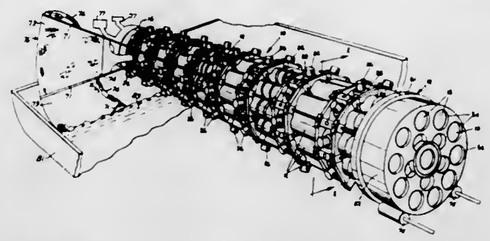
an an outlet conduit connected to communicate to the chamber to remove the processed fluid from the vessel.

4,075,103

FABRICATED DISC FILTER CORE

Alfred J. Kane, 1470 Washington St., Munising, Mich. 49862

Filed June 30, 1976, Ser. No. 701,197
Int. Cl.[2] B01D *33/26, 35/12*
U.S. Cl. 210—331 13 Claims



3. In a filter disc assembly for use in conjunction with a tank containing a slurry, an elongated central shaft, a plurality of radiating segmented filter discs having hollow interiors operably connected to and supported by said central shaft, means for rotatably mounting the central shaft above the tank such that when the shaft rotates, the segmented disc will rotate and each segment of filter disc alternately enters and withdraws from the tank, and passages through the central shaft circumferentially positioned about the central axis thereof through which a vacuum means is operably connected to the interior of the filter discs, the improvement in the rotatable shaft comprising:

a plurality of replaceable pipe segments each having a hollow interior and secured circumferentially about the central axis of the shaft;

an elongated frame comprising at least one reuseable securing means intervally spaced along the elongated frame between two ends of the frame for replaceably securing

each pipe segment circumferentially about the elongated frame such that one pipe segment is releasable from the securing means and a replacement pipe segment is securable to the same securing means;

the securing means being operable independently of the filter disc segments which are operably connected to the pipe segments;

each pipe segment has its axis substantially parallel to the central axis of the elongated frame, the hollow interior of at least one pipe segment forming each passage circumferentially positioned about the central shaft;

intake means in the pipe segment for allowing passage of filtrate of the slurry from the interior of the filter discs to the interior of the pipe segment; and

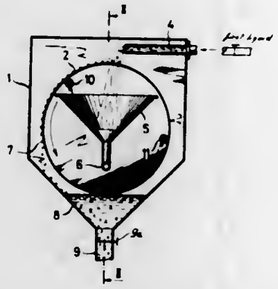
egress means coupled to an end of the pipe segment and adapted to be coupled to the vacuum means for allowing the filtrate to be withdrawn from the interior of the pipe segment.

4,075,104

DEVICE FOR SEPARATING IN A CONTINUOUS PROCESS PARTICLES FROM A FIRST LIQUID AND INTRODUCING THE SEPARATED PARTICLES INTO A SECOND LIQUID

Helmut Ringel, Hambach, Germany, assignor to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

Filed Sept. 15, 1975, Ser. No. 613,267
Claims priority, application Germany, Sept. 13, 1974, 2443843
Int. Cl.[2] B01D *33/06*
U.S. Cl. 210—402 6 Claims



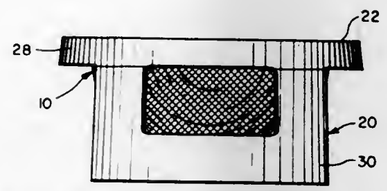
1. A device for continuously separating easily destroyable particles in a protective manner, especially heavy metal particles for core reactors, from a first liquid and introducing the separated particles into a second liquid without having first and second liquids coming into contact with each other, which includes in combination: a housing having an upper portion and a lower portion, an endless screen rotatably arranged in said housing, and defining a hollow chamber therein, a feeding conduit extending into the upper portion of said housing and having its mouth above said screen for feeding and discharging a first liquid with the particles to be separated therefrom onto the screen portion therebelow, liquid catching container means arranged within said hollow chamber below the mouth of said feeding conduit for collecting the liquid discharged from said mouth and passing through said screen, said container means having an outlet extending through said housing to discharge the liquid collected by said liquid catching container means, said lower portion of said housing forming a chamber means for holding a second liquid to receive the particles screened out from the first liquid discharged by said feeding conduit onto and screened out by said screen and remaining only on the outer surface of said screen, and means for setting liquid level of the second liquid.

4,075,105

STACKABLE COLANDER AND BASE

Fred S. Steiner, Woodmere, and Morison S. Cousins, Plainview, both of N.Y., assignors to Bonny Products, Inc., Hewlett, N.Y.

Filed Dec. 29, 1975, Ser. No. 644,567
The portion of the term of this patent subsequent to Dec. 6, 1991, has been disclaimed.
Int. Cl.[2] B01D *23/00*
U.S. Cl. 210—477 3 Claims



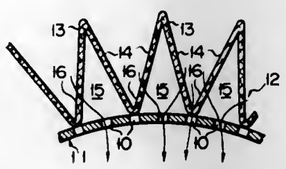
1. An apparatus including a colander having a supporting rim and a colander body formed of a permeable material attached to and depending from said supporting rim and a colander supporting base, said colander supporting base being open at the top and bottom and including a top wall and a pair of arcuate legs depending from said top wall, said arcuate legs having inner and outer surfaces, said outer surface of said legs imparting to said base the shape of a frustum of a cone with the bottom of said base wider than the top, the inner surface of said pair of arcuate legs having a frustum shape geometrically similar to the shape of said outer surface, said top wall having a recess adapted to receive and supporting said colander rim on said base top wall with said colander body suspended between said legs, whereby said colander and base is stackable with other paired colanders and bases with said inner surface of one of said paired colanders and bases securely resting upon said geometrically similar outer surface of another of said paired colanders and bases.

4,075,106

FILTERING DEVICE

Masahiko Yamazaki, 15-2 2-chome, Fujizuka, Kohoku Yokohama, Japan

Continuation-in-part of Ser. No. 685,685, May 12, 1976, abandoned. This application Dec. 2, 1976, Ser. No. 747,046
Claims priority, application Japan, May 7, 1976, 51-57411[U]
Int. Cl.[2] B01D *39/18*
U.S. Cl. 210—487 6 Claims



1. In a filtering device having a cylindrical member with a large number of holes therein and a flexible sheet-like porous filter element surrounding the cylindrical member, said filter element being folded in zigzag fashion so as to present a plurality of radially crosswise extending projections and root regions defined between every two adjacent projections, the improvement comprising:

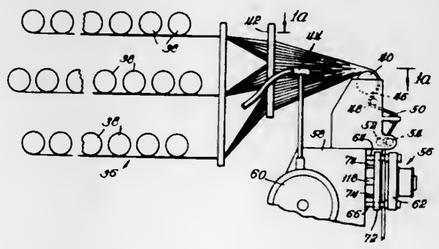
a large number of rigid passage plates each interposed between the inner edge of the radially crosswise extending projections and the outer wall of the cylindrical member, said passage plates being provided with a plurality of convex and concave portions on both sides thereof and having a width equal to or larger than a distance between the inner wall of the apex of the projecting folded portion of the filter element and the outer wall of the bottom of the root region defined between every adjacent projecting folded portions, and at least one annular support band surrounding and contacting substantially only the apexes of the folded projections and having its inner wall coated with an adhesive, which provides means to fix said apexes to said support band, said adhesive permeating through the apexes of said folded projections to further provide means to fix said apexes to the outer edge of the passage plates.

4,075,107

NOVEL FILTER AND METHOD OF MAKING SAME

Floyd S. Smith, Kalamazoo, Mich., assignor to Brown Company, Kalamazoo, Mich.

Filed July 14, 1976, Ser. No. 705,066
Int. Cl.[2] B01D *27/06, 29/06*
U.S. Cl. 210—493 R 7 Claims



1. A seamless filter cupcomprising a unitary sheet of filter paper having integral fluted side portions flaring outwardly from a dish-shaped bottom, in which the dish-shaped bottom has parallel side edges and arcuate end edges, and in which the dish-shaped bottom has substantially planar side portions which converge from said parallel side edges to a center line which is shorter than said parallel side edges and is parallel thereto, and having a mirror image symmetry about its longitudinal, transverse, and perpendicular axes.

4,075,108

POLYCARBONATE MEMBRANES AND PRODUCTION THEREOF

Willard S. Higley, Glendora; Paul A. Cantor, Los Angeles, and Bruce S. Fisher, Covina, all of Canada, assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Continuation-in-part of Ser. No. 454,939, March 26, 1974, abandoned. This application Nov. 28, 1975, Ser. No. 636,062
Int. Cl.[2] B01D *39/16;* B29D *27/04*
U.S. Cl. 210—500 M 25 Claims

1. A process for producing a polycarbonate membrane useful for hemodialysis which comprises casting on to a substrate surface having a smooth finish a layer of casting solution comprising a polyether-polycarbonate block copolymer having a molecular weight within the range of from about 50,000 to about 750,000 as determined by the intrinsic viscosity measurement and containing from about 5 to about 35% by weight of repeating alkylene ether units and correspondingly from about 95 to about 65% by weight of repeating bisphenol A-carbonate units and a water-miscible organic solvent together with a cosolvent which acts as a swelling agent for said copolymer, drying said layer to partially evaporate the solvents therefrom, immersing said partially dried layer in water to form a gelled membrane, and stripping said gelled membrane from said substrate surface.

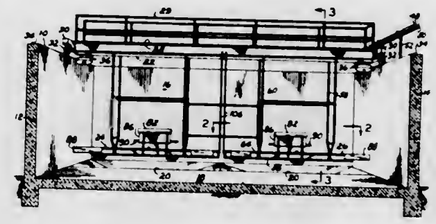
14. The polycarbonate membrane produced in accordance with the process of claim 1.

4,075,109

SETTLING TANK SLUDGE COLLECTOR

Eugene D. Blalock, P.O. Box 353, Pauls Valley, Okla. 73075

Filed Jan. 27, 1977, Ser. No. 762,914
Int. Cl.[2] B01D *45/02*
U.S. Cl. 210—527 2 Claims



1. A sludge and sediment collector for a longitudinal settling tank having a flat bottom and having a sump adjacent one of its ends, comprising:

bridge means transversely spanning said tank and operable for reciprocating movement between its ends;

friction wheel drive means for reciprocating said bridge means,

said friction drive means including a drive support bracket connected in depending relation with the respective end of said bridge means,

a reversible motor operatively connected with a source of electrical energy,

a pneumatic tire equipped wheel connected with and driven by said motor about an axis generally parallel with respect to the vertical plane of the respective bridge supporting tank wall, and,

means including a plate pivotally connecting said wheel with said support bracket in a manner permitting gravitational attraction for the mass of said wheel and said motor to maintain said tire in frictional driving contact with the adjacent tank wall surface;

sludge scraping means generally horizontally supported by said bridge means adjacent the upper surface of said tank bottom for vertical tilting movement about a horizontal axis from a sludge collecting position during movement toward said sump to an idle position during movement away from the sump,

said sludge scraping means including a rectangular scraper frame having a center bar extending transversely of said tank and having longitudinal side members,

said scraper frame having a pair of end members and a pair of transverse braces connecting one said frame side member with said center bar in a horizontal plane and connecting the other said frame side member with said center bar in a plane inclined upwardly with respect to the horizontal when said scraper frame is in one position, and,

a scraper blade secured to one said scraper frame side member; and,

cam plate means including an elongated arcuately curved plate secured at one end to the inner surface of the respective tank end wall and projecting, at its other end, toward an intermediate portion of the respective said scraper frame side member a distance sufficient for contacting the respective scraper frame side member when in one position and tilting said frame to the other of its positions.

4,075,110

FABRIC TREATMENT COMPOSITIONS

Bryan Duffin, Wirral, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Apr. 2, 1976, Ser. No. 673,022

Claims priority, application United Kingdom, Apr. 15, 1975, 15450/75

Int. Cl.[2] D06M *13/20*

U.S. Cl. 252—8.8 **9 Claims**

1. A fabric treatment composition comprising

A. from about 0.1% to about 10% by weight of

i. a condensation product of (a) an aliphatic dicarboxylic acid, or an ester- or amide-forming derivative thereof; (b) a hydroxypolyoxy-alkylene compound containing at least one polyalkylene chain consisting of a plurality of oxyalkylene radicals linked directly to one another, or an ester- or amide-forming derivative thereof; and (c) a compound selected from the groups

1. an aliphatic or cycloaliphatic amino acid or lactam,
2. an aliphatic or cycloaliphatic diamine or salt thereof with aliphatic dicarboxylic acid,
3. a mixture of the amino acid or lactam compound with the diamine compound or salts thereof, and
4. an ester- or amide-forming derivative of reactants 1), 2) or 3) above; or

ii. a reaction product of an alkylene oxide with polyamide; in an admixture with

B. from about 1% to about 60% by weight of a cationic fabric softener compound having a solubility in water not greater than 500 parts per million at 25° C and

C. an aqueous medium.

4,075,111

HEAVY METAL CHALCOGENIDE-POLYIMIDE LUBRICATIVE COMPOSITES

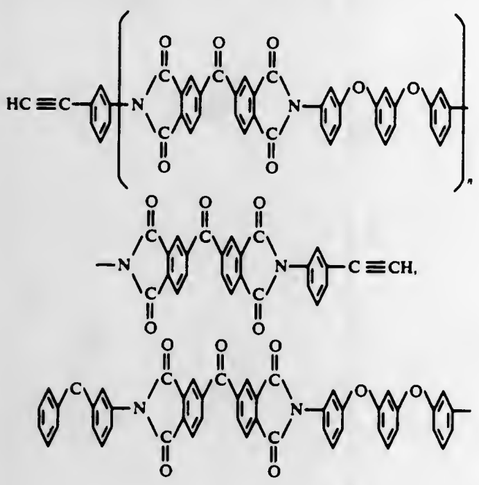
Norman Bilow, Encino, and Michael N. Gardos, Culver City, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 19, 1976, Ser. No. 678,285

Int. Cl.[2] C10M *5/00, 7/00*; F16D *69/00*; F16C *0/00*

U.S. Cl. 252—12 **4 Claims**

1. A self-lubricating composite comprised of an addition type polymerization polyimide taken from the group consisting of an acetylene-terminated polyimide oligomer selected from the group whose structures consist of:



4,075,112

GREASE COMPOSITION

Guy Camille Van Doorne, Zellik, Belgium, assignor to Labofina S.A., Brussels, Belgium

Continuation-in-part of Ser. No. 544,687, Jan. 28, 1975, abandoned, which is a continuation-in-part of Ser. No. 327,787, Jan. 29, 1973, abandoned. This application June 25, 1976, Ser. No. 699,853

Int. Cl.[2] C10M *1/24, 3/18, 5/14, 7/20*

U.S. Cl. 252—35 **8 Claims**

1. A lubrication grease composition consisting essentially of 2 to 8% by weight of an aluminum fayy acid soap, 25 to 98% by weight of hydrogenated polyisobutylene having a mean molecular weight ranging from 300 to 2500, 2 to 58% mineral lubricating oil, and 0.2% polyisobutylene having a mean molecular weight higher than 100,000, and also having a worked penetration in the range of about 285 to 340 and a wear index in the range of about 0.63 to 0.74.

5. A process for the manufacture of lubricating greases which comprise:

dispersing at 15°-50° C 2 to 8% by weight, based on the total composition, of aluminum fatty acid soap, into 10 to 50% by weight of a hydrogenated polymer of polyisobutylene said polymer having a mean molecular weight of between 300 and 2500.

progressively heating said dispersion,

adding 2 to 58% by weight of mineral lubricating oil when the temperature reaches 90° to 110° C, slowly adding 0.2% polyisobutylene having a mean molecular weight higher than 100,000 and 15 to 48% by weight of a polymer of hydrogenated isobutylene, said polymer having a mean molecular weight of between 300 and 2500 when the temperature reaches 150° to 180° C, and maintaining such temperature during the addition of the polymer,

cooling the mixture and homogenizing said mixture at 10° to 35° C.

4,075,113

GREASE COMPOSITION

Guy Camille Van Doorne, Zellik, Belgium, assignor to Labofina S.A., Brussels, Belgium

Continuation-in-part of Ser. No. 544,688, Jan. 28, 1975, abandoned, which is a continuation-in-part of Ser. No. 327,787, Jan. 29, 1973, abandoned. This application June 25, 1976, Ser. No. 699,854

Int. Cl.[2] C10M *1/24, 3/18, 5/14, 7/20*

U.S. Cl. 252—35 **8 Claims**

1. A lubricating grease composition consisting essentially of 2 to 8% by weight of an aluminum fatty acid soap, 25 to 98% by weight of non-hydrogenated polyisobutylene having a mean molecular weight ranging from 300 to 2500, 2 to 58% mineral lubricating oil, and 0.2% polysobutylene having a mean molecular weight higher than 100,000, and also having a worked penetration in the range of about 285 to 340 and a wear index in the range of about 0.63 to 0.74.

5. A process for the manufacture of lubricating greases which comprise:

dispersing, at 15°-50° C 2 to 8% by weight, based on the total composition, of aluminum fatty acid soap, into 10 to 50% by weight of a non-hydrogenated polymer of polyisobutylene said polymer having a mean molecular weight of between 300 and 2500,

progressively heating said dispersion,

adding 2 to 58% by weight of mineral lubricating oil when the temperature reaches 90° to 110° C,

slowly adding 0.2% polyisobutylene having a mean molecular weight higher than 100,000 and 15 to 48% by weight of a polymer of non-hydrogenated isobutylene, said polymer having a mean molecular weight of between 300 and 2500 when the temperature reaches 150° to 180° C, and maintaining such temperature during the addition of the polymer,

cooling the mixture and homogenizing said mixture at 10 to 35° C.

4,075,114

FLEXIBLE GRAPHITE MATERIAL CONTAINING BORIC ACID

Toshikatsu Ishikawa, Tokyo; Tanaka Junichi, Yokohama; Haruo Teranishi, Machida, and Shinichiro Kondo, Yokohama, all of Japan, assignors to Nippon Carbon Co., Ltd., Tokyo, Japan

Filed Mar. 12, 1976, Ser. No. 666,390

Claims priority, application Japan, Mar. 24, 1975, 50-35176

Int. Cl.[2] C01B *31/04*; C04B *35/54*; B29G *1/00*

U.S. Cl. 252—62 **5 Claims**

1. A process for producing flexible graphite material comprising incorporating expanded graphite material with boric acid in amounts of 3–15 % by weight thereof, and compression molding the mixture.

2. A process according to claim 1, wherein the compression molding is effected at 80–250 kg/cm^2.

4,075,115

SILICONE FLUID USEFUL AS A BRAKE FLUID

Edgar D. Brown, Jr., Schenectady, and Frank J. Traver, Troy, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Division of Ser. No. 290,075, Sept. 18, 1972, abandoned. This application June 11, 1973, Ser. No. 368,816

Int. Cl.[2] C09K *5/00*

U.S. Cl. 252—75 **8 Claims**

1. A process for transmitting force through a brake hydraulic system having hydraulic activating means, hydraulic activated means and hydraulic line means connecting said hydraulic activating means with said hydraulic activated means comprising applying mechanical force to said activating means wherein said hydraulic activating means, said hydraulic activated means and said hydraulic lines are substantially fluid with a linear polymer silicone hydraulic fluid of the formula,



where *n* varies from 1 to 2000, R is selected from the class consisting of monovalent hydrocarbon radicals, halogenated monovalent hydrocarbon radicals and cyanoalkyl radicals and the viscosity of said fluid varies from 20 to 500 centistokes at 25° C, and from 1 to 20% by weight of the total fluid of glycol water tolerance additive which has the formula,

$$HO—R^1—OH$$

where R^1 is selected from the class consisting of alkylene and arylene radicals of 2 to 12 carbon atoms.

4,075,116

MIXED PERSALTS STABLE IN DETERGENT COMPOSITIONS

Louis Mesaros, Oullins, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Aug. 11, 1976, Ser. No. 713,430

Claims priority, application France, Sept. 15, 1975, 75 28193

Int. Cl.[2] C11D *7/56, 7/60*

U.S. Cl. 252—102 **9 Claims**

1. A process for the preparation of sodium chloride-free mixed persalts capable of liberating hydrogen peroxide in aqueous solution and stable in dry alkaline mixtures, which process comprises adding aqueous hydrogen peroxide containing from 60 to 80% H_2O_2 and 0.6 to 1.8 percent, based upon 100 percent H_2O_2, of ethylenediaminetetraacetic acid at a temperature of from 20° to 60° C to sodium carbonate monohydrate or a hydrated sodium carbonate containing from 75 to 90% Na_2CO_3, and adding at least one alkali metal stabilizing compound chosen from the group consisting of sodium sulfate, potassium sulfate, sodium pyrophosphate, potassium pyrophosphate, sodium metasilicate, sodium disilicate, sodium citrate, sodium glucoheptonate, sodium perborate, anhydrous sodium carbonate, potassium carbonate, and mixed sodium and potassium carbonate.

4,075,117

BUILT DETERGENT COMPOSITIONS

Edgar J. Morton, Brantford; Harold Donnan, Waterford, both of Canada, and Arnold Wiesenfeld, Wyckoff, N.J., assignors to Witco Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 410,648, Oct. 15, 1973, abandoned, which is a continuation of Ser. No. 140,556, May 5, 1971, abandoned. This application Sept. 15, 1976, Ser. No. 723,511

Int. Cl.[2] C11D *1/12*

U.S. Cl. 252—135 **6 Claims**

1. An improved built dry powder laundry detergent composition in the form of spray dried beads consisting essentially of the following ingredients in the following ranges of percentages by weight:

(a) from 15 to 20% of a sodium linear alkyl benzene sulfonate detergent;

(b) about 12% amorphous water-soluble sodium silicate having an $Na_2O:SiO_2$ ratio between about 1:2 and 1:3;

(c) from 25 to 35% of a member selected from the group consisting of sodium carbonate, sodium bicarbonate, sodium sesquicarbonate and mixtures of same; and

(d) from 25 to 45% sodium sulfate.

4,075,118

LIQUID DETERGENT COMPOSITIONS CONTAINING A SELF-EMULSIFIED SILICONE SUDS CONTROLLING AGENT

Terrell Wilson Gault, Seattle, Wash., and Edward John Maguire, Jr., Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 622,305, Oct. 14, 1975, abandoned. This application Oct. 12, 1976, Ser. No. 731,256
Int. Cl.[2] C11D *3/37*; B01D *19/04*; C11D *3/20*
U.S. Cl. 252—135 20 Claims

1. A concentrated, essentially homogeneous, low-sudsing liquid detergent composition comprising:

(a) from about 10% to about 50% by weight of a non-ionic surfactant;

(b) from about 10% to about 50% by weight of an anionic surfactant, the total amount of surfactant being more than about 30% and the ratio of nonionic surfactant to anionic surfactant being within the range of from about 1:8 to about 8:1 based on the free acid form of the anionic surfactant; and

(c) an effective amount of self-emulsifiable silicone suds controlling agent comprising a silicone suds controlling agent and an emulsifier for said silicone suds controlling agent.

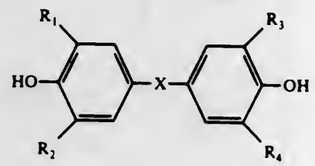
4,075,119

STATISTICAL MIXTURES OF HALOGENATED BISPHENOLS WITH HALOGEN-FREE BISPHENOLS

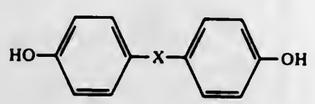
Manfred Schmidt; Dieter Freitag, and Werner Nouvertné, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 21, 1976, Ser. No. 678,807
Claims priority, application Germany, May 7, 1975, 2520317; Dec. 17, 1975, 2556739; May 7, 1975, 2520316
Int. Cl.[2] C07C *39/00, 39/24*; C08G *63/12*
U.S. Cl. 252—182 8 Claims

1. Statistical mixtures comprising halogen-free bisphenols of the formula II with mono-, di-, tri- and tetra -halogenated bisphenols, wherein the halogen is selected from the group consisting of bromine and chlorine, of the formula I



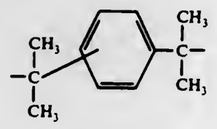
I



II

wherein

X denotes C_1 - C_9 alkylene, C_2 - C_9 alkylidene, C_5 - C_{15} cycloalkylene, C_5 - C_{15} cycloalkylidene, a single bond, —O—, —S—, —SO—, —SO_2—, —CO— or



R_1 to R_4 are identical or different and denote H, Br or Cl, and at least one R is Br or Cl

wherein the total halogen content of the statistical mixtures is about 3 to 48% by weight and they contain about 0 - 48% by weight of bromine alone, about 0 - 30% by weight of chlorine alone or bromine and chlorine conjointly in any desired ratios by weight.

4,075,120

LASER PHOSPHATE GLASS COMPOSITIONS

John D. Myers, Toledo, Ohio, and Charles S. Vollers, Blissfield, Mich., assignors to Kogre, Inc., Toledo, Ohio

Filed May 14, 1975, Ser. No. 577,331
Int. Cl.[2] C03C *3/16*; C09K *11/42, 11/46*
U.S. Cl. 252—301.4 P 12 Claims

1. A laser glass comprising the following ingredients in mole percentages:

Ingredient	Mole Percent
P_2O_5	35 to 65
R_2O_3	0.01 to 15
RO	5 to 30
R_2O	5 to 40
Nd_2O_3	0.01 to 7

wherein R_2O_3 is selected from the group consisting of Al_2O_3, La_2O_3, Y_2O_3, Tm_2O_3, B_2O_3, Er_2O_3 and mixtures thereof, wherein RO is selected from the alkaline earth oxide group consisting of BaO, BeO, MgO, SrO, CaO and mixtures thereof, wherein R_2O is selected from the alkali metal oxide group consisting of Li_2O, K_2O, Na_2O, Rb_2O, and mixtures thereof and wherein a solarization inhibiting oxide is present in an amount sufficient to prevent discoloration, and wherein said solarization inhibiting oxide is selected from the group consisting of TiO_2, Sb_2O_3, CeO_2, SiO_2 and mixtures thereof.

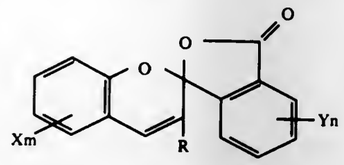
4,075,121

WOOD PRESERVATIVES AND METHOD FOR WOOD PRESERVATION TREATMENT

Kazuhiko Konno; Yoslo Hayasi; Eiji Taniyama, and Tetsuo Sekiya, all of Amimachi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Feb. 27, 1976, Ser. No. 662,084
Claims priority, application Japan, Mar. 3, 1976, 51-25047
Int. Cl.[2] C09K *15/22*
U.S. Cl. 252—407 5 Claims

1. A method for preservation treatment of wood which comprises treating wood or wood inhabited by wood-decaying microorganisms with 2H-benzopyran-2-spiro-3'-phthalide or its derivative of the following formula



wherein each of X and Y is a member selected from the group consisting of halogen atoms, a nitro group, an amino group, alkyl groups, alkenyl groups, alkoxy groups, alkylthio groups and alkyl-substituted amino groups; m and n are an integer of 0 to 4, and when m is an integer of 2 to 4 and n is an integer of 2 to 4, a plurality of members X and Y may be identical or different; R is a member selected from the group consisting of a hydrogen atom, alkyl groups and a phenyl group; and each of X and Y may be positioned at two adjacent carbon atoms on the benzene ring and may form another benzene ring together with these carbon atoms,

in an amount effective for controlling said wood-decaying microorganisms.

4,075,122

CATALYST AND METHOD OF OXYDEHYDROGENATION OF ALKYL AROMATIC COMPOUNDS

G. Edwin Vrieland, Midland, Mich., and Hans R. Friedli, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 474,124, May 28, 1974, Pat. No. 3,917,732. This application Oct. 1, 1975, Ser. No. 618,730
Int. Cl.[2] B01J *27/16*
U.S. Cl. 252—437 2 Claims

1. A catalyst for oxydehydrogenation of alkyl aromatic compounds consisting essentially of a magnesium pyrophosphate in which the ratio of magnesium to nickel is about 6 to about 9.5 atoms of magnesium per atom of nickel which has been calcined at about 550° C.

4,075,123

PROCESS FOR THE PREPARATION OF UNSATURATED ACIDS FROM UNSATURATED ALDEHYDES

James F. White, Akron; Wilfrid G. Shaw, Lyndhurst, and Michael D. Applequist, Mayfield Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Oct. 19, 1976, Ser. No. 733,737
Int. Cl.[2] B01J *27/14*; C07C *51/24*
U.S. Cl. 252—437 17 Claims

1. The catalyst composition described by the formula

$$X_aY_bMo_{12}P_cAs_dO_x$$

wherein

X is a rare earth element or a mixture thereof;

Y is at least one of Ag, Tl, Rh, Pd, Ru, Pt, Cd, Al, Au, Cu, alkaline earth metal, Cl, and NH_4;

wherein

a is 0.001 to 10;

b is 0 to 10;

c is 0.01 to 5;

d is 0.01 to 5;

x is the number of oxygens required to satisfy the valence states of the other elements present.

4,075,124

PROCESS FOR THE PREPARATION OF UNSATURATED ACIDS FROM UNSATURATED ALDEHYDES

James F. White, Akron; Wilfrid G. Shaw, Lyndhurst, and Michael D. Applequist, Mayfield Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Oct. 19, 1976, Ser. No. 733,738
Int. Cl.[2] B01J *27/14*; C07C *51/24*
U.S. Cl. 252—437 14 Claims

1. The catalyst composition described by the formula

$$X_aX_bMo_{12}P_cAs_dO_x$$

wherein

X is at least one element selected from the group consisting of Ag, Rh, Au and Ru;

Y is at least one of Cd, Tl, Pd, Al, Ge, Cu, Pt, Ni, alkaline earth metal, NH_4 and Cl;

and wherein

a is 0.001 to 10;

b is 0 to 10;

c is 0.01 to 5;

d is 0.01 to 5;

x is the number of oxygens required to satisfy the valence states of the other elements present.

4,075,125

CATALYSTS FOR HYDRODEMETALLIZATION OF HYDROCARBONS CONTAINING METALLIC COMPOUNDS AS IMPURITIES

Tatsuo Morimoto, Yokohama; Munekazu Nakamura, Kamakura; Masayoshi Inooka, and Teizaburo Yawata, both of Yokohama, all of Japan, assignors to Chiyoda Chemical Engineering & Construction Co., Ltd., Yokohama, Japan

Filed July 9, 1976, Ser. No. 704,020
Claims priority, application Japan, July 9, 1975, 50-83580; Sept. 25, 1975, 50-114807; Sept. 25, 1975, 50-114808; Sept. 25, 1975, 50-114809
Int. Cl.[2] B01J *29/06, 23/08*
U.S. Cl. 252—455 R 2 Claims

1. A catalyst for hydrodemetallization of hydrocarbons containing metallic compounds as impurities, said catalyst having been prepared by a process wherein red mud is admixed with alumina or/and an alumina-containing substance in a amount of from 1 to 10% by weight based on the weight of the red mud, shaped and calcined at a temperature of 600° C to 1,100° C.

2. A catalyst in accordance with Claim 1 in which an organic binder together with said alumina or/and said alumina-containing substance is admixed with said red mud.

4,075,126

CATALYST FOR ALKYLATING AROMATIC HYDROCARBONS

George E. Stridde, Houston, Tex., assignor to N L Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 671,507, March 29, 1976, Pat. No. 3,992,467, which is a division of Ser. No. 503,985, Sept. 6, 1974, Pat. No. 3,965,043. This application Nov. 5, 1976, Ser. No. 739,331
The portion of the term of this patent subsequent to June 22, 1993, has been disclaimed.
Int. Cl.[2] B01J *29/06, 29/00*
U.S. Cl. 252—455 R 30 Claims

1. A catalyst comprising a synthetic trioctahedral 2:1 layer-lattice smectite-type clay mineral containing a metallic cation having a Pauling electronegativity greater than 1.0 in cation exchange positions on the surface of said mineral, said mineral having the structural formula:

$$[(aM^{+1}+bM^{+2}+cM^{+3})^{VI}(dD^{+3}+eD^{+4}+fD^{+5})^{IV}O_{20}(OH)_{4-y}F_y](x/z)\ R^{z}$$

where

$11 \leqq a+2\,b+3c \leqq 12.3$

$31 \leqq 3d+4e+5f \leqq 32$

$43 \leqq a+2b+3c+3d+4e+5f \leqq 43.67$

$x = 44-(a+2b+3c+3d+4e+5f)$

$0 \leqq y \leqq 4$

$0 \leqq a \leqq 1$

$5 \leqq b \leqq 6$

$0 \leqq c \leqq 0.3$

$0 \leqq d \leqq 1$

$7 \leqq e \leqq 8$

$0 \leqq f \leqq 0.4$

provided that when a=0, then either: (1) $f > 0$; or (2) $c > 0$ and M^{+3} and D^{+3} are not Al^{+3} when M^{+2} is 100 mole percent Mg^{+2}, and where the cations M are in the octahedral layer and have an ionic radius not greater than 0.75 A, the cations D are in the two outer tetrahedral layers and have an ionic radius not greater than 0.64 A, and R is at least one of said metallic cations having a Pauling electronegativity greater than 1.0 of valence z.

6. The catalyst of claim 1 wherein said R is selected from the group consisting of Al^{3+}, Cr^{3+}, Ga^{3+}, In^{3+}, Mn^{2+}, Fe^{3+}, Co^{3+}, Co^{2+}, Ni^{2+}, Cu^{2+}, Ag^{+}, Be^{2+}, Mg^{2+}, La^{3+}, Ce^{3+}, Pd^{2+}, Pt^{2+}, and mixtures thereof.

16. The catalyst of claim 1 wherein M is selected from the group consisting of Li^{+}, Mg^{2+}, Ni^{2+}, Co^{2+}, Zn^{2+}, Cu^{2+}, Mn^{2+}, Al^{3+}, Cr^{+3}, and mixtures thereof, and D is selected

from the group consisting of Al^{3+}, Cr^{3+}, Fe^{3+}, Si^{+4}, Ge^{+4}, P^{+5}, V^{+5}, and mixtures thereof.

4,075,127

CATALYST FOR PRODUCTION OF α,β-UNSATURATED CARBOXYLIC ACIDS

Koju Kadowaki; Kenji Takagi, and Yoshiaki Tanaka, all of Ibaraki, Japan, assignors to Mitsubishi Petrochemical Company Limited, Japan

Filed Aug. 11, 1976, Ser. No. 713,593
Claims priority, application Japan, Aug. 18, 1975, 50-99890
Int. Cl.² B01J *23/84, 23/88*
U.S. Cl. 252—470 **7 Claims**

1. A catalyst for production of an α,β-unsaturated aliphatic carboxylic acid by the vapour phase oxidation of the corresponding α,β-unsaturated aliphatic aldehyde, which consists essentially of an activated catalytic oxide complex of antimony, nickel, molybdenum, vanadium, tungsten, niobium, copper and oxygen and defined by the following formula:

$$Sb_a Ni_b Mo_c V_d W_e Nb_f Cu_g O_h$$

wherein, $a = 100$, $b = 15 - 150$, $c = 10 - 500$, $d = 5 - 150$, $e = 0 - 100$, $f = 0 - 100$, $g = 0 - 50$ wherein g is not 0, when $f = 0$ and $h \leqq 2950$, which is a number determined by the valence requirements of the other elements present respectively, in atomic ratio.

4,075,128

PREPARATION OF METHYL ETHYL KETONE

Thomas Stephen Zak, Springfield, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 26, 1976, Ser. No. 745,504
Int. Cl.² B01J *23/16;* **C07C** *45/00*
U.S. Cl. 252—475 **2 Claims**

1. In the method of preparing methyl ethyl ketone by directing the vapors of secondary butyl alcohol through a catalytic dehydrogenation zone, the improvement which consists essentially of employing in said process a catalyst formed by:

preparing a brass powder having more than 50% of the particles having a particle size less than about 44 microns, less than 1% having a particle size larger than 250 microns, and the balance of the particles having a particle size from about 44 to about 250 microns,

compressing said brass powder into pellets each pellet having a density between about 5 and 6 grams per cubic centimeter,

heat treating a bed of pellets at conditions corresponding to treatment at about 950° F., ±50° F. for about one hour to provide activated pellets having a pore volume within a range from about 0.038 to about 0.046 cc per gram,

employing said activated pellets for said dehydrogenation of secondary butyl alcohol said dihydrogenation being at a pressure of from about 100 to about 150 psig at a temperature of from about 700° F. to about 750° F. at a liquid hourly space rate of about one.

4,075,129

DETERGENT COMPOSITION

Moriyasu Murata, Chiba; Makoto Yamanaka, Koganei, and Takashi Fujino, Yokohama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1976, Ser. No. 663,912
Claims priority, application Japan, Mar. 20, 1975, 50-33646
Int. Cl.² C11D *1/14, 3/08*
U.S. Cl. 252—527 **6 Claims**

1. A detergent composition consisting essentially of from 0.5 to 60 percent by weight of ether sulfate surfactant consisting of

(A) from 30 to 65 percent by weight of unbranched-alkyl ether sulfate having the formula

$$R_1—O—(CH_2CH_2O)_nSO_3M$$

and (B) the balance is branched-alkyl ether sulfate having the formula

$$R_2—\underset{\displaystyle R_3}{\underset{|}{CH}}—CH_2—O—(CH_2CH_2O)_nSO_3M \qquad (II)$$

wherein R_1 is unbranched alkyl having a carbon atom number range of from 6 to 15 and wherein the average number of carbon atoms in R_1 of (A) in the range of from 8 to 13, R_2 is unbranched alkyl having a carbon atom number range of from one to 12, R_3 is unbranched alkyl having a carbon atom number range of from one to 4, with the proviso that

$$R_2—\underset{\displaystyle R_3}{\underset{|}{CH}}—CH_2—$$

has an average numer of carbon atoms in the range of from 8 to 13, n is a number from 0.5 to 1.5 as an average for (A) and (B), and M is a water-solubilizing cation selected from the group consisting of alkali metals, alkaline earth metals and alkanol amines;

and the balance of said detergent composition is water-soluble, anionic surfactant with the proviso that said anionic surfactant is not an ether sulfate, or water-soluble, synthetic, nonionic surfactant, or water-soluble, synthetic, amphoteric surfactant, or water-soluble alkaline or neutral inorganic builder salt, or water-soluble organic heavy metal-sequestering agents, or solubilizing agents, or water, or mixtures thereof.

4,075,130

POLYOXYPROPYLENE POLYAMINE DERIVATIVES AS DEFOAMERS

Carter G. Naylor, and Ernest L. Yeakey, both of Austin, Tex., assignors to Texaco Development Corporation, New York, N.Y.

Filed Aug. 30, 1976, Ser. No. 718,490
Int. Cl.² C11D *1/10, 1/48, 3/30*
U.S. Cl. 252—548 **18 Claims**

1. A composition useful as a defoamer and foam inhibitor consisting essentially of the reaction product obtained by alkoxylating a polyoxypropylene polyamine having a molecular weight of 190–3000 and selected from the group consisting of a polyoxypropylene diamine of the formula:

$$H_2NCH(CH_3)CH_2O[CH(CH_3)CH_2O]_xCH_2CH(CH_3)NH_2$$

wherein x is an integer of from about 1 to 40, and a polyoxypropylene triamine of the formula:

$$CH_3CH_2C[CH_2[OCH_2CH(CH_3)]_xNH_2][CH_2[OCH_2CH(CH_3)]_yNH_2][CH_2[OCH_2CH(CH_3)]_zNH_2]$$

where x, y and z represent integers in the range of about 1 to 15, and the sum of x, y and z is from 3 to about 50, said alkoxylation being carried out with ethylene oxide and a higher alkylene oxide of three carbons or more in a manner such that said defoamer composition has a cloud point of 10°–60° by first alkoxylating said polyoxypropylene polyamine with ethylene oxide or a mixture of ethylene oxide and said higher alkylene oxide wherein said ethylene oxide predominates in said mixture, and effecting a final alkoxylation with said higher alkylene oxide or a mixture of ethylene oxide and said higher alkylene oxide wherein said higher alkylene oxide predominates.

16. A detergent composition comprising an alkaline inorganic detergent and a synthetic organic detergent selected

from the group consisting of an alkyl aryl sulfonate, an alkyl sulfonate, an alkanol amide, an alkyl aryl polyether and mixtures thereof having also incorporated therein in a minor amount the composition of claim 1.

4,075,131

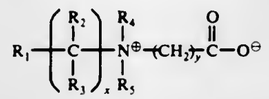
CONDITIONING SHAMPOO

Craig A. Sterling, North St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sept. 17, 1976, Ser. No. 724,111
Int. Cl.² C11D *1/02, 3/26;* **A61K** *7/06*
U.S. Cl. 252—542 **13 Claims**

1. A conditioning shampoo composition which consists essentially of from about 1% to about 60% by weight anionic or amphoteric surfactant and at least about 0.5% by weight zwitterionic polymer, said polymer containing at least 10% on a molar basis of zwitterionic moiety, having a viscosity of about 100 to 100,000 cps, when tested at 24.5 ± 0.25% nonvolatiles in water (with a Brookfield viscometer, using the appropriate spindle and speed) and being selected from a group consisting of

(A) polymers of carboxy betaines having the repeating formula



wherein, R_1 represents a polymerizable unsaturated group, x and y represent integers from 1 to 3 inclusive, R_2 and R_3 represent hydrogen, methyl, ethyl or propyl radicals, R_4 and R_5 represent a hydrogen atom or an alkyl radical with the total carbon atoms in R_4 and R_5 not exceeding six, and

(B) copolymers of monomers (1) and (2), shown below:

(1) substituted acidic vinyl compounds having the general formula $CR_7H{=}CR_8CO_2H$ wherein R_7 represents a hydrogen atom or a carboxylic acid group and R_8 represents a hydrogen atom, a chlorine atom or a methyl group, and

(2) substituted basic vinyl compounds having the general formula $CH_2{=}CR_6COQ$ wherein R_6 represents a hydrogen atom or a methyl group and Q is an organic radical containing a basic nitrogen-containing group, wherein the mole ratio of basic monomer to acidic monomer in said copolymer is from 0.6:1 to 1.5:1, except where R_7 is CO_2H, the mole ratio is 1.2:1 to 3:1.

4,075,132

METHOD OF PREPARING β-DIHYDROTHEBAINE

David Edward Portlock, Woburn, Mass., assignor to Sharp Associates, Cambridge, Mass.

Division of Ser. No. 624,666, Oct. 22, 1975, Pat. No. 4,025,521.
This application Dec. 23, 1976, Ser. No. 757,460
Int. Cl.² C07D *221/28*
U.S. Cl. 260—285 **2 Claims**

1. A method of producing β-dihydrothebaine, which method comprises:

the step of isomerizing dihydrothebaine-ϕ to β-dihydrothebaine with 3–5 equivalents of potassium in liquid ammonia with a ferric-ion catalyst.

4,075,133

ACIDIC COPOLYMERS BASED ON GLYCIDYL ALLYL POLYETHERS ADAPTED FOR ANIONIC ELECTRODEPOSITION

Kazys Sekmakas, Chicago, and Raj Shah, Schaumburg, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Aug. 2, 1976, Ser. No. 710,601
Int. Cl.² C08L *61/10, 61/28*
U.S. Cl. 260—29.3 **15 Claims**

1. An aqueous electrocoating bath comprising water having dispersed therein from 2–20% by weight of resin solids consisting essentially of:

(A) from 60–95%, based on total resin, of a carboxyl-functional copolymer of:

(1) from 5–75% of the copolymer of a polyethylenic polyether containing from about 1.2 to about 2.0 ethylenically unsaturated groups per molecule, said polyethylenic polyether being formed by reacting a polyepoxide which is a polyglycidyl ether of a bisphenol having a 1,2-epoxy equivalency of from 1.2 to about 2.0 with about one mole of a bisphenol per epoxy equivalent in said polyepoxide to consume the epoxy functionality by reaction with the phenolic OH group in said bisphenol and provide an intermediate carrying phenolic OH terminal groups, and then reacting phenolic OH terminal groups in said intermediate with the epoxy group in a molar excess of an ethylenically unsaturated monoepoxide;

(2) the balance of the copolymer consisting essentially of copolymerizable monoethylenically unsaturated monomers including carboxy-functional monomer, said copolymer having an acid number in the range of about 12 to about 100 and being dispersed in said aqueous bath with the aid of a base and water miscible organic solvent; and

(B) from 5–40%, based on total resin, of a heat-hardening formaldehyde condensate selected from the group of aminoplast resins and water dispersible phenolic resins; said bath having a pH in the range of 8–10 and a conductivity of less than 1800.

4,075,134

EMULSION POLYMERIZATION METHOD FOR PREPARING MICROSPHERES HAVING LIQUID CENTER AND SEAMLESS RIGID WALLS

Donald S. Morehouse, Jr., Midland, Mich.; Frank H. Bolton, deceased, late of Midland, Mich., and by Kathryn M. Bolton, administratrix, Grand Rapids, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 44,592, June 8, 1970, which is a continuation-in-part of Ser. No. 805,908, March 10, 1969, abandoned. This application Sept. 27, 1973, Ser. No. 401,474
Int. Cl.² C08L *25/04*
U.S. Cl. 260—29.6 RW **20 Claims**

1. An emulsion polymerization method for preparing microspheres having liquid centers and seamless rigid walls of a normally solid, organic polymer, said method comprising (1) admixing a water-insoluble, non-polymerizable, substantially inert liquid with a total monomer of at least one emulsion polymerizable, ethylenically unsaturated monomer, said liquid being soluble in the monomer and insoluble in said organic polymer and being present in amount sufficient to constitute from about 33 to about 55 volume percent of the total of monomers, non-polymerizable liquid and aqueous medium but less than 50 volume percent of the total of monomer and non-polymerizable liquid, said total monomer being capable of polymerization to form a water-insoluble polymer; (2) dispersing the resulting mixture in an aqueous medium containing from about 0.5 to about 4 weight percent based on total monomer of a stabilizing emulsifier and from about 0.2 to about 2 weight percent based on total monomer of an at least inherently water-dispersible polymer of a sulfohydrocarbyl ester of an α,β-ethylenically unsaturated carboxylic acid, said polymer

containing at least one milliequivalent of sulfo groups per gram of polymer; and (3) subjecting the dispersion to emulsion polymerization conditions whereby the polymer of the sulfohydrocarbyl ester acts as a coalescing aid and the total monomer polymerizes to form microspheres of a water-insoluble polymer encapsulating said non-polymerizable liquid.

4,075,135

METHOD AND RESINOUS VEHICLES FOR ELECTRODEPOSITION

Edward L. Jozwiak, Jr., Gibsonia, and Suryya K. Das, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 28, 1975, Ser. No. 599,746
Int. Cl.[2] C08L *9/10*
U.S. Cl. 260—29.7 DP **7 Claims**

1. A process for preparing a resinous vehicle suitable for electrodeposition which comprises:

A. addition polymerizing a material having $CH_2{=}C<$ moieties, in the presence of an oil-soluble free radical polymerization catalyst and a chain transfer agent, in aqueous medium with

B. an at least 30 percent neutralized reaction product of:

1. an alpha, beta-ethylenically unsaturated dicarboxylic acid or its anhydride containing from 4 to 12 carbon atoms, and

2. polybutadiene which is a liquid at room temperature and which has a molecular weight of 700–5000.

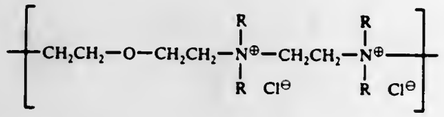
4,075,136

FUNCTIONAL IONENE COMPOSITIONS AND THEIR USE

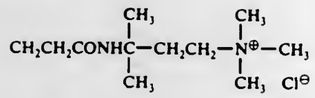
Raymond Joseph Schaper, Pittsburgh, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 436,419, Jan. 25, 1974, abandoned. This application Apr. 14, 1976, Ser. No. 676,777
Int. Cl.[2] C07D *211/00*
U.S. Cl. 260—2 R **3 Claims**

3. A polymer composition having recurring units represented by the formula:



wherein R is



4,075,137

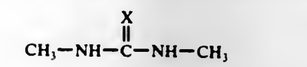
PROCESS FOR PREPARING FLAME RETARDING POLYURETHANE FOAMS

Yasumasa Sawachika, Ashikaga; Hiroshi Kawakami, Tanuma, and Shuzo Minegishi, Tokyo, all of Japan, assignors to Kohkoku Chemical Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 621,673, Oct. 14, 1975, abandoned, which is a continuation of Ser. No. 460,077, April 1, 1974, abandoned. This application Apr. 30, 1976, Ser. No. 682,351
Claims priority, application Japan, Apr. 19, 1973, 48-44468
Int. Cl.[2] C08G *18/14, 18/78*
U.S. Cl. 260—2.5 AT **8 Claims**

1. A process for preparing flexible and flame retarding polyurethane foams, comprising adding

A. a diisocyanate mixture which contains about 10 to 60% by weight of a divalent biuret diisocyanate obtained by reacting one mole of a compound having the formula of



wherein X is oxygen or sulfur with about 3.6 to 25.6 moles of an organic diisocyanate at a temperature below 150° C to

B. a mixture of polyhydroxyl compound having at least two active hydrogen atoms and a molecular weight between about 1000 and 10,000, at least 10% by weight of the total hydroxyl group being primary hydroxyl, a blowing agent, and a catalyst.

4,075,138

POLYMERIZATION PROCESS AND VINYLIDENE CHLORIDE MICROSPHERES PRODUCED THEREBY

Joseph L. Garner, Sanford, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 649,884, Jan. 16, 1976, abandoned, which is a continuation of Ser. No. 270,296, July 10, 1972, abandoned. This application May 3, 1977, Ser. No. 793,332
Int. Cl.[2] C08J *9/16, 9/18*
U.S. Cl. 260—2.5 B **6 Claims**

1. In a method for the preparation of synthetic resinous thermoplastic microspheres employing from 60 to 90 parts by weight of vinylidene chloride and from 40 to 10 parts by weight of acrylonitrile, the steps of the method comprising

preparing an oil phase containing the polymerizable component and a liquid blowing agent which volatilizes at a temperature below the heat softening point of the polymer prepared from the monomer mixture,

dispersing the oil phase in the water phase, the water phase containing a dispersion stabilizer, the oil phase being dispersed as a plurality of droplets having diameters from about 1 to about 50 microns,

initiating polymerization of the monomer in the droplets to form a plurality of hollow polymer particles having symmetrically encapsulated therein a volatile fluid foaming agent, the improvement which comprises

employing from about 3 to 12 parts by weight of a copolymerizable monomer having a propagation constant of from about 2 to about 15,000 liters per mole second and $(r_1/r_2) > 1$ wherein r_1 is the reactivity ratio for the copolymerizable monomer and r_2 is the reactivity ratio for acrylonitrile, with the further limitation that the vinylidene chloride/acrylonitrile/volatile fluid foaming agent and the copolymerizable monomer are mutually soluble at a temperature between about 20° to 90° C and the copolymerizable monomer being selected from the group consisting of methacrylonitrile, methylmethacrylate, styrene, 1,3-butadiene and mixtures thereof.

4,075,139

PROCESS OF MAKING A CURED RESOLE FOAM AND PRODUCT PRODUCED THEREFROM

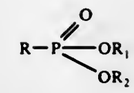
Richard L. Greer, Hermosa Beach, Calif., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 22, 1977, Ser. No. 770,286
Int. Cl.[2] C08J *9/14*
U.S. Cl. 260—2.5 F **11 Claims**

1. In a process for the preparation of a phenolic foam by the reaction of a phenol-aldehyde resole resin, a blowing agent and an acidic catalyst, the improvement which comprises employing a premixed catalyst combination comprising:

(a) an aromatic sulfonic acid; and

(b) a phosphonate compound having the formula



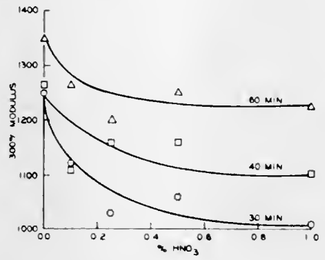
wherein R, R_1 and R_2 are each independently selected from the class consisting of alkyl having from 1 to 8 carbon atoms, inclusive, aryl having from 6 to 12 carbon atoms inclusive, and aralkyl having from 7 to 13 carbon atoms inclusive and wherein the proportion in parts by weight of said phosphonate compound to said aromatic sulfonic acid is from about 5:1 to 1:5, and said premixed catalyst combination is employed in the range of about 3 parts to about 30 parts per 100 parts of said resole resin.

4,075,140

OXIDIZING CARBON BLACK AND USE OF IT IN ELASTOMERS

Harold R. Hunt, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 19, 1976, Ser. No. 678,098
Int. Cl.[2] C08K *3/04*; C09C *1/56*
U.S. Cl. 260—5 **5 Claims**



1. A process to produce oxidized carbon black which comprises contacting said carbon black with an aqueous nitric acid having a concentration of about 0.05 to about 1 weight % with the weight ratio of HNO_3 to carbon black being in the range of about 5×10^{-4} to about 1×10^{-2} and drying the thus treated carbon black at a temperature in the range of about 400° to about 550° F.

3. A process for treating carbon black so as to adjust and control the modulus and/or scorch time of a rubber composition containing said carbon black which comprises

a. compounding a sample of said carbon black and a rubber into a rubber composition,

b. determining the modulus and/or scorch time of said rubber composition,

c. comparing said determined modulus and/or said determined scorch time with a preselected upper limit for the modulus and/or a preselected lower limit for the scorch time,

d. if said determined modulus is above said upper limit for the modulus, and/or if said determined scorch time is below said lower limit for the scorch time oxidizing the carbon black by

aa. contacting said carbon black with an aqueous nitric acid having a concentration of about 0.05 to about 1 weight % at a weight ratio of HNO_3 to carbon black in the range of about 5×10^{-4} to 1×10^{-2}, and

bb. drying the thus treated carbon black at temperatures in the range of about 400° F to about 550° F.

4,075,141

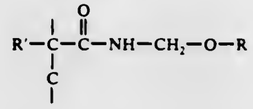
CARBOXYLIC ACID AMIDE INTERPOLYMER-BASED COATING COMPOSITIONS

Samuel Porter, Jr., Tarentum, and Bruce N. McBane, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 9, 1975, Ser. No. 621,109
Int. Cl.[2] C08L *5/00*
U.S. Cl. 260—17.2 **27 Claims**

1. In a coating composition comprising a solution or dispersion of an interpolymer consisting essentially of the interpolymerization product of:

A. from about 2.5 percent to about 50 percent of an unsaturated carboxylic acid amide in units of the structure:



wherein R′ is hydrogen or lower alkyl and R is hydrogen or lower alkyl with at least 50 percent of the groups represented by R being lower alkyl;

B. from about 1 percent to about 25 percent of an alpha, beta-ethylenically unsaturated carboxylic acid; and

C. at least one other copolymerizable ethylenically unsaturated monomer containing a $CH_2{=}C<$ group;

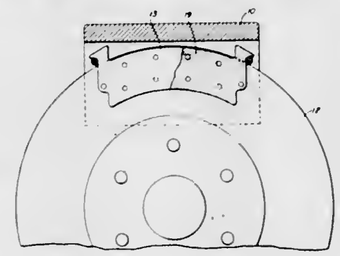
wherein the improvement comprises the addition to said solution or dispersion of from about 2 percent to about 50 percent of by weight crosslinked polymeric microparticles formed by the free radical addition copolymerization of from about 0.5 percent to about 15 percent of an alpha, beta-ethylenically unsaturated monocarboxylic acid, at least one other copolymerizable ethylenically unsaturated monomer, and from about 0.5 percent to about 15 percent of a crosslinking monomer selected from the group consisting of epoxy group-containing compounds, alkylenimines, organoalkoxysilanes and mixtures thereof in the presence of a dispersing liquid which is a solvent for the polymerizable monomers but a non-solvent for the resultant polymer, and a dispersion stabilizer containing at least two segments of which one segment is solvated by said dispersing liquid and a second segment is of different polarity than said first segment and is relatively insoluble in said dispersing liquid.

4,075,142

COMPOSITION FOR NON-SQUEAL DISC BRAKE PADS

Norman Bernard Morse, 56 Pratt Drive, Newton, Mass. 02165, and David Bruce Lester, 22 Gray St., Arlington, Mass. 02174

Division of Ser. No. 644,847, Dec. 29, 1975, Pat. No. 3,998,301. This application Aug. 27, 1976, Ser. No. 718,127
Int. Cl.[2] C08L *1/28*
U.S. Cl. 260—17 R **3 Claims**



1. A composition for automobile disc brake pads comprising:

a major proportion of soft water base polymeric emulsion having a glass transition temperature in the range between about −40° C and about +20° C; an antifreeze comprising

a liquid glycol; and a thickener comprising a hydrofluidic cellulose ether.

4,075,143

RAPID-DRYING PRINTING INK AND A PRINTING PROCESS USING SAME

Ealbertus Willem Schelhaas, Heiloo, Netherlands, and Eduard Johannes Cornelis Marie Blokker, Orry-la-Ville, France, assignors to O & R Inktchemie N.V., Zaandam, Netherlands

Filed Apr. 21, 1976, Ser. No. 678,971

Claims priority, application Netherlands, Apr. 23, 1975, 7504805; Jan. 28, 1976, 7600874

Int. Cl.² C08L *3/06, 3/10, 93/04;* C09D *11/08*

U.S. Cl. 260—17.2 **20 Claims**

1. A printing ink which rapidly dries under the influence of heat, and which is composed of a non-polar solvent, a binder formed from a phenol- or cresol formaldehyde resin modified with colophony or with colophony and a polyhydric alcohol and a crosslinkable unsaturated polyester, a peroxide catalyst for said polyester present in the amount of 1–6 wt.% of said binder, and a pigment, the weight ratio of the solvent, the resin and the polyester is such that the two latter components are present in dissolved state, but the resin is no longer soluble after the polyester has been crosslinked, and as a result has disappeared from the solution.

4,075,144

OIL BASE PAINTS CONTAINING WATER-SOLUBLE POLYMERS

Alvin J. Frisque, Western Springs, and Paul L. DuBrow, Chicago, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 425,483, Dec. 17, 1973, abandoned. This application Feb. 22, 1977, Ser. No. 770,954

Int. Cl.² B63B *1/34;* C08L *91/00*

U.S. Cl. 260—22 R **3 Claims**

1. A more tacky oil base paint which contains uniformly dispersed therethroughout from 2 to 50% by weight of a water-in-oil emulsion, which emulsion contains at least 2% by weight of particles ranging in size from 5 millimicrons to 5 millimeters of a water-soluble vinyl addition polymer, said oil base paint being composed of a binder, an organic solvent and optionally a pigment.

4,075,145

PROCESS FOR PRODUCING WATER SOLUBLE RESINS

Rex Hamilton Russell, 16 Bell Street, Hamilton, New Zealand

Filed May 28, 1976, Ser. No. 690,872

Claims priority, application New Zealand, June 6, 1975, 177731

Int. Cl.² C09D *3/56, 3/66, 5/02*

U.S. Cl. 260—22 M **10 Claims**

1. A process for producing water-soluble resins comprising the steps of:

(1) reacting (a) an unsaturated triglyceride oil or a mixture thereof, or (b) the reaction product of an unsaturated triglyceride oil or a mixture thereof and at least one of styrene, vinyl-toluene and methylmethacrylate, with maleic acid, maleic anhydride or fumaric acid, and

(2) polyesterifying the product of Step (1) with a mixture of at least one dicarboxylic acid or anhydride thereof and one or more polyols in proportions to give an hydroxy number of 70 to 140 at the theoretical end-point of reaction, until the resultant product is clear and has an acid value of 55 to 80.

4,075,146

STABILIZED POLYOLEFIN COMPOSITIONS

Kornel Dezso Kiss, Yonkers, N.Y., assignor to Dart Industries, Inc., Los Angeles, Calif.

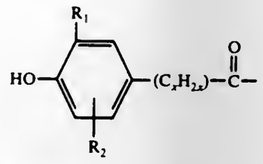
Filed Jan. 2, 1976, Ser. No. 645,982

Int. Cl.² C08K *5/09, 5/10, 5/25*

U.S. Cl. 260—23 H **11 Claims**

1. A polyolefin resin composition in direct contact with copper or copper alloys, which composition is stabilized against oxidative degradation with a stabilizer system consisting essentially of:

(a) a stabilizing amount of at least one phenolic antioxidant selected from mono or polyesters of alkane polyols, at least one of such ester groups comprising the acyl moiety



in which R_1 and R_2 independently are a lower alkyl group containing 1 to 5 carbon atoms and x has a value of from 1 to 6, and

(b) at least 100 ppm of calcium stearate based on the weight of the polyolefin resin.

4,075,147

POLYPROPYLENE/PELARGONATE DIVALENT METAL SALT

Donald F. Thompson, Elburn, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 20, 1976, Ser. No. 734,321

Int. Cl.² C08K *5/56;* C08L *23/12, 23/14*

U.S. Cl. 260—23 H **8 Claims**

1. In the process of producing polypropylene films by extruding a resinous polymer of propylene into an aqueous quench bath the improvement which comprises using a resinous polymer of propylene having at least 75 percent by weight propylene containing a divalent salt of pelargonic acid as a halide scavenger, wherein said divalent metal salt comprises at least one member selected from the group consisting of barium, calcium, strontium, zinc and magnesium.

4,075,148

WATER-BASED COATING COMPOSITIONS

Jean Zatmann, Neuilly, France, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 8, 1975, Ser. No. 594,171

Claims priority, application France, July 12, 1974, 74 24335; Dec. 10, 1974, 74 40526

Int. Cl.² C08L *63/10*

U.S. Cl. 260—23 EP **20 Claims**

1. A process for obtaining coating compositions containing the reaction product of epoxy resins having free oxirane functional groups and of diene polymers modified by carboxylic acids or anhydrides, said compositions being water-soluble after neutralization with a base, which comprises reacting until said free oxirane functional groups have reacted:

(1) at least one epoxy resin containing 1 to 2 free oxirane groups, with

(2) at least one compound obtained by the reaction of a diene polymerizate with an alpha, beta-unsaturated carboxylic or dicarboxylic acid or anhydride, in the presence of a liquid alcohol moderator solvent at a temperature of at least about 130° C., said liquid alcohol moderator solvent remaining in a liquid state at said reaction temperature during reaction of said free oxirane groups.

4,075,149

AQUEOUS UREA-FORMALDEHYDE RESIN COMPOSITIONS HAVING IMPROVED STORAGE LIFE

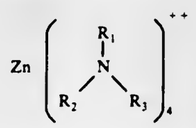
Pallavoor R. Lakshmanan, Houston, Tex., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 589,335, June 23, 1975, abandoned. This application Feb. 24, 1977, Ser. No. 771,608

Int. Cl.² C08L *61/24*

U.S. Cl. 260—29.4 R **5 Claims**

1. A method for preparing an aqueous solution of a urea-formaldehyde resin having a reduced tendency to polymerize at ambient temperature, which consists essentially of heating one mol of urea with 1.5 – 2.0 mols of formaldehyde in an aqueous medium, adjusting the pH of the resulting resin solution to a value greater than 7.0 by adding ammonium hydroxide to the solutions as the sole alkali, concentrating the resin solution by distillation so that it contains at least 50% by weight of resin solids, and incorporating into the resin solution a minor quantity of a salt of a complexed zinc ion sufficient to retard the rate of polymerization of the urea-formaldehyde resin at ambient temperature, said complexed zinc ion having the structure:



where R_1, R_2 and R_3 are independently selected from the group consisting of hydrogen atoms and lower alkyl groups containing up to 5 carbon atoms.

4,075,150

COMPOSITION FOR CURING POLYURETHANES

Guenther Kurt Hoeschele, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 30, 1977, Ser. No. 782,949

Int. Cl.² C08G *18/32;* C09K *3/00;* C08K *5/52, 5/10*

U.S. Cl. 260—30.6 R **14 Claims**

2. A composition, useful for curing a polyurethane prepolymer, which comprises

A. a substantially inert organic liquid in an amount equal to about 20–90% based on the combined weight of components A and B,

B. dispersed in component A, particles of a complex of 3 moles of 4,4'-methylenedianiline and 1 mole of a salt selected from the group: sodium chloride, sodium bromide, sodium iodide, lithium chloride, lithium bromide, and lithium iodide,

said particles being present in an amount equal to about 10–80% based on the combined weight of components A and B,

said particles having an average diameter of less than 60 microns, and

C. the reaction product obtained by adding an aromatic mono-carbodiimide to a mixture of A and B which has a free methylenedianiline content of about 0.1–5% by weight, and allowing said carbodiimide to react with said methylenedianiline, the amount of monocarbodiimide added being at least 0.2 equivalent per equivalent of free methylenedianiline originally present in said mixture.

12. A heat-curable composition, useful for preparing cured polyurethane products, which comprises

I. the composition defined in claim 2 and

II. an isocyanato-terminated prepolymer,

the ratio of components I and II being such that the composition contains about 0.7–1.2 equivalents of amine groups per equivalent of NCO groups.

4,075,151

SOLID, RAPID-SETTING, RIGID POLYURETHANES

Franciszek Olstowski, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 574,210, May 5, 1975, Pat. No. 3,989,663, which is a division of Ser. No. 405,244, Oct. 10, 1973, which is a continuation-in-part of Ser. No. 327,630, Jan. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 221,784, Jan. 28, 1972, abandoned. This application May 27, 1976, Ser. No. 690,460

The portion of the term of this patent subsequent to June 29, 1993, has been disclaimed.

Int. Cl.² C08K *5/06;* C08G *18/50*

U.S. Cl. 260—33.2 R **12 Claims**

1. A rigid, non-cellular, solid composition having a density of at least 1 g/cc, a percent elongation of less than 100 and which is demoldable within about 5 minutes, without the application of an external source of heat, after admixture of the components of a rapid-setting polyurethane-forming composition, free of catalytic quantities of a catalyst for urethane formation, and comprising

A. an amine initiated polyol having an OH equivalent weight of from about 50 to less than about 250;

B. an organic aromatic polyisocyanate;

C. a liquid modifier compound having a boiling point above about 150° C selected from the group consisting of non-ester-containing non-hydroxyl-containing polyoxyalkylene compounds and mixtures thereof; and

wherein components (A) and (B) are present in quantities such that the NCO:OH ratio is from about 0.8:1 to about 1.5:1 and component (C) is employed in quantities of from about 5% to about 60% by weight of the combined weight of components (A), (B) and (C).

4,075,152

PROCESS FOR STABILIZING PIGMENT DISPERSIONS IN URETHANE COATINGS

Robert Arthur Taller, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Apr. 2, 1976, Ser. No. 672,951

Int. Cl.² C08L *75/04*

U.S. Cl. 260—37 N **12 Claims**

1. In the process of producing a pigmented two-package urethane coating, the improvement which comprises:

a. forming a slurry predispersion of the pigment in an amount of an organic polyisocyanate from 0.5 to 50% by weight of the pigment; then

b. dispersing the slurry predispersion in the polyol package.

4,075,153

CORROSION-RESISTANT EPOXY-AMINE CHROMATE-CONTAINING PRIMERS

Angelo Frank Leo, Palatine Township, Cook County, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed Oct. 1, 1976, Ser. No. 728,714

Int. Cl.² C08L *63/02*

U.S. Cl. 260—37 EP **21 Claims**

1. A corrosion-resistant two component epoxy-amine primer system comprising a mixture of two components, said first component comprising a resinous polyepoxide having an average molecular weight in the range of about 350 to 6000 in a liquid vehicle and said second component comprising a solution of an epoxy curing agent carrying a plurality of amino hydrogen atoms, at least one inorganic corrosion-resistant chromate pigment present in at least one of said components, and at least one of said components containing a finely divided siliceous material carrying OH groups prereacted with the alkoxy group of a polyalkoxy silane or siloxane carrying at least one active hydrogen atom on an amine or mercaptan substituent.

4,075,154
ROOM-TEMPERATURE CURING ORGANOPOLYSILOXANE COMPOSITIONS

Kunio Itoh; Toshio Takago, both of Annaka; Tamio Sato, Takasaki, and Hisashi Aoki, Annaka, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 742,832, Nov. 18, 1976, abandoned, which is a continuation of Ser. No. 636,660, Dec. 1, 1975, abandoned. This application May 16, 1977, Ser. No. 796,865

Claims priority, application Japan, Nov. 29, 1974, 49-138056

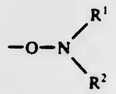
Int. Cl.² C08L 83/04

U.S. Cl. 260—37 SB **15 Claims**

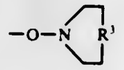
1. A room-temperature curing organopolysiloxane composition comprising

a. 100 parts by weight of a diorganopolysiloxane terminated at both chain ends with hydroxy groups directly bonded to the terminal silicon atoms,

b. from 0.1 to 30 parts by weight of a nitrogen-containing organosilicon compound having substituted aminoxy groups represented by the general formula



where R^1 and R^2 are each the same or different monovalent hydrocarbon groups or by the general formula



where R^3 is a divalent organic group, such aminoxy groups being at least 2.01 per molecule in number on an average,

c. from 0.05 to 10 parts by weight of a salt of a metal selected from the metallic elements belonging to the second, third, fourth and eighth groups in the Periodic Table having at least one inorganic counter anion, and

d. from 1 to 200 parts by weight of an inorganic filler with basicity.

4,075,155
MOLDING COMPOUNDS

Thomas E. Philipps, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 647,487, Jan. 8, 1976, abandoned, which is a continuation-in-part of Ser. No. 524,732, Nov. 18, 1974, abandoned. This application Dec. 17, 1976, Ser. No. 751,569

Int. Cl.² C08K 3/40

U.S. Cl. 260—38 **17 Claims**

1. A new and improved process for producing molding compounds comprising: mixing a liquid aldehyde condensate resole with inorganic fillers containing a divalent base to form a paste with the ratio of the resole to fillers being between 4:1 and 1:5, incorporating inorganic fibers into the paste, and converting the resole into a thickened state around the fillers to produce a mechanically handleable molding compound in which the resin will not separate from the filler.

4,075,156
PRODUCTION OF NON-CARCINOGENIC LARGE PARTICLE CARBON BLACK

Paul H. Johnson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 30, 1976, Ser. No. 681,974

Int. Cl.² C08K 3/04

U.S. Cl. 260—42.47 **7 Claims**

1. A process for the production of a non-carcinogenic large particle carbon black comprising

a. pyrolytically in a carbon black furnace decomposing a hydrocarbon feedstock having a low carbon residue of less than 0.2 weight % such as to form a smoke containing a carbon black having a CTAB surface area of less than about 80 m^2/g,

b. severly aftertreating said smoke by subjecting it to at least one of the steps of late quenching and secondary air injection such as to produce a smoke containing a carbon black having a photelometer of about 100% and a pitting degree defined as the difference between the nitrogen surface area in square meters per gram and the CTAB surface in square meters per gram of 0.2 m^2/g or more,

c. oxidizing said carbon black and pelleting the carbon black with an aqueous pelleting liquid, and

d. drying the wet carbon black pellets at a temperature of about 500° to about 600° F.

5. A non-carcinogenic carbon black obtained by pyrolytically in a carbon black furnace decomposing a hydrocarbon feedstock having a carbon residue of less than 0.2 weight percent such as to form a smoke containing a carbon black, severely aftertreating said smoke by subjecting it to at least one of the steps of late quenching and secondary air injection, oxidizing said carbon black and pelleting the carbon black and an aqueous pelleting liquid and drying the wet carbon black pellets at a temperature of about 500° to about 600° F., said carbon black being characterized by having

a CTAB surface area of less than 80 square meters per gram,

a pitting degree of 0.2 square meters per gram or more,

said pitting degree being defined as the difference between the nitrogen surface area in square meters per gram and the CTAB surface area in square meters per gram,

a photelometer of 100%

and a content of benzene extractables of less than 0.05 weight percent.

4,075,157
PRODUCTION OF NON-CARCINOGENIC CARBON BLACK

Paul H. Johnson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 30, 1976, Ser. No. 681,975

Int. Cl.² C08K 3/04

U.S. Cl. 260—42.47 **7 Claims**

1. A process for the production of a non-carcinogenic normal curing carbon black which comprises

a. pyrolytically in a carbon black furnace decomposing a hydrocarbon feedstock having a low carbon residue of less than about 0.2 weight % such as to form smoke containing carbon black,

b. severely aftertreating said smoke by subjecting it to at least one of the steps of late quenching and secondary air injection to produce a smoke containing a carbon black of about 100% photelometer and a pitting value of about 15 m^2/g or more, in the case of a small particle carbon black having a CTAB surface of 120 $m^{2/g.}$ of 7 m^2/g or more for the carbon black having a CTAB surface area of 80 m^2/g or more, and of 0.2 m^2/g or more in the case of a large particle carbon black having a CTAB surface of 30 m^2/g, said pitting value defined as the difference between the nitrogen surface area and the CTAB surface area, both in square meters per gram,

c. separating said carbon black from said carbon black-containing smoke,

d. oxidizing said carbon black and pelleting the carbon black with an aqueous pelleting agent,

e. drying the wet carbon black pellets at a temperature of about 500° to 600° F,

f. heat treating the dried carbon black pellets at a temperature in the range of about 1000° to 1400° F and thereafter recovering the dried carbon black pellets as the product of the process.

5. A non-carcinogenic normal curing carbon black obtained by pyrolytically in a carbon black furnace decomposing a hydrocarbon feedstock having a carbon residue of less than about 0.2 weight per cent such as to form a smoke containing carbon black, severely aftertreating said smoke by subjecting it to at least one of the steps of late quenching and secondary air injection, separating said carbon black from said carbon black containing smoke, oxidizing said carbon black and pelleting said carbon black with an aqueous pelleting agent, drying the wet carbon black pellets at a temperature of about 500° to 600° F., heating the dried carbon black pellets at a temperature in the range of about 1000° to 1400° F., the thus obtained carbon black being further characterized by having

a photelometer of 100 percent

a pitting degree of about 15 m^2/g or more in the case of a small particle carbon black having a CTAB surface of 120 m^2/g, a pitting degree of 7 m^2/g or more for a carbon black having a CTAB surface area of 80 m^2/g and a pitting degree of 0.2 m^2/g or more in the case of a large particle carbon black having a CTAB surface area of 30 m^2/g, the minimum pitting degree of a carbon black having other CTAB surface areas being obtained by interpolation, said pitting value being defined as the difference between the nitrogen surface area and the CTAB surface area, both in square meters per gram,

and a content of benzene extractables of less than 0.05 weight percent.

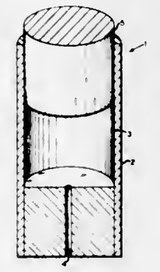
4,075,158
FLEXIBLE PRODUCT MADE FROM A POLY(PHENYLENE SULFIDE) BLEND AND METHOD OF MAKING SAME

Harold D. Coale, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 15, 1975, Ser. No. 640,986

Int. Cl.² C08K 7/14; C08L 27/12

U.S. Cl. 260—42.17 **6 Claims**



1. An extruded product comprising:

(a) an integral mass comprised of a mixture of poly(phenylene sulfide) in an amount of at least approximately 30 percent by weight of the total mixture weight and filler which includes at least polytetrafluoroethylene in an amount of at least approximately 20 percent by weight of the total mixture weight, said mixture having a stiffness of less than about 10,000 psi as measured by ASTM D747-70.

4,075,159
RUBBER COMPOSITIONS WITH BENZOIC ACID COMPOUNDS

Tsuneo Koyama; Yuichi Sugiyama; Teruhide Furuhama; Yoshio Tajima, all of Hiratsuka; Hiroshi Kakiuchi, Yokohama; Kazuhiro Yamada, Ihehara, and Masaaki Obara, Hiratsuka, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 588,047, June 18, 1975, abandoned. This application Sept. 14, 1976, Ser. No. 723,200

Claims priority, application Japan, June 21, 1974, 49-70258

Int. Cl.² C08F 8/28, 8/34; C08C 19/20

U.S. Cl. 260—42.47 **6 Claims**

1. A vulcanizable rubber composition that is fumeless during mixing together of the composition comprising a rubber selected from the group consisting of natural rubber, polyisoprene rubber, polybutadiene rubber, styrene-butadiene copolymer rubber, acrylonitrile-butadiene copolymer rubber, chloroprene rubber or mixtures thereof, a formalin generating compound selected from the group consisting of hexamethylenetetramine or hexamethylolmelamine; hydrous silicic acid; and benzoic acid or monohydroxy benzoic acid in the range of from 1 to 20 parts by weight per 100 parts of the rubber.

4,075,160
NON-CARCINOGENIC CARBON BLACK

King L. Mills, and Paul H. Johnson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 30, 1976, Ser. No. 681,976

Int. Cl.² C08K 3/04

U.S. Cl. 260—42.47 **8 Claims**

1. A process for the production of a non-carcinogenic carbon black comprising

a. pyrolytically in a carbon black furnace decomposing a hydrocarbon feedstock having a low carbon residue of less than about 0.2 weight % such as to form a smoke containing a carbon black having a CTAB surface area of about 80 m^2/g or more,

b. aftertreating said smoke by subjecting it to at least one of the steps of late quenching and secondary air injecting such as to produce a smoke containing a carbon black having a photelometer of about 100% and a pitting degree defined as the difference between the nitrogen surface area and the CTAB surface area of 7 m^2/g or more,

c. oxidizing the carbon black and pelleting the carbon black with an aqueous pelleting agent, and

d. drying the wet carbon black pellets at a temperature of about 500° to 600° F.

5. A non-carcinogenic carbon black obtained by a pyrolytic decomposition in a carbon black furnace of a hydrocarbon feedstock having a carbon residue of less than about 0.2 weight percent into a carbon black containing smoke, aftertreating said carbon black containing smoke by subjecting it to at least one of the steps of late quenching and secondary air injecting, oxidizing the so-produced carbon black and pelleting the carbon black with an aqueous pelleting agent and drying the wet carbon black pellets at a temperature of about 500° to 600° F., said carbon black being further characterized by having

a CTAB surface area of 80 m^2/g or more

a pitting degree of 7 m^2/g or more, said pitting degree being defined as the difference between the nitrogen surface area in the CTAB surface area,

a photelometer of 100 percent, and

a content of benzene extractables of less than 0.05 weight percent.

4,075,161

ESTERS AND AMIDES OF 2,4,6-TRIALKYL-3-HYDROXY-PHENYLALKANOIC ACIDS

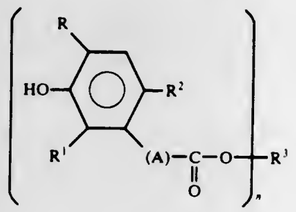
John D. Spivack, Spring Valley, and Martin Dexter, Briarcliff Manor, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 494,156, Aug. 2, 1974, Pat. No. 3,988,363, which is a continuation-in-part of Ser. No. 400,603, Sept. 25, 1973, abandoned. This application June 7, 1976, Ser. No. 693,390

Int. Cl.² C08K *5/20, 5/34, 5/12*

U.S. Cl. 260—45.8 A **29 Claims**

1. A composition of matter comprising an organic material subject to deterioration and from 0.01 to 5% by weight of a stabilizing compound of the formula



wherein

R is a branched alkyl of 3 to 8 carbon atoms,

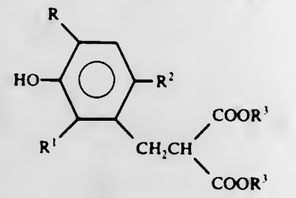
R^1 and R^2 are alkyl of 1 to 3 carbon atoms,

R^3 is alkyl of 1 to 18 carbon atoms; 2-(alkylthio)-ethyl of 5 to 21 atoms in the chain, alkylene of 2 to 6 carbon atoms; 3,6-dioxa-1,8-octamethylene; or a polyvalent saturated aliphatic hydrocarbon radical of 3 to 7 carbon atoms where *n* is 3 or 4,

A is a straight chain alkylene of 1 to 3 carbon atoms, and

n is an integer of 1 to 4.

13. A composition of matter comprising an organic material subject to deterioration and from 0.01 to 5% by weight of a stabilizing compound of the formula



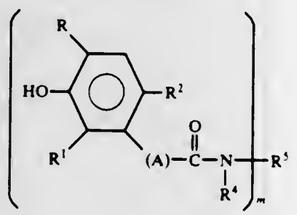
wherein

R is a branched alkyl of 3 to 8 carbon atoms,

R^1 and R^2 are alkyl of 1 to 3 carbon atoms, and

R^3 is alkyl of 1 to 18 carbon atoms.

20. A composition of matter comprising an organic material subject to deterioration and from 0.01 to 5% by weight of stabilizing compound of the formula



wherein

R is a branched alkyl of 3 to 8 carbon atoms,

R^1 and R^2 are alkyl of 1 to 3 carbon atoms,

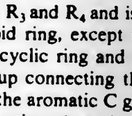
R^4 is hydrogen, lower alkyl of 1 to 4 carbon atoms or cyclohexyl,

R^5 is alkyl of 1 to 18 carbon atoms; alkylene of 2 to 12 carbon atoms or oxydiethylene, or

R^4 and R^5 together form a piperazinyl ring incorporating both nitrogen atoms when *m* is 2,

A is straight chain alkylene of 1 to 3 carbon atoms, and *m* is an integer of 1 to 2.

22. A composition according to claim 20 containing additionally from 0 to 2% by weight of a thio co-stabilizer having the formula



wherein R is alkyl of 6 to 24 carbon atoms and *n* is 1 to 6.

26. A composition according to claim 22 wherein the stabilizing compound is N-methyl-N-n-octadecyl-(4-tert-butyl-2,6-dimethyl-3-hydroxyphenyl)acetamide.

4,075,162

BICHROMOPHORIC BENZOXAZOLE-STYRENE ULTRAVIOLET STABILIZERS AND THEIR USE IN ORGANIC COMPOSITIONS

Gether Irick, Jr.; Charles A. Kelly, both of Kingsport, and James C. Martin, Johnson City, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 16, 1976, Ser. No. 715,012

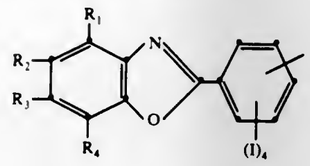
Int. Cl.² C08K *5/35*

U.S. Cl. 260—45.8 NZ **62 Claims**

1. An organic composition susceptible to ultraviolet light degradation stabilized against such degradation with a stabilizing amount of at least one bichromophoric compound having the formula:

A—B—C

wherein A is a group having the structure

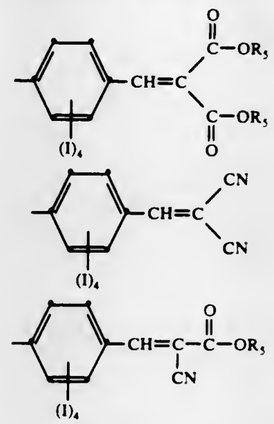


wherein

R_1, R_2, R_3 and R_4 are hydrogen, chloro, bromo, lower alkyl, substituted lower alkyl, cyclohexyl, substituted cycloalkyl, phenyl, substituted aryl, lower alkylaryl, aryl-substituted-aryl, alkoxy, substituted amino, cyano, carboalkoxy, acetamido and the substituents R_1 and R_2, R_2 and R_3, and R_3 and R_4, combined with the carbon atoms to which they are attached, are joined alkylene groups completing a carbocyclic ring, which ring can also be substituted with one or more of the substituents listed above for R_1, R_2, R_3 and R_4;

I is the same as R_1, R_2, R_3 and R_4 and is present on all positions of the benzenoid ring, except the carbon atom attached to the heterocyclic ring and the carbon atom attached to the B group connecting the heterocyclic aromatic A group with the aromatic C group, wherein B is a linking group connecting A and C and is oxy, carbonyloxy, oxycarbonylalkyleneoxy, oxyalkyleneoxycarbonyloxy, oxyalkylenecarbonyloxy, oxycarbonyloxy, alkyleneoxy, alkyleneoxyalkyleneoxy, oxyalkylenearylenealkyleneoxy, thio, thioalkyleneoxy, sulfinyldioxy, oxy(alkoxy)phosphinooxy, carbonylamino, N-alkylcarbonylamino, N-arylcarbonylamino, aminocarbonylalkyleneoxy, N-alkylaminocarbonylalkyleneoxy, N-arylaminocarbonylalkyleneoxy, aminocarbonylamino, N-alkylaminocarbonylamino, N-alkylamino, N-arylamino, N-alkylaminoalkyleneoxy, N-arylaminoalkyleneoxy, oxyalkyleneoxy, oxyaryleneoxy; and

wherein C is a group having the formula



where I is the same substituent as listed above and is present in all positions of the benzenoid rings except the carbon atom attached to the B group connecting the A and C moieties, and said I substituents can all be one of the substituents listed above or different listed substituents and R_5 is an alkyl group containing 1 to 20 carbon atoms or a hydroxyalkyl group or an alkoxyalkyl group.

4,075,163

BENZENE PHOSPHONOUS ACID COMPOUNDS, THEIR PRODUCTION AND USE AS STABILIZERS FOR ORGANIC MATERIALS

Kurt Hofer, Muenchenstein, and Guenther Tscheulin, Frick, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

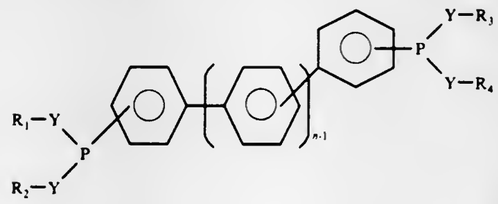
Division of Ser. No. 463,867, April 25, 1974, Pat. No. 3,962,175, which is a division of Ser. No. 191,079, Oct. 20, 1971, Pat. No. 3,825,629. This application Mar. 19, 1976, Ser. No. 668,598

Claims priority, application Switzerland, Oct. 22, 1970, 15605/70; June 30, 1971, 9597/71

Int. Cl.² C08K *5/50, 5/53*

U.S. Cl. 260—45.7 P **13 Claims**

1. A composition stabilized against the effect of light, oxygen and/or heat which comprises an organic polymeric material which is sensitive to said effect and an effective amount of a stabilizing agent of the formula



wherein each of

R_1, R_2, R_3 and R_4, independently, is a hydrocarbon radical of up to 16 carbon atoms, selected from the group consisting of alkyl which is unsubstituted or substituted by methoxy, phenoxy, cresoxy or chloro, cycloalkyl, aryl which is unsubstituted or substituted by methoxy or chloro, alkyl-aryl and benzyl which is unsubstituted or substituted by chloro,

Y is oxygen or sulphur

n is 1 or 2 and

the polyphenylene moiety is unsubstituted or substituted by alkyl, cycloalkyl, chlorine, bromine or alkoxy.

4,075,164

FLAME RETARDANT POLYCARBONATE COMPOSITION

Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 429,120, Dec. 28, 1973, Pat. No. 3,940,366. This application Dec. 22, 1975, Ser. No. 642,993

The portion of the term of this patent subsequent to Feb. 24, 1993, has been disclaimed.

Int. Cl.² C08K *5/42*

U.S. Cl. 260—45.7 S **11 Claims**

1. A flame retardant aromatic carbonate polymer composition comprising in admixture an aromatic carbonate polymer and a minor amount of a mixture of a metal salt of a monomeric substituted aromatic sulfonic acid and a polymeric substituted aromatic sulfonic acid or a polymeric substituted aromatic sulfonic acid, and wherein said metal salts thereof are selected from the group consisting of the alkali metal salts and the alkaline earth metal salts, and mixtures thereof, and said substituent on the metal salts of the substituted aromatic sulfonic acid is selected from the group consisting of an electron withdrawing radical and mixtures thereof.

4,075,165

STABILIZATION OF POLYMERS BY PENTA- OR HEXA-SUBSTITUTED 4-PIPERIDINOL DERIVATIVES

Nobuo Soma; Tomoyuki Kurumada, both of Tokyo, Japan; Heimo Brunetti, Reinach, and Jean Rody, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

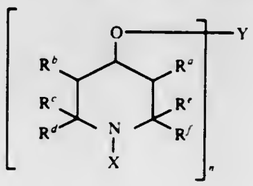
Filed May 19, 1976, Ser. No. 687,793

Claims priority, application Japan, May 28, 1975, 50-63850

Int. Cl.² C07D *211/6;* C08K *5/34*

U.S. Cl. 260—45.8 N **11 Claims**

1. A polymer composition stabilized against photo- and thermal-deterioration wherein there is incorporated, in an amount sufficient to prevent said deterioration, a stabilizer comprising a 4-piperidinol derivative having the formula (I):



(I)

wherein:

R^a and R^b are the same or different and each represents a hydrogen atom, a lower alkyl group, an alkenyl group, an alkynyl group or an aralkyl group, provided that R^a and R^b do not simultaneously represent hydrogen atoms;

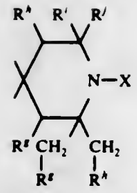
R^c and R^d are the same or different and each represents a lower alkyl group;

R^e represents an alkyl group;

R^f represents an alkyl group, a phenyl group, an aralkyl group or a 5- or 6-membered aromatic heterocyclic group containing an oxygen, sulphur or nitrogen atom;

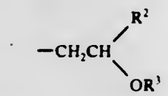
or

R^e and R^f, together with the carbon atom to which they are attached, represent a cycloalkyl group or a group of the formula:



(wherein R^g and R^h are the same or different and each represents a hydrogen atom or a lower alkyl group, provided that R^h does not represent a hydrogen atom when R^g represents a lower alkyl group; R^i and R^j are the same or different and each represents a lower alkyl group; and X is as hereafter defined):

X represents a hydrogen atom, an oxyl radical, an alkyl group, an alkenyl group, an alkoxyalkyl group, an aralkyl group, which is unsubstituted or which has one or more substituents in its aryl moiety, a 2,3-epoxypropyl group, a group of formula $—CH_2COOR^1$ (wherein R^1 represents an alkyl group, an alkenyl group, a phenyl group, an aralkyl group or a cyclohexyl group), a group of formula:



(wherein R^2 represents a hydrogen atom, a methyl group or a phenyl group and R^3 represents a hydrogen atom or an acyl group), an aliphatic acyl group or a group of formula —$COOR^4$ (wherein R^4 represents an alkyl group, a benzyl group or a phenyl group);

Y represents an organic or inorganic group or atom having a valency of from 1 to 4 and having essentially no adverse effect on the polymer stabilization activity; and n is an integer of from 1 to 4 inclusive.

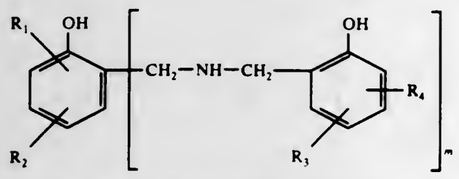
4,075,166

METHOD OF STABILIZATION OF RUBBERS AND VULCANIZATES

Vladimir Vasilievich Moiseev, Leninsky prospekt, 63, kv. 12; Vladimir Vasilievich Kosovtsev, Leninsky prospekt, 13, kv. 13; Galina Prokofievna Kolesnikova, ulitsa Karla Marxa, 92, kv. 23; Viktor Alexandrovich Zimnukhov, ploschad Lenina, 15, kv. 44; Lidia Alexeevna Miroshnikova, ulitsa Revoljutsii 1905 goda, 7, kv. 69, all of Voronezh; Esfir Abramovna Kimel, Tretya Vladimirskaya, 6, kv. 2, Moscow; Edit Konstantinovna Chefranova, Oktyabrsky prospekt, 120, kv. 95, Ljubertsy Moskovskoi oblasti; Valentina Ivanovna Guseva, Proletarskayprospekt, 16/37, kv. 53, Moscow, and Ljudmila Vladimirovna Masagutova, Naberezhnaya Tarasa Shevchenko, 1/2, kv. 7, Moscow, all of U.S.S.R.

Filed Oct. 10, 1975, Ser. No. 621,624
Int. Cl.[2] C08K *5/18*
U.S. Cl. 260—45.95 H 17 Claims

1. A method of stabilization of synthetic polydiene and copolymeric diene rubbers and their vulcanizates which comprises incorporation of phenolamine resins as antioxidants into said rubbers, a solution or latex thereof, said phenolamine resins having the formula



wherein R_1, R_2, R_3 and R_4 are each alkyl of from 1 to 12 carbon atoms, alkenynyl, aralkyl, hydroxy aralkyl, halogen, or carboxy and m is 2–20, obtained by condensation of hexamethylene tetramine with alkyl-, alkenynyl-, dialkyl-, aralkyl- or halo-substituted phenols, with dihydroxydiphenyl alkanes, hydroxybenzoic acids or mixtures of said resins with antioxidants selected from the series of secondary amines, diamines, 2,6-dialkyl derivatives of phenol, and phosphorus- and sulphur- containing compounds.

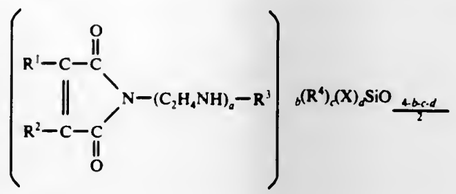
4,075,167

MALEIMIDO GROUP-CONTAINING ORGANOSILICON COMPOUNDS

Minoru Takamizawa; Yasushi Yamamoto; Yoshio Inoue, all of Annaka; Atsumi Noshiro, Chiba, and Hitoshi Fujii, Tokyo, all of Japan, assignors to Dai Nippon Printing Co., Ltd. and Shin-Etsu Chemical Co., Ltd., both of Tokyo, Japan

Filed Dec. 24, 1975, Ser. No. 644,319
Claims priority, application Japan, Dec. 28, 1974, 50-3997
Int. Cl.[2] C08G *77/04*
U.S. Cl. 260—46.5 E 10 Claims

1. An organosilicon compound represented by the formula



wherein

R^1 is a monovalent aromatic group selected from the group consisting of phenyl, naphthyl and substituted phenyl,

R^2 is hydrogen, chlorine, cyano or methyl,

R^3 is phenylene or lower alkylene,

R^4 is a monovalent hydrocarbon group selected from the group consisting of methyl, ethyl, propyl phenyl, benzyl, phenylethyl, tolyl, ethylphenyl, vinyl, allyl and cyclohexyl,

X is selected from the group consisting of hydroxy, halogen, alkoxy, acyloxy and aminoxy

a is zero or 1,

b is a positive number not exceeding 1, and

c and d each are zero or positive numbers not exceeding 3 with the proviso that $b+c+d$ is a positive number not exceeding 4.

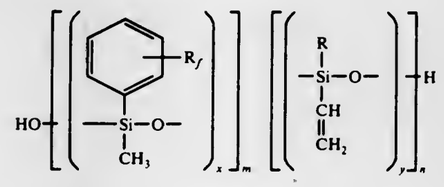
4,075,168

FLUOROSILOXANE DIOLS AND METHOD OF PRODUCING SAME

Alexei Ivanovich Ponomarev, prospekt Stachek, 59, korpus 2, kv. 47; Sergei Vasilievich Sokolov, ulitsa III Internatsionala, 67, kv. 222; Julia Alexeevna Larionova, prospekt Elizarova, 12, kv. 15; Tatyana Ivanovna Rymareva, bulvar Novatorov, 14, kv. 16; Alexandr Leibovich Klebansky, ulitsa Zhelyabova, 10, kv. 107, all of Leningrad; Vsevolod Volfovich Berenblit, ulitsa Nagornaya, 23, kv.10, Leningradskaya oblast, Vsevolozhsky raion, poselok Kuzmolovsky; Jury Pavlovich Dolnakov, ulitsa Narvskaya, 4, kv. 122, Leningradskaya oblast, Krasnoe selo; Lev Moiseevich Yagupolsky, ulitsa Ivana Kudri, 41, kv. 48, Kiev; Vladlen Vasilievich Malovik, ulitsa Osipovskogo, 4/5, kv. 6, Kiev; Miron Onufrievich Lozinsky, ulitsa Voroshilova, 18, kv. 13, Kiev; Viktor Mikhailovich Belous, ulitsa Ujutnaya, 5a, kv. 3, Odessa; Boris Efimovich Gruz, ulitsa Kurskaya, 10a, kv. 18, Kiev, and Ljubov Antonovna Alexeeva, Proletarsky bulvar, 41, kv. 28, Odessa, all of U.S.S.R.

Filed July 13, 1976, Ser. No. 704,924
Int. Cl.[2] C08G *77/04*
U.S. Cl. 260—46.5 R 1 Claim

1. Fluorosiloxane diols of the formula



where:

$R_F = OCF_3$, OC_2F_5, $OC_2F_4OCF_3$, $C_2F_4OCF_3$, C_3F_7,

$R = CH_3$, C_6H_5,

$x = 1.0 - 0.97$,

$y = 0 - 0.03$,

$m = 2.3 - 187.2$

$n = 0 - 3.8$

with an average molecular weight of 620 - 51,200.

4,075,169

FLUOROSILOXYDIPHENYLSILOXY BLOCK COPOLYMERS

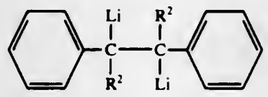
John S. Razzano, Watervliet, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 621,032, Oct. 9, 1975, Pat. No. 4,028,338. This application Dec. 15, 1976, Ser. No. 750,994
Int. Cl.[2] C08G *77/04*
U.S. Cl. 260—46.5 R 8 Claims

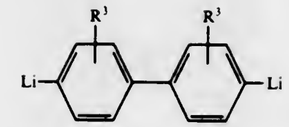
1. A process for producing a solvent resistant block copolymer comprising (a) reacting in an anhydrous system a trimer of the formula,

$$[(R)\,(R'\,CH_2CH_2)\,SiO]_3$$

in the presence of a solvent promoter selected from the class consisting of tetrahydrofuran, dioxane, dimethylformamide, dimethylsulfoxide, tetramethyl urea, and a catalyst which is a dilithium compound selected from the class of compounds of the formula,



and compounds of the formula,



where R^2 and R^3 are selected from the class consisting of hydrogen and lower alkyl radicals of 1 to 8 carbon atoms, and then adding a trimer of the formula,

$$[(C_6H_5)_2\,SiO]_3$$

and completing the reaction.

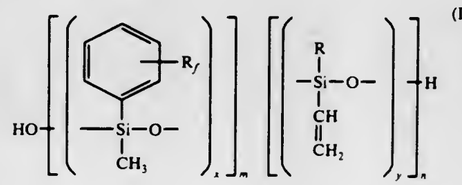
4,075,170

FLUOROSILOXANE RUBBERS AND PROCESS FOR PRODUCING SAME

Alexei Ivanovich Ponomarev, prospekt Stachek, 59, korpus 2, kv. 47; Julia Alexeevna Larionova, prospekt Elizarova, 12, kv. 15; Anatoly Kirillovich Ankudinov, ulitsa Lensoveta, 10, kv. 203; Rufina Mikhailovna Ryazanova, Vitebsky prospekt, 81, korpus 1, kv. 6; Alexandr Leibovich Klebansky, ulitsa Zhelyabova, 10, kv. 107; Sergei Vasilievich Sokolov, ulitsa III Internatsionala, 67, kv. 222, all of Leningrad; Vsevolod Volfovich Berenblit, Vsevolozhsky raion, poselok Kuzmolovsky, ulitsa Nagornaya, 23, kv. 10; Jury Pavlovich Dolnakov, Krasnoe selo, ulitsa Narvskaya, 4, kv. 122, both of Leningradskaya oblast; Tatyana Ivanovna Rymareva, Bulvar Novatorov, 14, kv. 16, Leningrad; Lev Moiseevich Yagupolsky, ulitsa Ivana Kudri, 41, kv. 48, Kiev; Vladlen Vasilievich Malovik, ulitsa Osipovskogo, 4/5, kv. 6, Kiev; Miron Onufrievich Lozinsky, ulitsa Voroshilova, 18, kv. 13, Kiev; Viktor Mikhailovich Belous, ulitsa Ujutnaya, 5-a, kv. 3, Odessa; Boris Efimovich Gruz, ulitsa Kurskaya, 10-a, kv. 18, Kiev; Ljubov Antonovna Alexeeva, Proletarsky bulvar, 41, kv. 28, Odessa; Alexandr Vasilievich Karlin, ulitsa Oboronnaya, 14, kv. 31, and Vasily Danilovich Lobkov, Krasnoputilovskaya ulitsa, 109, kv. 23, both of Leningrad, all of U.S.S.R.

Filed Aug. 12, 1976, Ser. No. 713,969
Int. Cl.[2] C08G *77/04*
U.S. Cl. 260—46.5 G 3 Claims

1. Fluorosiloxane rubber of the formula:



(I)

wherein:

$R_F = OCF_3$, OC_2F_5, $OC_2F_4OCF_3$, $C_2F_4OCF_3$, C_3F_7,

$R = CH_3$, C_6H_5,

$x = 1.0 - 0.97$,

$y = 0 - 0.03$,

$m = 370.9 - 1{,}863.4$,

$n = 0 - 44.5$

and having an average molecular weight ranging from 98,000 to 410,520.

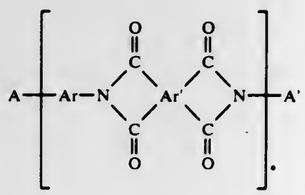
4,075,171

PROCESS FOR PREPARING AROMATIC POLYIMIDES AND SOME POLYIMIDES PREPARED THEREBY

Gaetano F. D'Alelio, South Bend, Ind., assignor to University of Notre Dame du Lac, Notre Dame, Ind.

Continuation-in-part of Ser. No. 363,800, May 25, 1973, Pat. No. 3,998,768. This application Dec. 16, 1974, Ser. No. 533,468
Int. Cl.² C08G *73/10, 73/12*
U.S. Cl. 260—47 CP **17 Claims**

1. A process for the preparation of a substantially cyclized polyimide of the formula:



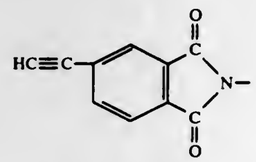
(A)

wherein

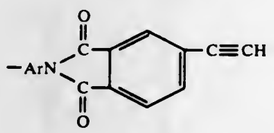
Ar is a divalent aromatic organic radical,

Ar' is a tetravalent aromatic organic radical, the four carbonyl groups being attached directly to separate carbon atoms and each pair of carbonyl groups being attached to adjacent carbon atoms in the Ar' radical,

A is



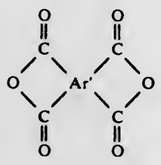
A' is



and

n is 0 or a positive integer of at least one, soluble in a phenol which comprises:

1. reacting a reaction mixture of at least one tetracarboxylic acid dianhydride of the formula:

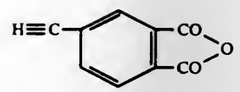


(B)

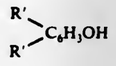
wherein Ar' is as defined above, and at least one aromatic diamine of the formula:

C. $H_2N—AR—NH_2$

wherein Ar is as defined above, at a molar ratio of dianhydride to diamine of *m* to *m* + 1 where *m* is zero or a positive integer of at least one and as high as *n* in formula (A), with the proviso that the reaction mixture contains 2 moles of an α,β-carboxylic acid monoanhydride of the formula



in a phenol of the formula



where each R' is hydrogen or $—CH_3$ in the presence of at least one organic azeotroping agent which:

a. gives a water azeotrope having a boiling point less than 95° C at atmospheric pressure,

b. is non-reactive with the dianhydride and the diamine, and

c. separates from water as a distinct phase,

said reaction conducted at a temperature less than 140° C and below the boiling point of said phenol and higher than the boiling point of said azeotroping agent with the vapor phase temperature being between that of the water azeotrope and no higher than 95° C.

2. removing water of reaction and the azeotroping agent from the reaction mixture as a water azeotrope and

3. returning quantities of azeotroping agent to the reaction mixture to maintain the temperature and reaction mixture volume substantially constant.

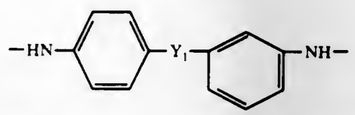
4,075,172

NOVEL AROMATIC COPOLYAMIDES PREPARED FROM 3,4' DIPHENYLENE TYPE DIAMINES, AND SHAPED ARTICLES THEREFROM

Shuji Ozawa, Hachioji; Yasuo Nakagawa, Hino; Kichiro Matsuda, Hino; Toshio Nishihara, Hino, and Hideki Yunoki, Hino, all of Japan, assignors to Teijin Limited, Osaka, Japan

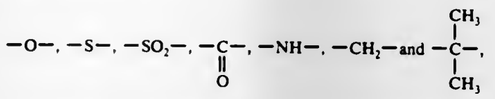
Filed Dec. 18, 1975, Ser. No. 641,898
Claims priority, application Japan, Dec. 27, 1974, 49-149027; May 20, 1975, 50-59200; May 20, 1975, 50-59201
Int. Cl.² C08G *69/32, 69/40, 69/42*
U.S. Cl. 260—47 CZ **15 Claims**

1. A fiber- or film-forming high-molecular weight aromatic copolyamide consisting essentially of (1-A) a diamine recurring unit of the following formula



(1-A)

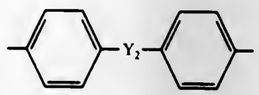
wherein Y_1 is at least one divalent-moiety selected from the group consisting of —O—, —S—, $—SO_2—$,



(1-B) a diamine recurring unit of the following formula

$—HN—AR_1—NH—$ (1-B)

wherein Ar_1 represents a phenylene group, a naphthylene group, a biphenylene group or a group of the formula



wherein Y_2 has the same definition as Y_1 and is identical to, or different from, Y_1, all of which groups have their bond chains extending in a coaxial or parallel direction, and (2) a dicarboxylic acid-type recurring unit of the following formula

$—OC—Ar_2—CO—$ (2)

wherein Ar_2 has the same definition as Ar_1, and is identical to, or different from, Ar_1, the total mole number of the diamine recurring units of formulae (1-A) and (1-B) being substantially equal to the mole number of the dicarboxylic acid-type recurring unit of formula (2), and the proportion of the diamine recurring unit (1-A) being 7.5 to 40 mole% of the entire recurring units.

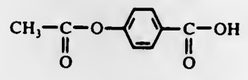
4,075,173

PROCESS FOR THE PRODUCTION OF AROMATIC POLYESTERS FROM HYDROXYBENZOIC ACID AND PRODUCTS THEREOF

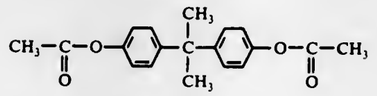
Takashi Maruyama, Toyonaka, and Katsuji Ueno, Hirakata, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jan. 28, 1977, Ser. No. 763,554
Claims priority, application Japan, Jan. 29, 1976, 51-8947
Int. Cl.² C08G *63/18*
U.S. Cl. 260—47 C **7 Claims**

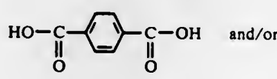
1. A process for producing an aromatic polyester which comprises preparing a prepolymer by subjecting the compounds of the formulae:



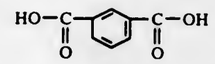
(I)



(II)



and/or



(III)

to heat-polycondensation at a temperature of 200°–380° C in the molar ratios of (I) : (II) = 1 : 100 to 100 : 1 and (II) : (III) = 1 : 10 to 10 : 1, pulverizing the prepolymer thus prepared and then heating the resultant in an inert gas or under reduced pressure at a temperature within the range of 200° to less than 380° C while raising the temperature at the rate of 1° to 20° C/hour.

4,075,174

PROMOTION OF MANGANESE CHELATE CATALYZED POLYPHENYLENE ETHER OXIDE POLYMERIZATION REACTIONS

Walter Karl Olander, Clifton Park, N.Y., assignor to General Electric Company, Pittsfield, Mass.

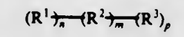
Filed Dec. 21, 1976, Ser. No. 753,509
Int. Cl.² C08G *65/44*
U.S. Cl. 260—47 ET **25 Claims**

1. In a process for the preparation of a polyphenylene oxide resin which comprises the steps of:

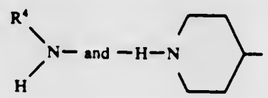
(a) oxidatively coupling a phenolic monomer to form a polyphenylene oxide resin in the presence of an organic solvent and a manganese chelate complex of the formula:

$(L)_x Mn$

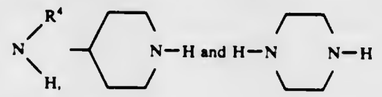
wherein L is a ligand derived from an ω-hydroxyoxime by conventional means, Mn is the transition metal manganese and *x* is at least equal to about 0.5, the improvement which comprises enhancing the rate of reaction by adding to the reaction mixture an amount of a bis-secondary diamine of the formula:



wherein R^1 is selected from the group consisting of:



wherein R^4 is lower alkyl of from 1 to 10 carbon atoms; R^2 is methylene; and R^3 is selected from the group consisting of:



wherein R^4 is the same as hereinabove defined; *n* is 0 or 1; *m* is 0 or a whole number from 1 to 10; and *p* is 0 or 1 with the proviso that the values of *n* and *p* are such that the compound always has two nitrogen atoms, said amount of said bis-secondary diamine being sufficient to increase the rate of reaction.

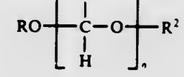
4,075,175

PREPARATION OF PHOTOSENSITIVE POLYALDEHYDES

Robert Paul Foss, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

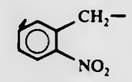
Filed Jan. 21, 1977, Ser. No. 760,934
Int. Cl.² C08G *2/12, 2/08*
U.S. Cl. 260—67 R **9 Claims**

1. A process for preparing a photosensitive polyaldehyde having the formula



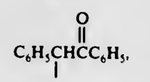
wherein

R is a photosensitive end group selected from



(a)

and



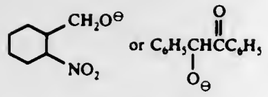
(b)

R^1 is H or n-alkyl of 1–5 carbon atoms,

R^2 is n-alkanoyl of 1–4 carbon atoms, and

n is a positive integer of about 10–4000, comprising:

contacting and anionically polymerizing a straight chain aldehyde of 1–6 carbon atoms with an initiating amount of an alkali metal or tetraalkylammonium, where each alkyl, alike or different, is from 1–6 carbon atoms, alkoxide of the formula:



4,075,176

CATALYSIS OF AMINO RESIN CROSS-LINKING REACTIONS WITH HIGH MOLECULAR WEIGHT SULFONIC ACIDS

Lawrence V. Gallacher, East Norwalk, Conn., assignor to King Industries, Inc., Norwalk, Conn.

Division of Ser. No. 466,079, May 1, 1974, Pat. No. 3,979,478. This application May 6, 1976, Ser. No. 683,778
Int. Cl.[2] C08G *12/12, 12/32;* C08L *61/32*
U.S. Cl. 260—67.6 R 16 Claims

1. A composition comprising a convertible amino resin and a catalytically effective amount of a thermally-decomposable adduct of a polyalkylaromatic polysulfonic acid, having a molecular weight of at least about 500.

4,075,177

THERMALLY HARDENABLE CATIONIC RESIN FROM DICARBOXYLIC ACID, DIALKANOLAMINE AND POLYAMINE COPOLYMER CONDENSED WITH EPICHLOROHYDRIN

Jean-Claude Bonnet, Blois, and Gerard Tesson, Auzouer-en-Touraine, both of France, assignors to Manufacture de Produits Chimiques Protex, Paris, France

Filed Jan. 12, 1976, Ser. No. 648,037
Int. Cl.[2] C08G *63/46*
U.S. Cl. 260—75 T 4 Claims

1. A process for producing a cationic thermally settable water soluble resin comprising the steps of:

a. readting in an acid aqueous medium a first component consisting of at least one aliphatic dicarboxylic acid with a mixture of a second component consisting of at least one polyamine and a third component consisting of at least one dialkanolamine to produce a polyamide-polyester copolymer soluble in water, where the molar ratio of said first component to said second component to said third component is substantially 0.8 to 1.1/0.3 to 0.9/0.1 to 0.7; and

b. condensing said polyamide-polyester copolymer with epichlorohydrin, said polyamide-polyester copolymer reacted with the epichlorohydrin in a proportion corresponding to 0.5 to 1.0 molecules of epichlorohydrin per atom of active hydrogen of the copolymer.

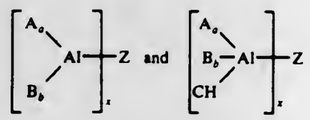
4,075,178

ORGANOALUMINUM COMPOSITIONS

John Harry Wallice Turner, Chapel-en-le-Firth, England, assignor to Manchem, Limited, London, England

Continuation-in-part of Ser. No. 345,377, March 27, 1973, abandoned. This application Oct. 6, 1975, Ser. No. 620,239
Claims priority, application United Kingdom, Mar. 28, 1972, 14390/72
Int. Cl.[2] C08G *63/76*
U.S. Cl. 260—75 T 14 Claims

1. A storage-stable, fluid, moisturesensitive compound of a formula selected from the group consisting of



in which A, B, and C are each selected from the group consisting of alkoxy, aryloxy, alkylcarboxyl, arylcarboxyl, a dicarboxylic acid half ester moity, a dicarboxylic acid half amide moity, alkyl sulfate, aryl sulfonate, dialkyl phosphate, alkylaryl phosphate, diarylphosphate, dialkylphosphite, alkylaryl phosphite, diarylphosphite, and an oxymetal organic group of the formula OMA in which M is a divalent metal and A is as defined herein, *a* and *b* are each selected from 0, 1 and 2 with the proviso that $a + b = 2$, Z is a polyfunctional organic polymer or polycondensation moity derived from polymers containing at least two reactive groups selected from hydroxyl, carboxyl and hydroperoxide, and *x* is at least 2, in which said polymers are selected from alkyd resins, phenolic resins, polyepoxides and silicone resins.

4,075,179

POLYESTERIMIDES AND PROCESSES FOR PREPARING SAME

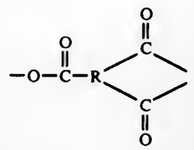
Joseph Karkoski; Charles William McGregor, and Lionel Joseph Payette, all of Fort Wayne, Ind., assignors to Essex International, Inc., Fort Wayne, Ind.

Filed Dec. 24, 1975, Ser. No. 644,374
Int. Cl.[2] C08G *63/68*
U.S. Cl. 260—75 N 13 Claims

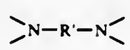
1. A solvent free hot melt polyesterimide polymer coating composition comprising the combination of:

an acid-imide component comprised of:

a tricarboxylic material unit represented by the following formula:



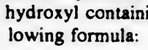
wherein: R is an organic trivalent radical, and an aromatic diamine material unit represented by the following formula:



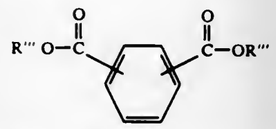
wherein: R′ is an aromatic divalent radical;

an ester component comprised of:

a hydroxyl containing material unit represented by the following formula:



wherein: R″ is an aliphatic divalent radical, and a carboxyl containing material unit represented by the following formula:



wherein: R‴ is selected from the group consisting of hydrogen and lower alkyl groups; and

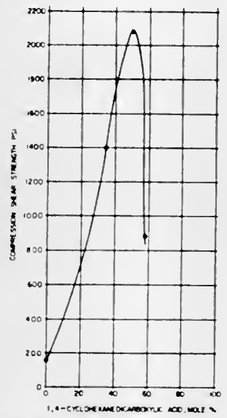
a tricarboxylic cross-link material component; said composition having an ester to imide equivalent ratio greater than about 2:1, an hydroxyl to carboxyl equivalent ratio greater than about 1.5:1, and an acid to cross-link equivalent ratio greater than about 1.5:1.

4,075,180

POLYESTERS CONTAINING A CRITICAL RANGE OF 1,4-CYCLOHEXANEDICARBOXYLIC ACID

Burns Davis, and Frederick David Petke, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 9, 1976, Ser. No. 749,190
Int. Cl.[2] C08G *63/12*
U.S. Cl. 260—75 R 3 Claims



1. A polyester having an inherent viscosity of at least 0.4 measured at 25° C. using 0.50 gram of polymer per 100 ml. of a solvent composed of 60 volumes of phenol and 40 volumes of tetrachloroethane consisting essentially of

A. a dicarboxylic acid component which is

1. about 25 to about 58 mole percent 1,4-cyclohexanedicarboxylic acid, and

2. about 75 to about 42 mole percent terephthalic acid, and

B. 1,4-butanediol.

4,075,181

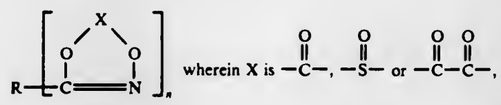
POWDER COATING COMPOSITIONS BASED ON A CYCLIC NITRILE COMPOUND

Kurt Charles Frisch, Grosse Ile, Mich., and Donald Henry Russell, Cherry Hill, N.J., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 22, 1975, Ser. No. 643,270
Int. Cl.[2] C08G *18/04, 71/02;* B05D *1/06*
U.S. Cl. 260—77.5 B 10 Claims

1. A shelf-stable powder coating composition having a particle size range such that most of the particles have a size of about 10 to 500 microns comprised of

A. 5 to 95 parts by weight of a cyclic nitrile compound having the structural formula



R is an organic radical free from reactive hydrogens as determined by the Zerewitinoff Test and *n* is at least 2,

B. 5 to 95 parts by weight of a member selected from the group consisting of styrene-maleic anhydride copolymer having a number average molecular weight of about 1,000 to 10,000, pyromellitic anhydride and trimellitic anhydride,

C. 0.001 to 10 parts per 100 total parts of (A) and (B) of a basic condensation-rearrangement catalyst having a pKa up to 8.

4,075,182

PROCESS FOR THE PREPARATION OF A CATALYST CONTAINING PYRROLIDONE COMPOSITION

Robert Bacskai, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 25, 1975, Ser. No. 607,845
Int. Cl.[2] C08G *69/24;* B01J *31/12*
U.S. Cl. 260—78 P 6 Claims

1. A process for preparing a catalyst-containing composition for the polymerization of 2-pyrrolidone consisting essentially of contacting a C_1-C_2 alkali metal alkoxide with an excess of 2-pyrrolidone to form a pyrrolidone solution comprising the alkali metal pyrrolidonate and a C_1-C_2 alcohol, and passing an inert gas, selected from the group consisting of nitrogen, dry air, and the rare gases, through said solution at a temperature of about 90° to about 200° C to remove said alcohol.

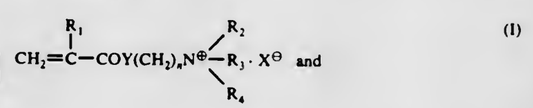
4,075,183

PREPARATION OF WATER-SOLUBLE HIGH POLYMERS

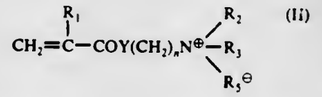
Shigenao Kawakami, Hirakata; Tatsumi Shibata, Ibaraki; Shinichi Isaoka, Minoo, and Tutomo Shintani, Ohita, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 18, 1975, Ser. No. 642,185
Claims priority, application Japan, Dec. 19, 1974, 49-146371; July 10, 1975, 50-85060
Int. Cl.[2] C08F *28/00;* C08G *75/00;* C08F *2/00, 20/70*
U.S. Cl. 260—79.3 MU 9 Claims

1. In the production of a water-soluble, cationic high polymer of (A) at least one of acrylamide and methacrylamide and (B) at least one of ammonium type monomers of either one of the formulas:



(I)



(II)

wherein R_1 is a hydrogen atom or a methyl group, R_2 and R_3 are each a lower alkyl group, R_4 is a hydrogen atom, a lower alkyl group, an aryl group, a hydroxy(lower)alkyl group, a benzyl group or a group of the formula: $-CH_2COO(CH_2)_mCH_3$ (*m* being an integer of 0 or 1), R_5^- is a group of either one of the formulas: $-(CH_2)_2COO^-$ and $-(CH_2)_3SO_3^-$, X is a halogen atom or an acid residue, Y is —O— or —NH— and *n* is an integer of 1 to 4, a process which comprises initiating the polymerization of the monomeric component (A) with a portion of the monomeric component (B) in an aqueous medium containing an organic solvent selected from the group consisting of acetone, acetonitrile, t-butanol, tetrahydrofuran and dioxane at a concentration of about 15 to 70% by weight until the polymerization proceeds to a certain extent and then continuing the polymerization while adding the remaining portion of the monomeric component (B) thereto under the occasional supplementation of a watermiscible organic solvent thereto so as to keep an appropriate viscosity of the reaction system to produce the high polymer.

4,075,184

METHOD OF SULFONATING FLUOROCARBON POLYMERS AND FLUOROCARBON POLYMER PRODUCED THEREBY

Thomas A. Rechlicz, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 11, 1976, Ser. No. 665,743
Int. Cl.² C08G 75/00
U.S. Cl. 260—79.3 R **7 Claims**

1. A method of preparing a polymer having trifluoroethylene sulfonyl moieties comprising:
providing a liquid composition comprising a polymer having chlorotrifluoroethylene moieties, a stoichiometric excess of a thiourea compound, and an organic solvent;
maintaining the liquid composition above about 100° C. and at a pressure sufficient to maintain the composition liquid for a time sufficient to form a polymer having trifluoroethylene isothiouronium salt moieties; and
thereafter converting the polymer having trifluoroethylene isothiouronium salt moieties to a polymer having trifluoroethylene sulfonyl moieties.

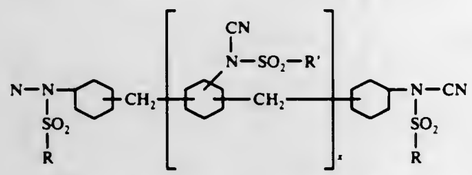
4,075,185

N-CYANOSULFONAMIDE RESINS AND INTERMEDIATES THEREFOR AND PRODUCTS THEREOF

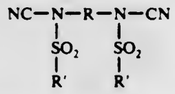
Raymond J. Kray, Berkeley Heights, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 661,468, Feb. 26, 1976, which is a division of Ser. No. 439,487, Feb. 4, 1974, Pat. No. 3,944,526.
This application Oct. 12, 1976, Ser. No. 731,485
The portion of the term of this patent subsequent to Mar. 16, 1993, has been disclaimed.
Int. Cl.² C08G 75/30
U.S. Cl. 260—79.3 M **15 Claims**

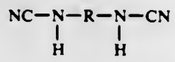
1. An addition polymerization product of
(a) an N-cyanosulfonamide compound of the formula



wherein each R′ is independently a monovalent aromatic, aliphatic, cycloaliphatic or heterocyclic radical; and x is 1 to 5
(b) with 0 to 20 moles per mole of (a) of a bis-N-cyanosulfonamide compound of the formula



wherein R is a divalent aromatic, aliphatic, cycloaliphatic or heterocyclic radical; and each R′ is independently a monovalent aromatic, aliphatic, cycloaliphatic or heterocyclic radical; and
(c) with 0 to 10 moles per mole of (a) of a bis cyanamide having the formula



wherein R is a divalent aromatic, aliphatic, cycloaliphatic or heterocyclic radical.

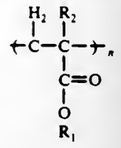
4,075,186

GRAFT COPOLYMERS OF POLYBUTADIENE AND SUBSTITUTED POLYACRYLATE

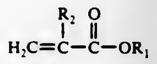
Richard J. Ambrose, Akron, and Robert A. Hayes, Cuyahoga Falls, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 518,655, Oct. 29, 1974, abandoned. This application Jan. 21, 1976, Ser. No. 651,094
Int. Cl.² C08L 9/00
U.S. Cl. 260—887 **14 Claims**

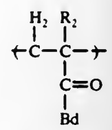
1. A process for producing a graft copolymer, in a vessel, comprising:
adding substituted polyacrylates to the vessel,
said substituted polyacrylates having the repeating unit



and produced by solely polymerizing monomers having the formula



wherein R_1 is an alkyl hydrocarbon group having from 1 to 30 carbon atoms and wherein R_2 is an alkyl hydrocarbon group having from 1 through 12 carbon atoms,
said polyacrylate having a number average molecular weight of from 10,000 to about 400,000,
adding polymeric butadienyl anions to the vessel,
anionically substituting said polymeric butadienyl anions for said $—OR_1$ groups of said substituted polyacrylate to form the graft copolymer so that said pendant substituted site has the structure



where Bd is said polymeric butadienyl anion, and
carrying out said substitution until said graft copolymer contains from 25 to 75 percent by weight of said substituted polyacrylate, the number average molecular weight of said pendant polybutadiene ranging from 1,000 to about 200,000.

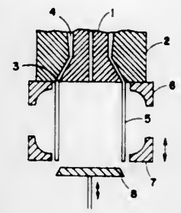
4,075,187

METHOD FOR MAKING BLOW MOLDED GENERALLY TIRE SHAPED ARTICLES

Tyler Keith Olcott, Valentines, Va., assignor to W. R. Grace & Co., Duncan, S.C.

Filed May 12, 1976, Ser. No. 685,567
Int. Cl.² B29C 17/07
U.S. Cl. 264—89 **6 Claims**

1. A method for blow molding a tire shaped article, comprising:
extruding a molten tubular thermoplastic parison downwardly from a die through a space intermediate two mold sections comprising an upper mold section and a lower mold section engageable with each other;
sealing a bottom opened end of the tubular parison to entrap a compressible fluid in said parison, said parison being sealed at its upper end by said die;
moving the lower mold section vertically into engaging relationship with the upper mold section, said mold sections when engaged forming a radially extended tire shaped cavity adjacent and surrounding an intermediate portion of the parison;
moving a lower portion of the tubular parison upwardly relative to said upper end and permitting a central portion of the tubular parison to expand outwardly radially into said tire shaped cavity;



injecting fluid into said parison under sufficient pressure to conform the outwardly expanded parison portion to the molds defining the tire shaped cavity;
opening the molds; and
unsealing both the bottom and top portions of said parison to provide the tire shaped article.

4,075,188

RECOVERY OF CRUDE TALL OIL

William G. Vardell, Jr., Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Feb. 2, 1976, Ser. No. 654,383
Int. Cl.² C09F 1/00
U.S. Cl. 260—97.7 **8 Claims**

1. A process for treating tall oil soap skimmings comprising admixing said skimmings with a water-immiscible solvent and an amount of carbon dioxide sufficient to acidify said soap to pH 7 to 8, whereby a water-immiscible solvent layer containing said acidified soap and unreacted soap is formed and a bicarbonate-brine layer is formed.

4,075,189

HEXAPEPTIDES

Francis John Tinney, Ann Arbor, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

Filed Sept. 15, 1976, Ser. No. 723,427
Int. Cl.² C07C 103/52; A61K 37/02
U.S. Cl. 260—112.5 R **6 Claims**

1. A hexapeptide of the formula

X-Pro-His(benzyl)-His(benzyl)-R-Trp-Ala-Y

wherein X is t-butoxycarbonyl or benzyloxycarbonyl, R is Ser(benzyl) or Tyr(benzyl) and Y is lower alkoxy, amino, lower alkylamino or di(lower alkyl)amino.

4,075,190

PENTAPEPTIDE WITH MORPHINE-LIKE ACTIVITY

Dimitrios Sarantakis, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Mar. 14, 1977, Ser. No. 777,211
Int. Cl.² C07C 103/52; A61K 37/00
U.S. Cl. 260—112.5 R **1 Claim**

1. A pentapeptide of the formula:

H-Tyr-Gly-Gly-Phe-D-Lys-OH

or a non-toxic salt thereof.

4,075,191

BIOLOGICALLY ACTIVE AMIDES

Christopher Raymond Beddell, Ashford; Lawrence Alfred Lowe, Swanley, and Samuel Wilkinson, Beckenham, all of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Oct. 24, 1975, Ser. No. 625,386
Claims priority, application United Kingdom, Oct. 25, 1974, 46167/74
Int. Cl.² C07C 103/52; A61K 37/00
U.S. Cl. 260—112.5 LH **6 Claims**

1. Glu—Phe—Ala—Tyr—Gly—Leu—Arg—Pro—ethylamide or an acid addition salt thereof, wherein all residues are those of the L-amino acids except in the case of glycine.
6. Cyclopentylcarbonyl—Phe—Ala—Tyr—Gly—Lue—Arg—Pro—ethylamide or an acid addition salt thereof, wherein all residues are those of the L-amino acids except in the case of glycine.

4,075,192

NONAPEPTIDES AND METHODS FOR THEIR PRODUCTION

Ernest D. Nicolaides, Ann Arbor, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

Filed June 13, 1977, Ser. No. 805,766
Int. Cl.² C07C 103/52; A61K 37/00
U.S. Cl. 260—112.5 LH **5 Claims**

1. A nonapeptide of the formula

pGlu-D-Phe-Trp-Tyr(benzyl)-Ser(benzyl)-D-Ala-Leu-Orn-Pro-Y

wherein Y is amino, lower alkylamino or di(lower alkyl)amino.

4,075,193

PROCESS FOR PRODUCING INTRAVENOUS IMMUNE GLOBULIN

Cyrill John Campbell, Detroit, and Daniel Ting Hsiu Liu, Sterling Heights, both of Mich., assignors to Parke, Davis & Company, Detroit, Mich.

Filed Nov. 26, 1976, Ser. No. 744,906
Int. Cl.² A23J 1/06; A61K 35/14
U.S. Cl. 260—112 B **10 Claims**

1. Process for producing immune globulin for intravenous administration which comprises
adsorbing plasminogen deriving from blood of a selected mammalian species on an adsorbent substrate of L-lysine agarose,
washing the adsorbate to elute impurities,
eluting the purified plasminogen from the substrate,
converting the eluted plasminogen to plasmin,
incubating a mixture of said plasmin and a quantity of homospecific immune globulin having anticomplementary activity under conditions such that the anticomplementary activity is substantially reduced,
inactivating plasmin present in said mixture by adsorption on an inactivation adsorbent for plasmin, and recovering the immune globulin.

4,075,194

NOVEL SYNTHETIC UNDECAPEPTIDE AND CLINICAL ASSAY

Michael Sela; Ruth Arnon, both of Rehovot, and Samario Chaitchik, Tel-Aviv, all of Israel, assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel

Filed Dec. 9, 1976, Ser. No. 749,093
Int. Cl.² C07C 103/52; A61K 39/00
U.S. Cl. 260—112.5 R **3 Claims**

1. The synthetic undecapeptide corresponding to the terminal amino acid residues of the amino-terminal portion of carcinoembrionic antigen (CEA) of the sequence Leu-Asn-Phe-Pro-Thr-Ser-Glu-Ile-Thr-Leu-Lys.

4,075,195

DEBITTERED PROTEIN PRODUCT AND METHOD FOR MANUFACTURE

John F. Roland, Glenview, Ill., assignor to Kraft, Inc., Glenview, Ill.

Filed Aug. 31, 1976, Ser. No. 719,347
Int. Cl.² A23J 1/14, 1/20
U.S. Cl. 260—119 10 Claims

1. A method for debittering protein hydrolysates comprising providing an aqueous solution of a protein hydrolysate, said hydrolysate having a molecular weight of less than about 10,000 and an amino nitrogen to total nitrogen ratio of from about 0.25 to about 0.80, feeding said solution to the top of a bed of phenol-aldehyde resin particles, collecting a first portion of said solution exiting from said bed which contains a non-bitter fraction of said hydrolysate and thereafter collecting a second portion of said solution exiting from said bed which contains a bitter fraction of said hydrolysate.

4,075,196

PRODUCTION OF CASEIN AND CASEINATES

Ernest Badertscher, Orbe, and Michel Chaveron, Vevey, both of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed May 7, 1975, Ser. No. 575,207
Claims priority, application Switzerland, June 7, 1974, 7780/74
Int. Cl.² A23J 1/20
U.S. Cl. 260—120 14 Claims

1. A process for the continuous production of casein and caseinates, which comprises
destabilizing a colloidal solution with the composition of a skimmed milk and converting the solution into a mixture of curd and serum,
separating the curd from the serum,
introducing the curd in the form of grains into a stream of washing liquid,
passing the mixture of curd grains and washing liquid under turbulent conditions through a first tube,
separating the curd from the washing liquid and introducing the curd in the form of grains into a second stream of water,
thereafter introducing the mixture of curd grains and second stream of water under turbulent conditions into a second tube,
thereafter separating the curd from the water, and
using the water obtained from this separation as washing liquid in the first tube wherein the quantity of water used is from 0.2 to 0.4 liters per liter of colloidal solution treated.

4,075,197

SERUM ALBUMIN PRODUCTION

James M. Schuck, Chesterfield, and Charles Lewis, Jr., Hazelwood, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Sept. 20, 1976, Ser. No. 724,438
Int. Cl.² C07G 7/00
U.S. Cl. 260—122 13 Claims

1. A method for the production of a serum albumin fraction in high yield and purity from admixture with other blood protein components comprising contacting the albumin-protein mixture with a resinous polymeric material selected from the group consisting of dilowerlalkylaminoloweralkyl-substituted cross-linked dextran polymers, heating at a temperature of from about 65° C to about 72° C and at a pH of from about 5.0 to about 5.5 for about one to about four hours and then adjusting the mixture to a pH of from about 3.5 to about 4.5 to selectively elute the desired albumin therefrom.

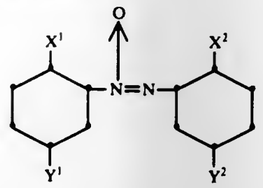
4,075,198

PROCESS FOR MANUFACTURE OF BENZIDINE PIGMENTS

Harald E. K. Gleinig, Bechen, Neschen, Germany, assignor to Colour-Chem Ltd., India

Filed Oct. 2, 1975, Ser. No. 618,886
Int. Cl.² C07C 109/04, 109/06; C09B 35/10, 35/18
U.S. Cl. 260—161 4 Claims

1. In the process of making a benzidine pigment by reducing an azoxybenzene to a hydrazobenzene, then subjecting the hydrazobenzene to benzidine rearrangement, diazotizing the resulting benzidine and coupling it to a benzidine pigment coupling component, the improvement according to which the azoxybenzene has the formula



in which X^1, X^2, Y^1 and Y^2 are selected from the class consisting of hydrogen, chlorine, methyl, methoxy, ethoxy, sulfo and carboxyl,

and the reduction to the corresponding hydrazobenzene is effected by technical NaHS in aqueous solution at a pH between about 8 and about 10, and at a temperature of 50° to 100° C, the solution is then cooled to precipitate out the hydrazobenzene, the precipitated hydrazobenzene is filtered off, washed, and in the resulting crude condition subjected to the benzidine rearrangement.

4,075,199

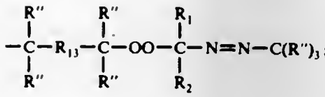
TERTIARY ALIPHATIC ALPHA-PEROXYAZO COMPOUNDS

Ronald Edward MacLeay, Williamsville; Chester Stephen Sheppard, Tonawanda, and Harold Carl Lange, Grand Island, all of N.Y. assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation of Ser. No. 88,110, Nov. 9, 1970, abandoned, which is a continuation-in-part of Ser. No. 725,180, April 29, 1968, abandoned, which is a continuation of Ser. No. 616,158, Feb. 15, 1967, abandoned, which is a continuation of Ser. No. 409,306, Nov. 5, 1964, abandoned. This application Dec. 19, 1973, Ser. No. 426,411
Int. Cl.² C07C 107/02; B01J 27/24; C08J 9/00; C08G 63/12
U.S. Cl. 260—192 8 Claims

1. An α-peroxyazo compound of the formula $(R'')_3C-N=N-C(R_1)(R_2)$—OOR where:
$(R'')_3C$ is t-alkyl or t-aralkyl where the R''s are the same or different and are selected from alkyl of 1-5 carbons or phenyl, not more than one R'' being phenyl;

R is $-C(R'')_3$, $-C(R'_1)(R'_2)-N=N-C(R'')_3$ or



R, R'_1, R_2 and R'_2 are separately selected from alkyl of 1-5 carbons; alkyl of 1-5 carbons substituted with lower alkoxy, carboxy or lower alkoxycarbonyl; phenyl; or join with their common carbon atom to form cyclohexyl; and R_{13} is C_1—C_6 alkylene.

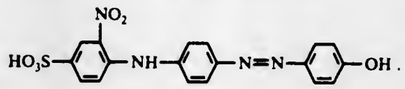
4,075,200

4(2'-NITRO-4'-SULFOANILINO) PHENYL AZO HYDROXYPHENYL DYES

Denis Robert Annesley Ridyard, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 516,801, Oct. 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 498,853, Aug. 19, 1974, abandoned, which is a division of Ser. No. 252,576, May 12, 1972, abandoned. This application Nov. 18, 1975, Ser. No. 632,980
Claims priority, application United Kingdom, May 17, 1971, 15272/71
Int. Cl.² C09B 29/12
U.S. Cl. 260—206 10 Claims

1. A monoazo dyestuff having the formula



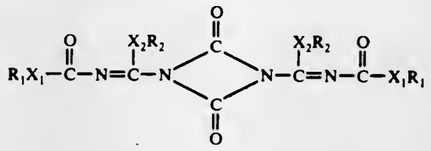
4,075,201

BIS CARBAMATE DERIVATIVES OF DIAZETIDINE DIONES

Julius Jakob Fuchs, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 603,651, Aug. 11, 1975, Pat. No. 4,045,473. This application Mar. 10, 1977, Ser. No. 776,258
Int. Cl.² C07D 229/00
U.S. Cl. 260—239 A 6 Claims

1. A compound of the formula:



where
R_1 is alkyl of 1-3 carbon atoms;
R_2 is alkyl of 1-4 carbon atoms; and
X_1 and X_2 are independently selected from oxygen and sulfur.

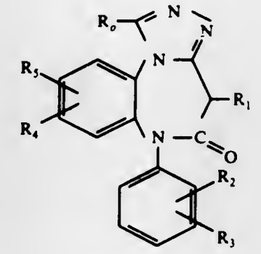
4,075,202

S-TRIAZOLO-1,5-BENZODIAZPINE-4-ONES

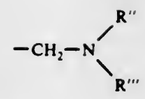
Robert Bruce Moffett, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Sept. 27, 1973, Ser. No. 401,220
Int. Cl.² C07D 487/04
U.S. Cl. 260—239.3 T 10 Claims

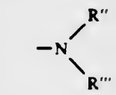
1. A compound of the formula IIIA



wherein R_0 is hydrogen, alkyl of 1 to 3 carbon atoms, inclusive, hydroxy, hydroxymethyl and



in which R'' and R''' are hydrogen, alkyl of 1 to 3 carbon atoms or together



is selected from the group consisting of pyrrolidino, piperidino, morpholino, and N-methylpiperazino; wherein R_1 is hydrogen or methyl and wherein R_2, R_3, R_4 and R_5 are selected from the group consisting of hydrogen, alkyl of 1 to 3 carbon atoms halogen, nitro, trifluoromethyl, alkoxy and alkylthio in which the carbon moieties of alkoxy and alkylthio have from 1 to 3 carbon atoms, inclusive, and the pharmacologically acceptable acid addition salts thereof.

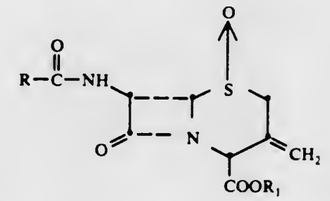
4,075,203

PROCESS FOR PREPARING A 3-EXOMETHYLENECEPHAM SULFOXIDE FROM PENICILLIN SULFOXIDES

Ta-Sen Chou, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

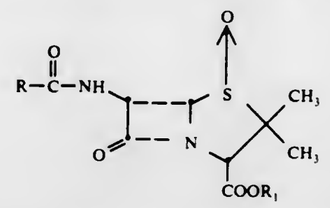
Filed June 16, 1976, Ser. No. 696,674
Int. Cl.² C07D 501/02
U.S. Cl. 544—18 19 Claims

1. In a process for preparing a 3-exomethylenecepham sulfoxide of the formula



by

1. reacting a penicillin sulfoxide of the formula



with an N-chloro halogenating agent at a temperature of from about 75° C. to about 135° C. in an inert solvent under anhydrous conditions and in the presence of an amount of an epoxide sufficient at least to account for any hydrogen chloride which may be formed, said epoxide having the formula

in which R_x is hydrogen or methyl; and in which, in the above formulae, R_1 is a carboxylic acid protecting group; and R is
(a) hydrogen, C_1-C_3 alkyl, halomethyl, cyanomethyl, benzyloxy, 4nitrobenzyloxy, t-butyloxy, 2,2,2-trichloro-

ethoxy, 4-methoxybenzyloxy, 3-(2-chlorophenyl)-5methylisoxazol-4-yl;

(b) the group R' in which R' is phenyl or phenyl substituted with 1 or 2 halogens, protected hydroxy, nitro, cyano, trifluoromethyl, C_1-C_4 alkyl, or C_1-C_4 alkoxy;

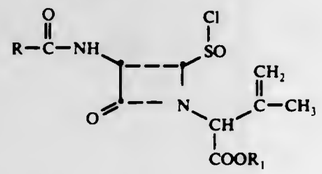
(c) a group of the formula R''-$(Q)_m$-CH_2- in which R'' is R' as defined above, 1,4-cyclohexadienyl, 2-thienyl, or 3-thienyl; *m* is 0 or 1; and Q is O or S; subject to the limitation that when *m* is 1, R'' is R'; or

(d) a group of the formula



in which R'' is as defined above, and W is protected hydroxy or protected amino;

to produce a sulfinyl chloride of the formula



in which R and R_1 are as aforedefined;

(2) treating the resulting reaction mixture to remove said epoxide therefrom;

(3) filtering insolubles from the epoxide-free mixture; and

(4) treating said epoxide-free mixture with a Friedel-Crafts catalyst at a temperature of from about −20° C. to about +100° C. to produce the aforementioned 3-exomethylenecepham sulfoxide; the improvement which comprises carrying out step (1) in the presence of from about 100 grams to about 500 grams of calcium oxide per mole of the penicillin sulfoxide.

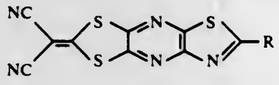
4,075,204

(1,3)DITHIOLO-(4,5-b)THIAZOLO(4',5'-e)PYRAZIN-2-YLIDENE-PROPANEDINITRILES

Charles A. Wilson, and Craig E. Mixan, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 23, 1977, Ser. No. 773,861
Int. Cl.² C07D *513/14*
U.S. Cl. 260—250 BC **4 Claims**

1. A compound corresponding to the formula



wherein R is either H or CX_3, with each X substituent being individually selected from the group consisting of H and X', wherein X' is either F or Cl.

4,075,205

(1,3-DITHIOLO-(4,5-b)(1,2,5)THIADIAZOLO(3',4'-e)PYRAZIN-6-YLIDENE)-PROPANEDINITRILE

Charles A. Wilson, and Craig E. Mixan, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 22, 1977, Ser. No. 770,716
Int. Cl.² C07D *513/14*
U.S. Cl. 260—250 BC **1 Claim**

1. The compound (1,3-Dithiolo(4,5-b)(1,2,5)-thiadiazolo(3',4'-e)pyrazin-6-ylidene)-propanedinitrile.

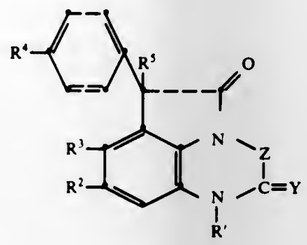
4,075,206

SUBSTITUTED PYRROLOQUINOXALINONES AND DIONES

Richard E. Holmes, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 25, 1977, Ser. No. 772,154
Int. Cl.² A61K *31/33*; C07D *487/04*
U.S. Cl. 260—250 BC **8 Claims**

1. A compound of the formula:



wherein

R' is H or C_1-C_3 alkyl;

when taken singly, R^2 is H, C_1-C_3 alkyl, C_1-C_3 alkoxy, or Cl and R^3 is H; and

R^2 and R^3 when taken together with the carbon atoms to which they are attached form a benzene ring;

R^4 is H, Cl or F;

R^5 is OH, H or phenyl;

Y is O or H_2;

Z is $-CH_2-CH_2-$ or $-CHR^6-$ wherein R^6 is H or C_1-C_3 alkyl.

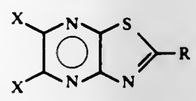
4,075,207

MICROBICIDAL/FUNGICIDAL THIAZOLOPYRAZINES

Yulan C. Tong, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 17, 1977, Ser. No. 769,487
Int. Cl.² C07D *513/04*; A01N *9/14*
U.S. Cl. 260—250 BC **10 Claims**

1. A compound of the formula



wherein, X, independently in each occurrence, is Br, Cl or F, R is H or $CH_{3-x}Y_x$, Y is Br, Cl or F, independently in each occurrence, and *x* is 0, 1, 2 or 3.

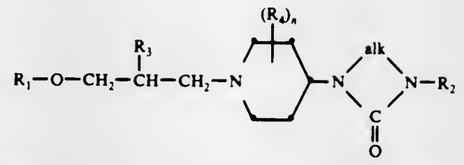
4,075,208

1-SUBSTITUTED-4-(2-OXO-HEXAHYDRO-1-PYRIMIDINYL)-PIPERIDINE

Max Wilhelm, Watchung, N.J.; Kurt Eichenberger, Therwil, Switzerland; Herbert Schröter, Fullinsdorf, Switzerland, and Franz Ostermayer, Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 483,742, June 27, 1974, Pat. No. 3,956,335, which is a continuation-in-part of Ser. No. 389,106, Aug. 16, 1973, abandoned. This application Jan. 28, 1976, Ser. No. 652,965
Claims priority, application Switzerland, Aug. 24, 1972, 12539/72; July 3, 1973, 9670/73; Apr. 30, 1974, 5907/74
Int. Cl.² A61K *31/505*; C07D *401/04*
U.S. Cl. 260—256.4 C **8 Claims**

1. A piperidine compound having the formula



wherein R_1 is phenyl, naphthyl, 5,6,7-tetrahydro-1-naphthyl or 5,6,7,8-tetrahydro-2-naphthyl, or phenyl, naphthyl, 5,6,7-tetrahydro-1-naphthyl or 5,6,7-tetrahydro-2-naphthyl which are monosubstituted or disubstituted by lower alkyl, lower alkoxy, lower alkenyl, lower alkenyloxy, halogen, halogen-lower alkyl, carbamoyl, lower alkyl-substituted carbamoyl, lower alkoxycarbonylamino-lower alkyl, lower alkoxy-lower alkoxy, lower alkanoylaminoethenyl, lower akylthio-lower alkoxy, hydroxyl, lower alkanoyl, lower alkoxy-lower alkyl, lower alkynyl, lower alkylthio-lower alkyl, hydroxy-lower alkyl, lower alkanoyloxy, lower alkylthio, lower alkanoyl amino, cyano, amino, nitro, ureido, lower alkylated ureido, phenyl-lower alkoxy, and/or lower alkynyloxy, R_2 is hydrogen, lower alkyl, lower alkenyl, α-phenyl-lower alkyl or lower alkanoyl, R_3 is hydroxyl, a lower alkanoyloxy or a lower alkoxy, R_4 is hydrogen or lower alkyl, n is an integer from 0 to 4, and alk is trimethylene or mono-lower alkylated trimethylene or a therapeutically acceptable salt thereof.

4,075,209

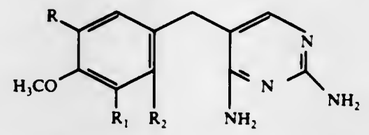
PROCESS FOR PREPARING SUBSTITUTED 2,4-DIAMINOPYRIMIDINES AND ISOXAZOLE INTERMEDIATE

Jane Liu Jernow, Verona, and Perry Rosen, North Caldwell, both of N.J., assignors to Hoffmann-La Roche, Inc., Nutley, N.J.

Filed Feb. 7, 1977, Ser. No. 766,094
Int. Cl.² C07D *239/48, 261/08*
U.S. Cl. 260—256.4 N **7 Claims**

1. A process for preparing a compound of the formula

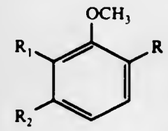
I



wherein R, R_1 and R_2 are hydrogen, lower alkoxy and lower alkyl,

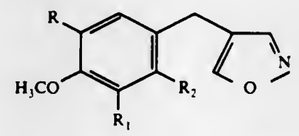
which comprises the steps of (a) reacting 4-bromomethylisoxazole with the corresponding aromatic compound of the formula

II



wherein R, R_1 and R_2 are as described above,
to yield a compound of the formula

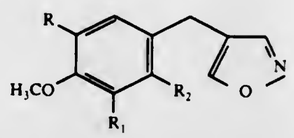
III



wherein R, R_1 and R_2 are as described above,
and subsequently (b) separating and treating the reaction product of step (a) with a guanidine salt, whose ½ M aqueous solution has a pH in the range of 9 to 12.

3. A compound of the formula

III



wherein R, R_1 and R_2 are hydrogen, lower alkoxy and lower alkyl.

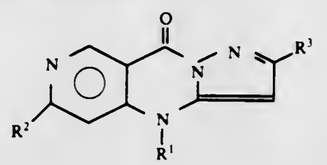
4,075,210

PYRAZOLO[1,5-a]PYRIDO[4,3-d]PYRIMIDIN-9(4H)-ONE AND DERIVATIVES THEREOF

Theodor Denzel, Regensberg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 31, 1977, Ser. No. 783,252
Int. Cl.² A61K *31/415*; C07D *471/04*
U.S. Cl. 260—256.4 F **16 Claims**

1. A compound of the formula



wherein

R^1 and R^3 each is hydrogen or lower alkyl; and

R^2 is hydrogen, halogen, lower alkylthio, lower alkoxy or lower alkylamino.

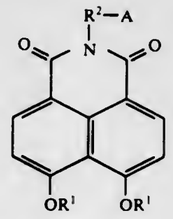
4,075,211

NAPHTHALIMIDE COMPOUNDS AND OPTICAL BRIGHTENERS

Horst Scheuermann, and Albert Hettche, both of Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Continuation-in-part of Ser. No. 479,892, June 17, 1974, abandoned. This application Jan. 2, 1976, Ser. No. 646,181
Claims priority, application Germany, 2331307
Int. Cl.² C07D *221/14, 401/06*; C09K *11/06*; C07D *413/06*
U.S. Cl. 260—270 H **9 Claims**

1. A naphthalimide compound of the formula

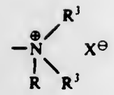


in which

R^1 is C_1- to C_4-alkyl or C_1- to C_4-alkoxyethyl,

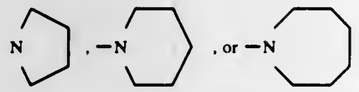
R^2 is branched C_3- to C_6-alkylene,

A is



R is hydrogen, C_1- to C_4-alkyl, allyl or benzyl,

$N(R^3)_2$ is $N(CH_3)_2$, $N(C_2H_5)_2$, $N(C_3H_7)_2$, $N(C_4H_9)_2$,



and

X^- is an unreactive and colorless anion.

4,075,212

METHOD OF PREPARING 8,8-DISUBSTITUTED-6-METHYLERGOLINES AND RELATED COMPOUNDS

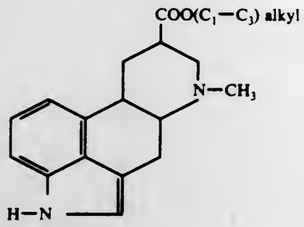
Nicholas J. Bach, and Edmund C. Kornfeld, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 530,320, Dec. 6, 1974, Pat. No. 3,968,111. This application Jan. 19, 1976, Ser. No. 650,582

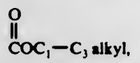
Int. Cl.² C07D *457/04*

U.S. Cl. 260—285.5 **1 Claim**

1. The process which comprises reacting a (C_1-C_3) alkyl dihydrolysergate of the formula



with at least 2 moles of non-hydrolytic base of the class consisting of lithium tetramethylpiperidide and potassium diisopropyl amide in an inert solvent to form a 1,8-dianion of the said (C_1-C_3) alkyl dihydrolysergate, and then reacting said dianion with not more than one mole of an alkylating agent, $R''''(CH_2)_nX$ wherein R'''' is CH_3, CH_2, CN or



X is halogen and *n* is 0, 1 or 2 to yield a (C_1-C_3) alkyl 8-R'''' dihydrolysergate substantially free from any 1,8-di R'''' dihydrolysergate and then isolating the thus formed (C_1-C_3) alkyl 8-R'''' dihydrolysergate in substantially pure form from the reaction mixture.

4,075,213

8-ARYL-9-ERGOLENES

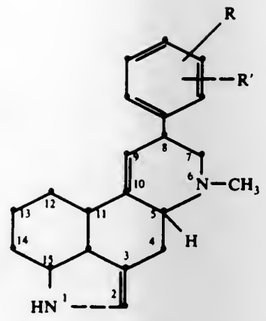
Edmund C. Kornfeld, and Nicholas J. Bach, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 2, 1977, Ser. No. 773,627

Int. Cl.² C07D *457/02*; A61K *31/48*

U.S. Cl. 260—285.5 **11 Claims**

1. A compound of the formula:



wherein R and R', when taken individually are hydrogen or ortho or para Cl, C_1-C_2 alkyl, or C_1-C_2 alkoxy and when taken together on adjacent carbons of the phenyl ring, are methylene dioxy; and pharmaceutically acceptable acid addition salts thereof formed with non-toxic acids.

4,075,214

PREPARATION OF LEUROSIDINE AND NOVEL LEUROSIDINE 4'-ETHERS AND ESTERS

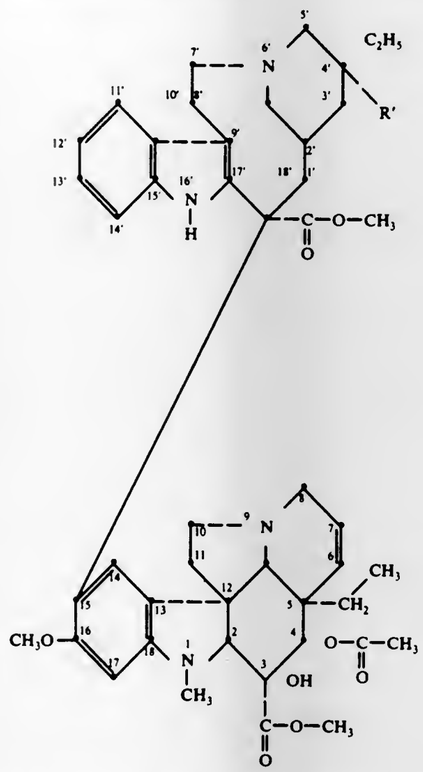
Allen S. Katner; Gerald E. Gutowski, and Jean C. Miller, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed May 17, 1976, Ser. No. 687,274

Int. Cl.² C07D *471/18*

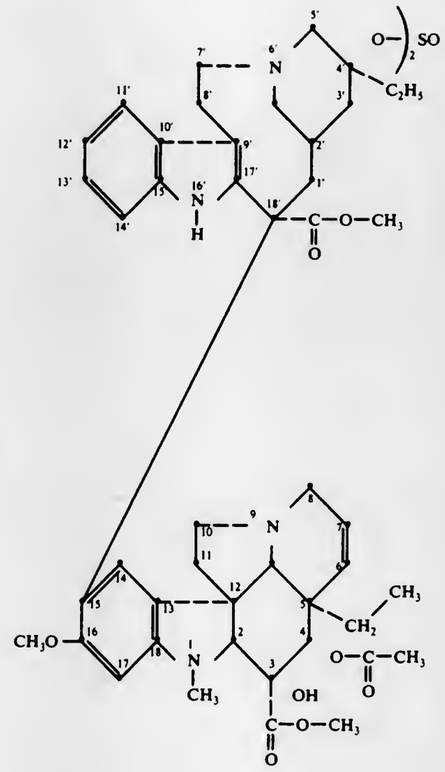
U.S. Cl. 260—287 B **5 Claims**

1. A compound of the formula



wherein R' is methoxy, ethoxy, propoxy or an azide group.

5. VLB 4'-bis-sulfite ester of the formula



4,075,215

THIENO-PYRIDINE DERIVATIVES

Albert Rene Joseph Castaigne, Toulouse, France, assignor to Centre d'Etudes Pour l'Industrie Pharmaceutique, Toulouse, France

Division of Ser. No. 660,248, Feb. 20, 1976, which is a division of Ser. No. 435,036, Jan. 21, 1974, abandoned. This application Aug. 18, 1976, Ser. No. 715,579

Claims priority, application France, Feb. 1, 1973, 73.03503

Int. Cl.² C07D *417/02*

U.S. Cl. 260—294.8 C **5 Claims**

1. A compound selected from the group consisting of 5-phenacyl-thieno[3,2-c]pyridinium bromide, 5-(o-methoxyphenacyl)-thieno[3,2-c]pyridinium bromide, 2-chloro-5-phenacyl-thieno[3,2-c]pyridinium bromide, N-parachlorophenacyl-thieno[3,2-c]pyridinium bromide, 5-(3,4-dihydroxyphenacyl)-thieno[3,2-c]pyridinium chloride, 5-para-fluorophenacyl-thieno[3,2-c]pyridinium chloride, N-(para-hydroxyphenacyl)-thieno[3,2-c]pyridinium chloride, N-(para-methoxyphenacyl)-thieno[3,2-c]pyridinium bromide and N-(meta-methoxyphenacyl)-thieno[3,2-c]pyridinium bromide.

4,075,216

CERTAIN BENZOTHIAZOLIN-2-ONE DERIVATIVES

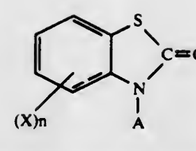
John J. D'Amico, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 26, 1976, Ser. No. 735,658

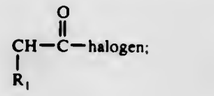
Int. Cl.² C07D *277/68*; A01N *9/12*

U.S. Cl. 260—294.8 C **22 Claims**

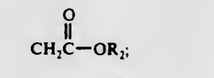
1. A compound having the formula



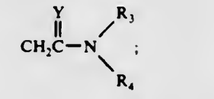
wherein A is selected from the group consisting of



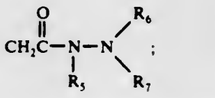
(I)



(II)



(III)



(IV)

wherein R_1 is selected from the group consisting of hydrogen and lower alkyl; X is halogen; Y is selected from the group consisting of oxygen and sulfur; R_2 is selected from the group consisting of lower alkenyl, monohalo lower alkenyl, dihalo lower alkenyl, trihalo lower alkenyl, lowe alkynyl, benzyl and benzyl optionally substituted by up to three substituents selected from the group consisting of lower alkyl, trifluoromethyl and halogen; R_3 is selected from the group consisting of hydrogen, lower alkenyl, lower alkynyl, pyridyl and pyridyl substituted by halogen; R_4 is selected from the group consisting of hydrogen and lower alkenyl; R_5 is selected from the group consisting of hydrogen and lower alkyl; R_6 and R_7 are independently selected from the group consisting of hydrogen, phenyl and lower alkyl; *n* is 0 or 1; provided that R_3 and R_4 may both be hydrogen only when Y is sulfur; further provided that R_6 may not be hydrogen when R_7 is hydrogen.

4,075,217

CONVERSION OF 3-(PYRIDINYL)-2-CYCLOHEXEN-1-ONE TO 3-(PYRIDINYL)ANILINES

Karl O. Gelotte, Nassau; Andrew W. Zalay, Albany, and Malcolm R. Bell, East Greenbush, all of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 668,451, March 19, 1976, Pat. No. 4,026,900. This application Nov. 1, 1976, Ser. No. 737,392

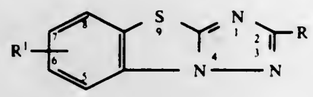
Int. Cl.² C07D *213/02*

U.S. Cl. 260—296 R **3 Claims**

1. The process which comprises heating at about 80° to 140° C. a solution containing 3-PY-2-cyclohexen-1-one oxime, a lower-alkanoic acid and a lower-alkanoic anhydride while passing hydrogen chloride gas through the reaction mixture to produce N-(lower-alkanoyl)-3-PY-aniline and hydrolyzing said N-(lower-alkanoyl) compound under aqueous alkaline or acidic conditions at about 80° to 150° C. to produce the corresponding 3-PY-aniline where PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents.

4,075,218
s-TRIAZOLO[5,1-b]BENZOTHIAZOLES
Charles J. Paget, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.
Division of Ser. No. 547,828, Feb. 7, 1975, Pat. No. 3,974,286. This application May 3, 1976, Ser. No. 682,007
Int. Cl.[2] C07D *277/82*
U.S. Cl. 260—305 **9 Claims**

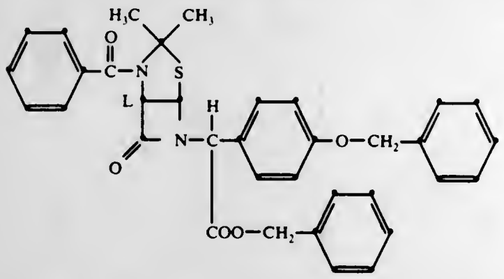
1. A compound of the formula



wherein R represents
hydrogen,
hydroxy,
trifluoromethyl,
methyl, or
ethyl;
R^1 represents
hydrogen,
methyl,
ethyl,
chloro,
propyl,
fluoro,
isopropyl,
bromo, or
methoxy;
provided that when R represents ethyl or trifluoromethyl, R^1 represents methyl or ethyl; and provided that methoxy, propyl and isopropyl R^1 groups occupy only the 5-position.

4,075,219
EPIMERIZATION PROCESS
Lawrence J. McShane, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.
Filed Mar. 31, 1977, Ser. No. 783,123
Int. Cl.[2] C07D *513/04*
U.S. Cl. 260—306.7 C **4 Claims**

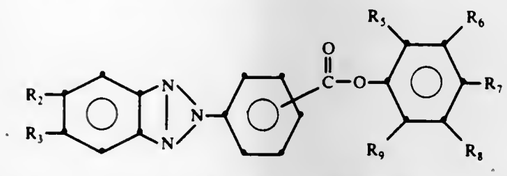
1. The process for preparing in the D-configuration the compound of the formula



which comprises dissolving at a temperature between about 20° C. and about 30° C. said compound in the L-configuration or said compound as a mixture of the L- and D-configurations in pyridine to a concentration between about 50 mg./ml. to about 100 mg./ml.; diluting said solution with water in an amount corresponding to between about 10 percent and about 50 percent by volume; and separating said compound in the D-configuration.

4,075,220
BENZOTRIAZOLE BENZOATE ULTRAVIOLET STABILIZERS
Gether Irick, Jr., and Charles A. Kelly, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.
Division of Ser. No. 484,848, July 1, 1974, Pat. No. 3,957,813. This application Feb. 17, 1976, Ser. No. 658,311
Int. Cl.[2] C07D *249/20*
U.S. Cl. 260—308 B **11 Claims**

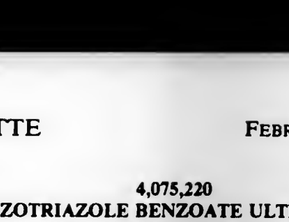
1. A composition of matter having the formula:



wherein R_2 is hydrogen, alkyl, alkoxy, cyano, chloro or bromo; R_3 is hydrogen or alkyl; and at least one R_5 or R_9 is hydrogen and the other R_5, R_6, R_7 and R_8 are hydrogen, alkyl, alkoxy, cyano, chloro or bromo; in which the alkyl and alkoxy groups contain 1-20 carbon atoms and the carbonyl group is attached at the meta or para position.

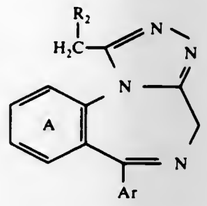
4,075,221
PROCESS FOR PREPARING TRIAZOLOBENZODIAZEPINES
Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
Filed Jan. 24, 1977, Ser. No. 761,803
Int. Cl.[2] C07D *487/04*
U.S. Cl. 260—308 R **14 Claims**

1. An improved process for the production of compounds of the formula II:



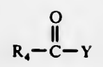
II

wherein R_1 is alkyl of 1 to 3 carbon atoms, inclusive; wherein R_2 is hydrogen, methyl or phenyl; wherein the ring A is unsubstituted, or monosubstituted with fluoro, chloro, bromo, nitro, trifluoromethyl, or methylthio; and wherein Ar is phenyl; o-chlorophenyl; o-fluorophenyl; 2,6-difluorophenyl or 2-pyridyl, which comprises reacting a compound of the formula I:

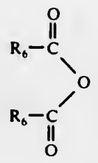


I

wherein ring A, Ar and R_2 are defined as above, with a dialkylmethyleneammonium salt wherein alkyl is of 1 to 3 carbon atoms, inclusive, in the presence of 0.05 to 0.5 moles of an acylating agent per 1 mole of the dialkylmethyleneammonium salt in which the acylating agent is selected from the group consisting of



wherein R_4 is phenyl, or alkyl of 1 to 5 carbon atoms, inclusive, in which the alkyl moiety can be chlorinated or fluorinated and Y is chloro or bromo, or with an acid anhydride of the formula:



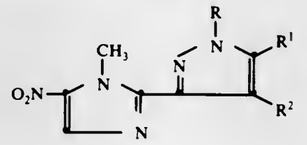
wherein R_6 is defined as a chloro or fluoro-substituted alkyl of 1 to 5 carbon atoms, or an alkyl chloroformate of the formula:

ClCOOR′

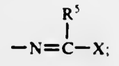
wherein R′ is a lower alkyl of 1 to 4 carbon atoms, to obtain the compound of formula II above.

4,075,222
3-(5-NITRO-2-IMIDAZOLYL)PYRAZOLES
John Pomfret Verge, Henley-on-Thames; Martin Charles Neville, Tadley, both of England, and Henry Friedman, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.
Division of Ser. No. 558,591, March 14, 1975, Pat. No. 3,980,794, which is a continuation-in-part of Ser. No. 469,176, May 13, 1974, Pat. No. 3,947,467, which is a continuation-in-part of Ser. No. 385,136, Aug. 2, 1973, abandoned. This application May 6, 1976, Ser. No. 683,985
Int. Cl.[2] C07D *233/92*; A01N *9/22*
U.S. Cl. 548—336 **8 Claims**

1. A compound of the formula



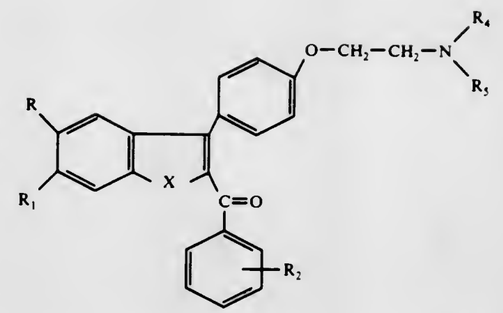
wherein
R is C_1-C_3 alkyl, halo(C_1-C_3)alkyl, or hydroxy(C_1-C_3)alkyl;
R^1 is



R^2 is cyano;
R^5 is hydrogen or C_1-C_3 alkyl;
X is OR^7; and
R^7 is C_1-C_8 alkyl, C_2-C_5 alkenyl, or halo(C_1-C_3)-alkyl.

4,075,223
NOVEL ANTIFERTILITY AGENTS
Tulio Suarez, and C. David Jones, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.
Division of Ser. No. 625,992, Oct. 28, 1975, Pat. No. 4,017,546. This application Nov. 24, 1976, Ser. No. 744,488
Int. Cl.[2] C07D *295/10*
U.S. Cl. 260—326.5 C **18 Claims**

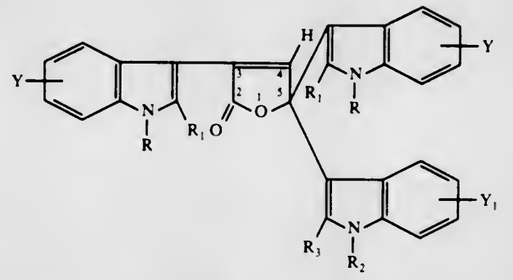
1. A compound of the formula



in which X is $-CH_2-$, $-CH_2-CH_2-$ or $-CH=CH-$; R and R_1 independently are hydrogen, hydroxyl, C_1- to C_5-alkoxy, or C_5- to C_6-cycloalkoxy; subject to the limitation that at least one of R and R_1 is hydrogen; R_2 is hydrogen, chloro, bromo, hydroxyl, C_1- to C_5-alkoxy, or C_5- to C_6-cycloalkoxy; subject to the limitation that at least one of R, R_1, or R_2 is other than hydrogen; and R_4 and R_5 independently are C_1-C_4 alkyl, or R_4 and R_5 taken together with the nitrogen to which they are bonded constitute a heterocyclic ring selected from the group consisting of pyrrolidino, piperidino, hexamethyleneimino, or morpholino; and pharmaceutically acceptable non-toxic acid addition salts thereof.

4,075,224
3,5-BIS (INDOLYL)-5-(INDOLYL)-2(5H)-FURANONES
Nathan Norman Crounse, Cincinnati, and Paul Joseph Schmidt, Sharonville, both of Ohio, assignors to Sterling Drug Inc., New York, N.Y.
Filed Jan. 22, 1976, Ser. No. 651,607
Int. Cl.[2] C07D *209/18, 209/20*
U.S. Cl. 260—326.14 R **20 Claims**

1. A 3,5-bis(1-R-2-R_1-5/6-Y-3-indolyl)-5-(1-R_2-2-R_3-5/6-Y_1-3-indolyl)-2(5H)-furanone having the formula



wherein:
R and R_2 represent hydrogen, non-tertiary alkyl of one to eight carbon atoms, alkenyl of two to four carbon atoms, benzyl or benzyl substituted in the benzene ring by one or two of halo or alkyl of one to three carbon atoms;
R_1 and R_3 represent hydrogen, alkyl of one to three carbon atoms or phenyl; and
Y and Y_1 represent one or two of hydrogen, alkyl of one to three carbon atoms, alkoxy of one to three carbon atoms, halo or nitro.

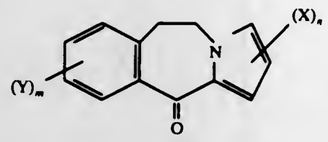
4,075,225

PYRROLO[2,1-B][3]BENZAZEPINES

Joshua Rokach, Laval; Joseph G. Atkinson, Montreal, both of Canada, and Clarence S. Rooney, Worcester, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed June 29, 1976, Ser. No. 701,047
Int. Cl.[2] C07D *487/04*
U.S. Cl. 260—326.31 18 Claims

1. A compound of structural formula:



wherein
n is [3, 2,]1, or 0 (X is hydrogen);
m is [4, 3, 2,[1 or 0 (Y is hydrogen); and
X and Y are independently selected from
(1) hydrogen,
(2) halo,
(3) formyl,
(4) lower alkanoyl,
(5) lower alkyl,
(6) lower alkoxycarbonyl,
(7) hydroxy-lower alkyl,
(8) perhalo-lower alkyl,
(9) lower alkoxy,
(10) cyano,
(11) perhalo-lower alkylthio,
(12) lower alkylthio,
(13) lower alkylsulfonyl,
(14) perhalo-lower alkylsulfonyl,
(15) lower alkylsulfinyl,
(16) perhalo-alkylsulfinyl,
(17) amino,
(18) lower alkanoylamino,
(19) lower alkylamino,
(20)di(lower alkyl)amino,
(21) hydroxy,
(22) N-lower alkylcarbamoyl,
(23) N,N-di(lower alkyl)carbamoyl,
(24) nitro,
(25) di(lower alkyl)sulfamoyl,
(26) lower alkoxycarbonylamino,
(27) N-loweralkyl-carbamoyloxy,
(28) carboxy, and
(29) carbamoyl;
with the proviso that if *m* is 0 (Y is hydrogen), *n* is 1 and X is —CN, X is in the 2 or 3-position.

4,075,226

SECONDARY ANTIOXIDANTS

Charles H. Foster, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 11, 1977, Ser. No. 777,236
Int. Cl.[2] C07D *335/04, 497/20*
U.S. Cl. 260—327 TH 3 Claims

1. Decahydro-3,3,8,8-tetramethoxy-2,7-epithio-1,4-ethanonaphthalene-5,9-dione.

2. Decahydro-3,3,8,8-tetraethoxy-2,7-epithio-1,4-ethanonaphthalene-5,9-dione.

3. Decahydro-dispiro[1,3-dioxolane-2,3'-(2',7'-epithio-1',4'-ethanonaphthalene)-8',2''-[1,3]dioxolane]-5',9'-dione.

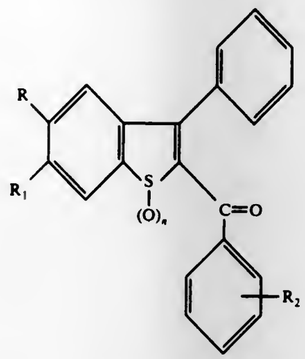
4,075,227

ANTIFERTILITY COMPOUNDS

C. David Jones, and Tullo Suarez, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 626,009, Oct. 28, 1975, abandoned. This application Nov. 22, 1976, Ser. No. 743,819
Int. Cl.[2] C07D *333/56, 333/64*
U.S. Cl. 260—330.5 8 Claims

1. A compound of the formula



in which *n* is 0 or 1; R and R_1 independently are hydrogen, hydroxyl, C_1- to C_5-alkoxy, or C_5- to C_6-cycloalkoxy; subject to the limitation that at least one of R and R_1 is hydrogen; R_2 is hydrogen, chloro, bromo, hydroxyl, C_1- to C_5-alkoxy, or C_5- to C_6-cycloalkoxy; subject to the limitation that at least one of R, R_1, or R_2 is other than hydrogen.

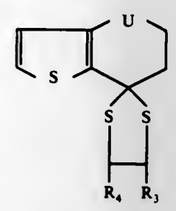
4,075,228

1,3-DITHIOLANE COMPOUNDS AND METHOD OF PREPARATION THEREOF

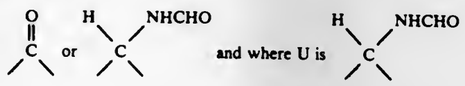
William Henry Gastrock, Hightstown, and Goro Asato, Titusville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 799,887, May 23, 1977. This application Sept. 2, 1976, Ser. No. 720,163
Int. Cl.[2] C07D *333/16*; A01N *9/00*
U.S. Cl. 260—332.3 P 3 Claims

1. A 1,3-dithiolane compound of formula:



wherein R_3 and R_4 are each hydrogen or methyl; and U is the substituent



said compound is the racemic mixture and the optical isomers thereof.

4,075,229

PROCESS FOR STABILIZING METALDEHYDE AND STABILIZED COMPOSITION

Beat Oehrli, Visp; Max Mettler, Ried near Brig, and Bruno Righetti, Naters, all of Switzerland, assignors to Lonza, Ltd., Gampel, Switzerland

Filed July 19, 1976, Ser. No. 706,272
Claims priority, application Switzerland, July 18, 1975, 009416/75
Int. Cl.[2] C07D *323/04*
U.S. Cl. 260—340 4 Claims

1. A process for stabilizing metaldehyde, which comprises mixing said metaldehyde and 0.005 to 5 percent by weight, based on the weight of said metaldehyde, of nicotinic acid amide, stabilizing said metaldehyde.

3. Stabilized metaldehyde which comprises metaldehyde and 0.005 to 5 percent by weight, based on the weight of said metaldehyde, of nicotinic acid amide, said nicotinic acid amide stabilizing said metaldehyde.

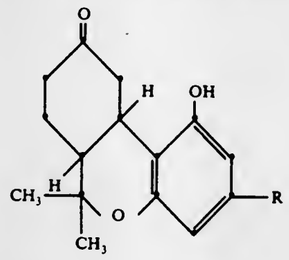
4,075,230

PREPARATION OF OPTICALLY ACTIVE TRANS-HEXAHYDRODIBENZOPYRANONES

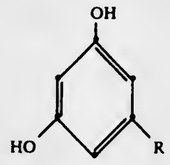
Robert A. Archer, and William A. Day, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 10, 1976, Ser. No. 740,507
Int. Cl.[2] C07D *311/78*
U.S. Cl. 260—345.3 9 Claims

1. A process for preparing an optically active trans-1-hydroxy-3-substituted-6,6-dimethyl-6,6a,7,8,10,10a-hexahydro-9H-dibenzo[b,d]pyran-9-one having the formula



wherein:
R is C_5–C_{10} alkyl, C_5–C_{10} alkenyl, C_5–C_8 cycloalkyl, and C_5–C_8 cycloalkenyl, comprising reacting an optically active isomer of apoverbenone with a 5-substituted resorcinol of the forumula



in the presence of aluminum chloride in an unreactive organic solvent.

4,075,231

PROCESS FOR PREPARING PHTHALIC ANHYDRIDE

Serge R. Dolhyj, Parma; Ernest C. Milberger, Solon, and James F. White, Akron, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 572,260, April 28, 1975, abandoned, which is a continuation of Ser. No. 362,412, May 21, 1973, abandoned. This application Nov. 12, 1976, Ser. No. 741,174
Int. Cl.[2] C07D *307/89*
U.S. Cl. 260—346.4 17 Claims

1. In the process for preparing phthalic anhydride by contacting a mixture of ortho-xylene and molecular oxygen at a temperature of about 200° C to about 600° C in the presence of an oxidation catalyst which is useful for reaction in a fixed-bed reactor, the improvement comprising:

using an oxidation catalyst consisting of
a. an essentially inert, porous support having a particle size of at least 20 microns, said inert support having an outer surface; and
b. a coating of a catalytically active material on said outer surface of said support which strongly adheres to said outer surface of said inert support, wherein said catalytically active material contains:

$$A_aD_bV_{12}O_x$$

wherein
A is Fe, Cr, Ni, Co, Mn, Cu, Ag, Bi, Zn, Mo, W or mixture thereof;
D is B, Sb or mixture thereof;
a is a number from greater than 0 to 5;
b is a number from greater than 0 to 10; and
x is the number of oxygens required to satisfy the valence requirements of the other elements present; wherein the weight of vanadium is less than 10% of the total weight of the oxidation catalyst.

4,075,232

PREPARATION OF MALEIC ANHYDRIDE FROM N-BUTENE IN A ONE-REACTOR, FLUID-BED SYSTEM USING TWO DIFFERENT CATALYSTS

Robert J. Zagata, Seven Hills, and Ernest C. Milberger, Solon, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Mar. 6, 1975, Ser. No. 556,092
Int. Cl.[2] C07D *307/60*
U.S. Cl. 260—346.75 10 Claims

1. In the process for the preparation of maleic anhydride by the reaction of n-butene with molecular oxygen wherein the reaction is carried out in the temperature range of about 200° to 600° C in the presence of an oxidation catalyst, utilizing a molar ratio of molecular oxygen to n-butene in the range of 4 to 12, the improvement comprising:
a. conducting the reaction in a fluid-bed reactor wherein the oxidation catalyst is maintained in one, substantially undivided reaction zone in such a manner that the oxidation catalyst can move to any point in the reaction zone; and
b. using as the oxidation catalyst a catalyst comprising a physical mixture of separate particles of first catalyst and separate particles of second catalyst—the first catalyst being one that is especially effective for the oxidation of n-butene to butadiene said first catalyst containing the oxides of at least molybdenum and bismuth, and the second catalyst being one that is especially effective for the oxidation of butadiene to maleic anhydride, said second catalyst containing molybdenum oxide and at least one other metal oxide selected from the group consisting of tungsten, antimony and vanadium.

4,075,233

16-DEHYDRO STEROIDS OF THE ANDROSTANE SERIES

Arthur Friedrich Marx, Delft, and Nicolaas Cornelis Maria Emanuel Barendse, Den Hoorn, both of Netherlands, assignors to Gist-Brocades N.V., Netherlands

Filed July 15, 1976, Ser. No. 705,446

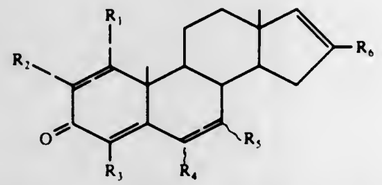
Claims priority, application United Kingdom, July 16, 1975, 29898/75

Int. Cl.² C07J *1/00*

U.S. Cl. 260—397.3 **44 Claims**

1. 16-Dehydro-androstane derivatives of the general formula:

I



wherein R_1, R_2 and R_5 each represent a hydrogen atom or a methyl group or R_1 and R_2 together represent a methylene group, R_3 represents a hydrogen or halogen atom or a hydroxyl or methyl group, R_4 represents a hydrogen or halogen atom or a methyl group or R_4 together with R_5 represent a methylene group, R_6 represents a hydrogen atom or an alkyl group having 1 to 3 carbon atoms, the dotted lines between the 1 - 2 and the 6 - 7 positions indicate the optional presence of one or two additional double bonds, but when all the symbols R represent a hydrogen atom there is at least one double bond in one of these positions, and the waved lines in the positions 6 and 7 indicate that R_4 and R_5 each are either in α- or β-position.

4,075,234

HYDRATED SOAP MAKING

Donald John Peterson, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 12, 1976, Ser. No. 731,163

Int. Cl.² C11C *1/04*; C11D *13/00*; C11C *1/08*; C10M *1/24*

U.S. Cl. 260—417 **15 Claims**

1. A process for preparing the sodium or lithium salts of organic carboxylic acids which comprises saponifying the corresponding organic carboxylic acid ester with a concentrated aqueous solution of sodium hydroxide or lithium hydroxide in a liquid reaction medium comprising an alkyl nitrile, separating said salts from the reaction mixture, and removing excess alkyl nitrile from the salts.

4,075,235

N-ARYL-UREA COMPOUNDS AND HERBICIDAL COMPOSITIONS

Engelbert Kuhle, Berg.Gladbach; Erich Klauke, Odenthal-Hahnenberg, and Ludwig Eue, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 5, 1973, Ser. No. 376,865

Claims priority, application Germany, July 14, 1972, 2234586

Int. Cl.² C07C *119/00*

U.S. Cl. 260—453 RW **1 Claim**

1. N-Aryl-urea compound designated N-(3-chloro-4-difluorochloromethylmercaptophenyl)-N'-methyl-N'-methoxyurea.

4,075,236

CONTINUOUS MANUFACTURE OF PEROXYESTERS

Uday Dakornath Wagle, Grand Island, and Venkatram Ramdas, Tonawanda, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Sept. 30, 1976, Ser. No. 728,349

Int. Cl.² C07C *179/18*

U.S. Cl. 260—453 RZ **9 Claims**

1. A process for the continuous manufacture of a peroxyester having the formula



wherein:

(a) *x*, *y*, and *n* are 1 or 2;

(b) when *x* is 2, *y* is 1 and *n* is 2;

(c) when *y* is 2, *x* is 1 and *n* is 2;

(d) when *x*, *y* and *n* are 1, R is selected from the group consisting of a primary, secondary, or tertiary alkyl of 1 to 17 carbons, aryl of 6 to 14 carbons, and cycloalkyl of 3 to 12 carbons, and R' is selected from the group consisting of a tertiary alkyl of 4 to 12 carbons, a tertiary aralkyl of 9 to 18 carbons, and tertiary cycloalkyl of 6 to 12 carbons;

(e) when *x* is 2, R is a diradical selected from alkylene of 1 to 16 carbons, arylene of 6 to 14 carbons, cycloalkylene of 3 to 12 carbons, and aralkylene of 7 to 18 carbons; and

(f) when *y* is 2, R' is a di-tertiary diradical selected from alkylene of 6 to 16 carbons, aralkylene of 12 to 18 carbons, and cycloalkylene of 7 to 12 carbons; which comprises:

(I) continuously reacting an acid chloride having the formula



a hydroperoxide having the formula $R'(OOH)_n$, and an aqueous alkali metal hydroxide in two reaction zones of intense mixing connected in series in a temperature range of about $-10°$ to $+50°$ C and a pH of 10 to 14, wherein the first reaction zone is maintained in the upper part of the temperature range and the second reaction zone is maintained in the lower part of the temperature range;

(II) continuously recovering the peroxyester product by

(i) continuously feeding the reaction mixture directly from the second reaction zone through a liquid-liquid separation unit;

(ii) continuously subjecting the product stream from the liquid-liquid separation unit to a series of washings and separations in a mixer-settler system; and

(iii) continuously gas stripping the product from the mixer-settler system in a stripping column; and

(iv) continuously adding the acid chloride, hydroperoxide and aqueous alkali metal hydroxide to the first reaction zone to replace that used up in the reaction effluent.

4,075,237

PERFLUORINATED ESTERS OF FUMARIC ACID AND CERTAIN OTHER ETHYLENICALLY UNSATURATED POLY-BASIC ACID AND SOIL REPELLANT POLYMERS THEREOF

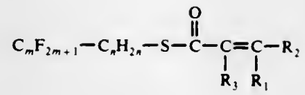
Eduard K. Kleiner, Dobbs Ferry, and Martin Knell, Ossining, both of N.Y., assignors to Geigy Chemical Corporation, Ardsley, N.Y.

Filed Apr. 10, 1968, Ser. No. 720,370

Int. Cl.² C07C *67/16, 69/60*

U.S. Cl. 260—455 R **2 Claims**

1. A compound of the formula:



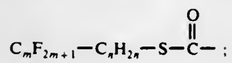
wherein

m is 6 to 12,

n is 1 or 2,

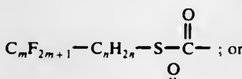
R_1 and R_2 are (a) hydrogen, (b) methyl, or

(c)



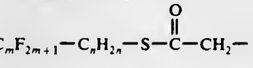
wherein *m* and *n* are as defined above; and R_3 is (a) hydrogen;

(c)



or

(d)



wherein *m* and *n* are as defined above;

provided that when

R_1 is (a), R_2 is (a), and R_3 is (c) or (d); or

R_1 is (a), R_2 is (c), and R_3 is (a) or (d); or

R_1 is (b), R_2 is (c), and R_3 is (a); or

R_1 is (c), R_2 is (a), and R_3 is (a) or (d); or

R_1 is (c), R_2 is (b), and R_3 is (a).

4,075,238

POLYHALOBENZYLIC DISULFOOXONIUM COMPOUNDS

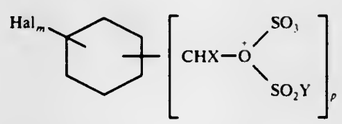
Victor Mark, Evansville, Ind., and Leon R. Zengierski, North Tonawanda, N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation of Ser. No. 410,723, Oct. 29, 1973, abandoned, and a continuation-in-part of Ser. No. 123,014, March 10, 1971, abandoned. This application Aug. 25, 1975, Ser. No. 607,326

Int. Cl.² C07C *141/14, 141/16, 47/48*

U.S. Cl. 260—458 C **23 Claims**

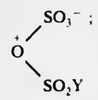
1. A compound of the formula:



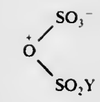
wherein

Hal is a halogen selected from the group consisting of fluorine, chlorine, bromine and iodine;

X is a substituent selected from the group consisting of —H and



Y is a substituent selected from the group consisting of chlorine and hydroxy, provided when X is



at least one Y is hydroxy;

m is at least one;

p is at least one;

m and *p* are integers so selected that their sum is six.

4,075,239

CYCLOHEXANE DERIVATIVES

Mikio Sawaki; Isao Iwataki, both of Odawara; Yoshihiko Hirono, Hiratsuka, and Hisao Ishikawa, Odawara, all of Japan, assignors to Nippon Soda Company, Limited, Tokyo, Japan

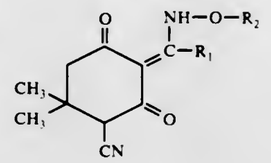
Continuation of Ser. No. 620,862, Oct. 9, 1975, Pat. No. 4,011,256, which is a division of Ser. No. 490,349, July 22, 1974, Pat. No. 3,950,420. This application Feb. 16, 1977, Ser. No. 769,346

Claims priority, application Japan, Aug. 15, 1973, 48-91425; Mar. 7, 1974, 49-25714

Int. Cl.² C07C *121/46*

U.S. Cl. 260—464 **4 Claims**

1. A compound of the formula



wherein

R_1 is selected from the group consisting of ethyl and propyl.

R_2 is selected from the group consisting of ethyl and allyl.

4,075,240

POLYSALTS OF POLYCARBOXYLIC ACID ESTERS AND HYDRAZINE OR HYDRAZIDES

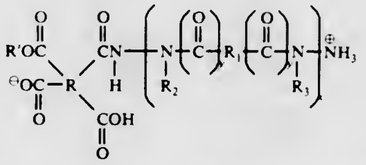
Karl F. Schimmel, Verona, and Marco Wismer, Gibsonia, both of Pa., assignors to PPG Industries, Inc, Pittsburgh, Pa.

Division of Ser. No. 511,322, Oct. 2, 1974, Pat. No. 4,020,050, which is a division of Ser. No. 369,628, June 13, 1973, abandoned. This application Nov. 4, 1975, Ser. No. 628,612

Int. Cl.² C07C *69/76, 109/04, 109/08, 109/10*

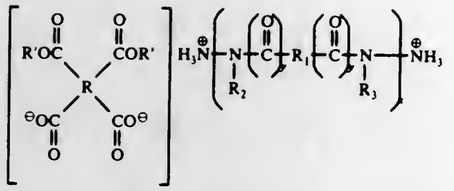
U.S. Cl. 560/34 **6 Claims**

1. A polysalt consisting of a repeating moiety of the structural formula:



wherein R is a tetravalent organic radical having at least two carbon atoms, R' is a monovalent alkyl, cycloalkyl or alkenyl radical having 1 to 20 carbon atoms, R_1 is a divalent organic radical selected from the group consisting essentially of alkylene, arylene, and heterocyclic; R_2 and R_3 are monovalent alkyl, aryl, aralkyl, cycloalkyl or hydrogen radicals and *x* and *y* are either 1 or 0.

4. A polysalt consisting of a repeating moiety of the structural formula:



wherein R is a tetravalent organic radical having at least two carbon atoms, R' is a monovalent alkyl, cycloalkyl or alkenyl radical having 1 to 20 carbon atoms, R_1 is a divalent organic radical selected from the group consisting essentially of alkylene, arylene, and heterocyclic, R_2 and R_3 are monovalent alkyl, aralkyl, cycloalkyl, or hydrogen radicals and x and y are either 1 or 0.

4,075,241

2-(ARYL)-3-(DIMETHYLAMINO)BUTYL-3,4,5-TRIMETHOXYBENZOATES

Elvio Bellasio, Albate (Como), and Franco Cristiani, Pavia, both of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

Filed May 8, 1972, Ser. No. 251,025
Claims priority, application Italy, May 12, 1971, 24390/71
Int. Cl.[2] C07C *65/08*
U.S. Cl. 560—73 **2 Claims**

1. The compound β-2-(3,4-dimethoxyphenyl)-3-(dimethylamino)butyl 3,4,5-trimethoxybenzoate hydrochloride.

2. The compound α-2-(3,4-dichlorophenyl)-3-(dimethylamino)butyl 3,4,5-trimethoxybenzoate hydrochloride.

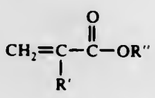
4,075,242

LOW MOLECULAR WEIGHT ACRYLATES OR METHACRYLATES

David Rhum, Westfield, N.J., and Patrick F. Aluotto, Cincinnati, Ohio, assignors to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 380,314, July 18, 1973, abandoned, and Ser. No. 521,723, Nov. 7, 1974, abandoned. This application Mar. 12, 1976, Ser. No. 666,527
Int. Cl.[2] C07C *69/34*; C08F *20/12, 20/14*
U.S. Cl. 560—190 **12 Claims**

1. A process for preparing low molecular weight, room temperature liquid acrylate or methacrylate resins from monomers about 20 to 100 weight percent of which are selected from acrylate and methacrylate esters having the general formula:



wherein R' is hydrogen or methyl and R'' is C_1-C_8 alkyl or mixtures thereof and about 0 to about 80 weight percent of which are selected from ethylenically unsaturated monomers copolymerizable therewith, which comprises:

A. heating to above about 150° C. at least 75 percent, by weight, of a reaction solvent containing an -OH group having a boiling point of above about 150° C. in a batch reactor;

B. adding at a temperature of above about 150° C. said monomers and the remaining solvent to the reactor over at least about 30 minutes so that the final polymerization solids of the reaction medium is above at least 30 weight percent;

C. maintaining the reaction above about 150° C. for a time sufficient to polymerize said monomers to a monomer to polymer conversion percentage of at least about 85 percent, by weight; and

D. stripping off substantially all of the reaction solvent.

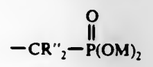
4,075,243

POLYQUATERNARY AMMONIUM METHYLENE PHOSPHONATES

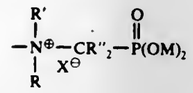
Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 237,883, March 24, 1972, Pat. No. 3,792,084. This application Oct. 29, 1973, Ser. No. 410,492
Int. Cl.[2] C07F *9/38*
U.S. Cl. 260—502.5 **7 Claims**

1. Polyquaternary ammonium methylene, or substituted methylene, phosphonates wherein all the methylene, or substituted methylene, phosphonate groups are of the formula



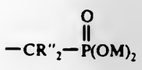
and are nitrogen-bonded and wherein the quaternary nitrogens are present in the phosphonates as



terminal groups and as



internal groups when there are more than 2 nitrogen atoms, there being at least two of the terminal groups in each phosphonate compound, wherein the nitrogen atoms are linked together by bridging groups containing at least 2 carbon atoms in each of the bridge chains, where the groups R and the bridging groups are hydrocarbon or hydrocarbon containing ethereal or hydroxy oxygen, where the groups R' are R groups or



groups, where the groups R'' are hydrogen or hydrocarbon, where M is hydrogen or a salt moiety, and where X^{31} is an anion.

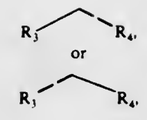
4,075,244

PROCESS FOR PREPARING METHACRYLIC ACID

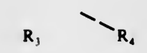
Shinichi Akiyama, and Haruhisa Yamamoto, both of Takaoka, Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 523,684, Nov. 14, 1974, abandoned. This application Oct. 26, 1976, Ser. No. 735,550
Claims priority, application Japan, Nov. 22, 1973, 48-131325; Mar. 14, 1974, 49-29405
Int. Cl.[2] C07C *51/32*
U.S. Cl. 260—530 N **17 Claims**

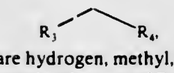
1. A process for the preparation of methacrylic acid which comprises reacting methacrolein with molecular oxygen in the vapor phase in the presence of an oxidation catalyst composition consisting essentially of a catalytic oxide of molybdenum (Mo), phosphorous (P), vanadium (V), at least one of rubidium (Rb), cesium (Cs), or potassium (K), and optionally at least one of strontium (Sr), zinc (Zn), cadmium (Cd), niobium (Nb), boron (B), lead (Pb) or tungsten (W), said catalyst composition having the following empirical formula:



or a mixture of



and



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl; wherein *g* is one, 2, or 3; and wherein *m* is one to 5, inclusive.

4,075,245

PROCESS FOR PREPARING SOLUTIONS OF N-METHYLOL-CHLOROACETAMIDE

Wilfried Paulus, and Karl-Heinz Rullmann, both of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 1, 1976, Ser. No. 701,929
Claims priority, application Germany, July 23, 1975, 2532805
Int. Cl.[2] C07C *103/38*
U.S. Cl. 260—561 HL **2 Claims**

1. Process for preparing a 35 to 45% strength by weight solution of N-methylol-chloroacetamide, which comprises treating chloroacetic acid methyl ester in solution in isopropanol with ammonia at temperatures of −20° to 10° C and then reacting with paraformaldehyde at temperatures of 60° to 120° C after the addition of water and a basic catalyst.

4,075,246

1,3-BIS(2,2,2-FLUORODINITROETHOXY)-2,2-BIS(DIFLUORAMINO) PROPANE

Kurt Baum, Pasadena, and Vytautas Grakauskas, Arcadia, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 29, 1976, Ser. No. 737,116
Int. Cl.[2] C07C *93/04*; C06B *25/00*
U.S. Cl. 260—584 C **1 Claim**

1. 1,3-bis(2,2,2, -fluorodinitroethoxy)-2,2-bis(difluoramino)-propane.

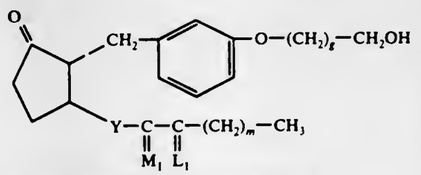
4,075,247

2-DECARBOXY-2-HYDROXYMETHYL-3,7-INTER-M-PHENYLENE-3-OXA-11-DEOXY-PGE$_1$ COMPOUNDS

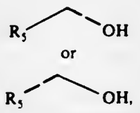
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,363, Jan. 8, 1976, Pat. No. 4,028,419. This application Mar. 17, 1977, Ser. No. 778,757
Int. Cl.[2] C07C *49/84*
U.S. Cl. 260—590 C **22 Claims**

1. A prostaglandin analog of the formula



wherein Y is trans-CH=CH-; wherein M_1 is



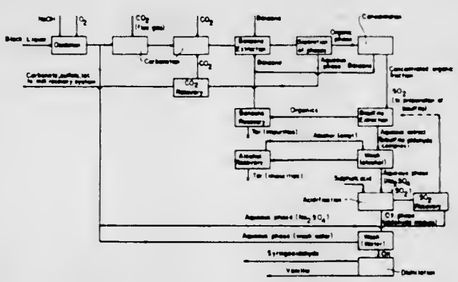
wherein R_5 is hydrogen or methyl; wherein L_1 is

4,075,248

PRODUCTION OF SYRINGEALDEHYDE FROM HARDWOOD WASTE PULPING LIQUORS

Harry Borden Marshall, Senneville, and Donald L. Vincent, Pointe Claire, both of Canada, assignors to Domtar Limited, Montreal, Canada

Filed Sept. 7, 1976, Ser. No. 720,628
Int. Cl.[2] C07C *45/00*
U.S. Cl. 260—600 R **6 Claims**



1. The process for the production of syringealdehyde from a lignin-containing waste liquor of a hardwood kraft pulping operation comprising: forming a charge of said waste liquor and alkali, passing oxygen-containing gas in intimate contact with said charge in a reactor under elevated temperature and pressure thereby to oxidize said liquor, neutralizing said oxidized liquor, extracting said neutralized oxidized liquor with an organic solvent thereby to separate an organic fraction soluble in said organic solvent from an aqueous fraction containing residual lignin and inorganic chemicals, recycling said aqueous fraction to the kraft pulping operation to recover alkali values from said fraction, treating said organic fraction with an aqueous solution of sodium bisulfite to form from part of said organic fraction an aqueous solution of a sodium bisulfite complex of syringealdehyde and vanillin, separating said aqueous solution of said complex from the remainder of said organic fraction, washing said aqueous solution of said complex with an aliphatic alcohol having a chain of 4–6 carbons, acidifying said washed aqueous solution to break up said complex and form an oil consisting essentially of a mixture of syringealdehyde and vanillin, and separating syringealdehyde from vanillin by fractional distillation.

4,075,249

3,4,5-TRIMETHOXY-α-ETHYNYL-BENZHYDROL AS A FUNGICIDALLY EFFECTIVE COMPOUND

Edit Toth; Jozsef Törley; Sandor Görög; Laszlo Szporny; Eva Palosi, and Szabolcz Szeberenyi, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar RT., Budapest, Hungary

Division of Ser. No. 495,846, Aug. 8, 1974, Pat. No. 3,965,179. This application Nov. 10, 1975, Ser. No. 630,510
Claims priority, application Hungary, Aug. 15, 1973, RI 520
Int. Cl.[2] C07C *33/06*
U.S. Cl. 260—613 D 1 Claim

1. 3,4,5-trimethoxy-α-ethynyl-benzhydrol.

4,075,250

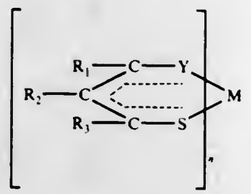
PRODUCTION OF PHENOLS

Peter Graham Spencer Field, St. Foy-les-Lyons, France, and Ronald Bennett, Chester, England, assignors to Burmah Oil Trading Limited, Cheshire, England

Filed May 5, 1975, Ser. No. 574,755
Claims priority, application United Kingdom, May 6, 1974, 19826/74
Int. Cl.[2] C07C *37/08*
U.S. Cl. 260—621 C 17 Claims

1. In the process comprising decomposing an aralkyl hydroperoxide, in which the aryl nucleus is substituted by at least one alkylhydroperoxide group containing from 2 to 24 carbon atoms and said aryl nucleus may be further substituted by one or more other substituents selected from halogen atoms and alkyl, alkoxy and nitro groups, to produce a correspondingly substituted or unsubstituted mono- or polyhydric phenol, the improvement comprising:

effecting the decomposition at a temperature of from ambient temperature to 180° C in the presence of a catalyst comprising a compound of the formula



wherein R_1, R_2 and R_3 are each independently selected from the group consisting of hydrogen atoms, straight chained and branched alkyl groups, phenyl, alkylphenyl groups and phenylalkyl groups, wherein the alkyl moieties contain from 1-8 carbon atoms, Y is an atom of oxygen or sulphur, M is a metal atom selected from the transition metals in Group VIII of the Periodic Table, and n is the oxidation state of the metal, said oxidation state being 2 or 3; and

recovering the produced phenol or substituted phenol from the decomposition product.

4,075,251

HYDROGENATION OF ORGANIC COMPOUNDS

Joseph K. Mertzweiller, and Horace M. Tenney, both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 596,584, July 17, 1975, Pat. No. 3,978,149, which is a division of Ser. No. 499,793, Aug. 22, 1974, Pat. No. 3,932,547, which is a division of Ser. No. 253,765, May 16, 1972, Pat. No. 3,855,324, which is a continuation-in-part of Ser. No. 880,933, Nov. 28, 1969, Pat. No. 3,711,423, which is a continuation-in-part of Ser. No. 674,098, Oct. 10, 1967, abandoned. This application Aug. 30, 1976, Ser. No. 718,548
Int. Cl.[2] C07C *29/14*
U.S. Cl. 260—638 B 16 Claims

1. A process for the hydrogenation of a feed containing C_4-C_8 aldehydes comprising the steps of:

forming a catalyst by

impregnating a support containing at least about 0.1 millimoles of hydroxyl groups per gram of support, said support comprising alumina with an aqueous solution of a transition metal salt comprising nickel acetate;

heat-treating the impregnated support at a temperature of at least about 500° F.;

activating the heat-treated impregnated support by contacting same with an organometallic compound having the formula: QR_n, wherein Q is selected from Group I, II or III metals of the Periodic Chart of the Elements, R is selected from the group consisting of hydride and alkyl, aryl, alkaryl, aralkyl and cycloalkyl radicals containing from 1 to about 20 carbon atoms and wherein n ranges from 1 to 3 and satisfies the valence of Q;

treating the activated supported metal complex in the presence of hydrogen at a temperature of at least about 300° F; and thereafter contacting said catalyst with said feed in the presence of a hydrogen-containing gas, thereby producing a hydrogenation reaction.

4,075,252

DIAZOTIZATION-FLUORINATION IN A MEDIUM OF HYDROGEN FLUORIDE-CONTAINING AMMONIUM IONS

Max M. Boudakian, Pittsford, N.Y., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 627,874, Oct. 31, 1975, abandoned. This application July 23, 1976, Ser. No. 707,975
Int. Cl.[2] C07C *25/13*
U.S. Cl. 260—649 F 11 Claims

1. In a process for preparing a fluorobenzene by (1) diazotizing a corresponding aminobenzene substrate in the presence of hydrogen fluoride and a diazotization agent selected from the group consisting of sodium nitrite, potassium nitrite, nitrous anhydride, nitrous acid, a nitrosyl halide, and a complex of a nitrosyl halide with hydrogen fluoride, to produce a corresponding diazonium fluoride and (2) decomposing said diazonium fluoride, the improvement which comprises:

conducting said diazotization and decomposition steps in a solution of hydrogen fluoride containing ammonium ions.

4,075,253

ORGANOLITHIUM POLYMERIZATION INITIATORS AND THEIR PREPARATIONS

Shigeki Horiie; Shin-Ichiro Asai; Takashi Torikoshi; Kazuhiro Shirakawa, and Minoru Handa, all of Machida, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 15, 1975, Ser. No. 577,980
Claims priority, application Japan, May 15, 1974, 49-54125
Int. Cl.[2] C07F *1/02*
U.S. Cl. 260—665 R 11 Claims

1. A process for preparing a polymerization initiator which comprises preparing a dilithium initiator solution by reacting lithium metal with alpha-methylstyrene in a polar solvent at a temperature of about −20° C to +30° C in a ratio of about 0.25 to 2.0 gram atoms of lithium metal per mole of said alpha-methylstyrene wherein the rate of addition of the alpha-methylstyrene ranges from about 0.06 mole to 2.0 moles per gram atom of lithium metal per hour, thereafter adding gradually at least 0.2 mole of a conjugated diene over a period more than about one hour at a temperature of about −20° C to +30° C to said dilithium initiator solution so as to consume completely any unreacted alpha-methylstyrene monomer and simultaneously obtain alpha-methylstyrene-conjugated diene oligomer dilithium, and then additionally adding at least two moles of said conjugated diene at a temperature of about −20° C to +30° C to said alpha-methylstyrene-conjugated diene oligomer dilithium so as to prepare a stable and non-polar solvent soluble alpha-methylstyrene-conjugated diene oligomer dilithium.

4,075,254

HYDROGENATION OF ALKYLSTYRENE TO PRODUCE ALKYLBENZENE USING COPPER CHROMITE CATALYSTS

Norman S. Boodman, and Jack W. Walter, both of Penn Hills Township, Allegheny County, Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 629,956, Nov. 7, 1975, abandoned. This application Apr. 29, 1977, Ser. No. 792,374
Int. Cl.[2] B01J *23/86;* C07C *15/02*
U.S. Cl. 260—667 14 Claims

1. In the process for producing alkylbenzene by hydrogenating a feed stream comprising α-alkylstyrene, the improvement comprising carrying out the hydrogenation in the presence of a copper chromite catalyst.

4,075,255

STEAM DEALKYLATION WITH HYDROGEN TREATED CATALYST OF GROUPS I, VI B, VIII

Tansukhlal G. Dorawala, Wappingers Falls; Russell R. Reinhard, Hopewell Junction, and John H. Estes, Wappingers Falls, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 610,198, Sept. 4, 1975, Pat. No. 4,008,181. This application Aug. 26, 1976, Ser. No. 717,843
Int. Cl.[2] C07C *3/58*
U.S. Cl. 260—672 R 8 Claims

1. The process for dealkylating an alkylaromatic hydrocarbon which comprises

a. treating a calcined supported catalyst bearing oxides of (i) a Group VIII metal, (ii) A group VI B metal, and (iii) a Group I A metal in the presence of hydrogen for 4-16 hours at 950°-1400° F thereby forming a treated catalyst;

b. passing a mixture of steam and alkylaromatic hydrocarbon, at steam dealkylating conditions, into contact with said treated catalyst thereby forming a product gas containing dealkylated alkylaromatic hydrocarbons; and

c. recovering said dealkylated alkylaromatic hydrocarbon.

4,075,256

PURIFICATION OF UNSATURATED COMPOUNDS

Alan W. Foster, and Alfio J. Besozzi, both of Houston, Tex., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

Division of Ser. No. 420,043, Nov. 29, 1973, Pat. No. 3,998,902, which is a continuation-in-part of Ser. No. 223,363, Feb. 3, 1972, abandoned. This application Aug. 16, 1976, Ser. No. 714,744
Int. Cl.[2] C07C *11/12*
U.S. Cl. 260—680 E 2 Claims

2. In a vapor phase process for the preparation of unsaturated hydrocarbons comprising

catalytic oxidative dehydrogenation of a feed stream of hydrocarbon compounds having 4 to 8 carbon atoms to produce an unsaturated hydrocarbon product stream having a greater degree of ethylenic unsaturation than said feed stream and containing organic carbonyl compounds as an impurity

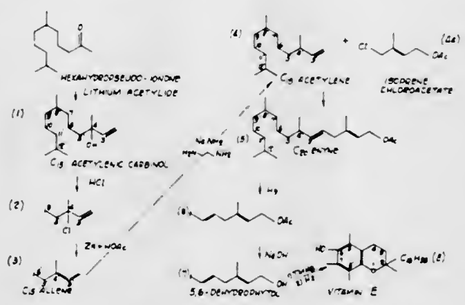
wherein the improvement comprises contacting only said product stream in vapor phase at a temperature in the range of 250° to 800° C and containing less than 5 mol percent free oxygen with a solid catalyst for destroying said carbonyl compounds and consisting essentially of Ca_2SiO_4 and calcium aluminate.

4,075,257

3,7,11-TRIMETHYLDODECA-1,2-DIENE

Ralph E. Close, Jacksonville, Fla., and William Oroshnik, Plainfield, N.J., assignors to SCM Corporation, New York, N.Y.

Division of Ser. No. 622,972, Oct. 16, 1975, which is a division of Ser. No. 560,550, March 20, 1975. This application Feb. 25, 1977, Ser. No. 772,264
Int. Cl.[2] C07C *11/12*
U.S. Cl. 260—680 R 1 Claim



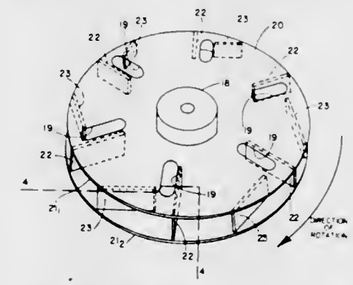
1. The compound 3, 7, 11-trimethyldodeca-1,2-diene.

4,075,258

ISOPARAFFIN OLEFIN ALKYLATION UTILIZING HIGH INTENSITY MIXING

Robert H. Caulk, and David E. Allan, both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 625,072, Oct. 23, 1975, Pat. No. 3,999,889. This application July 23, 1976, Ser. No. 708,058
Int. Cl.[2] C07C *3/54*
U.S. Cl. 260—683.44 11 Claims



1. In an alkylation process wherein a hydrocarbon phase, inclusive of an isoparaffin and olefin, is contacted with an acid catalyst in aqueous phase to produce an acid soluble oil and alkylation products, and wherein said hydrocarbon and aqueous phases are agitated, mixed and dispersed as an emulsion of said phases by use of a mixing apparatus, the head of said apparatus being inserted within the hydrocarbon and aqueous phases and rotated, the improvement comprising agitating said phases with said mixing apparatus, said head comprising a pair of coaxially aligned upper and and lower discs of similar size, geometric configuration and shape, a plurality of radially extended slots through said upper disc, the length of each slot being relatively long as contrasted with its width, compartments being formed between the spaced discs by a plurality of blade pairs associated with each of said radial slots, one blade of a pair being extended substantially from the peripheral edge

of said discs along the radius thereof for a distance of from 178 to about one-fourth of the radius, while the other blade of the pair being extended from the opposite side of a slot in a direction perpendicular to said radius and extended from the peripheral edge of the disc to the edge of said slot while maintaining the acid strength of the aqueous phase at concentration ranging from about 98 to 94 percent, and an acid soluble oil concentration ranging from about 0.5 to about 3 percent, based on the weight of the aqueous phase.

4,075,259

SATURATED HYDROCARBON ISOMERIZATION UTILIZING A CATALYST OF PLATINUM GROUP METAL, COBALT, TIN AND HALOGEN ON A CARRIER

Ernest L. Pollitzer, Skokie, and John C. Hayes, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 633,889, Nov. 20, 1975, Pat. No. 4,013,738, which is a continuation-in-part of Ser. No. 522,209, Nov. 8, 1974, Pat. No. 3,960,710. This application Nov. 1, 1976, Ser. No. 737,352

The portion of the term of this patent subsequent to June 1, 1993, has been disclaimed.

Int. Cl.² C07C *5/28*

U.S. Cl. 260—683.68 **16 Claims**

1. A process for isomerizing a saturated hydrocarbon which comprises contacting said hydrocarbon at isomerization conditions with a catalyst comprising a porous carrier material containing, on an elemental basis, 0.01 to 2 wt. % platinum group metal, 0.1 to 5 wt. % cobalt, 0.01 to 5 wt. % tin and 0.1 to 10 wt. % halogen, wherein substantially all of the platinum group metal, cobalt and tin are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum group metal and cobalt are present in the elemental metallic state and wherein substantially all of the tin is present in an oxidation state above that of the elemental metal.

4,075,260

EPOXY RESIN COMPOSITIONS AND LAMINATE MADE THEREWITH

Lo Kwang Tsen, Cosbocton, and John Louis Palkiewicz, Nashport, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 169,463, Aug. 8, 1971, abandoned. This application Feb. 13, 1976, Ser. No. 657,777

Int. Cl.² C08L *63/00*

U.S. Cl. 260—830 TW **7 Claims**

1. An epoxy resin composition which comprises a blend of first and second epoxy resins, said first epoxy resin comprising the diglycidyl ether of bisphenol A having an epoxy equivalent weight of 170 to 200 and an average functionality of not more than 2, said second epoxy resin comprising the reaction product of diglycidyl ether - bisphenol A epoxy resin and a polyhydric phenol selected from the group consisting of bisphenol A and tetrabromobisphenol A, said resulting second epoxy resins having an epoxy equivalent weight of 900 to 1900 and an average functionality of not more than 2, the proportions of said first resin ranging from about 30 to 60% by weight of resin solids and of said second resin from about 70 to 40% by weight of resin solids, and a curing system.

4,075,261

POWDER COATING COMPOSITION

Kanji Fujiyoshi; Yutaka Mizumura, and Junji Sono, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 373,218, June 25, 1973, Pat. No. 3,953,403. This application May 22, 1975, Ser. No. 580,376

Claims priority, application Japan, June 28, 1972, 47-65317; June 29, 1972, 47-65687; United Kingdom, June 27, 1973, 30522/73; Germany, June 27, 1973, 2332749; France, June 28, 1973, 73 23796; Italy, June 27, 1973, 68921/73

Int. Cl.² C08L *61/20, 61/28, 67/06*

U.S. Cl. 260—850 **7 Claims**

1. A powder coating composition comprising
1. a terephthalic acid-based unsaturated polyester which is prepared by reacting
   a. terephthalic acid or its lower alkyl ester, and
   b. an α-olefinic dicarboxylic acid or its anhydride, and
   c. optionally, an organic acid having at least three carboxy groups in the molecule or its anhydride, and
   d. an aliphatic or alicyclic glycol; and
2. an organic peroxide and an alkoxylatedpolyamino aldehyde resin.

4,075,262

COPOLYESTERS CAPABLE OF FORMING AN ANISOTROPIC MELT

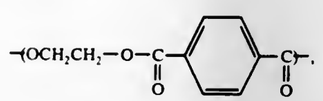
John Raymond Schaefgen, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 604,073, Aug. 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 468,696, May 10, 1974, abandoned. This application Dec. 21, 1976, Ser. No. 752,996

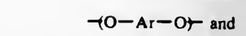
Int. Cl.² C08L *67/02*

U.S. Cl. 260—860 **10 Claims**

1. A fiber-forming melt spinnable copolyester capable of forming an anisotropic melt and consisting essentially of units of the formula:

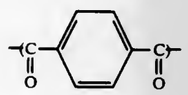


I



and II

III



wherein units II and III are present in substantially equimolar amounts; Ar is selected from the group of chloro-, methyl-, 2,6-dichloro-, 2,6-dimethyl-1,4-phenylene, or chloro-4,4'-biphenylene radicals; the copolyester containing from 15–70% by weight of unit I.

4,075,263

PROCESS FOR PREVENTING HYDROLYTIC DEGRADATION OF LINEAR SATURATED AROMATIC POLYESTERS COMPRISING A THERMOPLASTIC SATURATED AROMATIC POLYESTER AND A MOISTURE SCAVENGER POLYMER

Constance A. Lane, Philadelphia, and Joseph C. Koziar, Cornwells Heights, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Apr. 13, 1976, Ser. No. 676,596

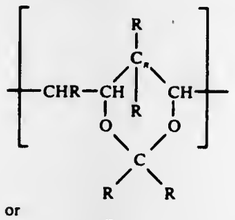
Int. Cl.² C08L *67/06*

U.S. Cl. 260—873 **13 Claims**

1. Composition comprising a linear thermoplastic saturated aromatic polyester, and a minor amount of a moisture scaven-

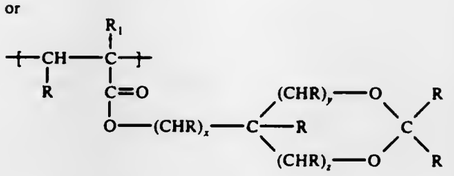
ger polymer containing cyclic acetal or cyclic ketal units, said units having a structure defined by either

I.



or

II.



where

R_1 is hydrogen or methyl;

each R is independently selected from hydrogen or an alkyl group having one to five carbon atoms;

x is an integer from one to nine;

y and z are zero or an integer from one to three but the sum of y plus z must equal one, two or three; and

n is 0, 1, or 2.

4,075,264

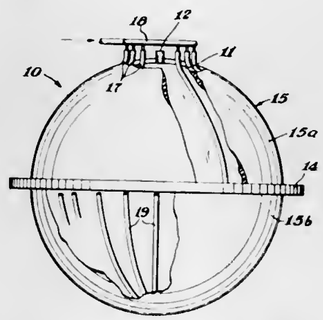
METHOD OF INSULATING A CONTAINER

Robert A. Hay, II, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 2, 1976, Ser. No. 673,335

Int. Cl.² B21D *51/18;* B29D *27/04*

U.S. Cl. 264—46.5 **6 Claims**



1. A method for the insulating of a container, the method comprising providing a container having at least a generally rigid containment wall, disposing over at least one face of the containment wall a layer of solid thermally insulating material of substantially lesser rigidity than the container wall to provide thermal insulation for the container, the improvement which comprises displacing the thermally insulating layer away from the container wall by means of fluid pressure applied between the container wall and the insulating layer and providing a solid thermal insulating material to a space formed between the container wall and the insulating layer.

4. The method of claim 1 wherein said fluid pressure is applied by a foamable, hardenable resinous composition.

4,075,265

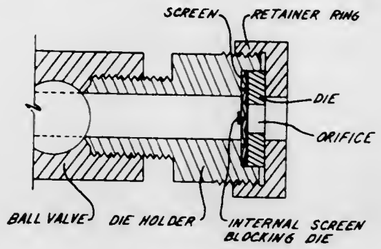
PROCESS FOR MAKING INSTANT SHAPED FOAMS

Charles E. McClung, Kettering; James L. Schwendeman, and Ival O. Salyer, both of Dayton, all of Ohio, assignors to Monsanto Research Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 597,113, July 18, 1975, abandoned. This application Apr. 30, 1976, Ser. No. 681,884

Int. Cl.² B29D *27/00*

U.S. Cl. 264—53 **14 Claims**



1. In a process for rapidly producing a substantially uniform, elongated, cellular, thermoplastic article comprising rapidly discharging from a vessel a pressurized gel of a solid thermoplastic amorphous polymer and a gaseous solvent in the range of about 25–100% by weight of said polymer, said polymer having a solubility parameter between 8.4 and 10.4 and an intrinsic viscosity value between 0.5 and 5.0, and said solvent being capable of forming a flowable gel with the polymer when subjected to super-atmospheric pressure, the improvement for shaping the article comprising restraining sufficiently the speed of flow of the gel from the vessel through the die to allow the die to shape the article, said gel being present in said vessel at a temperature in the range of about −10° to 50° C.

4,075,266

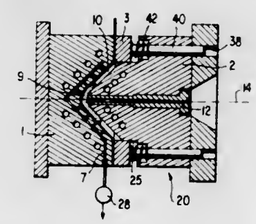
METHOD FOR COATING FOIL MATERIAL

Friedrich Theysohn, An den Hilligenwohren 9, D-3000 Hannover, Germany

Filed Nov. 1, 1976, Ser. No. 737,571

Int. Cl.² B29C *17/04;* B29D *9/00;* B29F *1/00*

U.S. Cl. 264—92 **4 Claims**



1. In an injection molding method for coating foil material of any desired shape with an injectable and pressable mass which stabilizes the foil material, the steps comprising:
   a. pressing an initially planar heated foil material by means of a depressor against a movable mold member of an injection mold having a movable mold member and a stationary mold member, the injection mold having a shape which corresponds to the later shape of the foil material;
   b. then pulling the foil material against the surface of the movable mold member by subatmospheric pressure;
   c. subsequently moving the movable mold member toward the stationary mold member of the injection mold to provide a gap between the foil material and stationary mold member and slowly injecting the mass into the gap

remaining between the foil material and the stationary mold member; and

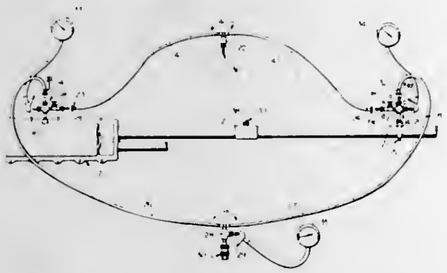
d. thereafter further moving the two mold members closer together to finally distribute the mass over the foil material and press the mass to the required thickness.

4,075,267

METHOD AND APPARATUS FOR MAKING PRESSURE PLUGS IN CABLES OR CABLE STUBS WITH CONTINUOUS AIR FLOW

James W. Florer, Los Angeles, Calif., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 9, 1976, Ser. No. 694,486
Int. Cl.² H01B *13/00*
U.S. Cl. 264—94 **11 Claims**



1. An apparatus for maintaining a continuous air flow through a cable under continuous air pressure during formtion of a cable pressure plug in said cable, said apparatus comprising:

a supplemental air source;

air pressure input assembly means connected to said supplemental air source for routing the air therefrom;

pressure valve crossover assembly means connected to said cable on each side of and spaced from the proposed location of said cable pressure plug and connected to said air pressure input assembly means for regulating and directing the flow of air coming from said air pressure input assembly means;

adjustable air pressure equalization assembly means connected between said pressure valve crossover assembly means on both sides of said proposed cable plug location for maintaining an adjusted equalized pressure therebetween; and

at least one gauge means adapted to be connected to said pressure valve crossover assembly means and said air pressure equalization assembly means for determining the air pressure thereat.

8. A method for forming a cable pressure plug in a cable under continuous air pressure while maintaining continuous air flow through said cable, said method comprising:

determining the air pressure in said cable on both sides of the proposed pressure plug location;

installing two pressure valve crossover assembly must spaced from each other, one on each side of the proposed pressure plug location;

connecting an air pressure input assembly means between both of said air valve crossover assembly means;

connecting an air pressure equalization assembly means between both of said pressure valve crossover assembly means, said air pressure equalization assembly means having an adjustable pressure release valve;

connecting gauging means to each of said pressure valve crossover assembly means and to said air pressure equalization assembly means;

opening said pressure release valve in said air pressure equalization assembly completely;

adjusting a supplemental air source to a desired output pressure and attaching said supplemental air source to said air pressure input assembly means;

adjusting said pressure release valve of said air pressure assembly means to continuously maintain a constant air pressure through said air pressure assembly means;

adjusting said pressure valve crossover assembly means to achieve equal pressure readings on said gauging means attached thereto by regulating downward the crossover assembly means on the higher pressure side;

preparing said cable and installing a pressure plug injecting means at the proposed pressure plug location;

injecting a predetermined amount of pressure plug forming compound into said cable through said pressure plug injecting means;

continuously maintaining a constant pressure on both sides of said pressure plug location by adjusting the crossover valve assembly means on the higher pressure side while said compound is being injected into said cable;

closing the pressure plug injecting means after all of the plugging compound has been completely injected into said cable;

maintaining equalized pressure on both sides of said plug location until said plugging compound is set; and

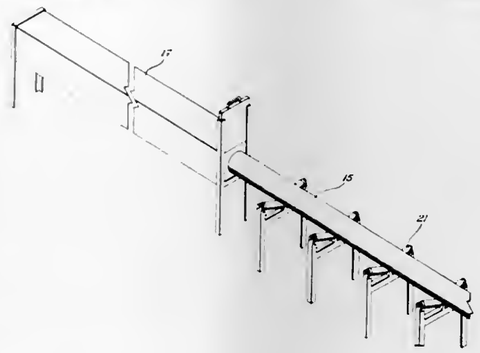
discontinuing the supplemental air supply once said plugging compound is set, and removing said air pressure input assembly means, said air pressure equalization assembly means and said pressure valve crossover assembly means from said cable.

4,075,268

METHOD OF MAKING DUAL WALL PIPE WITH FOAM INSULATION BETWEEN PIPE WALLS

Harold L. Nolan, 1914 Elmhurst Drive, Arlington, Tex. 76012

Filed Sept. 20, 1976, Ser. No. 724,637
Int. Cl.² B29C *17/00, 27/02;* B29D *23/00;* B29F *5/00*
U.S. Cl. 264—138 **14 Claims**



1. A method of insulating a conduit comprising:

heating a thermoplastic pipe to cause expansion of its diameter; the thermoplastic pipe being larger in diameter than the conduit, forming an annular space between the thermoplastic pipe and the conduit when the conduit is carried concentrically within the thermoplastic pipe;

forming an annular layer of insulating material of a size substantially equal to the annular space when the thermoplastic pipe is at ambient temperature;

inserting the conduit into the annular layer; and

inserting the annular layer into the thermoplastic pipe while the thermoplastic pipe is at an elevated temperature, to facilitate insertion.

4,075,269

PROCESS FOR PRODUCING WHOLLY AROMATIC POLYAMIDE FIBERS OF HIGH STRENGTH

Rufus S. Jones, Jr., Randolph; Marshall Tan, Ridgefield Park, and Eui Won Choe, Randolph, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Sept. 23, 1976, Ser. No. 726,089
Int. Cl.² D01D *5/12*
U.S. Cl. 264—184 **32 Claims**

1. An improved process for preparing wholly aromatic polyamide fibers comprising:

a. providing a spinning solution containing from about 10 to 30 percent by weight of a wholly aromatic polyamide having (1) chain extending bonds from the aromatic nuclei thereof which are coaxial or parallel and oppositely directed, and (2) a sulfur content of at least 0.5 percent by weight as sulfonic acid and/or sulfonate groups attached to said aromatic nuclei of said wholly aromatic polyamide;

b. solution spinning said spinning solution of said wholly aromatic polyamide through a spinning jet to provide as-spun fibers having an inherent viscosity of at least 1.0; and

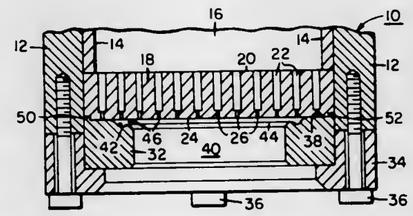
c. thermally treating said as-spun fibers at a temperature within the range of about 150° to 650° C. while under a longitudinal tension sufficient to maintain a constant length or to elongate the fibers up to about 5 percent of the as-spun length thereby producing fibers having a single filament tenacity of at least 15 grams per denier, an elongation of at least 1.5 percent, and an initial modulus of at least 400 grams per denier.

4,075,270

EXTRUSION DIE MASK

George M. Cunningham, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 532,362, Dec. 13, 1974, Pat. No. 3,947,214.
This application Nov. 10, 1975, Ser. No. 630,345
Int. Cl.² B29D *23/04*
U.S. Cl. 264—209 **2 Claims**



1. A method of forming an integral skin about an extruded honeycomb article as the article is being extruded, comprising the steps of extruding batch material through a die to form a honeycomb article, simultaneously collecting batch material extruded through said die in a reservoir peripherally of said extruded article, flowing such collected material radially inwardly through a predetermined gap toward the outer periphery of said extruded article, and forming an integral skin of predetermined thickness proportional to said predetermined gap on the outer periphery of said extruded article with the material flowing radially thereto.

4,075,271

PRODUCTION OF POLYCAPROAMIDE FIBER WHEREIN POLYCAPROAMIDE IS REACTED WITH PHENYLENE BIS-(3-BUTANE-1,2-DICARBOXYLIC ANHYDRIDE)

Robert Alden Lofquist, Richmond, and John Christopher Haylock, Midlothian, both of Va., assignors to Allied Chemical Corporation, Morris Township, N.J.

Continuation-in-part of Ser. No. 622,273, Sept. 10, 1975. This application Oct. 27, 1976, Ser. No. 735,932
The portion of the term of this patent subsequent to Dec. 6, 1994, has been disclaimed.
Int. Cl.² C08G *69/46;* D02J *1/22*
U.S. Cl. 264—210 F **2 Claims**

1. In a process for the formation of polycaproamide fiber from a fiber-forming polycaproamide polymer having excess number of carboxyl end groups over amino end groups, by melt-extruding the polymer through an orifice into a quenching medium and thereafter stretching the resulting filament, the improvement wherein said fiber-forming polycaproamide polymer is prepared by a process comprising:

a. forming a molten polymerization mixture at 240°–290° C. from e-caprolactam;

b. smoothly stirring said polymerization mixture while flowing over the surface thereof an inert gas at a flow rate of at least 1 unit volume of said gas, measured at standard temperature and pressure, per hour per each unit volume of said polymerization mixture, until the total primary amino group plus carboxyl group analysis of the resulting hot water washed and dried polymer is between 95 and 135 milliequivalents per kilogram of polymer; and

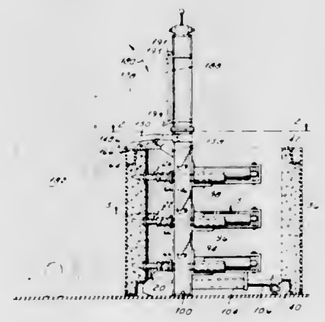
c. reacting said polymer at 250°–290° C. with about 0.06–0.7 mol per 100 mols of lactam in the polymer, of phenylene-bis-(3-butane-1,2,-dicarboxylic anhydride) until the primary amino group analysis of the polymer is between 5 and 35 milliequivalents per kilogram of polymer and the carboxyl group analysis of the polymer is between 30 and 90 milliequivalents per kilogram of polymer, thereby reducing the occurrence of nubs in the fiber.

4,075,272

LADDER RUNG IMPLANTER

Edward P. Washabaugh, 401 Kelton St., Bay City, Mich.

Division of Ser. No. 523,438, Nov. 13, 1974, Pat. No. 3,989,177.
This application Apr. 16, 1976, Ser. No. 677,726
Int. Cl.² B28B *1/00, 23/00*
U.S. Cl. 264—249 **6 Claims**



1. The method of casting concrete manhole sections and implanting steps therein comprising positioning a base ring and an outer form on a turntable, rotating the turntable to bring the base ring and outer form to a casting station, extending an inner form upwardly through the base ring in concentric relation with the outer form, pouring concrete between the forms and casting the section therebetween, withdrawing the inner form from the green concrete section, rotating the turntable to

another position, extending upwardly through the base ring and the green section step implanting means including a laterally shiftable step carrier, locating the implanting means against the base ring and upper edge of the outer form, shifting the carrier to implant a step carried thereby into the green concrete section, withdrawing the implanting means downwardly out of the green section, and removing the ring and outer form and the green manhole section from the turntable to a place for curing.

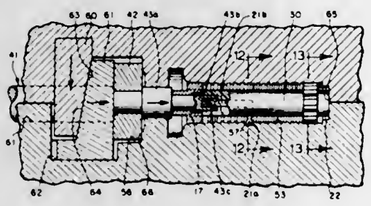
5. The method of affixing a manhole step having at least one projecting arm for embedment in a green concrete wall of a manhole comprising: positioning the step to be affixed so that the free end of the arm is disposed in confronting relation with the green concrete manhole wall and such that the plane of the step is substantially perpendicular to the axis of the manhole, applying a continuous and uninterrupted force exerted by a power source to the step in the direction to urge the arm into the green concrete wall and of a magnitude sufficient to overcome the resistance of penetration of the arm thereinto with the result that the arm is advanced into the wall in a continuous and uninterrupted manner, continuing the application of such uninterrupted force until the arm of the step has penetrated the green concrete wall to a depth represented by the abuttment of a depth ring carried by the arm with the inner surface of such wall, and further continuing the application of such force to the step to forcibly embed the depth ring in such surface of the wall thus compacting the green concrete immediately surrounding the penetrated portion of the arm.

4,075,273

METHOD OF MAKING A COIL FORM BY INJECTION MOLDING

James P. Liautaud, River Bluff Road, Trout Valley, Cary, Ill. 60013

Division of Ser. No. 676,682, April 14, 1976, abandoned. This application Oct. 28, 1976, Ser. No. 736,323
Int. Cl.[2] B29D *3/00*; B29F *1/10*
U.S. Cl. 264—250 **17 Claims**



1. The method of forming an injection-molded coil form having a winding support surface of precise dimensions comprising:

forming a coil insert member of electrically non-conductive material;

positioning electrically conductive end fittings at either end thereof to form a core assembly;

positioning the core assembly in a mold cavity having a molding surface corresponding to the desired winding support surface of the coil form;

injecting plastic into the mold cavity to form a thin overmold layer on said core to provide the desired winding support surface, and ejecting the coil form from the mold cavity;

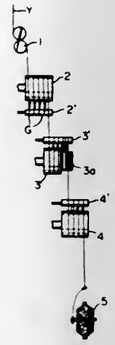
said forming a core including forming said core to dimensions which provide a core assembly of greater length than the coil form and axially comprising said core assembly before said injecting step to obtain a desired predetermined length for said core assembly.

4,075,274

METHOD FOR DRAWING AND HEAT-TREATING POLYESTER YARNS

Isao Kobayashi; Yoshiharu Asada, both of Matsuyama, and Shiro Kumakawa, Iwakuni, all of Japan, assignors to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 457,143, April 1, 1974, abandoned. This application Mar. 18, 1976, Ser. No. 668,037
Claims priority, application Japan, Apr. 7, 1973, 48-39123
Int. Cl.[2] B29C *17/02*
U.S. Cl. 264—290 T **10 Claims**



1. A method for drawing and heat treating a polyester yarn which comprises the successive steps of:

A. feeding an undrawn multifilament linear polyester yarn having a second order transition point Tg over a heated feed roller having a substantially uniform surface temperature of from (Tg − 10° C) to (Tg + 30° C);

B. picking up the yarn from the preceding heated roller onto a heated draw roller having a surface temperature which increases continuously from the yarn in-coming roller surface contact point to the yarn out-going roller surface contact point and having a maximum surface temperature higher than the surface temperature of the preceding heated roller, at a total draw ratio from the heated feed roller of from 3.5 to 7.5;

C. picking up the yarn from the heated draw roller in step (B) onto a non-heated take-up roller;

D. cooling the yarn on the take-up roller; and

E. winding the yarn;

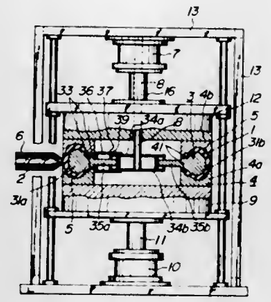
with the provisos that: (i) the yarn is shrunk from 1 to 10% on the heated draw roller in step (B), (ii) the yarn is shrunk a further 1 to 10% between the heated draw roller in step (B) and the take-up roller in step (C), and (iii) the yarn is picked up on the heated draw roller in step (B) at a low surface temperature point and discharged at a higher surface temperature point wherein when the operation of the method is resumed after stopping, the running speed of the yarn on the take-up roller is maintained at not more than (100 − 5.7 × S) m/min., wherein S is the total shrinkage of the yarn, until the yarn heated during stoppage has been shrunk in the subsequent shrinking step, and then the yarn is passed over the take-up roller at a running speed of 200 to 1200 m/min.

4,075,275

METHODS OF CASTING PNEUMATIC TIRES

Kazuhiro Nishimura, Kodaira; Jumei Harada, Higashi-Murayama; Tetsuhiko Migita, Kodaira, and Tsutomu Matsunaga, Higashi-Murayama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Division of Ser. No. 568,350, April 15, 1975, Pat. No. 3,994,650. This application Aug. 4, 1976, Ser. No. 711,668
Claims priority, application Japan, Apr. 22, 1974, 49-45212
Int. Cl.[2] B29C *1/12*
U.S. Cl. 264—313 **3 Claims**



1. In a method of casting pneumatic tires by pouring a fluidized tire-forming material into a molding cavity defined between the outer peripheral surface of a separable hard core of a mold assembly and the inner peripheral surface of an outer separable hard mold member of said mold assembly, said outer peripheral surface of said separable core defining the inner peripheral surface of a pneumatic tire to be cast and said inner peripheral surface of said outer separable mold member defining the outer peripheral surface of the pneumatic tire to be cast, the improvement comprising the steps of: coaxially aligning said separable core within said outer separable mold member to define said molding cavity therebetween, said core having at least three segments circumferentially arranged and adjoining with each other through a junction surface to make said core toroidal in shape, said junction surface permitting alternate segments to be retracted in a radial direction in succession, and each of said segments being provided at its inner peripheral upper and lower edges with portions engageable with said separable mold members, pouring a fluidized tire-forming material into said molding cavity under pressure, soldifying the material thus poured, separating said outer separable mold member from said tire and said core, retracting alternate segments of said separable core in the radial direction and then moving said alternate segments into planes defined by said segments which are different than a plane defined by the remaining unretracted segments, retracting the remaining unretracted segments of said separable core in the radial direction, and removing the cast tire from said mold assembly.

4,075,276

BORON NITRIDE-BORON NITRIDE COMPOSITES

James Economy, Eggertsville, N.Y.; Choll K. Jun, Greensburg, Pa., and Ruey Y. Lin, Williamsville, N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Feb. 27, 1974, Ser. No. 446,452
Int. Cl.[2] C04B *35/58*
U.S. Cl. 264—332 **9 Claims**

1. A process for the preparation of boron nitride-boron nitride composite bodies, comprising the steps of:

a. forming a blend of from about 10 to about 90 percent of essentially pure polycrystalline boron nitride fibers with from about 90 to about 10 percent of partially nitrided boric oxide fibers, said boron nitride fibers and said partially nitrided boric oxide fibers having a maximum diameter of 10 microns, and said partially nitrided fibers consisting essentially of boron, oxygen, hydrogen, and from about 30 percent to about 55 percent by weight of nitrogen;

b. forming a composite body of said blended fibers;

c. heating said composite body, at a pressure of from about 200 to about 500 psi in an inert atmosphere, to a first elevated temperature at which essentially all boric oxide present is decomposed; and

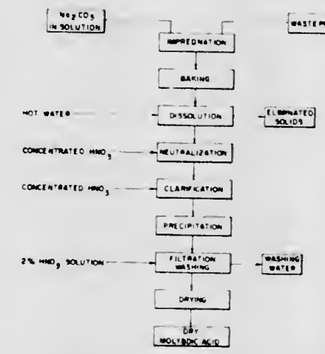
d. further heating said body to a second elevated temperature of from about 2000° C to about 2200° C.

4,075,277

PROCESS FOR RECOVERING MOLYBDENUM VALUES FROM SPENT CATALYSTS

Herman Castagna, Moutiers; Guy Gravey, Saint Marcel, and Andre Roth, Moutiers, all of France, assignors to Metaux Speciaux S.A., Paris, France

Filed Jan. 31, 1977, Ser. No. 763,911
Claims priority, application France, Feb. 5, 1976, 76 03674
Int. Cl.[2] C01G *39/00*
U.S. Cl. 423—55 **7 Claims**



1. A process for recovering molybdenum in the form of molybdic acid from alumina containing spent catalysts containing molybdenum oxide or molybdenum sulfide comprising treating the alumina containing spent catalyst with an aqueous solution of sodium carbonate at a temperature of from 60° to 100° C, and in a quantity in excess of that stoichiometrically necessary for obtaining the molybdenum in the form of sodium molybdate and the sulfur in the form of sodium sulfate which excess expressed in weight of sodium carbonate does not exceed 10%, baking the sodium carbonate treated alumina containing spent catalysts at a temperature of from 600° to 800° C to convert the molybdenum present to sodium molybdate, cooling to a temperature of from 70° to 80° C, dissolving the sodium molybdate by washing in hot water at a temperature of from 60° to 100° C, cooling the dissolved sodium molybdate to a temperature not exceeding 30° C, neutralizing the cooled solution of sodium molybdate by continuously introducing concentrated nitric acid at a temperature not exceeding 30° C and at a rate of flow adjusted to achieve a pH value of 5 to 6 to convert the sodium molybdate to molybdic acid, further adding nitric acid to clarify the nitric acid solution, and precipitating molybdic acid.

4,075,278

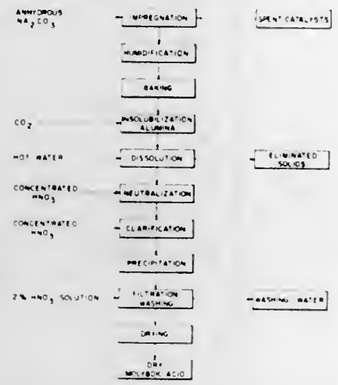
PROCESS FOR RECOVERING MOLYBDENUM VALUES FROM SPENT CATALYSTS

Guy Gravey, Saint Marcel; Paul Grolla, and Andre Roth, both of Moutiers, all of France, assignors to Metaux Speciaux S.A., Paris, France

Filed Feb. 3, 1977, Ser. No. 765,383
Claims priority, application France, Nov. 22, 1977, 77 35867
Int. Cl.[2] C01G *39/00*
U.S. Cl. 423—55 **7 Claims**

1. A process for recovering molybdenum in the form of a

substantially aluminum-free compound from spent catalyst based on active alumina comprising mixing the spent catalyst with sodium carbonate in the form of an anhydrous powder, whereby the sodium carbonate is distributed over the surface of the catalyst particles, adding water at ambient temperature and restirring to obtain by virtually complete absorption of the water inside the catalyst particles to impregnate the spent catalyst, baking the catalyst thus impregnated at a temperature



of from 600° C to 800° C to convert the molybdenum present to sodium molybdate, subjecting the baked spent catalyst to the action of carbon dioxide gas in a quantity of the order of 1 Nm^3 for 50 to 100 kg of catalyst and at a temperature close to ambient temperature, washing the carbon dioxide treated catalyst with water to form an alkaline solution, neutralizing and clarifying with concentrated nitric acid to convert the sodium molybdate to molybdic acid.

4,075,279

PROCESS FOR THE MANUFACTURE OF SWELLABLE CELLULOSE ETHERS

Arno Holst, and Michael Kostrzewa, both of Wiesbaden, Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Sept. 23, 1976, Ser. No. 726,000
Claims priority, application Germany, Sept. 27, 1975, 2543187
Int. Cl.² C08B *11/00, 15/10*
U.S. Cl. 536—88 **3 Claims**

1. In the process for the manufacture of water-absorbing, but largely water-insoluble cellulose ethers, wherein cellulose is etherified with a halogen fatty acid in an alkaline medium to which organic solvents may be added, to such an extent that without a further reaction a water-soluble cellulose ether would be produced, and wherein, prior to, during, or after etherification, said further reaction is carried out with a cross-linking agent which is polyfunctional towards cellulose in an alkaline reaction medium,

the improvement comprising that chips of regenerated cellulose film are used as cellulose.

4,075,280

PREPARATION OF IMPROVED ZEOLITES

Robert Charles Fitton, Bel Air, and Barbara Ann Fiore, Baltimore, both of Md., assignors to J. M. Huber Corporation, Locust, N.J.

Filed Sept. 28, 1976, Ser. No. 727,822
Int. Cl.² C01B *33/28*
U.S. Cl. 423—118 **19 Claims**

1. A method for the production of improved zeolite A products which comprises reacting a calcined kaolin clay in a first digestion stage with a source of alkali metal in aqueous solution, the amount of alkali metal in the first digestion stage being about 15–40 wt. % of the total weight of alkali metal to be contained in the final zeolitic batch composition comprising the zeolite A product and liquid phase mother liquor, the digestion step being conducted at a temperature of about 40°–65° C and under conditions of high shear, said high shear comprising high dispersive agitation which has sufficient magnitude and intensity to establish high shear zones and intense turbulence and maintain each crystal in a discrete, segregated condition, thereafter gradually increasing the temperature of the resulting mixture to the range of about 80°–100° C while maintaining said conditions of high shear and adding the remaining 60–85 wt. % of the alkali metal to be contained in the final zeolitic batch composition while continuing the conditions of high shear, thereafter permitting the resulting mixture to cool and recovering the zeolitic A product from the mixture by separation from the mother liquor.

4,075,281

PURIFICATION OF CARBONATE PROCESS SOLUTIONS

Eugene Baker Port, Green River, Wyo., and Norman Rutledge Garofano, Syracuse, N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Continuation-in-part of Ser. No. 146,443, May 24, 1971, Pat. No. 3,927,175, which is a continuation of Ser. No. 771,598, Oct. 29, 1968, abandoned. This application May 28, 1975, Ser. No. 581,467
The portion of the term of this patent subsequent to Dec. 16, 1992, has been disclaimed.
Int. Cl.² C01D *7/26;* B01D *15/06*
U.S. Cl. 423—206 T **3 Claims**

1. A process for the reduction of soluble organic contaminants in a carbonate process solution which comprises passing said process solution through a bed of activated carbon particles until the adsorption efficiencies of said bed for the removal of said organic contaminants is reduced to at least 75% of the original adsorptive capacity of the activated carbon bed prior to regeneration, regenerating said bed by subjecting said bed to an aqueous wash cycle which comprises passing an aqueous wash liquor through said bed until at least 60% of said adsorbed organic contaminants have been desorbed, wherein the flow rates of the aqueous wash liquor are periodically randomly varied from flow rates insufficient to effect reorientation of the carbon bed particles to flow rates sufficient to effect volume bed expansion up to about 75% of the static bed volume and said aqueous wash liquor has an organic contaminant level lower than the carbonate process solution and said aqueous wash liquor is maintained at a temperature between 50° and 95° C.

4,075,282

PROCESS FOR IMPREGNATING ACTIVE CARBON WITH IODINE COMPOUNDS

Klaus Storp, Frankfurt am Main; Hans Wirth, Bad Vilbel; Günter Rittinger, Karben, and Volker Hohmann, Frankfurt am Main, all of Germany, assignors to Laboratorium fur Adsorptionstechnik GmbH, Frankfurt am Main, Germany

Filed Jan. 22, 1976, Ser. No. 651,350
Claims priority, application Germany, Feb. 22, 1975, 2507672
Int. Cl.² C01B *17/16, 17/00;* B01J *27/06, 21/18*
U.S. Cl. 423—230 **4 Claims**

1. A process for the removal of sulfur dioxide or hydrogen sulfide from a gas stream which comprises the steps of:

a. impregnating in a static state an active-carbon bed with an aqueous solution containing iodine or a water-soluble iodide salt and a reducing agent soluble in said solution and selected from the group which consists of sulfur dioxide, alkali metal sulfites, alkali metal hydrogen sulfites and hydrazine, the quantity of said reducing agent being at least the equivalent of the reducing capabilities of 3 grams of SO_2 per liter; and

b. thereafter passing said gas through the impregnated bed.

4,075,283

SELECTIVE REMOVAL OF NITROGEN OXIDES FROM WASTE GASES CONTAINING SULFUR OXIDES

Tatsuo Shiraishi; Shinkichi Shimizu, and Tadashi Shindo, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed July 25, 1974, Ser. No. 491,760
Claims priority, application Japan, Feb. 1, 1974, 49-13829
Int. Cl.² B01J *8/00;* C01B *21/00*
U.S. Cl. 423—239 **11 Claims**

1. A process for the selective removal of nitrogen oxides from waste gases containing 20 ppm or more in gas volume of sulfur oxides a portion of which is sulfur trioxide and 1,500 ppm or less of nitrogen oxides, which comprises contacting said waste gases with ammonia in the amount of 0.3 to 4 moles of ammonia per 1 mole of nitrogen oxides contained in said waste gases in the presence of a catalyst consisting essentially of metal oxides consisting of vanadium oxide and at least one member selected from the group consisting of molybdenum oxide and tungsten oxide as the active component for the reduction of nitrogen oxides with ammonia and α-alumina having a specific surface area of 0.3 to 12 m^2/g and a pore volume of 0.1 cm^3/g or more as a carrier wherein the atomic ratio of the vanadium, molybdenum, tungsten and aluminum contained in the carrier alumina is:

$$V_{12-x-y}MO_xW_yAl_z$$

wherein $0 \leqq x \leqq 8$, $0 \leqq y \leqq 5$, $0.3 \leqq x + y \leqq 8$ and $40 \leqq z \leqq 480$, at a temperature of 150° to 700° C. and at a space velocity of 2,000 to 100,000 hr^{-1}, said catalyst having the property of resisting deterioration by the sulfur oxides contained in said waste gases.

4,075,284

PROCESS FOR THE REMOVAL OF SULFUR OXIDES BY THE USE OF ACTIVATED ALUMINA

Arthur F. Johnson, Franklin Lakes, N.J., assignor to R.C.M. Corporation, Los Angeles, Calif.

Division of Ser. No. 483,129, June 26, 1974, Pat. No. 3,955,969. This application Jan. 28, 1976, Ser. No. 653,260
The portion of the term of this patent subsequent to May 11, 1993, has been disclaimed.
Int. Cl.² C01B *17/00;* B01J *8/00;* C01C *3/00;* C01B *17/48*
U.S. Cl. 423—244 **14 Claims**

1. The process for sorbing sulfor compounds from hot gases on activated alumina produced from dross containing aluminum particles, alumina and impurities comprising:

charging said dross onto a layer of molten halides underlain by a layer of molten aluminum in a holding fernace, whereby a portion of the aluminum entrained within the dross enters the aluminum layer and the alumina and impurities are entrained in the halide flux layer;

separating said dross from said molten aluminum;

digesting said dross with hot water to at least partially dissolve soluble impurities and decompose insoluble impurities;

separating remaining aluminum particles and the purified alumina from said water as separate fractions; and

drying said alumina to produce an activated alumina,

pelletizing said activated alumina; and

sorbing sulfur oxides from hot gases onto the pellets so formed.

4,075,285

RUBBER-MODIFIED POLYSTYRENE RESIN COMPOSITION

Minoru Tabana, Suita; Shizuo Narisawa, Ichihara; Tatsuyuki Mitsuno, Toyonaka, and Hiroshi Maki, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, osaka, Japan

Filed Mar. 3, 1975, Ser. No. 554,524
Claims priority, application Japan, Mar. 9, 1974, 49-27405
Int. Cl.² C08L *53/02*
U.S. Cl. 260—876 B **4 Claims**

1. A resin composition consisting essentially of a rubber modified polystyrene which is obtained by mechanically mixing a rubbery substance selected from the group consisting of polybutadiene, and styrene-butadiene with polystyrene or by graft-copolymerizing styrene with said rubbery substance and a transparent styrene-butadiene block copolymer containing 65 to 95% by weight of styrene and 5 to 35% by weight of butadiene, wherein the ratio of said rubber-modified polystyrene to said styrene-butadiene block copolymer is in the range from 0.5 : 99.5 to 15 : 85 by weight.

4,075,286

PREPARATION OF BLOCK POLYMERS USING POLYAZO SEQUENTIAL FREE RADICAL INITIATORS

Ronald Edward MacLeay, Williamsville, and Chester Stephen Sheppard, Tonawanda, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 234,377, March 13, 1972, abandoned, which is a continuation-in-part of Ser. No. 752,752, Aug. 15, 1968, Pat. No. 3,649,614. This application May 30, 1974, Ser. No. 474,739
Int. Cl.² C07C *107/02, 107/04;* C08L *51/00, 53/00*
U.S. Cl. 260—877 **4 Claims**

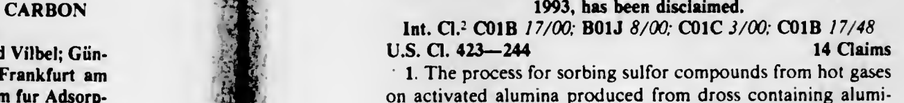
1. A process for preparing a block copolymer which comprises (a) forming a polymer having azo functions present by reacting vinyl polymer and a polyazo compound under vinyl polymerization conditions controlled to cause one type of azo function to rupture leaving the other type or azo function intact, said rupture having the effect of initiating polymerization of said vinyl polymer; and (b) reacting vinyl monomer with the polymer step (a) under conditions to rupture the azo function of said step (a) polymer to produce a block copolymer, said polyazo compound having the formula

$$\cdot (C{-}N = N{-}A{-}B{-}A'{-}N)_n(N{-}C')_{2-n}$$

where:

(a) $n = 1$ or 2;

(b) C and C′ are different unless—A—B—A′—is unsymmetrical and are selected from

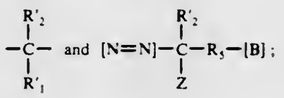


aryl of 6–14 carbons;

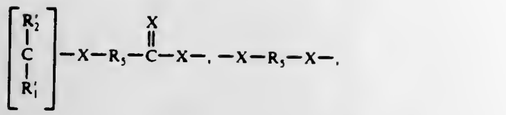
(c) A and A′ are the same or different, at least one being

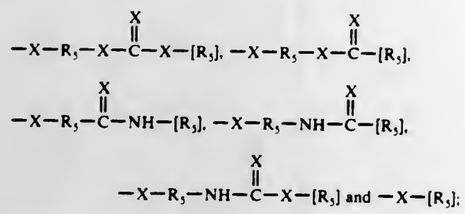


and the other being selected from

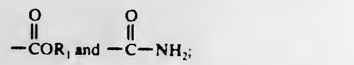


(d) B is selected from

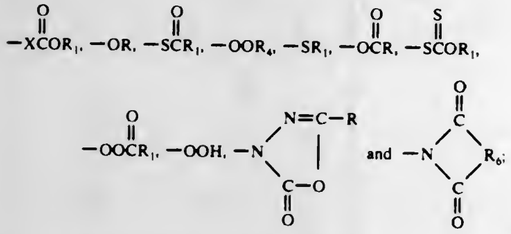




(e) X is sulfur or oxygen;
(f) Y is selected from lower alkyl of 1–4 carbons, —CN,



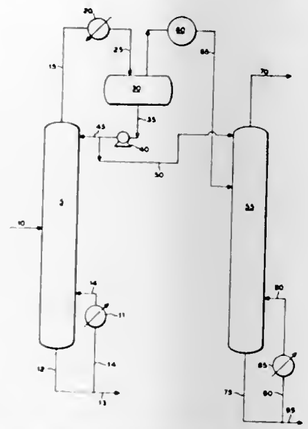
(g) Z is selected from—CN, —Cl,—Br, —N_3, —XCN, —R_1,



(h) R is selected from hydrogen, lower alkyl of 1–6 carbons and aryl of 6–14 carbons;
(i) R_1 and R'_1 are the same or different and are selected from alkyl of 1–8 carbons, cycloalkyl of 3–10 carbons, aralkyl of 7–12 carbons and aryl of 6–14 carbons;
(j) R_2 and R'_2 are the same or different and are alkyl of 1–10 carbons or cycloalkyl of 3–10 carbons;
(k) R_1 and R_2, R'_2 and R_5 and R'_1 and R'_2 when taken together with the tertiary carbon linked to the azo group, form a cycloalkyl of 4–12 carbons;
(l) R_4 is tertiary-alkyl of 4–8 carbons;
(m) R_5 is a diradical selected from alkyl of 1–12 carbons terminated by carbon atoms and containing 0–1 carbonyls and 0–4 nonadjacent oxygen, sulfur and nitrogen atoms in its backbone structure, alkylcycloalkyl or alkylcycloalkylalkyl of up to 12 carbons aralkyl of 7–12 carbons and phenyl; and
(n) R_6 is selected from lower akylene and cycloalkylene of 2–10 carbons, and an aromatic radical of 6–12 carbons.

4,075,287
SEPARATION PROCESS
Jack S. Scoggin, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Oct. 27, 1976, Ser. No. 735,911
Int. Cl.² C08F *297/08, 6/00;* B01D *3/00, 3/10*
U.S. Cl. 260—878 B **10 Claims**

1. A process for separation of a vapor stream containing a condensible component and at least one noncondensible component which comprises:
(a) condensing a portion of said vapor stream and allowing said stream to separate into a vapor phase and a liquid phase;
(b) introducing said liquid phase onto the top tray of a fractionation zone;
(c) compressing said vapor phase to a pressure sufficient to permit its entry into the fractionation zone and introducing same into said fractionation zone, below the point of



introduction of said liquid phase and subjecting said liquid phase and vapor phase therein to such distillation conditions including temperature and pressure as to cause a separation of said phases into an overhead comprising mainly said noncondensible component and said bottoms comprising essentially said condensible component.

4,075,288
VIBRATION-DAMPING MATERIAL
Bernard Jacques Graveron, Lyon, and Alain Jacques Essel, Calvine, both of France, assignors to Monsieur Jean Gole, France
Filed Dec. 10, 1974, Ser. No. 531,326
Claims priority, application France, Dec. 20, 1973, 73 45839
Int. Cl.² C08L *9/00*
U.S. Cl. 260—879 **1 Claim**

1. A vibration-damping material which comprises polyisoprene in which the total percentage of 1,2- and 3,4-vinyl structure is 75% and the temperature maximum of tan δ at 110 Hz is in the range between 0° and 23° C, the polyisoprene is in the form of a block copolymer, wherein the block copolymer is of polybutyl methacrylate, polyisoprene and polybutyl methacrylate in the weight proportion 20-60-20.

4,075,289
CHLORINATED, HYDROGENATED POLYBUTADIENE IMPACT MODIFIERS FOR PVC
John Carl Faik, Chicago, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Nov. 22, 1976, Ser. No. 743,825
Int. Cl.² C08F *8/22, 8/04*
U.S. Cl. 260—890 **3 Claims**

1. A thermoplastic composition comprising a blend of from about 95 to about 80 wt% of polyvinyl chloride and correspondingly from about 5 to about 20 wt% of a chlorinated polymer, said polymer being a fully hydrogenated polymer selected from the group consisting of hydrogenated homopolymers of 1,3-butadiene having greater than 30% 1,2-polymerized units and hydrogenated copolymers thereof containing up to 60 wt% styrene, said chlorinated polymer containing from 15 to 40 wt% chlorine.

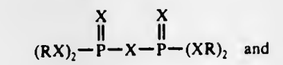
4,075,290
HEAT SEALABLE POLYBUTENE-1 BLENDS CONTAINING POLYPROPYLENE OR ETHYLENE COPOLYMER
Horst Denzel, and Otto Hahmann, both of Marl, Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Germany
Filed July 12, 1973, Ser. No. 378,689
Claims priority, application Germany, July 12, 1972, 2234103
Int. Cl.² C08L *23/16, 23/12*
U.S. Cl. 260—897 A **6 Claims**

1. A composition of matter consisting essentially of an intimate admixture of:
(a) 85–95 weight percent of an at least 95% isotactic polybutene-1 having a density of 0.914–0.919 and a solution viscosity molecular weight of 650,000–1,500,000; and
(b) correspondingly 15–5 weight percent of a low pressure ethylene copolymer with 1–3 weight percent of propylene or butene-1 having a density of 0.931–0.937 and a solution viscosity molecular weight of 75,000–140,000.

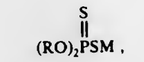
4. A composition of matter consisting essentially of an intimate admixture of:
(a) 85–95 weight percent of an at least 95% isotactic polybutene-1 having a density of 0.914–0.919 and a solution viscosity molecular weight of 650,000–1,500,000; and
(b) correspondingly 15–5 weight percent of an isotactic polypropylene having a density of 0.904–0.910 and a solution viscosity molecular weight of 200,000–350,000.

4,075,291
PYROPHOSPHATES
Derek Redmore, Ballwin; Benjamin T. Outlaw, Webster Groves, and Richard L. Martin, Brentwood, all of Mo., assignors to Petrolite Corporation, St. Louis, Mo.
Continuation-in-part of Ser. No. 874,713, Nov. 6, 1969, abandoned. This application Jan. 16, 1976, Ser. No. 649,832
Int. Cl.² C07F *9/165;* C02B *5/06*
U.S. Cl. 260—933 **8 Claims**

1. A mixture of compounds comprising
I. a mixture of different compounds, each having the formula



II. a compound or mixture of compounds, each having the formula

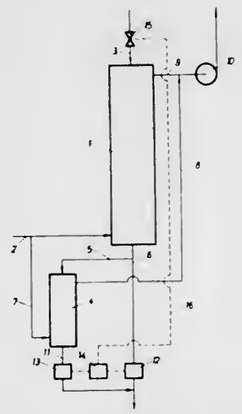


where R is an alkyl or oxyalkylated alkyl radical having at least 7 carbon atoms, X is oxygen or sulfur, each of said compounds in I containing both oxygen and sulfur, and the compound or mixture of compounds I being the major component of said mixture, M is hydrogen or a metal, said mixture of compounds I and II being prepared by an alcohol or a mixture of alcohols with P_2S_5 first to form O,O-disubstituted dithiophosphric acid or a mixture thereof until most of the P_2S_5 has dissolved and the evolution of H_2S has subsided and then continuing the reaction to shift the equilibrium in favor of converting dithiphosphoric acid or a mixture thereof to the pyrophosphates, with the proviso that, where M is a metal, dithiophosphoric acid or a mixture thereof is neutralized with a salt-forming base or by double decomposition.

4,075,292
PRODUCTION OF O,O-DIALKYL-PHOSPHOROCHLORIDOTHIONATES
Karl Heinz Vöpel, Kansas City, Mo.; Friedrich Hellrung, Nievenheim-Ueckerath, and Otto Berendes, Dormagen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany
Filed June 1, 1976, Ser. No. 691,957
Int. Cl.² C07F *9/146*
U.S. Cl. 260—986 **5 Claims**

1. In the reaction of O,O-dialkyl-dithiophosphoric acid ester with chlorine to produce an O,O-dialkyl-phosphorochloridothionate, the improvement which comprises effecting the chlorination in two steps, in the first step O,O-dialkyl-dithiophosphoric acid and about one-third to two-thirds of the chlorine being continuously reacted in a first stage at a temperature of about 30° to 60° C, material from the first stage along with the balance of the chlorine being continuously supplied to a second stage of the first step maintained at a temperature of about 10° to 25° C, with formation of a clear solution containing the desired product plus by-product di-(O,O-dialkylthionophosphoryl) disulfide and disulfurdichloride, the by-products formed in the first step reacting with each other in the second step at about 0° to 100° C with precipitation of sulfur and formation of further quantities of the desired product.

4,075,293
CONTROL SYSTEM FOR AN ABSORPTION COLUMN
Michael Grill, Leoben; Helmut Grohmann, and Franz Nössler, both of St. Jakob near Mixnitz, all of Austria, assignors to Veitscher Magnesitwerke-Actien-Gesellschaft, Vienna, Austria
Filed Aug. 19, 1976, Ser. No. 716,012
Claims priority, application Austria, Aug. 26, 1975, 6579/75
Int. Cl.² G01N *9/36, 21/08, 21/12, 21/48*
U.S. Cl. 261—20 **21 Claims**



1. A control system for an absorption column for absorbing a gaseous fluid in a liquid flowing through the column, comprising
a. inlet means for the gaseous fluid and the liquid, the inlet means including
1. an inlet for the gaseous fluid and
2. an inlet for the liquid,
b. an outlet for the liquid having said gaseous fluid absorbed therein,
c. a gage in the outlet for measuring a parameter which is a function of the amount of said gaseous fluid absorbed in the liquid and producing an output signal corresponding to said parameter,
d. an auxiliary absorption column of a substantially smaller capacity than that of the absorption column,
e. an inlet means for delivering the gaseous fluid and the

liquid to the auxiliary absorption column, said inlet means including

1. an inlet for the gaseous fluid arranged to deliver a small amount of the gaseous fluid to the auxiliary absorption column as compared to the amount of the gaseous fluid delivered through the inlet for the absorption column and
2. an inlet for the liquid, the gaseous fluid being delivered in substantial excess over the absorptive capacity of the gaseous fluid by the liquid,

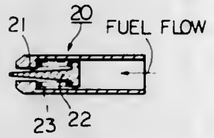
f. an outlet from the auxiliary absorption column for the liquid having the gaseous fluid absorbed therein,
g. another gage in the outlet from the auxiliary absorption column for measuring a parameter which is a function of the amount of said gaseous fluid absorbed in the liquid coming from the auxiliary absorption column and producing an output signal corresponding to this parameter,
h. a comparator having input means and an output, the input means being connected to the gages for receiving the output signals thereof, the output signals being compared in the comparator and the comparison producing a control signal at the output of the comparator, and
i. a flow control in the inlet means of the absorption column connected to the output of the comparator and being controlled by the control signal.

4,075,294

CARBURETOR ACCELERATING FUEL CIRCUIT MEANS

Masaaki Saito, No. 5-25-11, Iwato, Yokosuka, and Kenji Okamura, No. 3-5-20, Nakahara, Isogo, Yokohama, both of Japan

Filed Mar. 1, 1977, Ser. No. 773,350
Claims priority, application Japan, Mar. 19, 1976, 51-30581
Int. Cl.² F02M *7/08*
U.S. Cl. 261—34 A **6 Claims**



1. A carburetor for an internal combustion engine comprising:

an accelerating fuel circuit means for feeding fuel to an air induction passage upon acceleration conditions through a fuel discharge passageway leading to the air induction passage; and

a flow control valve means for reducing effective cross sectional area of said fuel discharge passageway in response to fuel discharge pressure in said fuel discharge passageway.

4,075,295

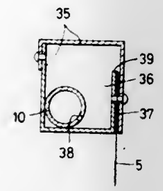
WATER FILM FORMING INSTALLATION

Eisuke Funakoshi, No. 1119-5, 1-chome, Hojo, Daito, Osaka, Japan

Continuation-in-part of Ser. No. 595,589, July 14, 1975, abandoned. This application June 7, 1976, Ser. No. 693,472
Claims priority, application Japan, Apr. 11, 1975, 50-50660
Int. Cl.² B01D *47/00*
U.S. Cl. 261—36 R **1 Claim**

1. A water film forming installation wherein air is shut out by a constant film of water, comprising in combination:

a. a first water supply conduit (**10**) having a plurality of nozzles (**38**) therein spaced from each other;
b. first and second enclosing members (**35**) with vertical side plates, the first member with a U-shape cross-section the second member with an inverted U-shape cross-section, one of the vertical side plates on each member being the taller side plate and substantially the same height as the corresponding one side plate on the other member, the other side plate on each member being of shorter height, the shorter heighth side plate on the first member being taller than the corresponding shorter heighth side plate on the second member, the first member being juxtapositioned under the second member, so that the side plates of the second member outwardly cover the side plates of the first member and the shorter side plate of the first member is disposed alongside and bolted to the taller side plate of the second member so that a slit (**37**) is formed between plates by said shorter side plate of the first member and the taller side plate of the second member said members defining a rectangular box-like reservoir (**36**) with lower corners, one corner being alongside said slit, the water supply



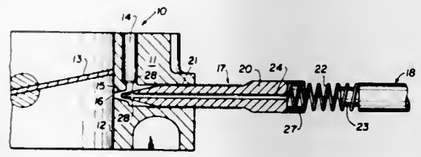
conduit (**10**) being disposed in the other lower corner, opposite said slit (**37**), so that water supplied by said nozzles (**38**) fill up said reservoir (**36**) until the water level rises above said slit and overflows it flowing down the slit;
c. a second water supply conduit (**22**) horizontally mounted right under said box-like reservoir, said second conduit (**22**) having an elongated opening (**4**), which is disposed under said box-like reservoir so as to catch said overflow;
d. a vertical net of ten to fifteen mesh Tyler stretched between said first second conduit and passing in the slit to the top of the slit so that the water overflowing said slit moves vertically down over the net shutting out the passage of air through the net; and,
e. means for raising the water collected in said second conduit back to said first conduit.

4,075,296

IDLE SPEED NEEDLE SCREW FOR CARBURETORS

Ronald J. Orsini, 19 Shenandoah Blvd., Coram, N.Y. 11727, and Joseph Della Universita, 212 Erlanger Blvd., North Babylon, N.Y. 11703

Filed Jan. 25, 1977, Ser. No. 762,257
Int. Cl.² F02M *3/08*
U.S. Cl. 261—41 D **1 Claim**



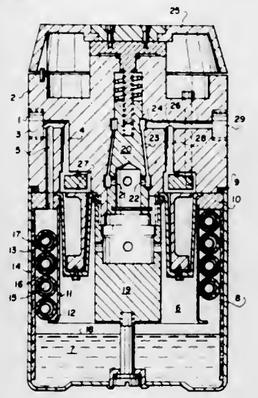
1. The combination of a carburetor having a suitable nose cone aperture in the wall of the idle system thereof and a tubular needle screw mounted therein and adapted to fit and coact with said aperture, said needle screw comprising an elongated tubular component having an exteriorly threaded cylindrical portion and a nose cone, said component having an axial passage disposed therethrough and extending to the tip of said nose cone for conducting air, and further having at least one radially disposed duct in said nose cone for conducting liquid fuel and communicating with said axial passage to produce an air-gasoline mixture within the cone prior to emerging therefrom.

4,075,297

ANESTHETIC VAPORIZER

Peter Seidel, Lubeck, Germany, assignor to Dragerwerk Aktiengesellschaft, Germany

Filed Feb. 19, 1976, Ser. No. 659,233
Claims priority, application Germany, Feb. 20, 1975, 2507262
Int. Cl.² A61M *17/00*
U.S. Cl. 261—104 **5 Claims**



1. An anesthetic vaporizer comprising a housing, including a lateral wall, defining an interior liquid reservoir and a vaporizing chamber above said reservoir, a gas inlet into said housing, a cylindrical wick tube support barrel supported in said vaporizing chamber and spaced inwardly from the inner surface of said lateral wall of said housing, a wick barrel on the interior surface of said lateral wall, with its lower end extending into the liquid in said liquid reservoir, a spirally wound wick tube, open at both ends, disposed between said tube support barrel and said wick barrel and supported, at its lower end, solely by said wick tube support barrel, with its adjacent convolutions in contact with each other, means defining a vaporizing gas passage in said housing communicating at one end with said inlet and at its opposite end with the interior of said tube through the open upper end thereof and with the space defined between convolutions of said spirally wound wick tube, said wick barrel and said wick tube support barrel, said vaporizing gas passage providing for flow of gas from said inlet through the interior of said tube and over the exterior thereof to said reservoir, a vaporizer outlet from said housing, means defining an outlet passage connecting said vaporizer chamber to said vaporizer outlet, means defining a by-pass passage extending from said gas inlet to said vaporizer outlet, and a supporting insert in said wick tube extending completely therethrough between the open ends thereof, said supporting insert maintaining said wick tube completely open for the flow of gas therethrough.

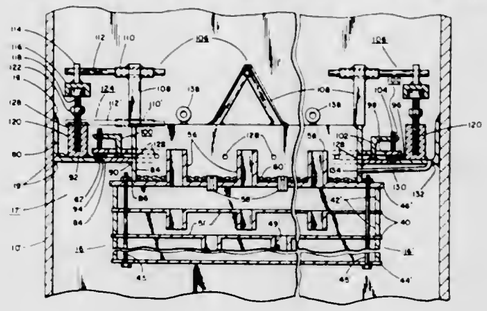
4,075,298

CONTACT TOWERS WITH LEAK-PROOF SUPPORT OF IMPROVED PLATE SUBASSEMBLY

Max Leva, and Joseph L. Leva, both of One Hodgson Ave., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 589,906, June 24, 1975, Pat. No. 3,997,633. This application Apr. 5, 1976, Ser. No. 673,880
Int. Cl.² B01D *3/22*
U.S. Cl. 261—114 TC **14 Claims**

1. In a gas-liquid contact tower the combination comprising a tower shell, a plurality of superimposed generally horizontal contact plates mounted in vertically spaced relation within said tower shell, said plates being grouped into at least one subassembly thereof, supporting and sealing means for removably supporting said plate subassembly within said tower shell and for preventing any of said contact liquid from bypassing said plate subassembly, said supporting and sealing means including a first annular component permanently secured and sealed to adjacent inner surfaces of said tower shell and a second annular component circumferentially joined to said plate subassembly and means movably mounting said second component to said
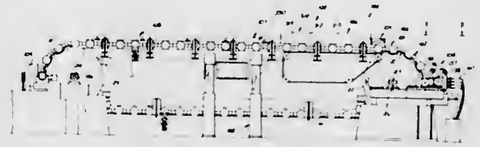


first component to enable leveling thereof and gasketing means for preventing passage of fluid between said components, said gasketing means being inserted generally between said components.

4,075,299

METHOD OF MAKING RETRACTILE CORDS

Gordon Foreman Bloxham, Baltimore; Claude Paren Brezeale, Columbia; Eugene Raymond Cocco, Baltimore; Edwin Charles Hardesty, Perry Hall; Byron Lee Small, Baltimore; Daniel Marion Steinert, Dundalk, all of Md., and Charles McGonigal, Grayson, Ga., assignors to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 641,003, Dec. 15, 1975, Pat. No. 3,988,092. This application July 19, 1976, Ser. No. 706,729
Int. Cl.² B29C *27/20*
U.S. Cl. 264—25 **7 Claims**



1. A method of making retractile cords each having a jacketed plurality of individual conductors, which includes the steps of:

providing a plurality of elongated workholders in spaced-apart parallel relationship to one another along a continuous path of travel substantially normal of the longitudinal axes of the workholders;
advancing a leading end of a supply of cordage into engagement with one of the workholders in registration with a cord-loading work station;
securing the leading end of the supply of cordage in engagement with each successive workholder in the cord-loading work station;
winding a plurality of convolutions of the cordage on successive ones of the workholders in registration with the cord-loading work station to form a helically wound cord on each successive workholder such that adjacent ones of the convolutions are spaced apart and the wound cord has inwardly and outwardly facing portions with respect to its associated workholder;
clamping the last wound convolution in engagement with the workholder;
severing the wound cord from the supply of cordage to form a trailing end portion extending from the workholder and a leading end portion from the supply such that the trail-

ing and leading end portions each includes jacketed conductors;

indexing each successive loaded workholder along the path of travel while simultaneously moving successive empty ones of the workholders into the cord-loading work station;

heating each successive loaded workholder to facilitate heat transfer from the workholder generally conductively into the inwardly facing portions of the convolutions, and causing radiant heat transfer into the outwardly facing portions of the convolutions of the cords on successive ones of the workholders while simultaneously winding cordage on the next successive ones of the workholders in the cord-loading work station;

cooling the cord wound on each successive one of the loaded workholders to facilitate removal subsequently of the cord from the workholder;

interposing a guide surface adjacent the wound portions of the cord on each successive one of the workholders in a cord removal work station;

twistingly rotating the ends of the helically wound cord on each successive one of the workholders in the cord removal work station relative to each other to reverse the direction of the pitch of the helices thereof; while

causing relative movement between the trailing end and the wound portion of each successive one of the wound cords to unwind the cord form the workholder with successive sections of the cord being moved past the guide surface to minimize enlargement of the convolutions; and

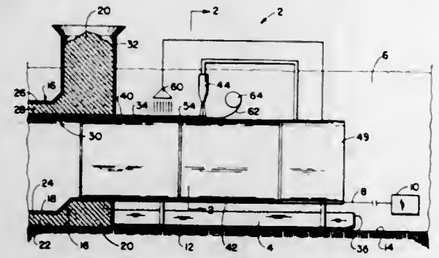
engaging unwound portions of the cord adjacent to the other end of the cord prior to the cord being unwound completely to secure the other end of the cord when the cord is unwound completely.

4,075,300

METHOD FOR PRODUCING CAST-IN-PLACE PIPE EMPLOYING PERMANENT PIPE MOLD

George M. Keller, 900 Indian Way, Novato, Calif. 94947

Filed Jan. 12, 1976, Ser. No. 648,241
Int. Cl.² B63B *35/04*
U.S. Cl. 264—32 **18 Claims**



1. In a method for constructing a continuous length of pipe from a deformable and hardenable material including the steps of providing an exterior form for supporting a lower portion of the pipe; providing an interior mold for supporting an upper portion of the pipe to prevent a collapse of the pipe while the material is deformable; casting the deformable material over the exterior form and the interior mold to construct homogenous, initially deformable pipe; and thereafter permitting the material to harden into a rigid, continuous length of pipe; the improvement to the step of providing the interior mold comprising the steps of providing a continuous length of a relatively thin plastic material; shaping the plastic material into a configuration to conform it to an interior surface of the upper pipe portion and so that it extends over less than the full circumferential extent of the interior pipe surface; providing a support for the plastic material in said configuration and supporting the plastic material with the support until it is substantially rigid; rendering the plastic material substantially rigid to thereby form a continuous, longitudinally extending mold; casting the deformable material about the mold; withdrawing the support from the plastic material before the deformable material has hardened; and supporting the deformable material while it is in its deformable state and until it is in its hardened state with the mold.

10. A method for the in situ formation of a long, continuous length of cementitious pipe in an open trench comprising the steps of providing a sled for movement along the trench, the sled having an intake for receiving deformable cementitious material, means for forming the cementitious material into a lower pipe half resting in the trench, and an upwardly convex, rigid mandrel; drawing the sled through the trench; flowing a plastic material over the mandrel and hardening the plastic material while supported by the mandrel to form a substantially rigid, downwardly open plastic mold; retaining the mold stationary relative to the trench; pouring the cementitious material into the intake and over the mold to thereby cast the pipe; withdrawing the mandrel while the cementitious material is in its deformable state; supporting an upper half of the deformable cementitious material with the mold only until such material hardens and becomes self-supporting; and leaving the mold permanently in the pipe.

17. A method for the in situ formation of a long, continuous length of cementitious pipe in an open trench comprising the steps of providing a sled for movement along the trench, the sled having an intake for receiving deformable cementitious material, means for forming the cementitious material into a lower pipe section resting in the trench, and an upwardly convex, rigid mandrel; drawing the sled through the trench to thereby move the forming means and the mandrel relative to the trench for forming the cementitious material into an upper pipe section; forming on the mandrel a downwardly open mold; hardening the mold while the upper pipe section is supported by the mandrel; pouring the cementitious material into the intake to thereby form the lower pipe section and an upper pipe section with the forming means and the mandrel, respectively; maintaining the pipe sections stationary relative to the trench, whereby the forming means and the mandrel move relative to the pipe sections and the freshly formed upper pipe section is initially supported by the mandrel and thereafter becomes unsupported by said mandrel; withdrawing the mandrel while the cementitious material is not self-supporting; continuing to support cementitious material of the upper pipe section with the mold after the mandrel is withdrawn therefrom until the cementitious material hardens and becomes self-supporting; and leaving the mold permanently in the hardened pipe.

4,075,301

METHOD AND APPARATUS FOR DEPOSITING MATERIAL INTO A MOVING RECEPTACLE

Leo Alex Oswald, Huntingdon, Pa., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 22, 1976, Ser. No. 651,308
Int. Cl.² B29C *1/00, 3/00, 5/10*
U.S. Cl. 264—40.7 **18 Claims**

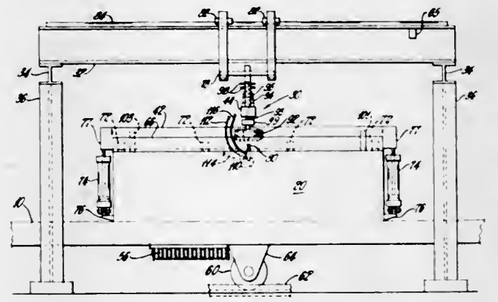
1. Apparatus for depositing material in a moving receptacle, comprising:

a. means for moving a receptacle in a path other than a straight line,

b. means for moving a discharge means for depositing a material in said moving receptacle, said means for moving said discharge means being adapted to maintain a predetermined movement of said discharge means relative said moving receptacle;

c. means for continuously sensing movement of said receptacle during said depositing of said material; and

d. control means responsive to said sensing means to control movement of said discharge means in a predetermined



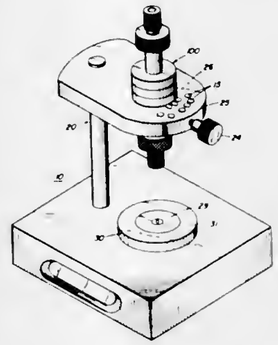
pattern of speeds relative to movement of said receptacle whatever the movement of said receptacle.

4,075,302

APPARATUS FOR GRIPPING AND HOLDING SMALL WORKPIECES

John K. Brady, and Robert Noyes, both of Champaign, Ill., assignors to University of Illinois Foundation, Urbana, Ill.

Filed June 13, 1977, Ser. No. 805,920
Int. Cl.² B25B *1/10*
U.S. Cl. 269—43 **5 Claims**



1. Apparatus for gripping and holding a plurality of relatively small flat chips by the edges thereof, comprising, in combination:

an elevated support member having a top surface which defines a table, said member having an aperture therein;

a support flange extending inwardly from said aperture a predetermined distance below said table surface; and

a gripping assembly removably mountable in the aperture in said support member, said assembly including:

a first gripping member having a periphery corresponding to the contour of said aperture and having a thickness at its periphery which corresponds to said predetermined distance;

a second gripping member having a periphery at least a portion of which has a contour that corresponds to the periphery of said first gripping member;

resilient spacer means disposed between said first and second gripping members and being operative to normally bias the peripheries of said gripping members slightly apart; and

means fo temporarily squeezing said gripping members together;

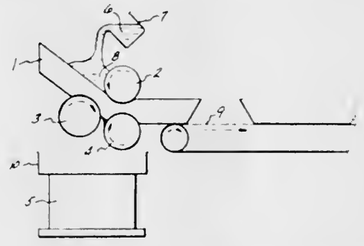
whereby when said gripping assembly is mounted in said support member and seated on said flange, chips placed on the table surface can be manually moved to positions where their edges are between the spaced peripheries of said gripping members, whereupon activation of said squeezing means causes gripping and holding of the chip edges by said gripping assembly.

4,075,303

METHOD OF PREPARATION OF CERAMIC FOAM

John C. Yarwood, Madison, Conn.; James E. Dore, Ballwin, Mo., and Robert K. Preuss, Middletown, Conn., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Continuation-in-part of Ser. No. 589,294, June 23, 1975, which is a continuation-in-part of Ser. No. 563,213, March 28, 1975, Pat. No. 3,962,081. This application Feb. 22, 1977, Ser. No. 770,395
The portion of the term of this patent subsequent to May 17, 1994, has been disclaimed.
Int. Cl.² B29H *7/20*
U.S. Cl. 264—44 **20 Claims**



1. A method of preparing a ceramic foam possessing controlled permeability and structural uniformity which comprises:

A. providing a hydrophobic, reticulated organic polymer foam possessing a predetermined permeability and resilience;

B. preparing an aqueous slurry of a thixotropic ceramic composition having a viscosity within the range of 1×10^3 to 80×10^3 cps;

C. providing at least three rolls mounted to furnish at least two gaps in close proximity between pairs of said rolls, the first gap being preset at a spacing of 50–90% of the thickness of said polymer foam and the second gap at 70–90% of said thickness;

D. passing said polymer foam through said roll gaps while flowing said slurry over at least one roll and a surface of said polymer foam to establish a supply of said slurry at the entrance to said first gap, thereby uniformly impregnating said polymer foam with said slurry; and

E. drying and heating said impregnated foam to remove the organic component therefrom.

4,075,304

METHOD OF MAKING FOAM FILLED PANELS

Lawrence A. Watson, Sebring, Fla., assignor to Edgewater Marine, Inc., Sebring, Fla.

Filed Jan. 29, 1976, Ser. No. 653,440
Int. Cl.² B29D *27/04;* B29C *5/00*
U.S. Cl. 264—46.5 **5 Claims**

1. A batch method of making a foam filled panel comprising:

placing a first sheet in a generally stationary position;

said first sheet having turned edges around its margin;

placing against said first sheet a second flexible sheet adapted to rest at said marginal edges;

selectively clamping marginal edges of said sheets together at one end thereof with individual clamps placed at laterally opposed marginal edges of said sheets;

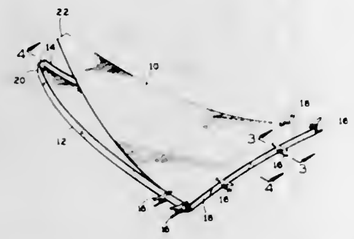
spreading said sheets apart from the opposite end thereof so that a hollow, closed space is formed between said sheets where so clamped;

after said spreading, introducing foamable material into said

hollow space while causing said foamable material to foam so as to fill said hollow space at least partially and then terminating the introduction of foamable material;

while continuing to clamp said sheets at said one end, further selectively clamping laterally opposed marginal edges of said sheets adjoining said one end with additional individual clamps to extend said closed, hollow space;

after said further clamping, introducing foamable material into said extended hollow space while causing said material to foam so as to fill said extended hollow space at least partially and then terminating the introduction of foamable material;



progressively alternately selectively clamping with further additional clamps and filling adjoining portions of said sheets with foamable material which foams therein until a foam filled panel is formed; and

keeping said sheets substantially stationary at a fixed location during the foregoing clamping and filling steps.

4,075,305

CONTINUOUS PROCESS FOR THE MANUFACTURE OF PHOSPHORIC ACID USING PROCESS WATER

Jean-Francois Gielly, Rouen, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Nov. 2, 1976, Ser. No. 738,141
Claims priority, application France, Nov. 4, 1975, 75 33657
Int. Cl.² C01B 25/16
U.S. Cl. 423—320 **10 Claims**

1. A process for the manufacture of phosphoric acid comprising the steps of continuously:

introducing phosphate ore and sulfuric acid into a reaction zone;

reacting the contents of said reaction zone in a circulating cooling air environment which results in the cooling air becoming heated;

removing calcium sulfate slurry containing phosphoric acid produced by the reaction in said reaction zone to a filtering zone;

separating said phosphoric acid from said calcium sulfate containing slurry in said filtering zone;

removing gases produced by the reaction and evaporated into said heated circulating cooling air in said reaction zone;

scrubbing said heated cooling air containing said evaporated gases in a scrubbing zone with process water to remove the recoverable gases from said cooling air into a solution and thereby purifying said air so that said process water is heated;

recovering said heated solution and introducing at least part of said heated solution into said filtering zone and the remainder of said solution into said reaction zone;

washing said calcium sulfate in said filtering zone with said heated solution introduced to said filtering zone by methodic washing techniques; and

introducing said solution from said filtering zone into said reaction zone.

4,075,306

METHOD FOR DRYING AN AMMONIA GAS STREAM

Tadasumi Muromura, Tokai, Japan, assignor to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Oct. 19, 1976, Ser. No. 733,903
Claims priority, application Japan, Dec. 26, 1975, 51-156280
Int. Cl.² C01C 1/00
U.S. Cl. 423—352 **5 Claims**

1. A method for drying an ammonia gas stream which comprises passing the ammonia gas stream through a liquified ammonia maintained at the boiling point and in which sodium metal is dissolved.

4,075,307

REACTION OF BETA PLATINUM CHLORIDE WITH GASEOUS AMMONIA

George T. Kerr, Lawrence Township, Mercer County, N.J., and Albert E. Schweizer, Levittown, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 532,445, Dec. 13, 1974, abandoned. This application Apr. 28, 1976, Ser. No. 680,960
Int. Cl.² C01B 21/00; C01G 55/00
U.S. Cl. 423—413 **3 Claims**

1. A method for preparing a complex having the formula:

$$PtCl_2 \cdot X\ NH_3$$

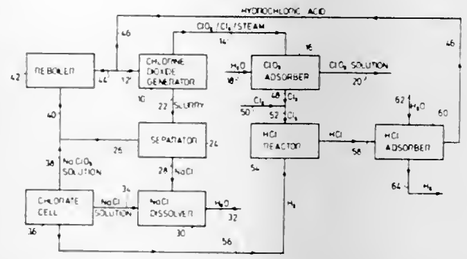
in which ammonia is irreversibly reacted and where X is a number greater than 0 but not greater than essentially 2; and when X is 1, the composition has an X-ray diffraction pattern which is the same as beta platinum chloride and distinct from the monoamine $Pt(NH_3)Cl_2$, prepared by the decomposition of trans $Pt(NH_3)_2Cl_2$; and when X is 2 the composition is amorphous in contrast to the crystalline platinum compounds having the empirical formula cis and trans $Pt(NH_3)_2Cl_2$; which comprises reacting beta platinum chloride with gaseous ammonia at a temperature between about 0° and 200° C. at an ammonia pressure in the approximate range of 0.05 to 0.3 atmospheres, and subsequently recovering said complex.

4,075,308

PRODUCTION OF CHLORINE DIOXIDE AT HIGH EFFICIENCY

W. Howard Rapson, Scarborough; Maurice C. J. Fredette, Mississauga, and Norman W. Meyers, Islington, all of Canada, assignors to Erco Industries Limited, Islington, Canada

Filed Feb. 22, 1977, Ser. No. 770,359
Claims priority, application United Kingdom, Feb. 24, 1976, 7188/76; Aug. 24, 1976, 35159/76
Int. Cl.² C01B 11/02; C01D 3/04; C01B 1/02, 7/01
U.S. Cl. 423—478 **10 Claims**



1. In a method of producing chlorine dioxide from sodium chlorate, which comprises:

(a) establishing in a reaction zone an aqueous reaction medium containing dissolved quantities of sodium chlorate, sodium chloride and hydrochloric acid, said aqueous reaction medium being substantially saturated with sodium chloride,

(b) continuously feeding an aqueous solution of sodium chlorate to said aqueous reaction medium,

(c) continuously feeding hydrochloric acid or hydrogen chloride to said aqueous reaction medium,

(d) continuously maintaining said reaction medium at its boiling point at the absolute pressure thereon and continuously maintaining said reaction zone under a subatmospheric pressure sufficient to maintain said reaction medium at its boiling point,

(e) continuously generating chlorine dioxide, chlorine and sodium chloride in said reaction medium,

(f) continuously removing from said reaction zone a gaseous mixture of chlorine dioxide, chlorine and steam wherein the volume ratio of steam to chlorine dioxide is greater than that below which substantial decomposition of chlorine dioxide occurs,

(g) continuously depositing said generated sodium chloride from said reaction medium in said reaction zone,

(h) removing said deposited sodium chloride from said reaction zone, and

(i) continuously maintaining the volume of liquid in said reaction zone substantially constant,

the improvement which comprises:

(j) continuously feeding said aqueous solution of sodium chlorate to said aqueous reaction medium in sufficient quantity to maintain a concentration of sodium chlorate in said reaction medium substantially saturating the same and to maintain said aqueous reaction medium at a mole ratio of chlorate ions to chloride ions of about 5.9:1 to about 2.1:1,

(k) continuously maintaining the actual hydrogen ion concentration in said reaction medium in the range of about 0.05 to about 0.3 normal, and

(l) continuously maintaining said boiling point of said reaction medium in the range of about 30° to about 85° C and continuously maintaining said subatmospheric pressure on said reaction zone in the range of about 20 to about 400 mm Hg,

said improvement resulting in the production of chlorine dioxide from sodium chlorate at an efficiency equivalent to about 39 to about 50 Gram Atom Percent ClO_2.

4,075,309

PROCESS FOR THE PRODUCTION OF HIGHLY CONCENTRATED MAGNESIUM CHLORIDE SOLUTIONS

Dietmar Kunze, and Siegfried Kirchner, both of Bad Salzdetfurth, Germany, assignors to Kali und Salz Aktiengesellschaft, Germany

Filed Mar. 29, 1977, Ser. No. 782,388
Claims priority, application Germany, Mar. 29, 1976, 2613289
Int. Cl.² C01F 5/30, 5/00; C01D 3/06; C01F 5/40
U.S. Cl. 423—497 **14 Claims**

1. In a process for the production of highly concentrated magnesium chloride solutions from industrial liquors or brines which contain less than 320 g/l $MgCl_2$, and which contain significant amounts of alkali chlorides, bromides, sulfates and other impurities, wherein the production steps include evaporation to form a hot liquor which contains crystallized carnallite and sodium chloride, separation of the crystallized carnallite and sodium chloride from the hot liquor, debromination of the resultant hot liquor by means of chlorine, neutralization, cooling and separation of crystallizates and impurities, the improvement which comprises:

a. evaporating an industrial liquor or brine in two or more stages under a vacuum and in a counter current evaporator with crystallization characteristics up to a final concentration of 440 to 475 g/l $MgCl_2$, a solid substance content of 12 to 25% by weight and final temperatures of 95° to 105° C;

b. separating the resulting hot liquor, together with magnesium sulfates and other impurities which are contained therein, from the crude crystallized carnallite and sodium chloride, said resulting hot liquor containing magnesium sulfate and other impurities in a finely dispersed form which renders them easily separable from the crude crystallized carnallite and sodium chloride;

c. debrominating said resulting hot liquor by oxidation by the addition of chlorine;

d. neutralizing the debrominated liquor while in the hot state with lime or dolomite milk;

e. removing from the hot neutralized liquor any solid substances formed during said neutralizing step;

f. cooling the hot neutralized liquor to room temperature while crystallizing additional carnallite and sodium chloride; and

g. separating the crystallized carnallite and sodium chloride from a concentrated magnesium chloride product solution containing 400 to 465 g/l of $MgCl_2$.

4,075,310

PRODUCTION OF SULFUR BY THE CLAUS PROCESS

Herbert Fischer, Lollar, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 19, 1976, Ser. No. 659,351
Claims priority, application Germany, Mar. 8, 1975, 2510240
Int. Cl.² C01B 17/04
U.S. Cl. 423—574 R **4 Claims**

1. In a Claus process for the production of sulfur from a raw gas which is poor in ammonia and consisting essentially of hydrogen sulfide, such as a gas from refinery plants, by scrubbing the gas with water to remove NH_3 and H_2S therefrom, separating the NH_3 and H_2S and producing a gas stream rich in H_2S and another gas stream rich in NH_3, subjecting the first and the second gas streams separately to combustion and cooling the combustion gases, the improvement which comprises:

(a) scrubbing the H_2S and NH_3-containing raw gas which is saturated with water vapor in two stages consisting of a bottom stage and a top stage, recirculating the scrubbing water repeatedly through only said bottom stage to remove most of the NH_3 from the raw gas in order to reach a high absorption rate and thereafter finally scrubbing the raw gas with fresh water in an open circuit in the top stage whereby the latter water then passes into the bottom stage without recirculation to remove the remainder of the NH_3 therefrom to a residual content of less than 100 ppm NH_3 and dissipating the heat of reaction and solution by a heat exchanger supplied with coolant;

(b) deriving a gas rich in H_2S and containing less than 100 ppm of NH_3 therein;

(c) driving H_2S from the scrubbing water of step (a) liberated from H_2S and cooling the formed NH_3 and forming a second gas rich in HH_3;

(d) recirculating the scrubbing water which is free of H_2S and NH_3 to the top of the bottom stage of the scrubbing column; and

(e) feeding the first mainly H_2S-containing gas and the second mainly NH_3-containing gas streams of steps (b) and (c) respectively into the same Claus plant furnace with temperatures of below 40° C and burning said gases separately with air or oxygen, the second gas being burned with an excess of oxygen to maintain a ratio of H_2S/SO_2 at a value of about 2 to 1 to produce elemental sulfur therefrom.

4,075,311

PROCESS FOR PREPARING GRANULATED MAGNESIUM HYDROXIDE AND MAGNESIA OF A LARGE SPECIFIC SURFACE

Peter Eustacchio, Leoben, Austria, assignor to Veitscher Magnesitwerke-Actien-Gesellschaft, Vienna, Austria

Filed Jan. 28, 1976, Ser. No. 653,223
Claims priority, application Austria, Jan. 31, 1975, 741/75
Int. Cl.² C01F 5/16
U.S. Cl. 423—636 **33 Claims**

1. A process for preparing insulation magnesium hydroxide,

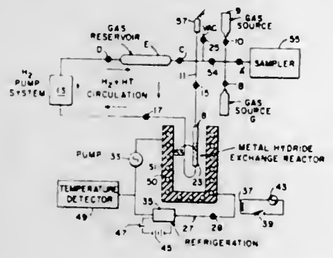
comprising the steps of adding to a mass of finely divided magnesia an amount of water sufficient to act as a binding agent for the finely divided magnesia granulating the mass to form granules and subjecting the granules to an exothermic hydration reaction for hydrating at least 50%, by weight, of the magnesia with the added water.

4,075,312

PROCESS FOR RECOVERING EVOLVED HYDROGEN ENRICHED WITH AT LEAST ONE HEAVY HYDROGEN ISOTOPE

John Tanaka, Storrs, Conn., and James J. Reilly, Jr., Bellport, N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed June 6, 1977, Ser. No. 804,124
Int. Cl.[2] C01B *4/00, 1/00;* C01G *6/24*
U.S. Cl. 423—648 A 9 Claims



8. The process of enriching a protium atmosphere with at least one heavy hydrogen isotope, comprising the steps of:

a. alloying titanium with at least one metal selected from the group of metals consisting of V, Cr, Mn, Mo, Fe, Co and Ni having an alloy hydride hydrogen separation factor greater than one;

b. hydriding the alloy with protium;

c. selectively contacting the alloy hydride at a pressure above the dissociation pressure of the hydrided alloy with a protium treating gas containing higher than normal amounts of at least one heavy isotope of hydrogen at a temperature in the range of up to 40° C to enrich the hydrided alloy in at least said one isotope;

d. isolating the enriched hydrided alloy; and

e. decomposing the isolated enriched alloy to produce the enriched atmosphere.

4,075,313

PROCESS FOR PRODUCING HYDROGEN AND OXYGEN FROM WATER

Jon B. Pangborn, Lisle, Ill.; John C. Sharer, Farmington, Maine, and Robert H. Elkins, Hinsdale, Ill., assignors to American Gas Association, Arlington, Va.

Continuation-in-part of Ser. No. 536,014, Dec. 23, 1974, Pat. No. 3,998,942. This application Mar. 18, 1976, Ser. No. 668,138
Int. Cl.[2] C01B *1/08, 13/00*
U.S. Cl. 423—658 17 Claims

1. In a reactant regenerative closed cycle process for the production of hydrogen from water the steps comprising:

reacting solid ferriferrous oxide and a gaseous chloride ion yielding substance selected from the group consisting of hydrogen chloride and chlorine at temperatures of about 125° to about 300° C when hydrogen chloride is used and about 800° to about 1000° C when chlorine is used to produce ferric chloride;

thermally reducing the ferric chloride at temperatures of about 225° to about 325° C to produce ferrous chloride;

reducing the ferrous chloride to metallic iron at temperatures of about 600° C. to about 1500° C.; and

then oxidizing the metallic iron with steam at temperatures of about 600° to about 1500° C to produce hydrogen and ferriferrous oxide and recycling said ferriferrous oxide for reaction with said gaseous chloride ion yielding substance and using some hydrogen produced for reducing the ferrous chloride and removing the remainder of the hydrogen from the cycle.

4,075,314

STANNOUS PYROPHOSPHATE TECHNETIUM-99m COMPOSITIONS

Robert G. Wolfangel, Ballwin, and Howard A. Anderson, Kirkwood, both of Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Filed Apr. 29, 1976, Ser. No. 681,626
Int. Cl.[2] A61K *43/00, 29/00*
U.S. Cl. 424—1 16 Claims

1. An improved composition for skeletal imaging comprising,

A. divalent tin

B. technetium-99m

C. pyrophosphate, and

D. sufficient ascorbate to reduce (1) the oxidation of Sn^{+2} to Sn^{+4} during extended storage and (2) reoxidation of reduced technetium and the formation of technetium labeled impurities.

4,075,315

DETECTION OF ANTIGENS BY ANTI-BODY SENSITIZED MICROBIAL PARTICLES

Herman Ainis; Charles F. Lange, both of Evanston; Abraham S. Mark, and George H. Scherr, both of Park Forest, all of Ill., assignors to Technical Research Affiliates, Inc., Park Forest, Ill.

Filed Sept. 19, 1975, Ser. No. 614,854
Int. Cl.[2] G01N *31/02, 33/16*
U.S. Cl. 424—12 23 Claims

1. A method of testing for the presence of a suspected specific antigen in a biological specimen of animal origin, comprising the step of combining the specimen containing the suspected antigen with a protein-A-containing microbial cell suspension so sensitized with an antibody specific to the suspected antigen that the Fc part of the antibody is attached to protein-A which in turn is attached to the microbial cell, whereby agglutination occurs if the test is positive.

4,075,316

DENTIFRICES

Martin Cordon, Highland Park, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 561,842, March 25, 1975, Pat. No. 3,957,968, which is a continuation-in-part of Ser. No. 389,826, Aug. 20, 1973, abandoned, which is a continuation-in-part of Ser. No. 355,365, April 30, 1973, abandoned. This application Feb. 27, 1976, Ser. No. 662,068
The portion of the term of this patent subsequent to May 4, 1993, has been disclaimed.
Int. Cl.[2] A61k *7/16*
U.S. Cl. 424—49 5 Claims

1. A dentifrice comprising, as an abrasive, alpha-alumina which is in the form of flat flakes having an average diameter of less than about 20 microns and thicknesses of less than about 3 microns, the proportion of said alpha-alumina being above about 0.1% and less than about 60% of said dentifrice, said alpha-alumina being a component of visible agglomerated particles of a thermoplastic resin having a molecular weight between about 1000 and 100,000, said visible agglomerated particles being in the range of about 0.5 to 50 microns in size and dispersed in said dentifrice in amount of up to about 60% by weight.

4,075,317

DENTAL CREAM COMPOSITION

Robert Lee Mitchell, Somerset, and William John Chung, Spotswood, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 464,898, April 29, 1974, abandoned, which is a continuation-in-part of Ser. No. 369,730, June 13, 1973, abandoned. This application Oct. 2, 1975, Ser. No. 618,855
Int. Cl.[2] A61K *7/16, 7/18*
U.S. Cl. 424—52 4 Claims

1. A dental cream suitable for compatible incorporation into an unlined aluminum container comprising a dental cream vehicle having dispersed or dissolved therein a water-soluble monofluorophosphate salt selected from the group consisting of alkali metal, calcium, magnesium and aluminum monofluorophosphates in an amount which provides between about 0.01 and 1% fluoride to said dental cream, about 35 to 60% by weight of abrasive which abrasive consists essentially of alumina in excess of calcium carbonate, said calcium carbonate being in amount of at least about 5% by weight of the total dental cream, an alkali metal tripolyphosphate in an amount of about 0.05 up to about 1.5% by weight and between about 0.05 and about 0.25 % by weight of a dissolved or dispersed silicate.

4,075,318

SKIN PROTECTIVE COMPOSITIONS

Ralph Kelly, Cincinnati, and Edmond Jean Ritter, Loveland, both of Ohio, assignors to Cincinnati Milacron, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 696,509, Jan. 9, 1968, Pat. No. 3,630,934, which is a continuation-in-part of Ser. No. 613,095, Feb. 1, 1967, Pat. No. 3,538,009. This application June 15, 1970, Ser. No. 46,561
The portion of the term of this patent subsequent to Oct. 30, 1990, has been disclaimed.
Int. Cl.[2] A61K *7/06*
U.S. Cl. 424—70 11 Claims

1. A skin protective lotion or creme consisting essentially of emollient, humectant, surfactant and a protective agent in an amount effective to reduce the amount of skin irritation; said lotion or creme capable of reducing skin irritation compared to said lotion or creme without protective agent when applied to the skin prior to contact with a skin irritant; said protective agent selected from the group consisting of:

A. The polymerized product obtained from the polymerization of 2 to 4 molecules of a monomeric ethylenically unsaturated C_{12} to C_{26} fatty acid, said product containing 2 to 4 carboxyl groups; or in place of carboxyl groups derivative radicals selected from the group consisting of carboxyl salt; hydroxyl; unsubstituted amino; substituted amino wherein the substituents are aliphatic or aromatic hydrocarbon radicals of 1 to 12 carbon atoms, or said substituents taken together form a 3 to 6 membered carbocyclic or heterocyclic ring with the amino nitrogen; unsubstituted amido; substituted amido wherein the substituents are aliphatic or aromatic hydrocarbon radicals of 1 to 12 carbon atoms, or said substituents taken together form a 3 to 6 membered carbocyclic or heterocyclic ring with the amido nitrogen, quaternary ammonium wherein the nitrogen substituents are alkyl of 1 to 6 carbon atoms; lower alkyl ester; sulfate; sulfonate; phosphate; phosphonate; and derivative compounds containing further substituents in said alkyl, aliphatic or aromatic hydrocarbon radicals selected from the group consisting of carboxyl and the said derivative radicals;

B. esters and polyesters of cycloaliphatic or aromatic polycarboxylic acids containing at least one 5 to 7 carbon ring and hydroxy containing polyoxyalkylene ethers containing 2 to 30 oxyalkylene units in which the alkylene radical contains 2 to 4 carbon atoms;

C. esters and polyesters of the polymerized fatty acid product or the hydrogenated derivative thereof defined in A above and a hydroxy compound selected from the group consisting of

(a) polyoxyalkylene ethers containing 2 to 30 oxyalkylene units in which the alkylene radical contains 2 to 4 carbon atoms; and

(b) condensation products of alkylene oxides having 2 to 4 carbon atoms and polyamines having 2 to 4 amino groups and containing 2 to 8 carbon atoms in an aliphatic, cycloaliphatic or aromatic group.

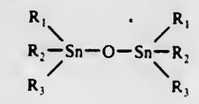
4,075,319

LOW LEACHING ANTIFOULING ORGANOMETALLIC POLYVINYLS

Edward J. Dyckman, Sunderland; Deborah M. Andersen, Annapolis, and Eugene C. Fischer, Arnold, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 24, 1976, Ser. No. 699,744
Int. Cl.[2] C08F *8/42;* C08K *5/57;* B32B *27/06*
U.S. Cl. 424—78 12 Claims

1. A composition of matter for preventing the growth of fouling organisms on marine structures said composition being characterized by a low leaching rate of the antifouling agent from the composition and comprising an organotin containing polymer, said polymer being the reaction product of a copolymer of methyl vinyl ether and maleic acid and an organotin oxide of the formula:



wherein R_1, R_2 and R_3 may be the same or different and are selected from the group consisting of propyl, butyl, phenyl and benzyl.

4,075,320

ATTRACTANT FOR ANTS

Fridolin Jacob Ritter, Waddinxveen, and Friedrich Stein, Schipluiden, both of Netherlands, assignors to Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek ten behoeve van Nijverheid, Handel en Verkeer, The Hague, Netherlands

Filed June 30, 1975, Ser. No. 592,085
Claims priority, application Netherlands, June 28, 1974, 7408757
Int. Cl.[2] A01N *17/14*
U.S. Cl. 424—84 10 Claims

1. An attractant composition for Pharaoh's ants which comprises biologically active amounts of (a) 2-(5'-n-hexenyl)-5-R-pyrrolidine wherein R is selected from the group consisting of n-pentyl, n-heptyl and n-nonyl, and (b) 5-methyl-3-n-butyloctahydroindolizine.

4,075,321

VACCINES, THE PROCESS FOR PREPARING THE SAME AND THE APPLICATIONS THEREOF

Edgar Hans Relyveld, Paris, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Division of Ser. No. 465,712, April 30, 1974, Pat. No. 3,983,229. This application July 12, 1976, Ser. No. 704,706
Claims priority, application France, May 4, 1973, 73.16131
Int. Cl.[2] A61K *39/02*
U.S. Cl. 424—92 26 Claims

1. An improvement in a process for preparing a bacterial vaccine by reacting whole bacteria with an inactivating agent and stopping the reaction as soon as said inactivation is achieved, wherein the improvement comprises the step of inactivating the whole bacteria with glutaraldehyde as the

inactivating agent at a concentration ranging from about 0.00131 M to 0.0526 M, whereby an inactivated product is obtained which is usable as a bacterial vaccine while remaining antigenic and retaining its immunizing power.

4,075,322

ENZYME COMPOSITION

Alexandr Pavlovich Bashkovich, prospekt M. Toreza, 40, korpus 7, kv. 21; Evgenia Semenovna Zimnukhova, ulitsa Pionerstroya, 18, kv. 206; Agnessa Vladimirovna Prokopovich, Bolsheokhtinsky prospekt, 79, kv. 9; Olga Grigorievna Polatovskaya, ulitsa Uchitelskaya, 19, korpus 1, kv. 29; Maria Ivanovna Pronina, ulitsa Sedova, 109, kv. 33; Valter Osvaldovich Kulbakh, Bukharestskaya ulitsa, 86, korpus 1, kv. 85; Khasya Ionovna Rivkina-Pevtsova, ulitsa Sadovaya, 92, kv. 5, and Grigory Efimovich Grinberg, prospekt Metallistov, 82, kv. 321, all of Leningrad, U.S.S.R.

Continuation of Ser. No. 418,847, Nov. 26, 1973, abandoned. This application July 7, 1975, Ser. No. 593,536

Int. Cl.[2] A61K *37/48*

U.S. Cl. 424—94 **6 Claims**

1. A composition having hydrolytic, proteolytic and thrombolytic properties consisting essentially of an effective amount of hygrolytin and a pharmaceutically acceptable carrier, said hygrolytin being the product of the process which comprises cultivating, under deep aerobic conditions, *Streptomyces hygroscopicus*, strain 1913 (All-Union Research Institute of Antibiotics, Moscow, Culture Collection, Deposit No. 997), using an aqueous nutrient medium containing assimilable sources of carbon, nitrogen and inorganic substances, and separating hygrolytin formed during the culture.

4,075,323

COCCIDIOCIDAL COMBINATIONS

Larry R. McDougald, Greenfield, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 25, 1976, Ser. No. 670,486

Int. Cl.[2] A61K *35/66, 31/35*

U.S. Cl. 424—114 **2 Claims**

2. A coccidiocidal method for poultry which comprises orally administering to the poultry a coccidiocidally-effective combination of about 50 ppm of monensin and about 37 ppm of lasalocid, together with a poultry feedstuff or drinking water.

4,075,324

FUNGICIDAL COMPOSITIONS CONTAINING PHOSPHOROUS ACID AND DERIVATIVES THEREOF

Andre Thizy; Daniel Pillon; Jean-Claude Debourge, and Guy Lacroix, all of Lyon, France, assignors to Pepro, France

Filed Nov. 26, 1974, Ser. No. 527,380

Claims priority, application France, Nov. 26, 1973, 73 43081; Nov. 27, 1974, 74 33409

Int. Cl.[2] A01N *936, 11/00*

U.S. Cl. 424—128 **20 Claims**

1. A method of controlling fungus disease in plants comprising applying to said plants a fungicidally effective amount of at least one compound selected from the group consisting of phosphorous acid and mineral and ammonium salts thereof.

4,075,325

VETERINARY LICK PREPARATION

Gabriel Peter Kauzal, P.O. Box 1 Potts Point, Sydney, Australia (2011)

Filed Oct. 22, 1976, Ser. No. 735,046

Int. Cl.[2] A61K *33/34, 47/00; A23K 1/02*

U.S. Cl. 424—140 **10 Claims**

1. A process for the production of a lick preparation for animals wherein molasses is compounded with at least one solidifying agent chosen from the group consisting of paraffin wax, hydrogenated animal fat, hydrogenated vegetable oil or a mixture of any of the foregoing, at an elevated temperature not exceeding 180° F and at an absolute pressure of at least 100 kilo Pascalls for a time sufficient to permit thickening thereof without solidifying and then allowing the preparation to cool and solidify.

4,075,326

FUNGICIDAL/ALGICIDAL COMPOSITION FOR NON-MEDICAL USES

Hiroshi Kuyama, Urawa, and Nobuyuki Higosaki, Tanashi, both of Japan, assignors to Rohm and Haas Company, Philadelphia, Pa.

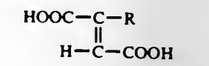
Division of Ser. No. 534,519, Dec. 19, 1974, Pat. No. 3,961,933. This application Mar. 19, 1976, Ser. No. 667,813

Claims priority, application Japan, Dec. 22, 1973, 49-3172

Int. Cl.[2] A01N *11/02, 11/04*

U.S. Cl. 424—141 **4 Claims**

1. A fungicidal composition which comprises a fungicide which consists essentially of a combined effective amount of at least one compound selected from Group A and at least one compound selected from Group B wherein Group A is a copper salt of an unsaturated dibasic acid of the formula:



wherein R is a hydrogen atom or a lower alkyl group and Group B is an inorganic copper salt selected from the group consisting of copper oxychloride, basic copper sulfate, basic copper carbonate, copper silicate, cuprous oxide, basic copper phosphate and copper hydroxide, the ratio of A to B being from 1:9 to 9:1.

4,075,327

METHOD FOR THE TREATMENT OF TREES SUBJECT TO DUTCH ELM DISEASE

Erik Jorgensen, Ottawa; Dibyendu N. Roy, Willowdale, and Edward S. Kondo, Sault Ste. Marie, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Division of Ser. No. 347,902, April 4, 1973, abandoned. This application May 17, 1974, Ser. No. 470,950

Claims priority, application Canada, May 7, 1972, 142406

Int. Cl.[2] A01N *9/22*

U.S. Cl. 424—273 R **5 Claims**

1. A method of systemic fungicide treatment of trees subject to Dutch elm disease comprising severing one or more roots of the tree below ground level and applying an aqueous solution of a water-soluble derivative of methyl-benzimidazole carbamate fungicide material, said solution having a concentration of 50 to 2000 parts of fungicide material per million parts of the aqueous solution, to the severed end of the root under a positive pressure in the range 5 psi. and 25 psi. and for a treatment time between one hour and 48 hours, wherein the fungicide material is methyl-2-benzimidazole carbamate chloride.

4,075,328

NAPHTHACENE DERIVATIVES

Jean Bernard Ducep, Paris; Daniel Farge, Thiais; Gerard Ponsinet, Sceaux, and Daniel Reisdorf, Thiais, all of France, assignors to Rhone-Poulenc Industries, Paris, France

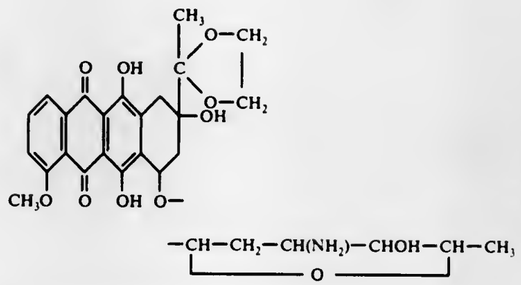
Filed June 14, 1976, Ser. No. 695,444

Claims priority, application France, June 16, 1975, 75 18746

Int. Cl.[2] A61K *31/71; C07H 15/24*

U.S. Cl. 424—180 **4 Claims**

1. The naphthacene derivative of the formula:



and non-toxic acid addition salts thereof.

4. A pharmaceutical composition which comprises as active ingredient a significant amount of the naphthacene derivative or non-toxic acid addition salt thereof as claimed in claim 1 in association with a compatible pharmaceutically acceptable carrier.

4,075,329

PROCESS FOR PROTECTING ORGANIC MATERIALS USING A BACTERIOSTATIC COFFEE EXTRACT

Pierre Hirsbrunner, Corseaux; Theodor Beyeler, Vevey, and David Shepherd, Morges, all of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Continuation of Ser. No. 556,290, March 7, 1975, abandoned. This application Apr. 22, 1976, Ser. No. 679,321

Claims priority, application Switzerland, Apr. 8, 1974, 4907/74

Int. Cl.[2] A01N *9/08*

U.S. Cl. 424—195 **8 Claims**

1. A process of obtaining a bacteriostatic agent from unroasted coffee beans comprising the steps of

contacting a mass of unroasted coffee beans with an organic solvent phase and a basic aqueous phase,

thereafter decanting and separating the basic aqueous phase,

acidifying the separated basic phase,

thereafter contacting the acidified aqueous phase with an organic solvent phase, and

then separating the solvent phase containing the bacteriostatic agent.

4,075,330

O,S-DIALKYL-O-[1-ALKYL-3,4-TRIMETHYLENE-PYRAZOL(5)YL]-THIONOTHIOLPHOSPHORIC ACID ESTER

Hellmut Hoffmann, Wuppertal, and Ingeborg Hammann, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

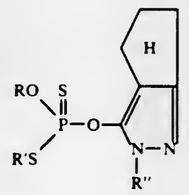
Filed Feb. 10, 1977, Ser. No. 767,585

Claims priority, application Germany, Feb. 26, 1976, 2607658

Int. Cl.[2] C07F *9/65; A01N 9/36*

U.S. Cl. 424—200 **10 Claims**

1. An O,S-dialkyl-O-[1-alkyl-3,4-trimethylene-pyrazol(5)yl]-thionothiolphosphoric acid ester of the formula



in which

R and R' each independently is alkyl with 1 to 6 carbon atoms, and

R'' is alkyl with 1 to 4 carbon atoms or cyanoalkyl with 1 to 4 carbon atoms in the alkyl radical.

8. An arthropodicidal composition containing as active ingredient an arthropodicidally effective amount of an ester according to claim 1 in admixture with a diluent.

9. A method of combating arthropods which comprises applying to the arthropods or to a habitat thereof, an arthropodicidally effective amount of an ester according to claim 1.

4,075,331

MONOESTERS OF ROSAMICIN FOR ELICITING AN ANTIBACTERIAL RESPONSE

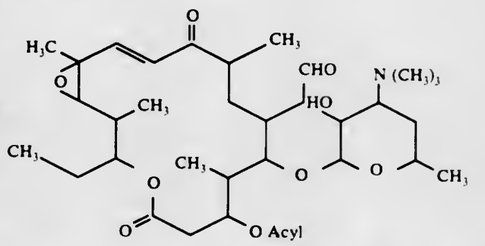
Hans Reimann, Wayne, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 627,322, Oct. 30, 1975, Pat. No. 4,017,516, which is a continuation-in-part of Ser. No. 303,903, Nov. 15, 1972, abandoned. This application Jan. 13, 1977, Ser. No. 759,317

Int. Cl.[2] A61K *31/665, 31/335*

U.S. Cl. 424—203 **6 Claims**

1. A method of eliciting an antibacterial response in mammals which comprises administering to a mammal having a bacterial infection a therapeutically effective quantity of a compound of the formula:



or the pharmaceutically acceptable acid addition salts thereof wherein the acyl function is a



moiety derived from a hydrocarbon carboxylic acid having from 2 to 18 carbon atoms consisting of straight and branched chain alkyl, cycloalkyl, aryl, aralkyl or dibasic acids.

4,075,332

PESTICIDAL O,S'-DIALKYL S-HYDROCARBYLTHIOALKYL DITHIOPHOSPHATES AND OXIDIZED DERIVATIVES THEREOF

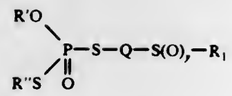
Alexis A. Oswald, Mountainside, and Paul L. Valint, Jr., Woodbridge, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation of Ser. No. 505,109, July 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 210,229, Dec. 20, 1971, abandoned, which is a continuation-in-part of Ser. No. 173,267, Aug. 19, 1971, abandoned, which is a continuation of Ser. No. 821,117, May 1, 1969, abandoned. This application Apr. 16, 1976, Ser. No. 677,719

Int. Cl.[2] A01N *9/36*

U.S. Cl. 424—216 **28 Claims**

1. A pesticidal composition for combatting insects, nematodes, mites, and fungi comprising as an active ingredient, a pesticidally effective amount of a compound of the formula:



where R′ is methyl or ethyl; R″ is primary or secondary C_3 to C_4 alkyl; R_1 is C_1 to C_3 alkyl, phenyl or chlorophenyl; Q is C_1 to C_4 alkylene; and *y* is 0 to 2; provided that when Q is methylene, *y* is 0; and further comprising a carrier.

4,075,333

STABLE INJECTABLE VITAMIN COMPOSITIONS

René Josse, Riedisheim, France, assignor to Hoffmann-La Roche, Inc., Nutley, N.J.

Filed Aug. 20, 1975, Ser. No. 606,383

Claims priority, application Switzerland, Feb. 14, 1975, 1897/75

Int. Cl.² A01N *9/28;* A61K *31/355, 31/595, 31/07*

U.S. Cl. 424—237 **9 Claims**

1. A stable injectable vitamin composition comprising on a weight to volume basis about 20–55% of vitamin A propionate, 0 to about 1% vitamin D component, 0 to about 8% vitamin E component, about 10–30% of a non-ionic emulsifier containing polyoxyethylene groups, about 5–45% of a solubilizing agent selected from the group consisting of polyoldiesters, triglycerides or monoglycerides of fatty acids containing 6–14 carbon atoms and mixtures thereof, and about 5–15% of isopropanol.

4,075,334

6β-IODOMETHYL-19-NORCHOLEST-5(10)-EN-3β-OL AND COMPOSITIONS CONTAINING SAME

Masaharu Kojima, Fukuoka; Hiroshi Ogawa, Chiba; Minoru Maeda, Fukuoka; Kazuo Nitta, and Takayuki Ito, both of Chiba, all of Japan, assignors to Mallinckrodt, Inc., St. Louis, Mo.

Filed Mar. 27, 1975, Ser. No. 562,666

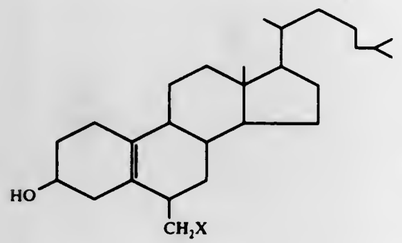
Claims priority, application Japan, May 20, 1974, 49-56822

Int. Cl.² C07J *9/00;* A61K *31/56*

U.S. Cl. 424—238 **10 Claims**

1. A compound represented by the following formula

I



wherein X is iodine or radioactive iodine, said compound being substantially free of 19-iodocholest-5-en-3β-ol and radioiodinated-19-iodocholest-5-en-3β-ol.

5. In a method for photoscanning the adrenal gland wherein a radioactive labelled compound is injected into a patient and thereafter a photoscan made of the patient's adrenal gland the improvement comprising using as the radioactive compound a compound of claim 1 wherein X is radioactive iodine.

4,075,335

PHARMACEUTICAL PIPERIDINE DERIVATIVES

Max Wilhelm, Watchung, N.J.; Kurt Eichenberger, Therwil, Switzerland; Herbert Schroter, Fullinsdorf, Switzerland, and Franz Ostermayer, Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

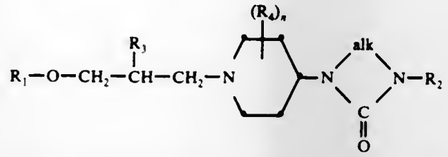
Division of Ser. No. 483,742, June 27, 1974, Pat. No. 3,956,335, which is a continuation-in-part of Ser. No. 389,106, Aug. 16, 1973, abandoned. This application Jan. 28, 1976, Ser. No. 652,966

Claims priority, application Switzerland, Apr. 30, 1974, 5907/74; Aug. 24, 1972, 12539/72; July 3, 1973, 9670/73

Int. Cl.² A61K *31/33*

U.S. Cl. 424—244 **13 Claims**

1. A pharmaceutical composition useful in treating hypertension and tachycardia which comprises an anti-hypertensively and anti-tachycardially effective amount of a piperidine compound having the formula



wherein R_1 is phenyl, naphthyl, 5,6,7,8-tetrahydro-1-naphthyl or 5,6,7,8-tetrahydro-2-naphthyl radical which is unsubstituted, monosubstituted or disubstituted by lower alkyl, lower alkoxy, lower alkenyl, lower alkenyloxy, halogen, halogeno-lower alkyl, carbamoyl, lower alkyl-substituted carbamoyl, lower alkoxycarbonylamino-lower alkyl, lower alkoxy-lower alkoxy, lower alkanoylaminoethenyl, lower alkylthio-lower alkoxy, hydroxyl, lower alkanoyl, lower alkoxy-lower alkyl, lower alkynyl, lower alkylthio-lower alkyl, hydroxy-lower alkyl, lower alkanoyloxy, lower alkylthio, lower alkanoyl amino, cyano, amino, nitro, ureido, lower alkylated ureido, phenyl-lower alkoxy, or lower alkynyloxy, R_2 is hydrogen, lower alkyl, lower alkenyl, α-phenyl-lower alkyl or lower alkanoyl, R_3 is a free hydroxyl group, a lower alkanoyloxy group or a lower alkoxy group, R_4 is hydrogen or lower alkyl, *n* is an integer from 0 to 4, and alk is an optionally mono-lower alkylated ethylene radical or a salt thereof, together with a therapeutically useful carrier.

4,075,336

THIAZINES AND METHOD

Yasunori Kondo, Tokyo, Japan, assignor to Kanto Ishiseiyaku Co., Ltd., Tokorozawa, Japan

Filed Nov. 29, 1976, Ser. No. 745,762

Claims priority, application Japan, Mar. 11, 1976, 51-26353

Int. Cl.² C07D *279/08;* A61K *31/54*

U.S. Cl. 424—246 **4 Claims**

1. 4-oxo-2-(3-hydroxy-4-methoxyphenyl)-2, 3-dihydro-5, 6-benzo-1, 3 -thiazine and pharmaceutically acceptable salts thereof.

2. A method for decreasing inflammation in mammals which comprises administering an anti-inflammatory effect amount of the compound of claim 1.

4,075,337

METHODS OF COMBATTING BACTERIAL INFECTIONS IN WARM-BLOODED ANIMAL WITH CEPHALSPORIN R-SULFOXIDE

Arthur Friedrich Marx, Delft; Jan Verwey, Leiden, and Peter Max Smid, Bleiswijk, all of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

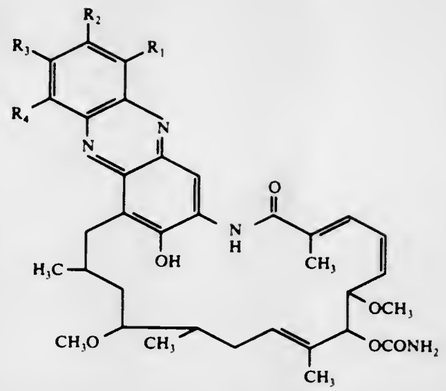
Division of Ser. No. 377,934, July 10, 1973, abandoned. This application Nov. 18, 1975, Ser. No. 633,006

Claims priority, application United Kingdom, July 18, 1972, 33596/72; Oct. 23, 1972, 48720/72

Int. Cl.² A61K *31/54, 31/43*

U.S. Cl. 424—246 **2 Claims**

1. A method of combatting bacterial infections in warm-blooded animals comprising administering to said warm-blooded animals a bactericidally effective amount of a compound selected from the group consisting of 7-phenylacetamido-Δ^3-desacetoxycephalosporanic acid R-sulfoxide and non-toxic, pharmaceutically acceptable salt thereof.



wherein R_1, R_2, R_3, and R_4 are the same or different and selected from hydrogen, hydroxy, halo, amino, and C_1 to C_{20} saturated alkyl, alkoxy wherein the alkyl portion is C_1 to C_{20} saturated alkyl, alkoxycarbonyl wherein the alkyl portion is C_1 to C_{20} saturated alkyl, amide or N-alkyl substituted amide wherein the alkyl portion is C_1 to C_{20} saturated alkyl.

3. A therapeutic method for treatment of a host to a bacterial or viral disease which comprises administering a therapeutically effective amount of a compound according to claim 1.

4,075,338

SUBSTITUTED ACETAMIDOCEPHALOSPORINS

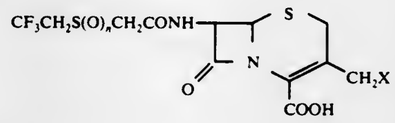
Robert M. DeMarinis, King of Prussia, Pa., assignor to Smith-Kline Corporation, Philadelphia, Pa.

Division of Ser. No. 644,475, Dec. 29, 1975, Pat. No. 4,013,765, which is a division of Ser. No. 428,536, Dec. 26, 1973, Pat. No. 3,957,770. This application Dec. 3, 1976, Ser. No. 747,131

Int. Cl.² A61K *31/545*

U.S. Cl. 424—246 **8 Claims**

5. A method of treating bacterial infections comprising administering by injection to a warm-blooded animal an effective but non-toxic dose of 250–1000 mg of a compound of the formula



where

n is 0, 1, or 2; and

X is hydrogen or acetoxy;

or a non-toxic pharmaceutically acceptable salt thereof.

4,075,339

BIOLOGICALLY ACTIVE COMPOUNDS

Kenneth L. Rinehart, Jr., Urbana, Ill.; Moses W. McMillan, Indianapolis, Ind., and Wojciech Sobiczewski, Warsaw, Poland, assignors to University of Illinois Foundation, Urbana, Ill.

Division of Ser. No. 458,139, April 5, 1974, Pat. No. 3,987,035. This application Aug. 2, 1976, Ser. No. 710,575

Int. Cl.² C07D *487/04;* A61K *31/395*

U.S. Cl. 424—250 **3 Claims**

1. A compound of the formula

4,075,340

THIENO [2,3-c] PYRIDINE DERIVATIVES AND THERAPEUTIC COMPOSITION CONTAINING SAME

Jean-Pierre Maffrand, Toulouse, France, assignor to Parcor, Paris, France

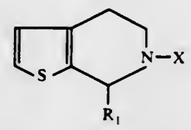
Filed June 2, 1976, Ser. No. 692,186

Claims priority, application France, June 27, 1975, 75 20241

Int. Cl.² A61K *31/54;* C07D *417/04*

U.S. Cl. 424—256 **5 Claims**

1. A compound having the following structure:



in which R_1 is a member selected from the group consisting of hydrogen and methyl, with a proviso that when R_1 is hydrogen, X is a member selected from the group consisting of

n-dodecyl,
o-methoxycarbonylbenzyl
o-carboxybenzyl
2-(5-chloro-thienyl)-methyl
2-acetoxy-2-p-chlorophenyl-ethyl
2-hydroxy-propyl
2-acetoxy-2-m.methoxyphenyl-ethyl
o-nitrobenzyl
p-nitrobenzyl
o-cyanobenzyl
2-chloro-benzyl
3,4,5-trimethoxy-benzyl
β-phenethyl
m.methoxybenzyl
p.chlorobenzyl
m.chlorobenzyl
2-hydroxy-2-phenyl-ethyl
p.methylbenzyl
3,4-dimethoxy-benzyl
o.fluorobenzyl

2-hydroxy-2- p.chlorophenyl-ethyl
2,3,4-trimethoxy-benzyl
2-hydroxy-2-p.fluorophenyl-ethyl
2-hydroxy-2-p.methoxyphenyl-ethyl
2-hydroxy-3-p.methoxyphenoxy-propyl
3-oxo-butyl
2-hydroxy-3,3,3-trichloro-propyl
3,4-dimethoxy-benzyl

and when R_1 is methyl, X is a member selected from the group consisting of

3,4,5-trimethoxy-benzyl
2-hydroxy-2-phenyl-ethyl
2-p.chlorophenyl-2-hydroxy-ethyl
o-chlorobenzyl
2-hydroxy-2-p.methoxyphenyl-ethyl
2-hydroxy-2-m.methoxyphenyl-ethyl
2-(2,4-dimethoxy-phenyl)-2-hydroxyethyl.

3. Therapeutic composition having an anti-inflammatory activity, comprising, as active ingredient, a compound according to claim 1 together with a pharmaceutically acceptable carrier, in unit dosage form, each unit dose containing 0.010–0.300 g active ingredient.

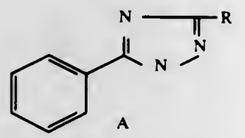
4,075,341

2-SUBSTITUTED PHENYL-5-TRIAZOLS [5,1-A] ISOQUINOLINE COMPOUNDS

Amedeo Omodei-Salé, Voghera (Pavia); Pietro Consonni, and Leonard Lerner, both of Milan, all of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

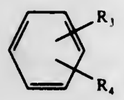
Continuation-in-part of Ser. No. 473,045, May 24, 1974, abandoned. This application Nov. 28, 1975, Ser. No. 636,330
Int. Cl.[2] C07D *471/04*; A61K *31/53*
U.S. Cl. 424—258 **14 Claims**

1. A compound of the formula



A

wherein A represents the group $-CH_2-CH_2-$ or $-CH=CH-$; and
wherein R is substituted phenyl of the formula



wherein one of the substituents R_3 and R_4 is located in the 3- or 4-position of the phenyl ring, and represents a lower alkoxy, lower alkenyloxy, lower alkynyloxy, fluoro, chloro, bromo, trifluoromethyl, hydroxy, cyclopropyloxy, cyclobutyloxy, cyclopentyloxy, benzyloxy, nitro or dimethylamino group and the other represents hydrogen, methoxy, fluoro, chloro or bromo; or R_3 and R_4 taken together represent a methylenedioxy group.

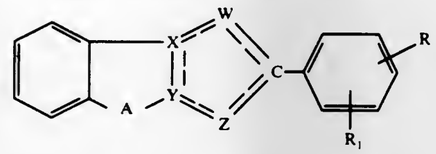
4,075,342

ANTIREPRODUCTIVE IMIDAZO[2,1-a]ISOQUINOLINE COMPOUNDS

Amedeo Omodei Salé, Pavia; Emilio Toia, Milan; Giulio Galliani, Milan, and Leonard J. Lerner, Milan, all of Italy, assignors to Gruppo Lepetit, S.p.A., Milan, Italy

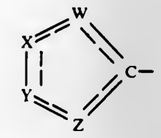
Filed Nov. 6, 1975, Ser. No. 629,339
Claims priority, application United Kingdom, Nov. 23, 1974, 50855/74
Int. Cl.[2] C07D *471/04*; A61K *31/47*
U.S. Cl. 424—258 **6 Claims**

1. A tricyclic compound of the formula

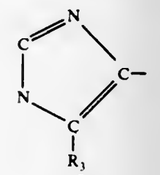


I

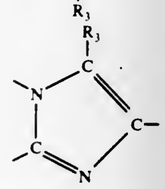
wherein:
A represents one member of the group $-CH=CH-$; and $-CH_2-CH_2-$;
R represents one member of the group: hydrogen, lower alkyl, lower alkoxy, lower alkenyloxy, lower alkylnyloxy, cyclopropyloxy, cyclobutyloxy, cyclopentyloxy, cyclohexyloxy, hydroxy, benzyloxy, fluoro, chloro, bromo, iodo, trifluoromethyl and nitro; R_1 represents hydrogen, lower alkoxy, fluoro, chloro or bromo; or R and R_1 taken together represent a methylenedioxy group;
the sequence



represents one of the following moieties:

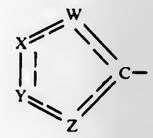


c)

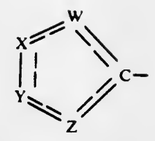


d)

R_3 represents hydrogen or lower alkyl;
when the sequence



represents the moiety c) wherein R_3 is hydrogen and simultaneously both R and R_1 represent hydrogen, the symbol A may not represent the group $-CH=CH-$; and when the sequence



represents the moiety (d) wherein R_3 is hydrogen and simultaneously both R and R_1 represent hydrogen, the symbol A may not represent $-CH=CH-$ or $-CH_2-CH_2-$; or a salt thereof with a non-toxic pharmaceutically-acceptable acid.

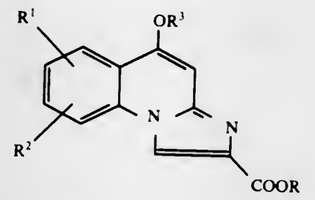
4,075,343

ANTI-ALLERGENIC 5-ALKOXYIMIDAZO[1,2-a]QUINOLINE-2-CARBOXYLIC ACIDS AND DERIVATIVES THEREOF

Saul B. Kadin, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

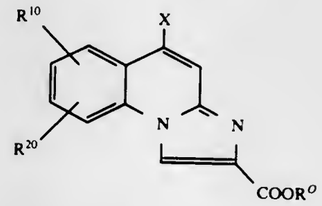
Filed Sept. 13, 1976, Ser. No. 722,429
Int. Cl.[2] A61K *31/47*; C07D *471/04*
U.S. Cl. 424—258 **23 Claims**

1. A compound of the formula



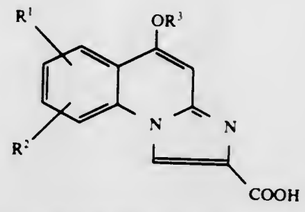
wherein R is hydrogen or alkyl having from one to five carbon atoms;
R^1 and R^2 are each selected from the group consisting of hydrogen, alkyl having from one to five carbon atoms, alkoxy having from one to five carbon atoms, fluoro, chloro, bromo, methylthio and methylsulfinyl, with the proviso that when both of said R^1 and R^2 are branched chain alkyl or branched chain alkoxy they are located on non-adjacent position; and when R^1 and R^2 are taken together they form a member of group consisting of tetramethylene, 1,3-butadienyl, methylenedioxy and ethylenedioxy, each said group being attached to adjacent carbon atoms of said benzenoid ring;
R^3 is alkyl having from one to five carbon atoms;
and the pharmaceutically acceptable cationic salts of those compounds wherein R is hydrogen.

11. A compound of the formula



wherein X is chloro or bromo;
R^0 is alkyl having from one to five carbon atoms;
R^{10} and R^{20} are each selected from the group consisting of hydrogen, alkyl having from one to five carbon atoms, alkoxy having from one to five carbon atoms and fluoro, with the proviso that when both of said R^{10} and R^{20} are branched chain alkyl or branched chain alkoxy they are located on non-adjacent positions; and when R^{10} and R^{20} are taken together they form a member of the group consisting of tetramethylene, 1,3-butadienyl, methylenedioxy and ethylenedioxy, each said group being attached to adjacent carbon atoms of said benzenoid ring.

12. A method of inhibiting the release of mediators of anaphylaxis in a mammalian subject which comprises administering to the subject orally, parenterally or by inhalation, an anaphylaxis mediator release inhibiting amount of a compound having the formula



wherein R^1 and R^2 are each selected from the group consisting of hydrogen, alkyl having from one to five carbon atoms, alkoxy having from one to five carbon atoms, fluoro, chloro, bromo, methylthio and methylsulfinyl, with the proviso that when both of said R^1 and R^2 are branched chain alkyl or branched chain alkoxy they are located on non-adjacent positions; and when R^1 and R^2 are taken together they form a member of the group consisting of tetramethylene, 1,3-butadienyl, methylenedioxy and ethylenedioxy, each said group being attached to adjacent carbon atoms of said benzenoid ring;
R^3 is alkyl having from one to five carbon atoms;
and the pharmaceutically acceptable cationic salts thereof.

19. A pharmaceutical composition active as an antiallergy agent comprising a pharmaceutically acceptable carrier and a compound of claim 1 wherein R is hydrogen and the pharmaceutically acceptable cationic salts thereof.

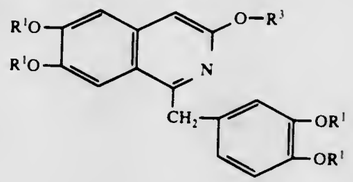
4,075,344

3-ALKOXYISOQUINOLINES FOR HYPOTENSIVE AND VASODILATING EFFECTS

William E. Kreighbaum, and William T. Comer, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Division of Ser. No. 612,884, Sept. 12, 1975, Pat. No. 4,015,006, which is a division of Ser. No. 423,841, Dec. 11, 1973, Pat. No. 3,910,927, which is a division of Ser. No. 184,197, Sept. 27, 1971, Pat. No. 3,798,225. This application Dec. 22, 1976, Ser. No. 753,123
Int. Cl.[2] A61K *31/47*
U.S. Cl. 424—258 **3 Claims**

1. A process for eliciting a hypotensive and vasodilating effect in a mammal in need thereof which comprises systemic administration to said mammal a non-toxic effective dose of from about 0.05 to 20 mg./kg. of body weight of said mammal of a compound selected from the group consisting of those having the formula



wherein
R^1 is lower alkyl having up to 4 carbon atoms;
R^3 is lower alkyl having up to 4 carbon atoms, alkenyl having from 3 to 6 carbon atoms, cycloalkyl having from 3 to 5 carbon atoms, benzyl;
and a pharmaceutically acceptable acid addition salt thereof.

4,075,345

3-PYRIDYLMETHYL ARYL UREA RODENTICIDES COMPOSITIONS

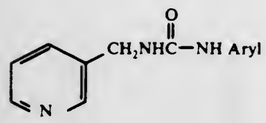
Edward E. Kilbourn; David L. Peardon, both of Chalfont, and J. Edgar Ware, Quakertown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

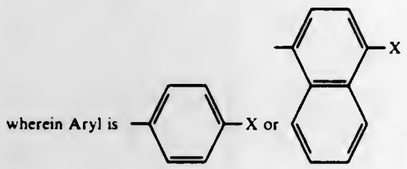
Continuation-in-part of Ser. No. 342,334, March 19, 1973, abandoned. This application Apr. 11, 1974, Ser. No. 460,263

Int. Cl.[2] A01N *9/22*

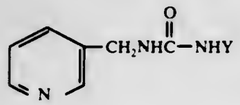
U.S. Cl. 424—263 **12 Claims**

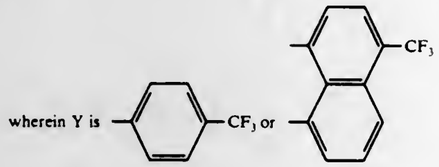
1. A rodenticidal composition comprising a carrier and as the active ingredient a rodenticidally effective amount of a compound, or an acid addition salt thereof, having the formula





wherein X is selected from the group consisting of $-NO_2$, —CH, $-C(O)CH_2CH_2CH_3$, —SCN, $-SCH_3$, $-SC_2H_5$, $-SC_4H_9$-n, $-SC_4H_9$-sec, $-SC_6H_{13}$-n, $-SO_2C_6H_5$, and $-SO_2N(C_2H_5)_2$, or a compound having the formula





4,075,346

CNS DEPRESSANT γ-(SECONDARY AMINO)-ORTHO-NITRO-BUTYROPHENONES

Kikuo Sasajima, Toyonaka; Keiichi Ono, Nishinomiya; Yasuo Motoike, Minoo; Shigeho Inaba, Takarazuka, and Hisao Yamamoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

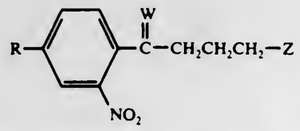
Filed July 16, 1976, Ser. No. 705,840

Claims priority, application Japan, July 17, 1975, 50-87962; July 18, 1975, 50-88473

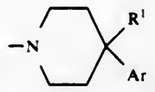
Int. Cl.[2] C07D *211/28;* A61K *31/445*

U.S. Cl. 424—267 **8 Claims**

1. A compound of the formula:

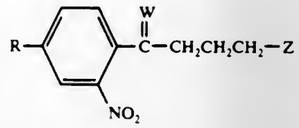


wherein R is a hydrogen atom or a fluorine atom, W is an oxygen atom, an ethylenediozy group or an ethylenedithio group and Z is a secondary amino group of the formula:

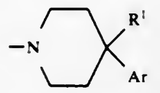


wherein Ar is an unsubstituted phenyl group or a phenyl group substituted with one or two substituents selected from the group consisting of halogen, methyl, methoxy and trifluoromethyl and R_1 is a hydrogen atom or a hydroxyl group, or a pharmaceutically acceptable acid addition salt thereof.

5. A central nervous system depressant composition which comprises as the active ingredient at least one of the γ-(secondary amino)-orthonitrobutyrophenones of the formula:



wherein R is a hydrogen atom or a fluorine atom, W is an oxygen atom, an ethylenedioxy group or an ethylenedithio group, and Z is a secondary amino group of the formula:



wherein Ar is an unsubstituted phenyl group or a phenyl group substituted with one or two substituents selected from the group consisting of halogen, methyl, methoxy and trifluoromethyl and R_1 is a hydrogen atom or a hydroxyl group, or a pharmaceutically acceptable acid addition salt thereof, and at least one pharmaceutically acceptable carrier or diluent.

4,075,347

FUNGICIDAL 5-DIALKYLAMINO-4-NITROSULFONAMIDOTHIOPHENES

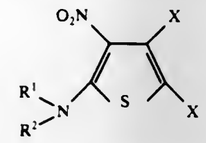
Laroy H. Edwards, Napa, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 578,851, May 9, 1975, Pat. No. 3,996,243. This application Oct. 12, 1976, Ser. No. 731,246

Int. Cl.[2] A01N *9/12*

U.S. Cl. 424—275 **14 Claims**

1. A method for controlling fungi which comprises contacting said fungi or their habitats with a fungicidally effective amount of the compound of the formula



wherein R^1 is alkyl of 1 to 6 carbon atoms; R^2 is alkyl of 1 to 6 carbon atoms; one X is hydrogen, fluoro, chloro or bromo and the other X is $-SO_2N(R^3)(R^4)$ wherein R^3 is hydrogen, alkyl of 1 to 6 carbon atoms, phenyl or phenyl substituted with 1 to 2 of the same or different substituents selected from trifluoromethyl, trichloromethyl, fluoro, chloro, bromo, nitro or alkyl of 1 to 3 carbon atoms and R^4 is haloalkylthio of 1 to 3 carbon atoms and 1 to 7 of the same or different halogens selected from fluoro, chloro or bromo.

4,075,348

ALKYL ALLOPHANATES, METHOD FOR PREPARATION AND FUNGICIDAL USE OF THE SAME

Paul William Knapp, Jr., Bordentown, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 689,030, May 24, 1976, Pat. No. 4,045,470. This application Apr. 22, 1977, Ser. No. 790,114

Int. Cl.[2] A01N *9/12*

U.S. Cl. 424—300 **1 Claim**

1. A method for the control of fungi comprising: contacting fungi with a fungicidally effective amount of allophanic acid-, 3-thio-4-{o-[(2,2,2-trichloroethylidene)amino]phenyl}-, methyl ester.

4,075,349

MICROBICIDAL COMPOSITIONS

Adolf Hubele, Magden; Walter Kunz, Oberwil, both of Switzerland, and Wolfgang Eckhardt, Lorrach, Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

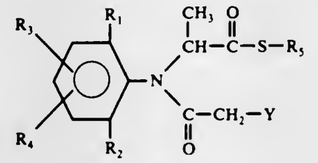
Filed Sept. 24, 1976, Ser. No. 726,321

Claims priority, application Switzerland, Sept. 30, 1975, 12649/75

Int. Cl.[2] A01N *9/12;* C07C *153/09*

U.S. Cl. 424—301 **22 Claims**

1. A compound of the formula I



(I)

wherein

R_1 represents a C_1-C_4-alkyl group, a C_1-C_4-alkoxy group or a halogen atom,

R_2 represents a C_1-C_3-alkyl group, a C_1-C_4-alkoxy group or a halogen atom,

R_3 represents a hydrogen atom, a C_1-C_3-alkyl group or a halogen atom,

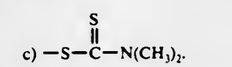
R_4 represents a hydrogen atom or a methyl group, with the proviso that the total number of carbon atoms contained by the substituents R_1, R_2, R_3 and R_4 in the phenyl ring does not exceed 8,

R_5 represents a methyl or ethyl group, while

Y represents one of the following groups:

a. —O—R_6,

b. —S—R_6, wherein R_6 represents alkyl of 1 to 6 carbon atoms, alkenyl of 3 to 6 carbon atoms, or alkinyl of 3 to 6 carbon atoms, or



c) $-S-\overset{S}{\overset{\|}{C}}-N(CH_3)_2$.

22. A method of combatting phytopathogenic fungi or of preventing attack by fungi, which comprises applying to plants or parts of plants a fungicidally effective, non-phytotoxic amount of a compound of the formula I according to claim 1.

4,075,350

ANTIMICROBIAL COMPOSITIONS EMPLOYING CERTAIN BETAINES AND CERTAIN AMINE OXIDES

Edwin B. Michaels, East Norwalk, Conn. 06855

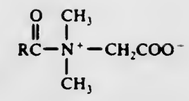
Filed Dec. 18, 1975, Ser. No. 641,728

Int. Cl.[2] A61K *31/13*

U.S. Cl. 424—316 **7 Claims**

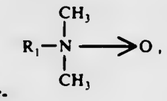
1. A broad spectrum antimicrobial composition having low toxicity which consists essentially of:

(a) 0.1 to 40 parts, by weight, of a higher acyl-N-betaine said betaine having the structure:

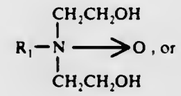


where R is a higher alkyl of from 10 to 18 carbon atoms,

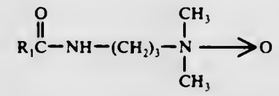
(b) 0.1 to 40 parts, by weight, of (1) a higher alkyl-N,N-dimethylamine oxide, (2) a higher alkyl-N,N-dihydroxyethylamine oxide, or (3) an acylamido t-amine oxide having the respective structure:



(1)



(2)



(3)

where R_1 is a higher alkyl of from 10 to 18 carbon atoms, or mixtures of the same, and

(c) a protonating agent, sufficient to adjust the pH of said composition from 4 to 5.5.

4,075,351

INHIBITION OF MALE FERTILITY WITH ALIPHATIC SULFAMATES

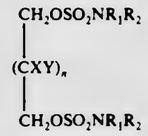
Allen Frederick Hirsch, Somerville, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Division of Ser. No. 537,613, Dec. 30, 1974, Pat. No. 3,997,585. This application Aug. 3, 1976, Ser. No. 711,188

Int. Cl.[2] A61K *31/255, 31/18, 31/455*

U.S. Cl. 424—303 **5 Claims**

1. A method of inhibiting fertility in male animals comprising administering to a male animal an effective amount of a compound of the formula



wherein *n* is an integer from 0 to 8 and X and Y are hydrogen, provided that when *n* is 1, X and Y are hydrogen, lower alkyl having 1–3 carbon atoms, phenyl, benzyl or phenethyl, R_1 and R_2 are hydrogen, alkyl having 1–7 carbon atoms, phenyl, benzyl, phenethyl or cycloalkyl having 5–6 carbon atoms, and R_1 and R_2 together with the nitrogen are piperidyl.

4,075,352

METHOD OF IMPROVING THE MYOCARDIAL FUNCTION BY THE ADMINISTRATION OF CARNITINE

Stephen L. De Felice, 430 Topping Hill Road, Westfield, N.J. 07090

Continuation-in-part of Ser. No. 485,301, July 2, 1974, Pat. No. 3,968,241, which is a continuation-in-part of Ser. No. 303,772, Nov. 6, 1972, Pat. No. 3,830,931. This application Apr. 28, 1976, Ser. No. 681,063

The portion of the term of this patent subsequent to Aug. 20, 1991, has been disclaimed.

Int. Cl.[2] A61K *31/195*

U.S. Cl. 424—319 5 Claims

1. A method of improving the myocardial function of a human or animal heart when the oxygen supply to said heart has been diminished which comprises administering to a human or animal whose heart's oxygen supply has been diminished, an amount of β-hydroxy-γ-trimethylaminobutyric acid or a pharmaceutically acceptable non-toxic salt thereof, sufficient to improve the myocardial function.

4,075,353

PROCESS FOR THE TREATMENT OF ACARID SKIN INFECTIONS IN ANIMALS

Stephen H. Mandy, Coconut Grove, and William D. Thompson, Miami, both of Fla., assignors to Dermatologics for Veterinary Medicine, Inc., Miami, Fla.

Filed June 9, 1976, Ser. No. 694,356

Int. Cl.[2] A61K *31/075*

U.S. Cl. 424—338 31 Claims

1. A process for treating a skin infection, caused by an acarid-parasite, in an animal comprising topically applying a therapeutically effective parasiticidal amount of benzoyl peroxide to said animal.

4,075,354

ETHYNYLBENZENE COMPOUNDS AND DERIVATIVES THEREOF FOR TREATING PAIN FEVER AND INFLAMMATION

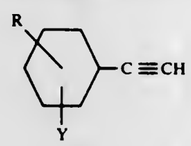
Julius Diamond, Morris Plains, N.J., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 493,590, Aug. 1, 1974, Pat. No. 3,898,292, which is a division of Ser. No. 268,419, July 3, 1972, Pat. No. 3,852,364. This application June 10, 1975, Ser. No. 585,631

Int. Cl.[2] A61U *31/015*

U.S. Cl. 424—356 4 Claims

1. A pharmaceutical composition in dosage unit form adapted for administration to obtain relief from inflammation, pain and fever, comprising, per dosage unit, an effective nontoxic amount of at least one compound of the formula:



wherein

R is selected from the group consisting of:
alkyl of 1 to 7 carbon atoms,
cycloalkyl of 5 to 7 carbon atoms,
1-7 carbon atoms alkyl
substituted cycloalkyl of 5 to 7 carbon atoms,
cycloalkenyl of 5 to 7 carbon atoms,
phenyl and
1 to 7 carbon atoms alkyl
substituted phenyl, and

Y is lower alkyl of 1 to 7 carbon atoms, and a suitable pharmaceutical carrier.

4,075,355

METHOD AND APPARATUS FOR REGULATING THE FAT CONTENT OF MILK

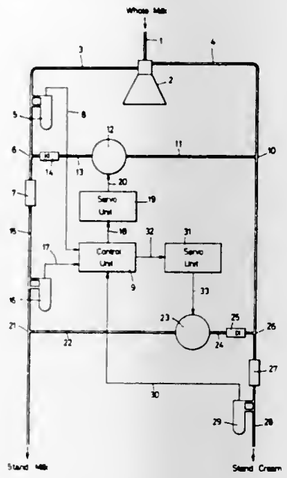
Tibor Pató, Bern, Switzerland, assignor to Gebruder Ott A.G., Worb, Switzerland

Filed June 25, 1976, Ser. No. 699,859

Claims priority, application Switzerland, July 4, 1975, 8782/75; May 26, 1976, 6652/76

Int. Cl.[2] A23C *9/14*

U.S. Cl. 426—231 14 Claims



1. A method of producing standardized milk with a given fat content from whole milk, said method comprising the steps of:
separating said whole milk into skim milk and cream;
passing said skim milk along a path without substantial temperature change;
measuring at an upstream measuring location in said path the density of said skim milk and producing a skim-milk output corresponding to the measured density;
introducing into said path at a mixing location downstream of said measuring location and mixing with said skim milk a variable portion of said cream;
measuring at a downstream measuring location downstream of said mixing location in said path the density of the mixture of said skim milk and said variable portion of said cream and producing a mixture output corresponding to the measured density of said mixture, whereby the variation between said mixture and skim-milk outputs is substantially only indicative of the fat content of said mixture; and
comparing said outputs and varying the size of said variable portion in dependence on the variation between said outputs so as to impart to said mixture said given fat content.

4,075,356

CEREAL PROCESS AND PRODUCT

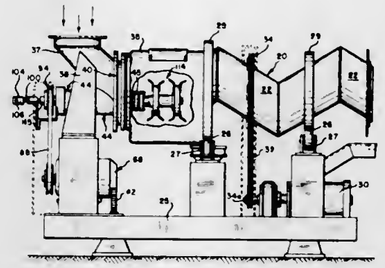
Robert A. Haag, Marietta, Ga.; Patrick M. Rousseau, Lansing, and Thom O. Martin, Richland, both of Mich., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 433,628, Jan. 16, 1974, abandoned. This application Aug. 21, 1975, Ser. No. 606,672

Int. Cl.[2] A23B *4/10*

U.S. Cl. 426—285 9 Claims

1. A process for agglomerating granular material having dissimilarly sized and shaped food particles of varying densities which comprises: charging said material and a discrete granular tackifying liquid-activatable composition to a first zone in a rotating vessel wherein said material is tumbled; centrifugally and continuously discharging from a rotating first spray head radially within said first zone a finely dispersed array of droplets of a first liquid, the rotational rate of the vessel being such in relation to the rate of discharge from the first spray head as to cause tumbling material to cascade into and be intercepted by said droplets and be coated thereby by migration through the particles and absorption therein, said coating action being promoted by paddles that rotate with said head and churn the particles undergoing said coating action by mechanically throwing the particles radially and axially; advancing the tumbling churned coated particles in said vessel to a second zone distinct from said first zone wherein they are contacted by a continuously and centrifugally finely dispersed discharged



array of droplets of an adhesive second liquid from a second rotating spray head within said vessel whereupon the adhesive and tackifying properties of the previously coated particles are activated causing aggregation thereof, said second liquid having a composition different from the first liquid, said aggregating action being promoted by second paddles that rotate with said head and cause mechanical throwing of the coated particles radially and axially to effect churning, mixing and aggregation; and continuing rotation of said vessel to discharge the aggregates to an undulation zone wherein they are subjected to successive changes in direction and agglomerated into chunks of lower density than said aggregates.

4,075,357

INTERMEDIATE MOISTURE MEATS

Alina Surmacka Szczesniak, Mount Vernon, and Wei-Wen Mao, Ossining, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 31, 1976, Ser. No. 672,571

Int. Cl.[2] A23B *4/00, 4/02*

U.S. Cl. 426—332 25 Claims

1. An intermediate-moisture meat product comprising meat containing from 15 to 50% moisture which is normally subject to bacterial growth, having incorporated therein a preservation system comprising at least one primary salt selected from the group consisting of sodium chloride and potassium chloride and at least one secondary salt selected from the group consisting of alkali metal salts of edible hydroxy carboxylic acids, alkali metal orthophosphates, alkali metal metaphosphates, alkali metal ultraphosphates, alkali metal polyphosphates and any combination of these, the weight ratio of the primary salt to the secondary salt being from 1:3 to 3:1, and the total weight of primary salt and secondary salt being from 6 to 13% of the weight of the product.

4,075,358

PROCESS FOR REDUCING COMBUSTION PRODUCT RESIDUES IN PRODUCTS DRIED BY A DIRECT FLAME UNIT

Ronald L. Madl, Webster Groves; Frank J. Simon, St. Charles, and Jerry T. Ortinau, St. Louis, all of Mo., assignors to Ralston Purina Company, St. Louis, Mo.

Filed Dec. 29, 1976, Ser. No. 755,414

Int. Cl.[2] A23B *7/00, 4/04*

U.S. Cl. 426—465 9 Claims

1. In a process for the air drying of a food material, wherein drying air is heated by direct contact with a burner and thereafter a food material is contacted with said drying air, the improvement comprising reducing levels of burner combustion products in said food material by the steps of;

a. forming a combustible fuel mixture by mixing a combustible fuel with a stoichiometric quantity of air to provide for substantially complete combustion of said fuel;

b. feeding said mixture to a burner in an amount effective to provide a burner output which does not exceed 800,000 BTU/hr. lineal ft. of burner and combusting said mixture to provide a drying air temperature of at least about 330° F., said drying air having a velocity of at least about 2,000 ft./min. and

c. shielding the flame formed by combustion of said mixture from said drying air such that aeration of said flame by said drying air for purposes of combustion is substantially reduced.

4,075,359

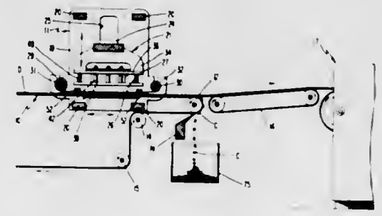
METHOD OF FORMING PERFORATED FLAT DOUGH PIECES

Robert R. Thulin, Friendswood, Tex., assignor to Nabisco, Inc., East Hanover, N.J.

Filed Oct. 14, 1976, Ser. No. 732,191

Int. Cl.[2] A21C *11/10, 11/12;* A21D *6/00*

U.S. Cl. 426—502 9 Claims



1. The method of forming a continuous flat dough piece subdivided to define individual product pieces and having perforations of substantial size formed in the product pieces comprising the steps of forming a continuous flat dough sheet, transporting the dough piece on a belt of a material to which the dough will adhere in response to pressure, moving cutting elements through said dough to subdivide the sheet to define individual product pieces and simultaneously cut out sections of dough and press the cut out sections to the belt with sufficient force to cause adhesion thereto, separating the dough piece from the belt without disturbing the cut out sections thus providing perforations in the flat dough piece, and then removing the cut out sections from the belt, each dough section cut out of said product pieces being cut out by a tubular cutting element having an inner and outer wall and a cutting edge defined by the junction of the outer wall and an inclined surface that extends inwardly and upwardly from the cutting edge into the inner wall so as to force the dough inwardly by the inclined surface of the cutting edge downwardly and inwardly to cause the dough section to adhere to the conveyor.

4,075,360

PREPARATION OF IMITATION MOZZARELLA CHEESE

Charles E. Rule, Lakewood, and Charles E. Werstak, Medina, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 489,583, July 18, 1974, abandoned. This application Dec. 20, 1976, Ser. No. 752,260

Int. Cl.[2] A23C *19/02, 19/12*

U.S. Cl. 426—582 9 Claims

1. The method of producing an imitation mozarella cheese characterized as being sufficiently hard to be gratable and

having the stretch, flavor, melt-down, and browning characteristics of natural mozzarella cheese, comprising the steps of:

a. preparing a cheese formulation which consists essentially of about 15–35% edible protein which includes about 70–100% sodium caseinate and up to about 30% calcium caseinate, about 0.5–1.0% of a calcium ion providing substance other than a calcium protein salt, about 45–53% water, up to about 3% organic emulsifying agent, about 0.2–3% of an edible acid, and about 15–30% of a vegetable oil, said vegetable oil having a Wiley Melting Point of about 60°–120° F, said edible acid being present in an amount sufficient to establish a pH of about 6–5; wherein said formulation is prepared by the steps of

1. preparing a first water mix consisting essentially of the water, a portion of the caseinate protein and other water soluble or dispersible ingredients;
2. preparing a second oil mix consisting essentially of the oil, the remaining portion of the caseinate protein and other oil soluble or dispersible ingredients;
3. separately heating said mixes to a temperature of about 130°–172° F, and thoroughly stirring the same; and
4. combining said mixes and adding said edible acid to the combined mixes to provide said pH;

b. thoroughly stirring the resulting mixture at a temperature of about 135°–170° F; and

c. cooling the resulting mixture until a hardened product is obtained.

4,075,361

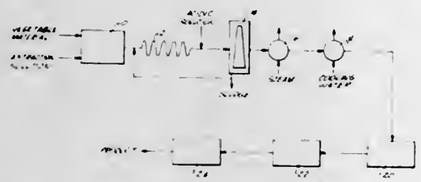
PROCESS FOR PREPARING STABLE FULL FAT OILSEED EXTRACT

Elmer B. Oberg, Camarillo, Calif., assignor to Paul Taylor Co., Pasadena, Calif.

Continuation-in-part of Ser. No. 614,486, Sept. 18, 1975, abandoned. This application Nov. 26, 1976, Ser. No. 745,488

Int. Cl.² A23L *1/20*

U.S. Cl. 426—655 **53 Claims**



17. A process for preparing a stabilized, full fat, high protein edible extract from an oilseed comprising the steps of:

a. comminuting one part by weight full fat oilseed in the presence of from about 3 to about 15 parts by weight of a hot alkaline extraction solution with a temperature of at least about 180° F and a sufficiently high pH from about 8 to about 13 so that the comminuted oilseed/extraction solution mixture is alkaline;

b. soaking the comminuted oilseed in the extraction solution for from about 1 to about 20 minutes;

c. neutralizing with an acidic solution and clarifying the comminuted oilseed/extraction solution mixture to yield an essentially clear extract and a sludge; and

d. heating the clear extract to a sufficient temperature to destroy anti-nutritional factors.

4,075,362

METHOD FOR PROVIDING HEATED FUSER ROLL WITH IMPROVED RELEASE AND WEAR LIFE

Thomas P. Concannon, Newtown Square, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 508,667, Sept. 23, 1974, abandoned. This application Aug. 13, 1976, Ser. No. 714,270

Int. Cl.² G03G *13/20*

U.S. Cl. 427—22 **13 Claims**

1. In a xerographic printing process, wherein the image particles are fused onto a supporting sheet by passing said sheet between a pressure roll and a heated fuser roll, the image particles come into contact with the metal surface of said fuser roll; the improvement consisting essentially of continuously applying to said surface a layer of an offset preventing composition consisting essentially of

(A) 5 to 30% by weight, based on the weight of (A) plus (B), of I, II or a mixture of I and II; wherein

(I) is a perfluoroolefin polymer containing 5 to 100% by weight, based on the perfluorolefin polymer, of tetrafluoroethylene and 95 to 0% by weight, based on the perfluoroolefin polymer, of hexafluoropropylene and

(II) is a fluorosurfactant, wherein said fluorosurfactant is a mixture of mono- and di- esters of phosphoric acid prepared with an alcohol of formula $F(CF_2CF_2)_nCH_2CH_2OH$, where n is from 3 to 8;

admixed with

(B) 95 to 70% by weight based on the weight of (A) plus (B) of a silicone oil dispersing agent, wherein said dispersing agent has surface tension of 16 to 30 dynes/centimeter, viscosity range of 0.5 to 100,000 centistokes at 25° C, and a maximum vapor pressure of 200 mmHg at 205° C.

4,075,363

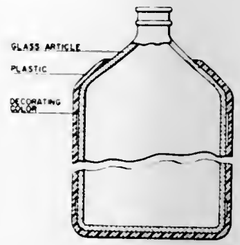
METHOD OF MAKING COLOR DECORATED, PLASTIC COATED GLASS ARTICLES

Herbert C. Shank, Jr., Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Division of Ser. No. 378,493, July 12, 1973, Pat. No. 3,937,853. This application May 5, 1975, Ser. No. 574,383

Int. Cl.² B05D *1/04*

U.S. Cl. 427—27 **11 Claims**



1. A method of permanently decal decorating a glass container at temperatures lower than required for glazing, comprising,

applying a thermal release decal by a decal transfer process directly onto an outside surface region of a preformed glass container, the decal requiring heating to a temperature higher than about 150° F to bond permanently to the glass surface,

maintaining said container with the said decal thereon at a temperature below the temperature effective for such permanent bonding to occur,

then coating a finely divided heat settable plastic resin onto said glass container, the said plastic resin being coated over the applied decal and extending on said glass surface beyond the surface region on which said decal has been applied,

then anchoring said plastic resin to said glass container and the decal by heating the decorated and thus coated container to set the resin so that it forms a smooth continuous film,

and cooling the container,

the resultant plastic film being supported by and anchored to the surface of said glass container beyond the region covered by said decal,

thereby producing a final permanently decorated glass container wherein said film provides a permanent outer covering over said decal which encloses and protects the latter on the glass surface, the decal being captured between the film and the glass surface.

4,075,364

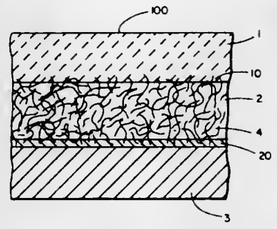
POROUS CERAMIC SEALS AND METHOD OF MAKING SAME

Carlino Panzera, Belle Mead, N.J., assignor to Brunswick Corporation, Skokie, Ill.

Filed Apr. 15, 1976, Ser. No. 677,258

Int. Cl.² B05D *3/06*

U.S. Cl. 427—34 **2 Claims**



1. A method of making a ceramic-metal composite comprising the steps of:

(a) providing a metal plate and a metal pad having a density of ranging from 5 to 80%;

(b) bonding the pad to be the metal plate;

(c) plasma spraying on the exposed surface of the metal pad a mixture of ceramic material and a sacrificial material where the volume fraction of the sacrificial material is increased from zero percent to 60 percent at convenient intervals to effect strength and porosity required; the sacrificial material being selected from one or more, but not limited to the following: graphite, plastic, aluminum, copper and sawdust; the inert ceramic layer being selected from one or more, but not limited to the following: stabilized zirconia, calcia, magnesia, yttria, glass, silicon carbide, silicon nitride, alumina, mullite, borides, silicides, and cermets;

(d) removal of sacrificial material by a chemical reaction such as oxidation or leaching.

4,075,365

TURQUOISE-PLASTIC-COMPOSITE

Homer Breault, and Alvin E. Witt, both of Pine Glen, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 14, 1976, Ser. No. 648,842

Int. Cl.² B05D *3/06;* **A44C** *17/00*

U.S. Cl. 427—36 **8 Claims**

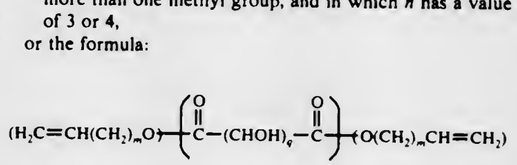
1. The method of enhancing the attractiveness of turquoise gems having impregnatable pores containing sorbed moisture which method consists essentially of the steps of:

impregnating a turquoise gem with a liquid monomeric diester formed by the esterification of two moles of a monoolefinic monomer and one mole of a difunctional reactant, said difunctional reactant having a plurality of supplemental hydrophillic groups of the class consisting of hydroxy groups and ether groups, said diester having a volatility corresponding to a boiling point within the range from about 150° C. to 300° C., said diester corresponding to either the formula:



in which each R is independently selected from hydrogen or a methyl group, except that each alkoxy group has not more than one methyl group, and in which n has a value of 3 or 4,

or the formula:



in which m is 1 or 2, and in which q is 2, 3 or 4;

polymerizing the monomeric diester thus impregnated into the turquoise gem to provide a solid plastic turquoise composite, at least some of the moisture sorbed in said turquoise gem being encapsulated within the plastic by reason of the presence of said plurality of hydrophillic groups in said difunctional reactant.

4,075,366

LOW GLOSS RADIATION CURE

Eugene S. Packer, Chicago, and George J. England, Hillside, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 694,935, June 11, 1976, abandoned. This application Oct. 21, 1976, Ser. No. 734,425

Int. Cl.² B05D *3/06*

U.S. Cl. 427—44 **22 Claims**

1. A method of obtaining a low gloss radiation-cured coating comprising applying an aqueous emulsion coating composition to a substrate, said emulsion being constituted by water having emulsified therein viscous droplets comprising radiation curable resin, and subjecting said applied emulsion to radiation energy to cure the same before the emulsion breaks.

4,075,367

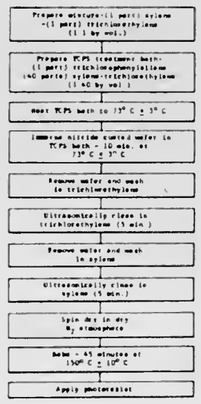
SEMICONDUCTOR PROCESSING OF SILICON NITRIDE

Michael R. Gulett, Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Mar. 18, 1976, Ser. No. 668,167

Int. Cl.² H01L *21/304, 21/306*

U.S. Cl. 427—94 **4 Claims**



1. A method of preparing a silicon nitride surface on a semiconductor device for improving the adhesion of photoresist

material to withstand a hydrofluoric acid etchant, comprising the steps of:

a. preparing a treatment bath consisting essentially of xylene, trichlorethylene, and trichlorophenylsilane in a ratio of 20:20:1 respectively by volume having a temperature of from 70° C to 76° C;
b. immersing said surface in said bath for about 10 minutes;
c. removing said surface from said bath and washing it in a trichlorethylene bath at room temperature;
d. subjecting said surface to ultrasonic cleaning while in said trichlorethylene bath;
e. removing said surface from said trichlorethylene bath and washing it in a xylene bath at room temperature;
f. subjecting said surface to ultrasonic cleaning while in said xylene bath;
g. removing said surface from said xylene bath and spin drying it in a nitrogen atmosphere at room temperature; and
h. baking said surface for about 45 minutes at a temperature of 140° C to 160° C.

4,075,368

BATTERY TERMINAL CONSTRUCTION

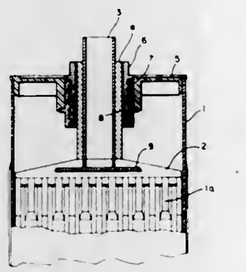
Klaus Salamon, Kelkheim, and Rudolf Eckardt, Steinbach, both of Germany, assignors to Varta Batterie A. G., Germany

Filed May 26, 1976, Ser. No. 690,267

Claims priority, application Germany, June 25, 1975, 7520197[U]

Int. Cl.² H01M *2/06*

U.S. Cl. 429—161 **6 Claims**



1. A terminal construction for a storage battery having a pole bridge connecting electrode plates within the battery and a lid through which the terminal extends, said construction comprising:

a hollow, tubular sleeve of copper or aluminum extending from above the battery lid, through an aperture in said lid all the way down to the pole bridge onto which the end of the sleeve is cast,

an annular mantle of lead surrounding and cast into the outside of the sleeve and extending upward from said pole bridge through the lid aperture,

means for sealing the portion of the lead mantle which extends through the lid aperture liquid-tight in the lid,

an annular lead terminal receptacle, set into and surrounding the mantle to which the mantle is welded in the region of its passage through the lid,

the terminal receptacle being coated at least on that portion of its outside where it passes through the lid with a synthetic plastic, and

the synthetic plastic coating extending around the bottom of the lead terminal receptacle and upwardly along at least a portion of its inner surface between receptacle and mantle, thereby to accommodate to slight variations in the outside of the lead mantle of the sleeve forming a tight seal around that mantle.

4,075,369

METHOD OF COATING WITH WATER DISPERSIBLE, LOW MOLECULAR WEIGHT POLYAMIDE RESIN PARTICLES OF UNIFORM SIZES

Charles F. Ferraro, Trenton; Richard A. Javick, Princeton Junction, both of N.J., and James A. Robertson, Levittown, Pa., assignors to FMC Corporation, Philadelphia, Pa.

Division of Ser. No. 492,609, July 29, 1974, abandoned, which is a division of Ser. No. 248,063, April 27, 1972, Pat. No. 3,844,991. This application Apr. 30, 1976, Ser. No. 681,826

Int. Cl.² B05D *1/24, 3/02*

U.S. Cl. 427—185 **8 Claims**

1. In a method of providing a substrate with a self-adherent coating of a high molecular weight, linear polyamide wherein

(1) the substrate is coated with a dispersion comprising water, finely-divided, water dispersible, low molecular weight, linear polyamide resin particles, between about 0.15% and about 0.8%, based upon the weight of the resin, of a catalyst consisting of a non-volatile, strong acid or a compound which upon heating is converted to a non-volatile, strong acid and between about 1% and 8%, based upon the weight of the resin, of a flow promoter,

(2) the coated substrate is heated to at least the melting temperature of the polyamide resin and

(3) the heated substrate is maintained at the temperature for a period sufficient to cause the polyamide resin to flow and to polymerize the resin to a predetermined high molecular weight,

the improvement which comprises employing as the dispersed polyamide resin particles, finely-divided, water dispersible, low molecular weight, linear polyamide resin particles consisting of loosely packed, randomly oriented, clusters of flaky sheets, the mean particle size of the dispersed particles being between about 0.03 micron and about 6 microns and the particle size distribution being about $d + 0.8\,d$, where d is the mean particle size.

4,075,370

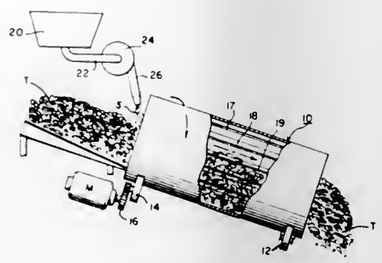
PASSIVATING METALLIC CUTTINGS AND TURNINGS

Richard D. Burlingame, Cleveland Heights, Ohio, and Michael Markels, Jr., Springfield, Va., assignors to Ogden Metals, Inc., Cleveland, Ohio and Versar, Inc., Springfield, Va.

Filed Apr. 28, 1976, Ser. No. 680,830

Int. Cl.² C23F *9/02*

U.S. Cl. 427—216 **5 Claims**



1. The method of passivating iron-containing cuttings and turnings materials to prevent overheating thereof as a result of the materials having been disturbed by being moved and compressed while wet into bulk confinement for storage or transportation thereof, comprising the steps of:

(a) preparing an aqueous slurry of an alkaline calcium compound comprising an oxide or hydroxide thereof;

(b) tumbling said materials while moving them into said confinement, and introducing into the tumbling materials a quantity of said slurry in the range of 1% to 5% by weight; and

(c) continuing said tumbling until the materials are substantially coated with the slurry.

4,075,371

WEAR RESISTANT ALLOY COATING CONTAINING TUNGSTEN CARBIDE

Mahesh S. Patel, Albertson, N.Y., assignor to Eutectic Corporation, Flushing, N.Y.

Division of Ser. No. 594,943, July 11, 1975, Pat. No. 4,013,453. This application July 29, 1976, Ser. No. 709,705

Int. Cl.² B05D *1/08*

U.S. Cl. 427—224 **5 Claims**



1. A method of hard facing a metal substrate with an alloy coating material adapted to impart improved resistance to wear and abrasion to said metal substrate which comprises,

flame spraying a fusible powder mixture onto a metal substrate by means of a flame-spraying torch,

said powder mixture comprising an atomized nickel-base alloy powder of minus 100 mesh having substantially uniformly blended therewith a powder comprising agglomerates of nickel powder intimately combined with tungsten carbide powder, said agglomerates being minus 150 mesh in size, the nickel powder and tungsten carbide powder in said agglomerates each having an average particle size ranging from about 0.1 to 10 microns,

the amount of tungsten carbide in said agglomerates ranging from about 70% to 90% by weight, with the nickel powder in said agglomerates ranging from about 30% to 10% by weight,

the ratio of said agglomerates to said nickel-base alloy powder in said mixture being such that the total mixture has an average tungsten carbide content of about 10% to 30% by weight,

the composition of said nickel-base alloy powder in said mixture comprising by weight about 2.5 to 20% Cr, about 0.5% to 6% Si, about 0.5% to 5% B, up to about 10% Fe and the balance essentially nickel,

maintaining a flame on said deposited hard facing alloy to assure a molten deposit on said substrate,

and then allowing said molten deposit to solidify,

whereby a hard coating is obtained metallurgically bonded to said metal substrate characterized metallographically by a substantially fine uniform dispersion of hard particles comprising tungsten carbide of average size not exceeding 10 microns dispersed through a nickel-base alloy matrix at an average interparticle spacing of less than about 15 microns.

4,075,372

FLEXIBILITY ENHANCING COATING FOR BOXBOARD, PARTICULARLY OF CARTON JOINTS AND FOLD LINES, AND METHOD OF APPLICATION

Robert M. Wilkinson, Florissant, Mo., assignor to Alton Box Board Company, Alton, Ill.

Filed Apr. 29, 1975, Ser. No. 572,878

Int. Cl.² B05D *1/38;* B32B *29/06, 3/02*

U.S. Cl. 427—258 **9 Claims**

1. The method of improving the resistance of boxboard to moisture absorption particularly at its fold areas, comprising the steps of initially coating the intended exterior surface of the boxboard through the use of a printing roller with a dryable flexible film forming material of a thermoplastic resin to form a stretchable membrane thereon, said flexible film forming material of a thermoplastic resin being selected from the group consisting essentially of polyvinyl acetate, ethylene vinyl acetate, ethylene vinyl chloride, and their copolymers thereof, with said flexible film forming material having the characteristic to exceed a percentage of elongation in excess of 350, heating said applied film to achieve its drying, and then applying over said coated film after drying a lacquer exhibiting moisture barrier properties.

4,075,373

METHOD FOR LINING CAR, TRUCKS AND SHIP BODIES, STEEL TUBES, PLATES AND OTHER METALLIC BODIES TO PROTECT SAME FROM ABRASION, CORROSION AND HEAT

Godofredo G. Monsod, Jr., 39 K-4th Street, Kamuning, Quezon City, Philippines

Continuation-in-part of Ser. No. 527,391, Nov. 26, 1974, abandoned. This application Sept. 21, 1976, Ser. No. 725,064

Claims priority, application Philippines, Nov. 26, 1973, 15256

Int. Cl.² B05D *3/02, 3/12, 3/10*

U.S. Cl. 427—327 **4 Claims**

1. A method for lining metal bodies and surfaces to protect the same from abrasion, corrosion and heat comprising:

(a) scrubbing or sanding the metal surface to be lined until the metal surface is thoroughly cleaned and rendered smooth;

(b) applying on the metal surface a coating of a solvent mixture comprising 80 parts of ethylene dichloride, 10 parts acetone, 10 parts benzol and thereafter allowing said applied solvent mixture to dry;

(c) applying on the resulting coated metal surface three (3) coatings of a rubber cement mixture having the following formula:

Isobutylene Isoprene Rubber	100 parts
Polyacrylate Rubber	5 parts
Zinc Oxide	5 parts
Heavy Magnesium Oxide	0.5 parts
Sulfur	2 parts
Dibenzothiazoledisulphide	0.5 parts
Tetramethylthiuramdisulphide	1 part

drying the rubber cement coat, before applying each subsequent coating of said rubber cement.

(d) applying a first coating of a compounded rubber composition essentially containing rubber, effective amounts of modifiers, extenders and accelerator of a thickness of about 0.02 inches uniform throughout the entire surface and then pressing the thus applied coating on to the contours and shape of the metal body, thereafter applying a coating of the ethylene dichloride solvent mixture of step (b) and then allowing the same to dry;

(e) applying a second and final coating of the rubber composition of step (d) of a uniform and desired thickness and then applying a final coating of a rubber cement mixture of step (c) and allowing the same to dry, and

(f) finally, setting the rubber lining to self cure in situ.

4,075,374

FLOOR PREPARATION AND METHOD

Clyde R. Jorgenson; Harold M. DeBoer, and Ronald M. Jorgenson, all of Minneapolis, Minn., assignors to Acoustical Floors, Inc., Hamel, Minn.

Filed July 30, 1975, Ser. No. 600,461

Int. Cl.² B05D *3/12*

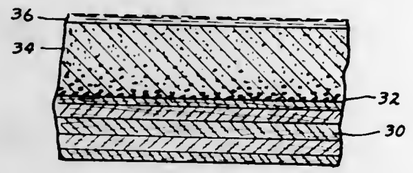
U.S. Cl. 427—355 **4 Claims**

1. Method of rapidly providing an acoustic floor covering over a subfloor, the method comprising

a. providing a thoroughly mixed slurry comprising 10 parts by weight of pressure-calcined calcium sulfate hemihydrate, 38–48 parts by weight of sand, a hardening amount of an aqueous latex polymeric dispersion, an antifoam agent substantially preventing foam production upon

violent mixing of the slurry, and sufficient water in the range of about 4 to about 10 parts by weight to provide the slurry with a watery, easily dripping, runny, self-leveling consistency;

b. pouring the watery slurry onto the subfloor to a predetermined thickness, the slurry flowing easily into a substantially level and uniform layer upon the subfloor;



c. lightly floating the surface of the watery slurry layer with a wooden float to provide the slurry layer with a top surface rich in latex and calcium sulfate hemihydrate, water in the slurry forming in a layer upon, and evaporating from, the top surface of the slurry layer as the latter sets up to provide a high-density, smooth, chip-resistant floor having low sound transmissivity and a hard upper surface.

4,075,375

CLEANING MATERIAL AND PROCESS FOR PREPARATION THEREOF

Toshiyoshi Komatsu, Osaka, Japan, assignor to Duskin Franchise Co. Ltd., Osaka, Japan

Filed Jan. 30, 1976, Ser. No. 653,735

Int. Cl.² B05D *3/02*

U.S. Cl. 427—390 R **18 Claims**

1. A process for the preparation of cleaning materials comprising a cleaning fibrous substrate and an oiling composition adsorbed and impregnated in said fibrous substrate, said process comprising contacting a cleaning fibrous substrate composed of cellulose fibers or a combination of up to 30% by weight, based on the fibers, of synthetic fibers and the remainder of cellulose fibers with an oil-in-water emulsion of an oiling composition consisting essentially of (a) an oiling agent composed of mineral oil, a synthetic lubricating oil or a mixture thereof and having a viscosity of 8 to 100 cps as measured at 100° F, (b) 0.5 to 35% by weight, based on the total oiling composition, of an amphoteric surface active agent or a surface active agent having in the molecule both cationic active and non-ionic active groups and (c) 1 to 4% by weight based on the total oiling composition, of a benzene-carboxylic acid ester having a solubility parameter of from 8 to 12.6, at a pH of 4.0 to 5.0, for a time of 5 to 20 minutes and sufficient for the emulsion to be rendered transparent, said oil-in-water emulsion having a particle size distribution in which the number of particles having a size smaller than 10μ occupies at least 85% of the total number of dispersed particles, the oiling composition being present in an amount of 0.5 to 35% by weight based on the fibrous substrate on the dry basis; dehydrating the thus oil-impregnated fibrous substrate so that the water content is lower than 70% by weight; and then drying the fibrous substrate.

4,075,376

BOILER TUBE COATING AND METHOD FOR APPLYING THE SAME

Frederick T. Jaeger, Rosemere, Canada, assignor to Eutectic Corporation, Flushing, N.Y.

Continuation-in-part of Ser. No. 567,091, April 11, 1975, abandoned. This application Apr. 1, 1976, Ser. No. 672,785

Int. Cl.² F16L *59/00*

U.S. Cl. 428—36 **8 Claims**

1. A method of extending the life of a boiler tube subject in use to corrosion, oxidation and erosion which comprises:

cleaning said boiler tube by grit blasting the surface thereof,

preheating said cleaned boiler tube preparatory to receiving an alloy coating thereon, spray coating an overlay on said boiler tube of a coating composition in the form of a powder mixture consisting essentially of 10% to 70% by weight of a refractory hard powder component selected from the group consisting of carbides of W, Si, V, Ti, B, Cr and Mo; nitrides of Si, B and Ti; borides of Cr. W, Mo, Ta and V; and silicides of B, Mo and Cb blended with 90% to 30% by weight of a self-fluxing matrix alloy powder selected from the group consisting of nickel-base, nickel-copper base, iron-base and cobalt-base alloys containing by weight at least one element from the group consisting of 0.5% to 6% silicon and 0.5% to 5% boron, and thereafter fusing said overlay to the surface of said boiler tube to provide a relatively void-free bonded coating characterized by improved resistance to corrosion, oxidation and erosion.

4. As an article of manufacture, a composite steel boiler tube comprising a fused protective overlay of a heat, corrosion and erosion resistant alloy consisting essentially of:

10% to 70% by weight of powder refractory hard component selected from the group consisting of carbides of W, Si, V, Ti, B, Cr, and Mo; nitrides of Si, B and Ti; borides of Cr, W, Mo, Ta and V; and silicides of B, Mo and Cb dispersed through 90% to 30% by weight of a matrix alloy selected from the group consisting of

a. 0.5 to 1.1% C, 3% to 6% Si, 3% to 4% B, 6% to 28% Cr, up to 5% Fe and the balance essentially nickel;

b. 0.01% to 0.1% C, 2% to 5% Si, 1% to 3% B, up to 2% Fe and the balance essentially nickel;

c. up to 0.2% C, 2% to 6% Si, 0.5% to 2% B, up to 1% Cr, up to 1.5% Fe, 20% to 40% Cu and the balance essentially nickel; and

d. 0.6% to 3% C, 0.3% to 2% Si, up to 3% B, 20% to 35% Cr, 4% to 14% W, up to 3% Fe, up to 5% Ni and the balance essentially cobalt;

said protective overlay being dense and relatively void-free.

4,075,377

COVERING FLOORS WITH STRIPPABLE CARPET

Lindsay Matthew Aitchison; Kenneth Arnold Sparks, and Earl Eugene Schuster, all of East Sydney, Australia, assignors to Monobond Australia Pty. Limited, East Sydney, Australia

Continuation of Ser. No. 488,799, July 15, 1974, abandoned. This application Mar. 19, 1976, Ser. No. 668,500

Claims priority, application New Zealand, July 23, 1973, 171456

Int. Cl.² B32B *33/00*

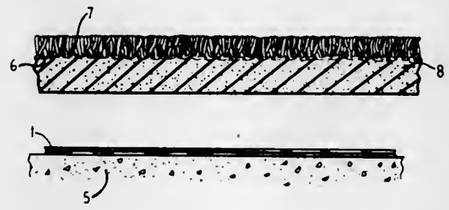
U.S. Cl. 428—95 **8 Claims**

1. A floor covering comprising:

a first layer having a surface for carrying traffic;

a second layer secured to the first layer and providing a resilient foam backing which is to be laid on a floor and secured thereto by adhesive; and

a knitted open mesh of material having a multiplicity of openings therein accounting for a large proportion of the area of the mesh and located on the side of said second layer remote from said first layer for contacting the floor on which the floor covering is to be laid, whereby the application of an adhesive to the floor permits portions of said resilient foam backing to adhere to the floor through said multiplicity of openings in the open mesh and by pulling on the open mesh said first and second layers



which are secured together, the floor covering may be peeled subsequently off the floor without leaving gross quantities of said foam backing adhering to the floor.

4,075,378

POLYAMIDE FILAMENTS WITH A BASIC-DYEABLE SHEATH AND AN ACID-DYEABLE CORE AND DYEING PROCESS THEREFOR

Anthony Anton, and Joseph Arthur Benoit Nolin, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 12, 1975, Ser. No. 612,730

Int. Cl.² B32B *3/02, 33/00*

U.S. Cl. 428—97 **10 Claims**

1. A synthetic polyamide filament composed of: an acid-dyeable fiber-forming polyamide core which constitutes at least about 40 volume percent of the filament and which contains from 40 to 100 equivalents of amine end-groups per 10^6 grams of the core polyamide; and, a substantially concentric, basic-dyeable, fiber-forming polyamide sheath which contains at least 50 equivalents of chemically attached aromatic sulfonate groups per 10^6 grams of the sheath polyamide.

4,075,379

MELT-EMBOSSED POLYMER FILM

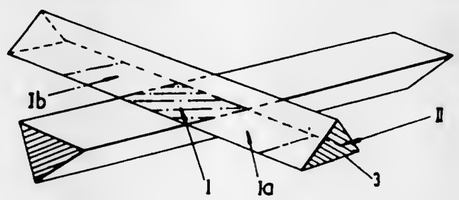
Ronald Lloyd, Sawbridgeworth, England, assignor to Smith & Nephew Plastics Limited, England

Filed June 18, 1975, Ser. No. 587,875

Claims priority, application United Kingdom, June 19, 1974, 27218/74

Int. Cl.² D04G *1/00*

U.S. Cl. 428—105 **8 Claims**



1. A net produced by biaxially stretching a melt-embossed film of synthetic polymeric material having on one surface a set of parallel grooves; on the other surface a second set of parallel grooves lying at an angle to the first set, said grooves being sufficiently deep to leave at the groove intersection areas a thin slittable membrane; the grooves in each set defining between themselves a set of parallel ribs; wherein the ratio between (I) the intersection area common to two ribs of different sets and (II) the cross-sectional area of each rib, is not greater than about 2:1 to ensure transmission of orientation through the rib intersection on subsequent stretching.

4,075,380

CONSTRUCTION PANELS

Joris Moens, Kortrijk, Belgium, assignor to N. V. Bekaert S. A., Zwevegem, Belgium

Filed Oct. 10, 1974, Ser. No. 513,832

Claims priority, application United Kingdom, Oct. 12, 1973, 47840/73

Int. Cl.² B32B *3/10*

U.S. Cl. 428—140 **9 Claims**



1. A construction panel comprising two substantially parallel sheets of concrete or mortar, said sheets being spaced apart and connected by bridging portions formed of concrete or mortar integral with said sheets, said bridging portions and at least the regions of said sheets at the respective ends of said bridging portions being reinforced with a multiplicity of randomly oriented metal fibers distributed therein, said sheets being otherwise substantially unreinforced, the cross sectional area of the bridging portions measured midway between said sheets comprising about 1-25% of the area of said panel, and a thermal insulating material filling the remainder of the volume between said sheets and surrounding said bridging portions.

4,075,381

LAMINATED GLASS WINDSHIELD AND METHOD OF MAKING SAME

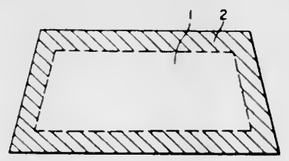
Yasuhiko Furukawa, and Tsuyoshi Igarashi, both of Tokyo, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Aug. 25, 1976, Ser. No. 717,687

Claims priority, application Japan, Sept. 9, 1975, 50-108529; Dec. 25, 1975, 50-153961

Int. Cl.² B32B *3/02, 27/42;* C03B *27/00*

U.S. Cl. 428—192 **3 Claims**



1. A laminated glass windshield, which comprises: two sheets of shaped plate glass bonded together by an interposed plastic layer wherein each of said glass plates has a thickness of 1.5 to 2.5 mm and has a plane compressive stress of 200 to 500 Kg/cm^2 on the peripheral portions of the outer surface within 15 mm of the outer edge of said plates and a tensile strength inside and adjacent said peripheral portions of less than 80 Kg/cm^2.

3. A method of making a laminated glass windshield, which comprises the steps of:

simultaneously shaping by heating two superimposed sheets

of glass plates having a thickness of 1.5 to 2.5 mm on a bending mold at 550° to 650° C;

quenching the glass plates at a quenching rate of 85° to 150° C/minute at least in an annealing zone from 450° to 550° C such that a plane compressive stress of 200 to 500 Kg/cm^2 is imparted to the peripheral portions of the outer surface of the glass plates within 15 mm of the outer edge of said plates;

arranging the glass plates such that between said plates is sandwiched a plastic layer and such that the face of each plate which has the plane compressive stress is faced outward; and

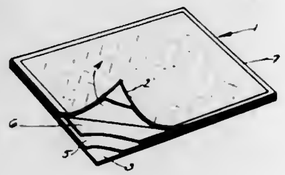
bonding the arranged glass plates by heat-pressing to form said laminate.

4,075,382

DISPOSABLE NONWOVEN SURGICAL TOWEL AND METHOD OF MAKING IT

Benjamin E. Chapman, Memphis, Tenn.; Danny R. Moore, Perry, Fla., and Arthur F. Phillips, Memphis, Tenn., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 27, 1976, Ser. No. 690,514
Int. Cl.² B32B *3/02, 7/14, 27/10*
U.S. Cl. 428—192 **26 Claims**



1. A disposable, sterilizable, surgical towel having a five-ply construction comprising a center ply of wettable microfibrous melt-blown fibers having a basis weight of from about 20 to about 60 grams per square meter and two identical primary laminates to each side of said center ply and each comprising an intermediate ply of wettable thermoplastic fibers having a basis weight of from about 10 to about 30 grams per square meter adhesively secured to a tissue ply having a basis weight of from about 10 to about 30 grams per square meter, said tissue plies comprising the outermost plies of said towel, said center ply and said primary laminates being bonded together about the periphery of said towel.

14. A disposable towel having a five-ply construction comprising a low density, soft, bulky, bendable, wettable, highly absorbent, nonwoven center ply and two identical primary laminates to each side of said center ply, each of said primary laminates comprising an inner ply and an outer ply adhesively adheared together, said inner ply comprising a medium density, soft, bendable, wettable, nonwoven ply, said outer ply comprising an abrasion resistant, low linting, soft, bendable, tissue ply, said primary laminates being characterized by fast strike through, said tissue plies comprising the outermost plies of said towel, said center ply and said primary laminates being bonded together about the periphery of said towel.

4,075,383

METHOD OF PATTERN BONDING A NONWOVEN WEB

Richard M. Anderson, Raleigh; Alton L. Caviness, Durham; Virginia C. Menikheim, Chapel Hill, and Bernard Silverman, Raleigh, all of N.C., assignors to Monsanto Company, St. Louis, Mo.

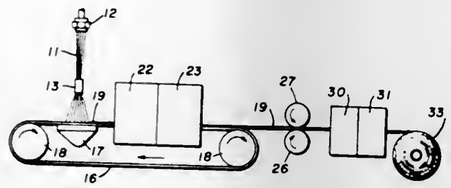
Filed Apr. 15, 1976, Ser. No. 677,183
Int. Cl.² B32B *7/14*
U.S. Cl. 428—198 **14 Claims**

1. The method of pattern bonding a nonwoven web made from polyamide filaments, comprising

a. advancing the web through first and second treatment zones,

b. applying an activating agent to the web in the first treatment zone to allow the web to absorb 0.1 to 20 weight percent of the activating agent,

c. applying sufficient water in vapor form to the web in the



second treatment zone to render the web unbondable when pressed at room temperature,

d. advancing the web between a pair of rolls at least one of which has raised portions which contact portions of the web, said raised portions being heated sufficiently to effect bonding in said portions of the web, and

e. removing said activating agent from the web.

4,075,384

MAGNETIC RECORDING TAPES WITH TWO-LAYERED MAGNETIC COATING

Masaaki Suzuki, and Akira Kasuga, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 21, 1976, Ser. No. 734,565
Claims priority, application Japan, Oct. 23, 1975, 50-127724
Int. Cl.² B32B *5/16, 7/02, 15/02*
U.S. Cl. 428—212 **15 Claims**



1. A magnetic recording tape comprising a non-magnetic support having thereon a two-layered magnetic coating composed of a ferromagnetic powder and a binder formed on one surface of said support, wherein the lower magnetic layer has a coercive force of about 250 to about 300 Oe, a residual magnetic flux density of at least about 1,500 Gauss and a dry thickness of at least about 2.5 μm, and the upper magnetic layer has a coercive force of about 350 to about 400 Oe, a residual magnetic flux density of not more than about 1,500 Gauss and a dry thickness of about 2.0 to 3.0 μm, the ferromagnetic powder contained in the upper magnetic layer having an APP value of not more than about 1.0 and wherein the ferromagnetic powder is a powder of a ferromagnetic iron oxide of the formula FeO_x wherein x is from 1.33 to 1.50.

4,075,385

ANTI-REFLECTIVE COATING FOR HIGH ENERGY OPTICAL COMPONENTS

Adrian D. Baer, and Terence M. Donovan, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 1, 1977, Ser. No. 783,883
Int. Cl.² B32B *7/00, 15/04;* **G02B** *5/26*
U.S. Cl. 428—215 **2 Claims**

1. An article of manufacture consisting essentially of:

A. a base selected from the group consisting of NaCl and KCl;

B. a layer of As_2Se_3 on said base;

C. a layer of NaF on said layer of As_2Se_3; and

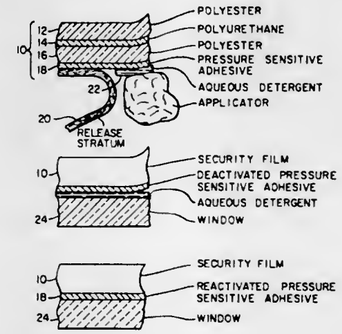
D. a layer of As_2Se_3 on said layer of NaF.

4,075,386

SECURITY FILM FOR SHATTERPROOFING WINDOWS

Michael E. Willdorf, Malden, Mass., assignor to Material Distributors Corporation, Woburn, Mass.

Division of Ser. No. 295,816, Oct. 10, 1972, Pat. No. 3,899,621, and a continuation-in-part of Ser. No. 113,426, Feb. 8, 1971, Pat. No. 3,775,226. This application July 21, 1975, Ser. No. 597,481
The portion of the term of this patent subsequent to June 24, 1992, has been disclaimed.
Int. Cl.² B44F *1/00;* **B32B** *17/06*
U.S. Cl. 428—216 **6 Claims**



1. A process for producing a security window, said process comprising the steps of applying a security film to a window surface with a polar aqueous detergent interposed therebetween, said security film comprising an assemblage of strata including at least one first polyester support stratum, at least one second polyester support stratum, at least one elastomeric bonding stratum, and only one nonpolar pressure sensitive adhesive stratum, said one first polyester support stratum and said one second polyester stratum each being composed of polyethylene terephthalate and ranging from 0.5 to 5 mils in thickness, said one elastomeric bonding stratum being composed of polyurethane and being interposed between said one first polyester support stratum and said one second polyester support stratum and in direct contact with the inner faces of said one first polyester support stratum and said one second polyester support stratum, said polyurethane bonding stratum ranging in thickness from 0.2 to 0.4 mil, said pressure sensitive stratum being coated on one of the outer faces of said assemblage for adhesion to said only one face of only one sheet of window glass, said pressure sensitive stratum being composed of a composition including a rubber and a tackifier and ranging in thickness from 0.5 to 1.5 mil, all of the strata of said assemblage being optically clear and moisture permeable, said pressure sensitive stratum being deactivated by said aqueous detergent, and permeating water from said aqueous detergent out of the interface between said security film and said window surface in order to reactivate said pressure sensitive adhesive stratum.

4,075,387

NON-WOVEN FABRIC BINDERS

Louis E. Trapasso, Watchung, and William B. Horback, Irvington, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed June 30, 1976, Ser. No. 701,314
Int. Cl.² B32B *27/04;* **C08L** *61/20*
U.S. Cl. 428—288 **6 Claims**

1. An aqueous polymer emulsion, suitable for binding loosely assembled fibrous webs into non-woven fabrics, which is prepared by over-polymerizing, in the presence of a polymerization catalyst and at elevated temperatures, a pre-formed aqueous ethylene-vinyl acetate copolymer emulsion containing about 70 to about 90 percent, by weight, vinyl acetate and about 10 to about 30 percent, by weight, ethylene, based on the total copolymer weight of the preformed emulsion, with about 10 to about 48 percent, by weight, vinyl acetate, and about 2 to about 6 percent, by weight, on an N-hydroxyalkyl(lower) acrylamide or methacrylamide, based on the total weight of the ethylene-vinyl acetate copolymer/vinyl acetate/N-hydroxyalkyl acrylamide or methacrylamide components.

4,075,388

ADHESIVE BONDING OF POLY(ARYLENE SULFIDE) SURFACES

Richard C. Doss, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 573,182, April 30, 1975, Pat. No. 4,011,121. This application Oct. 18, 1976, Ser. No. 733,606
Int. Cl.² B32B *31/12, 7/12, 31/26;* **B29C** *17/12*
U.S. Cl. 428—297 **9 Claims**

1. A laminate structure comprising three layers,

the first layer consisting essentially of unfilled poly(arylene sulfide) having a flame-treated surface facing the second layer,

the second layer consisting of an adhesive connected to said flame-treated surface, and said third layer consisting of a solid material connected to said second layer of adhesive, said third layer being selected from the group consisting of metals, plastic materials, wood, ceramic materials, glass and concrete.

4,075,389

OPAQUE MICROCAPSULAR RELEASE SHEET

Anthony E. Vassiliades, Deerfield, and David N. Vincent, Glenview, both of Ill., assignors to Champion International Corporation, Stamford, Conn.

Filed Feb. 28, 1972, Ser. No. 230,088
Int. Cl.² B01J *13/02;* **C09D** *5/00;* **B44D** *1/02*
U.S. Cl. 428—306 **22 Claims**

1. An opaque release sheet which comprises a substrate having at least one surface coated with a release composition, said release composition comprising three separate ingredients, said first ingredient being a primary release agent consisting essentially of discrete, substantially spherical, air-containing microcapsules, said second ingredient being binder for adhering said microcapsules to said substrate, and said third ingredient being between about 1 and 30 percent by weight of said air-containing microcapsules on a dry basis of a secondary release agent, said secondary release agent improving the release properties of said release composition as compared with said release composition omitting said secondary release agent, said release sheet being capable of removal from a tacky surface when said coated surface is applied thereto without affecting the properties of said tacky surface or said surface coated with said release composition.

4,075,390

FUSING SURFACE AND METHOD FOR FIXING TONER

Richard J. Murphy, Norwood, Mass., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 497,409, Aug. 14, 1974, Pat. No. 3,997,691. This application Oct. 4, 1976, Ser. No. 729,561
Int. Cl.² B05D *3/02;* **B05D** *3/12;* **G03G** *13/20*
U.S. Cl. 428—307 **18 Claims**

1. An article for use in a xerographic reproducing apparatus for fixing a resin-based powder image to a substrate at elevated temperatures, comprising a structure having a surface of silicone rubber having substantially no reinforcing filler and being capable of forming a degradation product in the presence of water at elevated temperatures and having an agent capable of supplying water dispersed therein in an amount which provides sufficient water to cause the degradation of the silicone rubber and the formation of the degradation product on the surface, said degradation product acting as a release material and having an adhesion for the resin-based powder which is

less than the adhesion which the fused resin-based powder has for the substrate.

18. A fuser member for an electrostatic copier comprising a structure having a substrate coated with a water-degradable silicone rubber having substantially no reinforcing filler and containing therein an agent capable of supplying water in an amount which provides sufficient water to cause the degradation of the silicone rubber at elevated temperatures, the surface of said coating comprising the degradation product of the silicone rubber, the degradation product being capable of acting as a release material for tackified resin-based powder or toner placed thereon.

4,075,391
PRODUCTION OF FERRITE ELECTROSTATOGRAPHIC CARRIER MATERIALS HAVING IMPROVED PROPERTIES

Allan C. Berg, Rochester; John W. Fitzpatrick, Fairport, and Lewis O. Jones, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

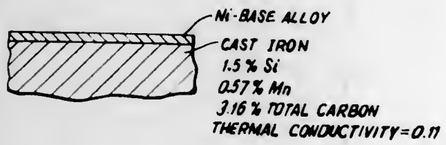
Filed Oct. 29, 1975, Ser. No. 626,907
Int. Cl.[2] G03G *9/14*
U.S. Cl. 428—407 **13 Claims**

1. A process for preparing humidity-insensitive electrostatographic ferrite carrier materials comprising dry blending a mixture of ferrite forming metal oxides calcining the blended oxides in air at a temperature of up to about 2150° F for up to about 30 minutes to provide said blended oxides with a saturation magnetic moment of between about 6 to about 30 electromagnetic units per gram, milling the calcined oxides in a slurry to reduce the particle size of said calcined oxides to between about 0.8 micron and about 1.6 microns while adding to said slurry from about 0.02 to about 0.08 mole fraction of manganese oxide and about 0.001 to about 0.100 mole fraction of copper oxide based on all divalent metal oxides, a sodium-free deflocculant in an amount of from about 0.5 to about 2.0 percent by weight based on the weight of said metal oxides, and water to provide a slurry having about 80.0 percent by weight of solids, pumping the milled slurry to hold/feed tanks with continuous mixing while adding a binder material to said slurry in an amount of from about 0.2 to about 1.5 percent by weight based on the weight of said metal oxides, spray-drying said slurry to form substantially spherical beads, screening said beads to obtain particles having a controlled size, firing the screened particles in air at a temperature of up to about 2500° F for about 4 to about 8 hours to provide them with a saturation magnetic moment of about 48 electromagnetic units per gram, deagglomerating the fired particles, and screen said particles to obtain ferrite particles having surface sodium in an amount of less than about 20 parts per million, surface zinc in an amount of less than about 5,000 parts per million, and a BET surface area of between about 170 cm^2/gram and about 500 cm^2gram.

4,075,392
ALLOY-COATED FERROUS METAL SUBSTRATE

Frederick T. Jaeger, Rosemere, Canada, assignor to Eutectic Corporation, Flushing, N.Y.

Filed Sept. 30, 1976, Ser. No. 728,284
Int. Cl.[2] B32B *15/18*
U.S. Cl. 428—457 **8 Claims**



1. An alloy coated ferrous metal substrate,
said ferrous metal substrate having a thermal conductivity relative to silver taken as 1 at substantially ambient temperature of at least about 0.06 calories/sq.cm./cm/° C/sec,
said alloy coating being a fused flame sprayed, self-fluxing heat and corrosion resistant iron-group metal-base alloy metalurgically bonded to said ferrous meal substrate and having a thickness ranging from about 0.005 to 0.15 inch,
said iron-group metal-base alloy consisting essentially of a total of about 5% to 30% by weight of a strong boride and carbide-forming solute metal selected from the group of refractory metals consisting of W, Mo and Cr, up to about 3% C, about 0.5% to 5% B, about 0.1% to 6% Si and the balance essentially said iron-group metal,
the amount of boron and/or carbon present in said alloy being sufficient to combine with a substantial amount of said refractory metal when present to form secondary borides and/or secondary carbides, such as to provide a coating having a thermal conductivity at substantially ambient temperature relative to silver taken as 1 of at least about 0.05 calories/sq.cm/cm/° C/sec.,
said coating also containing 0 to 80% by weight of primary refractory carbides selected from the group consisting of carbides of Ti, Zr, Hf, V, Nb, Ta, Cr, Mo and W based on the total coating.

4,075,393
MODIFIED TRIGLYCERIDE METAL WORKING LUBRICANTS

Robert J. Sturwold, Cincinnati, Ohio, assignor to Emery Industries, Inc., Cincinnati, Ohio

Division of Ser. No. 627,852, Nov. 3, 1975. This application Jan. 13, 1977, Ser. No. 759,071
Int. Cl.[2] B32B *15/04, 15/20*; C10M *1/06*
U.S. Cl. 428—457 **5 Claims**

1. An aluminum or aluminum alloy product essentially free of surface stain and resistant to subsequent water stain having applied on the surface thereof a protective coating of a modified triglyceride obtained by transesterifying until the acid value is reduced by at least 25%, 50–84 parts triglyceride derived predominantly from C_{12}–C_{18} fatty acids, 2–36 parts polyoxyethylene glycol having an average molecular weight from about 200 to 1500 and 7–48 parts of an aliphatic or cycloaliphatic dicarboxylic acid containing 18 to 54 carbon atoms.

4,075,394
PROCESS OF INHIBITING TANNIN MIGRATION IN TANNIN-CONTAINING WOOD SUBSTRATES

Victor E. Meyer, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 8, 1976, Ser. No. 674,789
Int. Cl.[2] B05D *7/06*; B32B *21/08*
U.S. Cl. 428—537 **8 Claims**

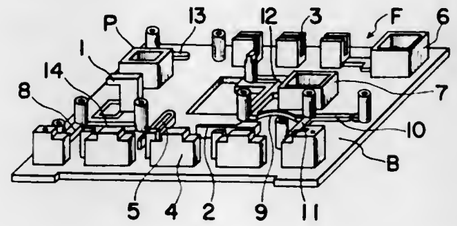
1. A process of inhibiting tannin migration in a tannin-containing wood substrate comprising applying to the wood substrate an aqueous solution consisting essentially of between about 2 and about 50 weight percent polyalkylenimine.

4,075,395
HYBRID FRAMEWORK CONSISTING OF METALLIC PLATE AND PROJECTIONS MADE OF SYNTHETIC RESIN

Masanori Ohnishi, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 4, 1976, Ser. No. 664,037
Claims priority, application Japan, Mar. 7, 1975, 50-28531[U]; Mar. 7, 1975, 50-28532[U]; Mar. 7, 1975, 50-28533; Mar. 7, 1975, 50-28534; Mar. 19, 1975, 50-34066; Mar. 11, 1975, 50-33028[U]; Mar. 11, 1975, 50-33029[U]
Int. Cl.[2] B32B *9/04*
U.S. Cl. 428—542 **19 Claims**

1. A hybrid framework assembly for use in electrical or mechanical devices as a substratum and capable of being formed by a process of injection molding, and for supporting various components incorporated in said devices, said hybrid framework assembly comprising;
a. a metallic base having opposite surfaces and at least one opening therein between said surfaces;
b. at least one projection on said metallic base plate and made of synthetic resin and having a base face thereof attached to said metallic base plate on a first of said surfaces of said metallic base plate adjacent said opening and

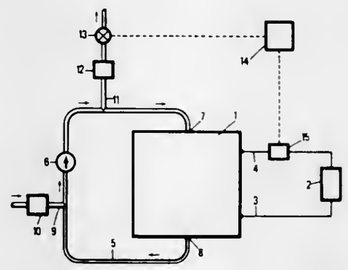


being larger than said opening and having a portion of said projection extending over said opening, said projection having a constricted portion integrally formed therewith extending into and through said opening, and a lump of synthetic resin on the second of said surfaces of said metallic base plate and integrally formed with said constricted portion, said lump of synthetic resin at least partially covering said opening for tightly holding said projection permanently on said metallic base plate.

4,075,396
METHOD AND DEVICE FOR FEEDING A FUEL CELL WITH A FLUID REACTANT

Alain Grehier, Paris, France, assignor to Institut Francais du Petrole, France

Filed Sept. 8, 1976, Ser. No. 721,217
Claims priority, application France, Sept. 17, 1975, 75 28900
Int. Cl.[2] H01M *8/04*
U.S. Cl. 429—17 **26 Claims**



1. A method of feeding a fuel cell with at least one fluid reactant, comprising circulating at least one fluid reactant through a closed loop including a fuel cell, introducing a make-up amount of fresh fluid into said loop, keeping at a substantially constant value the fluid pressure within the closed loop during the whole operating period of the fuel cell, automatically discharging, during a discharge period, a fraction of the fluid flowing through the loop and interrupting during a non-discharge period the discharge of said fluid from the loop, said discharge and non-discharge periods repeatedly following one another, wherein the flow rate of said discharged fluid has substantially the same value during all said discharge periods, said value being constant and wherein a time interval between the beginning of two consecutive discharge periods has a predetermined value.

4,075,397
CELL HAVING CHALCOGENIDE CATHODE AND SOLVATED ALKALI METAL SALT ELECTROLYTE

Robert W. Francis, Linden, and Gerald H. Newman, Westfield, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Mar. 1, 1977, Ser. No. 773,284
Int. Cl.[2] H01M *10/44*
U.S. Cl. 429—50 **13 Claims**

1. An electric current-producing cell, comprising:
a. an alkali metal-containing anode;
b. a cathode containing as its cathode active material, one or more chalcogenides of the empirical formula:

$$M'A_p$$

wherein M' is one or more metals selected from the group consisting of titanium, zirconium, hafnium, niobium, tantalum and vanadium, wherein A is one or more chalcogens selected from the group consisting of oxygen, sulfur, selenium and tellurium, and wherein p is a numerical value between about 1.8 and about 3.2; and
c. a solid electrolyte consisting essentially of one or more solvated compounds of the formula:

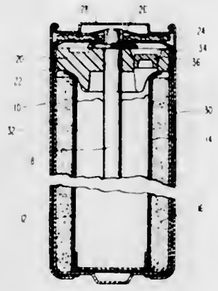
$$ZMX_n$$

wherein Z is an alkali metal, wherein M is a metal selected from the group consisting of Zn, Cd, B, Al, Ga, In, Tl, Sn (stannous), P and As, wherein X is one or more halogens selected from the group consisting of chlorine, fluorine, bromine and iodine, and wherein n is a numerical value equal to one plus the valence of the metal M, said compounds having been solvated with one or more solvents selected from the group consisting of unsubstituted and inertly substituted monoethers and polyethers.

4,075,398
MEANS OF PROVIDING PRESSURE RELIEF TO SEALED GALVANIC CELL

Isaac I. Levy, Cambridge, Wis., assignor to ESB Incorporated, Philadelphia, Pa.

Filed Oct. 26, 1976, Ser. No. 735,574
Int. Cl.[2] H01M *2/12*
U.S. Cl. 429—56 **8 Claims**



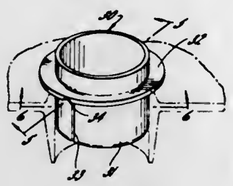
1. A sealed galvanic cell, comprising:
a generally tubular envelope having a mouth at one end thereof;
a mass of electrolyte disposed in said envelope;
an end cap having an inner and an outer surface and extending across the mouth of said envelope to seal the interior of the envelope, said end cap being formed of polysulfone;
said end cap defining a vent passage extending therethrough for allowing gases to escape from within said envelope;
a generally cylindrical plug formed of polysulfone disposed in said passageway, said plug having an uncompressed

diameter greater than the diameter of said vent passage to provide a compressive fit therewith;
the polysulfone of said end cap exhibiting a sufficiently low characteristic creep so that the pressure produced by the compressive fit remains substantially constant;
an outer cap assembly disposed over said end cap; and
terminal means extending through said end cap and into said electrolyte.

4,075,399
BATTERY VENT SEAL

Anthony Sabatino, St. Paul, and Purushothama Rao, Burnsville, both of Minn., assignors to Gould Inc., Rolling Meadows, Ill.

Continuation-in-part of Ser. No. 486,662, July 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 377,563, July 9, 1973, Pat. No. 3,896,177. This application June 4, 1975, Ser. No. 583,672
Int. Cl.² H01M *2/12*
U.S. Cl. 429—57 **8 Claims**

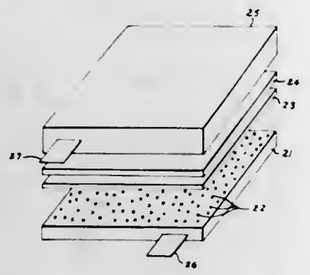


1. For use with a lead acid battery having a cell and positive and negative plates containing formed active materials with a retained quantity of electrolyte and being closed except for a substantially cylindrical collar, a seal for relieving internal gas pressure while protecting the active materials from substantial oxidation, comprising a substantially cup-shaped member having a conical body adapted to be sealingly wedged into said collar, said member having a means communicating with the atmosphere and sized to allow, after a slight pressure build-up, venting of the gas from the battery sufficient to prevent bulging of the container that would cause permanent deformation thereof or ejection of the vent seal, said seal having a tear tab comprising a main portion integrally formed with said conical body, rupturing means defining said main portion and allowing said main portion to be partially separated from said conical body and a tab in-integrally formed with said main portion.

4,075,400
OVER TEMPERATURE BATTERY DEACTIVATION SYSTEM

David H. Fritts, 112 Beverly Place, Dayton, Ohio 45419

Filed Feb. 4, 1977, Ser. No. 765,557
Int. Cl.² H01M *6/50*
U.S. Cl. 429—62 **6 Claims**

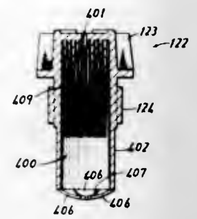


1. The improvement in battery structure to deactivate the battery in locations within the battery where overheating and temperatures exceeding a predetermined safe value occur, the battery having an electrode and a separator containing an electrolyte, the said improvement comprising:
a. a battery poisoning agent;
b. an encapsulant having a determined melting temperature approximately equal to the said safe value, encapsulating the said battery poisoning agent; and
c. means for positioning the said encapsulant encapsulating the said positioning agent between the said electrode and the said separator.

4,075,401
GAS-DISCHARGING PASSAGE OF STORAGE BATTERY AND MOLDING METHOD THEREOF

Shiro Miyagawa, Suita, Japan, assignor to Miyagawa Kasei Industry Co., Ltd., Osaka, Japan

Filed Oct. 28, 1976, Ser. No. 736,554
Claims priority, application Japan, Feb. 13, 1976, 51-15575[U]; Dec. 27, 1975, 51-179077[U]; Feb. 13, 1976, 51-16919[U]; Feb. 13, 1976, 51-16920[U]; Mar. 31, 1976, 51-40622[U]; June 16, 1976, 51-79208[U]; July 23, 1976, 51-98892[U]; Aug. 19, 1976, 51-112390[U]
Int. Cl.² H01M *2/12*
U.S. Cl. 429—89 **7 Claims**

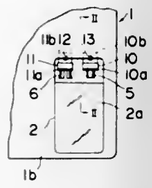


1. A storage battery plug with a gas discharging passage which is integrally molded from a moldable material of substantial elasticity, including a cylindrical portion having a central axis and a given length, as well as screening members in said cylindrical portion, said screening members comprising a plurality of hair-like elements which are provided inwardly of the given length of the inner peripheral wall of said cylindrical portion, said hair-like elements being inclined downwardly and distributed closely together across the entire area along the peripheral direction so that the mass of said plurality of hair-like elements form funnel shaped means in said cylindrical portion.

4,075,402
APPARATUS FOR HOLDING BATTERY

Shinobu Okamoto, 1-4-3, Yahata-cho, Koyama, Tochigi, Japan

Filed July 27, 1976, Ser. No. 709,187
Claims priority, application Japan, Jan. 22, 1976, 51-5155[U]
Int. Cl.² H01M *2/10*
U.S. Cl. 429—98 **2 Claims**



1. An improvement for an electrical apparatus for holding a battery which includes a pair of male and female terminals at one end thereof, the apparatus being of the type comprising a main body which includes a compartment therein for receiving the battery and a pair of female and male circuit terminals extending into the compartment and arranged for engagement with the respective male and female terminals of the battery, the improvement comprising: first and second resilient, electrically conductive, plate springs rigidly secured at their end portions to the main body and extending into and terminating in the battery compartment, one of said plate springs carrying at its free end portion the female circuit terminal for engagement with the battery male terminal and the other of said plate springs carrying at its free end portion the male circuit terminal for engagement with the battery female terminal, said first and second plate springs being electrically isolated from each other, the compartment being sized so that when the battery terminals on one end of the battery are engaged by the plate springs the other end of the battery will engage a surface of the compartment opposite said plate springs.

4,075,403
PHENOLIC RESIN AND BATTERY SEPARATOR IMPREGNATED THEREWITH

William D. Burke, West Springfield; Harold P. Higginbottom, and John R. Le Blanc, both of Wilbraham, all of Mass., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 691,276, June 1, 1976. This application Jan. 21, 1977, Ser. No. 760,873
Int. Cl.² H01M *2/16*
U.S. Cl. 429—253 **7 Claims**

1. An improved cellulosic fibrous permeable battery separator impregnated with a resole resin composition comprising:
A. a resole resin formed as a reaction product of about 1.0 to 3.0 mols of formaldehyde per mol of phenol in the presence of an alkaline catalyst, the improvement comprising having present:
B. an alkaline hydroxy organic acid salt formed by neutralizing said resole resin with sufficient hydroxy organic acid to provide said resin with a pH of 7 to 9.

4,075,404
COPOLYMERS OF ALPHA-METHYLSTYRENE AND STYRENE AND USES THEREOF

Paul S. Douglas, Jefferson Township, Fayette County; Anargiros Pete Patellis, Rostraver Township, Westmoreland County, and Walter A. Vredenburgh, Pleasant Hills, all of Pa., assignors to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 333,215, Feb. 16, 1973, Pat. No. 3,932,332. This application Nov. 25, 1975, Ser. No. 635,482
Int. Cl.² C08F *4/14, 212/12*
U.S. Cl. 526—237 **6 Claims**

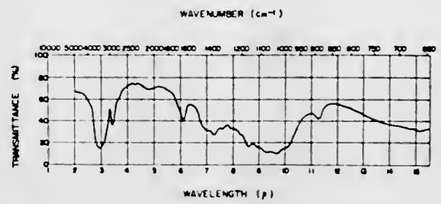
1. A copolymer consisting of α-methylstyrene and styrene as the sole monomers produced by copolymerization of, by weight, from about 90 parts to about 50 parts α-methylstyrene and from about 50 parts to about 10 parts styrene at a temperature range from about 15° C. to about 45° C. and in the presence of a Friedel-Crafts catalyst, said copolymer having a softening point (ring and ball) of under 100° C.

4,075,405
β-1,3-GLUCAN DERIVATIVES

Takeshi Takahashi, Tondabayashi; Yoshio Yamazaki, Toyonaka, and Koichi Kato, Neyagawa, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Nov. 26, 1975, Ser. No. 635,450
Claims priority, application Japan, Nov. 26, 1974, 49-136477; Nov. 26, 1974, 49-136478; Oct. 21, 1975, 50-127197
Int. Cl.² A61K *31/71;* C08B *37/00;* C12D *13/04*
U.S. Cl. 536—1 **8 Claims**

1. A beta-1,3-glucan derivative, which is produced by reacting water-insoluble beta-1,3-glucan produced by microorganisms belonging to the genus Alcaligenes, the genus Agrobacterium or Poria cocos, with cyanogen halide in the presence of water and with the addition of an alkali in an amount such that the pH of the reaction system is sufficiently increased to prevent dissolution of said water-insoluble beta-1,3-glucan, said increase being in the range of about 0.2 to 0.5 pH unit/minute.



4,075,406
PROCESS FOR MAKING XYLOSE

Asko J. Melaja, and Lauri Hamalainen, both of Kantvik, Finland, assignors to Suomen Sokeri Osakeyhtio, Helsinki, Finland

Continuation of Ser. No. 463,037, April 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 354,391, April 25, 1973, abandoned. This application Aug. 28, 1975, Ser. No. 608,706
Int. Cl.² C07G *1/08;* C07C *31/18;* C13K *1/02;* C13D *3/14*
U.S. Cl. 536—1 **5 Claims**

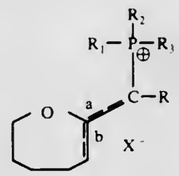
1. A method for the production of xylose from a pentose-rich solution obtained by acid hydrolysis of a pentosan-containing raw material which comprises the steps of:
a. removing suspended solids from the solution by mechanical filtration;
b. removing inorganic salts and the major portion of organic impurities and color by ion exclusion;
c. removing the balance of color and other organic impurities by treating the solution with a material selected from the group consisting of an ion exchange resin and activated carbon; and
d. fractionating the solution thus obtained by ion exchange chromatographic techniques to provide a xylose solution of high purity.

4,075,407
HETEROCYCLIC PHOSPHONIUM SALTS

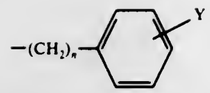
Richard A. Mueller, Northbrook, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 577,675, May 15, 1976, Pat. No. 3,997,588. This application Nov. 15, 1976, Ser. No. 741,909
Int. Cl.² C07D *307/10, 313/04, 309/04*
U.S. Cl. 542—412 **20 Claims**

1. A compound of the formula



wherein R is hydrogen or an alkyl containing 1-3 carbon atoms, R_1, R_2 and R_3 is each an alkyl radical containing 1-6 carbon atoms, a cycloalkyl radical containing 5 or 6 carbon atoms, or a radical of the formula



wherein n is 0–4, and Y is hydrogen, halogen, alkyl containing 1–6 carbon atoms or alkoxy containing 1–6 carbon atoms; X^- is a pharmacologically acceptable anion; and one of a and b is a double bond and the other is a single bond.

4,075,408

IMIDAZOPYRAZOLODIAZEPINE COMPOUNDS

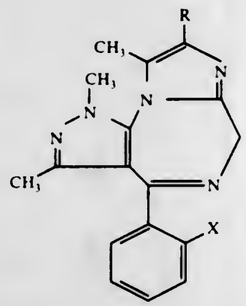
Donald E. Butler, Ann Arbor, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

Continuation-in-part of Ser. No. 611,042, Sept. 8, 1975, abandoned, which is a continuation-in-part of Ser. No. 521,318, Nov. 6, 1974, abandoned. This application June 17, 1976, Ser. No. 696,952

Int. Cl.[2] C07D *487/14*

U.S. Cl. 548—324 **6 Claims**

1. A member of the class consisting of compounds of the formula



and pharmaceutically acceptable acid-addition salts thereof; where R is hydrogen or methyl and X is hydrogen, fluorine, or chlorine.

4,075,409

BENZOPHENONE DERIVATIVES

Heinz Günter Greve, and Klaus Resag, both of Frankfurt am Main, Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Germany

Filed Oct. 21, 1974, Ser. No. 516,428

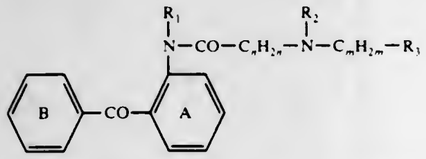
Claims priority, application Germany, Nov. 10, 1973, 2356239

The portion of the term of this patent subsequent to May 20, 1992, has been disclaimed.

Int. Cl.[2] C07C *103/50*

U.S. Cl. 560—36 **5 Claims**

1. A benzophenone derivative having the following structural formula



or a pharmaceutically-acceptable acid-addition salt thereof, in which each of R_1 and R_2 is, independently, a member selected from the group consisting of hydrogen and a saturated or unsaturated alkyl radical with from 1 to 4 carbon atoms, R_3 is a member selected from the group consisting of $-COOC_3H_7$, $-COOC_4H_9$ and $-COOC_6H_5$, n is 1 or 2, m is 1, 2 or 3, ring A is optionally substituted with a substituent selected from the group consisting of halogen, nitro, trifluoromethyl, methyl and methoxy, and ring B is optionally substituted with a substituent selected from the group consisting of chloro and fluoro.

4,075,410

Patent Not Issued For This Number

4,075,411

VINYL-POLYMERIZABLE SURFACTIVE MONOMERS

Jack Dickstein, Huntingdon Valley, Pa., assignor to Haven Industries, Inc., Worcester, Mass.

Filed May 23, 1975, Ser. No. 580,526

Int. Cl.[2] C07C *69/54*

U.S. Cl. 560—224 **5 Claims**

1. Esters of acrylic, methacrylic or crotonic acid with C_8-C_{20} alkyl phenoxy (ethyleneoxy) ethyl alcohols.

4,075,412

PROCESSES FOR PREPARATION OF DIACYLOXY OLEFINS

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 21, 1976, Ser. No. 678,856

Int. Cl.[2] C07C *67/05*

U.S. Cl. 560—244 **8 Claims**

1. In a process for the production of unsaturated diesters which comprises reacting under reaction conditions a conjugated diolefin with a carboxylic acid by contacting a mixture of said diolefin and said acid with free oxygen wherein the improvements comprises using a catalytic amount of a catalyst system consisting essentially of an indium compound selected from the group consisting of indium acetate, indium acetylacetonate, indium hydroxide, indium monochloride, indium trichloride, indium oxyhydroxide, indium selenide, indium sulfate, indium tribromide, indium triiodide, and indium trioxide, a source of chloride ion, bromide ion or iodide ion or mixture thereof, an alkali metal compound and, optionally, a dihalobutene catalyst adjuvant, wherein the halide moiety of said adjuvant is chloride, bromide or iodide.

4,075,413

PROCESS FOR PREPARATION OF DIACETOXYBUTENE

Yasuo Tanabe, Kurashiki, Japan, assignor to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed June 10, 1976, Ser. No. 694,534

Claims priority, application Japan, June 17, 1975, 50-73566; Oct. 23, 1975, 50-127776

Int. Cl.[2] C07C *67/05*

U.S. Cl. 560—244 **7 Claims**

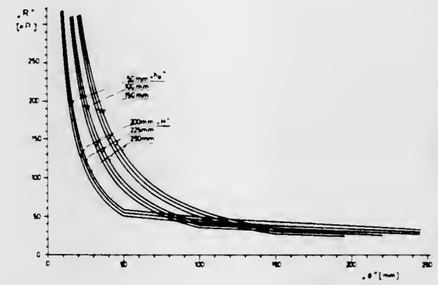
1. In a process for the preparation of diacetoxybutene by a catalytic reaction of butadiene, acetic acid and oxygen or an oxygen-containing gas in the presence of a catalyst containing palladium metal on a support, the improvement which comprises carrying out the reaction by using butadiene containing vinylcyclohexene in an amount of 1 to 5,000 parts by weight per million parts by weight of butadiene and at least one polymerization inhibitor selected from the group consisting of quinone, hydroquinone, 2,5-di-t-butyl-hydroquinone, 2,5-di-t-amylhydroquinone, anthraquinone, phenol, t-butylcatechol, 2,6-di-t-butylphenol, 2,4-di-t-butylphenol, 2,4-di-t-butyl-p-cresol, 4,4'-butylidene-bis (3-methyl-6-t-butylphenol), 2,2-methylene-bis (4-methyl-6-t-butylphenol), and elemental sulfur, the amount of the polymerization inhibitor other than elemental sulfur being from 5 to 50 parts by weight per million parts by weight of butadiene and the amount of elemental sulfur being from 10 to 7,000 parts by weight per million parts by weight of said butadiene.

4,075,414

APPARATUS FOR REGULATING THE IMMERSION DEPTH OF ELECTRODES IN ELECTRODE-MELTING FURNACES

Friedrich Werner Thomas, Niedermittlau, Germany, assignor to Leybold-Heraeus GmbH & Co. KG, Cologne, Germany

Filed Nov. 26, 1975, Ser. No. 635,462
Claims priority, application Germany, Nov. 29, 1974, 2456512
Int. Cl.[2] F27D *11/06*
U.S. Cl. 13—13 2 Claims



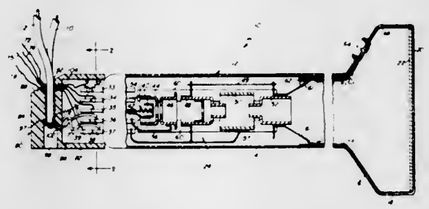
1. Apparatus for the continuous and automatic regulation of the depth of immersion of a driven remelting electrode in the slag layer of an electroslag remelting furnace, comprising regulating means for maintaining the depth of immersion essentially constant at a predetermined value, including first circuit means for detecting the actual resistance of the current-path through the slag layer and for producing a first signal corresponding to the actual resistance, and second circuit means for detecting the changing of the resistance upon the spatial displacement of the electrode within the slag layer and for producing a second signal defining a correction signal corresponding to the changing of the resistance and means receptive of the first signal corresponding to the actual resistance from the said first circuit means and the second signal from the second circuit means for algebraically summing the two and responsive to the sum for controlling the driving of remelting electrode to effect immersion thereof to a depth wherein the said second signal corresponding to the changing of the resistance is essentially constant whereby the electrode is remelted to form a solid ingot beneath the slag.

4,075,415

TUBE WITH TERMINAL END CAP

Warren C. Davis, Cohasset, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jan. 6, 1977, Ser. No. 757,408
Int. Cl.[2] H01R *13/58*
U.S. Cl. 174—50.52 10 Claims



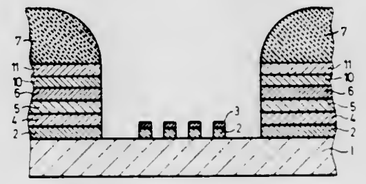
1. The combination comprising:
an electron tube including an evacuated envelope, and at least one terminal pin extending externally of the envelope;
a dielectric cap including a cylindrical wall encircling the pin and a transversely disposed wall having therein at least one pair of substantially mutually perpendicular openings;
a first wire attached directly to the terminal pin and extending through one of the openings in the transversely disposed wall; and
a second wire attached to the first wire and extending through the other opening in the transversely disposed wall.

4,075,416

ELECTRONIC THIN FILM CIRCUIT UNIT AND METHOD OF MAKING THE SAME

Klaus Küttner, Stuttgart; Günter Krüger, Leonberg, and Fedor Modic, Stuttgart, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 27, 1976, Ser. No. 652,728
Claims priority, application Germany, Mar. 7, 1975, 2509912
Int. Cl.[2] H05K *1/00*
U.S. Cl. 174—68.5 7 Claims



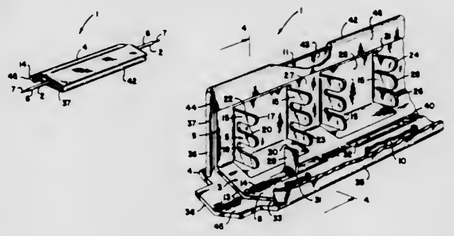
1. In a thin film electronic circuit unit comprising a substrate plate of insulating material, a patterned layer of a valve metal partly covering the substrate plate in accordance with a first and a second pattern, said first and second patterns being contiguous to each other in at least one location and respectively defining a first and a second portion of said valve metal layer, said first portion providing circuit elements and said second portion providing connecting conductors and areas for external contact and being provided with metallization, said metallization of said second valve metal layer portion including a first copper layer (**4**) on top of said valve metal layer, an intermediate layer (**5**) of a diffusion barrier metal on top of said first copper layer and a second copper layer (**6**) on top of said diffusion barrier metal layer, and a soft solder layer (**7**) provided on top of said metallization, the improvement wherein:
said metallization further comprises five layers (**4, 5, 6, 10, 11**) of which one is a nickel layer (**10**) located on top of said second copper layer (**6**) and another is a gold layer (**11**) superimposed on said nickel layer (**10**).

4,075,417

CRIMPED, INSULATION PIERCING ELECTRICAL CONNECTION

Dory J. Neale, Sr., St. Petersburg, Fla., assignor to The National Telephone Supply Company, Cleveland, Ohio

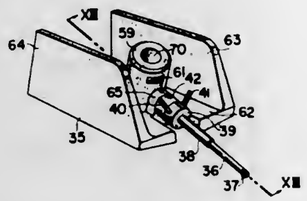
Filed Mar. 17, 1976, Ser. No. 667,505
Int. Cl.[2] H01R *5/10*
U.S. Cl. 174—84 C 10 Claims



1. An electrical connection of conductors having insulation thereon comprising:

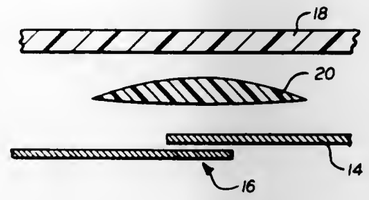
(a) a generally channel-shaped connector having a web with opposed, spaced apart side walls extending therefrom;
(b) said connector including an electrically conductive inner portion bonded to an electrically insulative outer portion;
(c) said connector inner and outer portions respectively including end portions, a web, and side walls having free longitudinal edges and transverse end edges;
(d) rows of conductor engaging protuberances on the inner portion side walls being disposed transversely thereof; each of said rows having a plurality of said protuberances with a spacing between adjacent protuberance edges for receiving one of said conductors therebetween;
(e) said spacing being smaller than the width of a conductor and being graduated such that the spacing gradationally decreases in width from the rows adjacent said connector ends to the rows intermediate of said connector; and
(f) said conductors having portions thereof clamped between the walls of said connector, and said protuberance edges penetrating into the insulation of said conductors therebetween to hold said conductors and to make electrical contact therewith.

4,075,418
STEREOPHONIC PICKUP CARTRIDGE
Mitsuo Nemoto, Machida, and Kimiyasu Honma, Kokubunji, both of Japan, assignors to Kabushiki Kaisha Audio-Technica, Machida, Japan
Continuation-in-part of Ser. No. 368,762, June 11, 1973, abandoned, which is a division of Ser. No. 849,767, Aug. 13, 1969, Pat. No. 3,761,647. This application May 23, 1975, Ser. No. 580,159
Claims priority, application Japan, Aug. 14, 1968, 43-57408; Feb. 3, 1969, 44-7290
Int. Cl.² H04R *11/12*
U.S. Cl. 179—100.41 K **13 Claims**



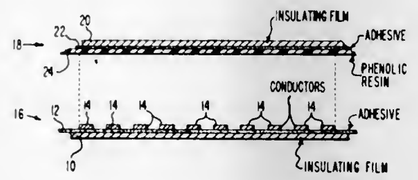
1. In a stylus assembly for incorporation in a cartridge destined for mounting on a tone arm of a record player, a stylus sub-assembly comprising an elongate integral synthetic resin moulded composite structure having a longitudinal axis and being constituted of (a) a mounting member, (b) an armature securing member axially spaced from said mounting member and (c) an interconnecting section between adjacent facing ends of said mounting and armature securing members and connect thereto at substantially central regions thereof, said interconnecting section serving as a fulcrum wire having a transverse section substantially smaller than each of the transverse sections of said mounting and armature securing members, an elongate cantilever arm adapted to have a stylus at one end thereof and being fixed at its opposite end to said armature securing member at a side thereof opposite that to which the fulcrum wire is connected, and a pair of armatures secured to said armature securing member and being disposed on opposite sides of a vertical plane including the longitudinal axis of said cantilever arm, said armatures beig disposed at an angle of inclination of 45° relative to said axis and being disposed at right angles to each other, said mounting member, armature securing member and intermediate interconnecting fulcrum wire comprising a single unitary component.

4,075,419
BRIDGING TAPE OVER LAP SEAM CABLE SHIELD
Kenneth J. Virkus, Englishtown, N.J., assignor to General Cable Corporation, Boonton, N.J.
Filed Dec. 20, 1976, Ser. No. 752,172
Int. Cl.² H01B *7/18*
U.S. Cl. 174—107 **13 Claims**



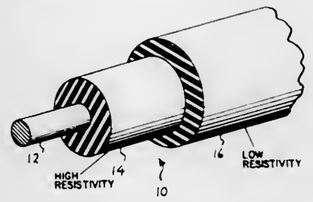
1. An electric power cable including in combination a core, a metal shield surrounding the core and having a lap seam with edges that move circumferentially over one another as the core expands and contracts with load cycling, an outer plastic jacket surrounding the metal shield, and a longitudinally extending bridging element having a mid portion that extends across the edge of the outer lap of the seam of the metal shield and circumferentially beyond said edge for distributing the increase in circumference of the metal shield over a greater axial extent of the inside surface of the jacket, the bridging element tapering from its mid portion to thin edges along both of its longitudinal edge portions to avoid abrupt change of displacement of the jacket at the edges of the bridging element.

4,075,420
COVER LAYER FOR FLEXIBLE CIRCUITS
Tommy L. Walton, Carlsbad, Calif., assignor to Burroughs Corporation, Detroit, Mich.
Filed Aug. 28, 1975, Ser. No. 608,457
Int. Cl.² H01B *7/08*
U.S. Cl. 174—117 F **7 Claims**



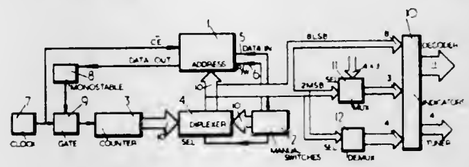
1. A cover layer for a flexible circuit having a plurality of spaced conductors on a flexible substrate, said cover layer comprising:
an outer layer of an insulating polyimide film;
an intermediate layer of a thermosetting adhesive bonded to said outer layer; and
an inner layer of a phenolic resin adhesive bonded to said intermediate layer, wherein said cover layer can be subsequently bonded to the flexible substrate with said inner layer being contiguous with said conductors to provide increased flexibility and protection for the flexible circuit.

4,075,421
DIRECT CURRENT CABLE WITH RESISTIVITY GRADED INSULATION, AND A METHOD OF TRANSMITTING DIRECT CURRENT ELECTRICAL ENERGY
Charles R. McCullough, Scotia, N.Y., assignor to General Electric Company, New York, N.Y.
Filed Dec. 23, 1975, Ser. No. 643,959
Int. Cl.² H01B *7/02*
U.S. Cl. 174—120 SC **12 Claims**



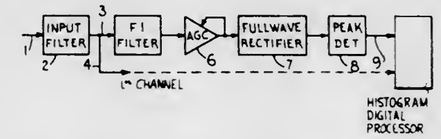
1. An electrical cable for the transmission of high voltage direct current electrical energy which minimizes disproportional direct current induced electrical stresses through the insulation due to temperature changes comprising an elongated metal electrical conductor enclosed within a resistivity graded, composite body of polymeric dielectric insulation, said composite dielectric insulation comprising the combination of an inner layer of polymeric insulation of relatively high resistivity and a contiguous outer layer of filled polymeric insulation of relatively low resistivity, the inner layer of the polymeric insulation comprising a polymeric material consisting essentially of cross-linked polyethylene and the outer layer of the filled polymeric insulation consisting essentially of cross-linked ethylene-containing polymer selected from the group consisting of polyethylene and copolymers of ethylene and propylene containing about 25 to about 150 parts by weight of at least one filler selected from the group consisting of clay and titanium dioxide per 100 parts by weight of the ethylene-containing polymer.

4,075,422
AUTOMATIC PAGE SELECTORS
Henry Louis Baker, Northwood, England, assignor to Communications Patents Limited, London, England
Filed June 17, 1976, Ser. No. 697,027
Claims priority, application United Kingdom, June 21, 1975, 26480/75
Int. Cl.² G06F *3/14*
U.S. Cl. 178—23 R **5 Claims**



1. A page selector comprising a counter, a page selector device responsive to the output of the counter to select pages for decoding and display, a clock for providing pulses to the counter, a memory the locations of which are sequentially addressable by the counter, means for writing data into the memory, means for controlling the intervals between successive clock pulses applied to the counter in accordance with the written data, manual switches for addressing selected locations of the memory, means for writing information in the selected locations wherein the counter output is connected permanently to the memory and is connected to receive inputs from the manual switches, and wherein the counter comprises first, second and third counter elements and the manual switches comprise first and second switches connected respectively to the first and second counter elements and to separate inputs of a first diplexer, a second diplexer being connected to apply the output of a third switch or the output of the first diplexer to a magazine selector device, and a gate being connected to apply the clock pulses to the first counter element.

4,075,423
SOUND ANALYZING APPARATUS
Michael Joseph Martin, Stevenage, and Michael John Underwood, Letchworth, both of England, assignors to International Computers Limited, London, England
Filed Apr. 14, 1977, Ser. No. 787,448
Claims priority, application United Kingdom, Apr. 30, 1976, 17614/76
Int. Cl.² G10L *1/00*
U.S. Cl. 179—1 SC **9 Claims**

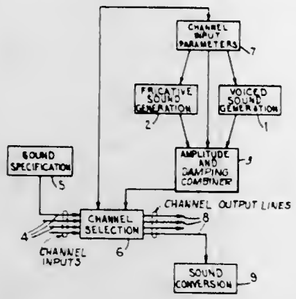


1. Sound analysing apparatus for the evaluation of speech including means for extracting from an applied speech signal a required formant waveform; means for identifying frequency components of the required formant in the waveform; a first store having a plurality of addressable storage locations each associated respectively with a different predetermined range of frequencies; means for adding during each of a succession of predetermined histogram sampling periods of value of unity for each frequency component identified into that one of the storage locations corresponding to the range in which lies the frequency of the identified component and means for producing over a histogram evaluation period comprising a plurality of sampling periods a histogram representation including means for scanning the storage locations in order, to produce for each successive sampling period a progressive total of the values added into the storage locations during a preceding predetermined number of sampling periods; means for deriving an indication that a predetermined fraction of the total has been at least equalled and means for registering an address representing the frequency range included in location currently being scanned at the time when the indication occurs.

4,075,424
SPEECH SYNTHESIZING APPARATUS
Michael John Underwood, Hitchin; Michael Joseph Martin, Stevenage, and Michael Victor Iles, Loughton, all of England, assignors to International Computers Limited, London, England
Filed Dec. 13, 1976, Ser. No. 749,768
Claims priority, application United Kingdom, Dec. 19, 1975, 52016/75
Int. Cl.² G10L *1/00*
U.S. Cl. 179—1 SG **7 Claims**

1. Speech synthesizing apparatus including means for producing a waveform representative of a voiced sound component comprising means for deriving separately for each of a plurality of formant waveforms respectively a sequence of digital values representing respectively successive instantaneous amplitudes of the formant waveform concerned taken at sampling instants occurring at a predetermined substantially constant frequency; and combining means operable for each sampling instant to combine at that instant the values derived for each of the formant waveforms to produce a resultant sequence of sum values representative of the voiced compo-

nent; the apparatus further including means for modifying the sum value sequence according to the character and damping of



the required sound and means for converting the modified sequence to an audible output.

4,075,425

MULTI-DIRECTIONAL SOUND SIGNAL REPRODUCING SYSTEM

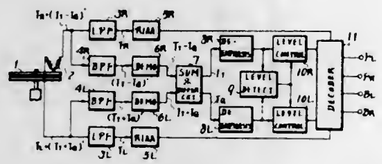
Yoshihisa Kamo; Takeshi Tachibana, and Masao Ichimura, all of Kawasaki, Japan, assignors to Nippon Columbia Kabushikikaisha, Tokyo, Japan

Filed Sept. 19, 1975, Ser. No. 614,873

Claims priority, application Japan, Sept. 24, 1974, 49-109715; Sept. 25, 1974, 49-115345[U]

Int. Cl.² H04R *5/00*

U.S. Cl. 179—1 GQ **12 Claims**



1. A multi-directional stereophonic sound reproducing apparatus for reproducing a multiplex signal of a plurality of stereophonic source signals, said multiplex signal including a first signal component T_Σ, a second signal component T_Δ, a third signal component T_T and a fourth signal component T_Q, wherein:

T_Σ is the sum of the stereophonic source signal

t_Δ is the difference of the stereophonic source signals

T_T is the first demodulated sub-channel information signal

T_Q is a second demodulated sub-channel information signal and, in which $(T_\Sigma + T_\Delta)$ is a first main signal T_R, $(T_\Sigma - T_\Delta)$ is a second main signal T_L, a carrier signal is angle-modulated with sub-signals $(T_T + T_Q)$, and said angle-modulated carrier signal is multi-imposed on said main signal, comprising:

(a) level detecting means comprising a circuit for slicing the T_T signal at a first working level and for wave shaping said sliced signal, a circuit for slicing the T_T signal at a second working level which is different from said first working level and for wave shaping said second sliced signal, and a circuit for transmitting waveforms at rising-up portions of said first and second wave shaped outputs to a flip-flop circuit and for applying outputs of said flip-flop circuit to a master-slave type JK flip-flop circuit at its terminals J and K, whereby a clock pulse produced at a falling-down portion of the waveform obtained by said circuit for wave shaping established to the first working level is applied to a clock terminal of said master-slave type JK flip-flop circuit so as to quickly respond to abrupt variation of the alternating input signal, and

(b) level controlling means provided with an output signal of said level detecting means for controlling the level of said T_T and T_Q to reduce reproduction noise.

4,075,426

PARALLEL SILENT COMMUNICATOR

Harvey Mitchell Gould, 270 High St., Clinton, Mass. 01510

Filed Mar. 12, 1976, Ser. No. 666,261

Int. Cl.² H04M *11/08*

U.S. Cl. 179—1 H **4 Claims**



1. In a parallel silent communicator:

(a) a pair of communicator units for an executive station console and an operator station console;

(b) said unit for said executive station having a screen for silent visual display of alphanumeric information as well as a set of individual switch elements corresponding to coded limited language messages;

(c) said unit for said operator station having a keyboard for composing silent unlimited language alphanumeric messages as well as a set of individual indicators corresponding to said switch elements;

(d) a communication link between said units;

(e) logic units for converting said alphanumeric messages to a visual display at said executive station; and

(f) means for switching said indicators to an "ON" state by operation of the corresponding switch element at the executive station.

4,075,427

SYSTEM FOR PHASE DIVISION MULTIPLEX DUPLEX COMMUNICATION OVER A TWO-WIRE CIRCUIT BETWEEN A MASTER TERMINAL AND A SLAVE TERMINAL

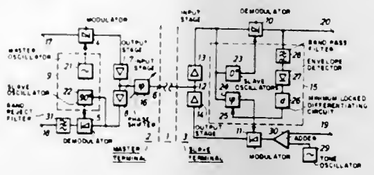
Örjan Mats Mattsson, Farsta, and Walter Herbert Erwin Widl, Bandhagen, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Nov. 15, 1976, Ser. No. 741,567

Claims priority, application Sweden, Dec. 2, 1975, 7513605

Int. Cl.² H04J *11/00*; H04L *5/14*

U.S. Cl. 179—15 BC **5 Claims**



1. System for phase division multiplex duplex communication over a two-wire circuit comprising: a master terminal and a slave terminal; said master terminal comprising a first modulator and a first demodulator jointly connected to a first end of the two-wire circuit, the first modulator being arranged to transmit an outgoing AM-signal with an essentially non-suppressed carrier forming a pilot signal and the first demodulator being arranged to receive an incoming AM-signal with a considerably suppressed carrier component having a frequency identical to the frequency of the pilot signal, a first oscillator circuit being arranged to supply the first modulator and the first demodulator with a first and a second, respectively, oscillator signal having a frequency identical to the frequency of the pilot signal and with a deviation from a phase relationship of 90° equal to the absolute value of the total phase shift in the transmission path from the first modulator to the first demodulator via the first end of the two-wire circuit; and the slave terminal comprising a second demodulator and a second modulator jointly connected to a second end of the two-wire circuit and arranged to receive the AM-signal with the pilot signal to transmit, respectively, the AM-signal with the suppressed carrier component, a second oscillator circuit being arranged to supply the second demodulator and the second modulator with a third and fourth, respectively, oscillator signals of a frequency identical to the frequency of the pilot signal and with a deviation from a phase relationship of 90° equal to the absolute value of the total phase shift in the transmission path from the second modulator to the second demodulator via the second end of the two-wire circuit.

4,075,428

DEVICE FOR PROVIDING PHASE SYNCHRONISM OF A TRANSIT STATION IN A DIGITAL TELECOMMUNICATION NETWORK

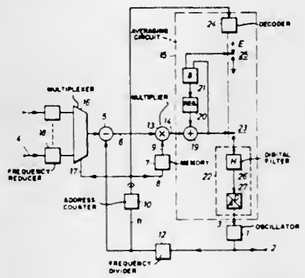
Walter Ghisler, Upplands-Vasby; Aleksander Marlevi, Saltsjo-Boo, and Johan Olof Ånäs, Huddinge, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Mar. 28, 1977, Ser. No. 782,043

Claims priority, application Sweden, Apr. 27, 1976, 7604797

Int. Cl.² H04J *3/06*

U.S. Cl. 179—15 BS **1 Claim**



1. Device for providing phase synchronism of a transit station in a digital telecommunication network, comprising within a phase-locked loop a voltage-controlled oscillator that has an output arranged to supply a station clock signal and a control input capable of being actuated upon by line clock signals pertaining to a plurality of incoming lines from other transit stations in the telecommunication network and a phase comparator that is arranged to compare the phase of the station clock signal with the phases of the line clock signals and has an output connected to the control input of the voltage controlled oscillator via a loop filter, wherein the loop filter comprises a memory means which has an address input and a read output and is arranged to store selected weighting coefficients for the line clock signals, an address counter means which has an input connected to the output of the voltage-controlled oscillator and an output arranged for a cyclical read out of address words allotted to said incoming lines and connected to the address input of the memory means, and a multiplier means which has a first input connected to the output of the phase comparator, a second input connected to the read output of the memory means and an output connected to the control input of the voltage-controlled oscillator via an averaging means, a time multiplexor stage being connected between said incoming lines and the phase comparator and having an address input connected to the output of the address counter means.

4,075,429

TRANSMULTIPLEXER

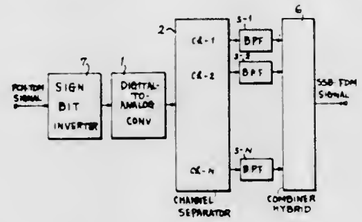
Fumio Takahata; Kazunori Inagaki, and Yasuo Hirata, all of Tokyo, Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Apr. 20, 1976, Ser. No. 678,686

Claims priority, application Japan, Apr. 21, 1975, 50-48509; May 6, 1975, 50-54410

Int. Cl.² H04J *1/00*

U.S. Cl. 179—15 BM **4 Claims**



1. A transmultiplexer comprising:

input terminal means receptive of a pulse-code-modulated, time-division multiplex signal,

a sign bit inverter connected to said input terminal means for reversing sign bits of predetermined specific channels in the pulse-code-modulated, time-division multiplex signal,

a digital-to-analog converter connected to the output of said sign bit converter,

a channel separator connected to the output of said digital-to-analog converter for branching the output signal of said digital-to-analog converter into a plurality of separated signals,

a plurality of band-pass filters connected to said channel separator for providing respective channel signals of a single-side-band frequency-divided multiplex signal, said

a combiner hybrid connected to said band-pass filters to obtain said single-side-band frequency-divided multiplex signal.

4,075,430

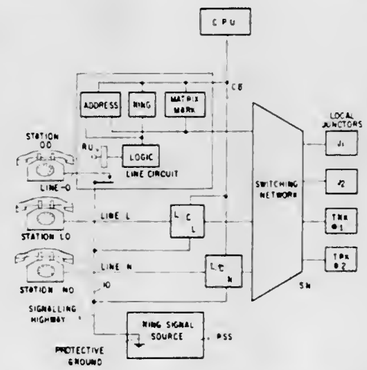
LINE SIGNALLING OVER COMMON HIGHWAY FOR TELECOMMUNICATIONS SYSTEM

Jose Reines, Glen Ellyn, Ill., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 14, 1976, Ser. No. 686,303

Int. Cl.² H04M *3/02*

U.S. Cl. 179—18 J **4 Claims**



1. A telephone system having a group of lines with each line directed to one or more stations, a line circuit individual to each line, a switching network, a common control for completing calls through the network to line circuits of calling and called lines, a two-conductor multiplex signaling highway

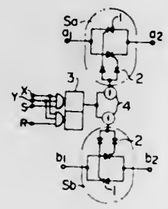
connected in multiple to the line circuits of said group, a plurality of signaling sources each generative of signals of a different type, each signaling source having a path to provide access to the signaling highway, switching means at each said path selectively operative to couple the respective source and its path to the highway, switching means in each line circuit selectively operative to connect the coupled signaling source to the multiplex signaling highway for transmission of signals from the coupled source to any line circuits in which said line circuit switching means are operative, and in which there are further groups of line circuits with a signaling highway individual to each group, the highways and said paths comprising an intersecting matrix with said path switching means at the intersections between highways and certain ones of said paths.

4,075,431

SPEECH PATH SYSTEM

Takuji Mukaemachi; Tetsuo Takeshita, both of Yokohama; Tatsuru Miyoshi, Fujisawa, and Takafumi Kojima, Yokohama, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 26, 1976, Ser. No. 661,660
Claims priority, application Japan, Feb. 28, 1975, 50-24015
Int. Cl.² H04M *7/06*; H04Q *3/00*
U.S. Cl. 179—18 GF **8 Claims**



1. A speech path system comprising:

a speech path network including a pair of line terminals and a pair of trunk terminals and having switching elements comprising semiconductors having at least four layers arranged at crosspoints for making or breaking the connections between said line terminal pair and said trunk terminal pair, and switch control means, each switch control means comprising a drive circuit for driving the individual semiconductor switching element and a memory circuit for storing the operating state of said drive circuit;

a subscriber line circuit for connecting said line terminal pair directly to a subscriber line; and

a trunk circuit connected to said trunk terminal pair and having a speech current supply circuit D.C. coupled to the trunk terminal pair and including means for turning on or off the speech current.

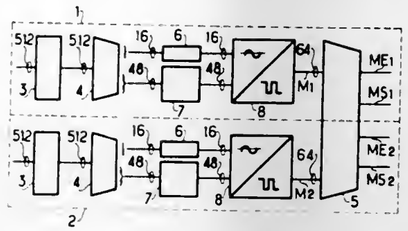
4,075,432

TELEPHONE CONCENTRATOR

Yves Renaudin, Bougival, France, assignor to Societe Lannionnaise d'Electronique Sle-Citerel S.A., Lannion, France

Filed Nov. 11, 1976, Ser. No. 741,080
Claims priority, application France, Nov. 21, 1975, 75 35686
Int. Cl.² H04J *3/00*; H04Q *3/60*
U.S. Cl. 179—18 FC **6 Claims**

1. In a line concentrator for use in a telecommunications system to connect analog subscriber lines to a PCM exchange and including a successive connection of a plurality of subscriber line equipments, at least one spaceswitched concentration network, junctors, and coder/decoders for analog/digital and digital/analog conversion, the improvements characterized by: said junctors comprising at least two different types including a "simplified" type capable of transmitting conversation but incapable of setting up a call and a "complete" type which is also capable of setting up a call, the concentrator including control means for selecting a complete junctor during the setting up of a call through the concentrator and for switching said call through a simplified junctor once the call is established, the coder/decoders being followed in the succes-



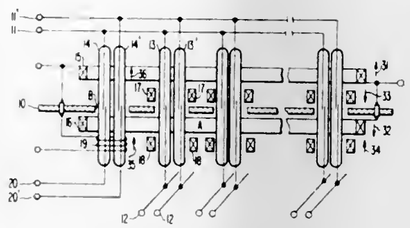
sive connection by a time-switched connection network for changing the multiplex time channel of said call in response to the change of junctors so that the same multiplex time channel is used throughout a call both before and after switching of the junctor.

4,075,433

SIGNAL SWITCHING DEVICE

Sadayuki Mitsuhashi; Norio Suzuki, and Kazuyoshi Nago, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Oct. 13, 1976, Ser. No. 731,961
Claims priority, application Japan, Oct. 14, 1975, 50-123921
Int. Cl.² H01H *67/14*; H04M *1/00*; H04Q *3/00*
U.S. Cl. 179—18 GE **5 Claims**



1. A signal switching device comprising:

a magnetic shunt plate having a first set of through apertures arranged in crossing rows and columns and a second set of through apertures formed in a column adjacent to said first set of through apertures;

electromagnetic switching elements inserted into the respective through apertures in the first and second sets through apertures so as to extend through the magnetic shunt plate;

first and second coil means associated with each row arranged on the opposite faces of said magnetic shunt plate in the direction of the rows of said through apertures for excitation of said electromagnetic switching elements inserted in said first and second sets of through apertures;

third and fourth coil means associated with each column arranged on the opposite faces of said magnetic shunt plate in the direction of the columns of said first set of through apertures for excitation of said electromagnetic switching elements inserted in said first set of through apertures; and

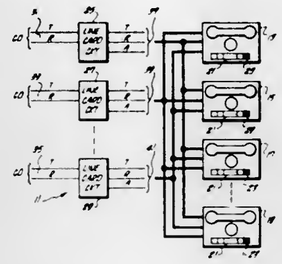
fifth coil means for exciting said electromagnetic switching elements inserted in said second set of through apertures.

4,075,434

KEY TELEPHONE PRIVACY EXCLUSION APPARATUS

George Albert Merritt, Jr., Irvine, Calif., assignor to San/Bar Corporation, Santa Ana, Calif.

Filed Mar. 25, 1976, Ser. No. 670,415
Int. Cl.² H04M *1/68*
U.S. Cl. 179—99 **10 Claims**



1. In key set subscriber systems wherein a plurality of central office lines go to a plurality of key sets through respective line card circuits which supply respective A leads to each of said key sets, each key set having a line button for each central office line and A lead terminating thereat and one hold button, privacy exclusion apparatus for at least two key sets in said system, said privacy exclusion apparatus comprising:

at a first key set;

means responsive to said first key set being off-hook and connected to a central office line, for sensing a voltage level on its A lead, said voltage level indicating whether a second key set is utilizing said line;

means responsive to said sensing means detecting a voltage level indicative of said second key set utilizing said line, for opening the line circuit of said first key set; and at a second key set;

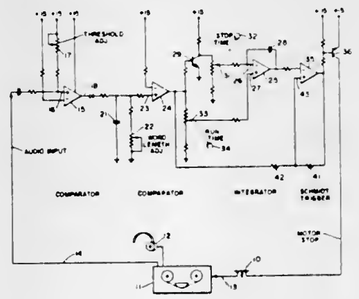
means responsive to a momentary hold button depression at said second key set for providing a voltage level on the A lead of said first key set, said voltage level indicating that said second key set is not utilizing said line.

4,075,435

METHOD AND APPARATUS FOR AUTOMATIC DICTATION PLAYBACK CONTROL

William G. Eppler, Jr., Westport, Conn., assignor to The VSC Company, Westport, Conn.

Filed Jan. 30, 1976, Ser. No. 654,026
Int. Cl.² G11B *15/18*
U.S. Cl. 179—100.1 VC **3 Claims**



3. The method of reproducing a continuous speech recording for substantially continuous transcribing comprising the steps of:

operating the record reproducer to obtain the signal recorded on a record medium;

analyzing said signal for word content by detecting word presence and word absence; and

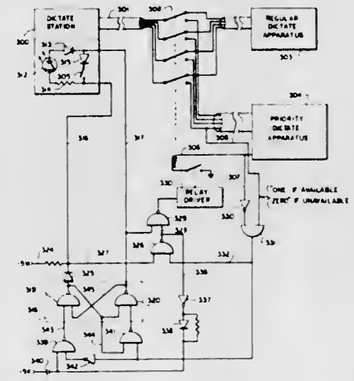
controlling operation of said reproducer so as to allow a substantially constant rate of transcription of word content by counting said word presence minus said word absence.

4,075,436

CASSETTE CENTRAL DICTATION SYSTEM

Fred C. Bolick, Jr.; Theodore Titus, IV, and Said Mohammadioun, all of Atlanta, Ga., assignors to Lanier Electronic Laboratory, Inc., Atlanta, Ga.

Division of Ser. No. 554,476, March 3, 1975, Pat. No. 4,024,354, which is a continuation of Ser. No. 327,501, Jan. 29, 1973, abandoned. This application Dec. 22, 1976, Ser. No. 753,359
Int. Cl.² H04M *11/10*
U.S. Cl. 179—100.1 DR **6 Claims**



1. Message recording apparatus for selectively recording either regular or priority messages, comprising:

message dictate station;

regular message recording means selectively operable for seizure and subsequent recording of dictated messages from said dictate station;

priority message recording means, including substitution means carrying a plurality of discrete recording members for substituting a second discrete recording member for a first discrete recording member in recording interrelationship with said priority message recording means, said priority message recording means being selectively operable for seizure, subsequent recording of dictated messages from said dictate station, and substitution of said second discrete recording member for said first discrete recording member;

control switch means associated with said dictate station and selectively operative to provide a priority signal condition corresponding to desired selection of said priority message recording means;

switching means operatively interconnected to control circuit means;

said control circuit means being operatively interconnected with said control switch means for generating a first switching signal condition in the absence of said priority signal condition or a second switching signal condition in the presence of said priority signal condition;

said first switching signal condition causing said switching means to assume a first state placing said dictate station in operative relation only with said regular message recording means;

said second switching signal condition causing said switching means to assume a second state placing said dictate station in operative relation only with said priority message recording means; and

said control circuit means being operative in response to

termination of seizure of said priority message recording means to restore said first switching signal condition, thereby causing said switching means to reassume said first state placing said dictate station in operative relation only with said regular message recording means.

4,075,437

COMPOSITION, PROCESSING AND DEVICES INCLUDING MAGNETIC ALLOY

Gilbert Yukyu Chin; John Travis Plewes, both of Berkeley Heights, and Bud Caesar Wonsiewicz, Summit, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 16, 1976, Ser. No. 705,994
Int. Cl.² H04R *13/02*; C22C *38/18*; C21D *1/04*
U.S. Cl. 179—114 R **22 Claims**

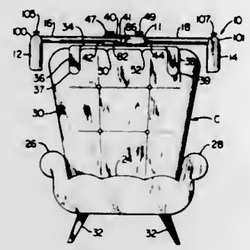
1. Method for producing a magnetic element which comprises mechanically working stock material comprising the ternary composition chromium 25-30 parts by weight, cobalt 10-20 parts by weight, remainder iron to total 100 parts by weight, the said composition additionally comprising at least 0.1 weight percent of at least one element selected from the group consisting of zirconium, molybdenum, vanadium, niobium, titanium, and aluminum which comprises the steps of (a) hot rolling a formed ingot, (b) rapidly quenching the ingot, (c) subjecting the resultant quenched ingot to room temperature forming so as to result in deformation of the stock material, such deformation including bending to produce a change in direction of at least 30° with such bending having a radius of curvature which attains a magnitude at least as small as a value which is inversely proportional to the extent of change in direction with such magnitude corresponding with a 30° change in direction being no greater than equal to the thickness of the said stock material and the radius corresponding with a 90° change in direction being no greater than four times the thickness of the said stock material and, (d) magnetically aging the formed product to develop desired magnetic characteristics.

4,075,438

STEREO SPEAKER SYSTEM

Gary Kappel, 1630 Centennial Drive, Longmont, Colo. 80501

Filed Dec. 2, 1976, Ser. No. 746,842
Int. Cl.² H04M *1/04*
U.S. Cl. 179—146 H **16 Claims**



1. A portable speaker apparatus adapted for attachment to a chair having a backrest portion thereon, comprising:
- a speaker housing having a speaker mounted therein;
- a mounting bracket including front and rear gripping means having a space therebetween for receiving the backrest portion for removably attaching said mounting bracket to the backrest of the chair, said mounting bracket also including adjustment means for adjusting the space between said front and rear gripping means according to the thickness of the backrest portion of the particular chair on which the speaker apparatus is being attached; and
- a support arm connected on one end to said speaker housing and connected on its opposite end to said mounting bracket, said support arm being operative to support said speaker housing in a position forward from the backrest of the chair near the space occupied by a person's head when he is sitting in the chair.

4,075,439

METHOD FOR PROVIDING TEMPORARY TELEPHONE SERVICE

Jack V. Smiley, 1307 Myra St. SW., Live Oaks, Fla. 32060

Filed Jan. 13, 1977, Ser. No. 759,073
Int. Cl.² H04B *3/46*
U.S. Cl. 179—175 **7 Claims**



1. A method for reinstating or establishing telephone service between a telephone central office and a subscriber to be connected to said central office by a permanent cable, comprising the steps of:
- providing a low tensile strength cable having a tensile strength substantially less than 60 pounds such that such cable may be easily broken by a person inadvertently walking therethrough, said cable comprised of insulating material having a spaced pair of low tensile strength conductors therein;
- stringing said cable along the ground between said subscriber's terminal and an uninterrupted connection to the central office;
- coupling said conductors at one end of said cable to said subscriber's telephone terminal;
- coupling said conductors at the other end of said cable to said uninterrupted connections; whereby
- said low tensile strength cable provides a temporary, low injury risk, above ground conductor until repair or installation of a permanent aerial or underground cable is completed.

4,075,440

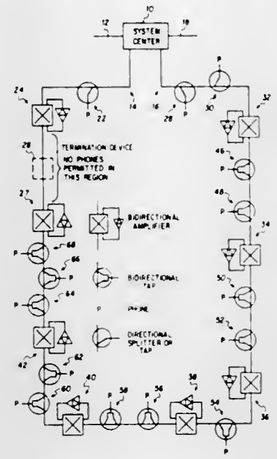
AUTOMATIC COMMUNICATION SYSTEM RECONFIGURATION APPARATUS

William C. Laubengayer, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed July 26, 1976, Ser. No. 708,962
Int. Cl.² H04B *3/46*
U.S. Cl. 179/175.3 S **4 Claims**

3. The method of automatically reconfiguring a pair of terminated communication links having reversible transmission capability, where the terminated sections are in close proximity, upon a break in one of the links to restore operation to the broken portion by connecting it to the other link comprising, the steps of:
- transmitting a carrier through each of the communication links;

- detecting the reception of said carrier at the termination section of one of the communications links; and



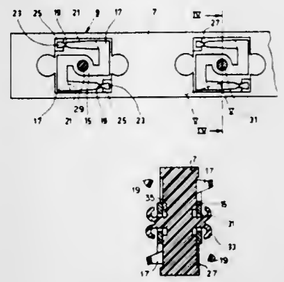
- electrically connecting the terminated sections to pass communication signals therethrough upon failure to detect the reception of said carrier from a given direction.

4,075,441

SLIDE SWITCH HAVING RESILIENT MOVABLE CONTACT ARM TWISTED TO PROVIDE EFFICIENT ELECTRICAL CONNECTION

Wilhelmus Johannes Franciscus Rath, and Johannes Martinus Augustinus Henricus van der Donk, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 12, 1976, Ser. No. 657,559
Claims priority, application Netherlands, Apr. 7, 1975, 7504084
Int. Cl.² H01H *15/06*, *1/50*
U.S. Cl. 200—16 D **3 Claims**



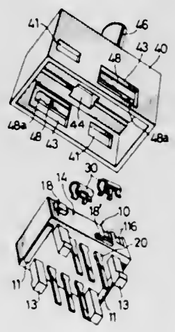
1. A slide switch comprising a strip-like contact slide having opposite parallel surfaces, each such surface being provided with at least one movable contact spring, a housing having opposing walls parallel to the plane of the contact slide, said contact slide being longitudinally slidable between said opposing housing walls, stationary contacts on each such housing wall for cooperation with the movable contact springs on the opposing contact-slide surface, each movable contact spring including a pair of elongated resilient legs respectively situated on both sides of a planar central portion serving for the connection of said movable contact spring to the contact slide, said pair of legs being formed as an integral unit from a plate-like material with said central portion, each leg being provided with a contact area adjacent its free end, and each leg being folded outwardly with respect to said central portion along a fold line oblique to the longitudinal direction of said leg so as to twist said leg at an angle with respect to said central portion, and means to movably connect each movable contact spring to the contact slide.

4,075,442

MINIATURE SLIDE SWITCH ASSEMBLY HAVING FLEXIBLE DETENT ON MOVABLE ACTUATOR OR FIXED HOUSING

Hiroshi Fukuda, and Tooze Kuzuo, both of Tokyo, Japan, assignors to Matsu Kyu Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 9, 1976, Ser. No. 713,217
Claims priority, application Japan, Feb. 26, 1976, 51-28898
Int. Cl.² H01H *15/02*, *9/00*
U.S. Cl. 200—16 F **4 Claims**



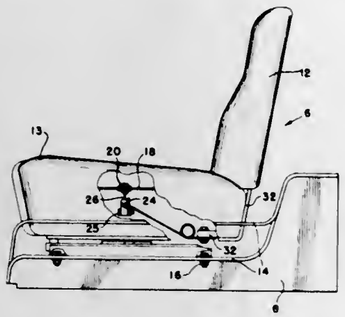
1. A miniature slide switch assembly comprising:
- a. a fixed base member, having a pair of opposite longitudinal side surfaces, molded out of any suitable insulating material, each of said side surface having a pair of recesses,
- b. at least two adjacent molded fixed contacts disposed in an array in the longitudinal direction of said base member and molded integrally with said base member, each of said fixed contacts comprising a contact plate having a pair of tapered edges at the lower end thereof and elongated leg portions integral with the top end of said tapered edges, said contact plate being disposed above said base member, said leg portions being disposed extending downwards below said base member,
- c. a movable casing member having opposite longitudinal walls and slidably riding on said base member so that it can slide in the direction of the array of said fixed contacts, a cavity at the upper end of said movable casing member in the upwardly extending direction of said fixed contact, a pair of resilient detent bars integral with said side wall of said movable casing member, each of said resilient detent bars having at the top end thereof a finger capable of being snap fitted into said recesses corresponding to the ON-condition and the OFF-condition of the switch assembly, respectively,
- d. an electrically conductive strip being inversed U-shaped and being accommodated in said cavity of said movable casing member,
- said conductive strip being slidable over said fixed contacts from one of a first and a second position to the other in accordance with the movement of said movable casing member, whereby, when said conductive strip is in the first position, it bridges said adjacent fixed contacts, while when said conductive strip is in the second position, the bridging of said strip between said adjacent fixed contacts is broken.

4,075,443

CUSHION SPRING SAFETY SYSTEM

Richard N. Fatur, Eastlake, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Aug. 11, 1976, Ser. No. 713,467
Int. Cl.[2] B60K *28/00*
U.S. Cl. 200—85 A **6 Claims**



1. In a vehicle, a seat having seat frame members, and seat covering material mounted upon said frame members, a vehicle safety system including: spring means mounted upon said frame members for supporting said covering material, pressure activated switch means for rendering said vehicle capable of operation when activated and incapable of operation when deactivated, at least one torsion spring having a free end and a fixed end, said fixed end being mounted upon said seat frame members, said switch means being mounted on said free end so that said at least one torsion spring is located interiorly of said covering material and of the confines of said seat, contact means mounted upon said spring means for engaging said switch means to activated said switch means upon the application of a predetermined force to said covering material and for disengaging said switch means to deactivate said switch means upon the cessation of application of said predetermined force, said contact means including a pair of flat plate members and means attaching said flat plate members to said spring means.

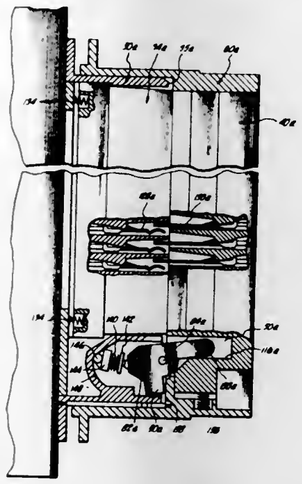
4,075,444

ELECTRICAL CONNECTOR STRUCTURE

Robert Allen Hollingsead, La Habra; Abraham Kuchler, and Clyde Robert Pryor, both of Anaheim, all of Calif., assignors to Hollingsead-Pryor Enterprises, Inc., Santa Fe Springs, Calif.

and a continuation-in-part of Ser. No. 613;348, Sept. 15, 1975, Continuation-in-part of Ser. No. 535,288, Dec. 23, 1974, abandoned. This application Jan. 9, 1976, Ser. No. 647,903
Int. Cl.[2] H01R *33/30*
U.S. Cl. 200—51.09 **22 Claims**

1. For use in an electrical connector racking system which comprises a previously-installed supporting member adapted to be connected to "in place" electrical equipment, and a modular, readily removable member supported on the supporting member and requiring electrical interconnection with said "in place" equipment, an electrical connector comprising:
- a first connector shell adapted to be mounted on one of the members;
- a second connector shell adapted to be mounted on the other member in alignment with the first connector shell and adapted to mate with said first connector shell;
- a first electric-terminal-providing means mounted at least partially within one of the connector shells and carrying a plurality of side-engaging terminals;
- a second electric-terminal-providing means movably mounted at least partially within the other connector shell and carrying a plurality of side-engaging terminals disposed to engage the side-engaging terminals of said first means when said second means is moved relative to its connector shell; and



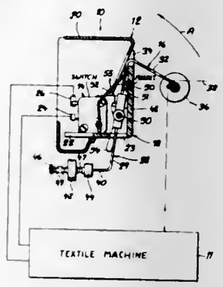
force transmitting means for automatically moving said second means to automatically bring its side-engaging terminals into engagement with the corresponding terminals of said first means.

4,075,445

THREAD MONITORING SWITCH FOR TEXTILE MACHINES HAVING MAGNET BIASING LEVER TO PREVENT ANY ANNOYING THREAD FLUTTER

Gerhard Kempf, Arbon, Switzerland, assignor to Evolution SA, Rorschach, Switzerland

Filed Apr. 14, 1976, Ser. No. 676,667
Claims priority, application Germany, Apr. 15, 1975, 2516488
Int. Cl.[2] B65H *25/14*
U.S. Cl. 200—61.18 **10 Claims**



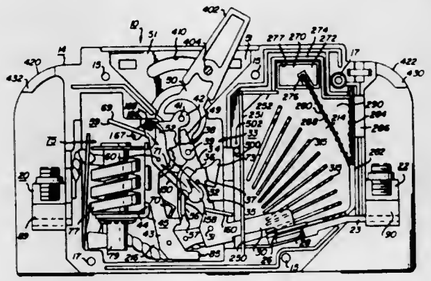
1. A device for monitoring the passage of a filament to a machine, comprising:
- a fixed support;
- a movable member mounted on said support and provided with thread-guiding means thread-guiding means for holding said filament under tension;
- stop means on said support defining a normal position for said member;
- switch means on said support operable by said member in an off-normal position thereof to arrest said machine upon rupture of said filament;
- biasing means tending to displace said member from said normal position to said off-normal position agains the tension of said filament; and
- magnetic means disposed in part on said member and in part on said support for exerting upon said member a retaining force supplementing the tension of said filament in opposing said biasing means, said retaining force being less than the force of said biasing means in said normal position and diminishing to substantially zero within the range of displacement of said member for rapid operation of said switch means by said member in the event of filament rupture.

4,075,446

CIRCUIT BREAKER ARC VENTING SCREEN

Frank P. Aadahl, Bound Brook, N.J., assignor to Heinemann Electric Company, Trenton, N.J.

Filed July 15, 1976, Ser. No. 705,458
Int. Cl.[2] H01H *33/08*
U.S. Cl. 200—144 R **3 Claims**



1. In a molded case circuit breaker,
- a case divided longitudinally into two approximate half cases,
- said case enclosing a linkage mechanism including a movable contact and a stationary contact engageable thereby,
- each case defining, in part, an arcing chamber,
- said half cases each having a side wall, an end wall, and a top wall,
- the end walls of each half case defining an opening through which the arc gases are vented,
- a unitary two-legged screen having apertures through which said arc gases may flow having one leg thereof positioned within said arcing chamber so as to restrict said opening,
- the two legs of said screen diverging from each other so as to define a diverging substantial space which increases in volume in the direction of the opening movement of said movable contact,
- whereby at least some of the arc gases flow sequentially through the apertures in both legs of the screen and substantially all of the arc gases flows through said space between the legs of the screen.

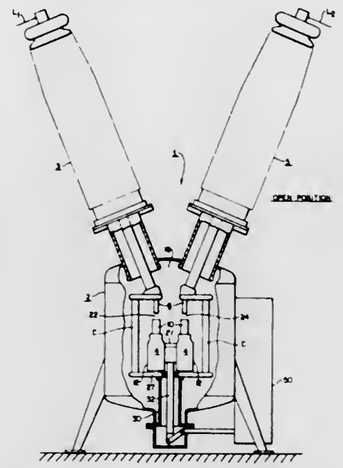
4,075,447

DOUBLE-PUFFER-TYPE COMPRESSED-GAS CIRCUIT-INTERRUPTER CONSTRUCTIONS

Joseph R. Rostron, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 21, 1975, Ser. No. 560,461
Int. Cl.[2] H01H *33/70*
U.S. Cl. 200—148 A **11 Claims**

1. A double-break type of circuit-interrupter including means defining a pair of spaced stationary contacts, a pair of laterally spaced vertically arranged bottle-type puffer cylinder electrically and mechanically interconnected by a movable yoke structure, a common vertically movable operating rod having one end thereof fixedly secured to said movable yoke structure to cause the simultaneous opening and closing vertical movements of said vertically arranged bottle structures, each vertically arranged bottle structure carrying therewith a movable insulating nozzle and movable contact, the sleeve portion of the vertically movable bottle moving over a fixed piston structure, whereby compression of the gas within the bottle will cause ejection thereof through said nozzle to effect extinction of the arc established between the respective stationary and movable contacts, and a common supporting structure (27) for the two fixed piston structures for the device.

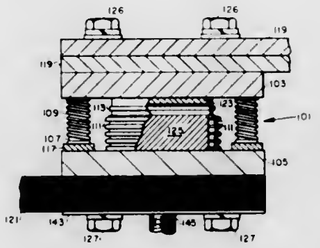


4,075,448

CELL BYPASS SWITCHES FOR ELECTROCHEMICAL CELL SYSTEMS

Jack H. Seedorf, North Tonawanda; Robert M. Hruda, Horseheads, both of N.Y., and Donald E. Abell, Chesterfield, Mo., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Sept. 29, 1975, Ser. No. 617,760
Int. Cl.[2] H01H *1/02, 33/00*
U.S. Cl. 200—262 **21 Claims**



1. In an electrochemical cell circuit having a plurality of electrolytic cells, the improvement comprising a cell by-pass switch having contact surfaces sealed in a corrosive resistant evacuated envelope.

7. The circuit of claim 1 wherein the cell by-pass switch has vacuum circuit interrupters comprising
- a. an upper end plate and a lower end plate
- b. two contact members of a copper-bismuth alloy, each in mechanical and electrical connection with each end plate, each contact member having a contact surface,
- c. a flexible envelope, mechanically connected to the upper and lower end plate and enclosing the contact members, the envelope being constructed of a material which is impermeable to air and the mechanical connection of the envelope to the end plate being such that a vacuum is maintained in the space enclosed by the envelope and the end plates.

4,075,449

SWITCH WITH ELECTROLUMINESCENT INDICATOR

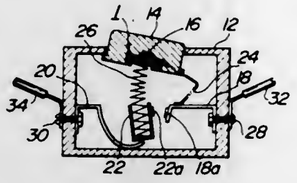
Hideaki Yagi, Kasugai, and Tetsuo Hishiki, Nagoya, both of Japan, assignors to NGK Spark Plug Co. Ltd., Nagoya, Japan

Filed Mar. 23, 1976, Ser. No. 669,733

Claims priority, application Japan, June 30, 1975, 50-91308[U]; July 8, 1975, 50-94938[U]

Int. Cl.² H01H *9/16*

U.S. Cl. 200—315 **13 Claims**



1. An electrical switch including an electro-luminescent element for visually indicating when the switch is in its OFF condition, comprising:

an OFF-ON actuator mounted for pivotal movement between OFF and ON positions, switch contacts for connection to an external supply of electricity, and switching means actuatable by said actuator between OFF and ON conditions;

said actuator including an electroluminescent element comprising a ferroelectric sintered ceramic substrate, a luminescent layer applied on one surface of said substrate, a transparent electrode layer applied over the surface of said luminescent layer, and another electrode on the opposite side of said substrate;

said actuator being at least semi-transparent so that light from said luminescent layer may be seen outside of said switch and actuator;

said electroluminescent element being electrically connected in parallel with said switching means so that current will flow through only one of them at any time, said luminescent layer thereby emitting light only when said switch is in its OFF condition.

4,075,450

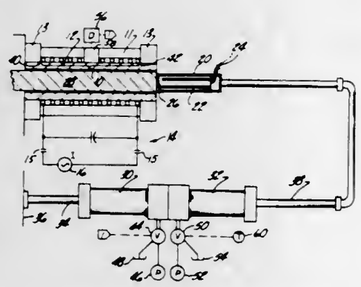
INDUCTION HEATER FOR FORGING BAR STOCK

Paul N. Lavins, Jr., Grosse Pointe Farms, Mich., assignor to American Induction Heating Corporation, Detroit, Mich.

Filed Feb. 23, 1976, Ser. No. 660,067

Int. Cl.² H05B *5/02*

U.S. Cl. 219—10.71 **8 Claims**



1. An induction heating system for heating the end of a length of forging bar stock, comprising: an induction heating coil wound about a longitudinal axis; an elongated support for bar stock disposed on the longitudinal axis of the coil so that it extends beyond the coil at both ends; a push rod movable along the longitudinal axis of the coil and having a stop surface to abut one end of a bar retained on said support and inserted into the coil from a first end thereof, said push rod having a travel which extends the stop surface from said first end of the coil, through the coil, and substantially beyond the second end; actuator means for said push rod to move the stop between a first position wherein the stop is external of the coil and beyond the second end of the coil so that the end of a bar inserted into the coil with its end abutting the stop surface has its end extending beyond the coil, a second position wherein the stop surface is adjacent the second end of the heating coil so that a bar inserted into the coil from the first end with its end abutting the stop surface has its end supported within the coil, and a third position wherein the stop surface is adjacent the first end of the coil, whereby motion of the stop member between said second position and said third position pushes the end of the bar out of the coil; and control means for the actuator means operative to control the time that the stop occupies said first position.

4,075,451

BUTT WELDING APPARATUS

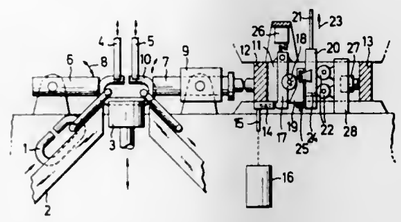
Toni Wüst, Cologne, Germany, assignor to Meyer, Roth & Pastor Maschinenfabrik GmbH, Cologne, Germany

Filed Dec. 1, 1975, Ser. No. 636,584

Claims priority, application Germany, Dec. 4, 1974, 2457180

Int. Cl.² B23K *11/02*

U.S. Cl. 219—51 **7 Claims**



1. In an apparatus for the electric butt welding of a workpiece having rod-like ends; the apparatus including a machine frame; at least two welding electrodes; means for bringing the electrodes into contact with the workpiece; two upsetting tools for supporting the workpiece; means for movably supporting at least one of the upsetting tools to be displaceable in the upsetting direction; an upsetting device connected to and actuating the upsetting tools; a control means for controlling the course of motion of the electrodes and the upsetting tools and for controlling the welding current as well as the upsetting device; a force measuring device connected to the movable upsetting tool for sensing the pressing force exerted by the upsetting tool on the workpiece; means for setting a desired value of the pressing force; a switch coupled to the force measuring device to be actuated by the force measuring device when the desired value of the pressing force is reached; and a welding circuit including the switch for effecting the flow of welding current when the desired value of the pressing force is reached; the improvement wherein said means for movably supporting at least one of the upsetting tools includes a sleeve pivotally secured to the machine frame; said movable upsetting tool being slidably supported in said sleeve; a carriage displaceably supported on said machine frame; said control means including a force exerting means for urging said carriage against said movable upsetting tool for imparting a pressing force by said carriage on said movable upsetting tool when the latter is in an operational position; said carriage being connected with said upsetting device; said control means further including a force transmitting means connected to said force exerting means and said force measuring device; said force measuring device being connected to said carriage for applying thereto a force derived from the force exerted by said force exerting means to said force measuring device through said force transmitting means; said force measuring device being operatively connected to said switch for actuating said switch when the desired value of the pressing force is reached.

4,075,452

ELECTRORESISTOR AND METHOD OF MAKING SAME

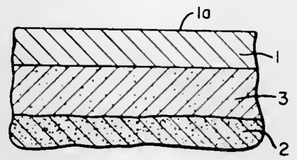
Paul René Simon, Nice, France, assignor to Societe Francaise de l'Electro-Resistance, Nice, France

Filed Oct. 7, 1976, Ser. No. 730,690

Claims priority, application France, Aug. 6, 1976, 76 17269

Int. Cl.² B23K *15/00*

U.S. Cl. 219—121 EM **12 Claims**



12. In a process for producing a high precision electrical resistance element by the effect of a beam of ions having a known average kinetic energy to produce a determinable etching effect at a target area at which is located a target array comprising an electrically conductive metallic layer secured to an electrically insulating substrate wherein the layer is masked with a masking material to define a pattern having a contour corresponding generally to the electrical resistance element produced and grooves therein; the improvement comprising:

applying to said metallic layer a masking material having an erosion rate greater than the erosion rate of said metallic layer under like conditions of ion bombardment and having a thickness which is a function of the erosion rates of said masking material and said metallic and the thickness of said metallic layer sufficient that, upon ion bombardment, said masking material is completely eroded prior to the complete erosion of said metallic layer in the grooves defined by said masking material.

4,075,453

WELDING

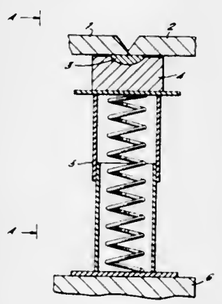
Paul Donald Roberts, 168 Carmel Road North, Darlington, Durham, England

Continuation-in-part of Ser. No. 385,581, Aug. 3, 1973, abandoned. This application Sept. 30, 1974, Ser. No. 511,034

Claims priority, application United Kingdom, Aug. 4, 1972, 36616/72

Int. Cl.² B23K *9/02*

U.S. Cl. 219—125.1 **6 Claims**



1. A method of butt welding two steel plates which comprises of steps of:

(1) placing the two steel plates so that their fusion faces are closely adjacent to or abut each other;

(2) placing against one side of the junction of the fusion faces a steel backing strip which extends along the junction, the steel backing strip having a cross-section which is a segment of a circle, the flat surface of the strip being in contact with the steel plates on either side of the junction and the strip being free of concontact with the fusion faces of the steel plates

(3) supporting the backing strip in a segmental shaped recess in a heat-conductive support block, the radius of curvature of the recess being substantially the same as the radius of curvature of the curved surface of the backing strip whereby good contact is obtained between the backing strip and the support block for conduction of heat from the backing strip to the support block; and

(4) welding together the two plates and the backing strip from the side of the steel plates opposite to the backing strip with an automatic metal arc welding machine using a current in the range of from 350 to 1500 amps.

4,075,454

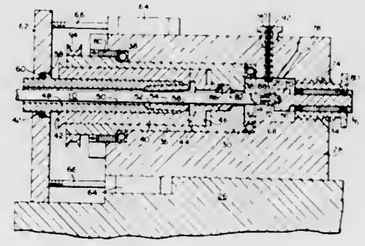
PROCESS AND APPARATUS FOR SEALING NUCLEAR REACTOR FUEL

Robert Duncan, and Richard P. Barna, both of Columbia, S.C., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 399,767, Sept. 20, 1973, abandoned. This application Sept. 10, 1975, Ser. No. 612,112

Int. Cl.² B23K *9/00*

U.S. Cl. 219—137 R **6 Claims**



1. Apparatus for pressurizing a fuel rod and sealing a plug in an end thereof comprising:

a base supporting a housing having a gas chamber and rotatable members therein;

a fuel rod adapted to be held by said rotatable members, said fuel rod having a closed end positioned outside said housing and a plug frictionally held in the other end, a radially extending orifice in said plug which communicates with the interior of said fuel rod;

a gas chamber in said housing positioned adjacent said rotatable members, said chamber having a fuel rod stop member therein and being constructed and arranged to receive said plug end of the fuel rod;

a gas inlet to said gas chamber so that gas introduced thereinto flows through the plug orifice to pressurize said fuel rod;

actuating means on said housing including a hydraulically actuated ram connected to said rotatable members which causes said rotatable members to firmly grasp the fuel rod and simultaneously effect sealing of the plug end of said fuel rod in the gas chamber;

drive means connected with said rotatable members for rotating said fuel rod at a predetermined speed; and

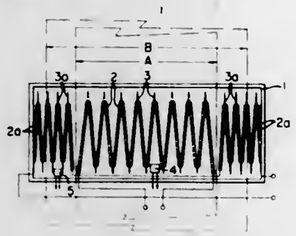
an electrode in said gas chamber for simultaneously sealing said orifice in the end plug and said plug in the fuel rod when the fuel rod is rotated by said rotatable members.

4,075,455

FIXING DEVICE FOR AN ELECTROPHOTOGRAPHIC COPYING MACHINE

Ko Kitamura; Mamoru Watanabe; Yojiro Watanabe, and Yutaka Seto, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed July 28, 1976, Ser. No. 709,523
Claims priority, application Japan, July 30, 1975, 50-92070
Int. Cl.² G03G *15/20*; H05B *1/00*
U.S. Cl. 219—216 6 Claims



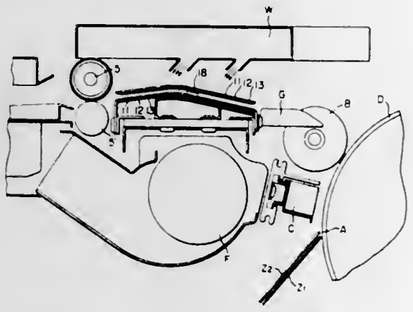
1. A fixing device for use in an electrophotographic copying machine comprising a fixing plate having a width substantially equal to the maximum width of recording sheets in use and a heater disposed transversely of the fixing plate, said heater being divided into heater sections in the direction of width of the recording sheets corresponding to the widths thereof, and a temperature sensing element associated with each of the divided heater sections and means for controlling supply of power to said heater sections in response to the output of said temperature sensing elements.

4,075,456

HEATING-FIXING DEVICE

Hisashi Sakamaki, Yokohama, and Toshiyuki Ohtani, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1975, Ser. No. 638,915
Claims priority, application Japan, Dec. 13, 1974, 49-143280
Int. Cl.² H05B *1/00*; G03G *15/20*
U.S. Cl. 219—216 6 Claims



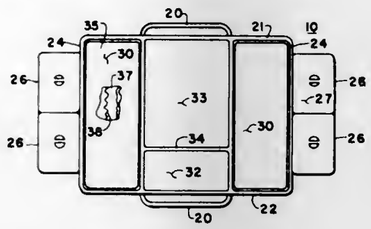
1. A heating-fixing device for fixing a developed electrophotographic image comprising:
a pair of heating members, each including a heat-resistant, insulative substrate and a heating element provided on said substrate, said heating elements being opposed to each other with a path for a copy material having a developed image thereon being interposed therebetween, wherein said heating elements are coated with a thin film of a material having a high heat resistance and a low coefficient of friction, and further comprising means for imparting an air flow to bring the copy material into contact with one of said two heating members.

4,075,457

PEDICURE TREATMENT UNIT

E. Elaine Williams, Cranford, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Oct. 4, 1976, Ser. No. 729,333
Int. Cl.² H05B *1/00*
U.S. Cl. 219—218 1 Claim



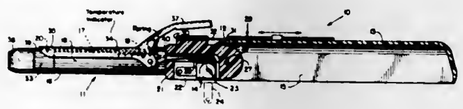
1. A portable unit for use in rendering of a pedicure treatment in the form of a bench,
said bench fitted on each side with at least one storage compartment, each fitted with a cover resting on the top of each storage compartment, with
a pair of recessed first chambers, each open to the top of said unit and spaced apart from each other by a central recessed second chamber open to the top of said unit,
said first chambers each fitted with a removable bath pan and with walls of said first chambers each fitted with heating means, such that
a patient may bathe each foot in an individual first chamber, with the bottom of the central compartment serving as a rest upon which the patient may place either foot for treatment by an operator in front of the unit, with
said storage compartments serving as containers for treatment implements and towels.

4,075,458

COMPACT HAIR CURLING IRON

Alan Ray Moyer, Natick, Mass., assignor to The Gillette Company, Boston, Mass.

Filed July 8, 1976, Ser. No. 703,580
Int. Cl.² A45D *1/04, 2/24*; H01R *11/02*; H05B *1/00*
U.S. Cl. 219—225 5 Claims



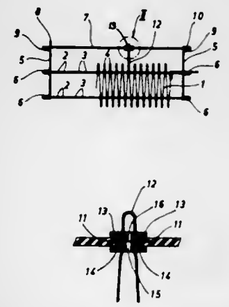
1. A hair curling iron comprising:
a handle having a concave portion;
hair curling means including an elongated tubular member provided with an electric heating element for heating said tubular member, and a mounting member having a cavity, a first end and a second end, said first end of said mounting member being connected to an end of said tubular member, said concave portion of said handle being of such size as to receive and accommodate said tubular member and said mounting member, said second end of said mounting member being pivotally connected to said handle in such a manner as to permit said tubular member and said mounting member to be folded into said concave portion of said handle; and
plug means for conducting current to said electric heating element, said cavity being of such size as to receive said plug means, said plug means being connected to said mounting member in such a manner as to permit said plug means to be moved between a first operative position wherein said plug means is extended outwardly of said cavity when said tubular member is unfolded from said concave portion of said handle whereby said plug means is accessible for connecting to a power source and a second inoperative position wherein said plug means is withdrawn within said cavity to permit said tubular member to be folded into said concave portion of said handle.

4,075,459

VOLTAGE TAPPING IN ELECTRICAL HEATING ELEMENTS

Ludwig Lieber, Steinweiler, Germany, assignor to Firma Fritz Eichenauer, Germany

Filed Dec. 23, 1975, Ser. No. 643,758
Claims priority, application Germany, Dec. 28, 1974, 2461754
Int. Cl.² H05B *3/02*; F24H *3/04*; H01C *1/148*
U.S. Cl. 219—375 4 Claims



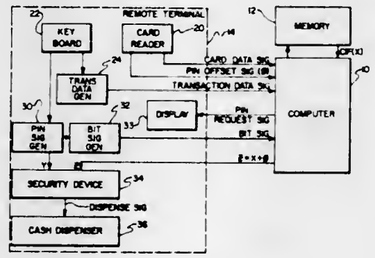
1. A heater element for an electrical appliance, said element consisting of a resistance heating wire which is looped as a series of reaches arranged in linear formation and having a plurality of tips with the loops being held against displacement, in planes disposed in succession transversely of the flow direction of the air, by at least one support plate which is arranged parallel to the flow direction, and a voltage tapping on the loops for providing an electrical supply to a component of the appliance, wherein at least one insulating material plate is arranged approximately parallel to said at least one support plate outside the region of the loops, and at least one of the loops, serving as a voltage tapping, projects beyond the other loops and the tip of said at least one loop is attached to one of said at least one insulating plate to form an electrical voltage tap connection.

4,075,460

CASH DISPENSING SYSTEM

Richard A. Gorgens, Bedford, Mass., assignor to Incoterm Corporation, Wellesley Hills, Mass.

Filed Nov. 28, 1975, Ser. No. 635,882
Int. Cl.² G06K *5/00*; G06F *7/00*
U.S. Cl. 235—420 14 Claims



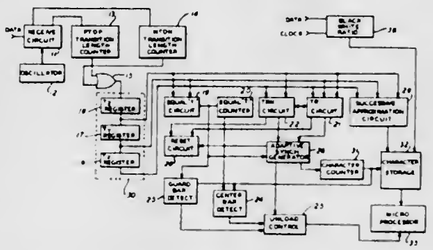
1. A cash dispensing system having
a central computer and associated memory and computer signal transfer means, for maintaining customer account records,
at least one remote transaction terminal, and a communication path interconnecting said remote terminal with said computer,
wherein each of said remote terminals includes means for generating a transaction data signal representative of a desired transaction in response to a customer initiated operation, and for transferring said transaction data signal to said computer, and wherein said computer signal transfer means includes means responsive to said transaction data signal from a remote terminal to generate a multiple bit customer information file (CIF) signal and to transfer said CIF signal to said remote terminal via said path, said CIF signal being representative of a predetermined multiple bit CIF data word associated with said customer, and said remote terminals include a cash dispensing apparatus comprising:
A. input means comprising a personal identification number (PIN) signal generator for generating a multiple bit PIN signal in response to a manual operation performed by said customer, said PIN signal being representative of a predetermined multiple bit PIN data word associated with said customer and bearing a predetermined relationship to said CIF signal,
B. a security device including a comparator means, said comparator means being responsive to said PIN and CIF signals to generate a DISPENSE signal only when said PIN and CIF signals bear said predetermined relationship,
C. transfer means comprising a PIN signal transfer means for transferring said PIN signal directly to said security device,
D. receiving means comprising a CIF signal receiving means for receiving said CIF signal as transferred from said computer and for transferring said received CIF signal to said security device, and
E. a cash dispenser for storing cash units and dispensing one or more of said cash units in response to said DISPENSE signal.

4,075,461

UPC SYMBOL DECODING SYSTEM

Paul S. Wu, Randolph, and Robert V. Reago, N. Plainfield, both of N.J., assignors to Litton Business Systems, Inc., Pine Brook, N.J.

Filed May 3, 1976, Ser. No. 682,246
Int. Cl.² G06K *7/14*
U.S. Cl. 235—466 9 Claims



1. A symbol decoding system for decoding symbols comprised of plurality of bars, some of which represent characters, comprising:
means for providing a series of pulses representative of said bars;
first counting means for counting the interval between negative-to-negative transistions between adjacent pulses in said series of pulses;
second counting means for counting the interval between positive-to-positive transitions between adjacent pulses in said series of pulses;
means coupled to said first and second counting means for storing data representing said counted intervals compris-

ing register means arranged in push-down stack, said register means comprising:

a first register for storing a first such transition interval;

a second register for storing a second such transition interval; and

a third register for storing a third such transition interval;

each subsequently-received transition interval being applied to said register means, said register means thereupon causing the previously-stored contents of each of said registers to shift position in said stack;

testing means coupled to said register means for testing for certain predetermined relationships among said counted intervals; and

identifying means for identifying particular characters whenever said predetermined relationships are satisfied.

4,075,462

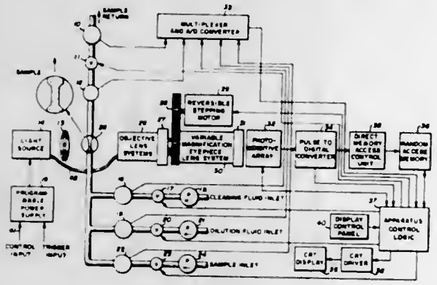
PARTICLE ANALYZER APPARATUS EMPLOYING LIGHT-SENSITIVE ELECTRONIC DETECTOR ARRAY

William Guy Rowe, P.O. Box 425, Boonville, Calif. 95415

Filed Jan. 8, 1975, Ser. No. 539,341

Int. Cl.² G06M *11/00*

U.S. Cl. 235—92 PC **11 Claims**



1. An apparatus for acquiring and formatting digital data representative of size and shape characteristics of particles within a designated sample zone, comprising:

a light source for illuminating, with coherent or incoherent radiation, the particles within the sample zone;

a lens system for producing on a focal plane an image of the particles within the illuminated sample zone;

a plurality of light-sensitive electronic elements located in the focal plane of the lens system having known and fixed spacings between the elements, each element having individually associated therewith memory means responsive to the light-sensitive elements for receiving and retrievably storing an analog of the total illumination incident upon each light sensitive element;

interrogating means responsive to the memory means for individually sampling the analog of the total illumination level incident upon each light-sensitive electronics element; and,

quantizing means for receiving each analog output from the interrogating means and converting each analog output into a digital data field representative of the illumination level incident upon each element of the array.

4,075,463

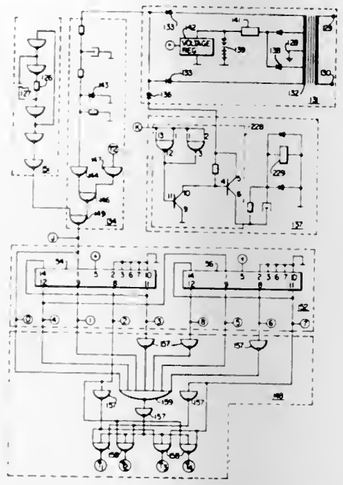
DEVICE FOR AUTOMATICALLY SUPPLYING DRINKS AND FOODSTUFFS

Jose Miguel Yurramendi Eguizabal, Avenida del Generalisimio, 32, San Sebastian, Spain

Continuation-in-part of Ser. No. 664,036, March 4, 1976, abandoned, which is a continuation of Ser. No. 439,864, Feb. 6, 1974, abandoned. This application Mar. 1, 1977, Ser. No. 773,405

Int. Cl.² G06M *3/08*; G07F *11/00*

U.S. Cl. 235—92 AC **6 Claims**



1. A device for dispensing products such as foodstuffs in locations such as hotel rooms, said device comprising:

a receptacle assembly having therein a plurality of receptacles arranged in a plurality of rows and a plurality of columns, each of said receptacles adapted to contain therein a product, said receptacle assembly being modular and comprising:

two symmetrical opposite lateral end elements spaced and positioned parallel to each other, each said end element having thereon inwardly facing slide elements;

a plurality of intermediate partition elements arranged parallel to each other and parallel to said end elements, each said partition element having thereon oppositely facing slide elements;

said end elements and partition elements being laterally spaced to provide a desired said plurality of columns,

a plurality of groups of shelves positioned between each pair of adjacent partition elements and between each end element and adjacent partition element, each said shelf fitting on said slide elements, the shelves of each group being spaced, and the spacing between shelves of each of said plurality of groups being the same, thus providing a desired said plurality of rows; and

said end elements, partition elements and shelves defining therebetween said plurality of receptacles, each said receptacle having a product withdrawal opening;

means for cooling at least a portion of said rows of receptacles;

each said receptacle having a swingable door pivotably connected thereto to pivot from a first position blocking the respective opening thereof to a second position unblocking said opening thereof and whereat a product contained in said receptacle may be withdrawn;

electrical detection means associated with each of said doors for detecting movement thereof from said first position to said second position and for producing an electric signal representative of such movement, said detection means of each said receptacle being codified to produce an electric

signal weighted to represent the value of the product in said each receptacle; and

electronic circuit means, operatively connected to all of said detection means, for receiving said signals from said detection means and for accumulating said signals as a record of consumption of products from said assembly.

4,075,464

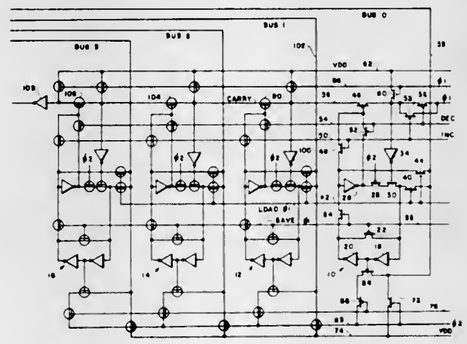
INCREMENTER/DECREMENTER CIRCUIT

Thomas J. Davies, Jr., San Jose, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed May 2, 1977, Ser. No. 792,617

Int. Cl.² G06M *3/14*; H03K *23/30*

U.S. Cl. 235—92 EV **7 Claims**



1. A digital incrementing/decrementing circuitry for receiving a binary number from a data bus, selectively incrementing and decrementing the number, and re-applying the new number to the data bus, said circuitry comprising:

a plurality of storage cells, one cell of said plurality being coupled to each conductor in the data bus, each cell in said plurality having a closed data circulation path containing an odd number of signal inverters and at least one signal gating means;

a first conductor intercoupling each of said plurality of cells, the end of said first conductor adjacent the least significant digit cell of said plurality of storage cells being selectively discharged at first predetermined times;

pre-charging means for charging said first conductor with a positive voltage at second predetermined times;

circuitry coupling said first conductor with the signal gating means in each cell of said plurality for enabling said gating means upon the selective discharging of said first conductor;

a plurality of switching means interposed in said first conductor, one of said switching means being associated with each of said plurality of storage cells, each switching means in said plurality being rendered conductive by the simultaneous application of a selectively applied incrementing signal and a first polarity signal in said cell and by the simultaneous application of a selectively applied decrementing signal and a first polarity signal in a signal inverted section of said cell;

loading means operative during said second predetermined time for loading data from each conductor in said data bus into its respective cell; and

re-loading means for applying the binary number from said plurality of storage cells into said data bus.

4,075,465

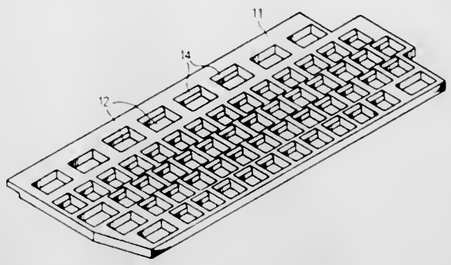
KEYBOARD OVERLAY

Buddy Keith Funk, Bountiful, and Elton Earl Tetrick, Draper, both of Utah, assignors to Sperry Rand Corporation, New York, N.Y.

Filed May 19, 1976, Ser. No. 687,836

Int. Cl.² B41J *5/08*; G06C *7/02*

U.S. Cl. 235—145 R **6 Claims**



1. A structure for mounting on a keyboard containing a plurality of keys, comprising in combination:

an overlay disposable on the keyboard and having a plurality of inside surfaces defining openings for each of the keys of the keyboard; and

a portion of at least some of said inside surfaces, which define said openings, being sloped and displaying a symbol associated with respective ones of said keys.

4,075,466

METHOD OF AND ARRANGEMENT FOR DETECTING FAULTS IN A MEMORY DEVICE

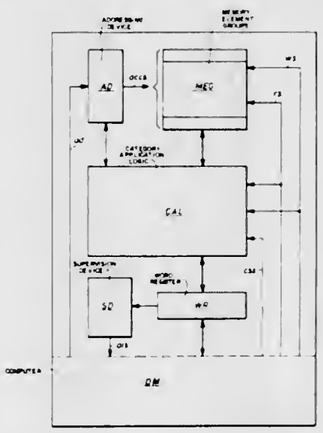
Björn Erik Rutger Jonsson, Järfälla; Ulf Ivan Gunnar Andersson, Bandhagen, and Gustav Ruben Bergman, Alvsjo, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Aug. 30, 1976, Ser. No. 718,839

Claims priority, application Sweden, Sept. 16, 1975, 7510332

Int. Cl.² G11C *29/00*

U.S. Cl. 235—302.3 **6 Claims**



1. In a memory device which includes addressable memory element groups for storing binary coded information words and a word register for temporarily storing information words which are transferred to the memory element groups during a writing phase and from the memory element groups during a reading phase wherein a fault in a memory element group is indicated if an incorrect word is registered in the word register

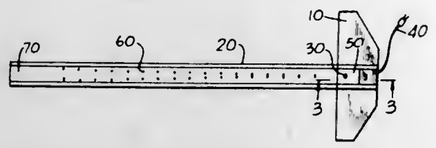
as the result of, during a reading phase, the transfer of the information word in said memory element group to the word register, the method of detecting faults comprising the steps of assigning some of the memory element groups to a first category, assigning other of the memory element groups to a second category, transferring in unchanged form information words between the word register and the memory element groups of the first category, transferring in binary complement form information words between the word register and the memory element groups of the second category, and changing at times the category assignments of the memory element groups.

4,075,467

ILLUMINATED DRAFTING INSTRUMENT

John G. Peterson, 4731 W. Hoffman St., Kearns, Utah 84118

Filed Nov. 17, 1975, Ser. No. 632,470
Int. Cl.² F21V *33/00*
U.S. Cl. 362—31 **6 Claims**



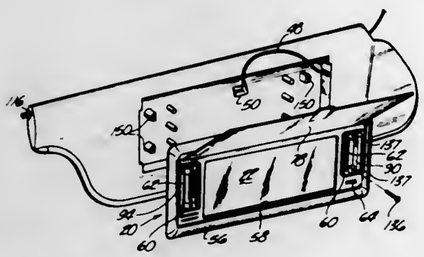
1. A drafting instrument comprising
a top;
a blade projecting from said top, said blade being made of transparent material;
a reflective coating applied to at least a portion of an upper flat surface of the blade;
spaced apart clear beads along the length of the blade, beneath the reflective coating, said beads being in a generally V-shaped pattern and converging on the blade at a location adjacent to the top;
at least one angled mirror arranged to reflect light along the length of the blade;
light means carried by the blade, and light means being positioned to illuminate the angled mirror whereby light is reflected by the mirror along the length of the blade to the clear beads.

4,075,468

VISOR AND MIRROR ASSEMBLY

Konrad H. Marcus, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Continuation of Ser. No. 595,894, July 14, 1975, abandoned.
This application Mar. 9, 1977, Ser. No. 775,714
Int. Cl.² B60J *3/00*; F21V *33/00*
U.S. Cl. 362—144 **21 Claims**



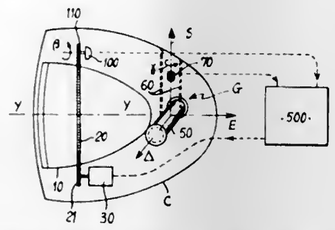
17. A vanity mirror and visor unit for a vehicle or the like comprising; an elongated visor, means delivering electric current from a source to said visor, an elongated vanity mirror assembly supported on said visor, said vanity mirror assembly including an elongated mirror, circuit means including a pair of conductors extending from one end of said mirror to the other, said conductors being attached to and supported on the rear surface of said mirror, said conductors being operatively connected to said means delivering electric current, light means associated with opposite ends of said mirror for illuminating the front surface of said mirror supported by said conductors relative to said mirror and being operatively connected to said conductors, and switch means movable from an open position to a closed position to energize said circuit means to illuminate said light means.

4,075,469

LIGHTING SYSTEMS FOR MOTOR CYCLES

Jacques Marius Alphen, 67, Allee Jules Verne, La Celle Saint-Cloud, France

Filed Dec. 16, 1975, Ser. No. 641,212
Claims priority, application France, Dec. 19, 1974, 74 42130
Int. Cl.² B62J *5/02*
U.S. Cl. 362—72 **14 Claims**



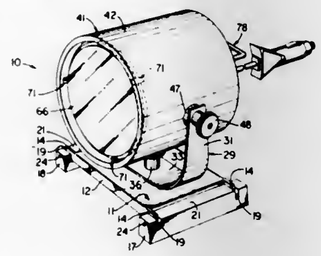
1. A headlight system for use with a two-wheeled vehicle, such as a motorcycle, comprising,
an optical system for producing a beam of light, said optical system having an optical axis along which light is projected therefrom,
a gyroscope unit pivotable about an axis, the angular position of said gyroscope unit about said gyroscope axis at any moment being a function of the angle of inclination which the vehicle makes at that moment with the vertical, and
means responsive to the angular position of said gyroscope unit for rotating said optical system about an axis extending in a front-to-rear direction of said optical system and at no more than a small acute angle to said optical axis, the angular position of said optical system with respect to said optical system axis at any moment being a function of the angular position of said gyroscope unit at that moment.

4,075,470

EMERGENCY LAMP

Charles R. Moore, Mishawaka, Ind.

Filed Dec. 22, 1975, Ser. No. 643,073
Int. Cl.² F21L *15/18*; B60Q *1/52*
U.S. Cl. 362—287 **13 Claims**



1. A portable electric lamp, comprising:
base means including a flat rectangular-shaped plate;

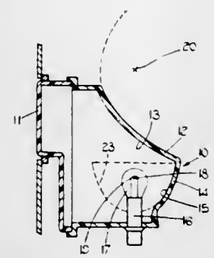
a pair of feet pivotally secured to said base means at spaced locations thereon along parallel side edges of said plate and about parallel axes, said parallel side edges of said plate each having a pair of spaced and laterally outwardly and parallel extending tabs thereon each having a first hole therethrough, each of said feet having a pair of parallel slots in a surface thereof, said slots having a sufficient depth to receive said tabs therein so that said hole is beneath said surface, each of said feet adjacent said slots having second holes therein, said second holes opening into said slots and the axis of each of said second holes extending perpendicular to the longitudinal axis of said slots, said second holes being aligned with said first holes;
at least one pin received in said aligned first and second holes on each foot for pivotally securing each one of said feet to said tabs;
a U-shaped bracket having a pair of upstanding and parallel legs and a bight portion connecting said legs;
first pivot means pivotally connecting said bight portion of said bracket to said base means and for movement about a first pivot axis;
lamp holding casing means received between said upstanding legs of said bracket and including holding means for releasably holding at least one lamp therein;
second pivot means pivotally connecting each of said legs of said bracket to said lamp holding casing means and effecting a movement of said lamp holding casing means about a second pivot axis perpendicular to said first pivot axis; and
electrical supply connection means for connection between said lamp and a source of electrical energy.

4,075,471

LAMP ASSEMBLY

Kenneth James Jones, Sutton Coldfield, England, assignor to Lucas Electrical Company Limited, Birmingham, England

Filed Oct. 8, 1975, Ser. No. 620,791
Claims priority, application United Kingdom, Oct. 17, 1974, 45134/74
Int. Cl.² F21V *7/02*
U.S. Cl. 362—300 **10 Claims**



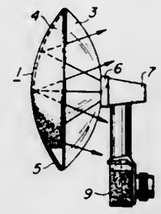
1. A lamp assembly comprising a housing, an ellipsoidal reflector and bulbholder arrangement in said housing, a convex mirror in said housing positioned to receive light emanating, in use, from said arrangement, and a window in said housing, said convex mirror lying on a paraboloidal surface formed by rotating a parabola about an axis which is perpendicular to a focal axis of said ellipsoidal reflector and being disposed in said housing so that a focal point of said parabola lies on an outer focal point of said ellipsoidal reflector, whereby, in use, said convex mirror reflects a substantially parallel beam of light through said window.

4,075,472

REFLECTOR FOR FLASH LIGHT APPARATUS

Masaru Higuchi, Toyonaka, Japan, assignor to West Electric Co., Ltd., Osaka, Japan

Filed Mar. 8, 1976, Ser. No. 665,073
Claims priority, application Japan, Mar. 11, 1975, 50-29864
Int. Cl.² F21V *7/02*
U.S. Cl. 362—255 **5 Claims**



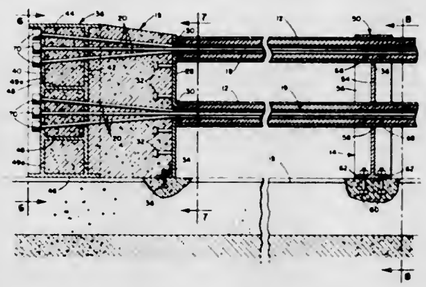
1. A reflector for a flash light apparatus, comprising:
a sealable container made of a soft material selected from the group consisting of vinyl chloride, nylon and high pressure polymerized polyethylene and consisting of a light transmissive portion and a light reflecting portion, said container being inflatable into a sphere by confining a gas therein;
gas inlet means attached to said container for introducing said gas into said container; and
mounting means attached to the outside of the light transmissive portion of said container for mounting said flash light apparatus, light directed from said flash light apparatus being transmitted from the outside of said container through said light transmissive portion of said container and reflected by the light reflecting portion of said container back out through said light transmissive portion.

4,075,473

CABLE-REINFORCED SAFETY BARRIER

George Winston, 1770 Bay Road, Miami Beach, Fla. 33139

Filed May 12, 1976, Ser. No. 685,985
Int. Cl.² E01F *15/00*
U.S. Cl. 256—13.1 **16 Claims**



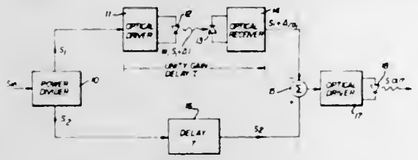
1. A safety barrier comprising:
substantially horizontal rail means having a recess,
support means supporting said rail means at intervals along the length thereof,
cable means disposed in said recess,
cable holding means disposed within said recess and comprising a mass of grout or the like interposed between the outer surface of said cable means and the inner surface of said rail means, and extending along at least portions of said rail means, and
cable anchoring means at each end of said cable means, said cable means being secured to said anchoring means.

4,075,474

METHOD AND APPARATUS FOR DISTORTION REDUCTION IN OPTICAL COMMUNICATION SYSTEMS

Jozef Straus, and Otto Istvan Szentesi, both of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 19, 1977, Ser. No. 788,789
Int. Cl.² H04B 9/00; G05D 25/02
U.S. Cl. 250—199 **10 Claims**



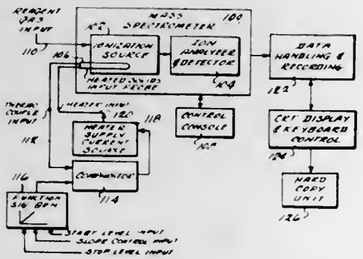
1. An optical transmitter having two parallel signal paths and comprising:
signal dividing means for coupling a first component of an electrical input signal to a first of said signal paths, and a second component of said input signal to a second of said signal paths;
said first signal path including a first electrical-to-optical converter optically coupled to an optical-to-electrical converter;
said second signal path providing a predetermined electrical delay;
means providing the instantaneous difference between signals at the ends of said first and second signal paths; and
a second electrical-to-optical converter for converting said instantaneous difference into an optical output.

4,075,475

PROGRAMMED THERMAL DEGRADATION-MASS SPECTROMETRY ANALYSIS METHOD FACILITATING IDENTIFICATION OF A BIOLOGICAL SPECIMEN

Terence H. Risby, State College, Pa., and Alfred L. Yergey, III, Columbia, Md., assignors to Chemetron Corporation, Chicago, Ill.

Filed May 3, 1976, Ser. No. 682,781
Int. Cl.² B01D 59/54; H01J 39/34
U.S. Cl. 250—282 **56 Claims**



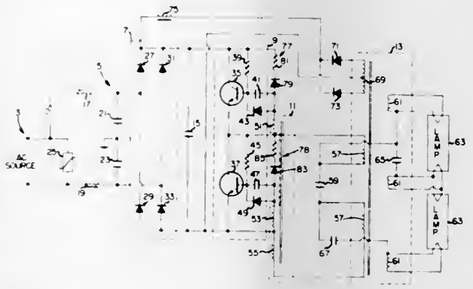
1. A method facilitating the classification and identification of an unknown biological specimen, said method comprising the following steps:
(a) providing a physical sample of at least one biological specimen;
(b) controllably heating said sample in accordance with a predetermined non-isothermal time dependent function so as to cause the sample temperature to increase from a first predetermined temperature to a second higher predetermined temperature during a correspondingly predetermined time span thereby causing the sample to undergo controlled thermal degradation and to give off a characteristic time dependent sequence of gaseous degradation components;
(c) providing a mass spectrometer having an ionization source therein;
(d) directly passing said gaseous degradation components within said ionization source from said heating step and ionizing said components in the same characteristic time dependent sequence involved in the formation of said components during said heating step to provide a respectively corresponding time dependent sequence of ions of said components; and
(e) analyzing and detecting the mass of at least some of said ions of the components within said mass spectrometer during said predetermined time span and recording a set of measured data representing the respective quantities of ions having particular masses being produced as a function of time or temperature during said predetermined time span;
(f) said steps *a–e* above being carried out at least once for a sample of biological specimen having known predetermined identity;
(g) said steps *a–e* above being repeated at least once for a sample of biological specimen having unknown identity thereby facilitating the classification and identification of such unknown biological specimen through comparison of the set of measured data resulting therefrom with the set of measured data resulting from said steps *a–f*.

4,075,476

SINUSOIDAL WAVE OSCILLATOR BALLAST CIRCUIT

Ira J. Pitel, Pittsburgh, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Dec. 20, 1976, Ser. No. 752,167
Int. Cl.² H05B 37/02, 39/04, 41/36
U.S. Cl. 315—209 R **10 Claims**



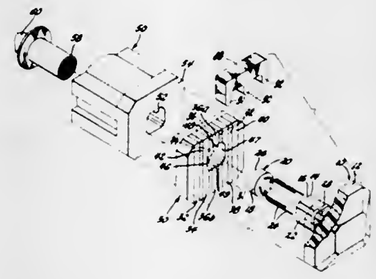
1. A sinusoidal wave oscillator ballast circuit comprising:
an AC potential source;
a DC rectifier means;
a power factor corrector circuit means coupled to said AC potential source and to said DC rectifier means;
oscillator means including a pair of series connected transistors shunting said DC rectifier means;
a first transformer having a primary and secondary windings, said secondary winding of said first transformer directly coupled to said oscillator means;
a second transformer having a primary winding and a first and second secondary winding, said primary windings of said first and second transformers in series connection with a capacitor to form a resonant circuit shunted across said oscillator means, said first secondary winding of said second transformer coupled to lamp circuitry to form a load circuit in shunt connection across said capacitor of said resonant circuit and said second secondary winding of said second transformer connected by a pair of diodes to said DC rectifier means to effect clamping thereof at a given potential level whereby said given potential level is maintained despite open circuiting of said load circuit; and
circuit means coupled to said oscillator means for effecting correction for storage time of said transistors of said oscillator means.

4,075,477

OPTICAL-ELECTRONIC INTERFACE CONNECTOR

Richard J. Hanson, Warren, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 21, 1977, Ser. No. 779,312
Int. Cl.² G02B 5/16
U.S. Cl. 250—227 **1 Claim**



1. Apparatus for connecting and interfacing the end of an optic signal conduit with electrical signal conducting means, comprising, in combination:
an optic-electronic signal conversion element having a body with means for communication with the end of the optic signal conduit and a plurality of electrically conducting leads;
a first housing member having an elongated portion with a free end adapted to receive the body of the optic-electronic signal conversion element, the elongated portion further having a plurality of sides each adapted to receive an electrically conducting lead of said signal conversion element therealong;
a second housing member having an opening adapted to receive the elongated portion of the first housing member therein and further having means adapted to receive the end of the optic signal conduit in communication with the optic-electronic signal conversion element;
an elastomeric ring comprising a plurality of axially extending layers of alternating electrically conducting and insulating elastomeric materials, the ring being disposed between the first and second housing members around the elongated portion of the first housing member with a separate layer of electrically conductive material for each electrically conducting lead biased into contact therewith, a portion of the ring including the electrically conducting layers extending outward from between the first and second housing members;
a third housing member adapted to receive the first and second housing members therein and including one or more internal electric contacts adapted to contact the electrically conducting layers of material in the outwardly extending portion of the elastomeric ring with the first and second housing members so received, the contacts communicating with the electrical signal conducting means, whereby the electrical leads of the signal conversion element are also made to communicate with the electrical signal conducting means.

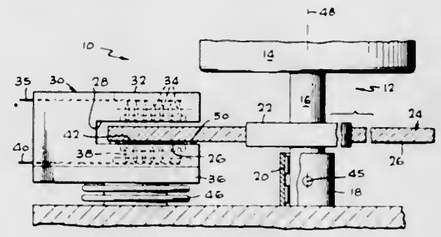
4,075,478

FLOATING HEAD ENCODER

Ralph Eldridge Walker, Canoga Park, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed June 3, 1976, Ser. No. 692,622
Int. Cl.² G01D 5/34
U.S. Cl. 250—231 SE **8 Claims**

1. An improved optical encoder for generating an electrical signal representative of the rotational position of a shaft, of the type having
a non-rotating optical head including light sources and light sensors connected by light paths,
a commutator including a coded pattern thereon mounted for rotation with the shaft through the light paths, wherein the improvement comprises:



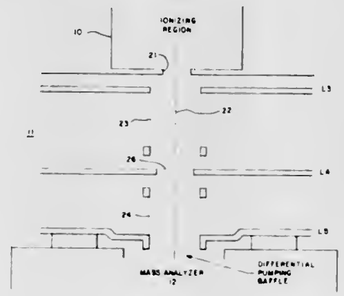
snubber means mounted to the optical head for contact with the commutator to maintain a constant air gap between the coded pattern and the optical head, and
means for urging the commutator and snubber posts into contact with each other.

4,075,479

FOCUSING ION LENS SYSTEM FOR MASS SPECTROMETER FOR SEPARATING CHARGED AND NEUTRAL PARTICLES

John R. Reeher; Michael S. Story, both of Los Gatos, Calif., and Ronald D. Smith, Bovingdon, England, assignors to Finnigan Corporation, Sunnyvale, Calif.

Filed Mar. 4, 1976, Ser. No. 664,047
Int. Cl.² H01J 39/34
U.S. Cl. 250—281 **3 Claims**



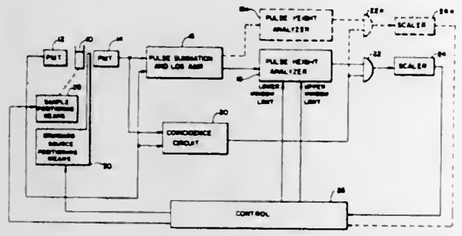
1. A mass spectrometer having an inlet system for admitting samples to be characterized, means for ionizing said samples to produce charged and neutral particles, a mass analyzer, and lens means located along an optical axis between said ionizing means and said mass analyzer for focusing the resultant ions into said mass analyzer, said lens means comprising a plurality of conductive lens elements in the direction of said axis said lens means forming a potential well along said axis to focus a selected charged particle into said mass analyzer while allowing the remaining particles to escape whereby a selected charged particle passes directly along said axis from said ionizing means to said mass analyzer said lens means including first and second enclosures having walls substantially transparent to said remaining particles for allowing their escape and separated by a plate substantially transparent to said selected particles, and voltage source means for applying a relatively high voltage to said plate relative to both of said enclosures to form said potential well.

4,075,480

QUENCH DETERMINATION IN LIQUID SCINTILLATION COUNTING SYSTEMS

Donald L. Horrocks, Placentia, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed June 7, 1976, Ser. No. 693,673
Int. Cl.² G01T *1/00*
U.S. Cl. 250—328 **8 Claims**



1. A method of measuring the degree of quench associated with a sample in a liquid scintillation medium comprising the steps of:

exposing the sample to radiation from a standard source for interaction therewith to produce Compton scattering of electrons having a Compton scattered electron energy distribution or pulse height spectrum, the pulse height spectrum being defined at a high energy end thereof by a Compton edge configuration;

analyzing the shape of the Compton edge to identify a unique characteristic of the Compton edge and measuring a pulse height value corresponding thereto; and

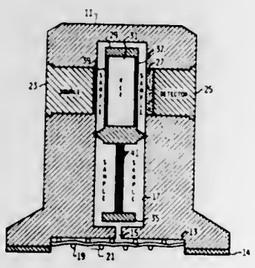
comparing the pulse height value measured for the sample with a pulse height value measured in a like manner for a calibration standard, the difference in the measured pulse height values being indicative of the degree of quench present in the sample.

4,075,481

MEDICAL-ANALYTICAL GAS DETECTOR

Paul E. Stoft, Menlo Park; John A. Bridgham, Palo Alto; Robert L. Chaney, Cupertino; Charles M. Hill, Los Altos; John K. D. Lazier; Barry G. Willis, both of Palo Alto, all of Calif.; Jacob Y. Wong, Framingham, Mass., and Moshe A. Fostick, San Francisco, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 547,670, Feb. 6, 1975, Pat. No. 3,987,303. This application June 14, 1976, Ser. No. 695,339
The portion of the term of this patent subsequent to Oct. 19, 1993, has been disclaimed.
Int. Cl.² G21F *3/02*; G21K *3/00*; G01N *21/34*
U.S. Cl. 250—343 **12 Claims**



1. A device for detecting a component gas in a sample gas comprising:

a housing;

source means mounted within the housing for providing radiation in a preselected spectral band having at least one absorption line of the component gas to be detected;

detector means mounted in the housing for detecting radiation in the preselected spectral band;

a plurality of reference cells, each reference cell containing a reference gas including a standard amount of said component gas to be detected;

a sample cell for containing a quantity of sample gas including the component gas to be detected; and

sequencer means in the housing for introducing in time sequence each of the reference cells and also the sample cell into an optical path between the source means and the detector means;

means for providing access to the sample cell for at least the component gas to be measured from a region of the skin surface of the body when the device is brought into intimate contact with said region;

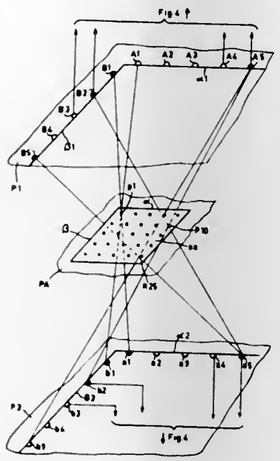
said detector means being responsive to radiation incident thereon when each of the reference cells is in the optical path and when the sample cell is in the optical path, for producing thereby a plurality of detector output signals whose amplitudes are dependent on the amount of the component gas which may be present in the plurality of reference cells and the sample cell respectively, said plurality of signals being operable in predetermined formulation to provide an indication of the concentration of the component gas in the sample gas.

4,075,482

GAMMA-RADIATION TOMOGRAPHY SYSTEM

Jean Robert Périlhou, Bourg la Reine, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 12, 1976, Ser. No. 648,398
Claims priority, application France, Jan. 17, 1975, 75 01471
Int. Cl.² G01T *1/164, 1/20*
U.S. Cl. 250—363 S **12 Claims**



1. A tomography system for direct display of an image of a radio-active body in a defined examination plane PA of examination points utilizing gamma-radiation, comprising:

an array of gamma-radiation comprising:

an array of gamma-radiation detectors situated in a configuration so as to define an array of examination lines each having a gamma-radiation detector at opposing ends thereof, at least two of the examination lines intersecting at each of the examination points;

means for detecting time coincidence of strikes of gamma-rays at the detectors at the opposing ends of each examination line indicative of a pair of gamma rays originating at the corresponding examination point

means for generating a signal for each examination point proportional to the product of the number of time coincidence strikes detected at the two examination lines intersecting thereat; and

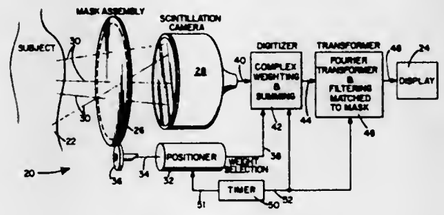
means for displaying the signals as an image of the plane of examination points.

4,075,483

MULTIPLE MASKING IMAGING SYSTEM

Roger H. Tancrell, Cambridge; William W. Stoner, Watertown, and David T. Wilson, Billerica, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed July 12, 1976, Ser. No. 704,138
Int. Cl.² G01T *1/20*
U.S. Cl. 250—363 S **23 Claims**



1. A system for imaging non-diffracting radiation comprising:

a detector of such radiation incident thereupon from a subject, said detector including means for providing an array of signals representing locations of impingement of said radiation upon said detectors;

means for masking such radiation propagating from said subject to said detector, said masking means providing a sequence of spatial modulation patterns to said radiation, the modulation of said radiation by each of said spatial modulation patterns varying the magnitudes of signals of said array of detector signals in accordance with respective ones of said modulation patterns; and

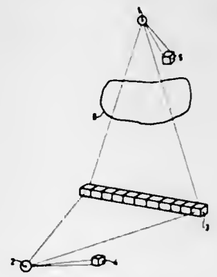
means coupled between said detector and said masking means for digitally filtering signals of said array with weighting factors corresponding to individual ones of said modulation patterns to provide an image of said subject.

4,075,484

DEVICE FOR MEASURING RADIATION ABSORPTION OR EMISSION

Dietrich Meyer-Ebrecht, and Günter Kowalski, both of Hamburg, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 14, 1976, Ser. No. 705,051
Claims priority, application Germany, July 15, 1975, 2531477
Int. Cl.² G01T *1/20*
U.S. Cl. 250—366 **13 Claims**



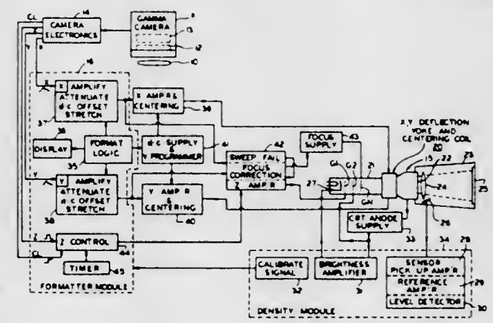
1. In a measuring system including a main source of radiation and a plurality of radiation detectors positioned to receive radiation from said main source, wherein the passage of radiation from said main source to said detectors may be interrupted; the improvement comprising a second source of radiation, means for irradiating said detectors with radiation of said second source when radiation from said main source is not incident thereupon, and circuit means connected to produce the quotient M_1/M_2 for each of said detectors, wherein M_1 is a measuring value of the related detector due to irradiation from said main source and M_2 is a measuring value of the relevant detector due to irradiation from said second source in the absence of incident radiation from said first source.

4,075,485

APPARATUS FOR CONTROLLING AND DISPLAYING SCINTILLATION CAMERA INFORMATION

Robert R. Lijewski, Milwaukee, and Ernest J. Wiesen, Wauwatosa, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed May 6, 1976, Ser. No. 683,732
Int. Cl.² G01T *1/20*
U.S. Cl. 250—369 **18 Claims**



1. A system having scintillation camera means for producing electric signals corresponding to the x and y coordinates of scintillations caused by nuclear particles or other radiation being detected by the camera means and for producing electric signals, called z signals, corresponding to detected signals which have desired amplitudes and are coincident with said x and y coordinate signals, comprising:

a cathode ray tube including an electron emissive cathode, an anode, a phosphor screen, electromagnetic deflection coil means for deflecting the electron beam from said cathode on said screen in x and y directions, respectively, a first control electrode to which a voltage signal is applied for selectively turning on said beam, electrostatic focusing means including an electrode to which a voltage signal is applied for focusing the beam on the screen,

first and second deflection signal amplifier means each having a high slew rate and each having input and output means, said input means being for receiving signals corresponding with x and y coordinate signals,

said input means of said respective deflection amplifier means including a first amplifier stage for impedance matching having an input for a voltage signal corresponding with one of said coordinate signals and having an output,

a second amplifier stage for amplifying the voltage signal from said last named output and having an output for the amplified voltage signal,

emitter follower buffer third amplifier means having a single ended input for receiving the signals from said second amplifier stage output and having a double ended output,

fourth amplifier means comprising, respectively, a complementary pair of NPN transistors and PNP transistors each having an emitter, a collector and a base, the bases of said transistors being connected to the respective ones of said double ended outputs, and a positive supply voltage terminal having the collector of said NPN transistor connected thereto, and a negative supply voltage terminal having the

collector of said PNP transistor connected thereto said collectors, respectively, serving as output means for said transistors,

fifth amplifier means comprising at least one complementary pair of PNP and NPN transistors, each transistor having an emitter, a collector and a base, bases of said PNP transistors being connected with the output of said fourth stage and bases of said NPN transistors being connected with the output of said fourth stage, a positive supply voltage terminal having the emitters of said PNP transistors connected thereto, a negative supply voltage terminal having the emitters of said NPN transistors connected thereto, an output current terminal having the collectors of all of said PNP and NPN transistors connected thereto, said output current terminal being for coupling with a deflection coil, and

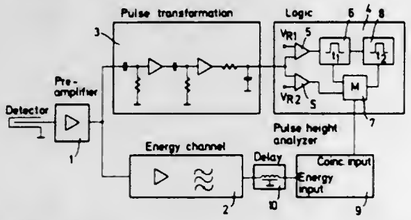
means for coupling signals corresponding with said *z* signals to said first control electrode means for turning on said beam in correspondence with the *x* and *y* coordinate signals with which said *z* signal is substantially coincident.

4,075,486

METHOD AND DEVICE FOR DIMINISHING THE BACKGROUND EFFECT IN A PROPORTIONAL COUNTER

Heikki Johannes Sipilä, and Erkki Sakari Kiuru, both of Espoo, Finland, assignors to Outokumpu Oy, Outokumpu, Finland

Filed Feb. 4, 1977, Ser. No. 765,584
Claims priority, application Finland, Feb. 5, 1976, 760280
Int. Cl.² G01T *1/18*
U.S. Cl. 250—374 **6 Claims**



1. A method for diminising the background effect in a proportional counter by using rise time and pulse interval analysis, which comprises

measuring the detector charge pulse collection time caused by electron diffusion;

measuring the interval between the detector pulses;

comparing said measured times with predetermined limit values; and

discriminating detector pulses which have collection times longer than said predetermined rise time as well as pulses which appear at shorter intervals than said predetermined limit value.

4,075,487

IONIZATION CHAMBER ASSEMBLY

Larry D. Larsen, Palatine, Ill., assignor to Patent Development & Management Company, Elgin, Ill.

Filed May 14, 1976, Ser. No. 686,590
Int. Cl.² G01T *1/18*
U.S. Cl. 250—385 **56 Claims**

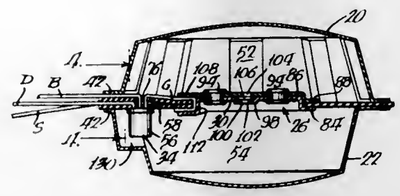
1. In an ionization smoke detector having a sensing circuit responsive to the relative impedances of a closed and an open ionization chamber, an ionization chamber assembly, comprising:

a first cup-shaped electrode defining an outer wall of the closed ionization chamber;

a second cup-shaped electrode defining an outer wall of the open ionization chamber;

a third electrode;

an insulator wall intermediate the first and second electrodes and carrying said third electrode spaced therefrom, said insulator wall defining an interior wall of both the closed and open ionization chambers; and



a circuit element of the sensing circuit having a body protectively mounted within the closed chamber by means of at least one of a plurality of leads of the element projecting from the body and extending through the insulator wall into the open chamber.

4,075,488

PATTERN FORMING APPARATUS USING QUADRUPOLE LENSES

Shigeo Okayama, Mitaka, and Hisazo Kawakatsu, Higashi-Kurume, both of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Continuation-in-part of Ser. No. 610,847, Sept. 5, 1975, abandoned. This application May 19, 1976, Ser. No. 687,690
Claims priority, application Japan, Sept. 6, 1974, 49-101966
Int. Cl.² H01J *3/14*
U.S. Cl. 250—396 R **22 Claims**



1. An apparatus for forming a rectangular or linear shaped pattern on an object with a beam of electrically charged particles, which comprises:

a. a source of a beam of electrically charged particles,

b. a diaphragm having a rectangular aperture for shaping the beam into a rectangular beam having four sides,

c. a quadrupole lens system comprising at least one quadrupole lens,

d. means for controlling the quadrupole lens systems for changing the ratio of the lengths of adjacent sides of the the rectangular beam to a desired ratio, and

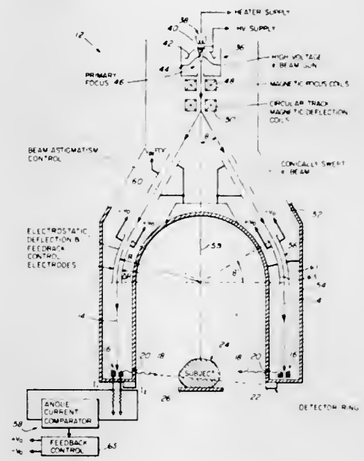
e. means for shifting the rectangular beam the lengths of whose sides have been changed to impinge upon a desired position on the object.

4,075,489

METHOD AND APPARATUS INVOLVING THE GENERATION OF X-RAYS

William R. Neal, and Roger G. Little, both of Bedford, Mass., assignors to Simulation Physics, Bedford, Mass.

Filed Jan. 21, 1977, Ser. No. 761,064
Int. Cl.² H05G *1/30*
U.S. Cl. 250—401 **15 Claims**



1. A method for producing a plurality of distributed X-ray generating sources comprising the steps of:

(a) generating an electron beam having sufficient electron energy for causing emission of X-rays;

(b) directing said electron beam towards a split anode structure composed of a material that emits X-rays upon impingement of said electron beam;

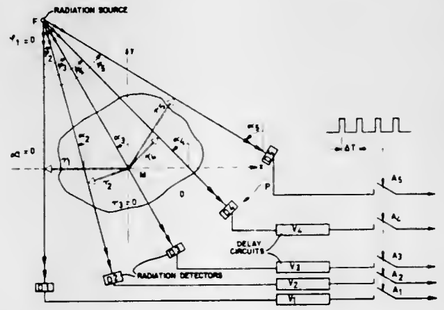
(c) scanning said split anode structure in a selected pattern with said electron beam, whereby X-rays are generated at the points of electron beam impingement upon said split anode structure, each point of beam impingement constituting an X-ray generating source.

4,075,490

DEVICE FOR MEASURING RADIATION ABSORPTION IN A LAYER OF A BODY

Günter Kowalski, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 8, 1976, Ser. No. 675,175
Claims priority, application Germany, Apr. 19, 1975, 2517440
Int. Cl.² G01N *23/00*
U.S. Cl. 250—445 T **13 Claims**



1. In apparatus for measuring radiation absorption in a planar layer of a body of the type including: radiator and detector means which function to simultaneously measure absorption values along a plurality of intersecting straightlines in said plane and to simultaneously produce a plurality of detector signals representative thereof; and means for sequentially rotating said radiator and detector means through a large number of discrete angular displacements about said body; the angles between said lines and between said angular displacements being chosen so that at each of said angular displacements the orientation of one or more of said lines is parallel to the orientation of corresponding other of said lines at one or more prior angular displacements; the improvement comprising:

delay means for delaying said detector signals representative of values along said corresponding other lines with respect to said detector signals representative of values along said one or more lines so that sets of signals representative of values along sets of parallel lines are simultaneously produced; and

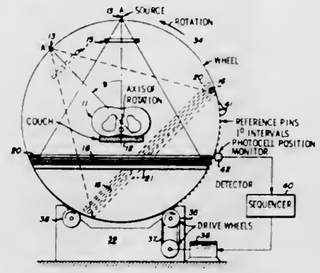
switch means for simultaneously sampling said sets of signals.

4,075,491

POSITION SENSITIVE X-RAY OR γ-RAY DETECTOR AND 3-D TOMOGRAPHY USING SAME

Douglas P. Boyd, Palo Alto, Calif., assignor to The Board of Trustees of Leland Stanford, Jr. University, Stanford, Calif.

Continuation of Ser. No. 528,025, Nov. 29, 1974, abandoned. This application Nov. 3, 1976, Ser. No. 738,630
Int. Cl.² G01N *21/34*
U.S. Cl. 250—445 T **23 Claims**



1. A position sensitive detector for detecting divergent rays of penetrating radiation transmitted from a source of penetrating radiation through an object being examined, said detector comprising:

a detector housing;

anode and cathode electrode means spaced apart to define a gap therebetween within said housing, said housing adapted to receive an ionizable gaseous medium disposed in the space between said anode and cathode electrode means; and

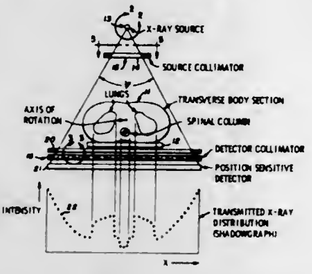
at least one of said spaced apart anode or cathode electrode means including a divergent array of spaced apart elongated electrically conductive electrode portions defining a divergent array of elongated detector gaps therebetween, such elongated electrode portions being elongated along radial lines with a common center at a point in space corresponding to the position of the source of penetrating radiation.

4,075,492

FAN BEAM X- OR γ-RAY 3-D TOMOGRAPHY

Douglas P. Boyd, Palo Alto, Calif., and Michael Goitein, Milton, Mass., assignors to The Board of Trustees of Leland Stanford Junior University, Stanford, Calif.

Filed Nov. 29, 1974, Ser. No. 528,026
Int. Cl.² G01N 21/34
U.S. Cl. 250—445 T 21 Claims



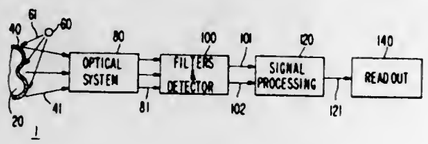
1. In a method of penetrating ray tomography the steps of:
directing a divergent beam of penetrating radiation through a body to be analyzed from a source on one side of the body to a detector on the other side of the body:
effecting relative angular displacement between the divergent beam of penetrating radiation and the body;
detecting the penetrating radiation that has passed through the body at a number of angularly spaced positions within the angle subtended by the divergent beam for each angular position of the divergent beam relative to the body to derive sets of detected radiation data representative of a plurality of angularly spaced shadowgrams of absorption or transmission of the penetrating radiation by the body, each of said shadowgrams representing the transmission of the penetrating radiation through the body along an array of divergent paths subtended by the divergent beam, and different ones of said sets of angularly spaced sets of shadowgram data corresponding to different sets of intersecting rays of penetrating radiation; and
reconstructing the sets of shadowgraphic data into a 3-D tomograph of the body under analysis.

4,075,493

OPTICAL TEMPERATURE MEASUREMENT TECHNIQUE UTILIZING PHOSPHORS

Kenneth A. Wickersheim, Palo Alto, Calif., assignor to Ronald Alves, Sunnyvale, Calif., a part interest

Filed Dec. 16, 1976, Ser. No. 751,366
Int. Cl.² G01N 21/38
U.S. Cl. 250—461 R 23 Claims



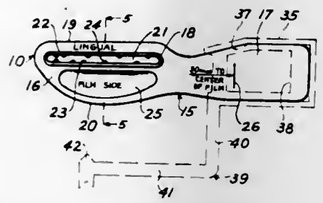
1. A method of determining the temperature of an object, comprising the steps of:
positioning a layer of phosphor material in a heat conductive relationship with said object, said phosphor being characterized by emitting, when excited, electromagnetic radiation within optically isolatable bandwidths at at least two distinct wavelength ranges and with relative intensities therein that vary as a known function of the phosphor temperature,
exciting said phosphor to cause emission of said at least two wavelength bands,
optically directing said phosphor emission to a detecting position, and
detecting the relative intensities of said at least two distinct wavelength bands, whereby said relative intensity is an indication of the temperature of the phosphor layer and related thereto by said known temperature emission function.

4,075,494

ORALLY RECEPTIVE HOLDER FOR A DENTAL X-RAY FILM PAQUETTE

Arthur C. Jermyn, 99 Whitestone Lane, Rochester, N.Y. 14618

Filed Nov. 29, 1976, Ser. No. 745,562
Int. Cl.² G03B 41/16
U.S. Cl. 250—479 13 Claims



1. An orally receptive device for retention between preselected teeth in the mouth of a person for supporting and maintaining an x-ray film paquette in proper exposure relation to at least one of the preselected teeth for making an exposure thereof, comprising:
a thin, flat member having a first portion for insertion into the mouth and a second portion continuous and coextensive with the first portion for positioning the first portion in the exposure relationship when the first portion is provided with the film paquette;
the first portion having a generally straight edge, a concave edge that intersects the straight edge and an intermediate area between the edges for engagement by the teeth to hold and maintain the member in the exposure relationship; and
means for holding the film paquette substantially perpendicular to the plane of the member and in close proximity to the teeth comprising an elongated protuberance forming a part of the first portion, extending generally parallel to the straight edge and having at least two parallel facing surfaces of a length greater than the larger dimension of the film paquette and spaced so as to frictionally engage the film paquette when the latter is inserted therebetween.

4,075,495

X-RAY LUMINESCENT SCREEN

Albert Leendert Nicolaas Stevels, and Agnes Desiree Maria Schrama-de Pauw, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 23, 1975, Ser. No. 616,052
Claims priority, application Netherlands, Oct. 1, 1974, 7412918
Int. Cl.² G01N 23/223; G01T 1/00; C09K 11/46
U.S. Cl. 250—483 5 Claims

1. An X-ray image intensifier screen comprising a substrate a surface of which is coated with a layer of a bivalent europium activated alkaline earth metal samarium fluoro-halide phosphor of the formula: $Me_{1-p-q}Eu_pSm_qFX$ wherein Me is at least one metal selected from the group consisting of barium, strontium and calcium with the proviso that only up to 20 mol % of Me is calcium, X is at least one halogen selected from the group consisting of chlorine, bromine and iodine and

$0.001 \leqq p \leqq 0.20$,

$0.0001 \leqq q \leqq 0.10$ and

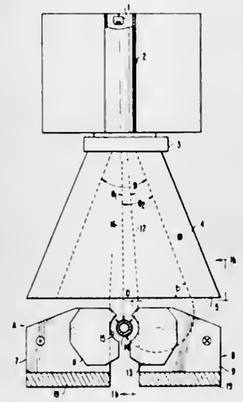
$0.02 \leqq q/p \leqq 0.50$

4,075,496

CHARGED PARTICLE IRRADIATION APPARATUS

Kenichiro Uehara, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed July 7, 1976, Ser. No. 703,143
Int. Cl.² H01J 37/00
U.S. Cl. 250—492 B 7 Claims



1. A charged particle irradiation apparatus of the type having a charged particle accelerating means including an accelerator tube, a charged particle discharging means connected to said accelerator tube and having an opening at the opposite end thereof and a scanning means for scanning the charged particle beam in a first plane, and means including at least a pair of magnetic structures disposed downstream of said opening and being symmetrically positioned about a center line of said scanning pattern to produce opposite d.c. magnetic fields in directions normal to said first plane for deflecting the beam toward a space between said magnetic structures, and an article to be irradiated with the charged particle beam being moved through said space in direction normal to said first plane, wherein the improvement comprises each said magnetic structure having a magnet and a pair of yokes magnetically connected to the opposite poles of said magnet to provide a gap therebetween, across which are lines of magnetic flux normal to said first plane and through which said charged particles pass, said gap being non uniform to produce a non uniform magnetic field intensity with the magnetic field in said gap being greater near said inter magnetic structure spce than it is farther from said space, a magnetic neutral plane disposed in said space which is produced by the cancellation of said opposite d.c. magnetic fields, said deflected charged particles irradiating completely about said article, said magnetic neutral plane being normal to the first plane and intersecting the first plane at the center line thereof and bisecting the space between the magnetic structures.

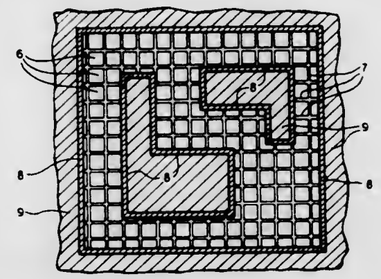
4,075,497

ELECTRON-OPTICALLY RADIATABLE STRUCTURE

Heinz Kraus, Traunreut, Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Germany

Filed Dec. 31, 1975, Ser. No. 645,924
Int. Cl.² G21K 1/00
U.S. Cl. 250—505 11 Claims

1. A metallic, thin layer diaphragm, having an object structure which forms the pattern for the electron-microscopic reduction of objects, comprising:
an aperture for the passage of electron beams, the aperture being formed by a thin perimeter which surrounds and defines the aperture and by a reinforcing member of substantially greater thickness than the perimeter, set away from the aperture and adjacent to the perimeter, which forms a mechanical reinforcement for the perimeter;
at least one electron absorbing, object structure within the aperture, said structure having a thin periphery and an interior of substantially greater thickness than the periphery to provide mechanical reinforcement for the periphery;



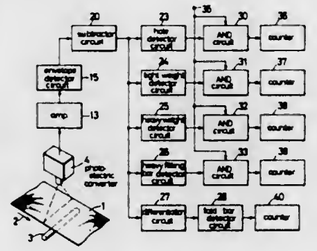
a meshlike supporting screen, formed by a plurality of screen elements, extending across the aperture and connecting the object structure to the perimeter of the aperture to support the object structure within the aperture;
the elements of the screen having approximately the same thickness as the periphery of the object structure, the width of the elements being so narrow that they are not resolvable by the microscope's electron beam; and
wherein the components of the diaphragm are formed from the same metal.

4,075,498

NON-WOVEN FABRIC DEFECT DETECTING DEVICE

Kaoru Takasuka; Masatatsu Takahashi, and Sadaji Nishimura, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

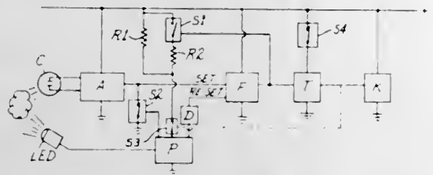
Filed Mar. 26, 1976, Ser. No. 670,610
Claims priority, application Japan, Mar. 31, 1975, 50-38672
Int. Cl.² G01N 21/32
U.S. Cl. 250—562 8 Claims



1. A non-woven fabric defect detecting device, comprising:
a light source for irradiating a travelling non-woven fabric by light;
a photoelectric converter for receiving a transmitted light or reflected light from the non-woven fabric and converting it into an electric signal output;
scanning means for sequentially picking up the converted output corresponding to each point on the non-woven fabric in its widthwise direction;
means for classifying the converted output into a plurality of levels and individually detecting a plurality of kinds of defects;
a differentiation circuit for differentiating the converted output;

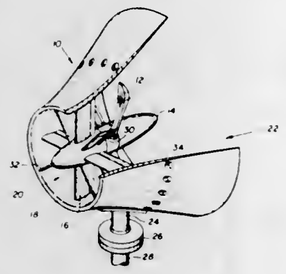
a fold bar detector circuit for detecting a differentiated output exceeding a predetermined level;
and characterized by:
a mean level detector circuit for detecting the mean level of the converted output from the converter; and
circuit means for controlling the light source in accordance with the detected level so that the mean level of the converted output applied to the classifying and defect detecting means is maintained constant.

4,075,499
SMOKE DETECTOR WITH MEANS FOR CHANGING LIGHT PULSE FREQUENCY
William J. Malinowski, Pembroke, Mass., assignor to Chloride, Incorporated, Tampa, Fla.
Filed Nov. 16, 1976, Ser. No. 742,194
Int. Cl.² G01N *21/26*
U.S. Cl. 250—574 **4 Claims**



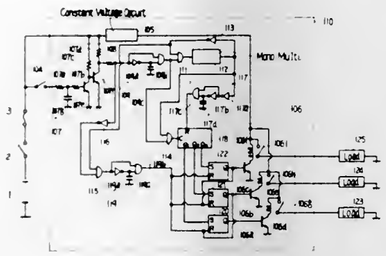
1. A detector, comprising a radiant energy-producing device, pulsing at a predetermined interval, means for producing a signal pulse in response to the pulsed radiant energy under predetermined conditions, means responsive to a predetermined number greater than one of produced signal pulses to provide an output signal, and means responsive to each signal pulse to decrease the interval to the next light pulse to less than that of the predetermined interval.

4,075,500
VARIABLE STATOR, DIFFUSER AUGMENTED WIND TURBINE ELECTRICAL GENERATION SYSTEM
Richard A. Oman, Huntington, and Kenneth M. Foreman, North Bellmore, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.
Filed Aug. 13, 1975, Ser. No. 604,466
Int. Cl.² H02P *9/04*
U.S. Cl. 290—55 **7 Claims**



1. A wind turbine comprising:
a rotatable duct having an outlet to inlet area ratio greater than one;
a wind-rotatable turbine mounted within said duct;
a generator driven by said turbine, said generator being a synchronous generator loading the drive from the turbine; and
stator means to vary the incidence of wind for rotating the turbine wherein the stator means includes a fixed leading portion and a trailing edge flap that is movable relative to the fixed leading portion, said trailing edge flap being movable by means sensitive to wind velocity to vary the swirl imparted to flow thereby providing a good working load distribution to all radial, span, stations of the turbine in optimizing disk loading for the turbine and the duct thereabout, so that with the load on the drive by the generator, constant turbine speed control can be effectuated over a wide range of wind velocities.

4,075,501
ELECTRIC CIRCUIT FOR SELECTING OPERATIONAL CONDITIONS OF LOAD
Yoshihiko Kondo, Nagoya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan
Filed Sept. 4, 1975, Ser. No. 610,437
Claims priority, application Japan, Sept. 30, 1974, 49-113048; May 27, 1975, 50-63697
Int. Cl.² H02J *1/00*
U.S. Cl. 307—41 **10 Claims**

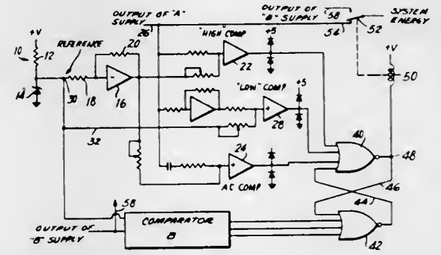


1. An electric circuit for selecting operational conditions of loads comprising:
an operational switch to be connected to a source of current;
a relay switch including at least one relay coil and one movable relay contact having a terminal to be connected to a load;
a trigger pulse generating circuit, connected to said operational switch, for producing a trigger pulse when said operational switch is at least once actuated from the closed state to the opened state and again to the closed state within a fixed time; and
a switching circuit, connected to said trigger pulse generating circuit, for actuating said relay switch upon receiving said trigger signal whereby the operationaL condition of said load is changed from one to the other condition, including means for generating a train of pulses at a fixed frequency in response to said trigger signal, means for coupling said pulses to said relay coil for intermittently shifting said contact to a position disconnecting said load from said source of current.

4,075,502
MONITORING DEVICE
Everette D. Walley, Jr., North Chili, N.Y., assignor to General Signal Corporation, Rochester, N.Y.
Filed Nov. 26, 1976, Ser. No. 745,268
Int. Cl.² H02H *11/00*
U.S. Cl. 307—64 **4 Claims**

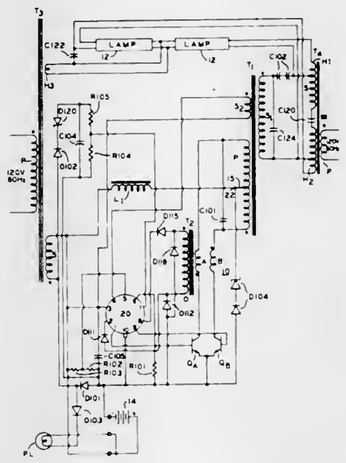
1. A system for selecting one of a plurality of available electrical components in the event that another of the components is subject to failure in accordance with a plurality of functional criteria, comprising:
an input and an output;
selection means for selecting one of the components to be connected between said input and said output, including means for insuring that said selection means operates to select one and only one of said components, whereby

failure of the selection means itself still results in one of the components being connected;
a reference device for supplying an independent positive reference voltage;
said selection means including a group of comparators for each component for comparing on a plurality of bases between each of said components and said reference device, each of said components and said reference device



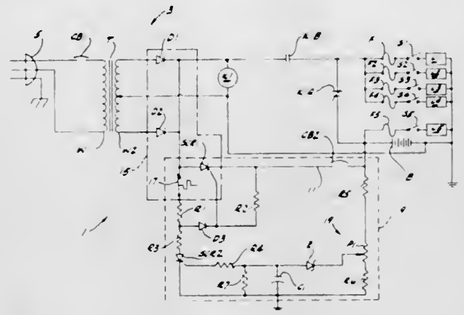
being connected to inputs of said respective groups of comparators;
a bistable device having its inputs connected to the outputs of all of the individual comparators in said groups of comparators and its output connected to said reference voltage; and
a relay connected to the output of said bistable device for connecting only one or the other of said components to said output.

4,075,503
EMERGENCY LIGHTING SYSTEM
Keith K. Klett, 203 E. 13th St., Danville, Ill. 61832
Filed Aug. 26, 1976, Ser. No. 718,029
Int. Cl.² H02J *7/00, 9/00*
U.S. Cl. 307—66 **3 Claims**



1. In an emergency lighting system having an inverter circuit for operating at least one gaseous discharge lamp from a battery when AC voltage from an AC electrical energy source falls below a predetermined level, the system being of the type including a transformer connecting the system to the AC source, means for providing an indication that the battery is connected into the system and AC electrical energy is available for charging the battery, and inhibit means monitoring the AC voltage for enabling the inverter when the AC voltage falls below the predetermined level, the improvement comprising:
means including a single secondary winding on the transformer for providing in a substantially non-interacting manner a voltage proportional to the AC voltage to the inhibit means and electrical energy to charge the battery.

4,075,504
POWER SUPPLY APPARATUS
Donald J. Gnaedinger, Highland, Ill., assignor to Basler Electric Company, Highland, Ill.
Filed May 19, 1977, Ser. No. 798,483
Int. Cl.² H02J *9/00*
U.S. Cl. 307—66 **10 Claims**

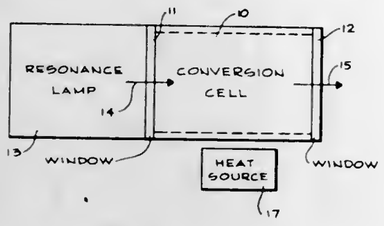


1. Apparatus for supplying electrical power to d.c. loads such as lights, pumps and the like in a recreational vehicle or the like comprising:
a converter adapted for connection to an a.c. power source external to the vehicle to convert a.c. power therefrom to d.c. power and to supply the d.c. power produced to the loads, the converter having a maximum current output rating;
a chargeable battery for supplying d.c. power to the loads when an external a.c. power source is unavailable;
means for charging the battery with d.c. power supplied by the converter so the battery has sufficient stored energy to supply d.c. power to the loads, the converter supplying power to the battery charging means concurrently with the supply of d.c. power to the loads; and
means responsive to the power demand on the converter both by the d.c. loads and the battery charging means for interrupting the supply of power to the battery charging means when the demand reaches a predetermined level whereby charging of the battery is thereupon interrupted and all the d.c. power up to the maximum current output rating of the converter is made available to the d.c. loads.

4,075,505
MOLECULAR EMISSION LAMP
Robert A. Young, Chatsworth, Calif., assignor to Xonics, Inc., Van Nuys, Calif.
Filed Jan. 10, 1977, Ser. No. 757,824
Int. Cl.² H02M *5/04*
U.S. Cl. 307—88.3 **33 Claims**

1. A method of producing molecular radiation of a single selected gas, including the steps of:
generating resonance photons characteristic of a single gas and at a first frequency; and

directing said resonance photons into a container of the single gas producing excited molecules of said single gas,



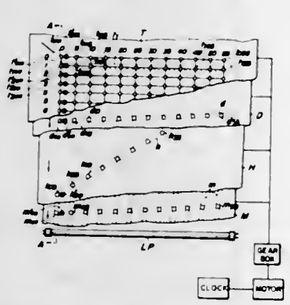
with said molecules emitting incoherent radiation at frequencies lower than said first frequency.

4,075,506

TIMING APPARATUS

Yohei Nakata, 22-2, Nakahara 2-chome, Isogo, Yokohama, Kanagawa, Japan

Filed Mar. 1, 1976, Ser. No. 662,513
Claims priority, application Japan, Mar. 5, 1975, 50-26717; Dec. 31, 1975, 50-158512
Int. Cl.² H01H *43/00*
U.S. Cl. 307—117 **10 Claims**



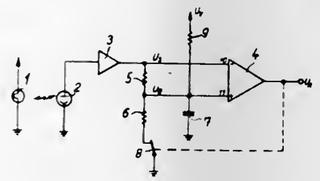
1. An apparatus comprising one or more timing devices, each timing device including a rotatable time plate having thereon time-representing points where time-indicating logical connection elements are to be provided, said points being arranged at least in one row at equal intervals in the direction of rotation; each timing device further including at least two rotators capable of rotating at different speeds in the vicinity of said time plate and individually holding at least one time-regulating logical connection element: wherein at least one of said time plate and said rotators of each said timing devices is used in common when a plurality of said timing devices are provided and wherein the time-representing point and the time-regulating logical connection element in each of said timing devices are in such positional relation that the time-regulating logical connection element comes into alignment with the time-representing point only at a given time assigned thereto; and the time-indicating logical connection element provided at said point and the time-regulating logical connection element of each rotator in each of said timing devices cooperate to effect timing connection through a logical product obtained at the given time assigned to said point; and either the time plate or the slowest rotator is installed to be stationary.

4,075,507

CIRCUIT ARRANGEMENT FOR EVALUATING SIGNALS, PARTICULARLY OUTPUT SIGNALS OF OPTICAL MEASURING DEVICES

Günter Pauli, Grobenzell, and Gerhard Jahn, Freising, both of Germany, assignors to G.A.O. Geseilschaft fur Automation und Organisation mbH, Germany

Filed Mar. 4, 1976, Ser. No. 663,856
Claims priority, application Austria, Mar. 18, 1975, 2084/75
Int. Cl.² H03K *3/42*
U.S. Cl. 307—117 **19 Claims**



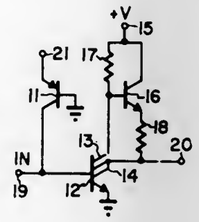
1. A circuit arrangement for evaluating signals, particularly output signals of optical measuring devices, such as light barriers, for example, which, by compensating and supervising variations in sensitivity, and with any signal sequence and signal duration, provides an operation signal or a quiescent signal which indicates the presence or absence of the test object and is compared with the voltage of a storage capacitor by means of a comparator, said circuit arrangement comprising, in combination, a measuring device having an output circuit; a voltage divider included in said output circuit; means connecting said output circuit and one end of said voltage divider to one input of said comparator; means connecting the tap of said voltage divider to the other input of said comparator; a storage capacitor connected to said other comparator input and providing a reference voltage (U_R) bearing a fixed relation to, but always lower than, the signal voltage (U_S) of said measuring device in the quiescent state of said arrangement; and means operable, with said measuring device responding to a test object, to so switch the voltages at said comparator inputs that said reference voltage (U_R) is held above said signal voltage (U_S) until said measuring device returns to its quiescent state; said signal voltage (U_S) exceeding said reference voltage (U_R) in such quiescent state and said comparator, changing back to the zero state in response thereto, causes said means operable to switch the voltages at said comparator inputs to return the voltages to the initial conditions.

4,075,508

I²L INJECTOR CURRENT SOURCE

Paul Howard Scott, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 4, 1976, Ser. No. 738,778
Int. Cl.² H03K *19/08, 19/40*
U.S. Cl. 307—213 **6 Claims**



1. An injector gate for use with an integrated injection logic semiconductor circuit, comprising: an I²L gate having an NPN

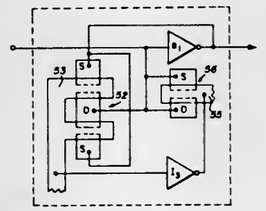
transistor with at least two collectors; means for providing a resistance, the means having a first and a second end; and an NPN transistor having a base, emitter, and collector, the base of the NPN transistor being coupled to one of the at least two collectors and the emitter being coupled to the first end of the means, the second end of the means being coupled to the other of the at least two collectors.

4,075,509

CMOS COMPARATOR CIRCUIT AND METHOD OF MANUFACTURE

Thomas P. Redfern, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Oct. 12, 1976, Ser. No. 731,269
Int. Cl.² H03K *17/60;* H01L *29/78, 27/08;* H03K *17/16*
U.S. Cl. 307—251 **3 Claims**



1. In a chopper stabilized amplifier including an amplifying section having input and output terminals, switch means coupled between said input and output terminals for periodically coupling said terminals together, and dummy transistor means for suppressing transient switching pulses produced at said input terminal by said switch means, means for combining said dummy transistor with said switch means whereby said transient suppression is rendered insensitive to gate alignment and lateral diffusion errors, said combination comprising:

dummy transistor means having source, gate and drain electrodes;

switch transistor means having a common drain electrode, a pair of source electrodes, and a pair of gate electrodes, each one of said pair of source electrodes having a length equal to the length of said dummy transistor source electrode and a spacing from said common drain electrode equal to the source to drain spacing in said dummy transistor;

means coupling said dummy transistor source and drain electrodes to said common drain electrode of said switch transistor means and means coupling said pair of gate electrodes of said switch transistor means together whereby said switch transistor means has an effective channel width of twice that of said dummy transistor means and said common drain electrode of said switch transistor means along with said source and drain of said dummy transistor means comprise a circuit node; and

means for switching said gate of said dummy transistor means in complementary fashion with said pair of gate electrodes of said switch transistor means whereby the switching transients at said circuit node cancel.

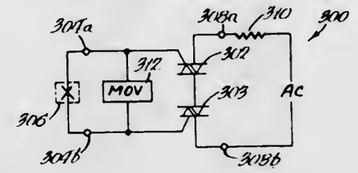
4,075,510

THYRISTOR VOLTAGE SWITCHING CIRCUITS

Joseph E. Pascente, 71 Regent Drive, Oak Brook, Ill. 60521

Filed Sept. 17, 1976, Ser. No. 724,326
Int. Cl.² H03K *17/72, 17/08*
U.S. Cl. 307—252 B **7 Claims**

1. In a voltage switching circuit, first and second semiconductor devices each having a pair of controlled electrodes, a control electrode for controlling conduction between said controlled electrodes, and a breakdown voltage rating between said controlled electrodes, one of said controlled electrodes of one said devices being connected with one of said controlled electrodes of the other said devices connecting said devices in series, the other controlled electrodes of said devices for being connected across a load and a source of voltage having a nominal value less than the combined value of said breakdown voltages, and means for sensing the voltage across said other controlled electrodes of said devices and for applying a signal to said control electrodes to establish conduction between said controlled electrodes of said devices whenever said voltage exceeds a predetermined value greater than said nominal value and less than the combined value of said breakdown voltages.

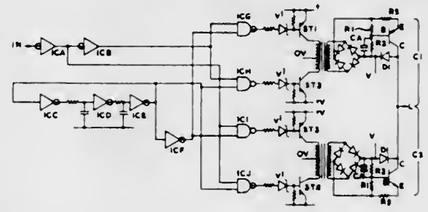


4,075,511

ELECTRONIC SWITCHES

John Didwith Lewis, Braintree, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Apr. 19, 1976, Ser. No. 678,425
Claims priority, application United Kingdom, Apr. 18, 1975, 16083/75; July 22, 1975, 30657/75
Int. Cl.² H03K *17/00*
U.S. Cl. 307—270 **5 Claims**



1. An electronic switch for driving a load comprising: an input, means for producing a first pulsed d.c. input current of a certain value and for a period of time sufficient to permit current flow through the load and applying said pulsed current to said input, second means for producing a second holding current sufficient to supply leakage current to the load and applying said second holding current to said input, the said input having one side thereof connected to a reference voltage to which it is required to switch the load and having the other side thereof connected to the emitter of a transistor, with the base of the transistor driven from a potential divider disposed across the input and with the collector of the transistor connected to the load, and a diode connected between the collector of the transistor and the reference voltage so that, in operation, when the transistor conducts, current passes through the load until the output voltage is higher than the reference voltage, whereupon the output is clamped by the current flowing in the diode.

4,075,512

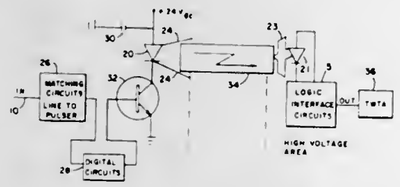
LIGHT PIPE TECHNIQUE FOR GRID PULSING

Gustaf J. Rast, Jr., and Thomas A. Barley, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 4, 1975, Ser. No. 546,969
Int. Cl.² H03K *17/00*
U.S. Cl. 307—311 **1 Claim**

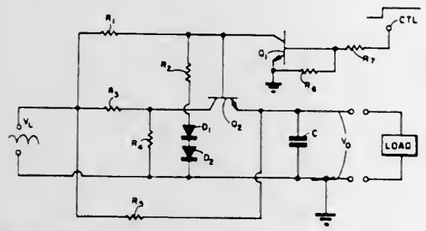
1. In a coupling system having a first circuit which has an output signal which is to be coupled to an input of a second circuit the improvement comprising a light pipe connected

between said first and second circuits for coupling said signal; light emitting means connected to the output signal of said first circuit so as to emit light in response to the output signal of said first circuit; said light emitting means being located at a first end of said light pipe so as to allow the light emitted to pass through said light pipe to a second end of said light pipe; detector means connected to the second end of said light pipe so as to detect said light and convert it to a signal; the output of said light detecting means being connected to an input of said second circuit; said first and second circuits have a high voltage potential difference between them; said light pipe



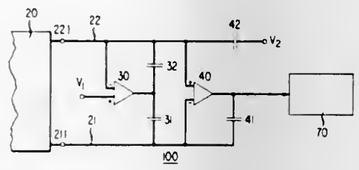
provides insulation between the circuits; said first circuit is at ground potential; said second circuit is operating at a high voltage with respect to the ground potential; said light emitting means is a light emitting diode; and said detecting means is a photodetector diode; said output signal is an electrical pulse; circuit means connected to said light emitting diode so as to cause said light emitting diode to emit a short light pulse as compared to the length of the pulse of the output signal upon the occurrence of the leading edge of said output signal and a second light pulse upon the occurrence of the trailing edge of said output signal pulse; and said second circuit converting these two light pulses back into one long electrical pulse.

4,075,513
AVERAGING AND PEAK DETECTION CIRCUIT
William L. Hinckley, Jr., Westminster, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.
Filed Oct. 4, 1976, Ser. No. 729,226
Int. Cl.² H03K *5/20*
U.S. Cl. 307—350 **9 Claims**



1. In combination:
charge storing capacitance means;
input terminal means to receive an input signal;
output terminal means connected to said charge storing capacitance means and responsive to the charge stored thereon;
impedance means connected between said input terminal means and said charge storing capacitance means; and
a first multi-terminal semiconductor device having first and second conduction path electrodes connected between said input terminal means and said charge storing capacitance means;
said multi-terminal device having a control electrode for receiving a first driving signal from a source of reference potential to disable said device, whereby said capacitance means is charged by the input signal via said impedance means, some of the charge stored by said capacitance means periodically leaking therefrom so that said capacitance means is charged up in a relatively long interval of time; or
the control electrode of said multi-terminal device receiving a second driving signal from said input terminal means to enable said device, whereby said capacitance means is charged by the input signal via the conduction path of said device, said device adapted to be periodically rendered non-conductive as a function of said input signal so as to thereby substantially reduce the leakage of charge from said capacitance means so that said capacitance means is charged up in a relatively short interval of time.

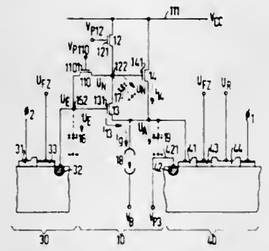
4,075,514
SENSING CIRCUIT FOR SEMICONDUCTOR CHARGE TRANSFER DEVICES
Carlo Heinrich Sequin, Berkeley, Calif., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Dec. 6, 1976, Ser. No. 747,900
Int. Cl.² H03K *5/20*
U.S. Cl. 307—355 **26 Claims**



1. Semiconductor apparatus which comprises
(a) a charge transfer device for transferring charge in a semiconductor medium having first and second sets of sense electrodes, each said electrode located in proximity to a major surface of the medium for detecting the charge in the medium underlying each said electrode;
(b) conducting means for electrically connecting together all of the electrodes of the first set to a first output terminal of said device and for connecting together all of the electrodes of the second set to a second output terminal of said device, said device also including at least one other separate electrode connected to a first reference terminal for connection to a first D.C. voltage source;
(c) a first amplifier means, for suppressing common mode signals on the first and second sets of electrodes, having at least first and second input terminals of opposite summing polarity, said first input terminal being connected to said second output terminal of said device and said second input terminal being connected to said reference terminal for connection to the first D.C. voltage source, said first amplifier means having an output terminal electrically coupled through a feedback means to the second output terminal of said device; and
(d) first and second electrical capacitors, one of which is electrically connected for coupling said first output terminal of said device to an output terminal of the first amplifier, and the other of which is connected for coupling said output terminal of the first amplifier to said second output terminal of said device.

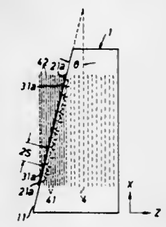
4,075,515
DIGITAL DIFFERENTIAL AMPLIFIER FOR CCD ARRANGEMENTS
Kurt Hoffmann, Taufkirchen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany
Filed Aug. 25, 1976, Ser. No. 717,690
Claims priority, application Germany, Sept. 18, 1975, 2541721
Int. Cl.² H03K *5/18, 5/02;* **H01L** *29/78*
U.S. Cl. 307—362 **14 Claims**

1. A digital differential amplifier comprising a first voltage supply terminal and a second voltage supply terminal, an input terminal, an output terminal, a first transistor connected to said input terminal via a first terminal of its source-drain-channel, said first transistor having a gate terminal for connection to a first control potential terminal, a first capacitance connected between said input terminal and said first voltage supply terminal, a circuit node point, a second transistor connected between said circuit node point and said output terminal, said second transistor having a gate connected to said input terminal, a third transistor connected between said second voltage supply terminal and said circuit node point, said third transistor



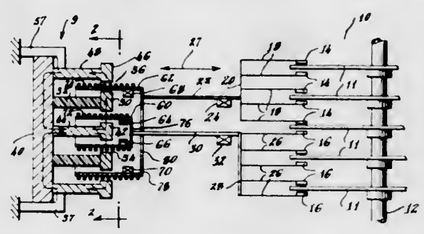
having a gate terminal for connection to a second control potential terminal, a fourth transistor connected between said second voltage supply terminal and said output terminal, said fourth transistor having its gate connected to said circuit node point, a second capacitance connected between said output terminal and said first voltage supply terminal, a third capacitance connected between said circuit node point and said first voltage supply terminal, a current sink connected between said output terminal and a third voltage supply terminal.

4,075,516
DIFFRACTION ELECTROACOUSTIC TRANSDUCER
Shuzo Hattori, and Tadao Hiramatsu, both of Nagoya, Japan, assignors to Hagiwara Denki Kabushiki Kaisha, Nagoya, Japan
Filed May 20, 1976, Ser. No. 688,358
Claims priority, application Japan, May 21, 1975, 50-61209
Int. Cl.² H01L *41/04*
U.S. Cl. 310—334 **4 Claims**



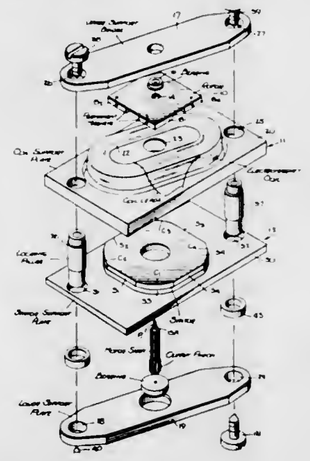
1. A diffraction electroacoustic transducer comprising:
a piezoelectric crystal;
a set of interdigital electrodes including a first plurality of metal strips and a second plurality of metal strips both provided on one surface of said crystal for producing an acoustic volume wave of a desired acoustic field within said crystal; and
means for applying an AC voltage to said interdigital electrodes;
said first plurality of metal strips of said interdigital electrodes positioned substantially along a first set of lines defined by the intersection of said one surface and a first set of equi-phase surfaces along a pre-specified wavefront defining the desired acoustic field; and said second plurality of metal strips of said interdigital electrodes positioned substantially along a second set of lines defined by the intersection of said one surface and a second set of equi-phase surfaces shifted π radians from said first set of equi-phase surfaces.

4,075,517
LINEAR ACTUATOR
David George Adler, Drexel Hill, Pa., assignor to Sperry Rand Corporation, New York, N.Y.
Filed Apr. 2, 1976, Ser. No. 673,021
Int. Cl.² H02K *33/00*
U.S. Cl. 310—13 **14 Claims**



1. An electromagnetic linear actuator comprising:
magnetic means providing a magnetic circuit having a plurality of annular, concentrically located air gaps in said circuit;
a plurality of annular actuator forms, each of said forms having a longitudinal axis and each form positioned in one of said air gaps; and
a plurality of actuator windings, each of said windings mounted on an actuator form and adapted, when electrically energized, to establish an electromagnetic field which reacts with a field of the magnetic circuit and cause rectilinear motion of the associated form in the direction of the longitudinal axis.

4,075,518
MICRO-MINIATURE STEPPING MOTOR
Dale R. Koehler, Westwood, N.J.; Robert F. Sagarino, Wheatley Heights, and Charles A. Sauter, Westbury, both of N.Y., assignors to Bulova Watch Company, Inc., New York, N.Y.
Filed June 22, 1976, Ser. No. 698,506
Int. Cl.² H02K *37/00*
U.S. Cl. 310—49 R **11 Claims**



1. A stepping motor for driving the gear train of a watch movement, said motor comprising:
A. a rotor formed by a plate mounted on a shaft passing through its center, and a set of four like permanent magnet pieces attached to the underside of the plate at positions corresponding to the corners of a square whose diagonals intersect said center, the magnetic poles of said pieces being in mutual opposition;
B. a generally square stator plate disposed in parallel relation

to said rotor plate to define an air gap therebetween, said stator plate having a central opening through which said shaft extends, said plates both being formed of ferromagnetic material, thereby creating, when the pieces of the rotor are aligned with the corner of the stator plate, a symmetrical magnetic circuit of four flux loops, each loop having lines of flux which pass through said rotor plate between a respective pair of adjacent pieces and bridge the air gap between said pieces and said stator plate, the loop being completed by lines of flux passing through said stator plate, said pieces in the absence of a torque applied to said rotor being aligned with the corners of said stator plate at positions of minimum reluctance, whereby said rotor has four stable positions;

C. a planar coil disposed in said gap in parallel relation to said plates, said coil being formed to produce a magnetic field which is asymmetrical relative to said symmetrical magnetic circuit; and

D. means to apply an electrical impulse to said coil to produce said asymmetrical magnetic field to cause said rotor to step from one stable position to the next.

4,075,519

BRUSHLESS ALTERNATOR

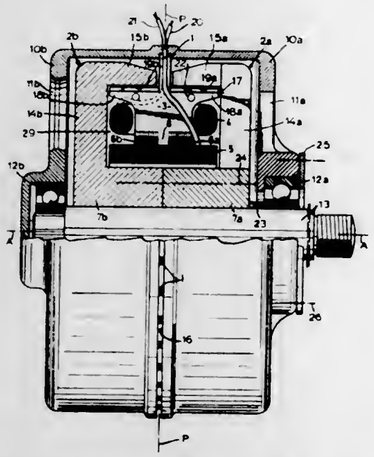
Ivan Mrcun, Kajuhova 4, Domzale, Yugoslavia (61230)

Filed Oct. 22, 1975, Ser. No. 624,934

Claims priority, application Yugoslavia, Nov. 22, 1974, 2819/74; Nov. 22, 1974, 2820/74

Int. Cl.² H02K *7/00*

U.S. Cl. 310—67 R **10 Claims**



1. In an electrical machine comprising two relatively rotatable members centered on a common axis, one of said members having a magnetically permeable body which includes a magnetized hub and two axially spaced annular arrays of pole pieces rigid with opposite extremities of said hub, the other of said members including a set of peripherally spaced teeth interconnected by an annular yoke and positioned for magnetic interaction with said pole pieces, said yoke and said teeth being magnetically permeable, and armature windings surrounding said teeth, the pole pieces of one array having substantially axially extending faces on one side of a transverse midplane and being peripherally offset from the oppositely polarized pole pieces of the other array, the latter having substantially axially extending faces on the other side of said midplane,

the improvement wherein said teeth are generally T-shaped in an axial plane with a stem passing radially along said midplane between said arrays and with an axially extending cross-bar positioned to pass close by said faces upon relative rotation of said members.

4,075,520

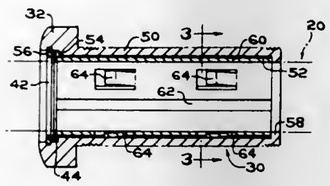
WHEEL SPEED SENSOR

David Larry Davy, Sr., Troy, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed May 6, 1976, Ser. No. 683,694

Int. Cl.² H02K *19/24*

U.S. Cl. 310—168 **4 Claims**



1. In a wheel speed sensing device for a wheel and brake assembly which sensing device comprises an elongated, substantially cylindrically contoured sensor and means to mount said sensor to a nonrotatable portion of said wheel and brake assembly such that said sensor is disposed in a fixed preselected position relative to a rotating portion of said wheel and brake assembly, the improvement wherein said mounting means comprises

A. an outer annular housing having a central bore extending therethrough of sufficient size to receive said sensor;

B. a longitudinally split, spring-like tubular sleeve disposed within said housing bore and substantially surrounding and engaging said sensor with a radially inwardly directed spring force, said sleeve having restraining means associated therewith to resist rotational movement of said sleeve relative to said housing bore, and

C. means to lock said sleeve against axial movement relative to said housing.

4,075,521

MULTI-PHASE GENERATOR WITHOUT SLIP RINGS AND BRUSHES

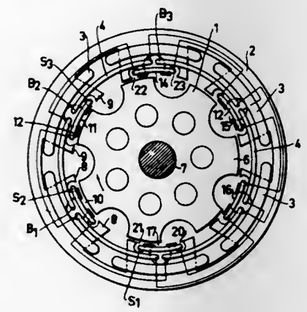
Knut Assar Nordebo, Ringvagen 28, Haparanda, Sweden (S-953 00)

Filed May 27, 1976, Ser. No. 690,597

Claims priority, application Sweden, June 6, 1975, 7506491

Int. Cl.² H02K *3/00*

U.S. Cl. 310—184 **1 Claim**



1. A multi-phase induction generator including in combination, a rotor having a plurality of equally spaced poles but no windings thereon, a stator having a different number of equally spaced poles, each provided with a single centrally disposed slot, said motor and stator being mounted concentrically for relative rotation and with an air gap therebetween, a direct current energizable exciting winding mounted on said stator and encompassing each said stator pole for producing magnetic flux of the opposite sense in adjacent stator poles, and a multi-phase alternating current output winding mounted on said stator with the phase windings located respectively in the centrally disposed slots of adjacent stator poles, thereby to achieve a mutual displacement of half a pole pitch between said exciting winding and said multi-phase output winding, said multi-phase output winding producing a multi-phase output voltage between beginning and end terminals of each stator phase winding, the number of stator poles being equal to m.p, the number of rotor poles being equal to m(p±1), *m* being an integer factor 1, 2, 3, . . . , and *p* being an even integer factor 2, 4, 6, . . . , an additional multi-phase alternating current winding mounted on said stator and having a coil pitch of about half the coil pitch of the said multi-phase output winding, said additional multi-phase winding having phase windings located in an additional pair of slots of each stator pole, said additional pair of slots being symmetrically disposed in relation to the central slot of each stator pole, the phase windings of said additional multi-phase winding being connected in series with those phase windings of said multi-phase output winding in which voltage occurs substantially simultaneously.

4,075,522

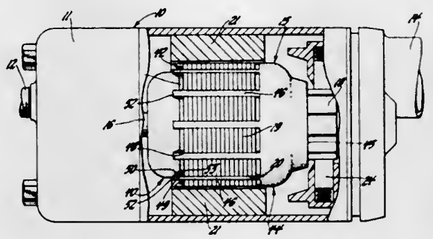
SELF CLAMPING ARMATURE CASING FOR AN ELECTRIC MOTOR DRIVEN FLUID PUMP

Robert P. Hoffman, Grand Blanc, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 16, 1976, Ser. No. 714,382

Int. Cl.² H02K *3/48*

U.S. Cl. 310—214 **1 Claim**



1. In an armature of an electric motor driven pump, the armature being adapted for rotation within a fluid medium and including a core with axially extending slots, a winding comprising conductors disposed in the slots and end turns disposed across the opposite axial ends of said core, and two part casing means enclosing the core, conductors and end turns for reducing armature induced fluid turbulence, the casing means comprising first and second end caps covering the end turns at opposite axial ends of the core, the first end cap having a plurality of integral axially extending fingers slidably disposed respectively in the core slots, the armature further having means wedging the fingers in the slots against radial outward movement, the improvement comprising, in combination:

an outwardly extending circumferential flange on the second end cap adjacent the axial ends of the core slots; and

a plurality of hooks, one on the end of each finger, adapted to engage a side of the flange to clamp the first and second end caps to each other for retention on the armature, each hook having a ramp surface sloping radially inward from the end of the finger, the ramp surface being cooperative with the flange, upon axial movement of the fingers during assembly, to force the respective hook radially outward over the flange into locking engagement therewith.

4,075,523

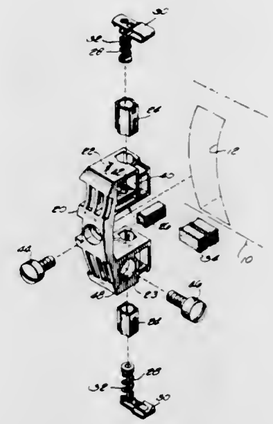
PLUG-IN BRUSH CARTRIDGE

Gary S. Lafferty, Sr., Franklin, Wis., assignor to Milwaukee Electric Tool Corporation, Brookfield, Wis.

Filed Sept. 2, 1975, Ser. No. 609,237

Int. Cl.² H02K *13/00*

U.S. Cl. 310—239 **7 Claims**



1. A plug-in cartridge adapted for insertion into a cartridge receiving opening in only one side of a motor housing forming part of a pistol handle type of power tool and containing an electric motor and its commutator for a power operated tool comprising:

(a) a motor housing having a cartridge receiving opening in one side thereof in juxtaposition to the commutator on the electric motor;

(b) a plug-in cartridge slidably received and seated in said cartridge receiving opening, said cartridge supporting at least two carbon brush assemblies each having an active carbon brush, said brushes being positioned to slide radially onto and engage the commutator from diametrically opposed positions; and

(c) terminal means in said opening and on said plug-in cartridge adapted to make and break electrical contacts as said cartridge is moved into or out of said opening.

4,075,524

BRUSH SHUNT CONNECTION

Elmo F. Bradshaw, and John F. Rakszawski, both of St. Marys, Pa., assignors to Airco, Inc., Montvale, N.J.

Filed July 1, 1976, Ser. No. 701,471
Int. Cl.² H01R *39/6*
U.S. Cl. 310—249 **5 Claims**



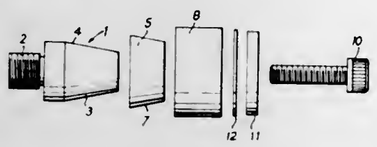
1. A tamping material for securing electrical connections to carbon blocks comprising free-flowing granules each consisting essentially of 85% to 97% by weight graphite particles and 15% to 3% by weight of polyaryl sulfone resin as a binder.

4,075,525

PIEZOELECTRIC ACCELEROMETER TRANSDUCER

Donald Jack Birchall, c/o D. J. Birchall Ltd., Finchley Avenue, Industrial Estate, Mildenhall, Suffolk, England

Filed Dec. 14, 1976, Ser. No. 750,415
Claims priority, application United Kingdom, Jan. 5, 1976, 241/76
Int. Cl.² H01L *41/04*
U.S. Cl. 310—329 **6 Claims**



1. A piezoelectric transducer comprising a hollow piezoelectric ceramic element having an axis, an internal conical surface and an external conical surface, the internal and external conical surfaces being inclined with respect to the axis in the same sense; the transducer further comprising a metal spigot; a metal sleeve; and a clamping arrangement for applying axial force to hold the element sandwiched between the spigot and the sleeve, the spigot and the sleeve having conical surfaces which make intimate surface contact with the internal and external conical surfaces of the element respectively.

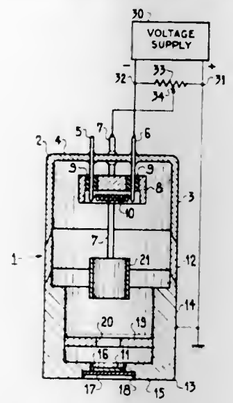
4,075,526

HOT-CATHODE X-RAY TUBE HAVING AN END-MOUNTED ANODE

Bernard Grubis, Paris, France, assignor to Compagnie Generale de Radiologie, Paris, France

Filed Nov. 5, 1976, Ser. No. 739,178
Claims priority, application France, Nov. 28, 1975, 75 36607
Int. Cl.² H01J *35/14*
U.S. Cl. 313—56 **18 Claims**

1. An X-ray tube of the type having a hot cathode at one end, a main anode in the form of a metal plate perpendicular to the axis of the electron beam located at the other end thereof, said beam bombarding the main anode so that at least part of the useful X-ray beam generated by this bombardment passes through the thickness of the main anode, which acts as a filter for the emitted X-ray beam by allowing the characteristic radiation of the material forming the main anode to pass therethrough preferentially, further comprising: an annular secondary anode provided with a central opening arranged in the path of the electron beam, near the main anode and coaxial



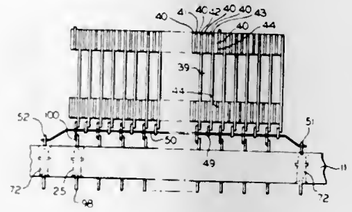
thereto, said secondary anode being at the same electrical potential as the main anode and having at least its surface made of the same metal as the main anode, thereby adding to the characteristic radiation from the main anode, a supplementary characteristic radiation resulting from electrons which are back-scattered due to elastic collisions with the atoms of the main anode and which strike the secondary anode.

4,075,527

X-RAY DETECTOR

Harold R. Cummings, Waukesha, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Sept. 27, 1976, Ser. No. 727,260
Int. Cl.² B32B *31/20*; H01J *1/90, 39/26*
U.S. Cl. 313—93 **23 Claims**



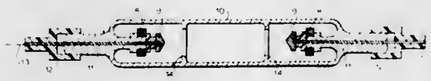
1. A radiation detector comprising:
means having walls defining a cavity for being filled with ionizable gas,
radiation permeable window means disposed in one of said walls,
a plurality of spaced apart conductive electrode members and insulating members interposed between said conductive electrode members and all of said members being arranged adjacent each other in a predetermined order in said cavity, some of said electrode members cooperating with adjacent electrode members to define gas filled ionization cells, said cells being arranged for radiation that passes through said window to enter said cells,
adhesive material disposed between and on selected adjacent portions of said members, said adhesive material being deposited on limited areas of said members and with sufficient thickness to space said members nonuniformly initially, said adhesive material having the property of yielding when said members are arranged and subjected to compression to thereby establish the desired total thickness and interspacing dimensions of said plurality of members and having the property of subsequently solidifying to bond said members together and thereby maintain said dimensions.

4,075,528

XENON LAMP WITH MAGNETS ON THE ELECTRODES

Shigeru Suga, Yoyogi 5-20-2, Shibuya, Tokyo, Japan

Filed Mar. 15, 1977, Ser. No. 777,938
The portion of the term of this patent subsequent to Nov. 9, 1993, has been disclaimed.
Int. Cl.² H01J *1/50, 61/16*
U.S. Cl. 313—154 **2 Claims**



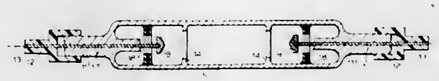
1. A xenon lamp comprising a transparent tube, and electrode structure at each end of said tube including an electrode extending into said tube and sealing said electrode into the end of said tube, and an open ring magnet around each electrode structure and mounted on the electrode structure between the free end of the electrode within the tube and the end of the tube in which the electrode is sealed.

4,075,529

XENON LAMP CONTAINING MAGNETIC ADSORBERS INSIDE THE TUBE THEREOF

Shigeru Suga, Yoyogi 5-20-2, Shibuya, Tokyo, Japan

Filed Mar. 18, 1977, Ser. No. 779,225
The portion of the term of this patent subsequent to Nov. 9, 1993, has been disclaimed.
Int. Cl.² H01J *1/50, 61/16*
U.S. Cl. 313—154 **5 Claims**



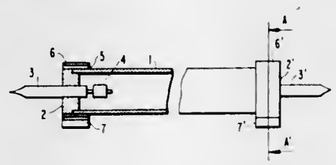
1. A xenon lamp comprising a transparent tube, and electrode structure at each end of said tube including an electrode extending into said tube and sealing said electrode into the end of said tube, and an annular magnetic absorber around each electrode structure and mounted on the inner surface of said tube between the free end of the electrode within the tube and the end of the tube in which the electrode is sealed.

4,075,530

HIGH PRESSURE SODIUM VAPOR LAMP OF UNSATURATED VAPOR PRESSURE TYPE

Haruo Furukubo, Kyoto; Yasaburo Takezi, Shiga, and Kenzi Takatuka, Kyoto, all of Japan, assignors to Japan Storage Battery Company Limited, Kyoto, Japan

Filed Apr. 21, 1976, Ser. No. 679,288
Int. Cl.² H01J *61/20, 61/22, 61/30*
U.S. Cl. 313—229 **5 Claims**



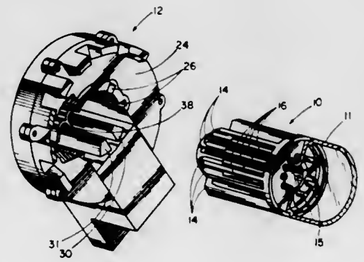
1. In a sodium vapor electric discharge lamp of the type having an arc tube made of a heat-resistant and light transmissive tubular body with sodium, mercury and a starting gas therein, the improvement characterized by the amounts of said sodium and said mercury being in the ranges of 0.007 to 0.054 mg and 0.054 to 0.6 mg, respectively, for every cubic centimeter of the volume of said arc tube, whereby all of the filled sodium and mercury are vaporized when operated.

4,075,531

BASE-SOCKET SYSTEM WITH ARC PREVENTION MEANS

Armando V. Marino, Chicago, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Jan. 3, 1977, Ser. No. 756,204
Int. Cl.² H01J *17/00*
U.S. Cl. 313—325 **2 Claims**



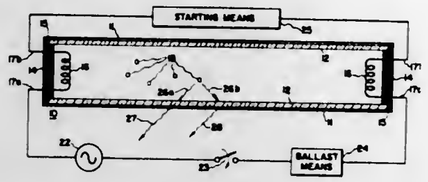
1. An axially compact and highly arc protective base-socket system for use with a color television picture tube having a narrow neck terminated by a cylindrical coaxial tubulation surrounded by a number of axially extending, electrically conductive low voltage pins and at least one high voltage pin, said base-socket system comprising:
a base fitting over and secured to said tubulation and passing said pins extending from said neck of said tube, said base comprising:
a plurality of axially and radially outwardly extending insulating walls, said low voltage pins lying between said walls,
means defining an axially extending deep narrow cavity which receives said high voltage pin, said cavity having a depth at least twice as great as the largest transverse dimension thereof, and
a cavity lip surrounding a mouth of said cavity;
a socket comprising:
an annular support means defining a series of axially and radially inwardly extending channels for mating with said insulating walls on said base to unambiguously orient said base relative to said socket,
a series of contacts on said annular support means for establishing electrical connection with said plurality of low voltage pins on said base when said base is inserted into said socket,
an axially extending socket protrusion for mating with said axially extending deep narrow cavity,
a high voltage contact in said socket protrusion for establishing electrical connection with said high voltage pin on said base when said base is inserted into said socket,
a cap having an annular arc-path-length-extending flange which externally telescopes over said cavity lip,
whereby when said base and socket are connected, the mating of said socket protrusion and flange with said base cavity and lip form multiply folded extended arc path lengths providing a very high degree of arc protection in an axially compact system.

4,075,532

COOL-WHITE FLUORESCENT LAMP WITH PHOSPHOR HAVING MODIFIED SPECTRAL ENERGY DISTRIBUTION TO IMPROVE LUMINOSITY THEREOF

William W. Piper, Scotia; Jerome S. Prener, Schenectady, both of N.Y., and George R. Gillooly, Cleveland Heights, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed June 14, 1976, Ser. No. 695,934
Int. Cl.[2] H01J *61/44*; C09K *11/12, 11/24, 11/42*
U.S. Cl. 313—497 8 Claims



1. In a fluorescent lamp of the type having a sealed envelope enclosing means to generate a low-pressure mercury discharge within said envelope, and a coating contained within said envelope for conversion of at least a portion of the radiation emitted from said discharge to visible light having a white color, the improved coating comprising:

a first phosphor having a relatively broad emission spectrum with a mean wavelength in a yellow portion of the visible spectrum, wherein said first phosphor is $Ca_{10-w-x-y}Cd_wMn_xSb_y(PO_4)_6F_{2-y}O_y$ where w is in the approximate range 0.0–0.2, x is in the approximate range 0.25–0.50 and y is in the approximate range 0.02–0.2;

a second phosphor having a relatively narrow emission spectrum in a blue portion of the visible spectrum;

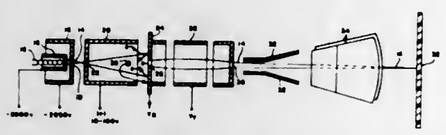
said first and second phosphors being uniformly blended together in a porportional relationship preselected to provide increased luminous efficacy for said mixture.

4,075,533

ELECTRON BEAM FORMING STRUCTURE UTILIZING AN ION TRAP

Bozidar Janko, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Sept. 7, 1976, Ser. No. 720,858
Int. Cl.[2] H01J *29/56*
U.S. Cl. 315—31 R 5 Claims



1. An electron discharge device in which the improvement comprises an electron beam-forming structure including:

a cathode having a negative potential connected thereto for emitting an electron beam;

a grid electrode adjacent said cathode including an aperture through which said electron beam passes, said grid electrode having a negative potential connected thereto slightly larger than the cathode potential; anode means disposed adjacent to said grid electrode including a first section having a beam-admitting aperture for admitting the electron beam from said grid electrode into said anode means and a second section having a beam-limiting aperture for limiting the electron beam as it passes therethrough, said second section being connected to a reference potential;

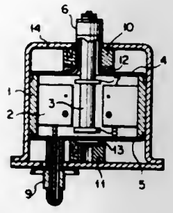
and positive bias means connected to said first section of said anode to repel positive ions away from said beam-admitting aperture as said positive ions approach said beam-admitting aperture to prevent said positive ions from reaching said cathode.

4,075,534

MAGNETRON WITH HOLDING MEANS TO SUPPORT A PAIR OF PERMANENT MAGNETS

Hisao Saito; Norio Tashiro, both of Yokohama, and Tokuju Koinuma, Kawasaki, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Aug. 25, 1976, Ser. No. 717,689
Claims priority, application Japan, Sept. 1, 1975, 50-104968
Int. Cl.[2] H01J *25/50*
U.S. Cl. 315—39.71 10 Claims



1. A magnetron comprising a main magnetron body including an anode cylinder formed interiorly with resonance cavities, a cathode member disposed along the central axis of said anode cylinder, and anode cylinder seal means made of non-magnetic material, for hermetically sealing openings at both ends of said anode cylinder, microwave output means connected to said resonance cavities in said anode cylinder, for transmitting microwaves generated from said resonance cavities outside said main magnetron body, a pair of permanent magnets disposed outside the main magnetron body in a manner opposing said anode cylinder seal means to produce a magnetic field in the axial direction of said anode cylinder, a yoke for magnetically mutually coupling said pair of permanent magnets outside said main magnetron body, and main magnetron body holding means mechanically reliably fixed to said main magnetron body, to support said pair of permanent magnets.

4,075,535

FLAT CATHODIC TUBE DISPLAY

Pierre Genequand, Geneva, and Didier Joyeux, Petit-Lancy, both of Switzerland, assignors to Battelle Memorial Institute, Switzerland

Filed Apr. 13, 1976, Ser. No. 676,492
Claims priority, application Switzerland, Apr. 15, 1975, 4764/75; Apr. 15, 1975, 4766/75
Int. Cl.[2] H01J *29/50, 31/10*
U.S. Cl. 313—422 14 Claims

1. Video cathode tube intended for the restitution in visible form of electric signals representing an image, comprising an air-free enclosure defined by a wall a portion of which constitutes a transparent window, said enclosure containing:

a. a layer of at least one luminescent substance carried by a transparent plate, this layer having a size substantially equal to that of said window and being visible through it;

b. a matrix of field effect emitters of low emission threshold distributed in rows and columns, oriented in such a manner as to emit towards the said luminescent layer;

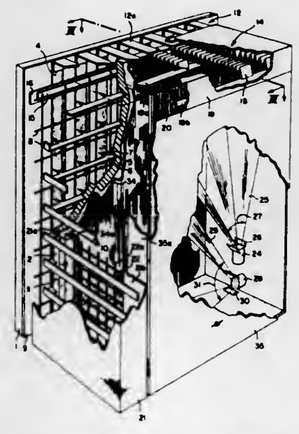
c. a first system of conductive paths insulated from each other and arranged along the rows of emitters, each of the emitters of any row being connected electrically to the corresponding path of the said first system;

d. a second system of conductive paths insulated from each other and from the paths of the said first system, disposed in contact with said luminescent layer and extending in front of the columns of emitters;

e. a first energizing device comprising a first bank of contacts connected individually to the paths of said first system at one end of them, and a first means for sequentially bringing the contacts of said first bank to a first potential;

f. a second energizing device comprising a second bank of contacts connected individually to the paths of said second system, at one end of them, and a second means for sequentially bringing the contacts of said second bank to a second potential;

g. and a control electrode in the form of a grid connected to a source of voltage interposed between said matrix of emitters and said second system of conductive paths and having substantially the same length as them, the selection of the voltage of said source and of said second potential



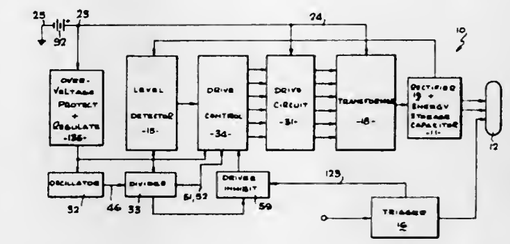
with respect to the said first potential being such that at the intersection of the paths brought respectively to said first and second potentials there prevails, simultaneously, in the immediate vicinity of the end of the emitter located at said intersection a low voltage drop which is sufficient to cause the emission by field effect of electrons from said emitter and in the vicinity of the portion of luminescent layer located at said intersection a high potential drop capable of imparting to the electrons emitted sufficient energy to excite said luminescent layer portion, the said first or second energizing devices being modulated by the said signals in such a manner that said luminescent layer portion is illuminated as a function of the said signals, the group of luminous points thus obtained sequentially constituting the said image.

4,075,536

CAPACITOR CHARGING SYSTEM

Carlile R. Stevens, 468 El Rio Road, Danville, Calif. 94526

Filed July 28, 1976, Ser. No. 708,851
Int. Cl.[2] H05B *41/32*; H02J *15/00*
U.S. Cl. 315—241 P 3 Claims



1. A system for charging an energy storage capacitor to a selected voltage level, comprising:

a transformer having a tapped primary winding and a secondary winding;

a rectifier connected to said secondary winding to rectify the output of said transformer, said rectified output being supplied to said energy storage capacitor;

at least two pairs of drivers connected to different taps of said primary winding, each pair of drivers being alternately switched on and off to provide an alternating input to said transformer;

level detector means, responsive to the voltage across said energy storage capacitor, for sequentially enabling different pairs of said drivers as the voltage across said energy storage capacitor reaches progressively higher preselected values, said enabled pairs of drivers providing an input to progressively decreasing portions of said transformer primary winding so that a corresponding larger voltage output, at lower current, is supplied via said secondary winding and rectifier to said energy storage capacitor;

said transformer primary winding is center-tapped, one polarity terminal of a voltage source being connected to said center tap, each pair of drivers comprising first and second drive transistors respectively connected to apply voltage from the other polarity terminal of said source to a respective primary winding tap on opposite sides of said center-tap, said system further comprising;

alternation means for periodically, alternately turning on one drive transistor and turning off the other drive transistor in an enabled pair of drivers;

said alternation means comprises:

an oscillator;

a counter, said counter having alternating output signals, and

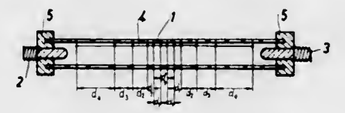
circuit means connecting said alternating output signals to said drivers alternately to enable the drive transistors in each pair.

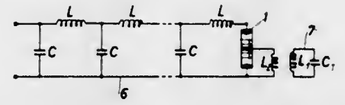
4,075,537

IGNITION ELECTRODE ARRANGEMENT FOR GAS DISCHARGE LAMPS, PARTICULARLY FOR FLASH TUBES

Winfried Quillfeldt, Jena, Germany, assignor to Jenoptik Jena G.m.b.H., Jena, Germany

Filed Oct. 13, 1976, Ser. No. 731,499
Claims priority, application Germany, Dec. 16, 1975, 190180
Int. Cl.[2] H05B *41/22, 41/32*
U.S. Cl. 315—354 1 Claim





1. An electrode arrangement for improving the ignition readiness of gas discharge lamps, particularly of flash tubes comprising

a gas discharge tube, being filled with a rare gas,

at least two electrodes, either of said electrodes being provided at the end portions of said tube,

a plurality of wire loops surrounding the surface of said tube,

a current supply unit, connected to said electrodes, and to said wire loops

said wire loops being employed as ignition electrode,

said wire loops being mutually spaced from one another at

a distance which is smaller in the center portion of said tube than towards said end portions,

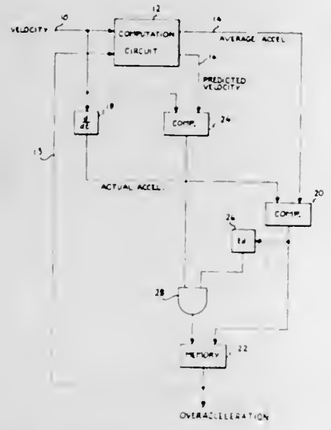
said current supply unit feeding ignition pulses into said wire loops.

4,075,538

ADAPTIVE ACCELERATION RESPONSIVE SYSTEM

Allan Barr Plunkett, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed May 19, 1976, Ser. No. 687,832
Int. Cl.[2] H02P 5/06
U.S. Cl. 318—52 **22 Claims**



1. A system for detecting a change in acceleration of a moving object, which change exceeds a predetermined margin, said system comprising:

a. means for sensing the instantaneous velocity of said object and for developing a first signal representative of said velocity;

b. computation means connected to receive said first signal, said computation means being operable upon said first signal to produce a second signal representative of the average acceleration of said object and to produce a third signal representative of a predicted velocity of said object;

c. differentiator means connected to receive said first signal and responsive thereto to produce a fourth signal representative of the actual acceleration of said object; and

d. first comparison means connected to receive said second and fourth signals, said first comparison means providing a fifth signal when said fourth signal differs from said second signal by at least a predetermined acceleration margin.

4,075,539

STEP-BY-STEP RECIPROCATING MECHANISM

Tasaku Wada, Tokyo, Japan, assignor to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

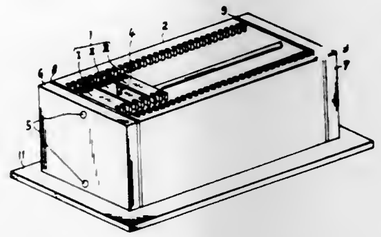
Filed Aug. 13, 1976, Ser. No. 714,245
Claims priority, application Japan, Aug. 15, 1975, 50-99362
Int. Cl.[2] H02K 41/00
U.S. Cl. 318—135 **4 Claims**

1. A step-by-step reciprocating mechanism comprising:

a movable member having a plurality of magnetic pole sets each for a respective phase of a multiphase exciting current and disposed one above another;

guide means coupled to said movable member for guiding the movable member to travel along a straight guide path in a forward direction and in a reverse direction;

stationary magnetic pole means magnetically coupled to said movable member for developing an equal number of lines of magnetic poles disposed one above another at both sides of the straight guide path, each of said lines of magnetic poles having a number of fixed magnetic poles which are successively arranged with the same pitch so as to successively oppose the poles of the movable member when the movable member travels along the straight guide path, said magnetic poles of one magnetic pole set of said movable member and a respective line of magnetic poles of said stationary means being successively displaced by a fraction of the pitch equal to the fraction of the number of phases of the multiphase exciting current one phase corresponds; and



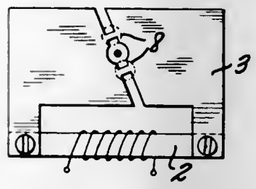
multiphase exciting means coupled to said moving member and said stationary means for successively magnetizing respective magnetic poles sets of said movable member and respective lines of poles of said stationary means in response to the multiphase exciting current.

4,075,540

STEPPING MOTOR FOR TIMEPIECE

Akira Torisawa, Machida, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed July 15, 1976, Ser. No. 705,441
Claims priority, application Japan, July 15, 1975, 50-87115; July 17, 1975, 50-88022; July 18, 1975, 50-881110
Int. Cl.[2] H02K 29/00
U.S. Cl. 318—138 **6 Claims**



1. A stepping motor for a timepiece, comprising:

a one-piece lower stator pair;

a one-piece upper stator pair;

magnetic material disposed between said lower and said upper stator pairs for magnetically connecting the same;

a magnetic rotor disposed between said upper and lower stator pairs and having a plurality of magnetic poles circumferentially disposed around said rotor;

means for magnetizing said upper and lower stator pairs to effectuate rotation of said rotor;

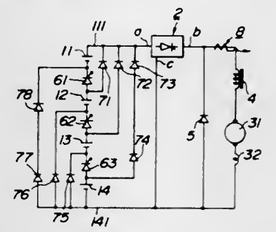
and means for defining a rest position of said rotor when said upper and lower stator pairs are not magnetized.

4,075,541

DIRECT CURRENT MOTOR CONTROL DEVICE FOR USE IN BATTERY AUTOMOBILES

Takanori Shibata, and Katsuji Marumoto, both of Hitachi, Japan, assignors to Keishin Matsumoto, Tokyo, Japan

Filed Dec. 12, 1973, Ser. No. 426,650
Claims priority, application Japan, Dec. 15, 1972, 47-125240
Int. Cl. H02p 5/00
U.S. Cl. 318—139 **1 Claim**



1. In a direct current motor control device for use in a battery-powered automobile having a direct current motor and a plurality of battery groups for supplying a direct current to said motor, a battery change-over thyristor circuit including a chopper circuit for changing over said battery groups from series connection to parallel connection and vice versa with respect to said motor, an accelerator signal generator connected to an accelerator pedal for delivering an output voltage in response to the operation of the accelerator pedal, a current detector circuit connected between said motor and said accelerator signal generator for delivering an output voltage in response to operation of the motor, and a turn-over signal generator circuit connected between said accelerator signal generator circuit and said motor current detector circuit and connected to said battery turn-over thyristor circuit for controlling said series-parallel change-over operation of said battery change-over thyristor circuit when the deviation between the output from said current detector circuit and the output from said accelerator signal generator circuit arrives at a predetermined value, the improvement comprising a αmax detector circuit connected to a common junction point between said current detector circuit and said accelerator signal generator circuit and said change-over signal generator circuit for detecting a predetermined maximum value in response to said deviation between the output from said current detector circuit and the output from said accelerator signal generator circuit to produce a step-up signal, and an αmin detector connected to the common junction point between said current detector circuit and said accelerator signal generator circuit on the one hand, and to said change-over signal generator circuit on the other hand, and for detecting a predetermined minimum value in response to said deviation between the output from said current detector circuit and the output from said accelerator signal generator circuit to produce a step-down signal, whereby said battery turn-over signal generator circuit becomes operated in response to the output signals from said αmax and αmin detector circuits.

4,075,542

INERTIA POWER SYSTEM

Robert J. Szegedy, 13 Mallory Hill Road, Georgetown, Conn. 06829

Filed July 29, 1975, Ser. No. 600,062
Int. Cl.[2] H02K 7/02
U.S. Cl. 318—161 **6 Claims**

1. An inertia power system comprising:

an inertia means including an inertia wheel for storing rotational energy and having an input and output end,

a drive means for effecting the rotation of said inertia wheel, operatively associated with the input end,

said drive means comprising an input magnet having a north and south pole journalled to said inertia wheel to rotate therewith,

a plurality of serially energized electromagnets circumferentially spaced about said input magnet so as to be opposite the poles of said magnet,

a second magnet rotatably mounted so as to be under the influence of said first magnet,

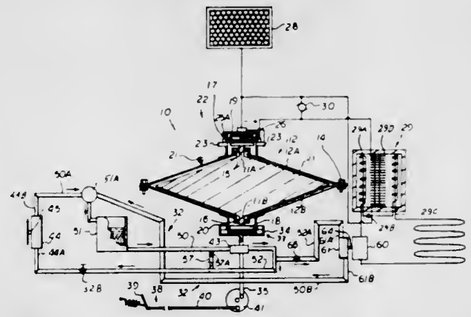
said second magnet having a field which is substantially less than the field of said input magnet,

spaced commutator stator stations operatively associated with said second magnet,

a terminal contact,

said electromagnets having windings connected between the associated commutator stator sections and said terminal contact,

and said second magnet having its poles oppositely disposed relative to the poles of said input magnet,



and a brush carried on one of the poles of said second magnet so as to electrically contact said commutator stator sections,

and a source of electrical energy for serially energizing said electromagnets whereby the developed field effects the rotation of said input magnet which imparts rotation to said inertia wheel and said second magnet,

and including a clutch means having;

an output magnet connected to the output end of said inertia wheel to rotate therewith,

a complementary clutch member moveably mounted relative to said output magnet,

said complementary clutch member including a plurality of magnets adapted to lock and unlock onto said output magnet as said complementary member is moved relative thereto,

and means for actuating said complementary clutch member.

4,075,543

METHOD OF DETERMINING THE POSITION AND CONNECTION OF MULTI-POLE WINDINGS FOR MULTI-SPEED ELECTRIC MACHINES

Thuy Nguyen Uyen, Grenoble, France, assignor to Anvar Agence Nationale de Valorisation de la Recherche, France

Continuation of Ser. No. 496,249, Aug. 9, 1974, abandoned. This application Apr. 29, 1976, Ser. No. 681,636
Claims priority, application France, Aug. 17, 1973, 73 30390
Int. Cl.[2] H02K 3/00
U.S. Cl. 318—224 R **7 Claims**

1. A method of modifying a one-speed machine, wherein the elementary coils are arranged to provide a 2 p pole machine, into a two-speed machine having $2|p \pm q|$ poles at the other speed, and having an optimum efficiency at both speeds, using only two 3-phased switches, comprising the steps of:

choosing a base winding wherein the elementary coils are arranged to provide a 2 p pole machine;

dividing the length of the base winding along the air gap into 6 q sectors;

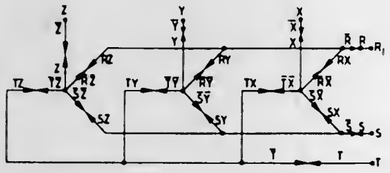
bringing the middle of any one of said 6 q sectors into the best coincidence possible with the middle of any one of the poles of any phase of said

2 p pole winding and denoting this sector as the first sector;

choosing an arbitrary positive direction for the pole and sector series:

referencing the elementary coils of said first sector for connection to the same phase in the 2 p pole configuration as in the $2|p \pm q|$ pole configuration;

assigning sector designations 2 to 6 to the sectors following said first sector in the positive direction, and referencing the elementary coils of sectors 2 to 6 for connection in phases which are shifted respectively for sectors 2 to 6 by $(\pi/6)$, $(2\pi/6)$, $(3\pi/6)$, $(4\pi,6)$, $(5\pi/6)$ with respect to the phase feeding them in the 2 p pole configuration in the case of the $2|p - q|$ pole configuration, and in phases which are shifted respectively for sectors 2 to 6 by $-\pi/6$, $(-2\pi/6,)$ $-3\pi/6$, $-4\pi/6$, $-5\pi/6$, with respect to the



phase feeding them in the case of the $2|p + q|$ pole configuration;

referencing the elementary coils for each of the q successive groups of 6 sectors for connection the same as is recited above; in the $2|p \pm q|$ pole winding thus determined, eliminating the elementary coils which are detrimental to the winding symmetry, whereby a winding is obtained which has 3 phases which are mutually phase-shifted by exactly 120° and which each comprise the same number of elementary coils;

connecting all of the elementary coils remaining after said elimination of said coils detrimental to winding symmetry in a circuit comprising three parallel stars, the ends of which are supplied through a first three-phase switch by three corresponding phases of the power supply source for operation at one of said speeds when said first switch is activated, the middle points of the star arms being respectively short-circuited for each phase and supplied through a second three-phase switch by three corresponding phases of said power supply source for operation at the other of said speeds when said second switch is activated.

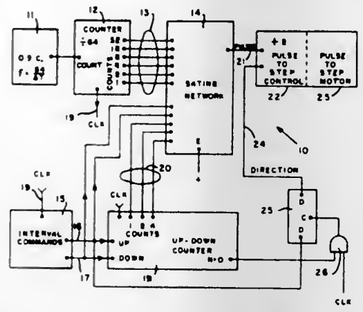
4,075,544

LINEAR VELOCITY CHANGE STEPPING MOTOR CIRCUIT

Albert C. Leenhouts, Harwinton, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed Oct. 27, 1976, Ser. No. 736,019
Int. Cl.² G05B 79/40
U.S. Cl. 318—696 **22 Claims**

1. A motion control system for producing digital motion in accordance with input commands of stepping rates for consecutive time intervals comprising means for accepting the input commands including a command for a different stepping rate for a present time interval as compared to the command for the stepping rate of a prior time interval, means for providing a train of pulses corresponding to the present commanded stepping rate including means for linearly changing the rate of the pulses in the train from initially the rate of the prior commanded stepping rate to finally the rate of the present commanded stepping rate and pulse to step means for receiving the



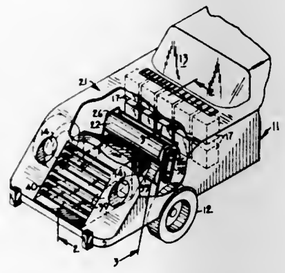
pulses and producing movement essentially in accordance with the rate of the pulses in the train.

4,075,545

CHARGING SYSTEM FOR AUTOMOBILE BATTERIES

Merle D. Haberer, Bowdle, S. Dak. 57428

Filed Dec. 6, 1976, Ser. No. 747,512
Int. Cl.² B60L 11/18; F03D 9/02
U.S. Cl. 320—61 **6 Claims**



1. In a vehicle having a body, supporting wheels for said body, motor means for driving at least one of said wheels, an electrical storage battery, and generator means for charging said battery and including field pole pieces and an armature; generator operating means for imparting relative rotation between said armature and pole pieces and comprising:

(a) a pair of impeller rotors each including a cylindrical drum and circumferentially spaced vanes projecting generally radially outwardly from said drum and extending generally longitudinally of said drum;

(b) means journaling said impeller rotors in said body on parallel axes and in closely spaced apart relationship to define an air passageway between said impellers rotors;

(c) one of said impeller rotors being operatively connected to said field pole pieces for rotation therewith;

(d) armature driving means operatively connecting the other of said impeller rotors to said armature for rotation therewith;

(e) conduit means defining an air inlet for movement of air from the exterior of said body to said air passageway for impartng rotation to each of said impeller rotors in a direction opposite that of the other of said impeller rotors responsive to forward movement of the vehicle, whereby to rotate said field pole pieces and armature in opposite directions relative to each other.

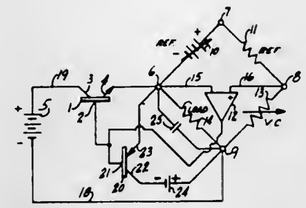
(f) and guide means in said body cooperating with said impeller rotors to provide discharge passageways leading from said air passageway generally circumferentially of said impeller rotors.

4,075,546

REGULATED POWER SUPPLY WITH COMBINED SERIES AND SHUNT REGULATING TRANSISTORS

Alfred William Barber, 50-16 232nd St., Bayside, N.Y. 11364

Filed Aug. 18, 1976, Ser. No. 715,397
Int. Cl.² G05F 1/56, 1/60
U.S. Cl. 323—22 T **3 Claims**



1. In a regulated power supply including a reference voltage source, a pair of load terminals, a capacitative load connected across said load terminals, means for controlling the voltage across said load terminals in accordance with said reference voltage consisting of; an error amplifier having input and output terminals connected with its input coupled to said source of reference voltage and said load terminals in order to provide an error voltage to said amplifier, a source of unregulated voltage and a series pass transistor of a given polarity connected between said source of unregulated voltage and one of said load terminals and coupled to the output of said error amplifier for controlling the current to said load terminals and the voltage thereacross; the improvement which includes;

a second transistor of opposite polarity to said pass transistor connected in shunt with said load terminals and with its base coupled to the output of said error amplifier;

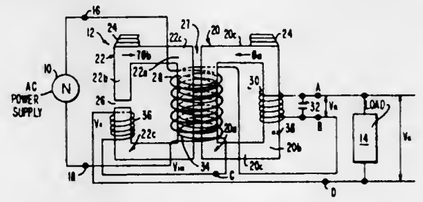
whereby said pass transistor solely controls current passing from said unregulated supply to said load and said second transistor solely absorbs current from said load providing two way flow of current to and from said load capacitance.

4,075,547

VOLTAGE REGULATING TRANSFORMER

Theodore Wroblewski, Danvers, Mass., assignor to Frequency Technology, Inc., Littleton, Mass.

Filed July 23, 1975, Ser. No. 598,270
Int. Cl.² G05F 3/06
U.S. Cl. 323—60 **2 Claims**



1. A ferro-resonant voltage regulating transformer, comprising:

A. first and second permeable magnetic cores, said cores spaced by an air gap and said first core comprising a closed magnetic circuit, said second core having an air gap,

B. a primary winding for connection to a source of alternating current of fluctuating voltage, said primary winding arranged around a portion of both said cores for inducing a magnetic flux therein,

C. a resonant secondary winding having first and second terminals, said resonant secondary winding being arranged around a portion of said first core, so that a voltage is induced in said resonant winding in response to the magnetic flux in said first core,

D. a capacitor in parallel with said resonant winding, said resonant winding and said capacitor forming a resonant circuit which resists voltage increases across said resonant winding beyond a preselected level and thereby substantially limits the maximum instantaneous magnetic flux in said first core over a range of primary voltage variations to regulate the voltage across the resonant circuit, whereby a substantial flux flows in said second core when the flux in said first core increases beyond the preselected level.

E. a direct transfer winding arranged around said primary winding, said primary winding inducing a voltage in said direct transfer winding proportional to the primary voltage,

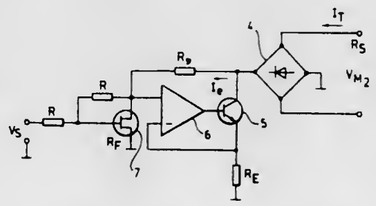
F. a secondary correction winding around a portion of said second core, said correction winding being connected in series with said resonant winding and said direct transfer secondary winding so that the regulated output voltage is the sum of the voltages across said resonant winding, said direct transfer secondary winding and the correction winding, and whereby the flux in said second core induces a voltage in said correction winding to compensate for fluctuations in the voltage across said direct transfer winding.

4,075,548

STABILIZED VOLTAGE SOURCE HAVING A SERIES REGULATOR ON THE ALTERNATING-VOLTAGE SIDE

Erkki Ilmari Leinonen, Vantaa, Finland, assignor to Outokumpu Oy, Outokumpu, Finland

Filed Oct. 27, 1976, Ser. No. 736,084
Claims priority, application Finland, Oct. 27, 1975, 752994
Int. Cl.² G05F 1/48
U.S. Cl. 323—86 **1 Claim**



1. A series regulated stabilized alternating voltage source, which comprises:

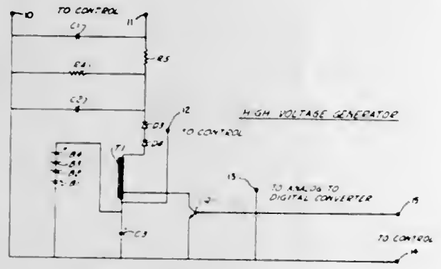
a transformer having a primary coil and a secondary coil, said primary coil being connected between an alternating voltage power input and a load terminal;

a feedback circuit connected between a load output and, said transformer for providing a resistance in the secondary coil of the transformer which is linearly dependent upon a control voltage,

said feedback circuit including means for rectification and smoothing of load output voltage to provide an actual-value DC voltage proportional to said load output voltage, means for providing an adjustable reference DC voltage, a differential amplifier having inputs receiving said actual-value and reference voltages for amplifying the difference between said voltages to produce a control voltage, an FET transistor connected to an output of said differential amplifier, further amplifier means connected to said FET transistor and a rectifier bridge connected between said further amplifier means and the secondary coil of said transformer for transferring to said secondary coil a drain-source resistance of said FET transistor, which resistance is essentially linearly dependent upon the

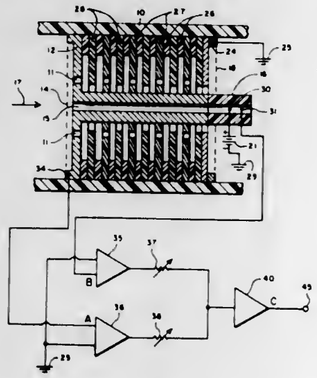
control voltage applied thereto by said differential amplifier.

4,075,549
APPARATUS AND METHOD FOR TESTING ELECTRICAL SURGE ARRESTERS
Roger P. Woodward, Atlanta, Ga., assignor to GW Electronics, Inc., Atlanta, Ga.
Filed June 1, 1976, Ser. No. 691,218
Int. Cl.[2] G01R *31/02*
U.S. Cl. 324—28 R **9 Claims**



1. An electrical surge arrester tester comprising two surge arrester test leads; voltage generating means for generating and applying d.c. voltages of continuously increasing magnitudes to said surge arrester test leads; monitoring means for continuously and simultaneously monitoring the continuously increasing magnitudes of d.c. voltage being applied to and the current being conducted across said surge arrester test leads; counter means for digitally recording the firing voltage monitored by said monitoring means when the current monitored by said monitoring means exceeds a preselected magnitude; means for terminating the the application of voltage by said voltage generating means to said test leads upon recording by said counter means of said firing voltage; and display means for displaying the digitally recorded firing voltage.

4,075,550
IONIZATION CELL FOR SENSING AND MEASURING GASEOUS IMPURITIES
B. Wayne Castleman, Largo, and Bernard C. Schluter, Clearwater, both of Liechtenstein, assignors to Honeywell Inc., Minneapolis, Minn.
Filed Dec. 27, 1976, Ser. No. 754,148
Int. Cl.[2] G01N *27/00*
U.S. Cl. 324—33 **4 Claims**



1. An ionization detector with compensation means for variations in the flow rate of gas sample through the detector and for variations in the ionizing radiation source intensity, comprising:

a housing having an input and an output for flow of gas therethrough;

a source of ionizing radiation positioned in said housing in the proximity of said input;

an electrically conductive manifold mounted within said housing adjacent said source of ionizing radiation on the side nearer said output, said manifold constituting a partition within said housing separating said source of ionizing radiation from a recombination region, said manifold further having a plurality of apertures to permit gas flow from the input of said housing, past said ionizing radiation, into said recombination region;

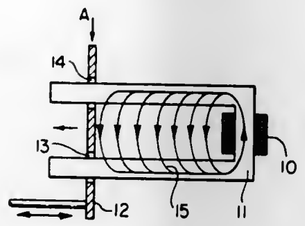
a collector electrode mounted near the output of said housing for generating a first electric signal which is a function of the number of ions present in the gas after passing through said recombination region;

a conduit connected to said manifold, said conduit providing a passage by-passing said recombination region for a portion of said gas ionized by said radiation source;

first and second electric probes mounted in the passage of said conduit for generating a second electric signal which is a function of the number of ions present in the portion of said gas not passing through the recombination region; and

means for utilizing said second signal to compensate for variations in said first signal caused by variations in the rate of gas flow and/or variations in intensity of said source of ionizing radiation.

4,075,551
INDUCTIVE DISPLACEMENT SENSOR
Erich Zabler, Karlsruhe, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany
Continuation-in-part of Ser. No. 523,869, Nov. 14, 1974, Pat. No. 3,973,191. This application Mar. 30, 1976, Ser. No. 671,984
Claims priority, application Germany, Apr. 8, 1975, 2515256
Int. Cl.[2] G01R *33/02*; H01F *21/04*
U.S. Cl. 324—208 **9 Claims**



1. An inductive angular displacement sensor for converting mechanical movement in angular displacement into an electrical signal in accordance with a desired relation between angular displacement of a body, the angular displacement of which is to be measured, and the magnitude of said electrical signal, comprising:

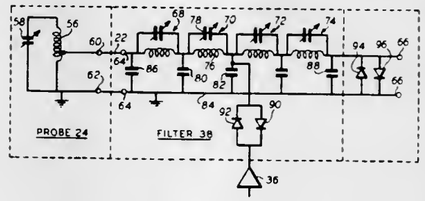
a ferromagnetic core having at least two circularly elongated legs (7,8) connected by a yoke portion (2) of said core at one end of said legs, said legs having an elongated gap between them of a width that varies along the circularly bent length of said legs,

a magnet winding (1) in the neighborhood of the yoke portion (2) of said core (3) wound so as to produce magnetic flux in said elongated gap(s) between the legs (7,8) of said core (3),

a short-circuiting ring member (4) pivoted on an axis perpendicular to the plane of curvature of said legs and passing through their centers of curvature, said short-circuiting ring member providing a short-circuiting path around and substantially adjacent to each leg of the core at substantially the same angular position with respect to said axis and being angularly displaceable about said axis and along the bent length of said core legs in response to angular displacement of the body the displacement of which is to be measured, and

an oscillator circuit (30, 32, 34) in which said magnet winding is connected for varying the frequency of oscillation in accordance with the angular displacement of said short-circuiting ring member, said oscillator comprising the series combination of a comparator (30) having a hysteresis characteristic, an inductance circuit which includes said magnet winding (1) and an integrator (34), and in which the output of said integrator (34) is connected with the variable voltage input of said comparator (30).

4,075,552
WIDE-BAND NUCLEAR MAGNETIC RESONANCE SPECTROMETER
Daniel D. Traficante, 16 Fairbanks Road, and Michael Mulcay, 21 Grant Place, both of Lexington, Mass. 02173
Filed Apr. 24, 1975, Ser. No. 571,433
Int. Cl.[2] G01N *27/00*
U.S. Cl. 324—0.5 AH **16 Claims**



1. In a wide-band nuclear magnetic resonance spectrometer for determining the NMR frequency of a sample in an external magnetic field, a system comprising transmitting means for generating a signal having a frequency equal to the NMR frequency of the sample, receiving means for receiving the signal from the sample, and probe means for applying said signal from said transmitting means to the sample and for applying the signal from said sample to said receiving means, said probe means comprising a first coil adapted to be inductively coupled to the sample and connected across a capacitor to form a tank circuit resonant at the NMR frequency of the sample for detecting the signal of NMR frequency from the sample, and a second coil coupled by mutual inductance to said first coil for applying said sample signal to said receiving means.

4,075,553
ELECTROMAGNETIC DETECTOR RESPONSIVE TO A MODIFICATION OF RADIATED FIELD BY AN INTRUDING METALLIC OBJECT
René Bouverot, and Jean-Raymond Narbaits-Jaureguy, both of Paris, France, assignors to Thomson-CSF, Paris, France
Filed Oct. 5, 1976, Ser. No. 729,802
Claims priority, application France, Oct. 7, 1975, 75 30695
Int. Cl.[2] G01R *33/12*
U.S. Cl. 324—233 **13 Claims**

1. An electromagnetic detector responsive to the intrusion of a metallic object into a radiated energy field, comprising:

field-generating means including a transmitter coil centered on a first axis and a source of alternating current connected to said transmitter coil;

pick-up means including a pair of closely juxtaposed receiver coils disposed on opposite sides of said first axis, said receiver coils being substantially centered on a second axis spaced from said transmitter coil and generally transverse to said first axis;

circuit means for deriving a reference oscillation from said source;

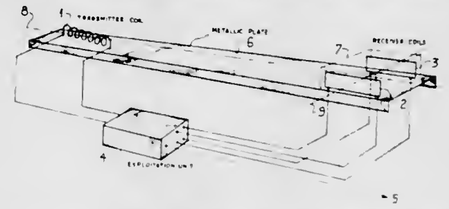
a pair of amplifiers respectively connected to said receiver coils, said amplifiers being provided with individual gain-control inputs for varying the amplitudes of currents induced in the associated receiver coils;

summing means connected to said amplifiers for combining the amplified currents thereof into a resultant oscillation varying in phase, with respect to said reference oscillation, with the relative amplitudes of said amplfied currents;

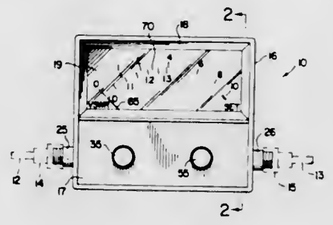
phase-comparison means connected to said circuit means and to said summing means for receiving said reference oscillation and said resultant oscillation therefrom, said phase-comparison means having a pair of output terminals respectively energizable in response to phase differences of different sign;

slow-acting feedback means connecting each of said output terminals to a respective one of said gain-control inputs for maintaining a cophasal relationship between said reference oscillation and said resultant oscillation in the absence of an intruding metallic object; and

utilization means connected to said output terminals.



4,075,554
VSWR METER CIRCUIT USING VARIABLE RF ATTENUATOR
Frank Howard Mecklenburg, Shaker Heights, Ohio, assignor to Bird Electronic Corporation, Solon, Ohio
Continuation-in-part of Ser. No. 719,565, Sept. 1, 1976. This application Nov. 3, 1976, Ser. No. 738,474
Int. Cl.[2] G01R *27/02, 21/04*
U.S. Cl. 324—58 B **1 Claim**



1. In an instrument for detecting and measuring directional RF voltage wave signals on a coaxial transmission line and including a coaxial line section adapted to be inserted in said transmission line, an inductive pick-up coil mounted for rotation about an axis normal to the axis of said line section for selectively sensing and measuring the magnitude of both the forward and reflected RF voltage standing waves on said transmission line, D'Arsonval meter movement means, and circuit means operatively connected between said meter movement means and said inductive pick-up coil, said circuit means including a rectifier diode and a scale expanding potentiometer for setting the meter pointer to a fixed index point on the meter scale when said inductive pick-up coil is rotated to a position to sense the forward RF voltage wave on said transmission line whereby when said inductive pick-up coil is thereafter rotated approximately 180° to a position to sense the reflected RF voltage wave on said transmission line, said pointer may indicate the voltage standing wave ratio on a respective meter scale, the improvement wherein said circuit means comprises:

a variable RF attenuator electrically connected between said

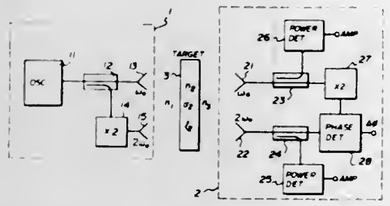
diode and said inductive pick-up coil, said attenuator including a series resistor, a shunt resistor and said scale expanding potentiometer connected in series with said shunt resistor, whereby the deflection of said D'Arsonval meter movement means is relatively undistorted throughout the range of induced RF voltage levels sensed by said pick-up coil.

4,075,555

ELECTRONIC PHASE COMPARISON APPARATUS FOR THE REMOTE MEASUREMENT OF LAYER THICKNESS

James S. Wight; Walter J. Chudobiak, both of Ottawa, Canada, and Vassilios Makios, Patras, Greece, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Mar. 25, 1977, Ser. No. 781,506
Int. Cl.² G01R 27/04
U.S. Cl. 324—58.5 R **8 Claims**



1. Apparatus for the remote measurement of the thickness of n layers in a dielectric target where $n \geq 1$, comprising:

transmitter means having $n + 1$ single frequency channels for directing $n + 1$ related frequency signals to the target; and

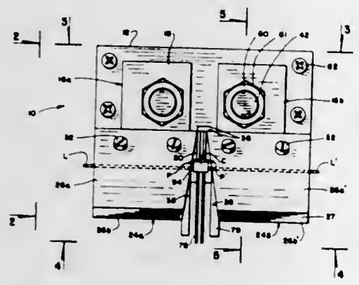
receiver means for receiving the $n + 1$ signals from the target, said receiver means including first means for converting the signals to a common frequency and second means for comparing the phase of pairs of the converted signals for determining the thicknesses l of the n layers as a function of the phase differences where $l < \lambda/4$, λ being the shortest wavelength of the difference frequency between the related $n + 1$ signals.

4,075,556

TEST FIXTURE FOR MINIATURE CAPACITORS

Harry V. Seaman, Northport, N.Y., assignor to American Technical Ceramics, division of Phase Industries Inc., Huntington Station, N.Y.

Filed Jan. 28, 1977, Ser. No. 763,346
Int. Cl.² G01R 11/52, 27/26
U.S. Cl. 324—60 C **10 Claims**



1. A test fixture for a miniature capacitor having terminal leads and conductive ends, comprising an insulative support;

two shield plate assemblies mounted on said support in coplanar spaced disposition, each shield plate assembly comprising:

a pair of flat conductive shield plates disposed parallel to each other with edges in registration; and

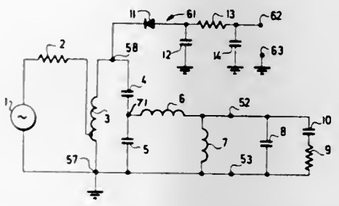
a spacer plate disposed between said shield plates, for receiving an axial one of said terminal leads between said shield plates and opposing inner edges of said spaced shield plate assemblies being disposed angularly to each other for engaging opposite conductive ends of said capacitor therebetween.

4,075,557

CONTACTLESS FACILITIES FOR DETERMINING THE SPECIFIC RESISTANCE OF A TEST SAMPLE

Milos Jurca, Prague, Czechoslovakia, assignor to CKD Praha, oborovy podnik, Prague, Czechoslovakia

Filed Oct. 1, 1976, Ser. No. 728,839
Claims priority, application Czechoslovakia, Oct. 1, 1975, 6635/75
Int. Cl.² G01R 27/02
U.S. Cl. 324—62 **9 Claims**



1. In an apparatus for determining the specific resistance of a test sample, a capacitive probe positionable in electrostatic coupling relation to the surface of the sample, a first coil having a reference terminal, a first path connected across the first coil and including first and second serially connected capacitors, a second path including first and second serially connected reactors for compensating the coupling capacitance between the probe and the substrate and the capacitance of the probe, respectively, means for connecting the second path between the junction of the first and second capacitors and the reference terminal, means for connecting the probe between the junction of the first and second reactors and the reference terminal, voltage detecting means connected across the first path, and means for supplying a high-frequency exciting current to the first coil, thereby to vary the voltage across the voltage detecting means as a prescribed function of variations in the specific resistance of the sample.

4,075,558

METHOD OF AND SYSTEM FOR METERING A PERIODICALLY VARYING VOLTAGE

Peter Harzer, Eningen, Germany, assignor to Wandel U. Goltermann, Reutlingen, Germany

Filed Sept. 7, 1976, Ser. No. 720,785
Claims priority, application Germany, Sept. 6, 1975, 2539694
Int. Cl.² G01R 17/06, 19/22
U.S. Cl. 324—99 R **10 Claims**

3. A system for determining the average amplitude of a pulsating input voltage, comprising:

a supply of continuous direct current;

a capacitor connected to said supply for charging by said continuous current;

subtractive circuitry including first current-control means pulsed by said input voltage connected to said capacitor for reverse-charging same during pulsations of said input voltage at a rate depending upon the magnitude of said pulsations;

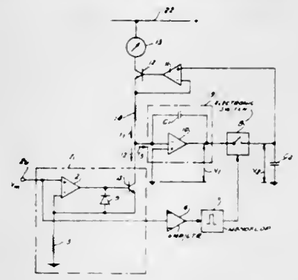
switch means controlled by said input voltage and connected to said capacitor for sampling the charge thereof at a point in each cycle of said input voltage, substantially coinciding with the beginning of each pulsation, at which said charge is at a substantially constant level during steady-state operation;

storage means connected to said switch means for deriving a reference voltage from successive charge samples;

second current-control means in series with said supply;

circuit means connecting said storage means to said second current-control means for varying the magnitude of said continuous current in response to said reference voltage to compensate for variations of said level due to changes in said input voltage; and

metering means in series with said second current-control means for measuring the magnitude of said continuous current.

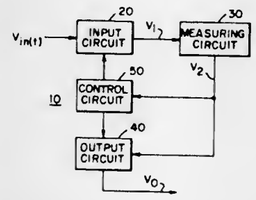


4,075,559

TECHNIQUE FOR EXTENDING THE RANGE OF A SIGNAL MEASURING CIRCUIT

Anthony G. Chaprnka, Cockeysville, Md.; Shan C. Sun, Pittsburgh, and Leonard C. Vercellotti, Verona, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 24, 1975, Ser. No. 598,611
Int. Cl.² G01R 15/08, 17/06; H04B 1/64
U.S. Cl. 324—115 **6 Claims**



1. The combination of:

a signal measuring circuit means having an input and an output, and a defined dynamic range;

an input circuit means connected to said input of said signal measuring circuit means, said input circuit means adjusting the magnitude of an input signal to a level within said defined dynamic range, the resulting adjusted signal being supplied to said signal measuring circuit means, said signal measuring circuit means producing a first output signal corresponding to a measured characteristic of the adjusted signal;

an output circuit means connected to the output of said signal measuring circuit means to adjust the magnitude of said first output signal to a level corresponding to said input signal to produce a second output signal indicative of the measured characteristic of said input signal; and

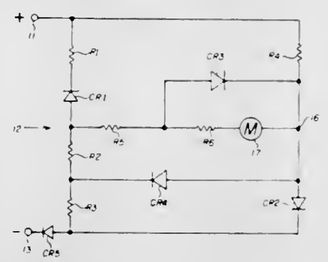
a control circuit means connected for producing first and second control signals, said input circuit means responding to said first control signal by adjusting the magnitude of said input signal a predetermined amount in a first direction and said output circuit means responding to said second control signal by adjusting the magnitude of said first output signal said predetermined amount in the opposite direction to produce said second output signal.

4,075,560

EXPANDED SCALE ELECTRICAL MEASURING CIRCUIT

Francis J. Stifter, 171 South Main St., Natick, Mass. 01760

Continuation of Ser. No. 555,065, March 3, 1975, abandoned. This application Dec. 10, 1976, Ser. No. 749,286
Int. Cl.² G01R 15/08
U.S. Cl. 324—131 **9 Claims**



1. A measuring circuit comprising:

a four-arm bridge having a pair of input terminals for connection to a source of input voltage to be measured, each of said input terminals connecting ends of a different pair of the arms of said bridge;

a first measuring terminal connecting opposite ends of one pair of arms comprising one arm in each of said different pairs of arms;

a second measuring terminal connecting opposite ends of another pair of arms comprising the other arms in each of said different pairs of arms;

voltage divider means in said one pair of arms, said voltage divider means comprising in a first arm of said one pair of arms a series combination of a linear resistor and a voltage regulator semiconductor means for producing a fixed reduction in the portion of said input voltage applied to said first measuring terminal;

voltage reference means in said another pair of arms, said voltage reference providing a fixed reference voltage at said second measuring terminal; and

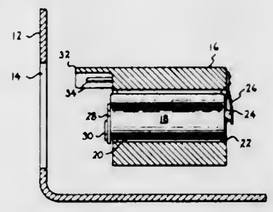
measuring means connecting said first and second measuring terminals.

4,075,561

PROGRAMMABLE ELECTRICAL APPARATUS CONTAINING A BATTERY

Francis Joseph Stevens, North Berwick, Maine, assignor to General Electric Company, New York, N.Y.

Filed Nov. 1, 1976, Ser. No. 737,675
Int. Cl.² G01R 1/04, 35/04, 1/20
U.S. Cl. 324—149 **6 Claims**



1. A programmable electrical apparatus containing a replaceable battery, comprising:

a. an electrical apparatus containing a replaceable battery and having an electrically programmable system therein;

b. a housing for enclosing said apparatus having a small access port therein for the installation and removal of replacement batteries and the insertion of a terminal coupling member of a programming instrument; and

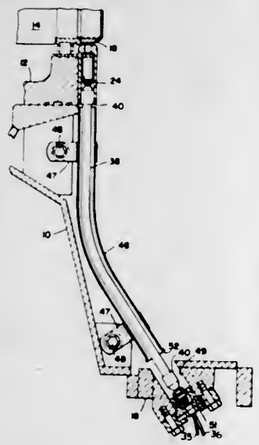
c. a composite unit including an integral battery supporting receptacle and an integral electrical terminal connector for making electrical contact with a terminal coupling member of a programmable instrument, said battery supporting receptacle and terminal connector of the unit being positioned inside the housing of the apparatus concentrically aligned with the access port of the housing and within a circumferential area smaller than the periphery of the access port, whereby replacement batteries can be installed through said access port in the housing and into the integral battery support receptacle and a terminal connecting member of a programming instrument can be inserted through said access port in the housing for mating in electrical contact with the integral terminal connector of the apparatus.

4,075,562

SPEED SENSOR MOUNTING FOR A GAS TURBINE

Karl W. Karstensen, and Brace C. Smith, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 1, 1976, Ser. No. 728,588
Int. Cl.² G01P *3/48*
U.S. Cl. 324—173 **9 Claims**



1. In a gas turbine engine having an output shaft mounted in a casing, the output shaft having a toothed nut mounted thereon, and a magnetic device responsive to rotation of the output shaft for generating a current fluctuating in direct proportion to the speed of rotation of the output shaft, an electromagnetic speed sensor mounting assembly for mounting said magnetic device adjacent said toothed gear comprising:

electrical conduit means interconnected with said magnetic device for conducting the fluctuating current therefrom;

threadably bored fitting means lockingly receiving the magnetic device, said magnetic device partially extending from a first end of the bored fitting means a predetermined distance so that the bored fitting means forms a stopped juncture with the magnetic device, said electrical conductor means extending from the other end thereof;

socket means rigidly associated with the turbine casing in the vicinity of the toothed nut and defining a threaded radial bore relative the shaft and a counterbore extending outwardly therefrom, said counterbore slidably receiving the fitting means allowing the magnetic device to be threadably received in the threaded radial bore;

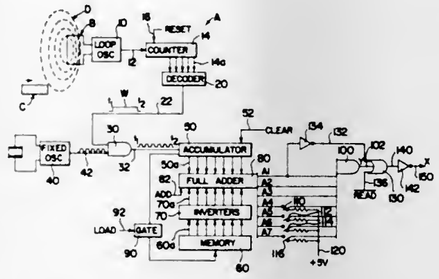
flexible conduit means removably lockably affixed to the threadably bored fitting means for protecting the electrical conductors and for rotating the fitting means in the socket means.

4,075,563

DIGITAL LOOP DETECTOR WITH IMPROVED DETECTION CONTROL

Francis L. Battle, Davenport, Iowa, assignor to Gulf & Western Industries, Inc., New York, N.Y.

Filed May 13, 1976, Ser. No. 686,026
Int. Cl.² G01R *33/12*
U.S. Cl. 324—236 **9 Claims**



1. In a digital detector device for detecting a metal object in the field of influence of a detector loop controlling the frequency of pulses created by an oscillator, said digital detector device including counter means for counting said pulses created by said oscillator during a counting interval having a selected duration whereby the magnitude of the pulses counted during said controlled interval is indicative of the inductance of said loop and digital means for creating an output signal when the number of pulses counted by said counter means for a given counting interval differs from a selected count by a number greater than a selected threshold number, the improvement comprising: said digital means including means for creating a binary coded signal having a series of binary bits arranged in a selected order for indicating the difference between said number of counted pulses and said selected count; a binary logic circuit having a plurality of input lines individually corresponding to said bits and divided into first and second groups, an output line and means for creating said output signal in said output line when the logic on one of said input lines is at a selected binary logic value; a source of binary logic value opposite to said selected binary logic value; separate sensitivity switch means for selectively shifting said input lines of said first group between a first position where said associated input line has a binary condition controlled by a corresponding one of said binary bits and a second position where said associated input line has a binary condition controlled by said binary logic source; means for directing bits of binary logic to corresponding input lines of said second group of input lines; and, means for inhibiting creation of said output signal when a selected one of said input lines in said second group is at said selected binary logic value.

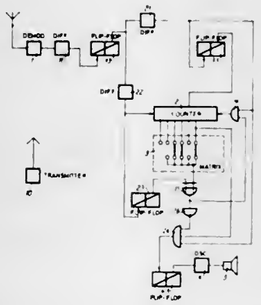
4,075,564

SELECTIVE CALLING ARRANGEMENT

Christian Masur, Grenchen, and Václav Štverák, Solothurn, both of Switzerland, assignors to Autophon Aktiengesellschaft, Solothurn, Switzerland

Filed Apr. 28, 1976, Ser. No. 680,916
Claims priority, application Switzerland, Apr. 28, 1975, 5435/75
Int. Cl.² H04B *1/00*
U.S. Cl. 325—55 **3 Claims**

1. In a selective calling system of the type wherein a fixed transmitter transmits a binary-encoded calling signal to a plurality of portable receivers, said calling signal comprising radio-frequency pulses of uniform width separated by first and second intervals respectively representative of the two binary states in said calling signal, and wherein each said receiver comprises means for receiving the encoded pulses transmitted by said transmitter, comprising an RF demodulator for generating DC pulses corresponding to said radio-frequency pulses, a first timing circuit triggered in dependence of said DC pulses, the holding time of said first timing circuit being intermediate said first and said second pulse intervals and being restored with every triggering pulse, means to detect the binary value of each interval by detecting the state of said first timing circuit at the end of said interval, a memory for storing the binary signal uniquely assigned to call said receiver, means for comparing said detected binary signal with said stored binary signal and for generating an alarm signal if there is a correspondence between said two binary signals and means for generating a reset signal for restoring said comparing means if there is no generation of DC pulses during a certain time interval, the improved receiver which comprises:



a first differentiating circuit connected to the output of said demodulator for generating a train of short pulses corresponding to the leading edges of said DC pulses;

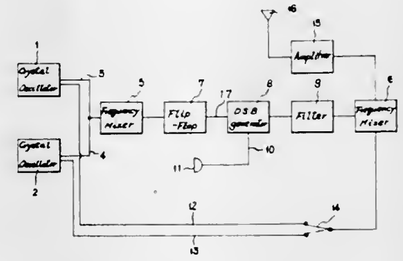
a second timing circuit having a triggering input connected to the output of said first differentiating circuit, said second timing circuit, when triggered, generating a pulse which has a duration substantially equal to the duration of each of said pulses of uniform width, said pulse duration is unaffected by repeated triggering of said second timing during the generation of said pulse, said pulse exclusively determining the triggering and the moment of detecting the state of said first timing circuit.

4,075,565

SINGLE SIDE-BAND WAVE GENERATION SYSTEM

Arai Kazuo, Kitamoto, Japan, assignor to Nissan Denshi Kabushikikaisha, Japan

Filed May 17, 1976, Ser. No. 686,681
Claims priority, application Japan, Oct. 17, 1975, 50-125493
Int. Cl.² H04B *1/04*
U.S. Cl. 325—138 **19 Claims**



2. Single sideband wave generating apparatus comprising:

a first oscillator producing a first wave of a first frequency;

a second oscillator producing a second wave of a second and different frequency;

means for mixing said first and second waves to produce a third wave of a third frequency corresponding to the difference between said first and second frequencies;

means for dividing the frequency of said third wave to produce a carrier wave of a frequency corresponding to a predetermined portion of said third frequency;

a source of an audio frequency input signal;

means for producing a modulated wave at said carrier wave frequency modulated by said audio frequency signal; and

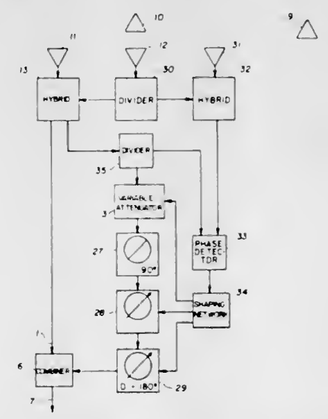
means for mixing said modulated wave with one of said first and second waves to produce a single sideband output wave.

4,075,566

CO-CHANNEL INTERFERENCE SUPPRESSION APPARATUS

Timothy D'Arcangelis, Oakdale, N.Y., assignor to CATV Components Co., Stony Brook, N.Y.

Continuation-in-part of Ser. No. 239,697, March 30, 1972, abandoned. This application Apr. 15, 1974, Ser. No. 461,155
Int. Cl.² H04B *1/10*
U.S. Cl. 325—369 **3 Claims**



1. Apparatus to suppress an interference signal on the same frequency as a desired signal, comprising:

a) a sum and difference hybrid having a first and second input port and two output ports, one a sum port and the other a difference port, the first and second input ports receiving signals from a first and second antenna respectively of a two antenna array directed at the desired signal source,

b) a combiner having a first and second input port and one output port the first input port of the combiner being connected to the hybrid sum port and the second input port of the combiner being connected to the hybrid difference port,

c) means for introducing a change in amplitude in the signal from one of the output ports of the hybrid to permit the interference signal component of said signal from the hybrid to be made equal in magnitude to the interference signal component of the signal from the other output port of the hybrid, and

d) means for introducing a change in phase of substantially 90° in one of the output signals from the hybrid to permit the interference component of that signal to be placed in phase opposition with the interference component of the other output signal from the hybrid to produce cancellation of the interference signal components when the hybrid output signals are added in the combiner, said means for introducing a change in phase includes a variable phase shifter, a fixed 90° phase shifter, a switchable 180°

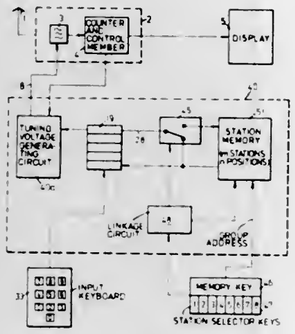
phase shifter in series with the 90° phase shifter to produce in combination a plus 90° total phase shift when the 180° phase shifter is switched out of the circuit and a −90° phase shift when the 180° phase shifter is switched into the circuit.

4,075,567

BROADCAST RECEIVER TUNING CIRCUIT WITH STATION MEMORY

Otto Klank, Arpke, and Dieter Rottmann, Misburg, both of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Dec. 21, 1976, Ser. No. 753,082
Claims priority, application Germany, Dec. 22, 1975, 2557856
Int. Cl.² H04B *1/16*
U.S. Cl. 325—453 **17 Claims**



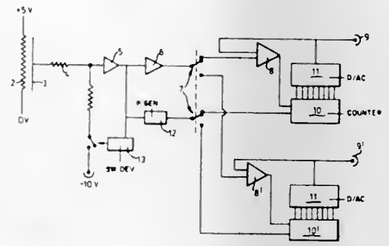
1. In a tuning circuit for a high frequency broadcast receiver, which circuit includes a voltage controllable superheterodyne oscillator arranged to receive a control voltage and to produce an oscillation whose frequency is determined by the value of the control voltage and determines the broadcast frequency to which the receiver is tuned, a counter connected to sense the frequency of the oscillations being generated by the oscillator and to produce therefrom a count state in the form of representations of the digits of a first decimal number identifying the broadcast frequency to which the receiver is currently tuned, input means for generating representations of the digits of a second decimal number identifying the broadcast frequency to which it is desired to tune the receiver, a circulating memory having a plurality of memory cells, including a memory input cell and a memory output cell, for storing a succession of digit representations and having an input connected to the input means for receiving the representations of successive digits of the second number and a feedback path connected for causing the representations in the memory output cell to be conducted back to the memory input cell and a comparison circuit for comparing the decimal number representations being produced by the counter and contained in the memory to vary the control voltage in a direction to cause the number representation produced by the counter to coincide with the number representation generated by the input means, the comparison circuit including a single comparator capable of comparing, at one time, only the representations of one digit of each of two numbers, and time multiplex means connected for delivering to the comparator, in succession, each digit representation produced by the counter, starting with the most significant digit, and, simultaneously therewith, each digit representation of corresponding significance generated by the input means, the improvement comprising: a station memory for storing the digit representations completely identifying at least one broadcast frequency, means for selectively connecting said station memory into the feedback path of said circulating memory in a manner to permit transfer of data between said memories; an input unit actuable for providing signals identifying particular station memory locations and initiating a station memory write-in operation; and a logic linkage circuit connected between said input unit and said station memory for selectively writing digit representations currently in said circulating memory into particular station memory locations or reading into said circulating memory digit representations previously stored in particular station memory locations.

4,075,568

ELECTRICAL CONTROL DEVICE

David Vaughan Watkins, London, England, assignor to Fidelity Radio Limited, London, England

Filed Feb. 18, 1976, Ser. No. 659,048
Claims priority, application United Kingdom, Feb. 19, 1975, 7094/75
Int. Cl.² H03K *3/26*; H04B *1/06*; G01N *27/00*
U.S. Cl. 328—1 **14 Claims**



1. Electrical apparatus comprising:
a control device defining a continuously variable quantity which can be set to a selected value by application of the operator's finger;
sensing means connected to said control device and having a first output signal variable over a range of values when the finger is present at said control device thereby placing said control device in a chosen condition, and having a second output signal when in the normal condition with the finger absent from said control device; and
digital storage means coupled to said control device and said sensing means, said storage means being adapted to positively store information representative of said selected value upon removal of the finger from said control device.

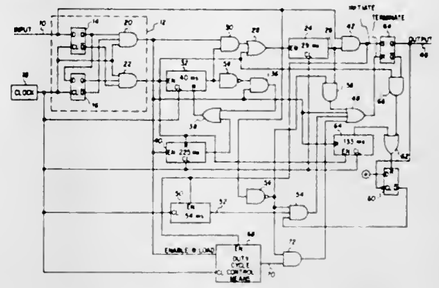
4,075,569

DIGITAL METHOD AND APPARATUS FOR DYNAMICALLY GENERATING AN OUTPUT PULSE TRAIN HAVING A DESIRED DUTY CYCLE FROM AN INPUT PULSE TRAIN

Howard O. Wright, Irvine, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 27, 1976, Ser. No. 727,071
Int. Cl.² H03K *5/04*
U.S. Cl. 328—58 **10 Claims**

1. Digital apparatus for dynamically generating an output pulse train in response to an input pulse train, comprising:
inititate circuit means for receiving the input pulse train and providing an initiate signal upon the transpiration of a predetermined period of time following the inception of each input pulse;
pulse generator means connected to said initiate circuit means for providing the output pulse train, each pulse thereof being initiated in response to an initiate signal and being terminated in response to a terminate signal;
duty cycle control means for receiving the input pulse train and connected to said initiate circuit means for digitally measuring each input cyclical period beginning with the leading edge of an input pulse to provide a digital counting interval indicative thereof and during the next successive input cyclical period traversing said digital counting interval in a time corresponding to a predetermined percentage of the measured cyclical period in response to said initiate signal, and
terminate circuit means for receiving the input pulse train and connected to said duty cycle control means for generating said terminate signal upon the earlier completion of said digital counting interval traversal or the input cyclical period during which it begins.
9. A digital method for dynamically generating an output pulse train in response to an input pulse train, comprising:
generating an initiate signal upon the transpiration of a predetermined period of time following the inception of each input pulse;



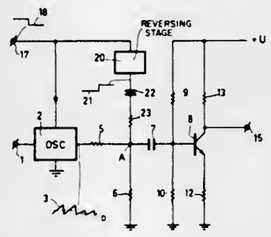
initiating an output pulse in resonse to said initiate signal and terminating it in response to a terminate signal;
digitally measuring each input cyclical period beginning with the leading edge of an input pulse to provide a digital counting interval indicative thereof and during the next successive input cyclical period traversing said digital counting interval in a time corresponding to a predetermined percentage of the measured, cyclical period in response to said inititate signal, and
generating said terminate signal upon the earlier completion of said digital counting interval or the input cyclical period during which it begins.

4,075,570

CIRCUIT ARRANGEMENT FOR TRANSMITTING AN ALTERNATING CURRENT OSCILLATION HAVING DIRECT CURRENT COMPONENTS WHICH CAN BE CHANGED ABRUPTLY

Jörg Wölber, Pinneberg-Thesdorf, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 13, 1976, Ser. No. 714,256
Claims priority, application Germany, Aug. 16, 1975, 2536495
Int. Cl.² H03K *1/14*
U.S. Cl. 328—262 **8 Claims**



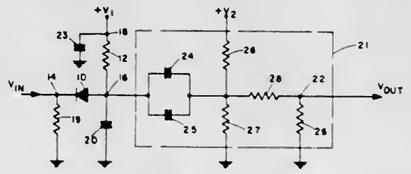
1. A circuit comprising:
an output stage;
a first high pass filter having an input means for receiving an alternating current oscillation having a direct current component with an amplitude in accordance with the amplitude of said oscillation, said direct current component being subject to undesired rapid changes and an output means coupled to said stage for applying said high pass filtered alternating current oscillation together with said undesired direct current component rapid changes to said output stage; and
a second high pass filter having an input means for receiving a control signal having rapid changes coinciding with said undesired rapid changes for effecting rapid changes in the amplitude of said alternating current oscillation, whereby the amplitude of said direct current component has rapid changes in accordance with said control signal, and an output means coupled to said stage for applying to said output stage a high pass filtered control signal with a variation for compensating only for said undesired rapid changes of said direct current component of said alternating current oscillations, said first and second filters having a cutoff frequency component of said oscillation and said control signal respectively.

4,075,571

EXTERNALLY BIASED VIDEO DETECTOR CIRCUIT FOR LIMITING CLUTTER AND NOISE IN A DETECTED RADAR SIGNAL

Garry N. Hulderman, Riverside, and Jay B. Winderman, Claremont, both of Calif., assignors to General Dynamics Corporation, Pomona, Calif.

Filed June 8, 1977, Ser. No. 804,671
Int. Cl.² H03K *9/00, 19/12*
U.S. Cl. 329—104 **4 Claims**



1. A video detector circuit for a radar system, comprising,
a detector diode having one of its electrodes connected to an input terminal for detecting an applied signal containing target information, rms noise voltage and components that are representative of clutter, and its other electrode connected to a load terminal for providing a detected signal, wherein the operating characteristics of the diode are defined by a curve having a gradual portion in which the diode forward current increases slightly as the diode forward voltage is increased from zero volts, a steep portion in which the diode forward current increases sharply as the diode forward voltage is further increased, and a knee portion defining a transition between the gradual and steep portions; and
a load resistance connected between the load terminal and a bias terminal;
wherein the improvement comprises,
means for providing a dc potential at the bias terminal to forward bias the detector diode to have a quiescent operating point below the midpoint of the knee portion of its said characteristic curve, thereby limiting diode rms noise current and components in said detected signal that are representative of clutter.

4,075,572

ISOLATION AMPLIFIER HAVING IMPROVED FIDELITY

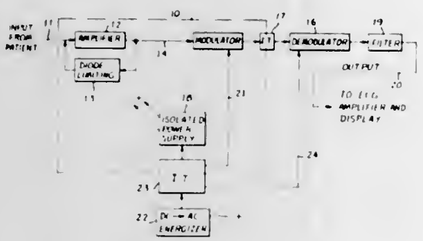
George A. Cavigelli, Lexington, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Jan. 6, 1977, Ser. No. 757,166
Int. Cl.² H03F *3/38*
U.S. Cl. 330—10 **3 Claims**

1. In an isolation amplifier for providing a high degree of conductive isolation between its input and output and for amplifying low level DC input signals, the amplifier compris-

ing: an input portion for receiving the DC input signal and including an AC energized modulator to produce an AC signal substantially corresponding to the DC input signal, an output portion for receiving the AC signal from the input portion and including a phase sensitive demodulator to produce a corresponding, relatively amplified DC output signal, first circuit means for inductively non-conductively coupling said AC signal from said input portion to said output portion, an AC power portion for producing an AC energizing signal for said modulator and said demodulator, said power portion including means having a pair of terminals for connection across a source of DC power for generating said AC energizing signal and second circuit means comprising a transformer having a secondary winding in said input portion and having its primary winding operatively connected in said power portion for non-conductively coupling the AC energizing signal from said AC energizing signal generating means to said input portion to activate said modulator, third circuit means for coupling the AC energizing signal from said power portion AC signal generating means to said output portion to activate said demodulator, said AC power portion exhibiting relatively low impedance during the opposite amplitude extremes of the AC cycle and normally a relatively higher impedance during the transition between the opposite amplitude extremes, the coupling of common mode interference signal sources through stray capacitance to said AC power portion being operative during said normally higher impedance thereof to modify the output voltage therefrom sufficiently to possibly interfere with the accurate reproduction of the input signal as the DC output signal;

the improvement wherein said AC energizing signal generating means of said AC power portion comprises a pair of complementary switch means actuable for alternately and oppositely connecting a source of DC power to said transformer primary to provide said AC energizing signal, each switch means of said complementary pair comprising a separate pair of semi-conductor switches having at least three electrodes including a control electrode, one switch of each said separate pair being connected intermediate one end of said transformer primary and one DC power source terminal and the other switch of said separate pair being connected intermediate the other end of said transformer primary and the other DC power source terminal, and means for controlling the conduction and non-conduction of said complementary pair of switch means, said switch conduction controlling means including means for generating a pair of square wave control signals of opposite polarity having relatively fast rise and fall times and means for connecting said square wave control signals of one polarity to the control electrodes of the switches comprising one switch means of the complementary pair and said square wave control signals of the opposite polarity to the control electrodes of the switches comprising the other switch means of the complementary pair such that substantially full conduction through one switch means of said complementary pair is at least substantially concurrent wit significantly reduced conduction through the other switch means of said complementary pair, thereby minimizing both the increase of impedance of said AC power portion during said transition and the interval during which said impedance increase exists.



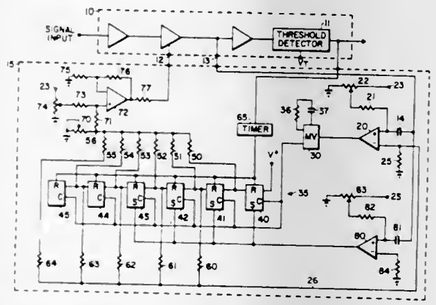


4,075,573

INCREMENTAL AGC SIGNAL GENERATOR WITH CONTROLLABLE INCREMENTS

Howard L. Kennedy, Phoenix, and John Ooms, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 5, 1977, Ser. No. 757,116
Int. Cl.² H03G *3/20*
U.S. Cl. 330—129 **9 Claims**



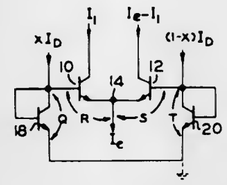
1. An AGC signal generator for controlling the output of a variable gain amplifier comprising generating means connected to the output of the amplifier for generating an output signal with an incrementally variable amplitude in response to the application thereto of an input signal exceeding an AGC threshold level, said generating means further causing the amplitude of the output signal thereof to increase in predetermined increments from a reference level in response to the application of the input signal in excess of the AGC threshold level for a period greater than a predetermined interval, the output signal from said generating means being coupled to control the output of the variable amplifier, and timing means responsive to signals at the output of the amplifier and connected to said generating means for returning the output signal thereof to the reference level when the signal at the output of the amplifier is below a threshold value for a predetermined length of time.

4,075,574

WIDEBAND DIFFERENTIAL AMPLIFIER

Barrie Gilbert, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 623,214, Oct. 16, 1975, abandoned, which is a division of Ser. No. 540,499, Jan. 13, 1975, Pat. No. 3,931,583, which is a continuation of Ser. No. 258,111, May 30, 1972, abandoned, which is a division of Ser. No. 27,765, April 13, 1970, Pat. No. 3,689,752, which is a continuation-in-part of Ser. No. 701,257, Jan. 29, 1968, abandoned, and Ser. No. 835,558, June 23, 1969, abandoned. This application July 15, 1976, Ser. No. 705,634
Int. Cl.² H03F *3/45*
U.S. Cl. 330—257 **19 Claims**



6. A wide band differential amplifier, comprising:

a pair of differentially coupled transistors the emitters of which are coupled together to a suitable source of current, and each having a base terminal and a collector output terminal; and

a pair of input devices receiving differential input signal currents and respectively connected to the differentially coupled transistors, said input devices comprising a pair of semiconductor junction devices having junctions similar to those of said differentially coupled transistors,

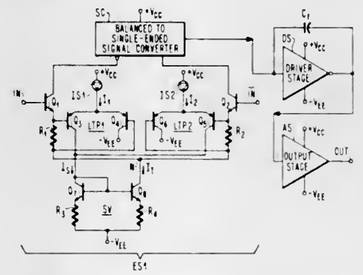
said input devices having logarithmic characteristics substantially matching that of said differentially coupled transistors for producing a linear output at said output terminals.

4,075,575

INPUT STAGE FOR FAST-SLEWING AMPLIFIER

Thomas Joseph Robe, Union, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 9, 1977, Ser. No. 775,867
Int. Cl.² H03F *3/45*
U.S. Cl. 330—259 **14 Claims**



1. A fast-slewing multi-stage amplifier having, in cascade connection, an input stage and stageand at least one succeeding amplifier stage with associated capacitance, the charge on which capacitance must be changed during slewing, wherein said input stage comprises:

first and second transistors of a first conductivity type, each having emitter and collector electrodes and a principal conduction path therebetween and having a base electrode;

means connecting said first and second transistors in long-tailed pair configuration including:

means for applying a first input potential to the base electrode of said first transistor;

means for applying a second input potential to the base electrode of said second transistor; and

a controlled source of tail current connected to an interconnection between the emitter electrodes of said first and said second transistors;

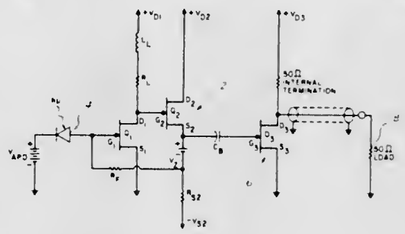
and means responsive to decreased current flowing in the principal conduction path of said first transistor to apply a control signal to said controlled source of tail current to increase said tail current.

4,075,576

SENSITIVE HIGH SPEED SOLID STATE PREAMP

Richard C. Eden, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 25, 1977, Ser. No. 772,173
Int. Cl.² H03F *3/16*
U.S. Cl. 330—277 **13 Claims**



1. A preamp comprising:

an input stage including

a first FET having a drain coupled to a positive voltage, a gate for coupling to the input of the preamp, and a grounded source;

a second FET having a source, a gate coupled to said drain of said first FET, and a drain coupled to a positive voltage;

a level shifting circuit; and

a feedback resistance in series with said level-shifting circuit, said source of said second FET being coupled to said gate of said first FET through said level-shifting circuit and said feedback resistance to provide a negative feedback to said first FET; and

an output stage coupled to said source of said second FET, and having a transmission line output which is lower in impedance than the output impedance of said second FET, said output stage serving as a low capacitance buffer between the low impedance of said transmission line output and the relatively higher output impedance of said second FET.

4,075,577

ANALOG-TO-DIGITAL CONVERSION APPARATUS

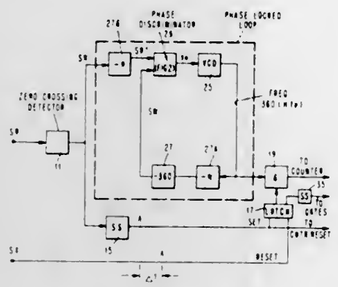
Ernest Lee Walker, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,150
Int. Cl.² H03B *3/04*
U.S. Cl. 331—17 **5 Claims**

1. In a frequency multiplication circuit having a continuously running VCO (voltage controlled oscillator), arranged in a phase locked loop controlled by a phase discriminator, for producing clock oscillation signals at a pedetermined harmonic of the frequency of recurrence of a cyclic reference signal — said clock oscillations being used intermittently for developing an encoded digital count representative of an analog magnitude, over discrete interval segments of a cycle of said reference input — the improvement comprising:

means in said phase discriminator for constraining variations in the VCO control input, during said discrete interval segments of said cycle, to a predetermined form giving

rise to invariably nullifying error contributions to said magnitude representation; said constraining means offsetting lock and capture properties of said loop from a desired norm; and



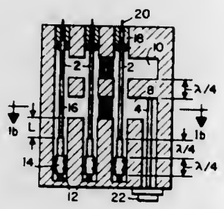
means associated with inputs to said phase discriminator for compensating for said lock and capture offset caused by the introduction of said constraining means.

4,075,578

ACCUMULATING CAVITY MICROWAVE OSCILLATOR

Michael Dydyk, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 21, 1977, Ser. No. 789,463
Int. Cl.² H03B 7/14
U.S. Cl. 331—56 **11 Claims**



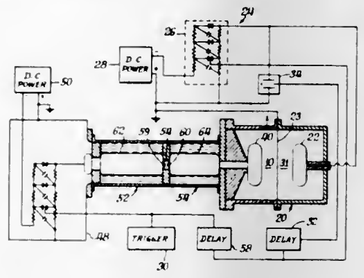
1. In a microwave oscillator circuit including a plurality of coaxial circuits, each of the coaxial circuits having a first and a second end, a negative resistance diode being positioned at the first end of each coaxial circuit and a matched terminating load being positioned at the second end of each coaxial circuit, an output signal being coupled from each of the plurality of coaxial circuits at points intermediate the diodes and loads, the combination comprising:
first cylindrical cavity means for accumulating power from the plurality of output signals from the plurality of coaxial circuits, said first cavity means having a resonant frequency, f_o and a central axis; and
at least one coupling means for coupling said accumulated output signal power from said first cavity means, said at least one coupling means being coupled to said first cavity means remote from said central axis of said first cavity means.

4,075,579

GASEOUS LASER MEDIUM AND MEANS FOR EXCITATION

Robert O. Hunter, Jr., Irvine, and Craig N. Howton, San Diego, both of Calif., assignors to Maxwell Laboratories, Inc., San Diego, Calif.

Filed Dec. 22, 1975, Ser. No. 643,508
Int. Cl.² H01S 3/22
U.S. Cl. 331—94.5 G **33 Claims**



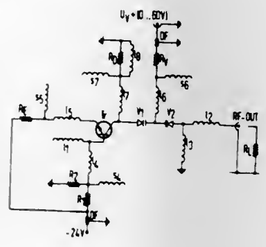
1. In a gas laser system, apparatus comprising
means defining a laser chamber containing a mixture of noble gas and a molecular gaseous laser medium,
said laser medium being relatively efficiently photodissociable by vacuum ultraviolet radiation to produce particles having an upper laser state from which they undergo transition to a lower laser state by laser action emitting pulses of coherent radiation of wave length longer than vacuum ultraviolet,
said noble gas, when excited to a predetermined energy level, radiating vacuum ultraviolet radiation of frequency effectively photodissociating said medium to produce said particles in said excited state, and
said laser medium being at a partial pressure a small fraction of the partial pressure of said noble gas, and
electrical means coupled to said noble gas for producing electronic pulses in said mixture for exciting said noble gas to said predetermined energy level.

4,075,580

MICROWAVE TRANSISTOR OSCILLATOR FOR WIDE BAND FREQUENCY TUNING

Anton Sunkler, Otterfing, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Nov. 17, 1976, Ser. No. 742,665
Claims priority, application Germany, Dec. 18, 1975, 2557134
Int. Cl.² H03B 5/18
U.S. Cl. 331—96 **9 Claims**



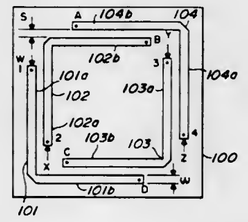
1. In a transistor oscillator for operation in a microwave frequency range having a transistor with a d.c. feedback means connected to the collector, a series connection of a capacitor and line element connected to the collector, and biasing means connected to the base, collector and emitter, wherein the improvement comprises the d.c. feedback means being provided as an attenuation network means for frequency selective action, the attenuation network means including a first $\lambda/4$ line element portion connected to a parallel circuit of an attenuation resistor and a second short-circuited line element portion connected in parallel thereto, a third no-load $\lambda/4$ line element portion being connected to the junction of the first line element portion and the parallel circuit and where λ represents the wavelength of oscillation in a middle of the microwave frequency range.

4,075,581

STRIPLINE QUADRATURE COUPLER

Allen Loy Davidson, Crystal Lake, and Ronald Joseph Wanat, Elgin, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed June 1, 1976, Ser. No. 691,683
Int. Cl.² H01P 5/18
U.S. Cl. 333—10 **4 Claims**



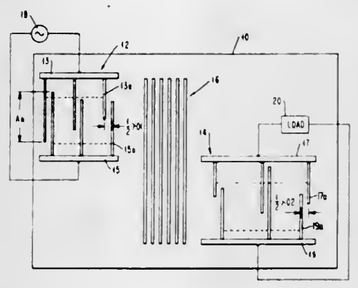
1. A 4-input/4-output port radio frequency coupler comprising:
a dielectric substrate material; and
four quarter wave length hybrid couplers comprising a plurality of four conductive paths formed on the substrate, each path having adjacent first and second legs with an input port at the end of one leg and an output port at the end of the other leg, the conductive paths being of predetermined configuration such that the legs of each path electromagnetically couple to legs of a different path to form said four hybrid couplers, the interconnecting lengths between connected coupers all being substantially zero.

4,075,582

SURFACE ACOUSTIC WAVE DEVICE

Ernest L. Walker, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 14, 1976, Ser. No. 696,095
Int. Cl.² H03H 9/04, 9/26, 9/32
U.S. Cl. 333—72 **9 Claims**



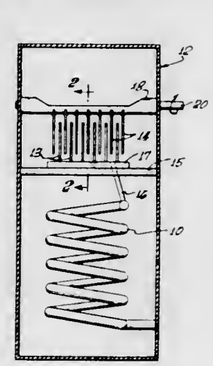
1. A surface acoustic wave filter device comprising:
a piezoelectric substrate capable of propagating surface acoustic waves therein;
an input and an output transducer located on said substrate, each having first and second comb shaped elements in which the teeth or electrodes are interleaved and are of a given respective width and spacing to provide respective different characteristic frequency responses from said transducers;
means for determining the lengths of the electrodes thereby determining the amount of overlap of interleaved electrodes in each of the input and output transducers in accordance with a weighting function determined by the Fourier transformation of the characteristic frequency response to said input and output transducers to produce a pair of frequency passbands for each of said transducers symmetrical about their respective center characteristic frequencies and having a passband of each of said pair of frequency passbands overlapping;
means for energizing said input transducers so as to produce a pair of responses at the frequencies of said input transducer frequency passbands respectively;
coupling means located on said substrate between said input and output transducers for receiving, transforming and retransmitting said pair of responses from said input transducer to said output transducer;
the cascading of the pairs of responses in said output transducer producing a response at the frequencies of the overlapping passbands from said output transducer.

4,075,583

LOW LOSS TUNEABLE FILTER

Joseph E. Kershaw, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 24, 1976, Ser. No. 689,417
Int. Cl.² H03H 7/10
U.S. Cl. 333—73 R **3 Claims**





1. A low loss tuneable RF filter capable of being continuously tuned over a frequency range of at least 2:1 comprising:
a. an enclosed housing forming a shield,
b. a helical coil resonator positioned in one end of said housing,
c. a variable capacitor having a rotor and a stator positioned in the other end of said housing,
d. one end of said helical coil being electrically connected to said housing at a point intermediate the end of said housing in which said variable capacitor is positioned and the end of said housing in which said helical is positioned, the other end of said helical coil being electrically connected to the stator of said variable capacitor,
e. the rotor of said varible capacitor being mounted on a shaft supported by opposing walls of said housing and being electrically connected to said housing to provide optimum Q for said helical coil resonator, and

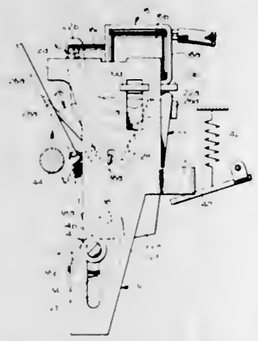
f. said rotor and stator being dimensioned to provide said rotor with a uniform width that is wider than said stator and establishing a constant overlap as the rotor is rotated for tuning said filter over said frequency range.

4,075,584

UNDERVOLTAGE RELEASE DEVICE FOR CIRCUIT BREAKERS

Roger N. Castonguay, Bristol, and Charles L. Jencks, Avon, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Oct. 6, 1976, Ser. No. 730,147
Int. Cl.² H01H *83/00*
U.S. Cl. 335—20 **12 Claims**



1. An undervoltage release device for tripping an electric circuit breaker automatically in response to an abnormal undervoltage condition, said device comprising, in combination:

A. a frame for mounting attachment to a circuit breaker;

B. a trip member mounted by said frame for movement between a latched position and a circuit breaker tripping position, said trip member being spring-biased to said tripping position;

C. a solenoid mounted by said frame, said solenoid having

1. a plunger movable between a seated position and an extended position, and

2. a coil for developing a magnetic force sustaining said plunger in its seated position under normal line voltage conditions;

D. a latch member linked to said plunger and mounted by said frame for movement from a first position latching said trip member in its latched position and a second position in response to movement of said plunger from its seated position to its extended position, thereby releasing said trip member for movement to its tripping position;

E. a first spring calibrated to overpower the magnetic force of said solenoid in the event of an abnormal undervoltage condition such as to move said plunger to its extended position and said latch member to its second position;

F. a reset member mounted by said frame for movement from a normal position to a reset position;

G. a second spring positioned to be charged by movement of said reset lever to its reset position, said charged second spring biasing said plunger to its seated position; and

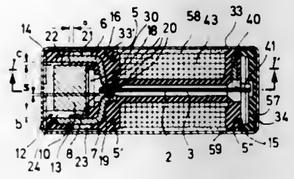
H. means carried by said trip and latch members for inhibiting movement of said plunger to its seated position under the bias of said second spring until said trip member is fully returned from its tripping position to its latched position, whereupon said second spring abruptly discharges to snap said plunger to its seated position and said latch member to its first position.

4,075,585

ELECTROMAGNETIC RELAY AND THE MANUFACTURE THEREOF

Hans Sauer, Fichtenstrasse 5, 8024 Deisenhofen, Germany, assignor to Matsushita Electric Works, Ltd., Osaka, Japan and Hans Sauer, Deisenhofen, Germany, part interest to each

Filed Dec. 10, 1975, Ser. No. 639,406
Claims priority, application Germany, Dec. 13, 1974, 2459039
Int. Cl.² H01H *51/22*
U.S. Cl. 335—78 **47 Claims**



1. An electromagnetic relay comprising:

a. a bobbin of plastic material defining therein a protective tube, a contact chamber and a magnet chamber that together form a space which extends the entire length of the bobbin and is open at both ends,

b. a permanent magnet disposed in the magnet chamber to seal one end of said space,

c. a contact actuator mounted to extend along the protective tube with a free end extending into the contact chamber,

d. a pair of pole shoes each having a first end disposed in proximity to the permanent magnet and a second end extending into said contact chamber, said second ends forming fixed contacts for cooperation with said free end of the contact actuator,

e. a coil mounted on the bobbin,

f. means activatable as a getter and disposed in said space, and

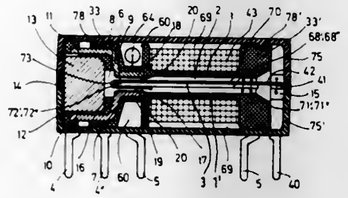
g. a closure sealing the other end of said space opposite said permanent magnet.

4,075,586

ELECTROMAGNETIC RELAY

Hans Sauer, Deisenhofen, Germany, assignor to Matsushita Electric Works, Ltd., Osaka, Japan and Hans Sauer, Deisenhofen, Germany, a part interest to each

Filed Feb. 24, 1976, Ser. No. 661,025
Claims priority, application Germany, Feb. 24, 1975, 2507914
Int. Cl.² H01H *51/27*
U.S. Cl. 335—79 **15 Claims**



1. An electromagnetic relay comprising:

a. a one-piece structural member defining a longitudinal plane and forming an interior protective space and a bobbin around said space, the space extending the entire length of the member which is open at both ends;

b. a coil mounted on said bobbin;

c. fixed contact means extending into the protective space;

d. a contact actuator mounted in said space to extend along said bobbin and having a free end disposed in proximity to said fixed contact means for cooperation therewith;

e. terminals connected to the coil, the actuator and the fixed contact means, said terminals being embedded in and extending outwardly from said structural member on opposite sides thereof in the longitudinal plane defined by said structural member;

f. an outer protective casing formed of two casing members sealed together generally in said longitudinal plane, said protective casing and said structural member together forming a seal around each said terminal; and

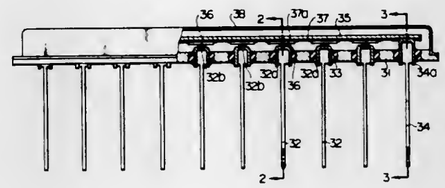
g. means sealing said open ends of said structural member, the sealing means of at least one of said open ends comprising first surfaces formed on said structural member and second surfaces formed on said casing members, said first and second surfaces mutually cooperating with each other.

4,075,587

MULTICONTACT SEALED ELECTROMAGNETIC COORDINATE SELECTION DEVICE

Hideo Suzuki; Ginya Ishiguro; Sadayuki Mitsuhashi, and Kazutoshi Wakamatsu, all of Tokyo, Japan, assignors to Nippon Telegraph and Telephone Public Corporation and Nippon Electric Co., Ltd., both of Tokyo, Japan

Filed Oct. 12, 1976, Ser. No. 731,315
Claims priority, application Japan, Oct. 23, 1975, 50-127827; Nov. 12, 1975, 50-135841; Nov. 12, 1975, 50-135842
Int. Cl.² H01H *67/14*
U.S. Cl. 335—112 **19 Claims**



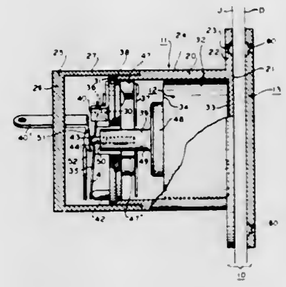
1. A multicontact sealed electromagnetic coordinate selection device comprising a metal plate having holes therein arranged in at least one line; stationary contact terminal means, one end portion of which penetrates the corresponding hole in said metal plate and which includes a stationary contact formed on the end face of said one end portion and cores; electrically insulating material for supporting stationary contact terminal means on the metal plate and electrically insulating said contact terminal means from the metal plate; magnetic flux path-forming means including a movable contact type spring having movable contacts facing the corresponding stationary contacts with a prescribed spacing therebetween, said spring comprising arms for elastically supporting the movable contacts to move them toward the corresponding movable contacts; supporting means for holding the magnetic flux path-forming means in parallel relationship with the metal plate, said magnetic flux path-forming means being electrically insulated from the metal plate; a container for sealing the magnetic flux path-forming means and stationary contacts; closed magnetic flux path-forming means for providing a closed magnetic flux path in cooperation with the core and magnetic flux path-forming means; and windings for selectively exciting a magnetic flux in said closed magnetic flux path.

4,075,588

SWITCHING APPARATUS

Nathan Verger, Great Neck, and Gerhard Schmidt, Rego Park, both of N.Y., assignors to Alarm Device Manufacturing, Co., Syossett, N.Y.

Continuation of Ser. No. 414,442, Nov. 9, 1973, abandoned, which is a continuation of Ser. No. 285,353, Aug. 31, 1972, abandoned. This application Nov. 5, 1975, Ser. No. 628,849
Int. Cl.² H01H *36/00*
U.S. Cl. 335—207 **9 Claims**



1. An apparatus for making and breaking connections in an electrical circuit, comprising:

a. a first contact;

b. a second contact;

c. means for positioning the second contact opposite the first contact;

d. a magnet which is magnetized such that opposite faces thereof define poles of opposite polarity;

e. means for connecting the magnet to the second contact positioning means comprising a connector secured to the magnet at the end thereof of the first pole and the resilient support arm at the other end thereof,

f. means for moving the magnet and the second contact to a position where the second contact breaks contact with the first contact comprising a metal plate positionable opposite a first pole of the magnet;

g. means for moving the magnet and the second contact to a position where the second contact makes contact with the first contact comprising a further metal plate positionable opposite a second pole of the magnet; and

h. a housing, in which the second contact positioning means comprises a resilient support arm extendable into the housing at a location therein adjacent the first contact, and in which the magnet is reciprocally movable in the housing, in which the first contact is mounted in one end of the housing, and in which the metal plate positionable opposite a first pole of the magnet is hollow, is mounted in the housing intermediate the first and second contacts and the magnet, and through which the connector extends.

4,075,589

MAGNETIC PLATE COMPRISING PERMANENT MAGNETS AND ELECTROPERMANENT MAGNETS

Philibert Maurice Braillon, 2, rue d'Alexandry, Chambery, Savoie, France

Filed Dec. 3, 1976, Ser. No. 747,206
Claims priority, application France, Dec. 4, 1975, 75 37873
Int. Cl.² H01F *7/20*
U.S. Cl. 335—286 **8 Claims**

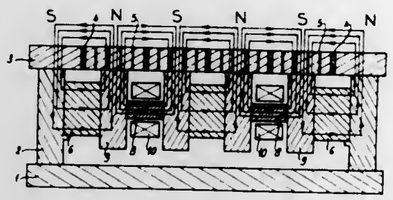
1. A magnetic holder comprising a hollow body having:

a pair of opposite walls of soft magnetic material;

a sole plate underlying said body and in contact with said walls, said sole plate composed of soft magnetic material;

a magnetic stack bridging said walls and in contact therewith, said magnetic stack comprising alternating high-coercive force magnets and low-coercive-force magnets

with soft magnetic pole pieces disposed between them, said pole pieces being spaced above said sole plate; and electric coils surrounding each of said low-coercive force



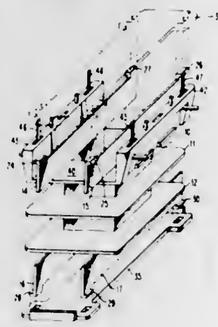
magnets, said high-coercive-force magnets being of invariable magnetic direction and the magnetic direction of said low-coercive-force magnets being reversible by the application of electrical pulses to said coils.

4,075,590

BOBBIN CONSTRUCTION FOR ELECTRICAL COILS

Stephen Foldes, 5 Riverside Drive, Binghamton, N.Y. 13905

Filed Feb. 22, 1977, Ser. No. 770,573
Int. Cl.² H01F *27/26*
U.S. Cl. 336—192 **2 Claims**



1. A bobbin construction, particularly for electrical coils having cores of ferromagnetic laminations, comprising a hollow skeletal frame member of molded plastic material over which a coil may be wound, said member having laterally extending walls defining the space for said coil and, at each end, a pair of axially-extending walls defining the space for said laminations, one of said lateral walls having axially-extending portions supporting terminal lugs for the electrical connection of said coil, said axially-extending walls having protuberant parts adapted to secure a cover member, comprising an oblong piece of flexible material having cutouts so dimensioned as to cooperate with said protuberant parts in a snap fastener mode of retention.

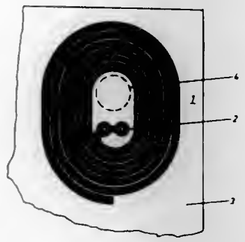
4,075,591

PRINTED CIRCUIT COILS

Dieter Haas, Hildesheim, Germany, assignor to Blaupunkt-Werke GmbH, Hildesheim, Germany

Division of Ser. No. 686,520, May 14, 1976, Pat. No. 4,016,519.
This application Jan. 31, 1977, Ser. No. 763,852
Int. Cl.² H01F *27/28*
U.S. Cl. 336—200 **2 Claims**

1. A printed circuit coil of spiral configuration formed on a surface plate of insulating material providing substantially all of the inductance of a resonant circuit and composed of a layer of conducting material in a continuous spiral path providing a plurality of coil turns with a substantially constant spacing between adjacent turns and further having the improvement



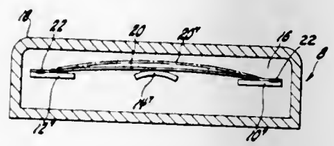
that the path width is not uniform and decreases from the outside turn to the inside turn.

4,075,592

ELECTRICAL LOAD OUTAGE DETECTOR

Thaddeus Schroeder, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 1, 1977, Ser. No. 820,411
Int. Cl.² H01H *71/18*
U.S. Cl. 337—139 **2 Claims**



1. An electrical load outage detector comprising first, second and third terminal strips secured together in a rigid assembly with insulating material therebetween, each terminal strip having a flat portion comprising a terminal connector at one end, the first and second terminal strips comprising input and output terminals respectively connectable to a load circuit, the flat portions of the first and second terminal strips being spaced apart and lying in a first plane, the third terminal strip having a contact portion disposed between and slightly spaced from the plane of the flat portions of the first and second terminal strips, an elongate thermally responsive expansion strip of conductive material fixedly connected at its ends to the flat portions of the first and second terminal strips to prevent longitudinal movement of the said ends and for electrically interconnecting the first and second terminal strips to carry load current therebetween, the expansion strip when unheated being slightly bowed and stressed into firm engagement with the contact portion of the third terminal strip to electrically interconnect the first, second and third terminal strips, the expansion strip having sufficient resistance to be significantly heated by the load current for longitudinal expansion when heated by load current flow to effect further bowing of the expansion strip and consequent movement away from engagement with the contact portion of the third terminal strip thereby electrically disconnecting the third terminal strip from the first and second terminal strips.

4,075,593

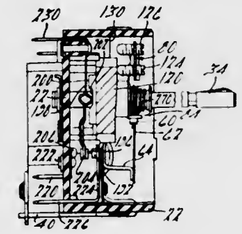
ROTATABLE SHAFT POSITIONING MEANS

Willi K. Beck, Hingham, Mass., assignor to King-Seely Thermos Co., Ann Arbor, Mich.

Division of Ser. No. 557,012, March 10, 1975, which is a continuation of Ser. No. 127,341, March 23, 1971, abandoned.
This application July 23, 1976, Ser. No. 708,192
Int. Cl.² H01H *61/08*
U.S. Cl. 337—312 **18 Claims**

10. A thermal controller for controlling electrical energy

being supplied to an oven having both a cooking range of temperatures and at least one self-clean temperature comprising a support housing assembly, an operation selector assembly including a shaft supported in said housing for rotational and axial movement relative to said housing, a first set of contacts operable to control electrical energy being supplied to said oven within said cooking range of temperatures, a second set of contacts operable to control electrical energy being supplied to said oven during an operation at said self-clean temperature,



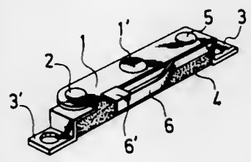
resilient means for biasing said shaft in a first axial direction relative to said housing, a detent member axially and rotatably fixed to said shaft, and shoulder means fixedly supported relative to said housing adjacent said detent member, said detent member engaging said shoulder during a predetermined arc of rotation of said shaft and axial movement of said shaft in a direction opposite to said first direction, said detent member and said shoulder coacting to rotatably fix said shaft relative to said housing thereby positioning said second set of contacts in operable position.

4,075,594

THERMOSTAT WITH RESET ARM

Uchiya Tomoyoshi, Misato, Japan, assignor to Uchiya Co., Ltd., Misato, Japan

Filed Aug. 16, 1976, Ser. No. 714,400
Claims priority, application Japan, Aug. 15, 1975, 50-112946[U]
Int. Cl.² H01H *37/54*
U.S. Cl. 337—348 **1 Claim**



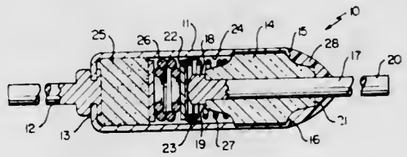
1. A thermostat comprising: an elongated frame (4) to define a contact zone having a hollow space therein; first and second terminals (3', 3) at each end of said zone; an elongated contact arm (1) stretched across said zone clamped (5) at one end to said first terminal (3), said other end having a contact (2) thereat in opposed relation to said first terminal (3') to make electric contact therewith; a curved bimetal strip (7) extending across said hollow space between said contact arm (1) and said frame (4) biased normally towards said frame but curving against said contact arm (1) and pushing said contact (2) away from said first terminal (3') when heated; a reset arm (6) extending from the vicinity of said second terminal (3) to said first terminal (3') with a flat section disposed alongside said frame (4) and a curved resilient section curved away from said frame (4) but biased to spring towards said frame; and, a flat free end (6') on said reset arm (6) disposed to enter the space between said contact arm (1) and said frame (4) but prevented from so doing by said contact arm being in contact (2) with said first terminal (3') but said free end (6') entering said space when said contact arm (1) is pushed away by said bimetal strip (7), said free end (6') then preventing said contact (2) from again contacting said first terminal (3') until said free end (6') is forcibly removed from the space between the contact arm and the frame.

4,075,595

TEMPERATURE RESPONSIVE ELECTRICAL SWITCH CONSTRUCTION AND METHOD OF MAKING THE SAME

Emil Robert Plasko, Washington Township, Montgomery County, Ohio, assignor to Emerson Electric Co., St. Louis, Mo.

Division of Ser. No. 471,851, May 21, 1974, Pat. No. 4,001,754.
This application Aug. 23, 1976, Ser. No. 716,807
The portion of the term of this patent subsequent to Jan. 4, 1994, has been disclaimed.
Int. Cl.² H01H *37/36*
U.S. Cl. 337—407 **18 Claims**



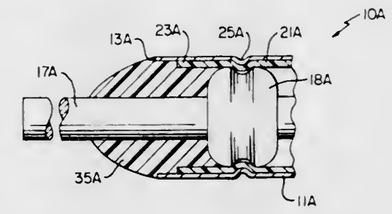
1. In a collapsible pellet thermal limiter construction having electrical switching means that changes its condition when said pellet melts by being heated to a certain temperature for the particular pellet and having an epoxy material sealing one end of a casing of said construction, the improvement comprising filler material in said epoxy material in the order of approximately 4% to approximately 6% by weight of said epoxy material whereby said filler material improves the effective seal life of said epoxy material, said pellet having a particular melting temperature of approximately 200° F. or lower or of approximately 370° F. or higher.

4,075,596

SEALED CASING FOR A THERMALLY ACTUABLE ELECTRICAL SWITCH

Emil Robert Plasko, Washington Township, Montgomery County, Ohio, assignor to Emerson Electric Co., St. Louis, Mo.

Filed Aug. 23, 1976, Ser. No. 716,806
Int. Cl.² H01H *37/76*
U.S. Cl. 337—408 **5 Claims**



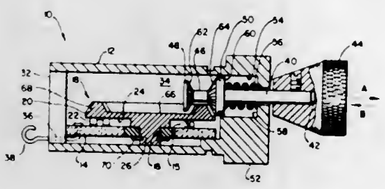
1. In a thermally actuatable electrical switch construction having a conductive open ended casing receiving an insulating sleeve in the open end thereof and a lead carrying insulating end plug disposed within said sleeve to close said open end, the improvement wherein said sleeve is disposed completely within said casing and inboard of the open end of said casing, and comprising a sealing means sealing said casing to said sleeve external to said sleeve and said casing.

4,075,597

VARIABLE RESISTOR WITH DUAL RATIO INPUT SHAFT

Leslie Thomas Peart, Santa Ana, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Dec. 20, 1976, Ser. No. 752,347
Int. Cl.² H01C *10/16*
U.S. Cl. 338—128 **13 Claims**



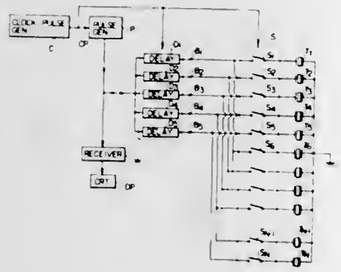
1. A variable resistor apparatus comprising:
a housing;
a resistor element mounted on one surface in said housing;
a wiper device rotatably mounted in said housing;
a contact member on said wiper device in contacting relation to said resistor element;
a control member positioned in said housing with one end of said control member adjacent said wiper device, said control member movable to move said contact member relative said resistor element;
a first drive surface positioned on said one end of said control member;
a second drive surface positioned on said one end of said control member in spaced relation to said first drive surface, one of said first and second drive surfaces being closer to the center of said wiper device than the other of said first and second drive surfaces; and
means on said wiper device acting in selective cooperation with one of said first and second drive surfaces for changing the ratio of movement of said contact member with respect to a constant movement of said control member.

4,075,598

ULTRASONIC WAVE TRANSMITTING AND RECEIVING APPARATUS

Kinya Takamizawa, Yokohama; Einoshin Itamura, Tokyo, and Kazuhiro Iinuma, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 21, 1976, Ser. No. 678,758
Claims priority, application Japan, Apr. 25, 1975, 50-50350
Int. Cl.² G01S *9/66*
U.S. Cl. 340—1 R **12 Claims**



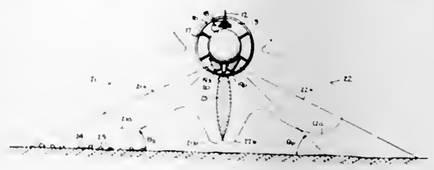
1. An ultrasonic wave transmitting and receiving apparatus comprising an N number of electro-acoustic conversion elements arranged on a flat plane, selectively connecting means for successively energizing each of an M (M<N) number of electro-acoustic conversion elements to transmit ultrasonic waves, means for deflecting ultrasonic wave beam transmitted from said M number of electro-acoustic conversion elements by relatively delaying the input supplied to the M number of elements so that the ultrasonic wave beams emitted respectively from said electro-acoustic conversion elements may be substantially deflected and scanned to such an extent that the centers of the beams do not intersect each other within a range of field to be examined, means for generating an electric signal in accordance with the received ultrasonic wave reflected from an object within the range of field, and means for displaying images in accordance with the electric signal from said last-mentioned means by using equidistant and parallel scanning lines.

4,075,599

UNDERSEA GEOPHYSICAL EXPLORATION

James George Kosalos, Kirkland, and Robert William Cooke, Issaquah, both of Wash., assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Nov. 30, 1976, Ser. No. 746,184
Int. Cl.² G01S *9/66*
U.S. Cl. 340—3 R **10 Claims**



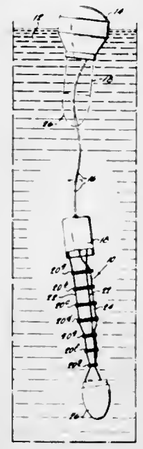
1. A process for geophysical surveying of an undersea floor area to obtain information indicative of physical characteristics of material on the undersea floor comprising:
(a) moving an undersea vehicle under water in a forward linear direction at a substantially constant altitude above the undersea floor;
(b) transmitting bilaterally from said vehicle two underwater acoustic beams, one at a first frequency and the second at a second frequency, both frequencies being in the transmitting frequency range of 12 to 40 kHz and differing from each other by a difference frequency of at least 2 kHz and each with power sufficient to intersect, and produce perceivable echos from, the undersea floor;
(c) said beams being directed bilaterally away from each other, one to the starboard and one to the port, with the acoustic axis of each beam in a plane perpendicular to the forward line of vehicle movement and slanted downward to intersect the undersea floorline at a grazing angle in the angular range of about 20° to 65°;
(d) each of said two beams having a portion extending vertically down to the undersea floor and sideward from the vertical at least about one degree from each side of the downward vertical from the vehicle and forming a downwardly directed difference-frequency beam of at least about two degrees width impinging on the undersea floor;
(e) perceiving underwater vibrations backscattered from where the starboard and port beams impinge on material of the undersea floor;
(f) converting the perceived backscattered vibrations to electric signals indicative of the amplitude of the backscattered vibrations reaching the undersea vehicle;
(g) displaying, storing or recording the amplitudes of the backscattered vibration signals;
(h) perceiving acoustic vibration at the difference-frequency reflected upward from where the difference-frequency impinges on undersea floor material;
(i) converting the perceived difference-frequency vibrations to electric signals indicative of the amplitude of the difference-frequency vibrations; and
(j) displaying, storing or recording the amplitudes of the difference-frequency signals.

4,075,600

DUAL RESONANCE BENDER TRANSDUCER

Claude C. Sims, Orlando, and Thomas H. Ensign, Winter Park, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 10, 1976, Ser. No. 694,623
Int. Cl.² H04B *13/00*
U.S. Cl. 340—9 **3 Claims**



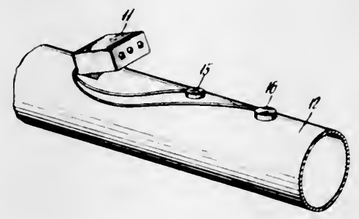
1. An acoustic array having a plurality of resonant frequencies within a preselected bandwidth, comprising, in combination:
a plurality of planar transducer means with selected ones being resonant at only the fundamental frequency thereof, and the others at the fundamental frequency and only one overtone frequency substantially six times the fundamental frequency, all of the fundamental and overtone frequencies being separate and discrete from each other and within said preselected bandwidth; and
coupling means operatively connected to said transducer means for spacing respective ones thereof in coaxial and parallel relation;
whereby the number of incremental resonance frequencies exceed the number of said transducer means.

4,075,601

COMBINED PIPELINE MARKER AND TEST UNIT

Norman E. Flournoy, Richmond, Va., assignor to Texaco Inc., New York, N.Y.

Filed June 20, 1975, Ser. No. 588,928
Int. Cl.² H04B *11/00*
U.S. Cl. 340—15 **1 Claim**



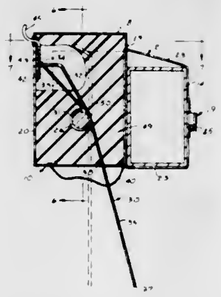
1. A combined pipeline marker and self test unit, comprising in combination
a pipeline
a first piezoelectric crystal bonded to said pipeline for emitting an acoustic marker signal having a predetermined frequency,
a low power oscillator for driving said first crystal comprising
a CMOS integrated circuit having six inverting buffers,
circuit means including a capacitor and two resistors connected to a pair of said buffers for producing said predetermined frequency oscillation,
three of said buffers being connected in parallel to drive said first crystal, and
one of the said buffers being connected between said oscillation pair and said three drive buffers to isolate said oscillation pair,
a second piezoelectric crystal bonded to said pipeline adjacent to said first piezoelectric crystal for detecting the presence of said marker signal,
a low power amplifier for amplifying signals generated by said second crystals, comprising
an integrated circuit amplifier,
a discrete transistor connected to the output of said integrated amplfier, and
filter means for connecting said second crystal to said integrated amplifier for tuning it to said predetermined oscillation frequency,
a light emitting diode connected to the output of said transistor for indicating presence of said marker signal, and
push button switch means for manually energizing said low power amplifier to test said marker operation.

4,075,602

LOW TIRE ALARM

Darrell S. Clothier, 744 6th Avenue W Kalispell, Mont.

Filed Aug. 4, 1976, Ser. No. 711,501
Int. Cl.² B60C *23/08*
U.S. Cl. 340—58 **6 Claims**



1. A low tire alarm for warning the operator of a forwardly moving vehicle of the type having one or more axle supported ground engaging pneumatic tires that one or more of the tires is at least partially deflated, said alarm comprising:
a hollow housing;
clamp means on the housing adapted to mount the housing to a vehicle axle directly adjacent a ground engaging tire thereof;
a shaft extending through the housing and substantially parallel with the axis of rotation for the tire;
an elongated electrically conductive rod having a coiled central portion wrapped loosely about the shaft such that the rod will pivot freely about the shaft axis;
wherein the rod includes an integral swing arm portion within the housing that protrudes from the coiled portion;
said swing arm including an electrical contact surface at a free end thereof movable with the swing arm in an arcuate path about the shaft axis;
said rod further including an integral feeler arm portion protruding from the coiled portion through an aperture in the housing to a free ground sensing end that is outside the housing;
an electrically conductive pad;
an insulator mounting the pad within the housing in the path of the electrical contact surface;
said rod further including an integral spring member engage-

able with the housing to resist pivotal movement of the electrical contact surface toward the electrically conductive pad;

an insulative foam resilient seal means for hermetically sealing the interior of the housing to seal the housing and keep the electrically conductive pad dry while enabling the rod to pivot about the shaft axis;

a conductor wire connected to the pad;

signal producing means connected to the conductor wire and adapted to be electrically connected to a grounded source of electrical energy for producing a signal when the free ground sensing end of the rod engages the ground and causes the rod to pivot about the shaft axis against the resistance of the integral spring member and swing the electrical contact surface of the swing arm into contact with the electrically conductive pad.

4,075,603

APPARATUS AND METHOD FOR INDICATING CONDITION OF A ROTATING BODY

Daniel S. Snyder, Norwalk, and Steven O. Luzsicza, Huron, both of Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Filed Oct. 4, 1976, Ser. No. 728,928
Int. Cl.² B60C *23/04*
U.S. Cl. 340—58 **38 Claims**



1. An indicator device adapted to be mounted relative to a rotatable body for rotation therewith to energize an electrically operated member, said device comprising:

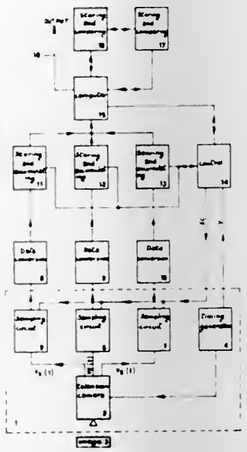
a generator unit including a housing member having a longitudinal housing axis and including means for mounting said housing to said body in a manner such that said longitudinal housing axis is fixedly disposed generally normal to the plane of said rotatable body, a stator component including an associated field winding and a rotor component with said stator and rotor components disposed in said housing generally coaxial with said housing axis in spaced apart operative communication with each other, one of said stator and rotor components being mounted for independent rotation about said housing axis with the other of said stator and rotor components being stationarily affixed to said housing, said one component including means for maintaining it in a generally stationary disposition when said housing is mounted to a rotatable body and rotated about the axis of said body whereby relative rotation is obtained between said stator and rotor components solely by the influence of rotation of said body with said relative rotation causing a voltage to be induced in said field winding; and, an electrically operated member connected to said field winding and energized by said voltage.

4,075,604

METHOD AND APPARATUS FOR REAL TIME IMAGE RECOGNITION

Mario Marco Degasperi, Milan, Italy, assignor to Tasco S.p.A., Milan, Italy

Filed Jan. 25, 1977, Ser. No. 762,423
Claims priority, application Italy, Feb. 23, 1976, 20452/76
Int. Cl.² G06K *9/00*
U.S. Cl. 340—146.3 AG **17 Claims**



1. A method for real time recognition of a test image supported on a background by comparison with known sample images, and selection of the sample image showing the least difference, comprising the steps of:

(a) preparing and storing for reference a plurality of sets of sample typical parameters, each set of typical parameters derived from the luminance of an individual known sample image;

(b) reading said test image on said background with a scanning device to produce a plurality of test signals proportional to the levels of luminance of said test image and said background;

(c) separating said test signals into discrete accumulations of signals having the same luminance level;

(d) eliminating from said plurality of test signals those signals produced from reading of said background;

(e) preparing from said separated test image signals a distribution function having luminance levels for one axis and frequency of occurrence of test image signals for the other axis, background signals being absent from said distribution function;

(f) operating on said distribution function of said test image signals to determine a set of test image typical parameters from said distribution function;

(g) comparing said test image typical parameters with said plurality of sets of sample image typical parameters, each set being compared in sequence, said sets of sample image typical parameters having been prepared in the manner of steps (b) to (f);

(h) selecting the one set of sample image typical parameters which in said comparison indicates the least difference with said set of test image typical parameters;

(i) comparing said least difference with a threshold value of difference; and

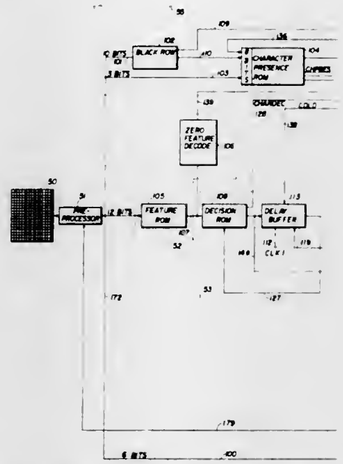
(j) generating a signal indicating the sample image providing said least difference when said least difference is less than said threshold value of difference.

4,075,605

CHARACTER RECOGNITION UNIT

Larry L. Hilley, Garland, and Marion W. Neff, Arlington, both of Tex., assignors to Recognition Equipment Incorporated, Dallas, Tex.

Filed Sept. 13, 1974, Ser. No. 505,931
Int. Cl.² G06K *9/12*
U.S. Cl. 340—146.3 AC **12 Claims**



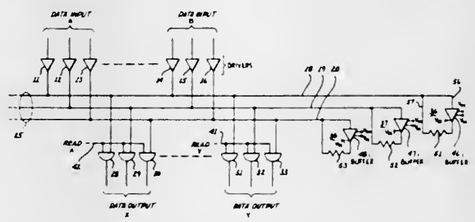
1. In an automatic optical pattern recognition system, the method which comprises scanning a two-dimensional array of photosensors in a raster-like ordered sequence at a scan rate high compared to relative movement between a field of information and said array, processing binary video data flowing from said array at said scan rate without intermediate storage to produce representative feature codes for each scan, applying said feature codes from a complete scan of said array to a distributed flow sequential network, processing said feature codes by a one step state transfer to any logical node in said network to generate a character code representative of a unique relationship between said sequence of feature codes, and identifying a pattern from a stream of character codes produced from repetitive scanning of said array while said pattern is in registration with said array.

4,075,606

SELF-MEMORIZING DATA BUS SYSTEM FOR RANDOM ACCESS DATA TRANSFER

Richard W. Wilkens, Largo, Fla., assignor to E-Systems, Inc., Dallas, Tex.

Filed Feb. 13, 1976, Ser. No. 657,828
Int. Cl.² G11C *11/40*; H04Q *9/00*
U.S. Cl. 340—147 B **6 Claims**



1. In a data bus system, the combination comprising:

a. a bus conductor for transferring electrical signals;

b. at least one input device connected to said bus for generating multi-state electrical signals indicative of data information;

c. at least one output device connected to said bus conductor, said output device being operable, at random, to read said electrical signals from said bus conductor; and

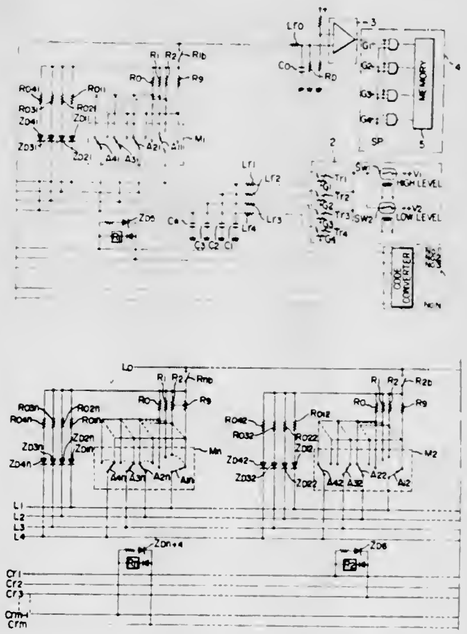
d. at least one non-inverting buffer having an input lead and an output lead, said input and said output leads being connected together to form a feedback loop and to said bus conductor to permit said buffer to be driven by said input device and to latch said buffer at the state of the last generated of said electrical signals when said buffer is not driven by said input device.

4,075,607

SYSTEM FOR COLLECTING DATA FROM METERS PLACED AT REMOTE PLACES

Takeshi Abe, Yokohama, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Nov. 22, 1976, Ser. No. 744,186
Claims priority, application Japan, Nov. 25, 1975, 50-140987
Int. Cl.² G08C *15/08*
U.S. Cl. 340—152 R **5 Claims**



1. In a data collection system of the type comprising a plurality of counter-meters installed at remote places, a data collection station for reading data from said countermeters, a plurality of transmission lines interconnected between said countermeters and said data collection station and comprising one common data transmission line and a plurality of other data transmission lines equal in number to the number of digits of each counter-meter, each counter-meter having a plurality of resistors equal in number to the number of digits of the counter-meter, each resistor being coupled between the corresponding counter-meter and one of said transmission lines to indicate a value at a corresponding digit position, said data collection station including means for sequentially sampling said counter-meters to read and collect the data of each counter-meter through said transmission lines,

the improvement comprising:

a voltage threshold element interconnected between said common data transmission line and each of said other data transmission lines corresponding to each digit to be read out, said voltage threshold element being connected in parallel with said resistors of each counter-meter, said

threshold element exhibiting a dynamic impedance substantially less than that of each of said resistors when subjected to a predetermined high-level voltage, and a resistance substantially greater than that of each of said resistors when subjected to a predetermined low-level voltage,

means for applying said high-level voltage between said common data tranmission line and a selected one of said other data transmission lines to cause a relatively high current to flow through said voltage threshold element to charge stray capacitance between said common data transmission line and said selected other data transmission line and between each of said lines and ground, and

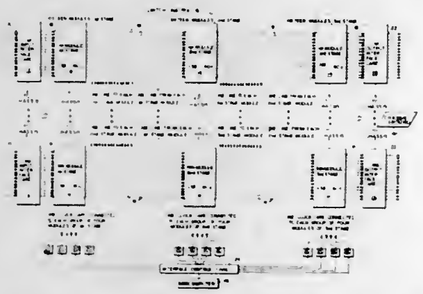
means for thereafter applying said predetermined low-level voltage between said selected data transmission line and said common data transmission line to cause current to flow through a corresponding one of said resistors of said counter-meter so that the corresponding digit value may be determined at said station.

4,075,608

MULTIPLE-CHANNEL DATA SWITCH

Harry J. Koenig, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 19, 1976, Ser. No. 650,104
Int. Cl.² H04Q *9/00*; H04J *3/00*
U.S. Cl. 340—166 R **12 Claims**



1. An apparatus having a plurality of input means and a plurality of output means for rapidly coupling digital information applied to any one of said input means to a selected one of said output means, said apparatus comprising:

(a) a matrix means comprising a plurality of consecutively numbered stages wherein the lowest numbered of said stages is the first stage and the highest numbered of said stages is the final stage, each stage including a plurality of switching element means, each of said switching element means having a plurality of element input means and a plurality of element output means, each of said switching element means for coupling digital information applied to one of its said element input means to a selected one of its said element output means in response to a control signal;

(b) an input coupling means for coupling said plurality of input means of said apparatus to the element input means of the switching element means of said first stage;

(c) an element coupling means for coupling the element output means of the switching element means of each stage except said final stage to the element input means of the switching element means of the next-highest-numbered stage;

(d) an output coupling means for coupling said plurality of output means of said apparatus to the element output means of the switching element means of said final stage;

(e) a control means coupled to each of said switching element means of said apparatus for providing a control signal to each of said switching element means;

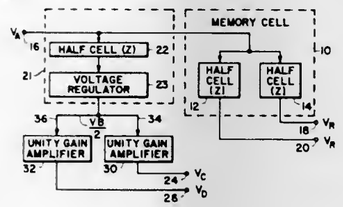
(f) instruction means coupled to said control means for instructing said control means to provide a control signal to a selected one of said switching element means in each of said stages for configuring a transmission channel for digital information from any one of said input means of said apparatus to a selected one of said output means of said apparatus.

4,075,609

ON-CHIP VOLTAGE SOURCE FOR INTEGRATED CIRCUITS

Michael Scott Millhollan, and Robert Michael Reinschmidt, both of Sunnyvale, Calif., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 29, 1976, Ser. No. 681,298
Int. Cl.² G11C *11/40*
U.S. Cl. 365—154 **8 Claims**



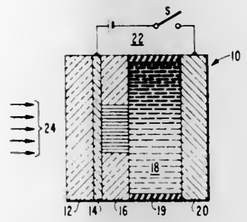
1. An integrated circuit disposed on a substrate comprising: first circuit means being capable of storing a signal and including means for providing the signal state of said first circuit means during a sense mode; and second circuit means to generate a reference signal and being coupled to said first circuit means for supplying the reference signal during the sense mode, the reference signal providing an amplitude reference, said first and second circuit means each having an impedance means, each impedance means being substantially identical during said sense mode.

4,075,610

METHOD OF STORING OPTICAL INFORMATION

Richard Seely Crandall, and Brian Wilfred Faughnan, both of Princeton, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 26, 1976, Ser. No. 735,399
Int. Cl.² G11C *13/02*
U.S. Cl. 365—107 **12 Claims**



1. A method of storing optical information, comprising the steps of:

providing a storage member having a layer of electrochromic material and an electrolyte in contact therewith, said electrolyte containing photoconductive material in particle form with at least some of said particles being in contact with said layer of electrochromic material, said photoconductive material being capable of creating electron-hole pairs when exposed to said optical information; and

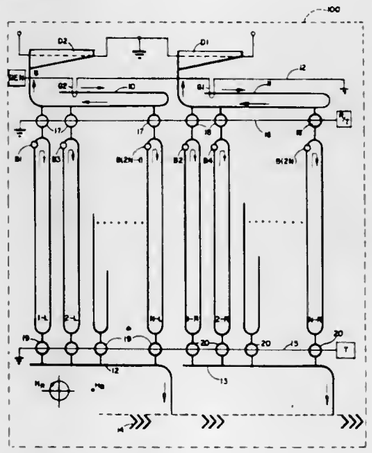
exposing said member to said optical information whereby said layer of electrochromic material colors in an area which corresponds to said optical information, said coloration occurring solely due to said exposure to said optical information.

4,075,611

CONSECUTIVE BIT ACCESS OF MAGNETIC BUBBLE DOMAIN MEMORY DEVICES

Isoris S. Gergis, Yorba Linda, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 19, 1975, Ser. No. 633,306
Int. Cl.² G11C *19/08*
U.S. Cl. 365—2 **13 Claims**



1. In combination,

first and second generator means capable of operating concurrently to produce information bits,

first and second storage means,

first and second separate access paths for coupling said first and second generator means to said first and second storage means, respectively,

said first access path defining a first access distance between said first generator means and the associated first storage means,

said second access path defining a second access distance between said second generator means and the associated second storage means,

said first and second access distances having a prescribed first difference whereby said first storage means can receive information only from said first generator means and said second storage means can receive information only from said second generator means via the respective first and second access paths,

first and second detector means,

first and second separate coupling means,

said first coupling means defining a first coupling distance between said first storage means and said first detector means, and

said second coupling means defining a second coupling distance between said second storage means and said second detector means,

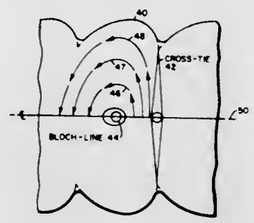
said first and second coupling distances having a prescribed second difference which is related to said prescribed first difference whereby said first detector can receive information only from said first storage means and said second detector means can receive information only from said second storage means via the respective first and second coupling means.

4,075,612

ROUNDED SERRATED EDGE FILM STRIP GEOMETRY FOR CROSS-TIE WALL MEMORY SYSTEM

Leslie Harold Johnson, Minneapolis; David Shih-Fang Lo, Burnsville, and Maynard Carlton Paul, Bloomington, all of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 3, 1977, Ser. No. 756,223
Int. Cl.² G11C *19/08*
U.S. Cl. 365—171 **3 Claims**



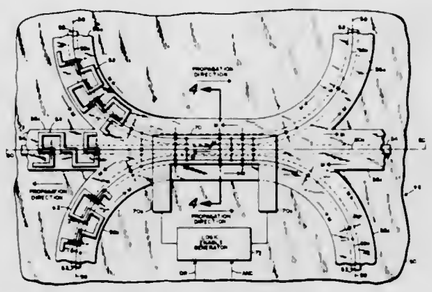
1. In a cross-tie wall memory system in which binary data are stored as inverted Neel wall sections, which inverted Neel wall sections are bounded by a cross-tie on one end and by a Bloch-line on the other end, of a cross-tie wall in a magnetic layer and in which said binary data are generated in and are serially propagated along said cross-tie wall by appropriate drive fields, the improvement in which said magnetic layer is configured into a strip whose two opposing edges are formed into uniformly spaced, repetitive patterns of asymmetrically rounded, serrated edges that match the natural contour of the magnetization that is oriented around a Bloch-line that is positioned along said cross-tie wall.

4,075,613

LOGIC GATE FOR CROSS-TIE WALL MEMORY SYSTEM INCORPORATING ISOTROPIC DATA TRACKS

Ernest James Torok, St. Paul, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 3, 1977, Ser. No. 756,225
Int. Cl.² G11C *19/08*
U.S. Cl. 365—87 **10 Claims**



1. A logic gate for a cross-tie wall memory system in which binary data are stored as cross-tie, Bloch-line pairs in a cross-tie wall in a data-track-defining magnetic film strip and in which said binary data are generated in and are serially propagated along said cross-tie wall in said data track by appropriate drive fields, comprising:

first, second and third magnetic film strips, each defining first, second and third data tracks, respectively, and each having a cross-tie wall oriented along its length for supporting cross-tie, Bloch-line pairs, said first, second and third data tracks having an overlapping, merging portion;

first, second and third propagating means associated with said first, second and third data tracks, respectively, for

propagating the cross-tie, Bloch-line pairs in said merging portion of said first, second and third data tracks; and,

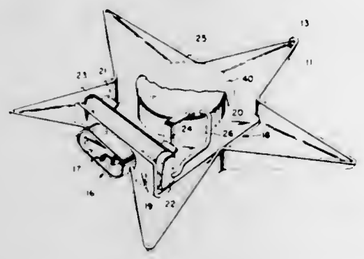
logic enable generator means coupling a logic enable field of a given intensity to said merging portion of said first, second and third logic data tracks for generating in said third data track the logic replica of the cross-tie, Bloch-line pairs in said first and second data tracks.

4,075,614

CHRISTMAS TREE FIRE DETECTOR AND ALARM

Donald A. White, 4701 E. Kessler View, Indianapolis, Ind. 46220

Filed June 16, 1976, Ser. No. 696,483
Int. Cl.² G08B *17/06*
U.S. Cl. 340—227.1 **15 Claims**



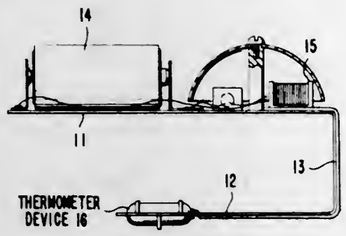
1. A Christmas tree ornament and fire alarm, comprising: a housing having an interior chamber; means for mounting the housing on the upper portion of a Christmas tree; detector means in communication with the environment exterior of the housing for providing a signal in response to a fire within the Christmas tree; means within the interior of said housing for providing an audible fire alarm in response to said signal; and a plurality of openings through said housing for passing the audible fire alarm signal from the interior of said housing to the exterior of said housing.

4,075,615

FREEZER ALARM

Beltran L. Garcia, Kingsville, Tex., assignor to The Raymond Lee Organization, Inc., New York, N.Y., part interest to each

Filed Feb. 25, 1977, Ser. No. 771,920
Int. Cl.² H01H *37/74*
U.S. Cl. 340—227.1 **2 Claims**



1. A freezer alarm for a freezer having an opening and a wall at the opening, the wall having an inside surface in the freezer, an outside surface out of the freezer and an edge at the opening between the inside and outside surfaces, said freezer alarm comprising

a bracket member of substantially square U-shaped configuration having first and second spaced substantially parallel arms and a head joining the arms and extending substantially perpendicularly thereto, said bracket member resting on a wall of a freezer at the opening thereof with the first arm abutting the outside surface of the wall, the second arm abutting the inside surface of the wall and the head abutting the edge of the wall;

battery means mounted on the first arm of the bracket member;

alarm means mounted on the first arm of the bracket member;

thermometer means mounted on the second arm of the bracket member and having a column of mercury for indicating the temperature and a pair of spaced electrical contacts in the path of the column of mercury at an unsafe temperature; and

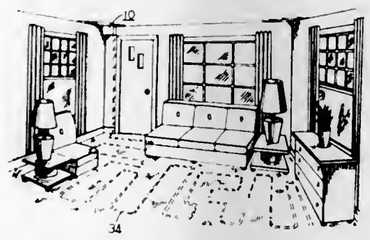
electrically conductive means connecting the battery means, the alarm means and the thermometer means in circuit whereby when the temperature in the freezer becomes unsafe, as indicated when the column of mercury reaches the electrical contacts, the circuit is closed and the battery means energizes the alarm means.

4,075,616

DETECTOR FOR ALARM SYSTEM

Joseph M. Rait, 1100 Amherst St., Buffalo, N.Y. 14216

Filed Nov. 12, 1975, Ser. No. 630,998
Int. Cl.² G08B *13/10*
U.S. Cl. 340—276 **4 Claims**



1. A switching device comprising an elongate flexible cable-like tubular carrier of insulating material of undefined length, sensing means occupying the full volume of said carrier and extending longitudinally substantially the entire length thereof, said sensing means comprising a fibrous, flexible, resilient mass of insulating material having a pair of uninsulated conducting wires spirally intertwined longitudinally therethrough in opposed spaced apart relationship, each point of one of said pair of conducting wire being disposed opposite a point on the other of said pair of conducting wires, the insulating material separating and insulating said conducting wires one from the other, said mass of insulating material being permeable to permit said conducting wires to penetrate said mass to thereby engage each other in response to an applied force transversely of the carrier in any direction and at any point, said mass being resilient for effecting restoration of said spaced relationship when the applied force is removed.

4,075,617

ALARM CIRCUIT FOR MONITORING REMOVAL OF PLUG FROM ELECTRICAL POWER RECEPTACLE

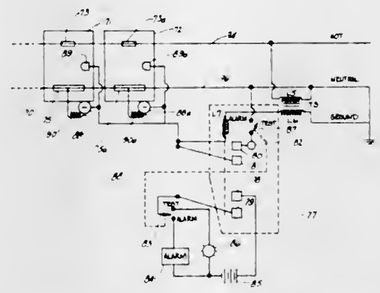
Wallace H. Wireman, 13 Park Ave., Walton, Ky. 41094

Filed May 17, 1976, Ser. No. 686,789
Int. Cl.² G08B *13/14*
U.S. Cl. 340—280 **12 Claims**

1. An alarm circuit for electrical devices of the type normally plugged into an electrical power receptacle to provide an alarm signal whenever an electrical plug having at least hot and neutral male contacts and associated with the electrical device has been removed from said receptacle, said alarm circuit comprising:

(a) an electrical power receptacle having hot, neutral and ground female contacts adapted to be connected respectively to hot, neutral and ground conductors of an alternating current supply system, said receptacle being adapted to receive therein said plug, said hot and neutral

male contacts adapted to make electrical connection respectively with said hot and neutral female contacts while said plug is inserted in said receptacle, said receptacle including switch means adapted to connect said ground conductor to said neutral conductor and being shiftable between a first switching condition for disabling said alarm circuit when said plug is inserted in said receptacle and a second switching condition for enabling said alarm circuit when said plug is removed from said receptacle,



said switch means being shiftable to said first switching condition by at least one of said male contacts when received in its respective female contact, said switch means being biased to return to said second switching condition when said at least one male contact is removed from its respective female contact; and

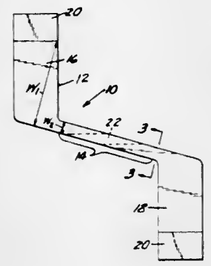
(b) an indicating circuit including a source of power operatively connected in series with said ground conductor and adapted to provide said alarm signal when said switch means is shifted to said second condition.

4,075,618

MAGNETIC ASYMMETRIC ANTIPILFERAGE MARKER

Samuel Montean, Blaine, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 15, 1976, Ser. No. 705,419
Int. Cl.² G08B *13/22*
U.S. Cl. 340—280 **15 Claims**



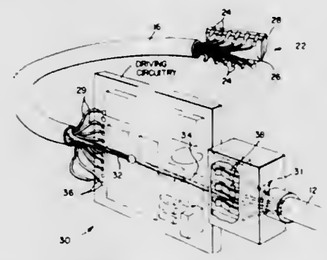
1. An antipilferage marker adapted for use in a system for sensing the presence of an object to which is affixed a said marker in an interrogation zone having therein a magnetic field periodically varying at a predetermined fundamental frequency, said marker comprising asymmetric sections of ferromagnetic material including a center section having end portions and having a permeability of not less than 10^4 and a coercive force of not more than 0.5 oersted, and two substantially planar flux concentrator sections having a permeability of not less than 10% of the permeability of the center section and a coercive force of not more than one oersted, one of which concentrator sections is secured to each end portion of the center section such that a low reluctance path exists therebetween, said concentrator sections having a predetermined area, the maximum dimension of which parallel to the width of the end portion of the center section to which it is secured is at least three times the width of said end portion such that magnetic lines of flux are collected and concentrated in the center section when a magnetic field periodically alternating at a predetermined frequency is impressed on the marker so as to provide an effective field impressed upon the center section of sufficient intensity to cyclically reverse the magnetization of the center section to result in the production of a detectable characteristic signal containing harmonics of the predetermined frequency in excess of the twentieth order.

4,075,619

REMOTE READING COMPASS DISPLAY

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Filed Mar. 6, 1975, Ser. No. 556,081
Int. Cl.² G06F *3/14*
U.S. Cl. 340—324 R **3 Claims**



1. For use with a remote reading magnetic compass in which a digital output signal is provided representative of compass headings, circuitry for display of the present compass heading, comprising:

a first electrical cable having one end connected to a remote reading compass;

a second flexible electrical cable;

a multi-digit numerical indicator package of a size and configuration approximating that of said second cable and affixed to one end thereof, and including a single, dual-in-line package, integrated circuit, multi-digit display operative in response to said digital signals, and a housing enclosing said display and in sealing engagement with said second cable;

an interface circuit connected to the other end of said first cable and to the other end of said second cable and operative to receive the digital compass output signals from said remote reading compass and provide in response thereto second digital signals which are applied to the other end of said second cable for activating the multi-digit display so that the compass heading is displayed thereby; and

a fastener affixed to said indicator package and adapted for semipermanent attachment to a mounting surface, whereby the indicator package may be readily moved to various locations.

4,075,620

VIDEO DISPLAY SYSTEM

Francis C. Passavant, West Newton, and Richard R. Pease, Hingham, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Apr. 29, 1976, Ser. No. 681,505
Int. Cl.² G06K *15/20*
U.S. Cl. 340—324 AD **7 Claims**

1. Apparatus for displaying characters including in combination

display means capable of producing images on a display surface by selectively writing on the display surface while

repeatedly sweeping a raster scanline pattern over the display surface;

first memory means for storing digital code words in a plurality of storage positions, each storage position corresponding to a location on the display surface of said display means, and the storage positions being arranged in an array designating the locations on the display surface by first and second orthogonal sets of lines;

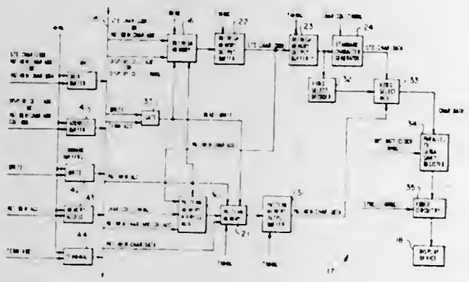
second memory means for storing character image data in a plurality of storage positions;

each of said digital code words being a character code word representing a character to be displayed or being an address code word designating storage positions in said second memory means;

data input storage means for receiving and storing a digital code word, or character image data;

address input storage means for receiving and storing display location information designating a storage position in said first memory means associated with a digital code word stored in said data input storage means, or storage position information designating storage positions in said second memory means associated with character image data stored in said data input storage means;

memory access storage means for receiving and storing a first indication when a digital code word is received and stored in said data input storage means and display location information is received and stored in said address input storage means, and for receiving and storing a second indication when character image data is received and



stored in said data input storage means and storage position is received and stored in said address input storage means;

said first memory means being operable to receive a digital code word from said data input storage means and the associated display location information from said address input storage means and to store the received digital code word in the storage position designated by the received display location information when enabled by a first indication from said memory access storage means;

said second memory means being operable to receive character image data from said data input storage means and the associated storage position information from said address input storage means and to store the received character image data in the storage positions designated by the storage position information when enabled by a second indication from said memory access storage means;

first memory readout means for reading out digital code words from the storage positions of said first memory means designating locations in a line of the first orthogonal set in sequence for each tracing of a scanline;

second memory readout means coupled to said first memory means for reading out character image data from the storage positions in said second memory means designated by an address code word read out of said first memory means;

character data generating means coupled to said first memory means and operable in response to a character code word being read out of a storage position in the first memory means to generate character image data pertaining to the character represented by the character code word; and

output means coupled to the character data generating means, the second memory means, and the display means;

said output means including character data selection means for selecting character image data from the character data generating means in response to a character code word being read out of said first memory means and for selecting character image data from the second memory means in response to an address code word being read out of said first memory means;

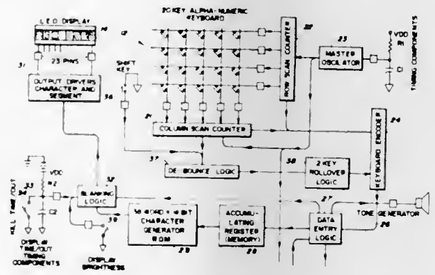
said output means being operable to cause the display means to write the selected character image data on the display surface at the location on the display surface corresponding to the storage position of the digital code word in said first memory means.

4,075,621

HAND HELD COMMUNICATION AID FOR THE DUMB

D'Miles E. Salmon, San Jose, Calif., assignor to Atari, Inc., Sunnyvale, Calif.

Filed Nov. 5, 1976, Ser. No. 739,149
Int. Cl.² G06F *3/14*
U.S. Cl. 340—337 **9 Claims**



1. A communication aid for the dumb comprising: a case having an elongated portion and an enlarged portion said portions constituting a substantially co-planar top surface of said case said elongated portion being configured so that it may be securely grasped by one hand and with an input alpha-numeric keyboard included in said top surface of said elongated portion oriented to face the user for operation by the other hand, said enlarged portion including an alpha-numeric visual display panel actuated by said keyboard located at an end of said enlarged portion of said case away from the user and oriented at a 90° angle with respect to said top surface in which said keyboard is included so that the display is visible and properly oriented for reading by a person standing opposite the user; and a power supply contained within said case.

4,075,622

VARIABLE-TO-BLOCK-WITH-PREFIX SOURCE CODING TECHNIQUE

John C. Lawrence, Encinitas, and Albert Roth, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 31, 1975, Ser. No. 546,051
Int. Cl.² H03K *13/24*
U.S. Cl. 340—347 DD **15 Claims**

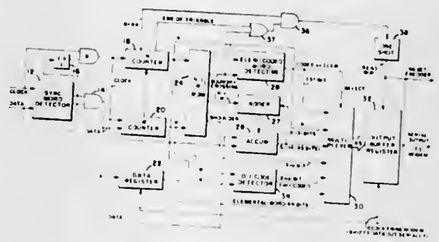
1. A data compression encoder for compressing a variable length N, stream of data bits into a block of N_o encoded bits including a group of S bits indicative of the rank of said sequence comprising:

a first means for providing a predetermined set of the elements of Pascal's triangle such that $2^S - 1$ is the largest member of said set provided;

second means for initiating a random walk in said predetermined set of the elements in Pascal's triangle in response to receipt of said stream of data bits;

third means connected to said first means for accumulating the sums of the Wth elements in the $(n-1)^{st}$ rows of Pascal's triangle in response to receipt of each binary "1" data bit from said stream of data bits where w is the current number of data stream "1"'s received and n is the current member of data stream data bits received; and

output means for accepting from said third means a group of S bits representative of the rank of said stream of data bits and for accepting from said second means a group of P bits representative of the length of said stream of data bits.

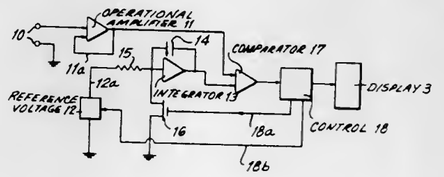


4,075,623

REFERENCE VOLTAGE CIRCUIT

Yoshikiyo Futagawa; Kanemitsu Kubota, and Hiroshi Kamakura, all of Shiojiri, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo and Shinshu Seiki Kabushiki Kaisha, both of, Japan

Filed June 28, 1976, Ser. No. 700,264
Claims priority, application Japan, June 26, 1975, 50-79770
Int. Cl.² H03K *13/02*; G05F *3/14*
U.S. Cl. 340—347 NT **21 Claims**



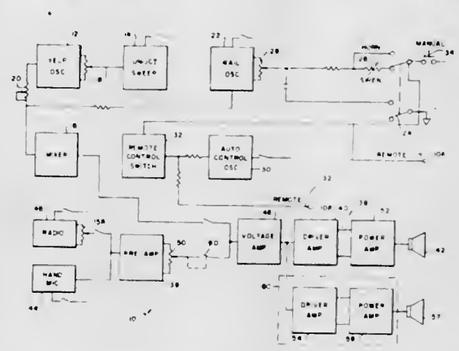
12. In an analog-to-digital converter circuit including reference voltage circuit means for producing a fixed reference voltage, integrator circuit means for integrating said fixed reference voltage, comparator means for comparing the voltage level of said integrated fixed reference voltage with a further voltage level, and control means coupled to the comparator means for producing a digital count representative of the magnitude of said further voltage level, the improvement comprising said fixed reference voltage circuit including a fixed voltage means adapted to be referenced to a fixed voltage in response to a referencing voltage being applied thereto, charge storage means coupled to said integrator circuit means and adapted to be charged to a reference voltage, a current gating means coupled in series with said charge storage means, said series-coupled current gating means and said charge storage means being coupled in parallel with said fixed voltage means, and supply means coupled to said control means for supplying a referencing voltage, a first transistor switching means disposed intermediate said supply means and said fixed voltage means for intermittently applying said referencing voltage to said charge storage means and said fixed voltage means for a sufficient interval of time to charge said storage means to a reference voltage when said fixed reference voltage is to be integrated by said integrator means.

4,075,624

ELECTRONIC SIREN STRUCTURE AND METHOD

Richard M. Sheff, 6564 E. Michigan Ave., Saline, Mich. 48176

Filed May 15, 1974, Ser. No. 469,945
Int. Cl.² G08B *3/00*
U.S. Cl. 340—384 E **11 Claims**



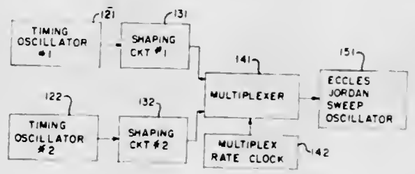
1. Electronic siren structure comprising a varying pitch yelp oscillator, means for driving the yelp oscillator to produce a square wave output therefrom, a varying pitch wail oscillator, means for driving the wail oscillator to produce a square wave output therefrom, mixer circuitry electrically connected to the yelp and wail oscillators for receiving and mixing square wave signals from the yelp and wail oscillators and providing a mixer output signal in accordance therewith, switch means connected to the yelp and wail oscillators and the mixer for switching the output signal from the mixer to one of the yelp oscillator signal separately, the signal from the wail oscillator separately, and the signal from the yelp and wail oscillators simultaneously, and output structure electrically connected to the yelp and wail oscillators for receiving the output signal from the mixer, and providing a signal output for warning of the approach of an emergency vehicle carrying the electronic siren structure.

4,075,625

AUDIBLE ELECTRONIC WARNING SYSTEM

Richard F. Cieslak, Algonquin, and John V. Balding, Palatine, both of Ill., assignors to Industrial Electronics Service Co., Schaumburg, Ill.

Continuation-in-part of Ser. No. 550,219, Feb. 18, 1975, which is a continuation-in-part of Ser. No. 377,644, July 9, 1973, Pat. No. 3,889,256. This application Mar. 8, 1976, Ser. No. 664,434
Int. Cl.² G08B *3/00*
U.S. Cl. 340—384 E **11 Claims**

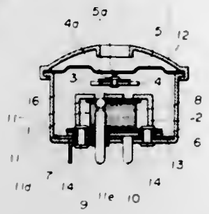


1. An electronic siren system including a first timing oscillator and a second timing oscillator, each of said oscillators having an associated shaping network, a mixing means common to both said oscillators and their respectively associated shaping networks, both of said timing oscillators and associated shaping networks directing their respective outputs to said mixing means, and a sweep oscillator, said mixing means fed by both said oscillators and associated networks creating a complex signal input to said sweep oscillator.

4,075,626
ALARM BUZZER

Mitsuo Sakaguchi; Hikoji Iwasaki, and Shigeo Shimoya, all of Tokyo, Japan, assignors to Kobishi Electric Co., Ltd., Tokyo, Japan

Filed Feb. 4, 1977, Ser. No. 765,466
Claims priority, application Japan, Nov. 11, 1976, 51-151613[U]; Nov. 11, 1976, 51-151614[U]; Nov. 11, 1976, 51-151615[U]
Int. Cl.² G10K *1/00*
U.S. Cl. 340—388 **9 Claims**

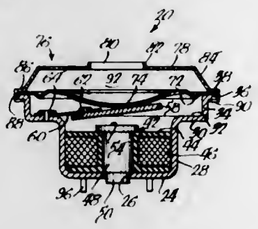


1. An alarm buzzer comprising an electromagnet, a yoke on which said electromagnet is mounted while maintaining insulation from a housing, an armature which is held with a plate spring on said yoke and is attracted by said electromagnet, a vibratory plate which contacts said armature, and a housing which incorporates the above components wherein a bobbin of said electromagnet is made of an insulating material and consists of a hollow cylinder which receives an iron core in it and is wrapped with coil on its outer periphery, first flange provided on one end of said hollow cylinder, second flange provided on the other end of the hollow cylinder and at least one hollow projection provided on said second flange in a direction parting from said first flange, said yoke is provided with at least one hole into which said hollow projections of the bobbin is inserted, and the bobbin and the yoke are fixed to the housing of the alarm buzzer by a fixture which is inserted into the hollow projection of the bobbin inserted into said hole of the yoke.

4,075,627
ELECTRIC HORN

George R. Pariza, Schaumburg, Ill., assignor to Pittway Corporation, Northbrook, Ill.

Filed Feb. 2, 1977, Ser. No. 765,049
Int. Cl.² G08B *3/10*
U.S. Cl. 340—388 **11 Claims**

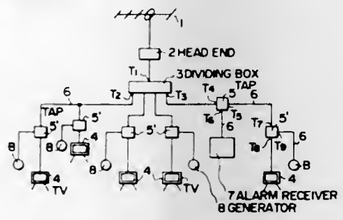


1. An improved horn for generating an audible signal, comprising a housing formed of magnetically permeable material having walls the margins of which define an opening; an electromagnetic coil closely confined within said housing; a diaphragm of relatively flexible material positioned on said housing over said opening and closing said housing; and a striker member of magnetically permeable material mounted in said housing between said diaphragm and said coil and operatively associated with said coil for movement away from and strikingly against said diaphragm to generate noise, said housing itself constituting the magnetic flux path for said coil and striker.

4,075,628
ALARM SYSTEM UTILIZING CABLE-TV MULTI-RECEIVER SYSTEMS

Hajime Masuda, Tokyo; Takeshi Takeuchi, Yokohama; Masakatsu Watanabe, Akatsukashin, and Yukio Tomioka, Tokyo, all of Japan, assignors to Hochiki Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 529,148, Dec. 3, 1974, abandoned. This application Nov. 17, 1976, Ser. No. 742,731
Claims priority, application Japan, Dec. 29, 1973, 49-4131
Int. Cl.² G08B *25/00*
U.S. Cl. 340—416 **2 Claims**



1. An alarm system combined with a cable TV system for a plurality of domiciles, comprising:
- a common antenna for receiving broadcast television carrier signals,
- a coaxial lead-in cable connected to said antenna,
- a head terminal connected to said lead-in cable having a circuit for amplifying such signals,
- an amplified-signal coaxial cable connected to said head terminal,
- a dividing manifold box connected to said amplified-signal cable having a plurality of output signal terminals,
- an individual-TV receiver coaxial cable having a core and a tube connected to each of said terminals,
- a separate terminal unit in each domicile connected to each individual-TV receiver cable, and
- a TV receiver connected to each terminal unit; with

an alarm system comprising
- a DC alarm signal generator associated with each domicile corresponding to each terminal unit, comprising:
- a normally open trigger switch-circuit for effectively connecting between the core and tube of a coaxial cable in each terminal unit in each domicile, a resistance of a preselected individual value corresponding to each domicile under protection of the alarm system, in response to need for generating an alarm; and
- a common alarm receiver located at a convenient station adjacent a terminal unit in one of said domiciles comprising:
- a DC alarm signal receiving circuit connected across the core and tube of a coxial cable in the terminal unit adjacent thereto, provided with means for indicating the particular domicile in which an alarm signal is generated by the corresponding alarm signal generator, when the latter switches the corresponding resistance in the core-tube circuit in response to a source of alarm in such domicile,

said driving manifold box comprising:
- a main TV signal dividing unit circuit in which the number of TV output signal terminals is increased by split choke coil circuits to correspond with the number of domiciles, and
- an auxiliary circuit including DC blocking capacitors for preventing an alarm signal flowing into said main TV signal dividing circuit,
- said auxiliary circuit also including low-pass filters comprising choke coils constituting a DC passing circuit for an alarm signal, without interference between the DC alarm and TV signals,

each terminal unit comprising:
- input and output terminals for TV and DC alarm signals,
- parallel circuits connecting said input and output terminals
- one of said parallel circuits containing a capacitor for blocking a DC alarm signal and passing the TV signal, and
- the other parallel circuit containing a low-pass filter comprising choke coils and a capacitor, for conducting an alarm signal,
- one of said terminal units adjacent the alarm receiver station also including:
- alarm signal receiver terminal in addition to said input and output terminals, and
- a circuit connecting the tube of the corresponding cable to ground through a choke coil, the other end of the latter circuit being connected to the low-pass filter circuit at a point between the choke coils threof,

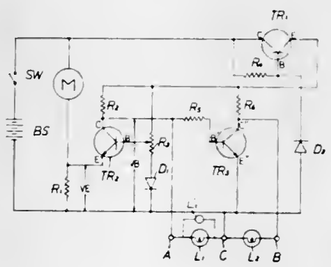
said alarm signal generator also comprising:
- a trigger circuit containing a resistor and an SCR thyristor connected to the core and tube respectively of the cable terminal unit associated threwith, and
- a firing circuit therefor comprising a normally open switch for energizing said thyristor and inserting said resistor in the core-tube circuit of the cable when said switch is closed,

said alarm receiver also comprising:
- a + line connected to a source of power and to the coaxial cable core,
- a − line connected to said power source and to the coaxiable cable tube,
- a first rotary switch having fixed contacts of resistence which correspond in value to that of the resistances peculiar to the several alarm signal generators,
- a second rotary switch interlocked with said first rotary switch having fixed contacts,
- a pilot lamp connected to each of said latter contacts and said + line, for indicating the domicile from which an alarm signal is generated.
- a circuit connected across said + and − lines, containing in series a first relay for driving said rotary switches, an interrupting switch adapted to open and close upon energization and deenergization of said relay, and a contact switch of a second relay, and
- a switching circuit automatically operable in conjunction with said relays and rotary switches for moving the latter stepwise to match the contact of a lamp corresponding to that of the particular domicile source of alarm signal generations.

4,075,629
WARNING DEVICE

Toshiaki Miyamae, 9-15, Nishi-1 chome, Nakagawa, Ikuno, Osaka, Japan

Filed Dec. 23, 1976, Ser. No. 753,906
Int. Cl.² G08B *21/00*
U.S. Cl. 340—421 **3 Claims**

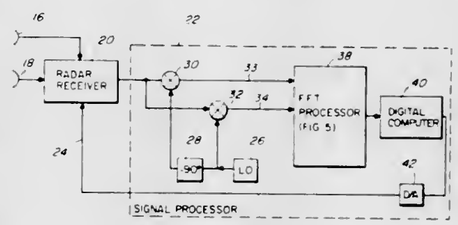


1. An electronic warning device for a motorized fishing reel, comprising
- (a) an electric circuit means including a carbon film resistor, a first transistor and a voltage stabilizing diode;
- (b) a switch means mounted in a reel body in externally operable relation, being connectable to an independent electric source;
- (c) an emitter of said first transistor adapted to normally emit a pre-determined voltage irrespective of the voltage emitted by said source;
- (d) a D.C. motor controllably rotatable by operating said switch means;
- (e) a nicrome wire resistor connected to said motor in series;
- (f) a potentiometer adapted to select a voltage greater than the voltage across said nicrome wire resistor;
- (g) a second transistor disposed between said nicrome wire resistor and said potentiometer, being normally kept in conductive condition;
- (h) a first output terminal connected to said second transistor and adapted not to emit voltage when said transitor is kept conductive but to emit said voltage when said transistor is turned off;
- (i) a first signal emitting element connected to said first output terminal and adapted to be actuated by voltage supplied by said terminal;
- (j) a third transistor that normally remains non-conductive when not being supplied with said voltage from said second transistor but which is turned on when supplied with said voltage from said second transistor through said carbon file resistor;
- (k) a second output terminal connected to said third transistor and adapted to be normally supplied with said voltage; and
- (l) a second signal emitting element connected to said second output terminal and adapted to be actuated by said voltage from said second output terminal.

4,075,630
SIGNAL PROCESSOR

Gerald N. Shapiro, Newton Center; Bertram J. Goldstone, Lexington; Joseph D. Simone, Chelmsford, and Edward E. Spignese, Marblehead, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Sept. 1, 1976, Ser. No. 721,629
Int. Cl.² G01S *9/02*
U.S. Cl. 343—5 DP **2 Claims**



1. In a radar-guided missile having a radar receiver for receiving radar return signals, a signal processor for processing such radar return signals to provide a discrete Fast Fourier Transform on such radar return signals, such signal processor comprising:
- (a) means for separating such radar return signals into two quadrature components;
- (b) means for converting each sample of such components into a corresponding digital word;
- (c) means for converting each digital word into a sequence of binary digits;
- (d) clock means for producing a sequence of binary control signals;
- (e) scaling means, responsive to a portion of the sequence of binary control signals, for scaling each digital word by a factor selected in accordance with the binary control

signals to form a sequence of binary digits corresponding to such scaled digital word;

(f) memory means for storing and serially retrieving such latter sequence of binary digits;

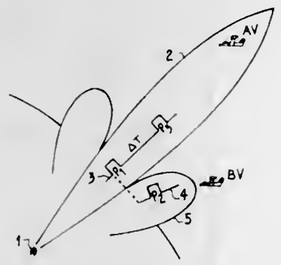
(g) data decoder means, responsive to at least a portion of the sequence of binary control signals, the serially retrieved sequence of binary digits and a second sequence of binary digits corresponding to a different one of the digital words, for producing a sequence of binary digits corresponding to an arithmetic operation of the digital words in the two sequences of binary digits responded to by the data decoder means.

4,075,631

SYSTEM FOR IDENTIFYING OBJECTS EQUIPPED WITH AN AUTOMATIC TRANSPONDER

Bernard Dumez, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 17, 1975, Ser. No. 641,620
Claims priority, application France, Dec. 18, 1974, 74 41801
Int. Cl.² G01S 9/56
U.S. Cl. 343—6.5 R **9 Claims**



1. In a system for identifying, with the aid of interrogation signals radiated from a fixed station in a directional pattern, moving objects equipped with an automatic transponder generating response signals upon receiving said interrogation signals,

the improvement wherein said transponder comprises:

a source of code words each consisting of a predetermined number of significant bits between a pair of framing pulses;

receiving means for picking up interrogation signals including an invariant number of characteristic pulses separated by at least one variable time interval;

detector means connected to said receiving means for generating an indexing signal depending upon the length of said variable time interval;

transmitting means connected to said source for sending out at least one code word upon reception of each interrogation signal;

programmable scrambling means inserted between said source and said transmitting means for interchanging the bits of an outgoing code word;

random-access memory means containing a multiplicity of stored programs for the selective control of said scrambling means, the latter including a multiplexer with parallel signal inputs connected to said source for receiving said significant bits, address inputs connected to said memory means and an output connected to said transmitting means, said source including a mode selector with a multiplicity of output terminals respectively connected to said signal inputs;

addressing means connected between said detector means and said memory means for selecting at least one of said stored programs upon reception of each interrogation signal in response to said indexing signal; and

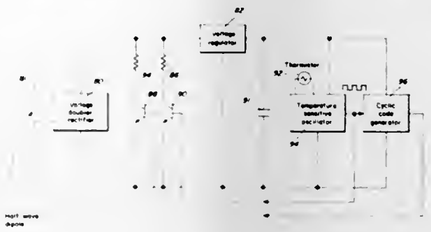
clock-controlled sequencing means connected to said addressing means for stepping same through the selected program.

4,075,632

INTERROGATION, AND DETECTION SYSTEM

Howard A. Baldwin; Steven W. Depp; Alfred R. Koelle, and Robert W. Freyman, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 501,020, Aug. 27, 1974, abandoned.
This application May 24, 1976, Ser. No. 689,708
Int. Cl.² G01S 9/56; H04B 1/59
U.S. Cl. 343—6.8 R **10 Claims**



1. In telemetry apparatus, a passive transponder comprising:

an antenna;

rectifier means having a first pair of terminals connected to said antenna and having a second pair of terminals providing direct current;

variable loading means connected to said second pair of terminals; and

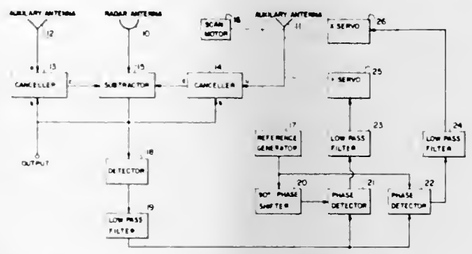
information encoding means in circuit with said variable loading means to enable encoded information to vary the direct current drawn from said rectifier by said variable loading means, thereby varying the impedance of said rectifier means at said first pair of terminals, and varying the reflectivity of said antenna.

4,075,633

SPACE ADAPTIVE COHERENT SIDELOBE CANCELLER

Bernard L. Lewis, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 25, 1974, Ser. No. 519,469
Int. Cl.² G01S 3/06
U.S. Cl. 343—100 LE **7 Claims**



1. An interference suppression system for cancelling interference from a multiple source environment comprising:

a main channel sensor constructed to receive desired and interference signals;

a plurality of auxiliary channel sensors spaced about said main channel sensor and constructed to receive primarily interference signals;

canceller means coupled to said main and auxiliary channel sensors for cancelling interference from said main channel signals and providing a main channel output; and

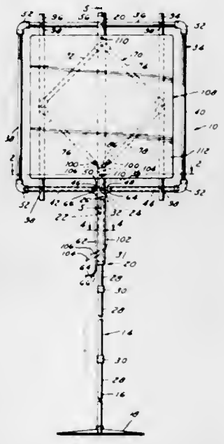
positioning means coupled to at least one of said auxiliary channel sensors and responsive to said main channel output for positioning said at least one auxiliary channel sensor relative to said main channel sensor such as to provide improved interference cancellation in said main channel output.

4,075,634

PORTABLE ANTENNA ASSEMBLY FOR TELEVISION RECEIVER

Edward Gutha, 13930 Mapleridge, Detroit, Mich. 48205

Filed Jan. 10, 1977, Ser. No. 757,814
Int. Cl.² H01Q 7/00
U.S. Cl. 343—742 **10 Claims**



1. A portable antenna assembly for use with a television receiver and for receiving very high and ultra-high frequency television signal carrier waves radiated from transmitters located at varying distances and in different directions from the antenna assembly comprising a stand having a vertically extending stationary base member and a vertically extending antenna support member which is carried by and rotatably mounted on said base member about a vertical axis, a first tubular antenna of generally rectangular configuration secured to said support member and located in a vertical plane, a second tubular antenna of generally rectangular configuration secured to said support member and located in a vertical plane, each of said first and second antennas having a gap between a pair of closely adjacent but spaced apart end portions thereof, a first cable consisting of two wires, each wire of said first cable being secured on one end thereof to an end portion of said first antenna and adapted to be secured on the other end to the very high frequency terminal of the television receiver, and a second cable consisting of two wires, each wire of said second cable being secured on one end to an end portion of said second antenna and adapted to be secured on the other end to the ultra-high frequency terminal of the television receiver, said antenna support member being adapted to be manually rotated on said base member so that it may be directed and positioned to best receive signals from a selected transmitter.

4,075,635

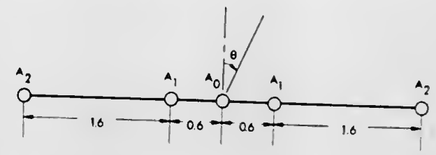
NONUNIFORMLY OPTIMALLY SPACED ARRAY WITH SPECIFIED ZEROS IN THE RADIATION PATTERN

Hillel Unz, c/o Electrical Engineering Department, University of Kansas, Lawrence, Kans. 66045

Filed Feb. 23, 1976, Ser. No. 660,627
Int. Cl.² H01Q 21/08
U.S. Cl. 343—844 **10 Claims**

1. A method of synthesis for controlling the radiation pattern of a general

linear nonuniformly spaced array with nonuniform amplitudes by specifying the zeros (nulls) of the radiation pattern explicitly, said method based on the following rigorous relationship which expresses the array radiation pattern (Fu) of an array of N elements by a determinant of N rows and N columns, with the first row consisting of N terms $\exp(ix_p u)$, and each subsequent row consisting of N terms $\exp(ix_p u_s)$, u, being identical in the terms of each row and represents explicitly the zero (null) of the array radiation pattern $F(u)$, the total number of zeros (nulls) so specified equal to (N-1), with N being the number of the elements of the array, where



$u = \pi \sin \theta$

θ being the angle with the normal to the array axis,

x_p is the distance of the p-th array element from the reference origin in terms of half wavelength ($\lambda/2$),

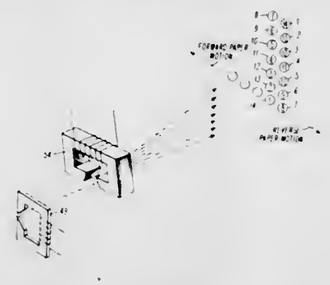
A_p is the amplitude of each corresponding element of the array to be found by developing the above mentioned determinant along its first row and identifying the amplitude of each element at position x_p as the factor multiplying the corresponding term $\exp(ix_p u)$.

4,075,636

BI-DIRECTIONAL DOT MATRIX PRINTER WITH SLANT CONTROL

Louis Valentine Galetto, Apalachin; Johann Hans Meier; Walter Thornton Pimbley, both of Vestal, and Bruce Allen Wolfe, Johnson City, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 16, 1976, Ser. No. 751,235
Int. Cl.² G01D 15/18
U.S. Cl. 346—75 **14 Claims**



13. A dot matrix printer apparatus capable of bi-directionally printing successive lines of characters using relative motion between a print medium and a print means,

said print means comprising means for sequentially recording a line of dots orthogonal to the direction of said bi-directional motion,

means for controlling the operation of said print means for recording characters in the form of a plurality of said lines of dots during said bi-directional relative motion including

slant correction means for correcting for slanting of said lines of dots due to said relative motion in both directions including,

direction determining means for indicating the direction of said relative motion during said recording of said lines of dots, and

means responsive to direction indications from said direction

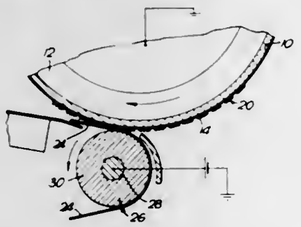
determining means for reversing the sequence for recording dots to form lines of dots in correspondence with reversals in the direction of said relative motion.

4,075,637

ELECTROSTATIC MULTI-COPIER

Joseph Gilbert, Ilford; Malcolm McKenzie McRobbie, Brentwood, and Wilfred Gee, New Barnet, all of England, assignors to Ozalid Group Holdings Limited, Loughton, England

Filed June 16, 1976, Ser. No. 696,805
Int. Cl.² G03G *15/09*
U.S. Cl. 346—153 **8 Claims**



1. An electrostatic duplicator, comprising:
- a rotatable cylinder for supporting a master constituted by a sheet of material bearing an image to be duplicated, the image area of the master having an electrical resistivity which is substantially greater than that of the background area;
- means for rotating the cylinder;
- an applicator for applying toner powder only to the image area of the master on the cylinder subsequent to charging of the master by means of a charge transfer roller;
- means for feeding transfer sheet material repeatedly into a nip between the cylinder and a charge transfer roller, to which nip the master is advanced from the applicator by rotation of the cylinder;
- a source of electrical potential connected to the charge transfer roller, said charge transfer roller being the sole agency for imparting electrical charge to said master and operating simultaneously not only to cause toner powder to be transferred from the master to the transfer sheet material but also to cause the image area of the master to receive sufficient electrical charge upon passage of said transfer sheet material through said nip to enable the image area to pick up toner powder from the applicator; and
- a unit for fixing the toner powder to the transfer sheet material.

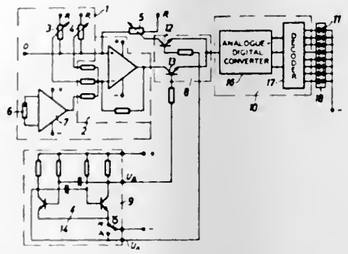
4,075,638

CAMERA WITH AUTOMATIC EXPOSURE FACTOR MECHANISM

Karl-Peter Strauss, Volkmarode, and Dietmar Elke, Braunschweig, both of Germany, assignors to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Filed Dec. 17, 1976, Ser. No. 751,868
Claims priority, application Germany, Dec. 20, 1975, 2557682
Int. Cl.² G03B *17/20*
U.S. Cl. 354—23 D **13 Claims**

1. A camera in which an exposure factor is determined automatically in accordance with prevailing illumination conditions and which may be selectively operated either in automatic mode with said factor set in accordance with its automatic determination or in manual mode with said factor set manually, said camera comprising indicating means for indicating both the automatically determined exposure factor and the manually set exposure factor when the camera is operated in manual mode, said indicating means including a plurality of



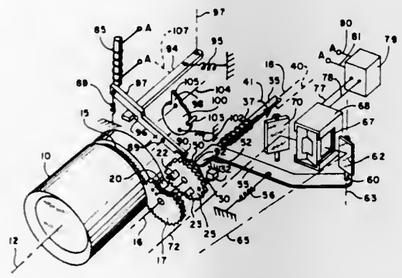
light sources respectively representing different values of said factor.

4,075,639

DUAL SCANNING FOCUSING SYSTEM

Dean M. Peterson, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 1, 1976, Ser. No. 728,565
Int. Cl.² G03B *7/08*
U.S. Cl. 354—25 **13 Claims**



1. Apparatus for use with a system which includes scanning means to receive and transmit radiation from a scene containing an object, radiation responsive means to receive radiation from the scanning means and to produce an output signal indicative of the distance to the object and a member to be positioned in accordance with the output signal comprising:
- drive means movable through a range of positions;
- movable means connecting said drive means to said scanning means, said drive means operable to cause said scanning means to provide first and second scans of the scene during one movement of the drive means through the range;
- Positioning means connecting said drive means to the member, said drive means operable to move the member; and
- signal responsive means connected to the radiation responsive means to receive the output signal and operable in accordance therewith to stop the movement of the member only during the second scan provided by the scanning means.

4,075,640

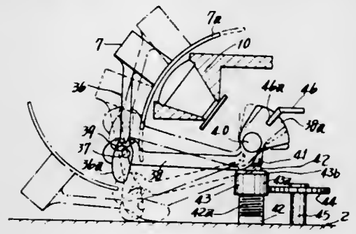
CAMERA WITH EXPOSURE CONTROL MECHANISM

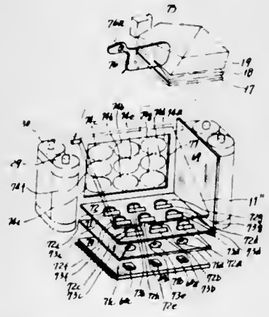
Hiroshi Ueda, Nara, and Akira Yoshizaki, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sept. 22, 1976, Ser. No. 725,470
Claims priority, application Japan, Sept. 29, 1975, 50115,486
Int. Cl.² G03B *7/08*
U.S. Cl. 354—31 **29 Claims**

1. A camera comprising:
- an objective lens;
- a diaphragm;

- a camera body in which a film is located at the focal plane of said objective lens;
- light responsive means arranged within said camera body for receiving scene light passing through said objective lens and providing an output signal in response to such light;
- means for indicating an exposure value in accordance with an output of said light responsive means;
- first reflecting means disposed between said focal plane and said objective lens, said first reflecting means being half transparent and being movable between a first position for causing scene light having passed through said objective lens and said diaphragm to be partially reflected away from said focal plane and partially passed through towards said focal plane and a second position for permitting all of such scene light to pass towards said focal plane;
- second reflecting means disposed behind said first reflecting means and in front of said focal plane, said second reflecting means being movable together with said first reflecting means between a first position for reflecting towards said light responsive means scene light having passed through said first reflecting means when in its first position and a second position when said first reflecting means is in its second position for permitting such scene light to pass towards said focal plane;





- light restricting means disposed in front of said light responsive means for restricting scene light incident on said light responsive means, said light restricting means including a central aperture and being movable with said aperture being in alignment with said light responsive means and said second reflecting means when in its first position; and,
- manual switch means for moving said light restricting means relative to said light responsive means.

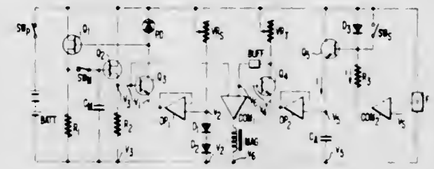
16. A camera including an objective lens, a diaphragm, a camera body in which a film is located at the focal plane of the objective lens, a focal plane shutter having a leading member and a trailing member which control the light reaching an image plane of the film to be exposed, the reflectance of the leading member being substantially equal to that of the surface of the film, means for driving the leading member to initiate an exposure of the film, and an exposure control mechanism, said exposure control mechanism comprising:
- light measuring means including a plurality of photosensitive means disposed in said camera body to respectively receive scene light passing through said objective lens and said diaphragm and reflected from different portions of the entire area of the surface of said leading member and exposed portions of said film;
- operable means for selectively activating said photosensitive means of said light measuring means, said light measuring means generating an output commensurate with the average value of the outputs of said activated photosensitive means; and,
- means for controlling an exposure in dependence upon the output of said light measuring means.

4,075,641

AUTOMATIC EXPOSURE CONTROL DEVICE IN A CAMERA

Naoyuki Uno, Urawa; Tetsuji Shono, Ranzan; Fumio Urano, Omiya, and Masahiro Kawasaki, Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 24, 1975, Ser. No. 625,613
Claims priority, application Japan, Oct. 29, 1974, 49-124563
Int. Cl.² G03B *7/08*
U.S. Cl. 354—43 **11 Claims**



1. An iris adjustment control for cameras which, using the APEX operational equations, compares the brightness value Bv and film sensitivity value Sv with the iris size indication value Av and shutter speed value Tv and automatically adjusts the iris when the shutter release is actuated, said iris adjustment control comprising:
- first means for generating a first voltage proportional to said brightness value Bv,
- second means for generating a second voltage proportional to said film sensitivity value Sv,
- memory means connected to said first and second means and responsive to the actuation of the shutter release for storing a third voltage proportional to said first and second voltages,
- third means for generating a fourth voltage proportional to said shutter speed value Tv,
- iris movement means responsive to the actuation of the shutter release for changing the iris setting at a constant rate from an initial position,
- pulse generating means responsive to the movement of the iris for genering electric pulses having a constant width, the cumulative number of pulses generated being directly proportional to the iris size indication value Av at any point in time during the movement of the iris,
- integrating means receiving said electric pulses and generating a fifth voltage proportional to said iris size indication value Av,
- summing means connected to said third means and said integrating means for genering a sixth voltage proportional to the sum of said fourth and fifth voltages,
- comparing means connected to said memory means and said summing means for generating an output when said third and sixth voltages are equal satisfying the APEX equation

$$Bv + Sv = Av + Tv,$$

and fifth means responsive to the output of said comparing means to stop further movement of the iris.

4,075,642

PHOTOGRAPHIC IMPLEMENT

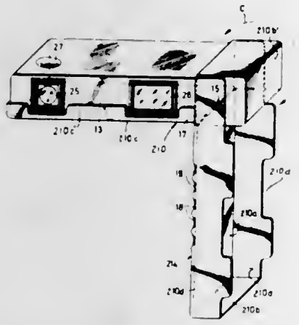
Fritz Niggeloh, Fichtenhof, (5608) Radevormwald, Germany

Filed Aug. 8, 1975, Ser. No. 603,199

Claims priority, application Germany, Aug. 8, 1974, 2438110; Nov. 2, 1974, 2452043

Int. Cl.[2] G03B *17/00*

U.S. Cl. 354—82 **13 Claims**



1. A photographic implement comprising:

a pocket camera having a flat, generally prismatic body with side faces provided with a photographic objective and a viewfinder alongside each other;

a protective case having a pair of cheek plates parallel to said side faces having formed thereon a pair of guide tracks, said body being provided on an end thereof with pivot studs transverse to said side faces engaging in said tracks for facilitating relative displacement of said body and said case in a composite motion with endwise insertion of said body into said case to establish a nonoperating position, said cheek plates bracketing said body and obstructing said objective and said viewfinder by respectively overlying said side faces in said nonoperating position; and

holding means on said case engageable with said body for arresting said case in an operating position with said cheek plates extending substantially perpendicularly to said body whereby said case is usable as a rigid handgrip for said camera.

4,075,643

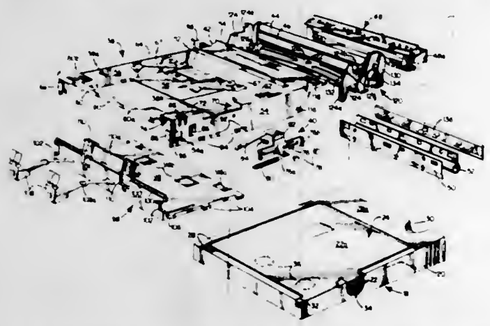
FILM-ENGAGING MECHANISM AND TRANSPORT RECEPTACLE THEREFOR

William P. Lane, Taunton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sept. 9, 1976, Ser. No. 721,856

Int. Cl.[2] G03B *17/52, 17/26*

U.S. Cl. 354—86 **17 Claims**



1. In apparatus for engaging self-developing photographic film, in the form of cassette-housed separate card-like film units, in a camera; said apparatus receiving and positioning a replaceable film cassette with the foremost film unit therein located for photographic exposure, advancing the foremost film unit from the cassette, and processing the advanced film unit with fluidic photoprocessing composition which it carries, said apparatus having

(i) a transparent receptacle for replaceably receiving a cassette having a casing containing such card-like self-developing film units stacked under an exposure window thereof, said casing further having an exit slot and having an access opening through which the foremost film unit is accessible for dislodgment from the cassette through the exit slot, said receptacle having a front end and a back end, and

(ii) a spread-roll processor for such self-developing film units, said processor being hingedly mounted to the receptacle for movement between a first position where it is aligned at the front of the receptacle with a film unit being advanced out of a cassette received in the receptacle, and a second position where the processor is removed from the front of the receptacle clear of the path of a cassette being loaded into and being removed from the receptacle, said apparatus comprising the improvement wherein

A. a single metal sheet of substantially uniform thickness forms a top wall, a bottom wall, and first and second side walls of said receptacle to define an open-fronted cassette compartment therein,

(1) said top wall having an aperture located above the exposure window of a cassette seated in said receptacle compartment and having first and second side members and back and front members around the periphery of said aperture,

(2) said front member of said top wall having to metal sheet configured to form deflection-resistant rib means along the span thereof at least between said side members,

(3) said metal sheet additionally forming a set of positioning tab members projecting across the back of said compartment,

(4) said compartment-forming walls and said tab member engaging a cassette inserted into said compartment for positioning the cassette relative to the receptacle along three different sides,

B. a pick mechanism mounted on said metal sheet for film-advancing movement relative thereto, and projecting a pick arm into said compartment from an actuator-engaging element thereof located outside said compartment, and

C. means carried on said metal sheet for pivotally mounting said processor to said receptacle and for fixing the pivotal orientation of said processor relative to said compartment when in said first position thereof and for releasably latching said processor in said first position.

4,075,644

MOTOR DRIVE MEANS FOR MOTOR DRIVEN SINGLE LENS REFLEX CAMERA

Tsutomu Hosono, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Sept. 8, 1976, Ser. No. 721,233

Claims priority, application Japan, Sept. 12, 1975, 50-110626

Int. Cl.[2] G03B *1/18*

U.S. Cl. 354—173 **5 Claims**

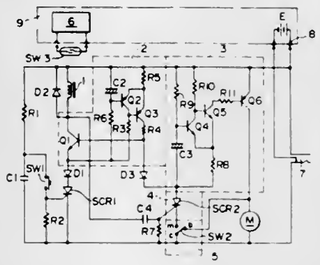
1. A device for operating a film wind-up motor in a motor driven camera provided with a motor for winding up a film having one perforation per frame comprising in combination:

a mirror operating solenoid provided in the camera for swinging up a mirror in a camera body upon receipt of an electric current,

a time constant circuit connected with said mirror operating solenoid for supplying an electric current thereto upon release of a shutter in the camera and stopping the supply of current when a time determined thereby has lapsed,

a switch means connected with a film wind-up motor in the camera for starting supply of current to the motor upon turning off of the solenoid or upon supply of electric power to said switch means, and

a film perforation detecting means provided in the camera for detecting perforations in the film loaded in the camera as the film is fed in the camera and turning off said switch means upon detection of a perforation in the film,



whereby the motor is driven when the solenoid is turned off or the switch means is supplied with electric power, and the motor is stopped when the film perforation detecting means detects a perforation in the film.

4,075,645

FOLDING CAMERA

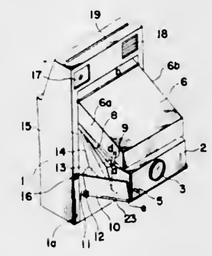
Tsuneaki Munakata, Tokyo, and Makoto Kuboshima, Sagamihara, both of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 27, 1976, Ser. No. 754,806

Claims priority, application Japan, Dec. 27, 1975, 51-157227

Int. Cl.[2] G03B *17/04*

U.S. Cl. 354—187 **4 Claims**



1. Folding camera comprising at least

an exposure compartment comprising opaque wall portions and defining an exposure station whereat film material may be exposed;

a lens mount carrying at least a taking lens means able to focus image-wise light reflected from an external scene to be photographed onto said film material, and having a first support shaft affixed to a first outer surface portion thereof and a second support shaft affixed to a second outer surface portion thereof which is diametrically opposed to said first outer surface portion thereof;

a forward camera portion defining a front opening which extends at least over an area corresponding to the area of said exposure compartment and the forward portion of which is defined by the front wall of said camera;

a first fixed shaft which extends across an upper end portion of said front opening;

a second fixed shaft which is located in a lower portion of said camera and which with respect to the front-to-rear dimension of said camera is in a generally central portion of said camera lower portion;

parallel quadrilateral linkage assemblies comprising a case means having a rear end portion pivotally mounted on said first fixed shaft, and on each side of said case a first link rod having one end pivotally mounted on said first fixed shaft and the opposite end thereof pivotally mounted on a first link pin located below and rearwardly of said first fixed shaft, a second link rod having one end pivotally mounted on said first link pin and the opposite end pivotally mounted on said second support shaft affixed to said second outer surface portion of said lens mount, and a third link rod having one end pivotally mounted on said second link pin and the opposite end pivotally mounted on a third link pin which is fixedly attached to a forward end portion of said case side, whereby said case may be moved to a first case position wherein said case is extended forwardly and downwardly with respect to said camera front wall and to a second case position wherein said case lies within said front opening of said camera and the outer cover of said case is on a plane generally level with that of said camera front wall, said lens mount being maintained at all times below the lower end portion of said case and being brought to a first lens mount position in which said lens mount is held forward of and clear of said camera front wall when said case is at said first case position and to a second lens mount position which is in the area of said front opening of said camera when said case is brought to said second case position;

a folding-box assembly comprising a rear box and a forward box, each said box comprising a bottom wall, two opposite side walls, and one end wall and defining an open top and an open end, said boxes having generally equal dimensions, having a width greater than that of and together defining a total space greater than that of said lens mount, and being in hinged attachment through a hinge element provided across the upper edges of said end walls thereof, the upper edge portions of said side walls of said rear box defining slots through which said second fixed shaft passes, whereby said rear box is pivotally and slidably movable about said second fixed shaft, and the forward end portions of the lower portions of said side walls of said forward box defining slots through which said first support shaft affixed to said first outer surface portion of said lens mount passes, whereby said lens mount is rotatable and slidable with respect to said forward box; and

an opaque hood element which has a front end portion attached to the rear portion of said lens mount and a rear end portion attached to the front portion of said exposure compartment, which when said lens mount is at said first lens mount position is extended and defines a hollow chamber, and which when said lens mount is moved to said second lens mount position is moved sideways and folded flat to a position wherein it lies generally level with the plane of said front portion of said exposure compartment.

4,075,646

MULTI-EXPOSURE DEVICE FOR CAMERA

Makoto Kurasawa, Tokyo, Japan, assignor to Taiwan Ricoh Co., Ltd., China /Taiwan

Filed Dec. 13, 1976, Ser. No. 749,811

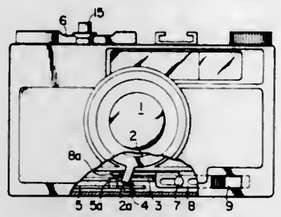
Claims priority, application Japan, Dec. 11, 1975, 50-167636[U]

Int. Cl.[2] G03B *19/02*

U.S. Cl. 354—209 **8 Claims**

1. A multi-exposure device for camera comprising a receiprocable shutter charging member, a self-cocking member for driving the shutter charging member to charge a shutter in

interlocked member for driving the charging member independently from the self-cocking member, and means interconnected with the operating member and adapted to be operated externally of a camera.

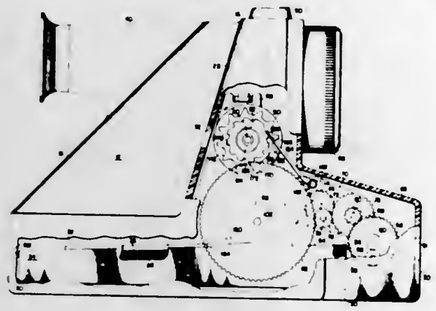


4,075,647

EXPOSURE COUNTER AND FLASH INHIBITING MEANS FOR A PHOTOGRAPHIC APPARATUS

Bruce K. Johnson, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 648,673, Jan. 13, 1976, abandoned. This application Dec. 30, 1976, Ser. No. 755,913
Int. Cl.² G03B *17/36*
U.S. Cl. 354—217 **17 Claims**



1. Photographic apparatus comprising:

a housing including means defining a chamber for receiving a film cassette of the type including a plurality of film units;

a door coupled to said housing adjacent said chamber for movement between an open position wherein the cassette may be inserted into or removed from said chamber and a closed position wherein the cassette is secured within said chamber;

means for exposing each of the film units;

means cooperable with said exposure means for initiating an exposure cycle, said exposure initiating means being mounted for movement between a first position wherein it cannot be actuated to initiate an exposure cycle, to a second position wherein it may be actuated to initiate an exposure cycle, and a third position wherein an exposure cycle is initiated; and

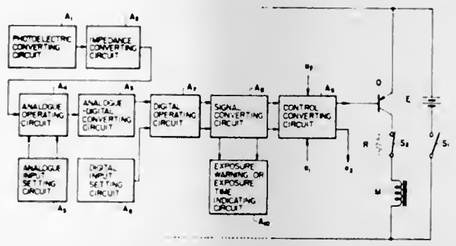
means coupled to said exposure initiating means for automatically moving said exposure initiating means from said first position to said second position responsive to the insertion of a cassette into said chamber and subsequently moving said door into said closed position.

4,075,648

ELECTRIC SHUTTER MEANS EQUIPPED WITH A SELF-TIMER MECHANISM

Nobuyoshi Inoue, and Munetaka Shimizu, both of Kawagoe, Japan, assignors to Copal Company Limited, Tokyo, Japan

Filed May 5, 1975, Ser. No. 683,615
Claims priority, application Japan, May 10, 1975, 50-62738[U]
Int. Cl.² G03B *9/64*
U.S. Cl. 354—238 **2 Claims**



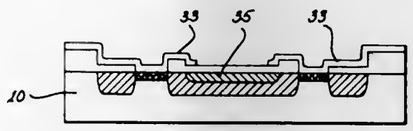
1. An electric shutter means comprising a controlling circuit including therein an electromagnet operable to terminate exposure, a current source switch selectively closed by actuation of a release button to connect said controlling circuit with a current source, an auxiliary switch connected in series with said electromagnet and in parallel with the current source switch, and a self-timer means including therein a sector gear arranged adjacently to said auxiliary switch and movable between a cocked position and an uncocked position for opening and closing said auxiliary switch, said auxiliary switch being opened by said sector gear when said sector gear is cocked, and said auxiliary gear being closed by said sector gear in a final stage of returning motion of said sector gear from its cocked position to its uncocked position.

4,075,649

SINGLE CHIP TEMPERATURE COMPENSATED REFERENCE DIODE AND METHOD FOR MAKING SAME

Rudolph R. Verderber, Scottsdale, Ariz., assignor to Siemens Corporation, Scottsdale, Ariz.

Filed Nov. 25, 1975, Ser. No. 635,241
Int. Cl.² H01L *29/90*
U.S. Cl. 357—13 **8 Claims**



1. A single chip temperature compensated reference diode comprising:

a. a wafer of semiconductive material of one conductivity type;

b. a first layer of semiconductive material of an opposite conductivity type diffused through a surface of said wafer to form a first reverse PN junction;

c. a second layer of semiconductive material of an opposite conductivity type diffused through said surface of said wafer to form a second reverse PN junction extending substantially the same depth as said first reverse PN junction and laterally displaced from said first reverse PN junction;

d. a third layer of semiconductive material of an opposite conductivity type formed in said wafer, laterally contiguous to said first and second layers, to form a third reverse PN junction, said third layer having a higher conductivity than said first and second layers, the reverse PN junctions formed by said first and second layers of semiconductive material laterally surrounding said third reverse PN junction to form a guard ring thereabout;

e. the reverse PN junctions formed by said first, second and third layers forming a continuous reverse PN junction with portions thereof having a lower breakdown voltage than the remainder of the reverse junction; and

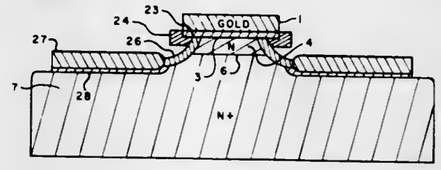
f. a fourth layer of semiconductive material of said one conductivity type diffused into said first layer to form a forward PN junction.

4,075,650

MILLIMETER WAVE SEMICONDUCTOR DEVICE

Joseph A. Calviello, Kings Park, N.Y., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Apr. 9, 1976, Ser. No. 675,621
The portion of the term of this patent subsequent to May 27, 1992, has been disclaimed.
Int. Cl.² H01L *29/48*
U.S. Cl. 357—15 **6 Claims**



1. A gallium arsenide microwave semiconductor device, comprising:

(a) a body of N+ doped gallium arsenide semiconductor material with a carrier concentration in the range of about 1×10^{18} to 1×10^{19} per cubic centimeter,

(b) a mesa located on the upper surface of the body and formed of N doped gallium arsenide at a carrier concentration in the range of about 1×10^{16} to 5×10^{17} per cubic centimeter,

(c) a first contacting layer of tantalum in contact with the upper surface of the mesa to form a Schottky barrier diode junction at the interface of the contacting layer and the mesa, said first contacting layer extending along the plane of the upper surface of the mesa beyond the periphery of the Schottky junction, and the surface on the side of the mesa adjacent the Schottky junction being approximately perpendicular to the plane of the upper surface of the mesa,

(d) a second contacting layer located substantially in a plane below the plane of the upper surface of said mesa with a thickness of at least one skin depth at the operation frequency in contact with and extending over at least a portion of the upper surface of the body about the base of the mesa,

(e) a first electrode connected to and extending over the upper surface of the first contacting layer,

(f) a second electrode connected to and extending over the upper surface of the second contacting layer,

(g) the exposed edge of said first contacting layer passivated with tantalum oxide, and

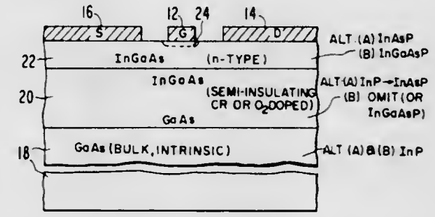
(h) the surface of the device between the first and second electrode passivated with native oxide.

4,075,651

HIGH SPEED FET EMPLOYING TERNARY AND QUARTERNARY III-V ACTIVE LAYERS

Lawrence W. James, Palo Alto, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Mar. 29, 1976, Ser. No. 671,189
Int. Cl.² H01L *29/203, 29/80, 47/00*
U.S. Cl. 357—22 **11 Claims**



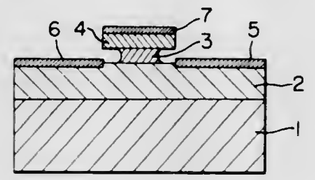
1. A high-speed field effect transistor comprising an active epitaxial layer of a predetermined conductivity type, a rectifying gate contact and ohmic source and drain contacts on said active layer, said gate contact being positioned to control current flow between said source and drain contacts, said active layer comprising a compound of at least three elements selected from columns III and V of the Periodic Table and doped to be of a predetermined conductivity type, said compound being $In_{1-x}Ga_xAs_{1-y}P_y$, where x + y is greater than 0.5 and less than 1.

4,075,652

JUNCTION GATE TYPE GAAS FIELD-EFFECT TRANSISTOR AND METHOD OF FORMING

Shotaro Umebachi, Takatsuki; Gota Kano, Nagaoka-Kyo, and Morio Inoue, Takatsuki, all of Japan, assignors to Matsushita Electronics Corporation, Japan

Continuation of Ser. No. 567,537, April 14, 1975, abandoned. This application May 5, 1977, Ser. No. 793,969
Claims priority, application Japan, Apr. 17, 1974, 49-44324
Int. Cl.² H01L *29/80, 29/161, 29/06, 29/167*
U.S. Cl. 357—22 **2 Claims**



1. A junction gate type field-effect transistor comprising a semiconductor substrate of p-type GaAs,

a semiconductor layer of n-type $Ga_{1-x}Al_xAs$ ($0 \leqq x \leqq 0.1$),

a semiconductor gate region of p-type $Ga_{1-y}Al_yAs$ ($0.2 \leqq y \leqq 0.8$) forming a heterojunction with said n-type layer,

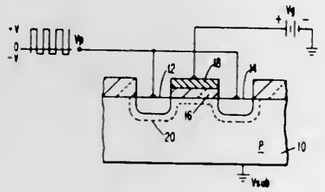
an electrode region of p-type $Ga_{1-z}Al_zAs$ ($0 \leqq z \leqq 0.1$) contiguous with said gate region, the width of said gate region being less than the width of said electrode region; and first and second ohmic electrodes disposed of said n-type layer and spaced apart from each other by said gate and electrode regions, whereby the conductivity of said semiconductor layer may be controlled by the electric field across said heterojunction.

4,075,653

METHOD FOR INJECTING CHARGE IN FIELD EFFECT DEVICES

Lowell Francis Howard, Essex Junction, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 19, 1976, Ser. No. 743,253
Int. Cl.² H01L *29/78, 29/40*
U.S. Cl. 357—23 **8 Claims**



7. A test structure for evaluating the effects of leakage induced threshold shift comprising:

an insulated gate field effect transistor having source and drain electrodes, a gate electrode for controlling a channel region, and a substrate;

means for applying a fixed potential between said gate electrode and said substrate, said fixed potential being of a magnitude and polarity to cause the formation of a depletion region in said channel region; and

means for coupling both of said source and drain electrodes to a source of bipolarity pulses for biasing said source and drain electrodes in alternating forward and reverse bias conditions with respect to the potential of said substrate;

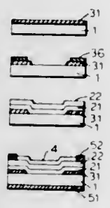
whereby minority carriers injected into the substrate of said transistor during said forward bias condition are injected into the insulated gate of said transistor during said reverse bias condition.

4,075,654

SEMICONDUCTOR PHOTOELECTRON EMISSION DEVICE

Katsuo Hara; Minoru Hagino, and Tokuzo Sukegawa, all of Hamamatsu, Japan, assignors to Hamamatsu Terebi Kabushiki Kaisha, Hamamatsu, Japan

Division of Ser. No. 647,761, Jan. 9, 1976, which is a division of Ser. No. 455,231, March 27, 1974, Pat. No. 3,953,880. This application Oct. 26, 1976, Ser. No. 735,333
Int. Cl.² H01L *27/14, 29/161*
U.S. Cl. 357—30 **5 Claims**



1. A semiconductor photoelectron emission device comprising

an electrode;

a base of direct transition semiconductor of p-type GaSb having an impurity concentration of about 10^{17} to 10^{19} atom/cm^3;

a first layer of n-type GaSb having a thickness of about 10μm epitaxially grown on and covering selected parts of said base;

a second layer of indirect transition semiconductor of $Al_{(1-x)}Ga_xSb$, wherein x is less than 1 and a positive number, having a wide forbidden band and low impurity concentration and of 500 A to 10μm thickness and defining a heterojunction with said base, said base and said second layer having substantially the same crystal structure at said junction and having small differences in lattice constants;

a third layer of $Al_{(1-x)}Ga_{(1-x)}Sb$ having a narrower forbidden band and with an electron emissive surface; and

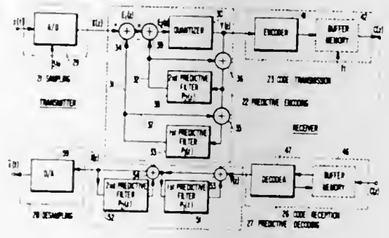
ohmic contacts.

4,075,655

COMPOSITE FEEDBACK PREDICTIVE CODE COMMUNICATION SYSTEM FOR A COLOR TV SIGNAL INCLUDING A CARRIER CHROMINANCE SIGNAL

Yukihiko Iijima; Kazumoto Iinuma, and Tatsuo Ishiguro, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1976, Ser. No. 673,327
Claims priority, application Japan, Apr. 3, 1975, 50-40619; Nov. 19, 1975, 50-139024
Int. Cl.² H04N *9/32*
U.S. Cl. 358—13 **36 Claims**



1. a predictive code communication system for a color television signal including a carrier chrominance signal component which comprises a transmitter and a receiver;

said transmitter comprising:

sampling means for sampling said television signal to produce signal samples;

predictive quantizing means responsive to said signal samples for producing quantized prediction error signals in comliance with a first overall transfer characteristic defined by a product of a first difference $1 - P_1$ and a second difference $1 - P_2$, where P_1 represents a first transfer function of frequencies and P_2 represents a second transfer function of frequencies, the absolute value of one of said first and second differences being a minimum which is sufficiently smaller than unity at least in the neighborhood of an integral multiple (including unity) of the frame frequency of said television signal, the absolute value of the other of said first and second differences being those minima which are sufficiently smaller than unity at least in the neighborhoods of zero frequency and the subcarrier frequency for said carrier chrominance signal component; and

code transmission means responsive to said quantized prediction error signals for transmitting predictive encoded signals to said receiver;

said receiver comprising:

code reception means responsive to said predictive encoded signals for producing reproduced prediction error signals;

predictive decoding means responsive to said reproduced prediction error signals for producing samples in compliance with a second overall transfer characteristic which is an inverse of said first overall transfer characteristic; and

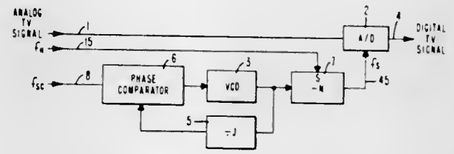
desampling means responsive to said reproduced samples for producing a reproduction of said television signal.

4,075,656

CIRCUIT FOR DIGITALLY ENCODING AN ANALOG TELEVISION SIGNAL

Daniel A. Beaulier, Menlo Park, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Jan. 26, 1977, Ser. No. 762,901
Int. Cl.² H04N *7/04, 9/32*
U.S. Cl. 358—13 **10 Claims**



1. A circuit for digitally encoding by sampling an analog television signal having synchronizing components including a horizontal sync pulse, said signal having a known horizontal blanking period, comprising:

a means for generating a clock signal having a frequency equal to a first integral multiple of a desired frequency of a sampling signal and to a second integral multiple of a frequency of a synchronizing component of said analog television signal, said desired sampling signal frequency being a non-integral rational multiple of the frequency of the horizontal sync pulse;

a means coupled to a source of said synchronizing component and to said clock signal generating means for phase-locking said clock signal to said synchronizing component;

a first means coupled to said clock signal generating means for dividing the frequency of said clock signal by a factor equal to said first integral multiple for providing a sampling signal of said desired frequency, said first means coupled to a source of said horizontal sync pulse and being presettable during each horizontal blanking period to provide a sampling signal whose phase is the same as the beginning of each horizontal line of said television signal; and

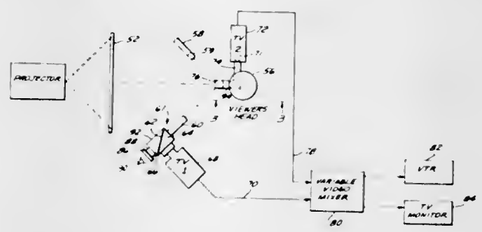
an analog-to-digital encoder coupled to receive both said analog television signal and said sampling signal for providing at an output a digitally encoded television signal.

4,075,657

EYE MOVEMENT MONITORING APPARATUS

Lee S. Weinblatt, 797 Winthrop Road, Teaneck, N.J. 07666

Filed Mar. 3, 1977, Ser. No. 773,899
Int. Cl.² H04N *7/18*
U.S. Cl. 358—93 **25 Claims**



1. Apparatus for determining the eye movements of a viewer in response to visual stimuli comprising:

a screen for displaying said stimuli;

support means placed at a preselected distance in front of said screen for maintaining the viewer's head in a relatively fixed position;

means for monitoring the viewer's eye movements;

means for monitoring said stimuli displayed on the screen and placed in front of the torso of said viewer, said stimuli monitoring means extending generally parallel to said screen;

lens means aimed at said screen and attached to said stimuli monitoring means adjacent said support means and below viewer eye level for receiving light from said screen and for transmitting it into said image monitoring means; and

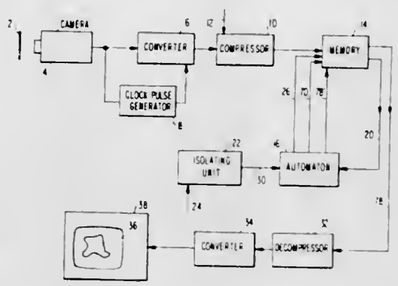
means for combining the outputs of both said monitoring means to superimpose the viewer's eye movements on the displayed stimuli.

4,075,658

METHOD AND DEVICE FOR ISOLATING FIGURES IN AN IMAGE

Bertrand de Cosnac, and Alain Spiwack, both of Paris, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 29, 1976, Ser. No. 681,300
Claims priority, application France, Apr. 29, 1975, 75 13434
Int. Cl.² H04N *7/18*
U.S. Cl. 358—96 **10 Claims**



1. A method of isolation of figures in an image, in which the graphic information contained in the image is converted by means of a television camera to a video signal constituted by a succession of lines, each line being in turn constituted by an electrical analog signal having an amplitude which is variable in time, in which each line is then sampled sequentially at uniform time intervals so as to obtain an ordered series of points having associated numerical values which are a function of the level of blackening of the points of the initial image, and in which said ordered series of points is stored in a memory device, wherein said method consists in selecting a parent point forming part of an isolated figure of the image, wherein all those points of said fi_ure in which the level of blackening on the image is higher than an adjustable threshold value are isolated automatically by marking with the aid of an isolating automaton coupled with said memory device, wherein all the marked points corresponding to said figure are extracted from the memory device and wherein said figure of the image is reconstituted from said points, whereupon the process of isolation is repeated for another figure, starting from another parent point.

4,075,659

ELECTRONIC DOOR ANNOUNCER

Etiennette Romani Desanti, "Le Clos des Oliviers " 80, avenue de Lattre de Tassigny, 06400 Cannes, France

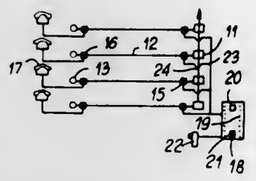
Continuation of Ser. No. 387,657, Aug. 13, 1973, abandoned. This application Sept. 25, 1975, Ser. No. 616,643
Claims priority, application France, Sept. 8, 1972, 72.31853
Int. Cl.² H04N *7/18*
U.S. Cl. 358—108 **15 Claims**

1. In an electronic door announcer system for multiple unit buildings including a main door announcer unit and at least one individual building unit announcer unit and a master antenna system having a coaxial cable network comprised of at least one coaxial trunk line and at least one coaxial branch line

coupled to said trunk line for utilizing said coaxial cable network as the signal transmission means for said door announcer system, said branch line being fed to a building unit including said at least one announcer unit, the improvement comprising:

circuit means including a high frequency modulator, adapted to modulate signals originating in said main door announcer unit, coupled to said trunk line in the region of said door announcer unit for transmitting modulated signals to said building unit via said branch line;

first and second bidirectional signal coupler means for audio frequency signals originating at said main door announcer unit and said building unit announcer unit, respectively,



coupled to said branch line, said first coupler unit being located at the trunk line end of the branch line and said second coupler means being located at the building unit end of the branch line;

audio signal transmission line means between said first coupler means and said main door announcer unit;

circuit means coupling audio signals between said second coupler means and said building unit announcer unit; and

circuit means, responsive to said modulated signals from said modulator, coupled between said branch line and said building unit announcer unit for providing signals, utilizable by said building unit announcer unit, corresponding to signals originating at said main door announcer unit.

4,075,660

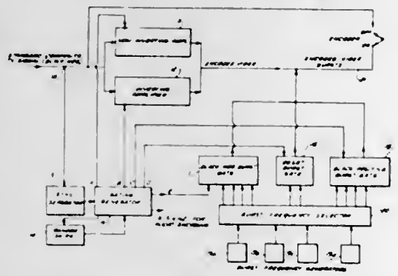
PAY TELEVISION SYSTEM WITH SYNCHRONIZATION SUPPRESSION

Irving Horowitz, Eatontown, N.J., assignor to Teleglobe Pay-TV System, Inc., Rego Park, N.Y.

Division of Ser. No. 429,216, Dec. 28, 1973, Pat. No. 3,924,059, which is a continuation of Ser. No. 227,582, Feb. 18, 1972, Pat. No. 3,824,332. This application July 23, 1975, Ser. No. 598,384

Int. Cl.² H04N *1/44*

U.S. Cl. 358—124 **6 Claims**



1. Encoding apparatus for a subscription television system, comprising, in combination, means for furnishing a television signal having a predetermined black level signifying picture black and having a plurality of vertical retrace intervals, each including a sequence of horizontal intervals separated by horizontal synchronization pulses, said horizontal synchronizing pulses having a predetermined synchronizing polarity relative to said black level; pulse generator means for furnishing a sequence of substantially identical pulses; inserting means connected to said pulse generator means and said means for furnishing a television signal, for inserting a first, second and third one of said substantially identical pulses into, respectively, a first, second and third predetermined one of said horizontal intervals within each of said vertical retrace intervals at a polarity opposite to said synchronizing polarity and at a predetermined time instant following a first, second and third predetermined one of said horizontal synchronizing pulses, each immediately following the corresponding one of said first, second and third horizontal intervals, thereby creating an encoded television signal; and transmitter means for transmitting said encoded television signal to at least one receiver location.

4,075,661

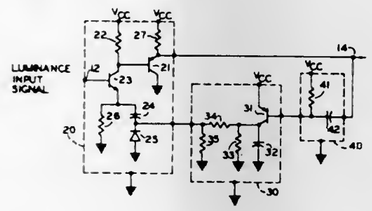
AUTOMATIC PEAKING CIRCUIT

Charles Buckner Heffron, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed Aug. 19, 1976, Ser. No. 715,768

Int. Cl.² H04N *5/14*

U.S. Cl. 358—166 **9 Claims**



1. An automatic frequency compensation apparatus for maintaining a predetermined amount of high frequency content in a video signal comprising:

a. a video amplifier having an input terminal for receiving said video signal and an output terminal, said amplifier having a selectable gain frequency response;

b. means for sampling the high frequency content of a signal at said output terminal; and

c. control means for changing the slope of the gain-frequency response of said amplifier, said control means being operatively connected to said means for sampling whereby a decrease in the amount of high frequency content at said amplifier output terminal will cause the slope of said amplifier gain-frequency response to increase positively.

4,075,662

METHOD AND SYSTEM FOR COMPENSATING THE NON-LINEARITIES IN A REPRODUCTION PROCESS

Winrich Gall, Klausdorf, Germany, assignor to Dr. -Ing. Rudolf Hell GmbH, Postfach, Germany

Filed June 8, 1976, Ser. No. 693,938

Claims priority, application Germany, June 13, 1975, 2526409

Int. Cl.² H04N *1/40*

U.S. Cl. 358—280 **9 Claims**

1. A method of calibrating a reproduction apparatus having a sensor device for generating sensor signals by optically scanning a picture original and a recording device controlled by recording signals for recording the picture original on a film, comprising the steps;

generating a set of first signals for said recording device to produce a sample gray scale on the film having a predetermined first range of gray scale values;

generating and storing a set of second signals corresponding respectively to said first signals;

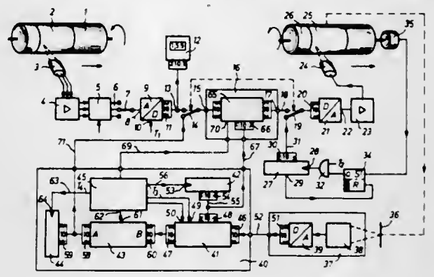
generating a set of third signals corresponding substantially to the gray scale values of said sample recorded gray scale;

correlating said third signals to said first signals;

generating a set of fourth signals representing a predetermined second range of gray scale values of a reference gray scale;

substantially correlating a first group of at least some of said fourth signals to a second group of at least some of said third signals for obtaining said second signals; and

storing said second signals in a storage device having addresses corresponding to the fourth signals of said first group, whereby a substantially generated sensor signal for a given gray scale value by the picture original can be used to select a recording signal from a stored second signal of said second group by a correlated fourth signal suitable for obtaining a substantially duplicate gray scale value.



4,075,663

METHOD FOR THE RASTERED REPRODUCTION OF HALF-TONE PICTURES PROVIDING CHANGES IN THE INDIVIDUAL PICTURE ELEMENTS DURING TRANSFER FROM AN ORIGINAL TO A REPRODUCTION

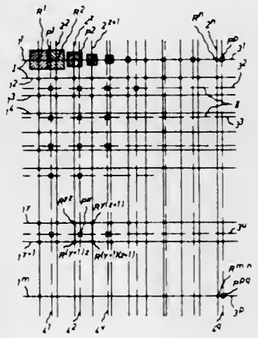
Klaus Wellendorf, Kitzeberg, near Kiel, Germany, assignor to Dr. -Ing. Rudolf Hell GmbH, Germany

Filed Mar. 17, 1976, Ser. No. 667,504

Claims priority, application Germany, Mar. 19, 1975, 2511922; Sept. 16, 1975, 2541138

Int. Cl.² H04N *1/06*

U.S. Cl. 358—283 **15 Claims**



1. The method for the rastered reproduction of half-tone pictures with changes in the picture-element break-up process during transfer from the original to the reproduction with the aid of electronically stored recording data in a randomly variable scale, the steps include:

scanning the picture according to the finest scale necessary, encoding and digitally storing the ascertained values,

reproducing a picture comprising the following steps:

removing the gray scale value data of four corner points of a mesh square of the original raster network of the model picture from the memory,

locating one or more picture elements of the new raster network for the reproduced, picture which is to be recorded,

calculating by means of linear interpolation the data to be recorded according to the picture scanning elements,

said calculating is done according to the following formula:

$$N = \frac{\frac{Ab + Ba}{aa + b} \cdot d + \frac{Cb + Da}{a + b} \cdot c}{c + d}.$$

where N is the gray scale value of the new picture element, A, B, C, D are the gray scale values of the corner points of the mesh square of the original raster network in which the new picture element is located, and

a, b, c, d are the coordinates of the point from the vertical and horizontal lines of the network square in which the point is located.

4,075,664

FACSIMILE SCANNING DEVICE

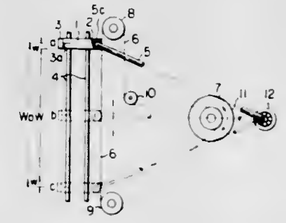
Ren Aoki; Mitsugu Fujiwara, both of Hanamaki, and Tasaku Wada, Tokyo, all of Japan, assignors to Yamura Shinko Seisakusho Co., Ltd., Hanamaki, Japan

Filed Feb. 22, 1977, Ser. No. 770,784

Claims priority, application Japan, Mar. 4, 1976, 51-23591

Int. Cl.² H04N *1/10, 1/24*

U.S. Cl. 358—286 **3 Claims**



1. A linear scanning system for a facsimile system comprising; a carrier movable linearly in both directions supported on a belt, a pulse motor engaged with said belt, a write-head mounted on said carrier, an optical fibre assembly composed of at least one thick emission fibre and a thin receiving fibre, a read-head composed of the end of said optical fibre assembly, a lamp positioned at the other end of said emission fibre, a photo-electric convertor positioned at the end of said receiving fibre, a bearing positioned on a center line perpendicular to the direction of travel of said carrier and said carrier supporting said optical fibre assembly near said other end, and said carrier being controlled to scan an original paper and a printing paper in both directions.

4,075,665

METHOD AND APPARATUS FOR INCREASING THE RECORDING CAPACITY OF A DISK

Jean Paul Borne, Saint-Maur, and Geert Jan Naaijer, Limeil-Brevannes, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 7, 1976, Ser. No. 703,302

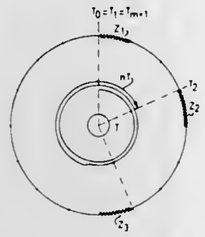
Claims priority, application France, July 9, 1975, 75 21530

Int. Cl.² G11B *5/012*

U.S. Cl. 360—8 **21 Claims**

1. A method of recording and reproducing x information signals, wherein x is an integer, on a disc-shaped record carrier driven at a substantially constant speed of revolution V in cooperation with a read/write head, comprising dividing each of the information signals during reading into consecutive information segments of equal duration τ_r, sampling each information segment and storing the sampled information in a first memory with a first clock frequency f_r said first clock fre-

quency being at least twice the highest frequency of the information signals, reading the stored information signals out of the first memory and recording the stored information on the record carrier at a second clock frequency F that is higher than the first clock frequency f, playing back the recorded material onto a second memory at the frequency F. and reading the material out of the second memory at a frequency f, synchro-



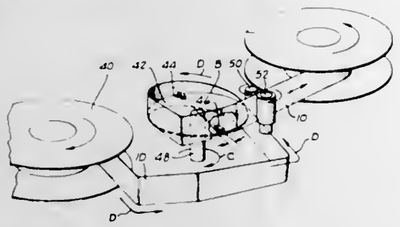
nizing the two clock frequencies f and F relative to the speed of revolution V of the record, the magnitude of the frequencies f and F and the magnitude of the period τ_i of the information segments being selected in such a way that $\tau_i < F/f^2$, and that for the time interval t_i during which each information segment is recorded on the carrier the expression $t\,f/F < t_i < 1/f$ is valid.

4,075,666

MAGNETIC TAPE RECORDER

John A. Lomax, Redwood City, and William J. Martin, Sunnyvale, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Nov. 12, 1964, Ser. No. 410,531
Int. Cl.² H04N 5/78; G11B 27/36
U.S. Cl. 360—11 **13 Claims**



1. A slow speed magnetic tape recorder having a rotary head drum, a first magnetic head mounted on the periphery of the head drum, a second magnetic head mounted on the periphery of the head drum and so positioned relative to said first magnetic head that it will re-scan the same track on a tape being played on the recorder that was previously scanned by the first magnetic head.

4,075,667

METHOD AND APPARATUS FOR ALIGNING READ/WRITE HEADS IN A DISC RECORDER

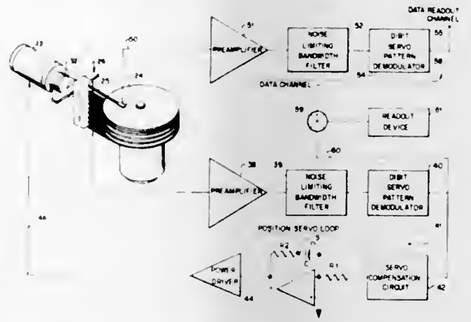
Andrew M. Rose, Santa Clara, and Brian Paul Tremaine, San Jose, both of Calif., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 17, 1975, Ser. No. 641,608
Int. Cl.² G11B 21/10
U.S. Cl. 360—77 **3 Claims**

1. In a recording device for recording data on a medium and having a plurality of read/write heads and a servo head mounted for simultaneous movement on a carriage effected by energization of an actuator acting responsive to a servo signal detected by the servo head, and wherein the read/write heads are mounted in a manner to allow fine position adjustment relative to the servo head;

the method of aligning the read/write heads relative to the servo head comprising the steps of:

placing on the recording device a medium having prerecorded aligned signals positioned to be detected by the read/write heads and servo head simultaneously to indicate track positions;



detecting the signals read by the servo head and the read/write heads;

subtracting the signals of one read/write head from the signal of the servo head to generate a differential signal; and

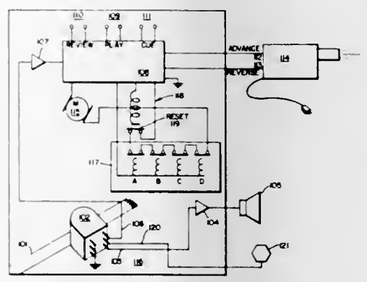
manually fine adjusting the position of said one read/write head to minimize said differential signal.

4,075,668

DIGITAL LOGIC CONTROL FOR AUDIO VISUAL PROGRAMS AND METHOD THEREFOR

Bernard C. Keach, Torrance, Calif., assignor to Educational Electronics of California Inc., Inglewood, Calif.

Filed Dec. 18, 1975, Ser. No. 642,051
Int. Cl.² G03B 31/00; G11B 31/00; G09B 1/00; G03B 21/00
U.S. Cl. 360—80 **6 Claims**



4. The method of logically controlling an audio visual program by magnetic tape comprising:

a. preparing a tape having two tracks, one of which carries an audio program to describe the visual program and a signal track which carries two detectable control tones one of which is a tape stop tone and the other of which is a projector frame change tone, and said tape being driven by a drive motor having off time during which the tape drive stops momentarily while the visual program changes one frame,

b. subjecting the detected signal control tones of the signal track to a digital logic circuit with combinations of play, review and cue switch closures which provide a first and second operating mode for the digital circuit, said digital circuit in a first mode controlling the audio program on the tape in sync with the projector frame presentation regardless of tape speed or direction, and

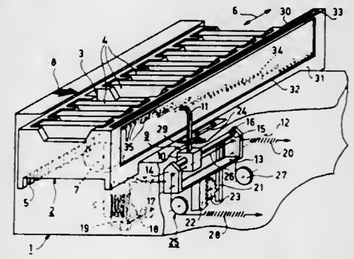
c. in a second mode to provide adjustable and automatic control of the "off" time, of the drive motor during advance or reverse signals allowing the control of projectors with differing operating speeds and characteristics to complete an operation while searching the tape in high speed either varying or constant, either forward or reverse.

4,075,669

INDEX MARKING FOR A CASSETTE MAGAZINE APPARATUS

Friedrich Louzil; Gerhard Habelt, and Gustav Mrazek, all of Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 559,739, March 19, 1975, abandoned. This application Sept. 23, 1976, Ser. No. 725,782
Claims priority, application Austria, Mar. 22, 1974, 2382/74
Int. Cl.² G11B 15/68, 23/04
U.S. Cl. 360—92 **6 Claims**



1. An improved recording and/or playback apparatus for record carriers accommodated in tape cassettes, comprising a magazine having a plurality of chambers for accommodating cassettes containing record carrier tapes, means for positioning said magazine to align a selected chamber for scanning, and means for scanning a track on the tape of the cassette associated with the selected chamber, wherein the improvement comprises:

an index strip having a respective plurality of index strip sections, one section associated with each cassette,

means for holding said strip on the magazine, each section being aligned at a location on the magazine associated with the respective cassette,

a strip mark device for marking or sensing marks at a point along a section,

mounting means for holding the said strip mark device at a starting position associated with the location of the section associated with a selected cassette, and

means, responsive to operation of said scanning means, for moving said strip mark device past said associated strip section in synchronism with scanning of a track on the carrier of the selected cassette.

4,075,670

TAPE AUTO-LOADING RECORDING AND REPRODUCING APPARATUS

Yoshiteru Namoto, Moriguchi, and Hideki Sakumoto, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 17, 1976, Ser. No. 658,759
Claims priority, application Japan, Feb. 19, 1975, 50-21175; Aug. 4, 1975, 50-95225
Int. Cl.² G11B 15/66
U.S. Cl. 360—85 **2 Claims**

1. A rotary head type magnetic recording and reproducing apparatus for use with a tape cassette having a supply reel, a take-up reel, a magnetic tape wound on said supply and take-up reels and means for feeding said magnetic tape adjacent an opening in one side of said cassette from said supply reel to said take-up reel, said apparatus comprising:

a tape-driving capstan;

a cylinder enclosing a rotary head;

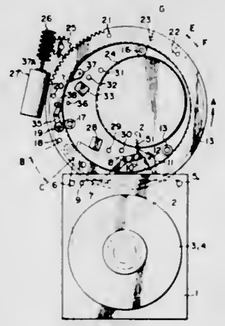
a rotary ring located for rotation around said cylinder;

driving means for selectively rotating said rotary ring in forward and backward directions about said cylinder;

tape pull-out means including a tape pull-out post mounted on said rotary ring for engaging the magnetic tape within said cassette, pulling the tape from said cassette and wrapping it around said cylinder at a predetermined angle in accordance with the rotation of said rotary ring;

a pinch roller supporting arm mounted rotatably on said rotary ring for rotatably supporting thereon a pinch roller;

cam means for engagement with said pinch roller supporting arm after said magnetic tape has been wrapped around said cylinder by rotation of said tape pull-out post in said forward direction on said rotary ring, said cam means



rotating said pinch roller supporting arm to place said pinch roller and said capstan into contact with each other during the recording-reproducing mode of said apparatus as said rotary ring rotates in said forward direction for withdrawing said magnetic tape from said cassette, the engagement between said cam means and said pinch roller supporting arm and the engagement between said pinch roller and said capstan being released when said rotary ring is rotated in said backward direction;

a tape anti-slacking pin for contacting said magnetic tape after it has been withdrawn from said cassette to provide tension thereto;

means for releasing said tape anti-slacking pin from contact with said magnetic tape; and

means for resetting said releasing means after a predetermined length of said magnetic tape has been withdrawn from said cassette by rotation of said rotary ring for placing said tape anti-slacking pin into pressure contact with said magnetic tape.

4,075,671

AUTOMATIC AC BIASING OF A MAGNETORESISTIVE ELEMENT

Samuel David Cheatham, Arvada, and Julian Lewkowicz, Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 24, 1976, Ser. No. 744,839
Int. Cl.² G11B 5/30
U.S. Cl. 360—113 **8 Claims**

1. A magnetic read head circuit comprising:

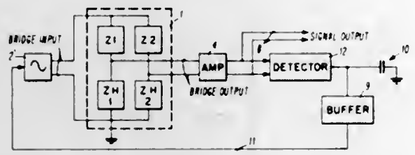
a source of magnetic flux manifesting recorded information;

bias means for supplying an alternating current bias signal having an adjustable amplitude;

a pair of elements exhibiting a magnetoresistive effect, intercepted by said magnetic flux, connected with a pair of impedance elements in a bridge arrangement having a signal input connected to the bias means, and a signal

output which is a function of the bias signal and the intercepted magnetic flux;

detection means, including storage, connected to the bridge signal output, supplying an output signal representing changes in the average value of the bridge signal output; and



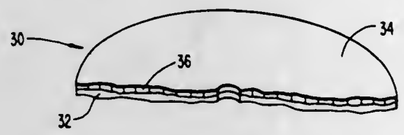
feedback means interconnecting the detection means output and the bias means for adjusting the bias signal amplitude as a function of the detection means output to maintain the bridge signal output at a predetermined constant average value.

4,075,672

MAGNETIC RECORDING MEMBERS

William A. Manly, Arlington, Tex., assignor to Graham Magnetics Incorporated, Graham, Tex.

Filed Feb. 9, 1976, Ser. No. 656,171
Int. Cl.² G11B 5/82; H01F 10/02
U.S. Cl. 360—135 **5 Claims**



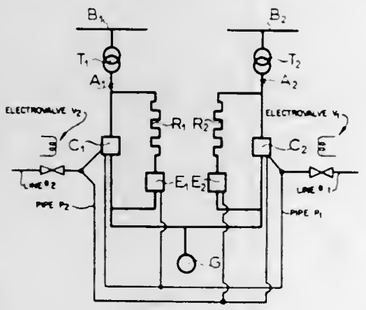
1. A magnetic recording member of the floppy disk type consisting essentially of a substrate and a magnetic recording layer of up to about 100 microinches in thickness and comprising metallic magnetic recording particles, dispersed in a binder, said particles oriented in a direction normal to the plane of the surface of said disk.

4,075,673

OPERATING SYSTEM FOR GENERATOR CIRCUIT-BREAKERS

Edmond Thuries, Pusignan, France, assignor to Delle-Alsthom S.A., Villeurbanne, France

Filed Aug. 11, 1976, Ser. No. 713,474
Claims priority, application France, Aug. 11, 1975, 75 25000
Int. Cl.² H01H 9/42
U.S. Cl. 361—10 **8 Claims**



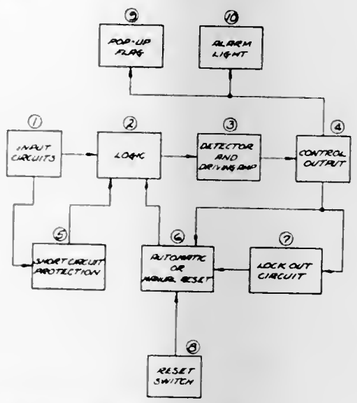
1. An electrical power supply system comprising: a generator, a plurality of separate load circuits, said generator being connected to each load circuit by a generator circuit-breaker corresponding to the load circuit, each generator circuit-breaker comprising a main cut-out chamber shunted by an auxiliary cut-out chamber connected in series with a power-dropping impedance, and means for operating said circuit-breakers associated with said generator in the event of a short-circuit failure occurring on one of the load circuits, in the following sequence: firstly, to open the main chamber of each circuit-breaker which is not connected to the failure; secondly, to open the main cut-out chamber of the circuit-breaker which is connected with the failure; thirdly, to open the auxiliary cut-out chamber of the circuit breaker connected to the failure; and finally, to close the main cut-out chamber of each circuit-breaker not connected to the failure.

4,075,674

EXPANDABLE ELECTRONIC PROTECTION SYSTEM

David J. Squiers, Attleboro Falls, and Robert E. Obenhaus, South Easton, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 316,194, Dec. 18, 1972, abandoned.
This application Dec. 5, 1975, Ser. No. 637,912
Int. Cl.² H02H 5/04
U.S. Cl. 361—27 **4 Claims**



1. A protection circuit which comprises,

a. a source of power,

b. a first switch means in series with said source of power,

c. circuit means responsive to an alarm condition to open said first switch means, and

d. lockout means responsive to opening of said switch to maintain said switch open upon removal of said alarm condition, said circuit means includes a second switch means responsive to said alarm condition to open said first switch means and said lockout means includes means responsive to opening of said first switch means to close said second switch means.

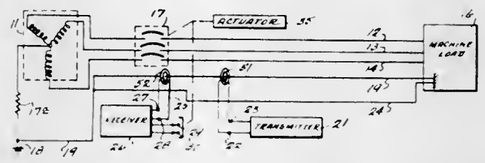
4,075,675

GROUND CONDUCTOR MONITORING SYSTEM AND METHOD

Joseph C. Burkett, Bramwell, and Harry L. Harshbarger, Bluefield, both of W. Va., assignors to Genoa Coal Company, Gary, W. Va.

Continuation-in-part of Ser. No. 557,901, March 13, 1975, abandoned, which is a continuation-in-part of Ser. No. 431,325, Dec. 28, 1973, abandoned. This application May 21, 1976, Ser. No. 688,553
Int. Cl.² H02H 1/02
U.S. Cl. 361—48 **6 Claims**

1. In a power transmission system including a power source and a load and a plurality of power transmission cables extending between the power source and the load and further including a continuous, uninterrupted ground conductor extending between the source and load, and being directly connected to the source ground and directly connected to frame ground of the load, a monitoring system for monitoring electrical continuity of the ground conductor comprising a transmitter for transmitting a signal having a predetermined frequency within the audio range over the ground conductor, said transmitter signal being coupled to the ground conductor only through a closed inductive system comprising a first toroid surrounding said ground conductor, a receiver, said receiver being coupled to the ground conductor only through an additional closed inductive system comprising a second toroid surrounding said ground conductor and functioning to continuously receive said



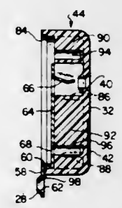
signal being carried over the ground conductor, said closed inductive system of said first and second toroids forming a closed system for monitoring continuity of said ground conductor so that possible parallel conductive paths which may extend from frame ground of the load to source ground cannot couple any signal to said receiver from said transmitter if said ground conductor is broken or open circuited, and whereby such possible parallel paths will not have any shunting effect on the receiver signal if the ground conductor is not open-circuited, and an alarm device associated with and actuated by said receiver to provide an indication when said revceiver no longer receives said signal, thereby indicating that an open circuit or high impedance condition exists in said ground conductor.

4,075,676

INTERRUPTER

Charles M. Phillips, Jr., 315 Haven St., Clearwater, Fla. 33516

Filed Dec. 24, 1975, Ser. No. 644,422
Int. Cl.² H02H 3/20
U.S. Cl. 361—56 **4 Claims**



1. A device for interrupting electrical current used by a household electrical appliance comprising:

a housing supporting a pair of prong means and a grounding prong means adapted to be inserted into a grounded electrical receptacle and a female receptacle adapted to be electrically connected to an appliance, said female receptacle including three apertures;

a plurality of means for electrically interconnecting said prong means and a corresponding element of said female receptacle, said plurality of interconnecting means including three non-fusible conductive elements being unitary portions of said three prong means and forming contact portions below said apertures of said female receptacle, and one of said conductive elements is rectangular having an L-shaped grounding prong means extending from one end of said conductive element in a first direction and a contact portion extending from the other end of said conductive element in a direction opposite said first direction; and

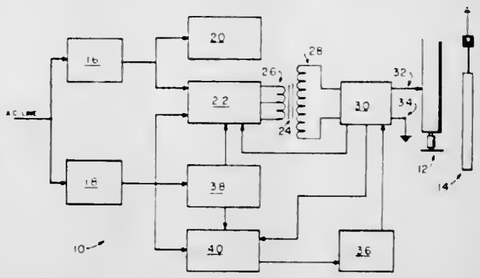
a means connected between two of said interconnecting means for interrupting current flow to said female receptacle at a predetermined voltage level by creating a path of minimum resistance between said two interconnecting means.

4,075,677

ELECTROSTATIC COATING SYSTEM

Stanley L. Bentley, Indianapolis, Ind., assignor to Ransburg Corporation, Indianapolis, Ind.

Filed Aug. 9, 1976, Ser. No. 712,781
Int. Cl.² H02H 3/08
U.S. Cl. 361—93 **30 Claims**



1. A system for controlling voltage across a pair of out-put terminals including a power supply for generating the voltage, means for coupling the supply to the output terminals, means for sensing the output current flowing between the terminals, means for disrupting the impressed voltage, the disrupting means being coupled to the terminals and having at least one control electrode, a control circuit, first circuit means for coupling the control circuit to the sensing means for providing an output current-related signal at a terminal of the control circuit, the control circuit including second circuit means for generating a first input signal related to the output current-related signal by a predetermined selectively variable fixed difference, sample-and-hold circuit means for sampling the first input signal during successive sampling intervals and for storing the value of the first input signal between successive sampling intervals, and a first comparator for comparing the stored value to the current-related signal and for generating a first output signal when the current-related signal exceeds the stored value, and means for coupling the first comparator to the control electrode, the first output signal controlling the disrupting means, the improvement wherein the control circuit further includes third circuit means for generating a second input signal related to the first input signal by a predetermined, selectively variable multiplier, and a second comparator for comparing the stored value to the second input signal when the second input signal exceeds the stored value, and means for coupling the second comparator to the control electrode, the second output signal also controlling the disrupting means.

4,075,678

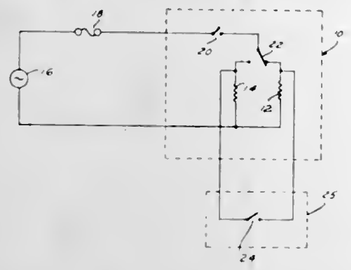
FAIL SAFE CIRCUIT FOR HEAT GENERATING DEVICE

Robert N. Levinn, Catskill, N.Y., assignor to American Thermostat Corporation, Cairo, N.Y.

Filed Feb. 13, 1976, Ser. No, 657,742
Int. Cl.² H02H 5/04
U.S. Cl. 361—104 **19 Claims**

1. A working circuit comprising a source, means for interrupting the working circuit when the current therethrough exceeds a given level and a first heating element in series with one another, and a fail safe circuit situated in parallel with said first heating element and comprising, in series, a second heating element and a normally opened temperature responsive

switch means for connecting said second heating element in parallel with said first heating element when the temperature sensed thereby exceeds a given level whereby load current does not normally pass through said temperature responsive



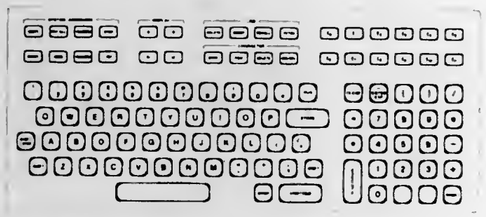
switch means and whereby, when said given temperature level is sensed by said switch means, the current in the working circuit is increased to the point where said current sensitive circuit interrupting means is actuated to open said working circuit.

4,075,679

PROGRAMMABLE CALCULATOR

Chris J. Christopher; Fred W. Wenninger; Donald E. Morris; Wayne F. Covington; Jerry B. Folsom; Joseph W. Beyers, all of Loveland; John H. Nairn, and Jeffrey C. Osborne, both of Longmont, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 8, 1975, Ser. No. 638,381
Int. Cl.² G06F *3/02, 9/18*
U.S. Cl. 364—200 **8 Claims**



1. An electronic calculator comprising:

memory means including a first area for storing a program of one or more lines of one or more alphanumeric statements per line and a second area for storing a single line of one or more alphanumeric statements;

keyboard input means for entering one or more lines of one or more alphanumeric statements per line into the memory means;

processing means coupled to said memory means and keyboard input means for executing lines of one or more alphanumeric statements per line; and

output display means coupled to said processing means for visually displaying alphanumeric information, including the results of execution of lines of alphanumeric statements, to the user;

said keyboard input means including a run control key for initiating execution by said processing means of a program of one or more lines of alphanumeric statements stored in said first area of said memory means; and an execute control key for initiating execution by said processing means of a single line of one or more alphanumeric statements entered from said keyboard input means and stored in said second area of said memory means;

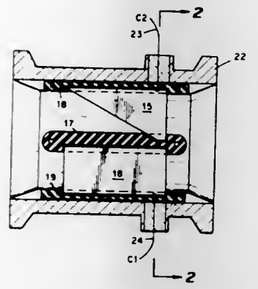
said processing means including logic means operative for enabling entry of a line of one or more alphanumeric statements from said keyboard input means during execution of a program stored in said first area of said memory means, said logic means further including means responsive to subsequent actuation of said execute control key, during execution of said program, for temporarily halting execution of said program, for initiating execution by said processing means of said entered line of one or more alphanumeric statements and for causing the results to be visually displayed on said output display means, said logic means further including means responsive to an indication by said processing means that execution of said entered line has been completed for causing said processing means to resume execution of said program.

4,075,680

CAPACITANCE DENSITOMETER FOR FLOW REGIME IDENTIFICATION

Roy L. Shipp, Jr., Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 27, 1977, Ser. No. 763,435
Int. Cl.² H01G *7/00*
U.S. Cl. 361—285 **2 Claims**



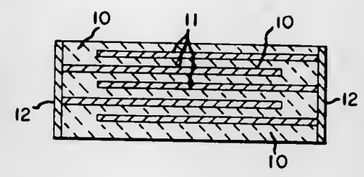
1. An improved two-element capacitance densitometer probe unit comprising a first insulator provided with slots on opposite sides thereof, a first triangular-shaped, ungrounded capacitor plate, a second rectangular-shaped, ungrounded capacitor one respective edge of each of said plates fitting within each of said respective slots of said insulator, a second insulator and a third insulator both provided with respective slots for receiving the other respective edges of said respective capacitor plates, a third capacitor plate and a fourth capacitor plate both adapted to be grounded, said third and fourth capacitor plates mounted on respective opposite sides of and in spaced relation to said first and second capacitor plates by means of all of said insulators and respective rivets therethrough, said probe unit adapted to be positioned into receiving grooves on the inside of a section of a flow tube and spot welded thereto, and a pair of respective output leads affixed to said respective first and second capacitor plates and adapted to extend exterior to said flow tube section through separate holes in opposite sides of said flow tube section, whereby the outputs of the respective capacitors formed by said capacitor plates can provide an indication of any one of several possible flow regimes existing in a flow tube in which said section containing said probe is mounted during the monitoring of two-phase flow through said flow tube.

4,075,681

CAPACITOR WITH NOBLE METAL ELECTRODES

Michael John Popowich, Lewiston, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 576,176, June 13, 1975, abandoned, which is a continuation-in-part of Ser. No. 406,362, Oct. 15, 1973, abandoned, which is a continuation-in-part of Ser. No. 380,602, July 19, 1973, abandoned. This application Dec. 12, 1975, Ser. No. 640,290
Int. Cl.² H01G *1/01*
U.S. Cl. 361—305 **6 Claims**



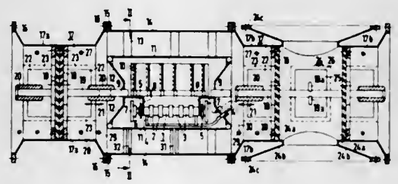
1. A multilayer capacitor of alternating layers of dielectric material and noble metal electrode material, wherein the electrode material is palladium or mixtures or alloys of at least 40% by weight palladium with one or more other noble metals selected from the class consisting of platinum, silver, and gold, plus about 0.2–14%, by weight, additive oxide, based on the total weight of additive oxide and noble metal present, wherein the additive oxide is one or more of ThO_2 and Gd_2O_3.

4,075,682

GAS-INSULATED THYRISTOR ASSEMBLY

Kurt Schilling; Manfred Schraudolph; Gerd Thiele, and Jürgen Weber, all of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed June 15, 1976, Ser. No. 696,435
Claims priority, application Germany, July 4, 1975, 2530017
Int. Cl.² H05K *7/20*
U.S. Cl. 361—386 **17 Claims**



1. A gas insulated thyristor assembly comprising:

at least one thyristor column comprised of disc-type thyristors stacked in side by side relationship and of heat sinks each arranged between adjacent pairs of thyristors and serving to conduct current;

drive means and circuit component groups connected to said one thyristor column;

substantially rotationally symmetric metallic shielding means, said shielding means being disposed in surrounding relationship to said one thyristor column and to the drive means and at least a part of the circuit component groups connected to that one thyristor column;

a pressure tube surrounding said metallic shielding means and adapted to receive SF_6 gas under pressure;

first means for supporting said shielding means within said tube including insulating posts;

first and second bulkhead means for closing off the opposite ends of said pressure tube;

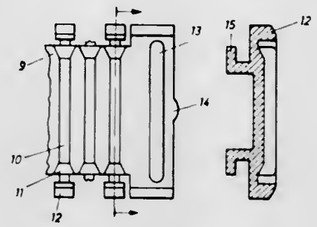
and first and second electrical connecting means extending in a gastight manner through said first and second bulkhead means, respectively, and providing electrical connections to said column.

4,075,683

RACK FOR CIRCUIT BOARDS

Åke Ernst Elof Johansson, Bandhagen, and Lars Christer Pahlén, Varby, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Aug. 27, 1976, Ser. No. 718,185
Claims priority, application Sweden, Sept. 5, 1975, 7509891
Int. Cl.² H02B *1/02*
U.S. Cl. 361—415 **2 Claims**



1. In a rack for the parallel arrangement of a number of circuit boards, each provided with electronic components and the associated electric wiring and a first part of a contact device, the rack including a front and a rear pair of mutually parallel profile bars attached between and perpendicular to two end plates, a corresponding number of second parts of the contact device arranged between the rear pair of profile bars and perpendicular to said pair of profile bars the improvement comprising guides mounted on each of said front profile bars for guiding the first part of a contact device towards the corresponding second part of the contact device when sliding the circuit boards into the rack, each of said guides comprising a guide moulding provided with transverse guide grooves for the circuit boards, and knobs blocking the mouth of at least some of the guide grooves, said knobs being selectively breakable to permit entry of the circuit boards into the corresponding grooves.

4,075,684

FOLDABLE LAMPSHADE

Sidney R. Witz, 420 N. Orange Drive, Los Angeles, Calif. 90036, assignor to Sidney R. Witz, Los Angeles, Calif.

Filed Oct. 20, 1976, Ser. No. 734,334
Int. Cl.² F21V *1/00*
U.S. Cl. 362—352 **3 Claims**

1. A foldable lampshade comprising, in combination:

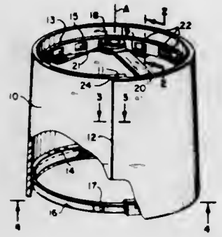
(a) flexible material capable of being rolled up into a cylindrical shape of relatively small diameter and unrolled into a relatively large cylindrical shape defining a shade with its ends in overlapping relationship;

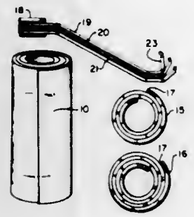
(b) upper and lower interior flexible channel means about the inside surface of said shade, said channel means lying in upper and lower parallel planes normal to the axis of said shade;

(c) upper and lower flat flexible strips arranged to be coiled into tight spirals and uncoiled into circles of diameters corresponding to the upper and lower interior diameters of said shade, respectively, and receivable in said upper and lower channel means, respectively, the ends of the flexible strips including snap means for connecting the same together to hold the upper and lower interior portions of the shade in circular shapes; and,

(d) a spider assembly including three elongated flat arm members, one above the other when in closed position, and pivoted at adjacent ends such that the arms may be scissored to an open position wherein they radially extend from the point of pivoting, the extending ends of said arms terminating in upturned portions dimensioned to cradle the upper flexible strip at circumferentially spaced points at 120° to provide a central mount for securing the shade to a lamp, said upper channel means including a series of

evenly spaced cut-out windows selected ones of which circumferentially spaced at 120° receive the extending ends of said arms making up said spider assembly whereby





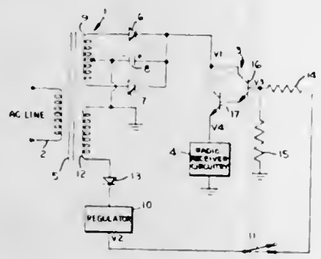
the lampshade can be disassembled and its components folded into compact configurations for storage or shipping.

4,075,685

EMITTER FOLLOWER VOLTAGE CONTROLLED POWER SUPPLY

Charles F. Fisler, New Hartford, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Dec. 30, 1976, Ser. No. 755,909
Int. Cl.² H02M 1/12
U.S. Cl. 363—44 **3 Claims**



1. An emitter follower voltage controlled power supply, comprising:

(a) a primary DC voltage source for generating a voltage with an inherent ripple component above a given level of voltage and having a relatively high current capacity,

(b) energy receiving circuitry,

(c) an emitter follower circuit having an input, output and control electrode for switchably connecting said primary DC voltage source to said energy receiving circuitry through said input and output electrodes, said emitter follower circuit developing a voltage drop between said control and output electrodes, during the conduction thereof,

(d) a secondary DC voltage source independent of said primary DC voltage source for generating a voltage of relatively constant voltage amplitude characteristics and having a relatively low current capacity, and

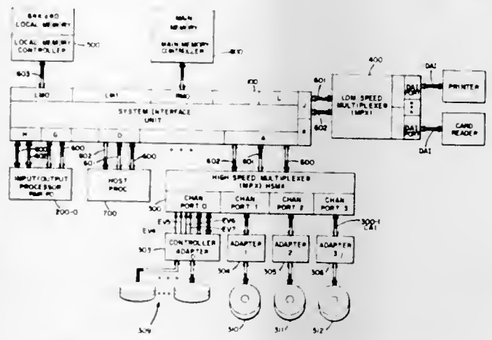
(e) circuit means for applying said secondary DC voltage source to the control electrode of said emitter follower circuit at a voltage level less than the sum of said given level and said voltage drop whereby there is applied across said receiver circuitry a voltage with the amplitude characteristics of said secondary DC voltage source and a current with the current capacity of said primary DC voltage source.

4,075,686

INPUT/OUTPUT CACHE SYSTEM INCLUDING BYPASS CAPABILITY

Jaime Calle, Glendale, and Lawrence W. Chelberg, Phoenix, both of Ariz., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 30, 1976, Ser. No. 755,871
Int. Cl.² G06F 13/00
U.S. Cl. 364—200 **35 Claims**



1. An input/output system for controlling input/output operations involving data transfers between a plurality of modules and a plurality of input/output devices, said system comprising:

system interface means having a plurality of ports;

a plurality of modules each connected to a different one of said plurality of ports, said modules including at least one memory module and a plurality of command modules, each of said command modules including:

command generating means for generating memory commands, a first type of memory command including at least a predetermined bit coded to designate first and second categories for accessing information stored in said memory module; and,

said one memory module including:

a cache store operatively connected to one of said ports for storing blocks of information previously fetched from a backing store included in said memory module in response to certain ones of said memory commands;

said backing store operatively connected to said one of said interface ports, said backing store storing information words; and,

control circuit means connected to said cache store and to said backing store for controlling the operation of said cache store and backing store, said control circuit means including:

input register means connected to said one port for receiving said memory commands from said plurality of command modules; and,

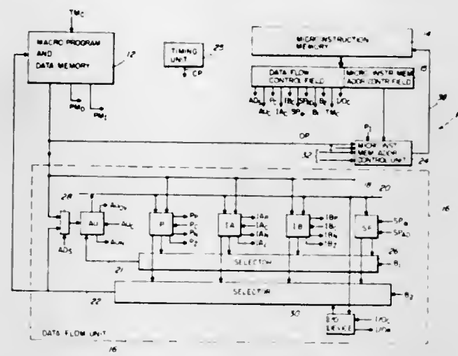
command decode circuit means connected to said input register means for decoding said commands, said decode circuit means including means which is responsive to said first type of memory command for generating control signals for enabling said backing store so as read out information specified by said first type of memory command in the absence of said accessed information being stored in said cache store and for generating control signals enabling said cache store to write therein said accessed information which is read out from said backing store only when said predetermined bit is coded to designate said first category.

4,075,687

MICROPROGRAM CONTROLLED DIGITAL COMPUTER

Stanley M. Nissen, Reading, and Steven J. Wallach, Framingham, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Mar. 1, 1976, Ser. No. 662,303
Int. Cl.² G06F 9/20
U.S. Cl. 364—200 **6 Claims**



1. A digital computer wherein a microinstruction memory stores an addressable fetch microprogram and independent sets of addressable microinstructions, each set of microinstructions including a last microinstruction for calling the fetch microprogram, and each one of the stored microinstructions in the sets thereof has an addressing control field, a microinstruction memory addressing control unit, comprising:

a. a first storage means for storing the beginning address of the fetch microprogram;

b. second storage means, responsive to a microinstruction in a first set of microinstructions under execution, for storing the address of a different microinstruction in such first set of microinstructions;

c. means for producing a control signal in accordance with a first portion of the addressing control field of one of the microinstructions in the first set of microinstructions; and

d . selector means, responsive to the control signal and a second portion of the addressing control field of the last microinstruction in a second one of the sets of microinstructions under execution, for coupling to the microinstruction memory as the next address for such memory either the beginning address of the fetch microprogram stored in the first storage means or the address of the different microinstruction in the first set of microinstructions stored in the second storage means.

4,075,688

SYSTEM FOR ADDRESSING AND ADDRESS INCREMENTING OF ARITHMETIC UNIT SEQUENCE CONTROL SYSTEM

David D. Lynch, Jr., Northridge, and Lee W. Tower, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 454,339, March 25, 1974, Pat. No. 4,025,771. This application Aug. 26, 1976, Ser. No. 718,443
Int. Cl.² G06F 9/20, 13/00
U.S. Cl. 364—200 **7 Claims**

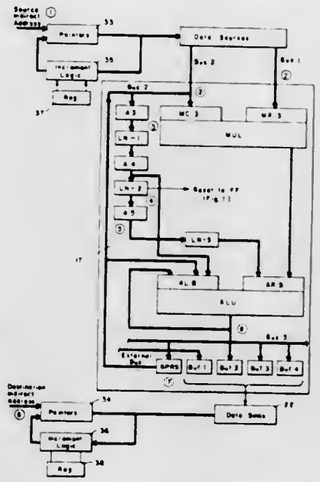
1. A processing system comprising:

a source of instructions wherein each instruction is capable of containing one or more indirect addresses or data containing one direct address;

a plurality of data memories for storng input and output data for said processing system and providing direct addresses;

processing means coupled to said source of instructions and said plurality of data memories for processing data from said plurality of data memories according to the instructions from said sources of instructions and for generating direct addresses when instructed by said source of instructions;

first pointer means comprising a plurality of first pointers each coupled to said data memories, to said processing means and to said source of instructions, said first pointers each comprising a plurality of first pointer register means



each of which stores one direct address whereby said first pointer means receives indirect addresses from said source of instructions to address one first pointer register means to fetch data from one of said plurality of data memories for said processing means; and

second pointer means comprising a plurality of second pointers each coupled to said data memories, to said processing means and to said source of instructions, said second pointers each comprising a plurality of second pointer register means each of which stoes one direct address, whereby said second pointer means receives indirect addresses from said source of instructions to address one second pointer register means to store data from said processing means in one of said memories.

4,075,689

COMPUTER EMPLOYING REDUCTION LANGUAGE

Klaus Berkling, St. Augustin, Germany, assignor to Gesellschaft fur Mathematik und Datenverarbeitung mbH Bonn, St. Augustin, Germany

Filed Feb. 13, 1976, Ser. No. 657,839
Claims priority, application Germany, Feb. 15, 1975, 2506454; June 10, 1975, 2557958
Int. Cl.² G06F 7/38
U.S. Cl. 364—200 **12 Claims**

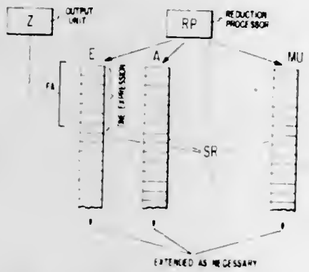
1. In a computer including a control unit, an arithmetic-logic unit, an input unit, an output unit, a signal storage unit, and a plurality of signal conducting buses, the improvement wherein:

said signal storage unit comprises at least three stack registers of arbitrary length, each said register presenting a plurality of binary word storage locations each capable of storing a binary word and the word storage locations of each said register being connected in succession to permit shifting of such words between locations;

said input unit is connected to said buses to supply a succes-

sion of binary words constituting binary encoded elements representing the atoms and constructors of a complete preorder linearized binary tree expression of a complete logic relation representing a problem to be solved, each atom representing a parameter to be operated on, each constructor defining a particular relation between two such elements, and each element being composed of at least one binary word;

each of said units is connected to communicate selectively with all of said buses, and each of said stack registers is



connected to communicate selectively with all of said buses in a manner to transport binary encoded elements into and out of each said stack register only via the storage location at one end thereof; and

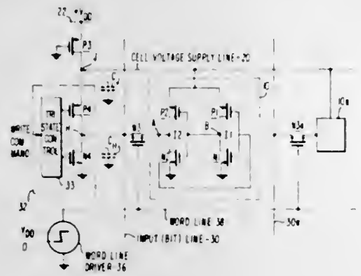
said control unit comprises means for sensing the identities of the binary encoded elements contained in the storage locations at said one end of a plurality of said registers, and means for altering the binary word of said storage location at said one end of at least one said register as a function of the identities of the binary encoded elements sensed by said means for sensing.

4,075,690

WRITE ENHANCEMENT CIRCUIT

Joel Roy Oberman, Somerville, and Roger Green Stewart, Neshanic Station, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 15, 1976, Ser. No. 667,101
Int. Cl.² G11C *11/40*
U.S. Cl. 365—156 **17 Claims**



1. The combination comprising:

two inverters, each inverter having an input and an output and first and second terminals for the application therebetween of an operating potential; means cross coupling the two inverters for forming a flip-flop;

a data input line;

a gating transistor connected between said data input line and a point common to the input of one inverter and the output of the other inverter;

a voltage supply terminal for the application thereto of an operating voltage;

an impedance element connected between said supply voltage terminal and said first terminals of said inverters providing a continuous conduction path therebetween when information is to be written into said flip-flop;

means for applying a reference potential to said second terminals of said inverters; and

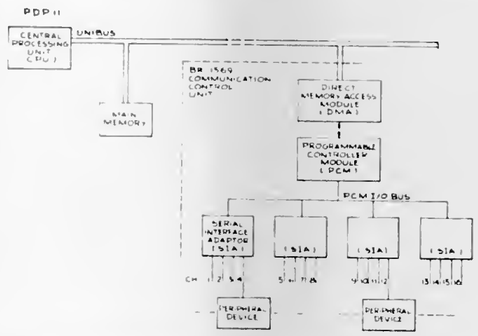
selectively enabled writing means connected between said first terminals of said inverters and said input data line for, when enabled, passing a current between said voltage terminal and said data line via said impedance element and said writing means thereby producing a potential drop across said impedance element which decreases the operating potential between said first and second terminals while simultaneously providing information of one binary significance to be written into said flip-flop onto said data input line.

4,075,691

COMMUNICATION CONTROL UNIT

John Stephen Davis, Glendale; Kenneth Norman Larson, Thousand Oaks, and Frank William Phalen, Canoga Park, all of Calif., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Nov. 6, 1975, Ser. No. 629,510
Int. Cl.² G06F *3/04, 5/04*
U.S. Cl. 364—200 **5 Claims**



1. In a communication control unit, useful in a data processing system having a central processing unit coupled to a main memory, and having a plurality of peripheral devices, each for communicating with said data processing system and each capable of handling messages in accordance with a different communication discipline, said communications control unit responding to messages from each peripheral device and transmitting messages to each peripheral device in accordance with the discipline defined therefor, said communication control unit comprising:

a programmable controller module including:

program memory means including a plurality of locations each storing an instruction, with sequences of instructions forming (1) control routines common to all peripheral devices and (2) character transmit/receive routines each unique to a particular communication discipline used by one or more of said peripheral devices;

instruction register means;

program address counter means for identifying a location in said program memory means and for transferring the instruction stored therein to said instruction register means;

a read/write memory means for storing data;

a data bus comprised of parallel bit lines;

means responsive to instructions transferred to said instruction register means for operating on data either in said read/write memory means or appearing on said data bus;

a direct memory access module means responsive to instructions transferred into said instruction register for transferring data from said read/write memory to said main memory and from said main memory to said read/write memory; and

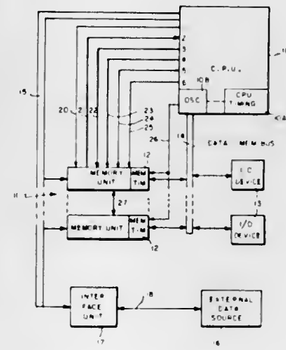
an interface adaptor means coupled between said programmable controller parallel data bus and said peripheral devices for receiving data from and transmitting data to said peripheral devices serial by bit.

4,075,692

DATA PATH CONFIGURATION FOR A DATA PROCESSING SYSTEM

Karsten Sorensen, Lexington; David H. Bernstein, and Michael B. Druke, both of Cambridge, all of Mass., assignors to Data General Corporation, Southboro, Mass.

Division of Ser. No. 646,351, Jan. 2, 1976, Pat. No. 4,014,006, which is a continuation of Ser. No. 387,523, Aug. 10, 1973, abandoned. This application Nov. 1, 1976, Ser. No. 737,416
Int. Cl.² G06F *7/38*
U.S. Cl. 364—200 **5 Claims**



1. A data processing system comprising

a central processor unit for processing address words and data words and at least one memory unit connected in communication with said central processor unit for storing address words and data words,

said central processor unit including

a skew protected quadriport register file having first and second read ports and first and second write ports for permitting the writing of information into said register file subsequent to the reading of information therefrom during the same processor cycle has been inserted;

an arithmetic logic unit having a first input, a second input and an output;

a parallel shifter unit having an input and an output;

said first read port of said register file connected to said first input of said arithmetic logic unit for supplying address words or data words to said arithmetic logic unit;

said second read port of said register file connected to said second input of said arithmetic logic unit and to said first write port of said register file for supplying address words or data words to said arithmetic logic unit or to said first write port;

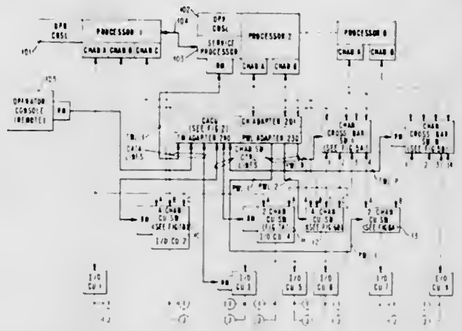
the output from said arithmetic logic unit connected to the input of said shifter unit and the output of said shifter unit connected to said second write port of said register file for writing the logic unit result in parallel into the register file.

4,075,693

CONFIGURATION AND CONTROL UNIT FOR A HETEROGENEOUS MULTI-SYSTEM

Joel Lawrence Fox, Rhinebeck, and Eugene Everett Marquardt, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 646,698, Jan. 5, 1976, Pat. No. 4,014,005. This application Dec. 15, 1976, Ser. No. 750,987
Int. Cl.² G06F *3/00*
U.S. Cl. 364—200 **11 Claims**



1. A system control arrangement for obtaining selective connections among one or more CPUs and remote devices, comprising

a configuration and control unit (CACU) connected between the CPUs and the devices, the CACU having at least one CACU modem for communicating control information for at least one remote device,

a remote modem adapter located with the remote device, the remote modem adapter comprising

a remote modem connected by a time-multiplexed transmission line to the CACU modem,

a command decoder having an input connected to the output of the remote modem, a plurality of control lines providing an output of the command decoder being selectively activated in response to commands received by the command decoder from the CACU, and

a configuration register for storing a path between a selected one of the one or more processors in the system and the remote device or any I/O unit connected to the remote device, the configuration register having at least an input gate and an output gate, each of the gates having a control input connected to different ones of the control lines of the command decoder, the input gate also connected to an output of the remote modem,

whereby the output gate provides configuration signals for the remote device on a command from the CACU to the command decoder.

4,075,694

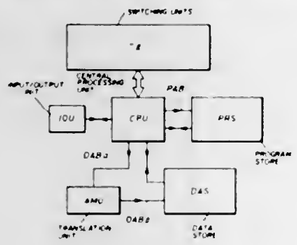
APPARATUS IN CONNECTION WITH A COMPUTER MEMORY FOR ENABLING TRANSPORTATION OF AN EMPTY MEMORY FIELD FROM ONE SIDE TO THE OTHER OF AN ADJACENT DATA FIELD WHILE THE COMPUTER IS OPERATIVE

Ernst Enoch Ericsson, Alta, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Oct. 4, 1976, Ser. No. 729,359
Claims priority, application Sweden, Oct. 23, 1975, 7511893
Int. Cl.² G06F *13/00*
U.S. Cl. 364—200 **3 Claims**

1. In apparatus for use in a computer system having an addressable computer memory for enabling a step by step transportation of an empty memory field containing a number of empty memory words from one side to the other of an adjacent data field containing a number of occupied memory

words, while the computer is operative, by relocating the data field in such a manner that the information stored in each successive memory word adjacent to one border of the empty memory field is transferred to an empty memory word on the other border of the empty memory field, the latter field thus dividing the data field into two field portions which share said number of occupied memory words during the transportation, an address modification unit for modifying of incoming addresses concerning a data field in the process of being relocated in order for the addresses to become related to said two field portions, each having two limit addresses, whereas having been related to one continuous area with two limit addresses, said continuous area being chosen such that one of said field portions is enclosed by the continuous area and shares one of its limit addresses with the latter area, said modification unit



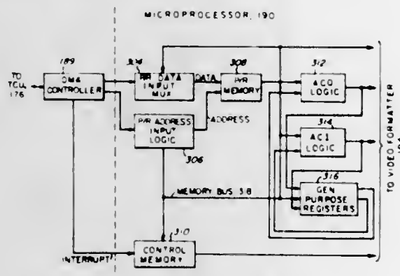
comprising comparator means for comparing said incoming addresses with that address in said empty memory field which adjoins to said one of said field portions and with a reference address which, in order to include all incoming addresses to be modified but exclude addresses relating to memory field not being concerned with said relocation, is allocated any chosen address in the address range starting with the other limit address of said continuous area and including the extreme border of the other of said field portions, and logic circuits responsive to output signals from said comparators for incrementing the incoming address by an address distance corresponding to said number of empty memory words when said output signals indicate that said incoming address falls within a range delimited by and including on the one hand said address in said empty memory field which adjoins said one of said field portions and on the other hand said reference address.

4,075,695

DISPLAY PROCESSOR SYSTEM

Helmut Lelke, Southboro, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed June 1, 1976, Ser. No. 691,955
Int. Cl.² G06F *3/14*
U.S. Cl. 364—200 **11 Claims**



1. A processor for performing predetermined operations upon digital data comprising in combination:

a plurality of accumulator means;

register means;

a permanently programmed control memory coupled to said accumulator means and said register means, said accumulator means being coupled to said register means in accordance with control signals produced as outputs of said control memory, said accumulator means and said register means performing predetermined operations upon digital data in accordance with instruction control sequences produced by said control memory, said control memory operating at least some of said accumulator means as separate from one another for predetermined ones of said operations and coupling together at least some of said accumulator means to act as a single accumulator having a larger capacity than a single one of said accumulator means for other ones of said operations; and

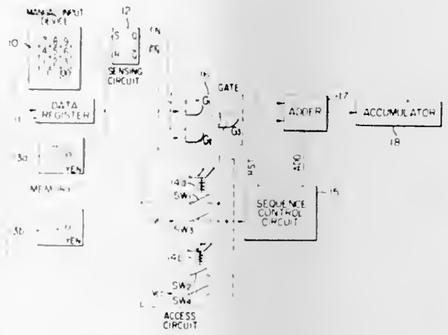
a data storage memory, said data storage memory coupling digital data to inputs of said accumulator means and instruction addresses to address inputs of said control memory.

4,075,696

DATA CONTROL DEVICE FOR SELECTIVELY PROVIDING DATA TO A PROCESSING SYSTEM

Nobuhiko Shinoda, and Tadao Kusumoto, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 586,412, June 12, 1975, abandoned. This application Dec. 20, 1976, Ser. No. 752,171
Claims priority, application Japan, June 17, 1974, 49-68881
Int. Cl.² G06F *15/24*
U.S. Cl. 364—404 **3 Claims**



1. A data control device for selectively providing data to a processing system comprising:

an input device having numeral keys for entering first numerical data;

sensing means responsive to the operation of any one of said numeral keys for providing a predetermined output signal;

register means responsive to the operation of said numeral keys for storing the first numerical data;

memory means for storing predetermined second numerical data corresponding to selected items;

item key means operative to provide access to the second numerical data stored in said memory means;

a discriminating circuit for selecting the data to be provided to the processing system from the first numerical data stored in said register means and the second numerical data stored in said memory means in accordance with the predetermined output signal from said sensing means; and

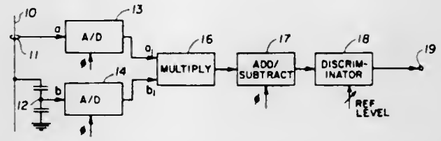
control circuit means for applying the selected numerical data to the processing system, and for actuating said sensing means to remove said predetermined output signal therefrom, wherein when any one of said numeral keys is depressed and then any one of said item keys is depressed, the first numerical data is selected by said discriminating circuit and is provided to the processing system, and when any one of said item keys is depressed without an immediately preceding actuation of a said numerical key, the second numerical data is selected by said discriminating circuit and is provided to the processing system.

4,075,697

APPARATUS FOR MONITORING TWO ELECTRIC QUANTITIES BY COMBINING THREE CONSECUTIVE SAMPLES OF EACH QUANTITY

Tomoyoshi Ochiai; Takeshi Hayashi, and Mituhiro Furuse, all of Tokyo, Japan, assignors to Tokyo Denryoku Kabushiki Kaisha and Kabushiki Kaisha Meidensha, both of Tokyo, Japan

Continuation of Ser. No. 508,629, Sept. 23, 1974, Pat. No. 4,006,348. This application Oct. 21, 1976, Ser. No. 734,539
Claims priority, application Japan, Oct. 1, 1973, 48-110856; Oct. 1, 1973, 48-110857
The portion of the term of this patent subsequent to Feb. 1, 1994, has been disclaimed.
Int. Cl.² G06F *15/20*; G01R *13/02*
U.S. Cl. 364—481 **4 Claims**



1. Apparatus for monitoring a variable derived from a first substantially sinusoidal electric quantity having a first period and a second substantially sinusoidal electric quantity having a second period nominally substantially equal to said first period, said variable being independent of time, comprising:

a source of sampling pulses of a predetermined sampling period;

two samplers responsive to said sampling pulses and respectively responsive to said first and second electric quantities for respectively deriving first and second discrete signals from said first and second electric quantities at individual sampling points defined by said sampling pulses, said first and second discrete signals being representative of samples of said first and second electric quantities, respectively;

at least one multiplier unit coupled to said samplers for calculating at least one product of samples which are representative of at least one pair of said discrete signals to produce at least one product signal representative of said product, one and the other of said at least one pair being derived from said first and second electric quantities; respectively:

arithmetic means coupled to said multiplier unit for carrying out at least an algebraic addition of a signal representative of at least one of the product signals produced by said at least one multiplier unit with another signal in response to the discrete signals derived at three consecutive ones of said sampling points to produce a first result signal representative of said variable, said variable being further independent of phase relations between said sampling pulses and respective ones of said electric quantities; and

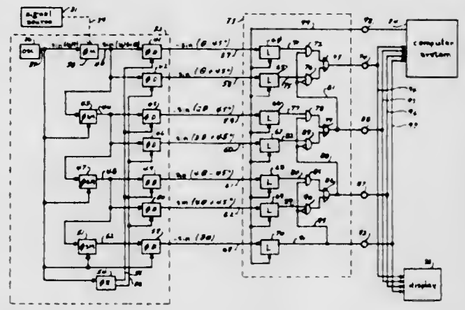
a discriminator circuit coupled to said arithmetic means and responsive to said first result signal for producing a second result signal when said variable exceeds a given reference value.

4,075,698

DIGITAL PHASE MEASUREMENT SYSTEM

Tenny D. Lode, 3270 Cherryridge Road, Englewood, Colo. 80110

Continuation of Ser. No. 456,853, April 1, 1974, abandoned. This application May 28, 1976, Ser. No. 690,869
Int. Cl.² H03K *13/02*; G01R *25/00*
U.S. Cl. 364—483 **32 Claims**



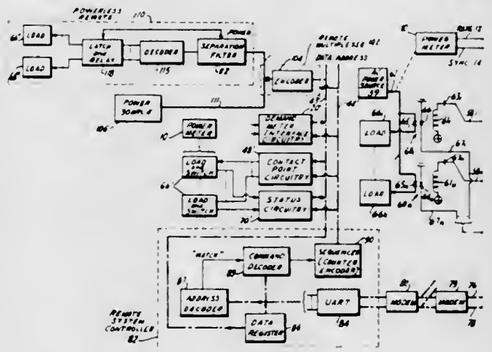
1. In a digital phase measurement system, the combination including a source of a first reference alternating signal establishing a reference phase, a source of a second alternating signal of substantially the same frequency of the reference signal whose phase is to be measured relative to the phase of said reference signal, means responsive to said first and second alternating signals generating a set of additional alternating signals each in a substantially predetermined phase relationship to predetermined multiples, differing from one, of the phase differences of said second alternating signal relative to the phase of said first alternating signal, means generating a set of a plurality of logical signals whose values are predetermined functions of said first, second and additional alternating signals respectively, means to provide a plurality of first subsets of logical signals, with each first subset comprising a plurality of said logical signals, and with each of said first subsets of logical signals corresponding to the relative phase of a single one of said alternating signals, means to control said means to provide, and means for connecting said logical signals to digital data responsive means.

4,075,699

POWER MONITORING AND LOAD SHEDDING SYSTEM

Richard A. Schneider, Edison, N.Y.; Gerald L. Freed, Highland Park, and Richard Lipnick, Scotch Plains, both of N.J., assignors to Lockheed Electronics Co., Inc., Plainfield, N.J.

Filed June 24, 1976, Ser. No. 699,571
Int. Cl.² G01R *21/00*; G05B *15/02*
U.S. Cl. 364—492 **16 Claims**



1. In combination in a power load shedding system for con-

trolling the operative status of plural controllable system loads each selectively connectable to a source of energy, comprising stored program controlled digital computer means including a central processing unit and memory means communicating with said central processing means, said memory means including data storage means for each load for storing the characteristics and status of the associated load, plural controlled switch means for selectively connecting and disconnecting the controllable system loads with the energy source, control circuitry responsive to signals issued by said computer means for controlling the status of said controlled switch means, and means for signaling to said computer means the power being consumed by the system loads, said computer means including means for projecting energy consumption over a measuring interval, excessive power signaling means for comparing said projected energy consumption with a permissible bound therefor and for signaling when the projected consumption exceeds said permissible bound therefor, load shedding means responsive to said excessive power signaling means indicating an excessive energy consumption projection for examining said data storage means for the system loads in said memory means for selectively operating said controlled switch means via said control circuitry to operatively disconnect selected system loads from the energy source, wherein said control circuitry comprises a register having plural stages each signaling the desired relative operative condition for a different system load, and plural relays each responsive to the output of an associated register stage for controlling the state of an associated one of said plural controlled switch means, further comprising plural multi-position switches including a first pole serially included between said register and one of said controlled switch means associated therewith, further comprising status circuitry for supplying information to said central processing unit, said status circuitry including an additional register having a first plurality of stages, wherein each of said multi-position switches of said control circuitry includes an additional pole connected to a different stage to said additional register

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4,075,700

INFORMATION DISPLAY ARRANGEMENTS

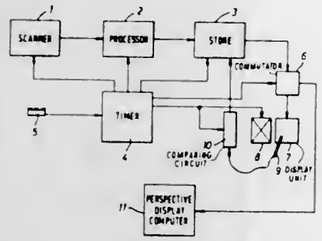
Alan George Blay, Kenley, England, assignor to EMI Limited, Hayes, England

Filed July 6, 1976, Ser. No. 703,004

Claims priority, application United Kingdom, July 4, 1975, 28219/75

Int. Cl.² G01T *1/16*; G08C *21/00*

U.S. Cl. 364—515 **5 Claims**



1. An information display arrangement including a store for information signals indicative of variation of a parameter of a body over each of a plurality of substantially two-dimensional regions in the body, adjacent regions overlying one another to at least a substantial extent, means for displaying individually the information signals relating to at least some of said regions, means for selecting features of interest contained in the displayed information, and means for combining the information so displayed to provide a pseudo three-dimensional display of part of said body with the selected features shown in relief.

4,075,701

METHOD AND CIRCUIT ARRANGEMENT FOR ADAPTING THE MEASURING RANGE OF A MEASURING DEVICE OPERATING WITH DELTA MODULATION IN A NAVIGATION SYSTEM

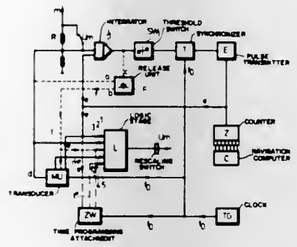
Fritz Hofmann, Munich, Germany, assignor to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung, Munich, Germany

Filed Feb. 3, 1976, Ser. No. 654,960

Claims priority, application Germany, Feb. 12, 1975, 2505838; Jan. 23, 1976, 2602496

Int. Cl.² G01C *21/16*; G06F *15/50*; G01R *15/08*

U.S. Cl. 364—579 **4 Claims**



4. A method for adapting the measuring range of a measuring device in a navigation system working with delta modulation, including the steps of:

integrating the measuring value in an integrator switchable between different input sensitivities, said integrating step continuing until a following threshold value switch responds;

providing a pulse by way of a pulse, generator which serves to reset the integrator by one pulse weight, and which is stored at the same time in a counter at the input of a navigational computer;

controlling the release time of the pulse generator by a synchronizer so that the pulse is timed according to the remaining periphery of the navigational computer;

controlling the switching between different input sensitivities of the integrator to take place only when a small signal appears at the output of the integrator and when switching is necessary because of the size of the data signal, the release time of the pulse generator serving as a switching criterion;

correcting the zeroing error of the measuring instrument by switching the input of the integrator to a measuring range with reversible measuring direction and different switchable input sensitivities; and

providing a second equivalent measuring instrument for supplying data signals during the reversal of the measuring direction, the measuring direction being reversed only when a small signal appears at the output of the integrator.

4,075,702

ELECTRONIC CALCULATING APPARATUS AND WALLET ENCLOSURE

David C. Davies, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

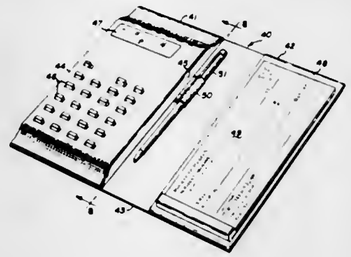
Filed Mar. 12, 1976, Ser. No. 666,362

Int. Cl.² G06F *15/02*

U.S. Cl. 364—705 **16 Claims**

1. In a battery-operated, portable electronic calculating apparatus having means for inserting numbers, computing means, means for displaying the results of insertions and computations, and battery containing means for powering said apparatus, the improvement comprising means forming an

elongated battery compartment having a location extending along one side of said apparatus parallel to the longitudinal axis



thereof for receiving an elongated battery means to operate said apparatus.

4,075,703

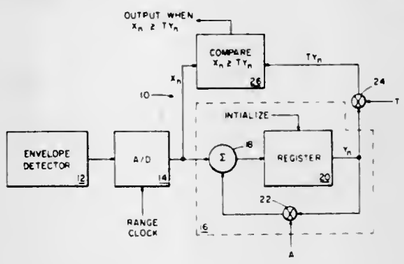
RECURSIVE FILTER MEAN-LEVEL DETECTOR

George M. Dillard, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 1, 1976, Ser. No. 737,877

Int. Cl.² G06F *15/34*

U.S. Cl. 364—715 **6 Claims**



1. A device for calculating the mean level of a stochastic process and for using the mean level to provide a threshold for determining the presence or absence of a signal comprising:

first means for outputting sample values X_n of a detected signal;

a first order recursive filter connected to the output of said first means for providing output values Y_n proportional to the mean value of said stochastic process;

second means connected to said first order recursive filter for forming the products TY_n where T is a predetermined value; and

third means for comparing the values TY_n with said values X_n and for providing an output when $X_n \geqq TY_n$.

4,075,704

FLOATING POINT DATA PROCESSOR FOR HIGH SPEECH OPERATION

George P. O'Leary, Beaverton, Oreg., assignor to Floating Point Systems, Inc., Portland, Oreg.

Filed July 2, 1976, Ser. No. 702,148

Int. Cl.² G06F *7/38*

U.S. Cl. 364—748 **11 Claims**

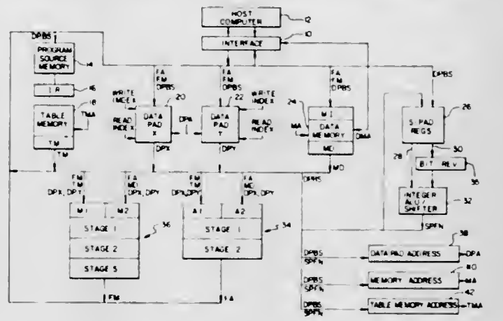
1. A floating point data processor comprising:

a plurality of memory register means, said memory register means having inputs and outputs,

a floating point adder means for receiving a pair of inputs and performing arithmetic operations on said inputs, said adder means including a mantissa portion and an exponent portion,

a floating point multiplier means for receiving a pair of inputs for multiplication, said multiplier means including a mantissa portion and an exponent portion,

and a plurality of separate, simultaneously operable bus means including first bus means coupled to said adder means for receiving the ouput of said adder means while also being coupled to the said memory register means, multiplier means, and adder means for providing the output of said adder means as selectable input to the said memory register means, multiplier means and adder means, second bus means coupled to said multiplier means for receiving the output of said multiplier means while also being coupled to the said memory register means,



multiplier means and adder means for providing the output of said multiplier means as selectable input to the said memory register means, multiplier means and adder means, third bus means coupled to said adder means for providing input to said adder means while also being coupled to said memory register means for receiving output from said memory register means as selectable input to said third bus means, and fourth bus means coupled to said multiplier means for providing input to said multiplier means while also being coupled to said memory register means for receiving output from said memory register means as selectable input to said fourth bus means.

4,075,705

CALCULATOR FOR DETERMINING CUBIC ROOTS

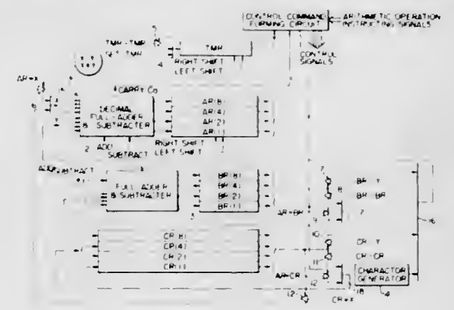
Yoichi Kawabata, and Minoru Machida, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 15, 1975, Ser. No. 640,845

Claims priority, application Japan, Dec. 16, 1974, 49-144741

Int. Cl.² G06F *7/48*

U.S. Cl. 364—752 **5 Claims**



1. A calculator comprising:

numerical keys for entering numerical data into said calculator;

a cubic root key for actuation to enter an instruction signal operative to extract a cubic root;

storage means coupled to said numerical keys for storing the data entered by said numerical keys; and

processing circuit means coupled to said cubic root key and

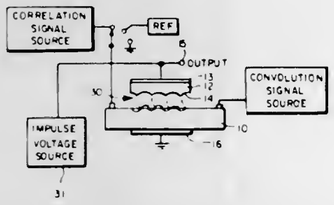
said storage means and operative in response to said cubic root instruction signal for developing the cubic root of the data in said storage means, wherein said processing circuit means comprises means for processing the data stored in said storage means as sets of data, wherein each set includes three successive digits of the data in the storage means, and for performing numerical operations on each of the respective sets.

4,075,706

SURFACE WAVE DEVICES FOR PROCESSING SIGNALS

Ernest Stern, Concord; Richard C. Williamson, Framingham, and Henry I. Smith, Sudbury, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 555,367, March 5, 1975, Pat. No. 4,016,412.
This application Mar. 31, 1976, Ser. No. 672,344
Int. Cl.² G06G 7/19; G11C 27/00
U.S. Cl. 364—821 **7 Claims**



1. A device for processing and storing signals comprising

a first piezoelectric substrate capable of propagating acoustic wave signals on a selected surface thereof;

at least one transducer means formed on said selected surface for generating a surface acoustic wave traveling on said surface along a selected direction thereof in response to an electrical signal;

a semiconductor material positioned so as to have a first surface thereof adjacent and spaced from said selected surface of said first substrate to form an interaction region which includes the region at or near said surfaces and the spatial region therebetween;

a layer of conductive material disposed on a second surface of said semiconductor material, said layer forming an electrode;

means for providing a first signal at said at least one transducer means to produce a first traveling acoustic wave signal along said selected surface of said first substrate;

means for applying a second signal uniformly over said interaction region to provide time-varying properties thereof, the interaction of said first and second signals thereby providing an altered stationary conductivity pattern in said semiconductor material as said acoustic wave signal travels along said selected surface of said first substrate, said altered stationary conductivity pattern being stored in said semiconductor material and representing said interacting first and second signals, said means including

means for supplying a substantially instantaneous burst of low energy electrons in said interaction region to establish electrostatic fields in said interaction region, the interaction of said first traveling acoustic wave signal with said low energy electrons thereby providing said altered stationary conductivity pattern; and wherein said low energy electron supplying means comprises

an array of field emitting devices positioned on said first surface of said semiconductor material, and

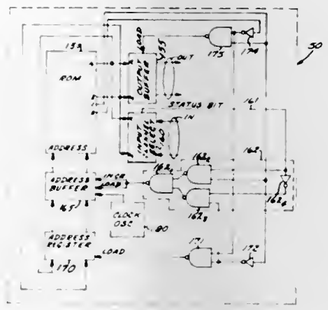
means for activating said field emitting devices to produce a plurality of electrons in said interaction region to form said electrostatic fields.

4,075,707

PROGRAMMED DEVICE CONTROLLER

Michael E. Wilmer, Portola Valley, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed May 21, 1976, Ser. No. 688,653
Int. Cl.² G05B 11/01; G06F 9/00
U.S. Cl. 364—900 **12 Claims**



1. A programmable controller adapted to control an automated device, comprising:

a programmable memory adapted to store a plurality of binary words at corresponding addressable locations therein, each word comprising binary bits, bit 0 and 1 containing an operating instruction and bits 2 through *n* containing a binary address code;

an input selector adapted to receive a plurality of input signals from said device and connected to receive said bits 2 through *n* for selecting one of said input signals corresponding to said address code on said bits 2 through *n;*

address buffer means connected to said memory for selecting said addressable locations therein;

output buffer means adapted for connection to said device for applying control signals thereto; and

gating means connected to receive said bits 0 and 1 from said memory and a selected one of said input signals from said selector for applying said bits 2 through *n* to said address or output buffer when said bit 0 is of a first polarity according to the polarity of said bit 1 and for applying said bits 2 through *n* to said selector when said bit 0 is of a second polarity and loading or incrementing said address buffer means according to the relationship of the polarity of said selected one of said input signals with said bit 1.

4,075,708

LARGE CAPACITY MAJOR-MINOR LOOP BUBBLE DOMAIN MEMORY WITH REDUNDANCY

Thomas T. Chen, Yorba Linda, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 24, 1976, Ser. No. 689,312
Int. Cl.² G11C 19/08
U.S. Cl. 365—2 **9 Claims**

1. A large capacity memory comprising

a plurality of substantially similar modules,

interconnecting means at the edges of each module for interconnecting the modules,

said interconnecting means having sufficient size to permit reasonable tolerance in alignment thereof while permitting interconnection of the modules,

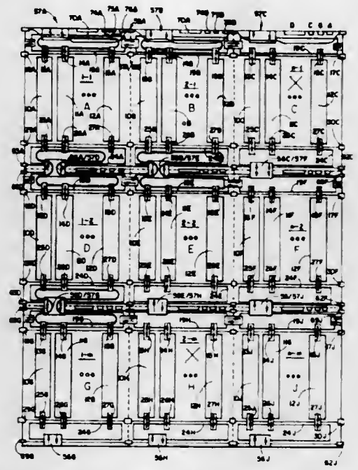
each of said modules including:

a primary major loop,

a secondary major loop,

at least one minor loop coupled to said primary major loop and to said secondary major loop to permit the selective interchange of information between the respective loops, and

junction means connected between said primary major loop and said secondary major loop and at least some of said interconnecting means to permit the selective interchange



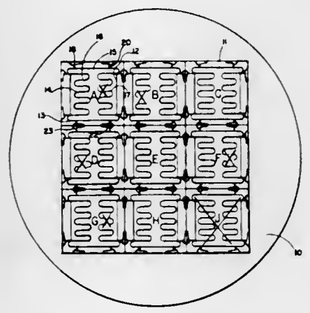
of information between the associated major loops of adjacent interconnected modules.

4,075,709

LARGE CAPACITY BUBBLE DOMAIN MEMORY WITH REDUNDANCY

Thomas T. Chen, and Isoris S. Gergis, both of Yorba Linda, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 24, 1976, Ser. No. 689,313
Int. Cl.² G11C 19/08
U.S. Cl. 365—2 **11 Claims**



1. A large capacity memory comprising:

a plurality of substantially similar modules arranged in an array,

interconnecting means in each module for interconnecting the adjacent modules in said array,

said interconnecting means having sufficient size to permit reasonable tolerance in alignment thereof while permitting actual interconnection of the adjacent modules,

each of said modules including a plurality of propagation paths arranged substantially in parallel to each other in a functional manner,

passive junction means connected to the ends of certain propagation paths and to said interconnecting means,

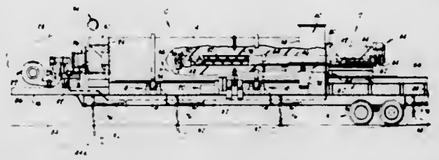
said junction means is selectively alterable to establish the connection between respective paths in said module whereby the propagation paths in all of said modules are connected together in series.

4,075,710

APPARATUS FOR PRODUCING HOT MIX ASPHALT UTILIZING RECYCLABLE ASPHALT AGGREGATE

Herbert E. Jakob, Taylors, S.C., and David L. Garbelman, Edmond, Okla., assignors to CMI Corporation, Oklahoma City, Okla.

Filed Mar. 7, 1977, Ser. No. 775,388
Int. Cl.² B28C 1/22, 5/06
U.S. Cl. 366—25 **9 Claims**



1. Apparatus for producing hot mix asphalt utilizing new aggregate and a previously manufactured and layed asphalt mix which has been reduced to form recyclable aggregate, comprising:

a cylindrical mixer drum having a first end and a second end;

means supporting the mixer drum for rotation about the longitudinal axis thereof with the first end of the mixer drum higher than the second end of the mixer drum;

burner means at the first end of the mixer drum for producing a flame in the mixer drum extending from the first end of the mixer drum to a medial portion of the mixer drum;

recyclable aggregate conveyor means extending from the second end of the mixer drum to a medial portion of the mixer drum for feeding the recyclable aggregate into a medial portion of the mixer drum;

means for feeding the new aggregate into the first end of the mixer drum;

means for injecting asphaltic oil into the mixer drum;

flights in the mixer drum for moving the new aggregate and recyclable aggregate around the mixer drum and mixing the asphaltic oil, new aggregate and recyclable aggregate within the mixer drum to form a hot mix asphalt; and

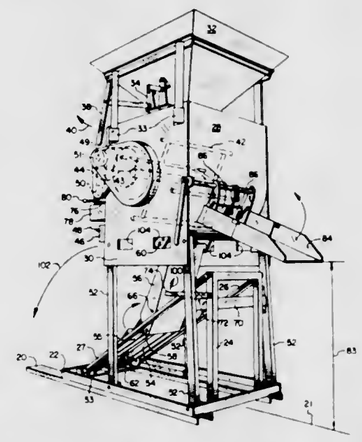
means for discharging the hot mix asphalt from the second end of the mixer drum.

4,075,711

CONCRETE MIXING SYSTEM

Jack F. Hall, Portland, Oreg., assignor to U-Cart Concrete Systems, Inc., Vancouver, Wash.

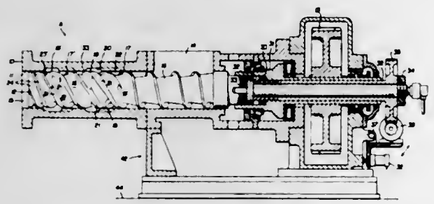
Filed Dec. 9, 1976, Ser. No. 749,042
Int. Cl.² B28C 5/14
U.S. Cl. 366—26 **4 Claims**



1. An apparatus for mixing concrete, comprising:

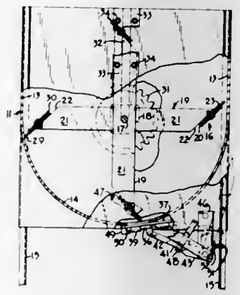
(a) an upright mixing chamber having a top and bottom;
(b) inlet means, having a top, attached to said mixing chamber for permitting the introduction of concrete mix materials into said mixing chamber;
(c) mixing means within said mixing chamber for blendingly combining said mix materials with one another so as to form a concrete mixture in said mixing chamber;
(d) outlet means proximate the bottom of said mixing chamber for selectively discharging said concrete mixture from said mixing chamber;
(e) support means connected to said mixing chamber for engaging a horizontal working surface and supporting said mixing chamber in a lowered upright position with the bottom thereof at a first predetermined distance above said working surface to facilitate access to said inlet means; and
(f) lifting means connected to said mixing chamber for selectively raising said mixing chamber to a raised upright position, with the bottom thereof at a second predetermined distance above said working surface greater than said first predetermined distance, so as to provide sufficient clearance between the bottom of said mixing chamber and said working surface to permit movement of a concrete mixture transport device to a position on said working surface beneath said outlet means, said lifting means comprising a plurality of members movable with respect to one another in such a manner that such plurality of members push upwardly against said mixing chamber during such movement, means for energizing said members, and means for continuously maintaining said upright mixing chamber in upright orientation during said lifting and said discharging.

4,075,712
EXTRUSION AND MIXING APPARATUS
Paul Geyer, 15660 Tacoma Ave., Detroit, Wayne County, Mich. 48205
Continuation-in-part of Ser. No. 712,450, Aug. 8, 1976, abandoned, which is a continuation of Ser. No. 565,453, April 7, 1975, abandoned. This application Dec. 22, 1976, Ser. No. 753,595
Int. Cl.² B29B *1/06*
U.S. Cl. 366—79 **32 Claims**



1. An apparatus for the extruding and mixing of thermo-plastic and thermo-setting materials for both hot and cold feed which comprises: an elongated generally cylindrical barrel member and an elongated rotor member disposed coaxially in the interior of said barrel member; means provided for relative rotational movement between said rotor and barrel members in the treating and axial advancing of the material to be processed along said members; said rotor and barrel members having a feed end, a discharge end, and a mixing stage including a rotor to barrel zone and a barrel to rotor zone interposed between said feed and discharge ends; the portions of said rotor and barrel members in said zones each being provided with one or more longitudinal helical grooves; the grooves of said rotor and barrel members in said rotor to barrel zone being sized, with the extrusion capacity of the helical groove in said rotor member decreasing uniformly along the length of said rotor to barrel zone with maximum extrusion capacity at the beginning of said rotor to barrel zone and minimum extrusion capacity of helical groove in said barrel member increasing uniformly along the length of said rotor to barrel zone with minimum extrusion capacity at the beginning of said rotor to barrel zone and maximum extrusion capacity at the end of said rotor to barrel zone, whereby said relative rotational movement between said rotor and barrel members causes materials to flow outward from the groove in said portion of the rotor member in said rotor to barrel zone along the length of said rotor to barrel zone into the groove of the portion of said barrel member in said rotor to barrel zone which receives the material; said grooves in the portion of said barrel member in said barrel to rotor zone having reduced change in depth to turn the material presented away from the groove provided in said barrel member and to direct the reoriented material towards the groove provided in said rotor member for changing the axis of material shear as said material is advanced from said barrel member to said rotor member in said barrel to rotor zone from where the material flows to said discharge end upon relative rotational movement between said members.

4,075,713
FEED MIXER
Harlan J. Easton, R.F.D. 3, Blooming Prairie, Minn. 55917
Filed Nov. 11, 1976, Ser. No. 741,159
Int. Cl.² B01F *7/04*
U.S. Cl. 366—192 **4 Claims**



1. A granular feed mixer comprising:
a. a container having generally vertical side and end walls, and a semi-cylindrical bottom portion having a discharge opening therethrough;
b. an agitator in said container and including a central shaft, arms extending radially outwardly from said shaft, and mixing vanes on the radially outer ends of said arms;
c. means journaling said shaft in said end walls for rotation generally on the axis of the radius of said bottom portion;
d. drive means for imparting rotation to said agitator, to mix and blend material in said container;
e. and closure means for said discharge opening and including, a plate-like closure member having opposite ends, guide means mounting said closure member for movements toward and away from a closed position underlying said discharge opening, closure member moving means having an end portion connected to one end of said closure member in angularly spaced relation thereto for imparting opening and closing movements thereto, and cam means on said bottom portion engaging the outer end of said closure member and cooperating with said closure member moving means end portion to exert sealing pressure to said closure member against said bottom portion responsive to movement of said closure member to its closed position.

DESIGN PATENTS

GRANTED FEBRUARY 21, 1978

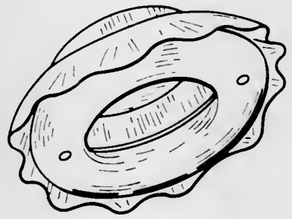
ERRATA

For CLASS	See PATENT NO.
D22–028	247,304

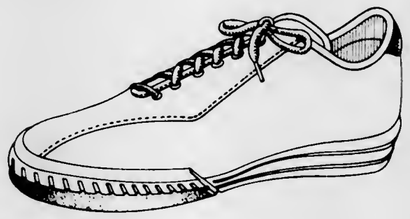
DESIGNS

FEBRUARY 21, 1978

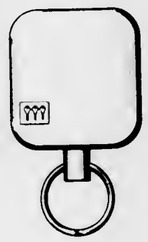
247,266
HAT HAVING AIR CHAMBER
Yutaka Yoshida, 1941-8, Manazuru, Manazurucho, Ashigara-shimo, Kanagawa, Japan
Filed Aug. 11, 1976, Ser. No. 713,422
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—230



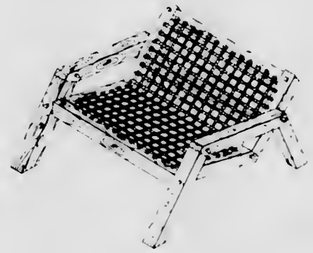
247,267
SHOE
Dennis P. Dolinsky, Naugatuck, Conn., assignor to Uniroyal, Inc.
Filed June 3, 1976, Ser. No. 692,612
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310



247,268
KEY-KEEPER
Michel Quenot, Rue Grenier, France, assignor to Stanley-Mabo, Besancon, France
Filed Dec. 30, 1975, Ser. No. 645,359
Claims priority, application France, July 4, 1975, 1,091
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—400



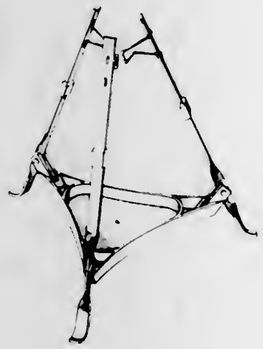
247,269
SETTEE
Larry L. Hughes, 2923 Winter St., Fort Wayne, Ind. 46806; Don E. Lutz, 9314 Kress Road, Fort Wayne, Ind. 46809, and Mark A. Hade, R.R. No. 1, Grabill, Ind. 46741
Filed Feb. 27, 1976, Ser. No. 661,939
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



247,270
STAND FOR TRANSPORTING AND PERMITTING WORK ON MOTORS
George Allan Barnes, 5220 NE. 45th Terrace, Kansas City, Mo. 64117
Filed Oct. 24, 1975, Ser. No. 625,463
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—85



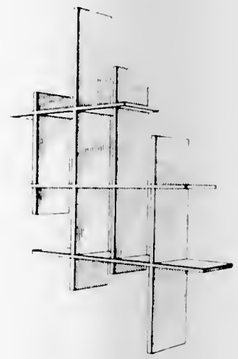
247,271
HOLDER FOR CHRISTMAS TREE OR POTTED PLANTS
Albert E. Zipser, P.O. Box 778, Ceres, Calif. 95307
Filed Mar. 3, 1976, Ser. No. 663,348
Term of patent 14 years
Int. Cl. D6—*99, 06*
U.S. Cl. D6—105



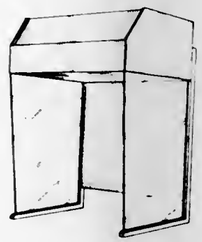
247,272
STORAGE PANEL FOR SKI BOOTS OR THE LIKE
Bernard J. Putt, Star Route Box 169, Howard, Colo. 81233, and Roger E. Hughet, 5635 Putnam, West Bloomfield, Mich. 48033
Filed Jan. 28, 1976, Ser. No. 652,977
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—130



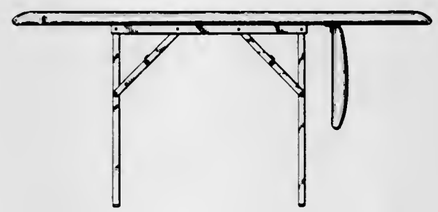
247,273
SHELF UNIT
Robert Peters, Ville St. Laurent, Canada, assignor to Swen Decorative Products Limited - Produits Decoratifs Swen Limitee, Montreal, Canada
Filed Aug. 6, 1976, Ser. No. 712,366
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—135



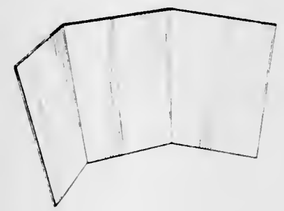
247,274
CABINET
Bryan McKinnon, St. Laurent, Canada, assignor to Robert A. Elder, Chateauguay-Centre, Canada
Filed Sept. 25, 1975, Ser. No. 616,896
Claims priority, application Canada, July 30, 1975, 25-04-75-1
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—172



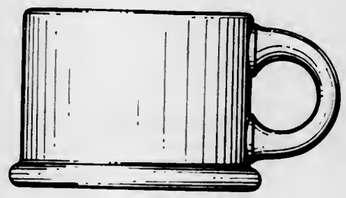
247,275
BEAUTY TREATMENT OPERATORY TABLE
Joseph Colombo, Whitestone, N.Y., assignor to Keron Laboratories Ltd., College Point, N.Y.
Filed July 1, 1976, Ser. No. 701,928
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177



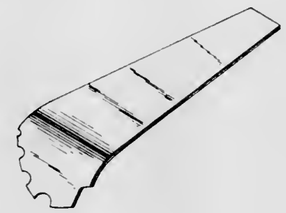
247,276
EASEL OR SIMILAR ARTICLE
Donald B. Smith, R.R. No. 1, Mount Brydges, Ontario, Canada (N0L 1W0)
Filed Apr. 28, 1975, Ser. No. 572,409
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—184



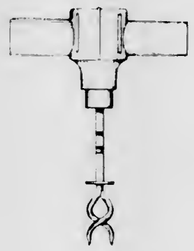
247,277
CUP
Niels Refsgaard Andersen, Rude, Denmark, assignor to Dansk International Designs Ltd., Mount Kisco, N.Y.
Filed June 23, 1976, Ser. No. 698,981
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—9



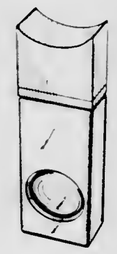
247,278
BLADE FOR A BARBECUE GRILL SCRAPER
Richard W. Dunn, Jr., 328 Belvedere SE., Warren, Ohio 44483
Filed Sept. 29, 1976, Ser. No. 727,971
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—181



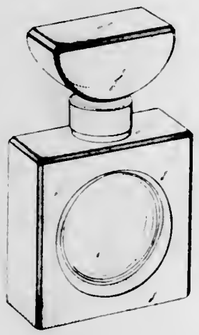
247,279
COMBINED CORKSCREW AND CAN OPENER OR SIMILAR ARTICLE
Robert K. Marceca, 246 E. 58th St., New York, N.Y. 10022
Filed June 18, 1976, Ser. No. 697,326
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D8—42



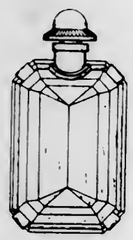
247,280
BOTTLE OR SIMILAR ARTICLE
Adam J. Grodin, Forest Hills, N.Y., assignor to American Cyanamid Company, Stamford, Conn.
Filed Mar. 1, 1976, Ser. No. 662,297
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—71



247,281
BOTTLE OR SIMILAR ARTICLE
Adam J. Grodin, Forest Hills, N.Y., assignor to American Cyanamid Company, Stamford, Conn.
Filed Mar. 1, 1976, Ser. No. 662,299
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—71



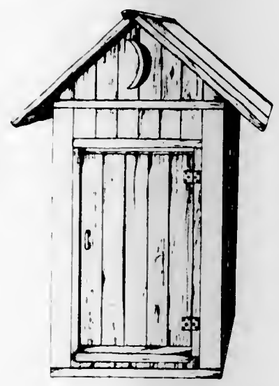
247,282
BOTTLE
Jacques Zimmermann, Saint-Cloud, France, assignor to Les Must de Cartier-France, Paris, France
Filed Mar. 22, 1976, Ser. No. 668,817
Claims priority, application France, Sept. 24, 1975, 74.185
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—71



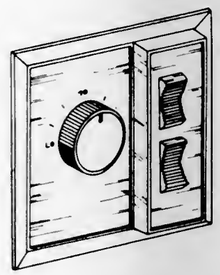
247,283
BOTTLE
Richard L. Weckman, Perrysburg, Ohio, assignor to Owens-Illinois, Inc.
Division of Ser. No. 467,079, May 6, 1974. This application Sept. 29, 1975, Ser. No. 617,352
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—157



247,284
CLOCK
Rodney T. Huddleston, Box 409, Lead, S. Dak. 57754
Filed Apr. 5, 1976, Ser. No. 673,678
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—11



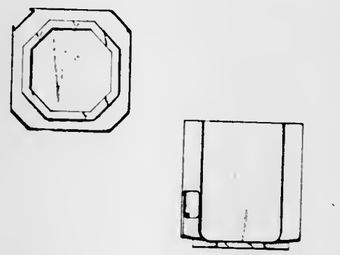
247,285
THERMOSTAT
Herbert J. Taylor, Aloha, Oreg., assignor to Sunne Controls Division Peco, Inc., Portland, Oreg.
Filed Apr. 12, 1976, Ser. No. 676,209
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—50



247,286
PLAQUE
Betty M. Mathie, 2958 E. Lake Merry Drive, Salt Lake City, Utah 84121
Filed June 16, 1975, Ser. No. 587,249
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—134



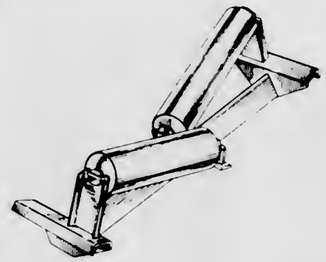
247,287
FLOWER POT
Raymond E. Grosfillex, Arbent, France, assignor to Grosfillex S.A.R.L., Arbent, France
Filed Apr. 7, 1977, Ser. No. 785,551
Claims priority, application France, Oct. 7, 1976, 76 2672
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—155



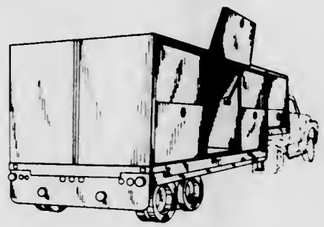
247,288
LIFT TRUCK
John W. Haswell, Belleville, Mich., assignor to Master Craft Engineering, Inc., Belleville, Mich.
Filed Apr. 2, 1976, Ser. No. 672,433
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—57



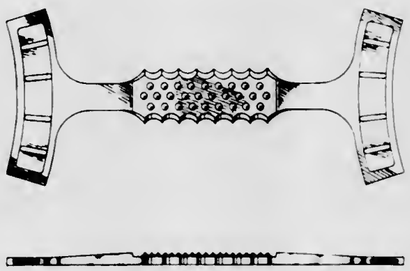
247,289
BELT CONVEYOR IDLER
Edward J. Christiansen, Beaverton, Oreg., assignor to Barber-Greene Company, Aurora, Ill.
Filed May 17, 1976, Ser. No. 687,238
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—60



247,290
TRAILER
Leland D. Arnot, Jr.; Ray C. Imel, Jr., and Donald E. Imel, all of Boulder, Colo., assignors to Wano Company, Inc., Lafayette, Colo.
Filed Dec. 8, 1975, Ser. No. 638,903
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—97



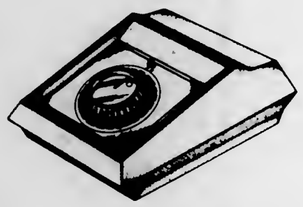
247,291
TRANSVERSE TRACTION TREAD FOR VEHICLE TIRES
Harry M. Gilmartin, Bellevue, Wash., assignor to Polytech Industries Inc., Woodenville, Wash.
Filed Aug. 12, 1976, Ser. No. 713,847
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—154



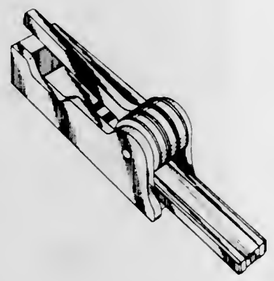
247,292
MIRROR FOR BICYCLE HANDLEBAR
George Malcolm Brown, R.F.D. No. 2, Box 144, Canterbury, Conn. 06331
Filed July 30, 1976, Ser. No. 710,334
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—189



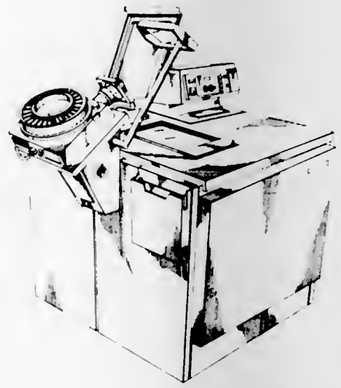
247,293
ANTENNA ROTATOR CONTROL
David D. Tompkins, Columbus, Ohio, assignor to Crown Controls Corporation
Filed Feb. 25, 1976, Ser. No. 661,320
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—32



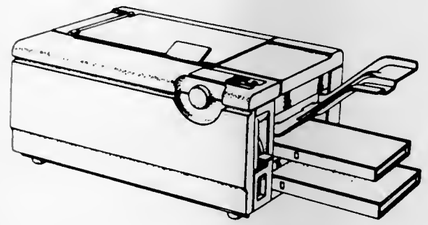
247,294
CAN CRUSHER
Andre L. Grable, 3020 Abilene St., Aurora, Colo. 80011
Filed May 7, 1976, Ser. No. 684,182
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—123



247,295
MULTICOLOR TRANSPARENCY REPRODUCTION MACHINE
Abraham Cherian, Webster, and Ruedigar W. Knodt, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Mar. 3, 1976, Ser. No. 663,387
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—27



247,296
ELECTROSTATIC COPIER
Kenichi Nakade, Yokohama, Japan, assignor to Ricoh Co., Ltd., Japan
Filed Sept. 7, 1976, Ser. No. 720,796
Claims priority, application Japan, Mar. 18, 1976, 51-9536
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—31



247,297
ADJUSTABLE SUPPORT-TYPE HOLDER FOR BINOCULARS
Neil D. Adams, St. Genevieve, Mo., assignor to Adco Products, Inc.
Filed Jan. 9, 1976, Ser. No. 647,894
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—50

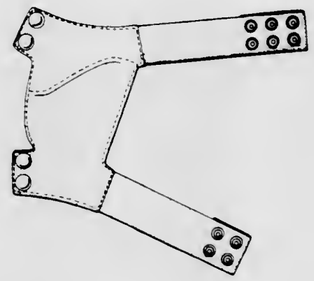


247,298
CARD FILE
Joseph P. Maruca, Coventry, R.I., and Robert A. Chieda, Westport, Conn., assignors to Textron, Inc., Providence, R.I.
Continuation of Ser. No. 392,358, Aug. 28, 1973. This application Oct. 8, 1975, Ser. No. 620,857
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—76

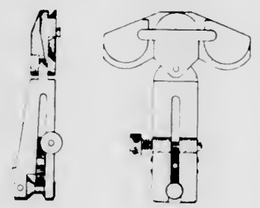




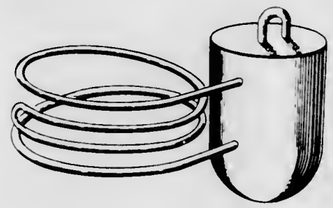
247,299
LEG HOLSTER
John E. Bianchi, and Richard D. E. Nichols, both of Fallbrook, Calif., assignors to Bianchi Leather Products, Inc., Temecula, Calif.
Filed June 21, 1976, Ser. No. 698,031
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D22—13



247,300
TROLLING DOWNRIGGER
Jerry G. Dusich, 4898 Washington St., Gary, Ind. 46408, and Willard Basco, 1009 E. 61st Place, Merrillville, Ind. 46410
Filed Feb. 4, 1977, Ser. No. 765,660
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—13



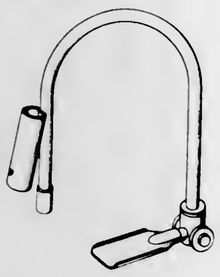
247,301
FISHING LURE RETRIEVER
Clemens A. Ostoski, 11600 Norgate, Bellefontaine Neighbors, Mo. 63138
Filed June 21, 1976, Ser. No. 697,776
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—31



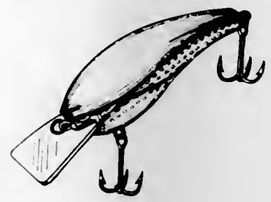
247,302
COMBINED HAND SPRAYER AND BOTTLE
Joseph Benedict Federico, Sarasota; Walter Herbert Wesner, Fort Lauderdale, and John Richard Cary, Miami Lakes, all of Fla., assignors to The AFA Corporation, Miami Lakes, Fla.
Continuation-in-part of Ser. No. 657,809, Feb. 13, 1976. This application Aug. 2, 1976, Ser. No. 710,757
The portion of the term of this patent subsequent to Jan. 25, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—18



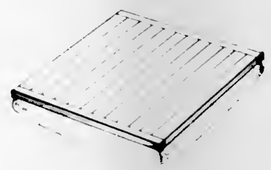
247,303
GUTTER CLEANER
Desmond James Boyd, 4 Livingstone Court, Mount Eliza 3930 Victoria, Australia
Filed Apr. 16, 1976, Ser. No. 677,635
Claims priority, application Australia, Sept. 29, 1975, 3352/75
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—34



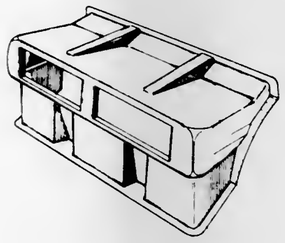
247,304
CRANK BAIT FISHING LURE
Kenneth M. Pruitt, 206 S. Pink St., Cherryville, N.C. 28201, and William O. Williams, Jr., 1309 Lynhurst Drive, Gastonia, N.C. 28052
Filed Nov. 22, 1976, Ser. No. 743,687
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—28



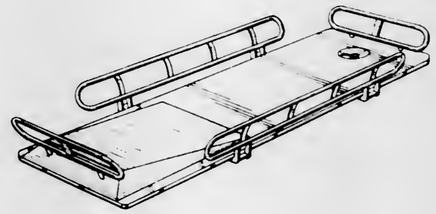
247,305
SOLAR HEATER
Normand Lysons Baxter, Lugarno, and Paul Frederick Norrie, Waitara, both of Australia, assignors to Bax Products Pty. Limited, Rockdale, Australia
Filed Dec. 31, 1975, Ser. No. 645,544
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—127



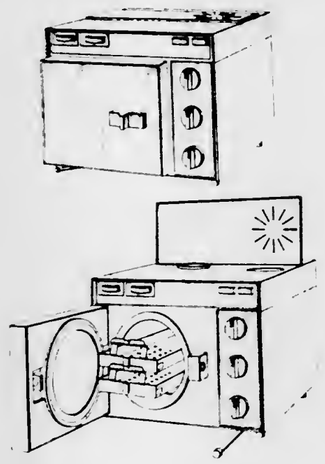
247,306
AIR CONDITIONER HOUSING
Robert S. Magee, 3410 Tanglewilde, Houston, Tex. 77063
Filed July 23, 1976, Ser. No. 708,207
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—142



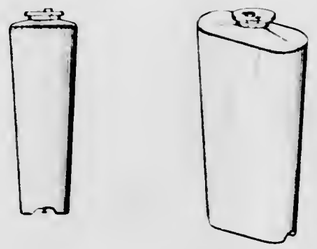
247,307
TABLE PLATE FOR PATIENT SUPPORTING TABLE
Hans Arne Valentin Johansson, Treharadsvagen 36, S-241 00 Eslov, Sweden
Filed Jan. 15, 1976, Ser. No. 649,532
Claims priority, application Sweden, Nov. 3, 1975, 752173
Term of patent 14 years
Int. Cl. D24—*01;* D6—*01*
U.S. Cl. D24—3



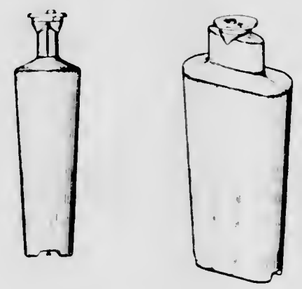
247,308
AUTOCLAVE
Danny M. Truette, Pineville, N.C., assignor to The Pelton & Crane Company
Filed Mar. 22, 1976, Ser. No. 668,995
Term of patent 14 years
Int. Cl. D24—*01;* D23—*04*
U.S. Cl. D24—9



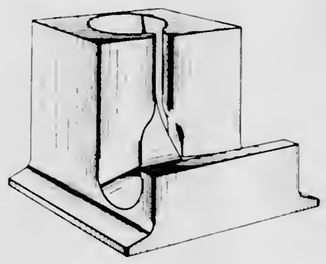
247,309
PLASTIC CONTAINER FOR STERILE LIQUID COLLECTION
Albert Safianoff, Rancho Palos Verdes, Calif., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Aug. 3, 1976, Ser. No. 711,327
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—56



247,310
PLASTIC CONTAINER FOR STERILE LIQUID COLLECTION
Albert Safianoff, Rancho Palos Verdes, Calif., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Aug. 3, 1976, Ser. No. 711,328
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—56



247,311
ARM ELEVATION PILLOW
Peter R. Carter, 3504 Lindenwood, Dallas, Tex. 75205
Filed June 4, 1976, Ser. No. 692,843
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—64



247,312
HEAD REST FOR A BACK MASSAGING CUSHION
Ernest R. Zeiss, Lombard, Ill., assignor to Associated Mills, Inc., Chicago, Ill.
Filed July 19, 1976, Ser. No. 706,194
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—64



247,313
FACING PANEL FOR FACADES OR THE LIKE
Edward C. Hallock, Summit, and Michael Polifka, Spotswood, both of N.J., assignors to Construction Specialties, Inc., Cranford, N.J.
Filed Mar. 19, 1976, Ser. No. 668,602
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—87



247,314
FLOOR TILE
Stanley King, New York, N.Y., assignor to Dunlop Limited, London, England
Filed May 11, 1976, Ser. No. 685,292
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—80

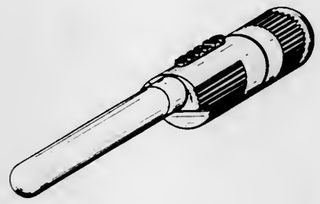
247,315
TABLE LIGHTER BASE
Joseph R. DiMatteo, Billerica, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Aug. 23, 1976, Ser. No. 716,782
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—39



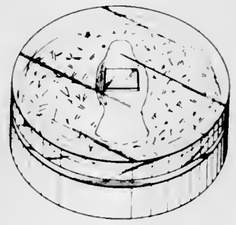
247,316
TABLE LIGHTER HOUSING
Thomas T. Beeson, Fairfield, and Salvatore A. La Monica, Derby, both of Conn., assignors to Bic Pen Corporation, Milford, Conn.
Filed Dec. 6, 1976, Ser. No. 748,106
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—39



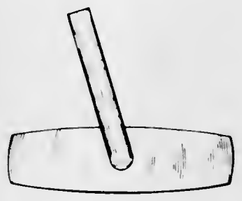
247,317
COSMETIC APPLICATOR
Jean Mantelet, 46-48, avenue Montaigne, 75008 - Paris, France
Filed July 26, 1976, Ser. No. 708,768
Claims priority, application France, Apr. 5, 1976, 74 701
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—7



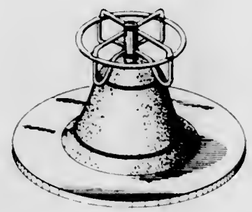
247,318
BIRD COFFIN
Helen M. Bennett, 744 Pine Tree Road, Pittsburgh, Pa. 15243
Filed Mar. 22, 1976, Ser. No. 668,819
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D31—1



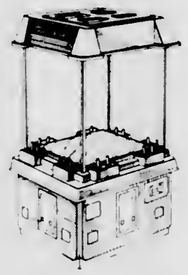
247,319
GOLF PUTTER HEAD
Samuel J. Barr, 500 N. Washington Ave., Titusville, Fla. 32780
Filed June 18, 1976, Ser. No. 697,340
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH



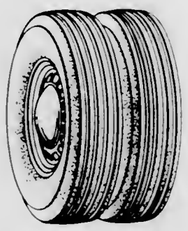
247,320
PLAYGROUND ROUNDABOUT
Ronald W. Zick, Minneapolis, Minn., assignor to Game Time, Inc., Litchfield, Mich.
Filed July 26, 1976, Ser. No. 709,110
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 G



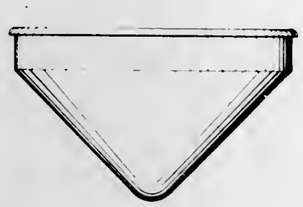
247,321
GAME CABINET
David M. Cook, San Jose, Calif., assignor to Atari, Inc., Sunnyvale, Calif.
Filed July 29, 1976, Ser. No. 709,882
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 J



247,322
RETURN TOP
Robert C. Burroughs, 408 W. Deer Park Road, Gaithersburg, Md. 20760, assignor to Robert C. Burroughs
Filed Nov. 3, 1975, Ser. No. 628,550
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 BB



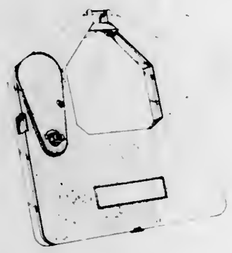
247,323
ROCKING TOY
Carl Risberg, 160 Hampshire, Beaconsfield, Quebec, Canada
Filed July 30, 1975, Ser. No. 600,451
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AE



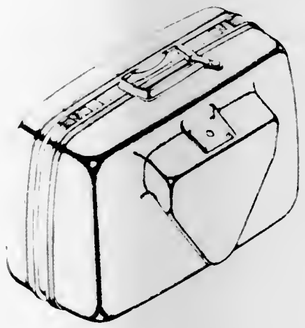
247,324
COMBINED FLASHLIGHT ALARM AND DEFENSIVE ELECTRIC PROD
John L. Bugler, 401 E. 105th Terrace, Kansas City, Mo. 64131
Filed Aug. 27, 1976, Ser. No. 718,391
Term of patent 14 years
Int. Cl. D26—*02;* D10—*05;* D22—*02*
U.S. Cl. D48—24 A



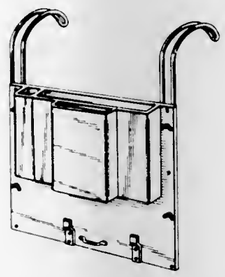
247,325
RIBBON CARTRIDGE
Richard D. Trezise, San Jose, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed June 28, 1976, Ser. No. 700,416
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11A



247,326
DETACHABLE LUGGAGE CASE FOR A MOTORCYCLE
John A. Warren, Jr., Yorba Linda, Calif., assignor to Dan Gurney Cycle Products, Santa Ana, Calif.
Filed May 17, 1976, Ser. No. 687,371
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—5 F



247,327
COMBINED ORGANIZER FILE AND STORAGE UNIT FOR A VEHICLE SEAT
Charles W. Tracy, Tallahassee, Fla., assignor to Sargent-Sowell, Inc., Grand Prairie, Tex.
Division of Ser. No. 476,003, June 3, 1974, Pat. No. 243,974.
This application Dec. 13, 1976, Ser. No. 750,085
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1 R



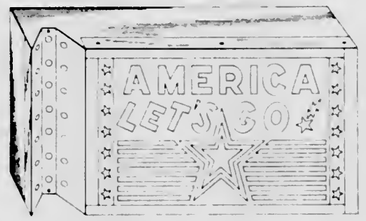
247,328
INFLATABLE UMBRELLA
Yutaka Yoshida, 1941-8 Manazaru, Manazurucho, Ashigarashimo, Kanagawa, Japan
Filed Nov. 24, 1975, Ser. No. 634,511
Term of patent 14 years
Int. Cl. D3—*03*
U.S. Cl. D88—3 R



247,329
INFLATABLE UMBRELLA
Yutaka Yoshida, 1941-8, Manazuru, Manazurucho, Ashigarashimo, Kanagawa, Japan
Filed Apr. 8, 1976, Ser. No. 675,193
Term of patent 14 years
Int. Cl. D3—*03*
U.S. Cl. D88—3 R



247,330
ILLUMINATED SIGN
Ralph Kutschmende, 395 Manhattan Ave., Brooklyn, N.Y. 11211
Filed Mar. 26, 1975, Ser. No. 562,199
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 R



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 21ST DAY OF FEBRUARY, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aadahl, Frank P., to Heinemann Electric Company. Circuit breaker arc venting screen. 4,075,446, Cl. 200-144.00R.

AB Akerlund & Rausing: *See—*
Davidsson, Sven; Christensson, Nils Bertil; and Axelsson, Per Hugo, 4,074,849, Cl. 229-1.50B.

AB Bahco Verktyg: *See—*
Jansson, Conny Erik, 4,074,597, Cl. 81-417.000.

AB Svenska Flaktfabriken: *See—*
de Feudis, Sergio, 4,074,921, Cl. 302-39.000.

Abdulla, Riaz F., to Eli Lilly and Company. Herbicidal use of 4-amino-3,3-dimethyl-1-phenyl-2-azetidinones. 4,075,000, Cl. 71-88.000.

Abe, Takeshi, to Ricoh Co., Ltd. System for collecting data from meters placed at remote places. 4,075,607, Cl. 340-152.00R.

Abe, Tetsuo: *See—*
Hashimoto, Hiroshi; Abe, Tetsuo; and Kato, Akira, 4,074,425, Cl. 29-813.000.

Abell, Donald E.: *See—*
Seedorf, Jack H.; Hruda, Robert M.; and Abell, Donald E., 4,075,448, Cl. 200-262.000.

ACF Industries, Incorporated: *See—*
Hicks, Paul E., Jr.; and Hammonds, James C., 4,074,633, Cl. 105-368.00B.
Krug, John A., 4,074,577, Cl. 73-421.00B.
Lewis, Irwin M., 4,074,702, Cl. 137-625.660.

Ackerman, Roger G.; and Karstetter, Bruce R., to Corning Glass Works. Potassium ion-exchange on surface of beta-spodumene. 4,074,993, Cl. 65-30.00E.

Acoustical Floors, Inc.: *See—*
Jorgenson, Clyde R.; DeBoer, Harold M.; and Jorgenson, Ronald M., 4,075,374, Cl. 427-355.000.

Adams, Charles E.; Quackenbush, Harold E.; Harrer, Paul H.; Langford, Le Roy; and Cleek, Alvin L., to Allis-Chalmers Corporation. Compressed air seed planter. 4,074,830, Cl. 221-266.000.

Adams & Coltrin, Inc.: *See—*
Coltrin, George E., 4,074,893, Cl. 256-21.000.

Adams, Franklin Montague, to Price International, Inc. Masking tape applicator for pipe. 4,075,053, Cl. 156-391.000.

Adams, Stanley B.; Carbaugh, Frederick A.; and Cryder, John R., to Caterpillar Tractor Co. Pre-adjusted control module for construction vehicles. 4,074,690, Cl. 137-344.000.

Addressograph-Multigraph Corporation: *See—*
Bradbury, Wilburn F., 4,074,902, Cl. 271-34.000.

Adler, David George, to Sperry Rand Corporation. Linear actuator. 4,075,517, Cl. 310-13.000.

Aerpat A.G.: *See—*
Summerlin, Frederick Arthur, 4,074,554, Cl. 72-114.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
Relyveld, Edgar Hans, 4,075,321, Cl. 424-92.000.

Agency of Industrial Science & Technology: *See—*
Okayama, Shigeo; and Kawakatsu, Hisazo, 4,075,488, Cl. 250-396.00R.
Yabe, Akira, 4,075,074, Cl. 204-158.00R.

AGFA-Gevaert Aktiengesellschaft: *See—*
Saleck, Wilhelm; and von Rintelen, Harald, 4,075,020, Cl. 96-94.00R.

AGFA-GEVAERT N.V.: *See—*
Priem, Jan Josef; and De Winter, Walter Frans, 4,075,023, Cl. 96-114.000.

Ainis, Herman; Lange, Charles F.; Mark, Abraham S.; and Scherr, George H., to Technical Research Affiliates, Inc. Detection of antigens by anti-body sensitized microbial particles. 4,075,315, Cl. 424-12.000.

Air Products and Chemicals, Inc.: *See—*
Doelp, Louis C.; Friedman, Lee; and Mitchell, Maurice M., 4,075,082, Cl. 208-10.000.

Airco, Inc.: *See—*
Bradshaw, Elmo F.; and Rakszawski, John F., 4,075,524, Cl. 310-249.000.

Aisin Seiki Kabushiki Kaisha: *See—*
Kondo, Toshio; Ishikawa, Masakazu; Katagiri, Masayoshi; and Kizaki, Jiro, 4,074,795, Cl. 188-73.300.

Aitchison, Lindsay Matthew; Sparks, Kenneth Arnold; and Schuster, Earl Eugene, to Monobond Australia Pty. Limited. Covering floors with strippable carpet. 4,075,377, Cl. 428-95.000.

Akerley, Arnold J.: *See—*
Smits, Donald M.; Daley, Patrick J.; and Akerley, Arnold J., 4,074,721, Cl. 128-461.000.

Akiyama, Shinichi; and Yamamoto, Haruhisa, to Nippon Zeon Co. Ltd. Process for preparing methacrylic acid. 4,075,244, Cl. 260-530.00N.

Aktiebolaget Tudor: *See—*
Borjesson, Anders; and Rehnberg, Tore, 4,074,422, Cl. 29-730.000.

Alarm Device Manufacturing, Co.: *See—*
Verger, Nathan; and Schmidt, Gerhard, 4,075,588, Cl. 335-207.000.

Alcan Research and Development Limited: *See—*
Bhilotra, Kaloo Raj Kumar, 4,075,067, Cl. 204-67.000.

Alexeeva, Ljubov Antonovna: *See—*
Ponomarev, Alexei Ivanovich; Sokolov, Sergei Vasilievich; Larionova, Julia Alexeevna; Rymareva, Tatyana Ivanovna; Klebansky, Alexandr Leibovich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; and Alexeeva, Ljubov Antonovna, 4,075,168, Cl. 260-46.50R.
Ponomarev, Alexei Ivanovich; Larionova, Julia Alexeevna; Ankudinov, Anatoly Kirillovich; Ryazanova, Rufina Mikhailovna; Klebansky, Alexandr Leibovich; Sokolov, Sergei Vasilievich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Rymareva, Tatyana Ivanovna; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Karlin, Alexandr Vasilievich; and Lobkov, Vasily Danilovich, 4,075,170, Cl. 260-46.50G.

Alfieri, Romeo. Index cover for knock-out punch. 4,074,432, Cl. 30-360.000.

Allan, David E.: *See—*
Caulk, Robert H.; and Allan, David E., 4,075,258, Cl. 260-683.440.

Allen, Alvin, to Du Pont de Nemours, E. I., and Company. TiO_2 Pigment coated with dense silica and porous alumina/silica. 4,075,031, Cl. 106-300.000.

Allen, Frederick G., to Wood Industries, Inc. Paper web perforating machine. 4,074,599, Cl. 83-346.000.

Allied Chemical Corporation: *See—*
Li, Hsin Lang; Oswald, Hendrikus Johan; and Liland, Alfred Louis, 4,074,405, Cl. 28-257.000.
Lofquist, Robert Alden; and Haylock, John Christopher, 4,075,271, Cl. 264-210.00F.
Port, Eugene Baker; and Garofano, Norman Rutledge, 4,075,281, Cl. 423-206.00T.
Woolf, Cyril, deceased; Mares, Frank; and Oxenrider, Bryce C., 4,075,410, Cl. 560-87.000.

Allis-Chalmers Corporation: *See—*
Adams, Charles E.; Quackenbush, Harold E.; Harrer, Paul H.; Langford, Le Roy; and Cleek, Alvin L., 4,074,830, Cl. 221-266.000.

Alloy Metals, Inc.: *See—*
Stern, Marvin J., 4,075,009, Cl. 75-170.000.

Allura Corporation: *See—*
Schmidt, Frederick O. G., 4,074,543, Cl. 66-193.000.

Alphen, Jacques Marius. Lighting systems for motor cycles. 4,075,469, Cl. 362-72.000.

Alton Box Board Company: *See—*
Wilkinson, Robert M., 4,075,372, Cl. 427-258.000.

Altshuler, John Henry: *See—*
Braun, Walter Jacob; Altshuler, John Henry; and Cherry, Peter Whitfield, 4,074,971, Cl. 23-230.00B.

Altstadter Verpackunga-Vertriebs GmbH: *See—*
Reil, Wilhelm, 4,074,961, Cl. 425-112.000.

Aluotto, Patrick F.: *See—*
Rhum, David; and Aluotto, Patrick F., 4,075,242, Cl. 560-190.000.

Alves, Ronald: *See—*
Wickersheim, Kenneth A., 4,075,493, Cl. 250-461.00R.

Ambrose, Richard J.; and Hayes, Robert A., to Firestone Tire & Rubber Company, The. Graft copolymers of polybutadiene and substituted polyacrylate. 4,075,186, Cl. 260-887.000.

American Cyanamid Company: *See—*
Capozza, Richard Carl, 4,074,366, Cl. 3-1.000.
Capozza, Richard Carl, 4,074,713, Cl. 128-92.00C.
Gastrock, William Henry; and Asato, Goro, 4,075,228, Cl. 260-332.30P.
Knapp, Paul William, Jr., 4,075,348, Cl. 424-300.000.

American Defibrator, Inc.: *See—*
Kollberg, Ture Eric, 4,074,803, Cl. 198-670.000.

American Gas Association: *See—*
Pangborn, Jon B.; Sharer, John C.; and Elkins, Robert H., 4,075,313, Cl. 423-658.000.

American Hoist & Derrick Company: *See—*
Garrett, Charles Ronald, 4,074,519, Cl. 59-95.000.

American Home Products Corporation: *See—*
Sarantakis, Dimitrios, 4,075,190, Cl. 260-112.50R.

American Hospital Supply Corporation: *See—*
Nielsen, Milton R.; and Olsen, Robert A., 4,074,434, Cl. 32-27.000.

American Induction Heating Corporation: *See—*
Lavins, Paul N., Jr., 4,075,450, Cl. 219-10.710.

American Monitor Corporation: *See—*
Denney, Jerry W., 4,074,972, Cl. 23-230.00B.
American Optical Corporation: *See—*
Cavigelli, George A., 4,075,572, Cl. 330-10.000.
Link, William Trevor; Rugge, Henry Ferdinand; and Jansen, William David, 4,074,711, Cl. 128-2.05A.
American Technical Ceramics, division of Phase Industries Inc.: *See—*
Seaman, Harry V., 4,075,556, Cl. 324-60.00C.
American Thermostat Corporation: *See—*
Levinn, Robert N., 4,075,678, Cl. 361-104.000.
Amosov, Vladimir Alexandrovich; Guschin, Alexandr Evgenievich; Efremov, Jury Nikolaevich; and Smirnov, Rudolf Evgenievich. Composition for treating cellulose-containing fibrous materials and method of producing composition for treating cellulose-containing materials. 4,075,028, Cl. 106-186.000.
AMP Incorporated: *See—*
Krider, Paul Robert, 4,074,929, Cl. 339-97.00R.
Ampex Corporation: *See—*
Beaulier, Daniel A., 4,075,656, Cl. 358-13.000.
Lomax, John A.; and Martin, William J., 4,075,666, Cl. 360-11.000.
Anas, Johan Olof: *See—*
Ghisler, Walter; Marlevi, Aleksander; and Anas, Johan Olof, 4,075,428, Cl. 179-15.0BS.
Anchor Hocking Corporation: *See—*
Shank, Herbert C., Jr., 4,075,363, Cl. 427-27.000.
Anchortank, Inc.: *See—*
McFatter, Myron L., 4,074,847, Cl. 228-145.000.
Anderka, Gerold; and Kuparinen, Lasse, to Koh-I-Noor Rapidograph, Inc. Process for the production of lettering or symbol templates. 4,074,414, Cl. 29-509.000.
Andersen, Deborah M.: *See—*
Dyckman, Edward J.; Andersen, Deborah M.; and Fischer, Eugene C., 4,075,319, Cl. 424-78.000.
Anderson, David G., to Miner Enterprises, Inc. Telescopic draft gear. 4,074,813, Cl. 213-24.000.
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Anderson, John H. Flower pot support holder. 4,074,882, Cl. 248-208.000.
Anderson, Margaret. Combination pocketbook and cushion. 4,074,740, Cl. 150-35.000.
Anderson, Richard M.; Caviness, Alton L.; Menikheim, Virginia C.; and Silverman, Bernard, to Monsanto Company. Method of pattern bonding a nonwoven web. 4,075,383, Cl. 428-198.000.
Anderson, Weston A., to Varian Associates, Inc. Reconstruction system and method for ultrasonic imaging. 4,074,564, Cl. 73-596.000.
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Anglada, Leonard R.: *See—*
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Anthony, Thomas R.; and Cline, Harvey E., to General Electric Company. Deep diode devices and method and apparatus. 4,075,038, Cl. 148-1.500.
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Antoszewski, Alex Joseph, to Leigh Products, Inc. Pivoted locking wall bracket. 4,074,884, Cl. 248-289.00R.
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Cailliot, Serge Leon Louis, 4,074,621, Cl. 99-286.000.
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Aoki, Ren; Fujiwara, Mitsugu; and Wada, Tasaku, to Yamura Shinko Seisakusho Co., Ltd. Facsimile scanning device. 4,075,664, Cl. 358-286.000.
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Jablonski, Edward R., 4,074,941, Cl. 403-260.000.
Applied Power Inc.: *See—*
Miller, Douglas P., 4,074,612, Cl. 91-290.000.
Arato, Paul; Leikes, Antony; and Reid, Larry Ronald, to Centaur Floor Machines Ltd. Vacuum cleaner attachment. 4,074,387, Cl. 15-322.000.
Archer, John S., to TRW Inc. Compliant mesh structure and method of making same. 4,074,731, Cl. 140-112.000.
Archer, Robert A.; and Day, William A., to Eli Lilly and Company. Preparation of optically active trans-hexahydrodibenzopyranones. 4,075,230, Cl. 260-345.300.
Arcidiacono, Agostino. Swimming workout suit. 4,074,904, Cl. 272-116.000.
Ardito, Gerald J., to Deena Packaging Industries, Inc. Tablet dispensing container. 4,074,806, Cl. 206-531.000.
Arduser, Dell H. Forced aerating means for inboard live wells. 4,074,651, Cl. 114-255.000.
Arkla Industries, Inc.: *See—*
Dailey, Donald E., 4,074,675, Cl. 126-41.00R.
Armco Steel Corporation: *See—*
Siebol, George, 4,074,608, Cl. 85-71.000.
Warren, Daniel E.; and Taylor, Donald M., 4,074,789, Cl. 182-37.000.
Armistead, William H., to Corning Glass Works. Colored glasses and method. 4,075,024, Cl. 106-53.000.
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Armstrong Cork Company: *See—*
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Arndt, Kenneth E.; Otto, Lonnie E., Jr.; and Siekmeier, David A., to Lindsay Manufacturing Company. Water drive system for a center pivot irrigation unit or the like. 4,074,783, Cl. 180-14.00R.
Arnon, Ruth: *See—*
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Asada, Yoshiharu: *See—*
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Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
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Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
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Asai, Shin-Ichiro: *See—*
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Hishida, Yukio; Watanabe, Tomoyoshi; Hirayama, Takanobu; and Asakura, Hideo, 4,074,799, Cl. 197-151.000.
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Frisch, Kurt Charles; and Russell, Donald Henry, 4,075,181, Cl. 260-77.50B.
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Atomic Energy of Canada Limited: *See—*
Pauluis, Gerard J. C. A., 4,074,974, Cl. 23-270.00R.
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Curry, Harold George; Attwood, Brian William; and White, Derek Graham Walter, 4,074,959, Cl. 425-81.100.
Hicklin, Denis Raymond; and Attwood, Brian William, 4,074,393, Cl. 19-303.000.

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Johnston, James J., 4,074,928, Cl. 339-91.00R.
Automation Industries, Inc.: *See—*
Ball, David J., 4,074,927, Cl. 339-89.00M.
Automobiles Peugeot: *See—*
Le Salver, Robert, 4,074,525, Cl. 60-322.000.
Autophon Aktiengesellschaft: *See—*
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Avery, Bennett W., to Caterpillar Tractor Co. Orbiting motor gear drive. 4,074,615, Cl. 91-490.000.
Avrus, Albert Vladimirovich: *See—*
Glikman, Mark Leonovich; Sapunar, Zakhar Isaevich; Avrus, Albert Vladimirovich; Gorokhovsky, Vladilen Alexandrovich; Fainberg, Evgeny Borisovich; Ivanov, Vladimir Alexandrovich; Shirkevich, Tatyana Leonidovna; and Sizov, Vadim Mikhailovich, 4,074,994, Cl. 65-44.000.
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Ayeah, Mark G. Reading bed. 4,074,374, Cl. 5-327.00R.
B. F. Goodrich Company, The: *See—*
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Bach, Nicholas J.; and Kornfeld, Edmund C., to Eli Lilly and Company. Method of preparing 8,8-disubstituted-6-methylergolines and related compounds. 4,075,212, Cl. 260-285.500.
Bach, Nicholas J.: *See—*
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Bacakai, Robert, to Chevron Research Company. Process for the preparation of a catalyst containing pyrrolidone composition. 4,075,182, Cl. 260-78.00P.
Bader, Hartmann; and Bolleter, Ulrich, to Sulzer Brothers, Ltd. Cover for a weaving machine. 4,074,725, Cl. 139-1.00R.
Badertscher, Ernest; and Chaveron, Michel, to Societe d'Assistance Technique pour Produits Nestle S.A. Production of casein and caseinates. 4,075,196, Cl. 260-120.000.
Baer, Adrian D.; and Donovan, Terence M., to United States of America, Navy. Anti-reflective coating for high energy optical components. 4,075,385, Cl. 428-215.000.
Baikie, Hugh E., to Kenbudge Holdings Limited. Ice skate. 4,074,909, Cl. 280-11.120.
Baker, Henry Louis, to Communications Patents Limited. Automatic page selectors. 4,075,422, Cl. 178-23.00R.
Bakke, Even, to United States Filter Corporation. Wet electrostatic precipitators. 4,074,983, Cl. 55-118.000.
Balding, John V.: *See—*
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Baldwin, Howard A.; Depp, Steven W.; Koelle, Alfred R.; and Freyman, Robert W., to United States of America, Energy. Interrogation, and detection system. 4,075,632, Cl. 343-6.80R.
Ball, David J., to Automation Industries, Inc. Electrical connector with insert member retaining means. 4,074,927, Cl. 339-89.00M.
Balz, Gunther W., to Roto-Finish Company. Improved finishing method. 4,074,472, Cl. 51-313.000.
Bandag Incorporated: *See—*
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Barber, Alfred William. Regulated power supply with combined series and shunt regulating transistors. 4,075,546, Cl. 323-22.00T.
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Scheuermann, Horst; and Hettche, Albert, 4,075,211, Cl. 260-270.00H.
Bashkovich, Alexandr Pavlovich; Zimnukhova, Evgenia Semenovna; Prokopovich, Agnessa Vladimirovna; Polatovskaya, Olga Grigorievna; Pronina, Maria Ivanovna; Kulbakh, Valter Osvaldovich; Rivkina-Pevtsova, Khasya Ionovna; and Grinberg, Grigory Efimovich. Enzyme composition. 4,075,322, Cl. 424-94.000.
Basler Electric Company: *See—*
Gnaedinger, Donald J., 4,075,504, Cl. 307-66.000.
Bates Printing Specialties, Inc.: *See—*
Stipek, Charles J., Jr., 4,074,911, Cl. 283-6.000.
Battelle Memorial Institute: *See—*
Genequand, Pierre; and Joyeux, Didier, 4,075,535, Cl. 313-422.000.
Battle, Francis L., to Gulf & Western Industries, Inc. Digital loop detector with improved detection control. 4,075,563, Cl. 324-236.000.
Bauer, James J., to Clark Equipment Company. Hydraulic system of a skid steer loader. 4,074,782, Cl. 180-6.480.
Baum, Kurt; and Grakauskas, Vytautas, to United States of America, Air Force. 1,3-Bis(2,2,2-fluorodinitroethoxy)-2,2-bis(difluoramino) propane. 4,075,246, Cl. 260-584.00C.
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Kuhle, Engelbert; Klauke, Erich; and Eue, Ludwig, 4,075,235, Cl. 260-453.0RW.
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Paulus, Wilfried; and Rullmann, Karl-Heinz, 4,075,245, Cl. 260-561.0HL.
Schmidt, Manfred; Freitag, Dieter; and Nouvertne, Werner, 4,075,119, Cl. 252-182.000.
Vopel, Karl Heinz; Hellrung, Friedrich; and Berendes, Otto, 4,075,292, Cl. 260-986.000.
Beals, Charles E., to Caterpillar Tractor Co. Valving for dual radial piston motor. 4,074,614, Cl. 91-490.000.
Beane, David J.; and Kaplan, Ronald M., to United Technologies Corporation. Forging method. 4,074,559, Cl. 72-354.000.
Beaulier, Daniel A., to Ampex Corporation. Circuit for digitally encoding an analog television signal. 4,075,656, Cl. 358-13.000.
Beaver, John R.; and Kozlowski, George J., to Rudolph Beaver, Inc. Surgical knife assembly, surgical blade, and method of manufacture thereof. 4,074,431, Cl. 30-353.000.
Bechtel, Alfred R., Jr., to Ashworth Bros., Inc. Card clothing clipped top and a method of manufacturing therefor. 4,074,392, Cl. 19-113.000.
Beck, James Richard; and Gajewski, Robert Peter, to Eli Lilly and Company. Novel herbicidal method utilizing 1,4-diphenyl-3-pyrazolin-5-ones. 4,075,003, Cl. 71-92.000.
Beck, Willi K., to King-Seely Thermos Co. Rotatable shaft positioning means. 4,075,593, Cl. 337-312.000.
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Horrocks, Donald L., 4,075,480, Cl. 250-328.000.
Peart, Leslie Thomas, 4,075,597, Cl. 338-128.000.
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Geiger, Kenneth E., 4,074,715, Cl. 128-218.00P.
North, Howard L., Jr., 4,074,562, Cl. 73-32.00A.
Beddell, Christopher Raymond; Lowe, Lawrence Alfred; and Wilkinson, Samuel, to Burroughs Wellcome Co. Biologically active amides. 4,075,191, Cl. 260-112.5LH.
Beesley, John Harold: *See—*
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Beghin, Marcel, to Fives-Cail Babcock. Internally cooled roll. 4,074,750, Cl. 165-89.000.
Behn, Frederick H., to Construction Innovations, Inc. Reinforcing bar aligner and clamp. 4,074,897, Cl. 269-43.000.
Behrends, Bertwin E.: *See—*
Hoehn, Richard F.; Morris, Hugh C.; Therkildsen, Henry T.; and Behrends, Bertwin E., 4,074,796, Cl. 192-3.570.
Beilman, John L.; and Deazley, William R., to Calspan Corporation. Fluid speed measuring apparatus. 4,074,570, Cl. 73-182.000.
Bell, Graham Elsworth; and Winters, Alden Bernard, to Boeing Company, The. Clip shock mount. 4,074,491, Cl. 52-394.000.
Bell & Howell Company: *See—*
Flint, John R., 4,074,853, Cl. 235-477.000.
Bell, Malcolm R.: *See—*
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Sequin, Carlo Heinrich, 4,075,514, Cl. 307-355.000.
Bellasio, Elvio; and Cristiani, Franco, to Gruppo Lepetit S.p.A. 2-(Aryl)-3-(dimethylamino)butyl-3,4,5-trimethoxybenzoates. 4,075,241, Cl. 560-73.000.
Belleview, Inc.: *See—*
Stauble, Alfred G., 4,074,635, Cl. 108-27.000.
Bellhouse, Brian John, to National Research Development Corporation. Method for effecting heat or mass transfer. 4,075,091, Cl. 210-19.000.
Bellinder, Alex J. Knockdown lighting boxes and means for clamping the front panels thereof. 4,074,452, Cl. 40-571.000.
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Bengtsson, Ulf. Nibbling tool. 4,074,603, Cl. 83-596.000.

Benner, Reimund: *See*—
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Bennett, Ronald: *See*—
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Bentley, Stanley L., to Ransburg Corporation. Electrostatic coating system. 4,075,677, Cl. 361-93.000.

Berberich, Joseph P.: *See*—
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Berenblit, Vsevolod Volfovich: *See*—
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Berg, Allan C.; Fitzpatrick, John W.; and Jones, Lewis O., to Xerox Corporation. Production of ferrite electrostatographic carrier materials having improved properties. 4,075,391, Cl. 428-407.000.

Berger, Michael A., to Xerox Corporation. Encoded print wheel system. 4,074,798, Cl. 197-53.000.

Bergman, Gustav Ruben: *See*—
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Bergman, Mark Otho; and Rentmeester, Paul Clement, to Trane Company, The. Temperature and failure indicating probe for a bearing. 4,074,575, Cl. 73-344.000.

Berkin, Harvey: *See*—
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Berkling, Klaus, to Gesellschaft fur Mathematik und Datenverarbeitung mbH Bonn. Computer employing reduction language. 4,075,689, Cl. 364-200.000.

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Berstermann, Wilhelm: *See*—
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Bertrand, Marcel J.: *See*—
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Besozzi, Alfio J.: *See*—
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Bethell, Michael R.: *See*—
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Beyers, Joseph W.: *See*—
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Bhilotra, Kaloo Raj Kumar, to Alcan Research and Development Limited. Production of aluminium. 4,075,067, Cl. 204-67.000.

Bickford, Gardner Lloyd, to Vickery, James R. Tripod assembly. 4,074,881, Cl. 248-188.700.

Biesel, John W. Drain system for protecting buildings against flooding and method. 4,074,684, Cl. 137-1.000.

Bills, Kenneth W., Jr.: *See*—
Briar, Herman P.; and Bills, Kenneth W., Jr., 4,074,563, Cl. 73-35.000.

Bilow, Norman; and Gardos, Michael N., to Hughes Aircraft Company. Heavy metal chalcogenide-polyimide lubricative composites. 4,075,111, Cl. 252-12.000.

Binard, William J.; Ciarico, Anthony J.; Anglada, Leonard R.; and Patel, Bhupendra C., to Kendall Company, The. Syringe assembly. 4,074,714, Cl. 128-218.00P.

Biornstad, Peter; and Dolenc, Anton, to Escher Wyss Limited. Method of adjusting the contact pressure of a rolling mill and apparatus for the performance thereof. 4,074,624, Cl. 100-35.000.

Birchall, Donald Jack. Piezoelectric accelerometer transducer. 4,075,525, Cl. 310-329.000.

Bird Electronic Corporation: *See*—
Mecklenberg, Frank Howard, 4,075,554, Cl. 324-58.00B.

Bisutti, Guy. Concrete pile coupling device. 4,074,500, Cl. 52-726.000.

Blair, James M.; Sebring, Michael; Underwood, Warren H.; and Bley, William P., to Armour and Company. Poultry carcass-treating apparatus. 4,074,389, Cl. 17-11.000.

Blalock, Eugene D. Settling tank sludge collector. 4,075,109, Cl. 210-527.000.

Blasnik, William; and Halpert, David, to Lerner Manufacturing, Inc. Garment hanger construction. 4,074,838, Cl. 223-85.000.

Blaupunkt-Werke GmbH: *See*—
Haas, Dieter, 4,075,591, Cl. 336-200.000.

Blay, Alan George, to EMI Limited. Information display arrangements. 4,075,700, Cl. 364-515.000.

Bley, William P.: *See*—
Blair, James M.; Sebring, Michael; Underwood, Warren H.; and Bley, William P., 4,074,389, Cl. 17-11.000.

Blokker, Eduard Johannes Cornelis Marie: *See*—
Schelhaas, Ealbertus Willem; and Blokker, Eduard Johannes Cornelis Marie, 4,075,143, Cl. 260-17.200.

Bloxham, Gordon Foreman; Brezeale, Claude Paren; Cocco, Eugene Raymond; Hardesty, Edwin Charles; Small, Byron Lee; Steinert, Daniel Marion; and McGonigal, Charles, to Western Electric Company, Inc. Method of making retractile cords. 4,075,299, Cl. 264-25.000.

Bodewes, Hermanus J. A., to Rapistan Incorporated. Installation equipment with a driving mechanism. 4,074,805, Cl. 198-790.000.

Bodnar, Ernest Robert. Sheet metal panel. 4,074,495, Cl. 52-613.000.

Boeing Company, The: *See*—
Bell, Graham Elsworth; and Winters, Alden Bernard, 4,074,491, Cl. 52-394.000.

Bolick, Fred C., Jr.; Titus, Theodore, IV; and Mohammadioun, Said, to Lanier Electronic Laboratory, Inc. Cassette central dictation system. 4,075,436, Cl. 179-100.1DR.

Bolleter, Ulrich: *See*—
Bader, Hartmann; and Bolleter, Ulrich, 4,074,725, Cl. 139-1.00R.

Boltinghouse, Joseph C.; and Atkinson, James L., to Rockwell International Corporation. Electrostatic pickoff system for ball gyros of the electrostatic levitation type. 4,074,580, Cl. 74-5.60D.

Bolton, Frank H., deceased: *See*—
Morehouse, Donald S., Jr.; Bolton, Frank H., deceased; and Bolton, Kathryn M., administratrix, 4,075,134, Cl. 260-29.6RW.

Bolton, Kathryn M., administratrix: *See*—
Morehouse, Donald S., Jr.; Bolton, Frank H., deceased; and Bolton, Kathryn M., administratrix, 4,075,134, Cl. 260-29.6RW.

Bond, Charles Stephen. Music magic circular calculator. 4,074,607, Cl. 84-471.0SR.

Bond, Helen Inez. Contoured security pillow. 4,074,376, Cl. 5-338.000.

Bonnet, Jean-Claude; and Teason, Gerard, to Manufacture de Produits Chimiques Protex. Thermally hardenable cationic resin from dicarboxylic acid, dialkanolamine and polyamine copolymer condensed with epichlorohydrin. 4,075,177, Cl. 260-75.00T.

Bonny Products, Inc.: *See*—
Steiner, Fred S.; and Cousins, Morison S., 4,075,105, Cl. 210-477.000.

Boodman, Norman S.; and Walter, Jack W., to United States Steel Corporation. Hydrogenation of alkylstyrene to produce alkylbenzene using copper chromite catalysts. 4,075,254, Cl. 260-667.000.

Borg-Warner Corporation: *See*—
Dick, Wesley Marion, 4,074,591, Cl. 74-674.000.
Falk, John Carl, 4,075,289, Cl. 260-890.000.
Schmittle, Karl V.; and Starner, Keith E., 4,074,753, Cl. 165-184.000.

Borjesson, Anders; and Rehnberg, Tore, to Aktiebolaget Tudor. Apparatus for holding electrode sets. 4,074,422, Cl. 29-730.000.

Borne, Jean Paul; and Naaijer, Geert Jan, to U.S. Philips Corporation. Method and apparatus for increasing the recording capacity of a disk. 4,075,665, Cl. 360-8.000.

Bosch, Paul: *See*—
Nonnemacher, Gerhard; Knodel, Emil; Robeller, Walter; and Bosch, Paul, 4,074,955, Cl. 417-218.000.

Boudakian, Max M., to Olin Corporation. Diazotization-fluorination in a medium of hydrogen fluoride-containing ammonium ions. 4,075,252, Cl. 260-649.00F.

Boudet, Georges; Charpentier, Jacques; Vinel, Rene; Desmoulins, Jean-Claude; and de Blic, Emmanuel, to SKF Compagnie d'Applications Mecaniques. Multi-stage hydraulic stretcher for elongated fasteners. 4,074,890, Cl. 254-29.00A.

Boussaid, Issam S., to Texaco Inc. Oil recovery process using a polymer slug with tapered surfactant concentration. 4,074,759, Cl. 166-273.000.

Bouverot, Rene; and Narbaits-Jaureguy, Jean-Raymond, to Thomson-CSF. Electromagnetic detector responsive to a modification of radiated field by an intruding metallic object. 4,075,553, Cl. 324-233.000.

Bouwmaatschappij Nederhorst B. V.: *See*—
Hendriks, Nicolaas Arie, 4,074,485, Cl. 52-224.000.

Bowe Bohler & Weber Maschinenfabrik: *See*—
Fuhring, Heinrich, 4,074,984, Cl. 55-163.000.

Bowler, Michael Kendal: *See*—
Knill, Kenneth George; Bowler, Michael Kendal; and Hambleton, Peter, 4,075,027, Cl. 106-99.000.

Boyd, Douglas P., to Leland Stanford, Jr. University, The Board of Trustees of. Position sensitive X-ray or γ-ray detector and 3-D tomography using same. 4,075,491, Cl. 250-445.00T.

Boyd, Douglas P.; and Goitein, Michael, to Leland Stanford Junior University, The Board of Trustees of. Fan beam X- or γ-ray 3-D tomography. 4,075,492, Cl. 250-445.00T.

Boyd, John B.; and Rees, Norman E. Method for manufacturing solar energy collectors. 4,074,406, Cl. 29-157.30C.

Boyles, Tonnie M.: *See*—
Monk, James T.; Hailey, James L.; and Boyles, Tonnie M., 4,074,801, Cl. 198-304.000.

Bradbury, Wilburn F., to Addressograph-Multigraph Corporation. Sheet feeder. 4,074,902, Cl. 271-34.000.

Bradshaw, Elmo F.; and Rakszawski, John F., to Airco, Inc. Brush shunt connection. 4,075,524, Cl. 310-249.000.

Brady, John K.; and Noyes, Robert, to University of Illinois Foundation. Apparatus for gripping and holding small workpieces. 4,075,302, Cl. 269-43.000.

Braillon, Philibert Maurice. Magnetic plate comprising permanent magnets and electropermanent magnets. 4,075,589, Cl. 335-286.000.

Brake Engineering, Inc.: *See*—
Hoffman, Neil R.; and Jansen, Johannes H., 4,074,910, Cl. 280-289.00R.

Brakebill, Harold G.; Lewis, Jay L.; and Asbill, Clarence M., III, to Robertshaw Controls Company. Adjustable bimetal construction and method of making the same. 4,074,855, Cl. 236-87.000.

Brammall, Inc.: *See*—
Schindler, Robert, 4,074,916, Cl. 292-307.00R.

Brams, Bernhard: *See*—
Koch, Heinz; Pawlowicz, Manfred; and Brams, Bernhard, 4,074,982, Cl. 51-92.00R.

Brandt, Michael W. Threaded blade holder. 4,074,426, Cl. 30-1.500.

Branham, Charles L.: *See*—
Paul, George A.; Hegel, Robert W.; Bethell, Michael R.; Branham, Charles L.; and Utter, Allan D., 4,075,098, Cl. 210-168.000.

Braun, Walter Jacob; Altshuler, John Henry; and Cherry, Peter Whitfield, to HemoTec, Inc. Apparatus and method for the pharmacological manipulation of the coagulation mechanism in blood and for signalling the event of blood coagulation. 4,074,971, Cl. 23-230.00B.

Breault, Homer; and Witt, Alvin E., to Atlantic Richfield Company. Turquoise-plastic-composite. 4,075,365, Cl. 427-36.000.

Breeden, William J.: *See*—
Pearce, Godfrey R.; Breeden, William J.; and See, Francis R., 4,074,417, Cl. 29-570.000.

Brewer, Donaldee: *See*—
Brodie, Edwin T.; and Brewer, Donaldee, 4,075,047, Cl. 156-96.000.

Brewer, Stephen J.: *See*—
Fleming, Ian D.; Turner, Michael K.; and Brewer, Stephen J., 4,075,061, Cl. 195-29.000.

Brewster, Robert W.: *See*—
Warren, Lyle D.; and Brewster, Robert W., 4,074,601, Cl. 83-425.200.

Brezeale, Claude Paren: *See*—
Bloxham, Gordon Foreman; Brezeale, Claude Paren; Cocco, Eugene Raymond; Hardesty, Edwin Charles; Small, Byron Lee; Steinert, Daniel Marion; and McGonigal, Charles, 4,075,299, Cl. 264-25.000.

Briar, Herman P.; and Bills, Kenneth W., Jr., to United States of America, Air Force. In-situ measurement apparatus. 4,074,563, Cl. 73-35.000.

Bridgestone Tire Company Limited: *See*—
Kawakami, Hiroshi; Tsukagawa, Yukio; and Nagaoka, Isao, 4,075,096, Cl. 210-96.00R.
Nishimura, Kazuhiro; Harada, Jumei; Migita, Tetsuhiko; and Matsunaga, Tsutomu, 4,075,275, Cl. 264-313.000.

Bridgham, John A.: *See*—
Stoft, Paul E.; Bridgham, John A.; Chaney, Robert L.; Hill, Charles M.; Lazier, John K. D.; Willis, Barry G.; Wong, Jacob Y.; and Fostick, Moshe A., 4,075,481, Cl. 250-343.000.

Bright, Robert G., to Draftex Development AG. Flexible channel-shaped sealing and guiding strips. 4,074,465, Cl. 49-491.000.

Broad, Roy M., to Scott & Fetzer Company, The. High voltage electrical connector. 4,074,926, Cl. 339-60.00R.

Brockschmidt, Robert W.: *See*—
Brockschmidt, Willis H.; Brockschmidt, Robert W.; and Grabenhofer, John D., 4,074,561, Cl. 73-17.00R.

Brockschmidt, Willis H.; Brockschmidt, Robert W.; and Grabenhofer, John D., to Fuel Research & Instrument Co. Means for measuring the plasticity of coal. 4,074,561, Cl. 73-17.00R.

Brodie, Edwin T.; and Brewer, Donaldee, to Bandag Incorporated. Tire retreading system. 4,075,047, Cl. 156-96.000.

Brooks & Perkins, Incorporated: *See*—
Snow, Conley H.; and Messerschmidt, Rudolph (said Snow assors. to), 4,074,634, Cl. 105-493.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Hishida, Yukio; Watanabe, Tomoyoshi; Hirayama, Takanobu; and Asakura, Hideo, 4,074,799, Cl. 197-151.000.

Brower, Robert W., to C. O. Porter Machinery Company. Defecting saw. 4,074,602, Cl. 83-471.200.

Brown, Cicero C., deceased; and by Brown, Joe R., executor. Drilling assembly. 4,074,774, Cl. 173-44.000.

Brown Company: *See*—
Smith, Floyd S., 4,075,107, Cl. 210-493.00R.

Brown, Edgar D., Jr.; and Traver, Frank J., to General Electric Company. Silicone fluid useful as a brake fluid. 4,075,115, Cl. 252-75.000.

Brown, Harold J.: *See*—
Keren, Eitan; and Brown, Harold J., 4,074,505, Cl. 53-28.000.

Brown, Joe R., executor: *See*—
Brown, Cicero C., deceased; and Brown, Joe R., executor, 4,074,774, Cl. 173-44.000.

Brown & Root, Inc.: *See*—
Lochridge, Joe Cooper, 4,074,541, Cl. 61-110.000.

Brown & Williamson Tobacco Corporation: *See*—
Kohnhorst, Earl E., 4,074,722, Cl. 131-8.00R.

Brunetti, Heimo: *See*—
Soma, Nobuo; Kurumada, Tomoyuki; Brunetti, Heimo; and Rody, Jean, 4,075,165, Cl. 260-45.80N.

Bruno, Stephen James; Dunn, Stephen Alfred; and Raber, Marvin, to Combustion Engineering, Inc. Reactor power reduction system and method. 4,075,059, Cl. 176-22.000.

Brunswick Corporation: *See*—
Panzera, Carlino, 4,075,364, Cl. 427-34.000.

Brusasco, Enzo, to Roltra S.p.A. Screw-nut screw transmission coupling. 4,074,587, Cl. 74-424.80R.

Bryzzhev, Lev Dmitrievich; and Kupko, Viktor Semenovich. Fluid pressure measuring device. 4,074,576, Cl. 73-702.000.

Brzozowski, Paul Charles, to Du Pont de Nemours, E. I., and Company. Method of trimming photoresist film. 4,075,051, Cl. 156-236.000.

Brzozowski, Stanley F.; and Cooper, Joseph E., to PPG Industries, Inc. Method of preparing anhydrous boric acid-containing glass batch. 4,074,989, Cl. 65-27.000.

Brzozowski, Stanley F.; and Cooper, Joseph E., to PPG Industries, Inc. Method of preparing colemanite-containing glass batch. 4,074,990, Cl. 65-27.000.

Brzozowski, Stanley F.; and Cooper, Joseph E., to PPG Industries, Inc. Method of preparing boric acid-containing glass batch. 4,074,991, Cl. 65-27.000.

Bucher, James L.: *See*—
Lupton, Daniel C.; Vermilion, Donn R.; and Bucher, James L., 4,075,048, Cl. 156-136.000.

Budde, Antonius Wilhelmus Hermanus; and Wiggers, Johannes Bernardus Maria, to Ingenieursbureau Dwars, Heederik en Verhey B.V. Surface aerator. 4,074,953, Cl. 416-183.000.

Budzich, Tadeusz. Load responsive system pump controls. 4,074,529, Cl. 60-445.000.

Building Components Research, Inc.: *See*—
Wahlquist, Carl D., 4,074,475, Cl. 52-70.000.

Bullis, Robert H.; Meyerand, Russell G., Jr.; and Wiegand, Walter J., Jr., to United Technologies Corporation. Method and apparatus for sensing the flux of a flowing fluid. 4,074,572, Cl. 73-194.00F.

Bulova Watch Company, Inc.: *See*—
Koehler, Dale R.; Sagarino, Robert F.; and Sauter, Charles A., 4,075,518, Cl. 310-49.00R.

Bunda, Tsuchio: *See*—
Noguchi, Masaaki; Bunda, Tsuchio; and Tanaka, Taro, 4,074,661, Cl. 123-3.000.

Bundy, Wayne M.; Berberich, Joseph P.; and Sastre, David, to Yara Engineering Corporation. High bulking clay pigments and methods of making the same. 4,075,030, Cl. 106-288.00B.

Bunker Ramo Corporation: *See*—
Davis, John Stephen; Larson, Kenneth Norman; and Phalen, Frank William, 4,075,691, Cl. 364-200.000.

Burdzinski, Boguslaw: *See*—
Daniels, Lawrence H.; Hood, Murray C.; and Burdzinski, Boguslaw, 4,074,487, Cl. 52-236.300.

Burgess, Thomas H., to Fischer & Porter Co. Obstacle assembly for vortex type flowmeter. 4,074,571, Cl. 73-194.00B.

Burke, William D.; Higginbottom, Harold P.; and Le Blanc, John R., to Monsanto Company. Phenolic resin and battery separator impregnated therewith. 4,075,403, Cl. 429-253.000.

Burkett, Joseph C.; and Harshbarger, Harry L., to Genoa Coal Company. Ground conductor monitoring system and method. 4,075,675, Cl. 361-48.000.

Burlingame, Richard D.; and Markels, Michael, Jr., to Ogden Metals, Inc.; and Versar, Inc. Passivating metallic cuttings and turnings. 4,075,370, Cl. 427-216.000.

Burmah Oil Trading Limited: *See*—
Field, Peter Graham Spencer; and Bennett, Ronald, 4,075,250, Cl. 260-621.00C.

Burns, David J.; Mohaupt, Udo H.; and Yie, Gene G., to Institute of Gas Technology. High pressure pulsed water jet apparatus and process. 4,074,858, Cl. 239-172.000.

Burov, Atanas Tzvetanov; Simidchieva, Penka Atanassova; and Kolev, Konstantin Nikolaev, to Ziafop pri Ban. Positive-working photographic process and radiation elements utilizing a chalcogenide of arsenic imaging compound and a noble plating metal. 4,075,016, Cl. 96-48.0PD.

Burroughs Corporation: *See*—
Walton, Tommy L., 4,075,420, Cl. 174-117.00F.

Burroughs Wellcome Co.: *See*—
Beddell, Christopher Raymond; Lowe, Lawrence Alfred; and Wilkinson, Samuel, 4,075,191, Cl. 260-112.5LH.

Burton, Henry W. G. Kit for converting single-glazed window to double-glazed window. 4,074,480, Cl. 52-127.000.

Bushnell, David William. Domestic food mixers. 4,074,584, Cl. 74-421.00A.

Busler, Albert, to Hilti Aktiengesellschaft. Anchor bolt assembly. 4,074,609, Cl. 85-77.000.

Butler, David M. Solar converter. 4,075,034, Cl. 136-89.0PC.

Butler, Donald E., to Parke, Davis & Company. Imidazopyrazolodiazepine compounds. 4,075,408, Cl. 548-324.000.
BWG Bergwerk-und Walzwerk Maschinenbau Gesellschaft mit beschrankter Haftung: *See—*
Noe, Oskar, 4,074,555, Cl. 72-128.000.
C.A.V. Limited: *See—*
Skinner, Robert Thomas John, 4,074,667, Cl. 123-139.0AQ.
C. O. Porter Machinery Company: *See—*
Brower, Robert W., 4,074,602, Cl. 83-471.200.
Cailliot, Serge Leon Louis, to Societe Normande de Services; Anvar Agence Nationale de Valorisation de la Recherche; Societe Generale pour le Financement de l'Innovation Soginnove; Cor, Bertrand; and Gastinne, Arnaud, part interest to each. Infusion-making machine. 4,074,621, Cl. 99-286.000.
Calder, Oliver J. Reversible spray tip. 4,074,857, Cl. 239-119.000.
Calgon Corporation: *See—*
Schaper, Raymond Joseph, 4,075,136, Cl. 260-2.00R.
Calle, Jaime; and Chelberg, Lawrence W., to Honeywell Information Systems Inc. Input/output cache system including bypass capability. 4,075,686, Cl. 364-200.000.
Calspan Corporation: *See—*
Beilman, John L.; and Deazley, William R., 4,074,570, Cl. 73-182.000.
Calviello, Joseph A., to Cutler-Hammer, Inc. Millimeter wave semiconductor device. 4,075,650, Cl. 357-15.000.
Campbell, Cyrill John; and Liu, Daniel Ting Hsiu, to Parke, Davis & Company. Process for producing intravenous immune globulin. 4,075,193, Cl. 260-112.00B.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Gray, Thomas J.; and Wojtowicz, Jan, 4,074,733, Cl. 141-32.000.
Canadian Patents and Development Limited: *See—*
Jorgensen, Erik; Roy, Dibyendu N.; and Kondo, Edward S., 4,075,327, Cl. 424-273.00R.
Wight, James S.; Chudobiak, Walter J.; and Makios, Vassilios, 4,075,555, Cl. 324-58.50R.
Canaris, Valerie: *See—*
Eckles, William Edward; and Canaris, Valerie, 4,075,066, Cl. 204-55.00R.
Canevari, Louis T.: *See—*
Schubert, Keith E.; and Canevari, Louis T., 4,074,574, Cl. 74-335.000.
Canon Kabushiki Kaisha: *See—*
Kawabata, Yoichi; and Machida, Minoru, 4,075,705, Cl. 364-752.000.
Sakamaki, Hisashi; and Ohtani, Toshiyuki, 4,075,456, Cl. 219-216.000.
Shinoda, Nobuhiko; and Kusumoto, Tadao, 4,075,696, Cl. 364-404.000.
Cantor, Paul A.: *See—*
Higley, Willard S.; Cantor, Paul A.; and Fisher, Bruce S., 4,075,108, Cl. 210-500.00M.
Capozza, Richard Carl, to American Cyanamid Company. Poly(N-acetyl-D-glucosamine) products. 4,074,366, Cl. 3-1.000.
Capozza, Richard Carl, to American Cyanamid Company. Poly(N-acetyl-D-glucosamine) products. 4,074,713, Cl. 128-92.00C.
Capriotti, Alfred J.; Lazzaretti, Louis G.; and O'Donnell, Brian, to United States Steel Corporation. Mold discharge rack gapping apparatus. 4,074,439, Cl. 33-286.000.
Capriotti, Alfred J., to United States Steel Corporation. Torch and cutoff table arrangement. 4,074,895, Cl. 266-50.000.
Carbaugh, Frederick A.: *See—*
Adams, Stanley B.; Carbaugh, Frederick A.; and Cryder, John R., 4,074,690, Cl. 137-344.000.
Carborundum Company, The: *See—*
Economy, James; Jun, Choll K.; and Lin, Ruey Y., 4,075,276, Cl. 264-332.000.
Carlson, Ronald H., to FMC Corporation. Sodium hypochlorite treatment for removal of cyanurate compounds from aqueous waste streams. 4,075,094, Cl. 210-62.000.
Carnegie-Mellon University: *See—*
Komanduri, Rangachary; and Shaw, Milton C., 4,074,471, Cl. 51-295.000.
Carson, Michael David Nisbet: *See—*
Dorfman, Jan William; Carson, Michael David Nisbet; and Rolston, George Angus, 4,074,646, Cl. 114-39.000.
Case, Richard P., to Franklin Manufacturing Company. Bimetal lid lock. 4,074,545, Cl. 68-12.00R.
Cassella Farbwerke Mainkur Aktiengesellschaft: *See—*
Greve, Heinz Gunter; and Resag, Klaus, 4,075,409, Cl. 560-36.000.
Cassidy, Dale A.: *See—*
Groh, Edward F.; and Cassidy, Dale A., 4,074,848, Cl. 228-173.00C.
Castagna, Herman; Gravey, Guy; and Roth, Andre, to Metaux Specisaux S.A. Process for recovering molybdenum values from spent catalysts. 4,075,277, Cl. 423-55.000.
Castaigne, Albert Rene Joseph, to Centre d'Etudes Pour l'Industrie Pharmaceutique. Thieno-pyridine derivatives. 4,075,215, Cl. 260-294.80C.
Castleman, B. Wayne; and Schluter, Bernard C., to Honeywell Inc. Ionization cell for sensing and measuring gaseous impurities. 4,075,550, Cl. 324-33.000.
Castonguay, Roger N.; and Jencks, Charles L., to General Electric Company. Undervoltage release device for circuit breakers. 4,075,584, Cl. 335-20.000.
Catallo, Frank. Folder for web materials. 4,074,901, Cl. 270-79.000.
Caterpillar Tractor Co.: *See—*
Adams, Stanley B.; Carbaugh, Frederick A.; and Cryder, John R., 4,074,690, Cl. 137-344.000.
Avery, Bennett W., 4,074,615, Cl. 91-490.000.
Beals, Charles E., 4,074,614, Cl. 91-490.000.
Cochran, Thomas E., 4,074,942, Cl. 404-121.000.
Cole, Carroll Richard, 4,074,767, Cl. 172-781.000.
Eftefield, Larry G., 4,074,896, Cl. 267-139.000.
Gale, Preston Lee; and Fair, Jack E., 4,074,616, Cl. 92-222.000.
Gill, Stephen H.; Knell, Harvey A.; and Tucker, Joseph M., III, 4,074,820, Cl. 214-138.00R.
Hoehn, Richard F.; Morris, Hugh C.; Therkildsen, Henry T.; and Behrends, Bertwin E., 4,074,796, Cl. 192-3.570.
Karstensen, Karl W.; and Smith, Brace C., 4,075,562, Cl. 324-173.000.
Lanz, William E.; and Stepe, Visvaldis A., 4,074,449, Cl. 37-141.00R.
Muntjanoff, John R., 4,074,613, Cl. 91-413.000.
Smith, Duane R., 4,074,703, Cl. 137-798.000.
Sons, Charles C., Jr., 4,075,054, Cl. 156-414.000.
Stedman, Robert N., 4,074,768, Cl. 172-796.000.
Stevens, W. Gene, 4,074,581, Cl. 74-15.660.
Stevens, W. Gene; and Windish, Willis E., 4,074,592, Cl. 74-740.000.
Catlett, Richard E., to Raymond Lee Organization, Inc., The, a part interest. Fly gun. 4,074,458, Cl. 43-139.000.
CATV Components Co.: *See—*
D'Arcangelis, Timothy, 4,075,566, Cl. 325-369.000.
Caulk, Robert H.; and Allan, David E., to Exxon Research & Engineering Co. Isoparaffin olefin alkylation utilizing high intensity mixing. 4,075,258, Cl. 260-683.440.
Cavey, William: *See—*
Mowbray, Warwick; Hart, Richard; and Cavey, William, 4,074,659, Cl. 119-159.000.
Cavigelli, George A., to American Optical Corporation. Isolation amplifier having improved fidelity. 4,075,572, Cl. 330-10.000.
Cavil, David T.; Hansen, Einar T.; and Schmidt, Henry J., to Outboard Marine Corporation. Rotor controlled automatic spark advance. 4,074,669, Cl. 123-148.0CC.
Caviness, Alton L.: *See—*
Anderson, Richard M.; Caviness, Alton L.; Menikheim, Virginia C.; and Silverman, Bernard, 4,075,383, Cl. 428-198.000.
CCL Systems Limited: *See—*
Outram, Christopher David, 4,074,493, Cl. 52-583.000.
Cecil Instruments Manufacturing Limited: *See—*
Tarbet, Cecil Sidney Charles, 4,074,940, Cl. 356-246.000.
Celanese Corporation: *See—*
Jones, Rufus S., Jr.; Tan, Marshall; and Choe, Eui Won, 4,075,269, Cl. 264-184.000.
Rhum, David; and Aluotto, Patrick F., 4,075,242, Cl. 560-190.000.
Trapasso, Louis E.; and Horback, William B., 4,075,387, Cl. 428-288.000.
Centaur Floor Machines Ltd.: *See—*
Arato, Paul; Lelkes, Antony; and Reid, Larry Ronald, 4,074,387, Cl. 15-322.000.
Centenary Central, Inc.: *See—*
Sauer, Louis E.; and Miller, Orville C., 4,074,595, Cl. 76-107.00C.
Centralny Osrodek Projektowo-Konstrukcyjny Maszyn Gorniczych "Komag": *See—*
Jedo, Antoni; and Jachna, Waclaw, 4,075,090, Cl. 209-173.000.
Centre d'Etudes Pour l'Industrie Pharmaceutique: *See—*
Castaigne, Albert Rene Joseph, 4,075,215, Cl. 260-294.80C.
Chaitchik, Samario: *See—*
Sela, Michael; Arnon, Ruth; and Chaitchik, Samario, 4,075,194, Cl. 260-112.50R.
Chambley, Phillip W.; and Norris, Alan H., to Champion International Corporation. Self twist yarn strand system. 4,074,511, Cl. 57-34.0AT.
Chamblin, Kenneth Donald. Indicator for tire wear patterns. 4,074,742, Cl. 152-330.00A.
Champion International Corporation: *See—*
Chambley, Phillip W.; and Norris, Alan H., 4,074,511, Cl. 57-34.0AT.
Vassiliades, Anthony E.; and Vincent, David N., 4,075,389, Cl. 428-306.000.
Chaney, Robert L.: *See—*
Stoft, Paul E.; Bridgham, John A.; Chaney, Robert L.; Hill, Charles M.; Lazier, John K. D.; Willis, Barry G.; Wong, Jacob Y.; and Fostick, Moshe A., 4,075,481, Cl. 250-343.000.
Chano, Takashi; and Masuda, Kohji, to Tokyo Juki Kogyo Kabushiki Kaisha; and Kayaba Industry Co., Ltd. Automatic sewing machine. 4,074,640, Cl. 112-121.110.
Chapman, Benjamin E.; Moore, Danny R.; and Phillips, Arthur F., to Procter & Gamble Company, The. Disposable nonwoven surgical towel and method of making it. 4,075,382, Cl. 428-192.000.
Chaprnka, Anthony G.; Sun, Shan C.; and Vercellotti, Leonard C., to Westinghouse Electric Corporation. Technique for extending the range of a signal measuring circuit. 4,075,559, Cl. 324-115.000.
Charcon Products Limited: *See—*
Knill, Kenneth George; Bowler, Michael Kendal; and Hambleton, Peter, 4,075,027, Cl. 106-99.000.
Charpentier, Jacques: *See—*
Boudet, Georges; Charpentier, Jacques; Vinel, Rene; Desmoulins, Jean-Claude; and de Blic, Emmanuel, 4,074,890, Cl. 254-29.00A.
Chaveron, Michel: *See—*
Badertscher, Ernest; and Chaveron, Michel, 4,075,196, Cl. 260-120.000.

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Chefranova, Edit Konstantinovna: *See—*
Moiseev, Vladimir Vasilievich; Kosovtsev, Vladimir Vasilievich; Kolesnikova, Galina Prokofievna; Zimnukhov, Viktor Alexandrovich; Miroshnikova, Lidia Alexeevna; Kimel, Esfir Abramovna; Chefranova, Edit Konstantinovna; Guseva, Valentina Ivanovna; and Masagutova, Ljudmila Vladimirovna, 4,075,166, Cl. 260-45.95H.
Chelberg, Lawrence W.: *See—*
Calle, Jaime; and Chelberg, Lawrence W., 4,075,686, Cl. 364-200.000.
Chemetron Corporation: *See—*
Risby, Terence H.; and Yergey, Alfred L., III, 4,075,475, Cl. 250-282.000.
Chemische Werke Huels Aktiengesellschaft: *See—*
Denzel, Horst; and Hahmann, Otto, 4,075,290, Cl. 260-897.00A.
Chen, Thomas T., to Rockwell International Corporation. Large capacity major-minor loop bubble domain memory with redundancy. 4,075,708, Cl. 365-2.000.
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Cheung, John B.; and Murman, Earll M., to United States of America, Interior. Backwashing system for slurry pick-up used in hydraulic borehole mining devices. 4,074,779, Cl. 175-314.000.
Chevron Research Company: *See—*
Bacskai, Robert, 4,075,182, Cl. 260-78.00P.
Edwards, Laroy H., 4,075,347, Cl. 424-275.000.
Stevens, Robert A., 4,074,763, Cl. 166-325.000.
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Colbachini, Daciano; and Chiarotto, Romeo, 4,074,790, Cl. 182-63.000.
Chin, Gilbert Yukyu; Plewes, John Travis; and Wonsiewicz, Bud Caesar, to Bell Telephone Laboratories, Incorporated. Composition, processing and devices including magnetic alloy. 4,075,437, Cl. 179-114.00R.
Chisum, Finis Lavell. Method and apparatus for transporting one vehicle by another. 4,074,822, Cl. 214-152.000.
Chiyoda Chemical Engineering & Construction Co., Ltd.: *See—*
Morimoto, Tatsuo; Nakamura, Munekazu; Inooka, Masayoshi; and Yawata, Teizaburo, 4,075,125, Cl. 252-455.00R.
Chloride, Incorporated: *See—*
Malinowski, William J., 4,075,499, Cl. 250-574.000.
Chmela, Frank P.: *See—*
Deahich, Dushan C.; Chmela, Frank P.; and Kufner, Kenneth L., 4,074,424, Cl. 29-753.000.
Choe, Eui Won: *See—*
Jones, Rufus S., Jr.; Tan, Marshall; and Choe, Eui Won, 4,075,269, Cl. 264-184.000.
Chou, Ta-Sen, to Eli Lilly and Company. Process for preparing a 3-exomethylenecepham sulfoxide from penicillin sulfoxides. 4,075,203, Cl. 544-18.000.
Christensen, Carl O., to Roll-Rite Corporation. Method for making a hollow-bodied caster wheel. 4,074,407, Cl. 29-159.00R.
Christensson, Nils Bertil: *See—*
Davidsson, Sven; Christensson, Nils Bertil; and Axelsson, Per Hugo, 4,074,849, Cl. 229-1.50B.
Christian, Lawrence D., to Exxon Production Research Company. Method for producing geothermal energy and minerals. 4,074,754, Cl. 166-245.000.
Christian Services, Inc.: *See—*
Lindbloom, John L., 4,074,371, Cl. 5-13.000.
Christie, John B.: *See—*
Wescott, Robert D.; and Christie, John B., 4,074,852, Cl. 235-463.000.
Christopher, Chris J.; Wenninger, Fred W.; Morris, Donald E.; Covington, Wayne F.; Folsom, Jerry B.; Beyers, Joseph W.; Nairn, John H.; and Osborne, Jeffrey C., to Hewlett-Packard Company. Programmable calculator. 4,075,679, Cl. 364-200.000.
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Hodgson, James H., 4,074,639, Cl. 111-6.000.
Chudobiak, Walter J.: *See—*
Wight, James S.; Chudobiak, Walter J.; and Makios, Vassilios, 4,075,555, Cl. 324-58.50R.
Chugunov, Viktor Dmitrievich: *See—*
Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Kudryakov, Mikhail Nikolaevich; Tsipkis, Alexandr Moiseevich; Yakovlev, Vladimir Germogenovich; Averbukh, Alexandr Samoilovich; Scherbakov, Jury Ilich; Yakobson, Natalia Dmitrievna; Semikozov, Vyacheslav Fedorovich; Medvedev, Viktor Vladimirovich; Yartsev, Valery Vasilievich; Kaganov, July Davydovich; Kuznetsov, Vladimir Ivanovich; and Sinelnikov, Alexandr Iosifovich, 4,074,773, Cl. 173-23.000.
Chung, William John: *See—*
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Churillo, Charles J.: *See—*
Lock, William E.; and Churillo, Charles J., 4,074,610, Cl. 89-34.000.
Ciarico, Anthony J.: *See—*
Binard, William J.; Ciarico, Anthony J.; Anglada, Leonard R.; and Patel, Bhupendra C., 4,074,714, Cl. 128-218.00P.
Ciba-Geigy Corporation: *See—*
Florer, James W., 4,075,267, Cl. 264-94.000.
Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, 4,075,349, Cl. 424-301.000.
Kray, Raymond J., 4,075,185, Cl. 260-79.30M.
Lacroix, Roger; and Haberli, Roland, 4,074,966, Cl. 8-41.00R.
Mowbray, Warwick; Hart, Richard; and Cavey, William, 4,074,659, Cl. 119-159.000.
Soma, Nobuo; Kurumada, Tomoyuki; Brunetti, Heimo; and Rody, Jean, 4,075,165, Cl. 260-45.80N.
Spivack, John D.; and Dexter, Martin, 4,075,161, Cl. 260-45.80A.
Wilhelm, Max; Eichenberger, Kurt; Schroter, Herbert; and Ostermayer, Franz, 4,075,208, Cl. 260-256.40C.
Wilhelm, Max; Eichenberger, Kurt; Schroter, Herbert; and Ostermayer, Franz, 4,075,335, Cl. 424-244.000.
Cicalak, Richard F.; and Balding, John V., to Industrial Electronics Service Co. Audible electronic warning system. 4,075,625, Cl. 340-384.00E.
Cina, Ronald A.; and Kluge, Albert D., to Roberts Corporation. Automatic apparatus for producing molds using chemically bonded sands. 4,074,744, Cl. 164-187.000.
Cincinnati Milacron-Heald Corporation: *See—*
Robillard, Edward George, 4,074,467, Cl. 51-165.920.
Cincinnati Milacron, Inc.: *See—*
Kelly, Ralph; and Ritter, Edmond Jean, 4,075,318, Cl. 424-70.000.
Ciazek, Theodore Frank; and Schwuttke, Guenter Herbert, to International Business Machines Corporation. Method and apparatus for forming an elongated silicon crystalline body using a <110>{21-1}orientated seed crystal. 4,075,055, Cl. 156-608.000.
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Gregoli, Armand A., 4,075,081, Cl. 208-11.00R.
Cito Kunststoffe und Verpackungsfolien Erich Gilberg KG: *See—*
Sander, Bernd, 4,074,506, Cl. 53-59.00R.
City of Hope National Medical Center: *See—*
Tiep, Brian L., 4,074,710, Cl. 128-2.05P.
CKD Praha, oborovy podnik: *See—*
Jusca, Milos, 4,075,557, Cl. 324-62.000.
Clark Equipment Company: *See—*
Bauer, James J., 4,074,782, Cl. 180-6.480.
Clark, Gary E.; Frielinghaus, Klaus H.; and Smith, Barry L., to General Signal Corporation. Track signalling system. 4,074,879, Cl. 246-37.000.
Clarke, John Elwood; Andrews, Austin M., II; Gertner, Edward R.; Longo, Joseph T.; and Pasko, John G., to Rockwell International Corporation. Liquid phase epitaxy method of growing a junction between two semiconductive materials utilizing an interrupted growth technique. 4,075,043, Cl. 148-171.000.
Clarke, Robert John; Hundy, Guy Francis; and Zimmern, Bernard, to Monovis B. V. Screw compressors. 4,074,957, Cl. 418-195.000.
Cleek, Alvin L.: *See—*
Adams, Charles E.; Quackenbush, Harold E.; Harrer, Paul H.; Langford, Le Roy; and Cleek, Alvin L., 4,074,830, Cl. 221-266.000.
Cline, Harvey E.: *See—*
Anthony, Thomas R.; and Cline, Harvey E., 4,075,038, Cl. 148-1.500.
Close, Ralph E.; and Oroshnik, William, to SCM Corporation. 3,7,11-Trimethyldodeca-1,2-diene. 4,075,257, Cl. 260-680.00R.
Clothier, Darrell S. Low tire alarm. 4,075,602, Cl. 340-58.000.
Cluett, Peabody & Co., Inc.: *See—*
Lawrence, Jackson, 4,074,969, Cl. 8-125.000.
CMI Corporation: *See—*
Jakob, Herbert E.; and Garbelman, David L., 4,075,710, Cl. 366-25.000.
Coale, Harold D., to Phillips Petroleum Company. Flexible product made from a poly(phenylene sulfide) blend and method of making same. 4,075,158, Cl. 260-42.170.
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Cochran, Thomas E., to Caterpillar Tractor Co. Compactor wheel with cross-shaped tips. 4,074,942, Cl. 404-121.000.
Cockcroft, Frederick Edward, to Hepworth & Grandage Ltd. Pistons for internal combustion engines or for compressors. 4,074,617, Cl. 92-228.000.
Cohen, Merrill. Plant plug. 4,074,997, Cl. 71-24.000.
Colanzi, Franco, to RIV - SKF Officine de Villar Perosa S.p.A. Electrically controlled window regulator. 4,074,463, Cl. 49-352.000.
Colbachini, Daciano; and Chiarotto, Romeo. Vehicle-borne inspection and maintenance apparatus. 4,074,790, Cl. 182-63.000.
Colburn, Richard P., to Westinghouse Electric Corporation. Method for removing fission products from a nuclear reactor coolant. 4,075,060, Cl. 176-37.000.
Cole, Carroll Richard, to Caterpillar Tractor Co. Motor grader support structure and side shift mechanism. 4,074,767, Cl. 172-781.000.
Colgate-Palmolive Company: *See—*
Cordon, Martin, 4,075,316, Cl. 424-49.000.
Mitchell, Robert Lee; and Chung, William John, 4,075,317, Cl. 424-52.000.
Schaar, Charles H., 4,074,716, Cl. 128-287.000.
Colgate, Stirling A. Blasting agent and method. 4,074,629, Cl. 102-23.000.

Collins, Jack: *See—*
Grossman, Leroy W.; Collins, Jack; and Kohls, E. Eugene, 4,074,379, Cl. 9-1.600.
Collins, William J. Molten metal sampler. 4,074,578, Cl. 73-425.40R.
Colour-Chem Ltd.: *See—*
Gleinig, Harald E. K., 4,075,198, Cl. 260-161.000.
Coltrin, George E., to Adams & Coltrin, Inc. Fence. 4,074,893, Cl. 256-21.000.
Combette, Marc; and Ollivier, Jean. Device for maintaining in position the piston of a fastener tool. 4,074,845, Cl. 227-10.000.
Combette, Marc: *See—*
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Combustion Engineering, Inc.: *See—*
Bruno, Stephen James; Dunn, Stephen Alfred; and Raber, Marvin, 4,075,059, Cl. 176-22.000.
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Ferrin, Charles Robert, 4,075,102, Cl. 210-277.000.
Hochmuth, Frank William, 4,074,708, Cl. 126-360.00A.
Noyes, Richard Croissant, 4,075,058, Cl. 176-21.000.
Comer, William T.: *See—*
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Commissariat a l'Energie Atomique: *See—*
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Communications Patents Limited: *See—*
Baker, Henry Louis, 4,075,422, Cl. 178-23.00R.
Compagnie Generale de Radiologie: *See—*
Grubis, Bernard, 4,075,526, Cl. 313-56.000.
Compo Industries, Inc.: *See—*
Kaplan, Martin; and Tassone, Joseph V., 4,074,383, Cl. 12-145.000.
Concannon, Thomas P., to Du Pont de Nemours, E. I., and Company. Method for providing heated fuser roll with improved release and wear life. 4,075,362, Cl. 427-22.000.
Consonni, Pietro: *See—*
Omodei-Sale, Amedeo; Consonni, Pietro; and Lerner, Leonard, 4,075,341, Cl. 424-258.000.
Constien, Vernon G.: *See—*
Copeland, Claude T.; and Constien, Vernon G., 4,074,760, Cl. 166-276.000.
Construction Innovations, Inc.: *See—*
Behn, Frederick H., 4,074,897, Cl. 269-43.000.
Continental Group, Inc., The: *See—*
Pelton, Peter G.; Grubman, Alan A.; and Hasegawa, Gary, 4,075,099, Cl. 210-168.000.
Continental Oil Company: *See—*
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Cooke, Claude E., Jr., to Exxon Production Research Company. Apparatus and method for well repair operations. 4,074,756, Cl. 166-253.000.
Cooke, Robert William: *See—*
Kosalos, James George; and Cooke, Robert William, 4,075,599, Cl. 340-3.00R.
Cooper, David Eugene; Hendee, Leon Clyde, III; Hill, Walter Guy, Jr.; Leahem, Adam; and Marugg, Martin Lewis, to Combustion Engineering, Inc. Method and apparatus for controlling surface traversing device. 4,074,814, Cl. 214-1.0BB.
Cooper, Joseph E.: *See—*
Brzozowski, Stanley F.; and Cooper, Joseph E., 4,074,989, Cl. 65-27.000.
Brzozowski, Stanley F.; and Cooper, Joseph E., 4,074,990, Cl. 65-27.000.
Brzozowski, Stanley F.; and Cooper, Joseph E., 4,074,991, Cl. 65-27.000.
Coors Container Company: *See—*
McMillin, Danny Leon; and Dugan, Larry Mason, 4,074,809, Cl. 209-75.000.
Copal Company Limited: *See—*
Inoue, Nobuyoshi; and Shimizu, Munetaka, 4,075,648, Cl. 354-238.000.
Copeland, Claude T.; and Constien, Vernon G., to Dow Chemical Company, The. Method for forming a consolidated gravel pack. 4,074,760, Cl. 166-276.000.
Cor, Bertrand: *See—*
Cailliot, Serge Leon Louis, 4,074,621, Cl. 99-286.000.
Corbett, William H.: *See—*
Lewis, Kim R.; and Corbett, William H., 4,074,797, Cl. 197-1.00R.
Cordell, Carl R., Jr. Fishing lure. 4,074,454, Cl. 43-42.280.
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Corning Glass Works: *See—*
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Armistead, William H., 4,075,024, Cl. 106-53.000.
Cunningham, George M., 4,075,270, Cl. 264-209.000.
Voss, Raymond O., 4,074,992, Cl. 65-30.00E.
Cory, Halsey W., to Force Control Industries, Inc. Internal combustion engine and cooling fan drive system. 4,074,663, Cl. 123-41.120.
Cousins, Morison S.: *See—*
Steiner, Fred S.; and Cousins, Morison S., 4,075,105, Cl. 210-477.000.
Coval, Arthur B.: *See—*
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Covington, Wayne F.: *See—*
Christopher, Chris J.; Wenninger, Fred W.; Morris, Donald E.; Covington, Wayne F.; Folsom, Jerry B.; Beyers, Joseph W.; Nairn, John H.; and Osborne, Jeffrey C., 4,075,679, Cl. 364-200.000.
Crandall, Richard Seely; and Faughnan, Brian Wilfred, to RCA Corporation. Method of storing optical information. 4,075,610, Cl. 365-107.000.
Credit Industry Associates, Inc.: *See—*
Jarm, Robert L., 4,074,410, Cl. 29-265.000.
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Crompton & Knowles Corporation: *See—*
Roberson, James H., 4,074,546, Cl. 68-205.00R.
Crounse, Nathan Norman; and Schmidt, Paul Joseph, to Sterling Drug Inc. 3,5-Bis (indolyl)-5-(indolyl)-2(5H)-furanones. 4,075,224, Cl. 260-326.14R.
Cryder, John R.: *See—*
Adams, Stanley B.; Carbaugh, Frederick A.; and Cryder, John R., 4,074,690, Cl. 137-344.000.
Cumming, Edward P., to Robertshaw Controls Company. Control unit having an adjustable differential and method of making the same. 4,074,588, Cl. 74-522.000.
Cummings, Harold R., to General Electric Company. X-ray detector. 4,075,527, Cl. 313-93.000.
Cumpston, Edward H., Jr. Mortars and concretes containing pretreated aggregate fillers. 4,075,026, Cl. 106-97.000.
Cunningham, George M., to Corning Glass Works. Extrusion die mask. 4,075,270, Cl. 264-209.000.
Cunningham, Richard I.; and Day, Daniel E., to Lenmar Industries, Inc. Safety device for a fork-lift equipped refuse vehicle. 4,074,787, Cl. 180-82.00B.
Curry, Harold George; Attwood, Brian William; and White, Derek Graham Walter, to Karl Kroyer St. Anne's Limited. Apparatus for forming multi-ply fibrous sheets. 4,074,959, Cl. 425-81.100.
Curtis, James David, to Curtis, James David. Interfitting game board and playing pieces. 4,074,907, Cl. 273-282.000.
Custer, Peter Anderson. Motion picture film, soundtrack and method for production thereof. 4,075,018, Cl. 96-39.000.
Custom Rolled Corrugated Metals Co.: *See—*
Daniels, Lawrence H.; Hood, Murray C.; and Burdzinski, Boguslaw, 4,074,487, Cl. 52-236.300.
Cutler-Hammer, Inc.: *See—*
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Dai Nippon Printing Co., Ltd.: *See—*
Takamizawa, Minoru; Yamamoto, Yasushi; Inoue, Yoshio; Noshiro, Atsumi; and Fujii, Hitoshi, 4,075,167, Cl. 260-46.50E.
Dailey, Donald E., to Arkla Industries, Inc. Cooking device. 4,074,675, Cl. 126-41.00R.
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Fulenwider, John E.; Belmonte, Carl; and Dakss, Mark L., 4,074,840, Cl. 225-96.500.
D'Alelio, Gaetano F., to University of Notre Dame du Lac. Process for preparing aromatic polyimides and some polyimides prepared thereby. 4,075,171, Cl. 260-47.0CP.
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Dall, Arthur G.; and Morgan, Donald L., to North American Products Corporation. Rotary cutter for agglomerated foam plastic. 4,074,594, Cl. 76-101.00A.
Daly, George W.; and Rucker, Joseph R., to Mastermount Corporation. Speaker mounting system. 4,074,883, Cl. 248-286.000.
D'Amico, John J., to Monsanto Company. Certain benzothiazolin-2-one derivatives. 4,075,216, Cl. 260-294.80C.
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Daniels, Lawrence H.; Hood, Murray C.; and Burdzinski, Boguslaw, to Kaiser Steel Corporation; and Custom Rolled Corrugated Metals Co. Multi-story wall framing system and method. 4,074,487, Cl. 52-236.300.
D'Arcangelis, Timothy, to CATV Components Co. Co-channel interference suppression apparatus. 4,075,566, Cl. 325-369.000.
Darlington, William B.: *See—*
Du Bois, Donald W.; and Darlington, William B., 4,075,070, Cl. 204-129.000.
Dart Industries, Inc.: *See—*
Kiss, Kornel Dezso, 4,075,146, Cl. 260-23.00H.
Das, Dilip K., to Raytheon Company. Samarium-cobalt magnet with grain growth inhibited $SmCo_5$ crystals. 4,075,042, Cl. 148-103.000.
Das, Suryya K.: *See—*
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Data General Corporation: *See—*
Sorensen, Karsten; Bernstein, David H.; and Druke, Michael B., 4,075,692, Cl. 364-200.000.
Dauben, Dwight L.: *See—*
Felber, Betty J.; Dauben, Dwight L.; and Marrs, Richard E., 4,074,757, Cl. 166-261.000.

Davidson, Allen Loy; and Wanat, Ronald Joseph, to Motorola, Inc. Stripline quadrature coupler. 4,075,581, Cl. 333-10.000.
Davidsson, Sven; Christensson, Nils Bertil; and Axelsson, Per Hugo, to AB Akerlund & Rausing. Blank for forming a receptacle having opposite handles. 4,074,849, Cl. 229-1.50B.
Davies, David C., to National Semiconductor Corporation. Electronic calculating apparatus and wallet enclosure. 4,075,702, Cl. 364-705.000.
Davies, Thomas J., Jr., to Fairchild Camera and Instrument Corporation. Incrementer/decrementer circuit. 4,075,464, Cl. 235-92.0EV.
Davis, Burns; and Petke, Frederick David, to Eastman Kodak Company. Polyesters containing a critical range of 1,4-cyclohexanedicarboxylic acid. 4,075,180, Cl. 260-75.00R.
Davis, Dalton M., to FDI, Inc. Method for making vehicle wheel assembly. 4,074,408, Cl. 29-159.010.
Davis, John Stephen; Larson, Kenneth Norman; and Phalen, Frank William, to Bunker Ramo Corporation. Communication control unit. 4,075,691, Cl. 364-200.000.
Davis, Mary Evelyn. Portable open fireplace blowing appliance. 4,074,863, Cl. 239-589.000.
Davis, Michael W.: *See—*
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Davis, Warren C., to Raytheon Company. Tube with terminal end cap. 4,075,415, Cl. 174-50.520.
Davy, David Larry, Sr., to B. F. Goodrich Company, The. Wheel speed sensor. 4,075,520, Cl. 310-168.000.
Day, Daniel E.: *See—*
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Day, William A.: *See—*
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Beilman, John L.; and Deazley, William R., 4,074,570, Cl. 73-182.000.
De Beau, Gerard Anthony; and Price, Harold Arnold, to Union Oil Company of California. Liquid delivery system. 4,074,734, Cl. 141-44.000.
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Debourge, Jean-Claude: *See—*
Thizy, Andre; Pillon, Daniel; Debourge, Jean-Claude; and Lacroix, Guy, 4,075,324, Cl. 424-128.000.
de Cosnac, Bertrand; and Spiwack, Alain, to Commissariat a l'Energie Atomique. Method and device for isolating figures in an image. 4,075,658, Cl. 358-96.000.
Deena Packaging Industries, Inc.: *See—*
Ardito, Gerald J., 4,074,806, Cl. 206-531.000.
Deever, William R.: *See—*
Fuller, Matthew H.; and Deever, William R., 4,075,101, Cl. 210-275.000.
De Felice, Stephen L. Method of improving the myocardial function by the administration of carnitine. 4,075,352, Cl. 424-319.000.
de Feudis, Sergio, to AB Svenska Flaktfabriken. Device for emptying waste material from waste-storage containers. 4,074,921, Cl. 302-39.000.
Degasperi, Mario Marco, to Tasco S.p.A. Method and apparatus for real time image recognition. 4,075,604, Cl. 340-146.3AG.
Dehn, Joseph W., Jr.: *See—*
Lipowski, Stanley A.; Dehn, Joseph W., Jr.; and Retzsch, Clinton E., 4,074,968, Cl. 8-94.220.
Del Norte Technology, Inc.: *See—*
Parker, William H.; and Hart, Lawrence, 4,074,762, Cl. 166-315.000.
Delaney, Richard D. Sailing rig having camber adjustments. 4,074,647, Cl. 114-102.000.
Delle-Alsthom S.A.: *See—*
Thuries, Edmond, 4,075,673, Cl. 361-10.000.
DeMag Aktiengesellschaft: *See—*
Varwig, Karlheinz, 4,074,815, Cl. 214-1.0QG.
DeMarinis, Robert M., to SmithKline Corporation. Substituted acetamidocephalosporins. 4,075,338, Cl. 424-246.000.
DeMichele, Ernest: *See—*
Roberts, Charles; and DeMichele, Ernest, 4,074,670, Cl. 123-119.00E.
Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Horiie, Shigeki; Asai, Shin-Ichiro; Torikoshi, Takashi; Shirakawa, Kazuhiro; and Handa, Minoru, 4,075,253, Cl. 260-665.00R.
Denney, Jerry W., to American Monitor Corporation. Urea assay. 4,074,972, Cl. 23-230.00B.
Denzel, Horst; and Hahmann, Otto, to Chemische Werke Huels Aktiengesellschaft. Heat sealable polybutene-1 blends containing polypropylene or ethylene copolymer. 4,075,290, Cl. 260-897.00A.
Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. Pyrazolo[1,5-a]pyrido[4,3-d]pyrimidin-9(4H)-one and derivatives thereof. 4,075,210, Cl. 260-256.40F.
Depp, Steven W.: *See—*
Baldwin, Howard A.; Depp, Steven W.; Koelle, Alfred R.; and Freyman, Robert W., 4,075,632, Cl. 343-6.80R.
Dermatologics for Veterinary Medicine, Inc.: *See—*
Mandy, Stephen H.; and Thompson, William D., 4,075,353, Cl. 424-338.000.
Desanti, Etiennette Romani. Electronic door announcer. 4,075,659, Cl. 358-108.000.
Deshich, Dushan C.; Chmela, Frank P.; and Kufner, Kenneth L., to Molex Incorporated. Crimping and wire lead insertion machine. 4,074,424, Cl. 29-753.000.
Desmoulins, Jean-Claude: *See—*
Boudet, Georges; Charpentier, Jacques; Vinel, Rene; Desmoulins, Jean-Claude; and de Blic, Emmanuel, 4,074,890, Cl. 254-29.00A.
DeSoto, Inc.: *See—*
Leo, Angelo Frank, 4,075,153, Cl. 260-37.0EP.
Packer, Eugene S.; and England, George J., 4,075,366, Cl. 427-44.000.
Sekmakas, Kazys; and Shah, Raj, 4,075,133, Cl. 260-29.300.
De Winter, Walter Frans: *See—*
Priem, Jan Josef; and De Winter, Walter Frans, 4,075,023, Cl. 96-114.000.
Dexter, Martin: *See—*
Spivack, John D.; and Dexter, Martin, 4,075,161, Cl. 260-45.80A.
Diamond, Julius, to William H. Rorer, Inc. Ethynylbenzene compounds and derivatives thereof for treating pain fever and inflammation. 4,075,354, Cl. 424-356.000.
Diamond Shamrock Corporation: *See—*
Lipowski, Stanley A.; Dehn, Joseph W., Jr.; and Retzsch, Clinton E., 4,074,968, Cl. 8-94.220.
Di Chiara, Anthony J. Walker with tray. 4,074,683, Cl. 135-67.000.
Dick, Wesley Marion, to Borg-Warner Corporation. Combined torque proportioning and reduction drive assembly. 4,074,591, Cl. 74-674.000.
Dickstein, Jack, to Haven Industries, Inc. Vinyl-polymerizable surfactive monomers. 4,075,411, Cl. 560-224.000.
Diez de Aux, Alphonzo. Snow skiing simulation apparatus. 4,074,903, Cl. 272-16.000.
DiGiacomo, Hector L.; and Sacco, John A., to General Battery Corporation. System and apparatus for assembling industrial lead-acid storage batteries. 4,074,423, Cl. 29-730.000.
Dillard, George M., to United States of America, Navy. Recursive filter mean-level detector. 4,075,703, Cl. 364-715.000.
Dockray, Edward; and Killen, Denis, to Unifoam A.G. Manufacture of polymeric foam. 4,074,960, Cl. 425-89.000.
Dr. -Ing. Rudolf Hell GmbH: *See—*
Gall, Winrich, 4,075,662, Cl. 358-280.000.
Wellendorf, Klaus, 4,075,663, Cl. 358-283.000.
Dr. Johannes Heidenhain GmbH: *See—*
Kraus, Heinz, 4,075,497, Cl. 250-505.000.
Dodd, Gilbert E. Apparatus for mixing medication with water supply. 4,074,685, Cl. 137-101.110.
Doelp, Louis C.; Friedman, Lee; and Mitchell, Maurice M., to Air Products and Chemicals, Inc. Process for hydrodesulfurization and liquefaction of carbonaceous stocks using suspended catalyst. 4,075,082, Cl. 208-10.000.
Dolenc, Anton: *See—*
Biornstad, Peter; and Dolenc, Anton, 4,074,624, Cl. 100-35.000.
Dolhyj, Serge R.; Milberger, Ernest C.; and White, James F., to Standard Oil Company, The. Process for preparing phthalic anhydride. 4,075,231, Cl. 260-346.400.
Dolnakov, Jury Pavlovich: *See—*
Ponomarev, Alexei Ivanovich; Sokolov, Sergei Vasilievich; Larionova, Julia Alexeevna; Rymareva, Tatyana Ivanovna; Klebansky, Alexandr Leibovich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; and Alexeeva, Ljubov Antonovna, 4,075,168, Cl. 260-46.50R.
Ponomarev, Alexei Ivanovich; Larionova, Julia Alexeevna; Ankudinov, Anatoly Kirillovich; Ryazanova, Rufina Mikhailovna; Klebansky, Alexandr Leibovich; Sokolov, Sergei Vasilievich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Rymareva, Tatyana Ivanovna; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Karlin, Alexandr Vasilievich; and Lobkov, Vasily Danilovich, 4,075,170, Cl. 260-46.50G.
DoMinh, Thap, to Eastman Kodak Company. High gain cobalt(III)-complex composition and element. 4,075,019, Cl. 96-88.000.
Domtar Limited: *See—*
Marshall, Harry Borden; and Vincent, Donald L., 4,075,248, Cl. 260-600.00R.
Donkle, Lucius B., Jr.: *See—*
Skubic, Leroy F.; Donkle, Lucius B., Jr.; and Groth, Donald L., 4,074,812, Cl. 211-192.000.
Donnan, Harold: *See—*
Morton, Edgar J.; Donnan, Harold; and Wiesenfeld, Arnold, 4,075,117, Cl. 252-135.000.
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Baer, Adrian D.; and Donovan, Terence M., 4,075,385, Cl. 428-215.000.
Donze, Jean-Marie; and Vuffray, Georges, to Girard-Perregaux S.A. Electronic display device. 4,074,513, Cl. 58-4.00A.
Dorawala, Tansukhlal G.; Reinhard, Russell R.; and Estes, John H., to Texaco Inc. Steam dealkylation with hydrogen treated catalyst of groups I, VI B, VIII. 4,075,255, Cl. 260-672.00R.

Dore, James E.: *See—*
Yarwood, John C.; Dore, James E.; and Preuss, Robert K., 4,075,303, Cl. 264-44.000.
Dorfman, Jan William; Carson, Michael David Nisbet; and Rolston, George Angus. Variable foil keel and sail boat. 4,074,646, Cl. 114-39.000.
Doss, Richard C., to Phillips Petroleum Company. Adhesive bonding of poly(arylene sulfide) surfaces. 4,075,388, Cl. 428-297.000.
Douglas, Paul S.; Patellis, Anargiros Pete; and Vredenburgh, Walter A., to Hercules Incorporated. Copolymers of alpha-methylstyrene and styrene and uses thereof. 4,075,404, Cl. 526-237.000.
Dow Chemical Company, The: *See—*
Copeland, Claude T.; and Constien, Vernon G., 4,074,760, Cl. 166-276.000.
Garner, Joseph L., 4,075,138, Cl. 260-2.50B.
Greenawalt, Eddie Lee; and Geren, Lorenzo Dow, 4,074,504, Cl. 53-22.00A.
Hay, Robert A., II, 4,075,264, Cl. 264-46.500.
Meyer, Victor E., 4,075,394, Cl. 428-537.000.
Morehouse, Donald S., Jr.; Bolton, Frank H., deceased; and Bolton, Kathryn M., administratrix, 4,075,134, Cl. 260-29.6RW.
Olstowski, Franciszek, 4,075,151, Cl. 260-33.20R.
Tong, Yulan C., 4,075,207, Cl. 260-250.0BC.
Vrieland, G. Edwin; and Friedli, Hans R., 4,075,122, Cl. 252-437.000.
Wilson, Charles A.; and Mixan, Craig E., 4,075,204, Cl. 260-250.0BC.
Wilson, Charles A.; and Mixan, Craig E., 4,075,205, Cl. 260-250.0BC.
Draftex Development AG: *See—*
Bright, Robert G., 4,074,465, Cl. 49-491.000.
Dragerwerk Aktiengesellschaft: *See—*
Seidel, Peter, 4,075,297, Cl. 261-104.000.
Drake, Bascom A. Roofing mop. 4,074,386, Cl. 15-229.00R.
Drewe, Nigel Wyndham; Parker, Roger John; and Tadros, Tharwat Fouad, to Imperial Chemical Industries Limited. Herbicidal compositions having improved stability. 4,075,002, Cl. 71-92.000.
Droste, Gunter; Seiler, Klaus-Dieter; and Stapel, Wilhelm, to Durkoppwerke GmbH. Controlled braking device for the gripper-thread bobbin of a double lock-stitch sewing machine. 4,074,645, Cl. 112-229.000.
Druke, Michael B.: *See—*
Sorensen, Karsten; Bernstein, David H.; and Druke, Michael B., 4,075,692, Cl. 364-200.000.
Drury, Frederick H., to Weatherford Oil Tool Company, Ltd. Dental amalgam capsule holder. 4,074,900, Cl. 269-254.00R.
Du Bois, Donald W.; and Darlington, William B., to PPG Industries, Inc. Electrode material. 4,075,070, Cl. 204-129.000.
DuBrow, Paul L.: *See—*
Frisque, Alvin J.; and DuBrow, Paul L., 4,075,144, Cl. 260-22.00R.
Ducasse, Joseph Christophe Victor, to Unice Machine Company. Multiflow rotary heat exchanger element. 4,074,751, Cl. 165-92.000.
Ducep, Jean Bernard; Farge, Daniel; Ponsinet, Gerard; and Reisdorf, Daniel, to Rhone-Poulenc Industries. Naphthacene derivatives. 4,075,328, Cl. 424-180.000.
Duffin, Bryan, to Lever Brothers Company. Fabric treatment compositions. 4,075,110, Cl. 252-8.800.
Dugan, Larry Mason: *See—*
McMillin, Danny Leon; and Dugan, Larry Mason, 4,074,809, Cl. 209-75.000.
Duir, John H.: *See—*
Skripek, Milan; and Duir, John H., 4,075,084, Cl. 208-93.000.
Dumez, Bernard, to Thomson-CSF. System for identifying objects equipped with an automatic transponder. 4,075,631, Cl. 343-6.50R.
Duncan, Robert; and Barna, Richard P., to Westinghouse Electric Corporation. Process and apparatus for sealing nuclear reactor fuel. 4,075,454, Cl. 219-137.00R.
Dunham, Philip N.; Tillyer, John N.; and Martin, Armand. Charcoal briquet system. 4,074,977, Cl. 44-38.000.
Dunn, Stephen Alfred: *See—*
Bruno, Stephen James; Dunn, Stephen Alfred; and Raber, Marvin, 4,075,059, Cl. 176-22.000.
Du Pont de Nemours, E. I., and Company: *See—*
Allen, Alvin, 4,075,031, Cl. 106-300.000.
Anton, Anthony; and Nolin, Joseph Arthur Benoit, 4,075,378, Cl. 428-97.000.
Brzozowski, Paul Charles, 4,075,051, Cl. 156-236.000.
Concannon, Thomas P., 4,075,362, Cl. 427-22.000.
Foss, Robert Paul, 4,075,175, Cl. 260-67.00R.
Fuchs, Julius Jakob, 4,075,201, Cl. 260-239.00A.
Hoeschele, Guenther Kurt, 4,075,150, Cl. 260-30.60R.
Popowich, Michael John, 4,075,681, Cl. 361-305.000.
Schaefgen, John Raymond, 4,075,262, Cl. 260-860.000.
Durkoppwerke GmbH: *See—*
Droste, Gunter; Seiler, Klaus-Dieter; and Stapel, Wilhelm, 4,074,645, Cl. 112-229.000.
Duskin Franchise Co. Ltd.: *See—*
Komatsu, Toshiyoshi, 4,075,375, Cl. 427-390.00R.
Dyckman, Edward J.; Andersen, Deborah M.; and Fischer, Eugene C., to United States of America, Navy. Low leaching antifouling organometallic polyvinyls. 4,075,319, Cl. 424-78.000.
Dydyk, Michael, to Motorola, Inc. Accumulating cavity microwave oscillator. 4,075,578, Cl. 331-56.000.
Dyjak, Richard C., to United States of America, Navy. Expendable light-weight minesweeping cutter. 4,074,650, Cl. 114-221.00A.
Dynacore, S.A.: *See—*
Vaucher, Jean M., 4,074,514, Cl. 58-23.0AC.
E. R. Squibb & Sons, Inc.: *See—*
Denzel, Theodor; and Hoehn, Hans, 4,075,210, Cl. 260-256.40F.
E-Systems, Inc.: *See—*
Wilkens, Richard W., 4,075,606, Cl. 340-147.00B.
Earth Sciences, Inc.: *See—*
Loest, Kent W.; and Schaefer, John T., 4,075,068, Cl. 204-93.000.
East/West Industries, Inc.: *See—*
Spinosa, Dominic J.; and Knoll, Frank, 4,074,401, Cl. 24-236.000.
Eastman Kodak Company: *See—*
Davis, Burns; and Petke, Frederick David, 4,075,180, Cl. 260-75.00R.
DoMinh, Thap, 4,075,019, Cl. 96-88.000.
Foster, Charles H., 4,075,226, Cl. 260-327.0TH.
Goffe, Charles A., deceased; and Heseltine, Donald W., 4,075,017, Cl. 96-48.0HD.
Irick, Gether, Jr.; Kelly, Charles A.; and Martin, James C., 4,075,162, Cl. 260-45.8NZ.
Irick, Gether, Jr.; and Kelly, Charles A., 4,075,220, Cl. 260-308.00B.
Morie, Gerald P.; and Sloan, Cephas H., 4,074,724, Cl. 131-267.000.
Easton, Harlan J. Feed mixer. 4,075,713, Cl. 366-192.000.
Eck, Norbert Otto; Stark, Siegfried Alfons; and Wieland, Erich Georg, to Koenig & Bauer Aktiengesellschaft. Apparatus for preventing non-uniform application of ink. 4,074,627, Cl. 101-425.000.
Eckardt, Rudolf: *See—*
Salamon, Klaus; and Eckardt, Rudolf, 4,075,368, Cl. 429-161.000.
Eckel, Alan, to Eckel Industries, Inc. Wall panel assembly. 4,074,489, Cl. 52-272.000.
Eckel Industries, Inc.: *See—*
Eckel, Alan, 4,074,489, Cl. 52-272.000.
Eckhardt, Wolfgang: *See—*
Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, 4,075,349, Cl. 424-301.000.
Eckles, William Edward; and Canaris, Valerie, to R. O. Hull & Company, Inc. Electroplating zinc, ammonia-free acid zinc plating bath therefor and additive composition therefor. 4,075,066, Cl. 204-55.00R.
Economy, James; Jun, Choll K.; and Lin, Ruey Y., to Carborundum Company, The. Boron nitride-boron nitride composites. 4,075,276, Cl. 264-332.000.
Eden, Richard C., to Rockwell International Corporation. Sensitive high speed solid state preamp. 4,075,576, Cl. 330-277.000.
Edgewater Marine, Inc.: *See—*
Watson, Lawrence A., 4,075,304, Cl. 264-46.500.
Educational Electronics of California Inc.: *See—*
Keach, Bernard C., 4,075,668, Cl. 360-80.000.
Edwards, Laroy H., to Chevron Research Company. Fungicidal 5-dialkylamino-4-nitrosulfonamidothiophenes. 4,075,347, Cl. 424-275.000.
Efremov, Jury Nikolaevich: *See—*
Amosov, Vladimir Alexandrovich; Guschin, Alexandr Evgenievich; Efremov, Jury Nikolaevich; and Smirnov, Rudolf Evgenievich, 4,075,028, Cl. 106-186.000.
Eftefield, Larry G., to Caterpillar Tractor Co. Cushion compression struts for bulldozer blades. 4,074,896, Cl. 267-139.000.
Eichelberger, Edward Baxter; Muehldorf, Eugen Igor; Walther, Ronald Gene; and Williams, Thomas Walter, to International Business Machines Corporation. Method of level sensitive testing a functional logic system with embedded array. 4,074,851, Cl. 235-302.000.
Eichenberger, Kurt: *See—*
Wilhelm, Max; Eichenberger, Kurt; Schroter, Herbert; and Ostermayer, Franz, 4,075,208, Cl. 260-256.40C.
Wilhelm, Max; Eichenberger, Kurt; Schroter, Herbert; and Ostermayer, Franz, 4,075,335, Cl. 424-244.000.
Eilerman, George E.; and Tamosauskas, Albert E., to PPG Industries, Inc. Glass fiber coating method. 4,074,988, Cl. 65-3.00C.
Eisenberg, Joel Howard. Ski boot. 4,074,446, Cl. 36-120.000.
Eli Lilly and Company: *See—*
Abdulla, Riaz F., 4,075,000, Cl. 71-88.000.
Archer, Robert A.; and Day, William A., 4,075,230, Cl. 260-345.300.
Bach, Nicholas J.; and Kornfeld, Edmund C., 4,075,212, Cl. 260-285.500.
Beck, James Richard; and Gajewski, Robert Peter, 4,075,003, Cl. 71-92.000.
Chou, Ta-Sen, 4,075,203, Cl. 544-18.000.
Holmes, Richard E., 4,075,206, Cl. 260-250.0BC.
Jones, C. David; and Suarez, Tulio, 4,075,227, Cl. 260-330.500.
Katner, Allen S.; Gutowski, Gerald E.; and Miller, Jean C., 4,075,214, Cl. 260-287.00B.
Kornfeld, Edmund C.; and Bach, Nicholas J., 4,075,213, Cl. 260-285.500.
Lacefield, William B., 4,074,998, Cl. 71-66.000.
McDougald, Larry R., 4,075,323, Cl. 424-114.000.
McShane, Lawrence J., 4,075,219, Cl. 260-306.70C.
Paget, Charles J., 4,075,218, Cl. 260-305.000.
Suarez, Tulio; and Jones, C. David, 4,075,223, Cl. 260-326.50C.
Verge, John Pomfret; Neville, Martin Charles; and Friedman, Henry, 4,075,222, Cl. 548-336.000.
Elke, Dietmar: *See—*
Strauss, Karl-Peter; and Elke, Dietmar, 4,075,638, Cl. 354-23.00D.
Elkins, Robert H.: *See—*
Pangborn, Jon B.; Sharer, John C.; and Elkins, Robert H., 4,075,313, Cl. 423-658.000.

Ellis, Richard W.: *See—*
Zaugg, Alonzo N.; and Ellis, Richard W., 4,074,792, Cl. 182-150.000.
Elmessaar, Heino: *See—*
Andersson, Sture Roland; and Elmessaar, Heino, 4,074,777, Cl. 173-138.000.
Ely, Donald E.; and Schmitt, Arnold J., to Beloit Corporation. Press section structure. 4,075,056, Cl. 162-305.000.
Emerson Electric Co.: *See—*
Plasko, Emil Robert, 4,075,595, Cl. 337-407.000.
Plasko, Emil Robert, 4,075,596, Cl. 337-408.000.
Emery Industries, Inc.: *See—*
Sturwold, Robert J., 4,075,393, Cl. 428-457.000.
EMI Limited: *See—*
Blay, Alan George, 4,075,700, Cl. 364-515.000.
Endo, Takaya: *See—*
Kikuchi, Shoji; Endo, Takaya; Kagami, Teruo; and Sato, Ryosuke, 4,075,021, Cl. 96-95.000.
Engel, Hans O., to Honeywell G.m.b.H. Rotary valve. 4,074,889, Cl. 251-298.000.
Engel, Werner. Automatically operating casting ladle apparatus. 4,074,837, Cl. 222-629.000.
England, George J.: *See—*
Packer, Eugene S.; and England, George J., 4,075,366, Cl. 427-44.000.
Engle, Thomas H., to General Signal Corporation. Quick-acting valve assembly. 4,074,700, Cl. 137-625.270.
Ensign, Thomas H.: *See—*
Sims, Claude C.; and Ensign, Thomas H., 4,075,600, Cl. 340-9.000.
Enters, Edward W., to Gilson Brothers Company. Tiller. 4,074,764, Cl. 172-42.000.
Enthone, Incorporated: *See—*
Hajdu, Juan; and Sosnowski, Raymond A., 4,074,706, Cl. 126-271.000.
Eppler, William G., Jr., to VSC Company, The. Method and apparatus for automatic dictation playback control. 4,075,435, Cl. 179-100.1VC.
Erco Industries Limited: *See—*
Rapson, W. Howard; Fredette, Maurice C. J.; and Meyers, Norman W., 4,075,308, Cl. 423-478.000.
Ericsson, Ernst Enoch, to Telefonaktiebolaget L M Ericsson. Apparatus in connection with a computer memory for enabling transportation of an empty memory field from one side to the other of an adjacent data field while the computer is operative. 4,075,694, Cl. 364-200.000.
ESB Incorporated: *See—*
Levy, Isaac I., 4,075,398, Cl. 429-56.000.
Malchman, Franklin L.; Raddi, William J.; and Sharples, Susan, 4,074,720, Cl. 128-419.0PG.
Escher Wyss Limited: *See—*
Biornstad, Peter; and Dolenc, Anton, 4,074,624, Cl. 100-35.000.
Essel, Alain Jacques: *See—*
Graveron, Bernard Jacques; and Essel, Alain Jacques, 4,075,288, Cl. 260-879.000.
Essex Group, Inc.: *See—*
Mihulka, Merle C., 4,074,596, Cl. 81-9.510.
Essex International, Inc.: *See—*
Karkoski, Joseph; McGregor, Charles William; and Payette, Lionel Joseph, 4,075,179, Cl. 260-75.00N.
Estan Manufacturing Company: *See—*
Haines, Walter E.; and Richardson, Mason E., 4,074,828, Cl. 220-254.000.
Estes, John H.: *See—*
Dorawala, Tansukhlal G.; Reinhard, Russell R.; and Estes, John H., 4,075,255, Cl. 260-672.00R.
Estes, Kenneth K. Cooling fan control. 4,074,662, Cl. 123-41.120.
Eue, Ludwig: *See—*
Kuhle, Engelbert; Klauke, Erich; and Eue, Ludwig, 4,075,235, Cl. 260-453.0RW.
Eustacchio, Peter, to Veitscher Magnesitwerke-Actien-Gesellschaft. Process for preparing granulated magnesium hydroxide and magnesia of a large specific surface. 4,075,311, Cl. 423-636.000.
Eutectic Corporation: *See—*
Jaeger, Frederick T., 4,075,376, Cl. 428-36.000.
Jaeger, Frederick T., 4,075,392, Cl. 428-457.000.
Patel, Mahesh S., 4,075,371, Cl. 427-224.000.
Evolution SA: *See—*
Kempf, Gerhard, 4,075,445, Cl. 200-61.180.
Explosive Metal Working Holland B.V.: *See—*
Zondag, Nicolaas Abraham, 4,074,630, Cl. 102-24.00R.
Extrudart Metal Products, Inc.: *See—*
McHeffey, Murray Parker, 4,074,462, Cl. 49-192.000.
Exxon Production Research Company: *See—*
Christian, Lawrence D., 4,074,754, Cl. 166-245.000.
Cooke, Claude E., Jr., 4,074,756, Cl. 166-253.000.
Exxon Research & Engineering Co.: *See—*
Caulk, Robert H.; and Allan, David E., 4,075,258, Cl. 260-683.440.
Francis, Robert W.; and Newman, Gerald H., 4,075,397, Cl. 429-50.000.
Lang, Robert J., 4,075,079, Cl. 208-8.000.
Luckenbach, Edward C., 4,074,691, Cl. 137-382.000.
Mertzweiller, Joseph K.; and Tenney, Horace M., 4,075,251, Cl. 260-638.00B.
Oswald, Alexis A.; and Valint, Paul L., Jr., 4,075,332, Cl. 424-216.000.
Panzer, Jerome, 4,074,978, Cl. 44-62.000.
F. Garofalo Electric Co., Inc.: *See—*
Garofalo, Frank S., 4,074,373, Cl. 5-325.000.
Fainberg, Evgeny Borisovich: *See—*
Glikman, Mark Leonovich; Sapunar, Zakhar Isaevich; Avrus, Albert Vladimirovich; Gorokhovsky, Vladilen Alexandrovich; Fainberg, Evgeny Borisovich; Ivanov, Vladimir Alexandrovich; Shirkevich, Tatyana Leonidovna; and Sizov, Vadim Mikhailovich, 4,074,994, Cl. 65-44.000.
Fair, Jack E.: *See—*
Gale, Preston Lee; and Fair, Jack E., 4,074,616, Cl. 92-222.000.
Fairchild Camera and Instrument Corporation: *See—*
Davies, Thomas J., Jr., 4,075,464, Cl. 235-92.0EV.
Falk, John Carl, to Borg-Warner Corporation. Chlorinated, hydrogenated polybutadiene impact modifiers for PVC. 4,075,289, Cl. 260-890.000.
Farge, Daniel: *See—*
Ducep, Jean Bernard; Farge, Daniel; Ponsinet, Gerard; and Reisdorf, Daniel, 4,075,328, Cl. 424-180.000.
Fatur, Richard N., to Towmotor Corporation. Cushion spring safety system. 4,075,443, Cl. 200-85.00A.
Faughnan, Brian Wilfred: *See—*
Crandall, Richard Seely; and Faughnan, Brian Wilfred, 4,075,610, Cl. 365-107.000.
Fawn Engineering Corporation: *See—*
Lee, Gerry A., 4,074,829, Cl. 221-238.000.
FDI, Inc.: *See—*
Davis, Dalton M., 4,074,408, Cl. 29-159.010.
Feather Kogyo Kabushiki Kaisha: *See—*
Sugiyama, Tsuneyoshi, 4,074,430, Cl. 30-260.000.
Federico, Arthur. Pastry serving implement. 4,074,917, Cl. 294-7.000.
Feigin, Robert, to Sybron Corporation. Dyeing of synthetic fibers with cationic dyes in the presence of cationic assistants containing hydroxyl and cyclic moieties. 4,074,970, Cl. 8-169.000.
Felber, Betty J.; Dauben, Dwight L.; and Marrs, Richard E., to Standard Oil Company (Indiana). Method using lignosulfonates for high-temperature plugging. 4,074,757, Cl. 166-261.000.
Feldman, Marvin: *See—*
Mason, Burton Hoster; and Feldman, Marvin, 4,074,540, Cl. 61-69.00R.
Feliks, James J., to Mead Corporation, The. Heading machine. 4,074,619, Cl. 93-55.10R.
Fender, C. Leo. Musical instrument truss rod assembly. 4,074,606, Cl. 84-293.000.
Ferraro, Charles F.; Javick, Richard A.; and Robertson, James A., to FMC Corporation. Method of coating with water dispersible, low molecular weight polyamide resin particles of uniform sizes. 4,075,369, Cl. 427-185.000.
Ferrin, Charles Robert, to Combustion Engineering, Inc. Liquid processing media bed drain system. 4,075,102, Cl. 210-277.000.
Ferro Corporation: *See—*
Nuss, James W., 4,075,029, Cl. 106-288.00B.
Fidelity Radio Limited: *See—*
Watkins, David Vaughan, 4,075,568, Cl. 328-1.000.
Field, Peter Graham Spencer; and Bennett, Ronald, to Burmah Oil Trading Limited. Production of phenols. 4,075,250, Cl. 260-621.00C.
Filak, Andrew M. Multi-level knock-down framework structure for supporting a plurality of objects. 4,074,811, Cl. 211-191.000.
Film Cassette Inc.: *See—*
Gourley, Dennis R., 4,074,876, Cl. 242-199.000.
Finnigan Corporation: *See—*
Recher, John R.; Story, Michael S.; and Smith, Ronald D., 4,075,479, Cl. 250-281.000.
Fiore, Barbara Ann: *See—*
Fitton, Robert Charles; and Fiore, Barbara Ann, 4,075,280, Cl. 423-118.000.
Firestone Tire & Rubber Company, The: *See—*
Ambrose, Richard J.; and Hayes, Robert A., 4,075,186, Cl. 260-887.000.
Fischer, Artur. Composite plate. 4,074,496, Cl. 52-622.000.
Fischer, Eugene C.: *See—*
Dyckman, Edward J.; Andersen, Deborah M.; and Fischer, Eugene C., 4,075,319, Cl. 424-78.000.
Fischer, Herbert, to Metallgesellschaft Aktiengesellschaft. Production of sulfur by the Claus process. 4,075,310, Cl. 423-574.00R.
Fischer, John Joseph, to International Nickel Company, Inc., The. Dispersion strengthened ferritic alloy for use in liquid-metal fast breeder reactors (LMFBRS). 4,075,010, Cl. 75-235.000.
Fischer & Porter Co.: *See—*
Burgess, Thomas H., 4,074,571, Cl. 73-194.00B.
Fisher, Bruce S.: *See—*
Higley, Willard S.; Cantor, Paul A.; and Fisher, Bruce S., 4,075,108, Cl. 210-500.00M.
Fishing Tools, Inc.: *See—*
Lee, William T., 4,074,775, Cl. 173-79.000.
Fisler, Charles F., to General Electric Company. Emitter follower voltage controlled power supply. 4,075,685, Cl. 363-44.000.
Fitton, Robert Charles; and Fiore, Barbara Ann, to J. M. Huber Corporation. Preparation of improved zeolites. 4,075,280, Cl. 423-118.000.
Fitzpatrick, John W.: *See—*
Berg, Allan C.; Fitzpatrick, John W.; and Jones, Lewis O., 4,075,391, Cl. 428-407.000.
Fives-Cail Babcock: *See—*
Beghin, Marcel, 4,074,750, Cl. 165-89.000.
Fleming, Ian D.; Turner, Michael K.; and Brewer, Stephen J., to Glaxo Laboratories Limited. Method for producing cephalosporins. 4,075,061, Cl. 195-29.000.

Flint, John R., to Bell & Howell Company. Dual function probe. 4,074,853, Cl. 235-477.000.

Floating Point Systems, Inc.: *See—*
O'Leary, George P., 4,075,704, Cl. 364-748.000.

Florer, James W., to Ciba-Geigy Corporation. Method and apparatus for making pressure plugs in cables or cable stubs with continuous air flow. 4,075,267, Cl. 264-94.000.

Flournoy, Norman E., to Texaco Inc. Combined pipeline marker and test unit. 4,075,601, Cl. 340-15.000.

FMC Corporation: *See—*
Carlson, Ronald H., 4,075,094, Cl. 210-62.000.
Ferraro, Charles F.; Javick, Richard A.; and Robertson, James A., 4,075,369, Cl. 427-185.000.
Gibbons, Loren Kenneth, 4,075,001, Cl. 71-90.000.
Lee, Arthur L.; and Coval, Arthur B., 4,074,784, Cl. 180-24.000.

Foldes, Stephen. Bobbin construction for electrical coils. 4,075,590, Cl. 336-192.000.

Folsom, Gary J.; and Kaisler, Francis J., to United States of America, Air Force. Coaxial optical system. 4,074,930, Cl. 350-33.000.

Folsom, Gary J.: *See—*
Wells, H. David; Folsom, Gary J.; and Kaisler, Francis J., 4,074,964, Cl. 8-10.200.

Folsom, Jerry B.: *See—*
Christopher, Chris J.; Wenninger, Fred W.; Morris, Donald E.; Covington, Wayne F.; Folsom, Jerry B.; Beyers, Joseph W.; Nairn, John H.; and Osborne, Jeffrey C., 4,075,679, Cl. 364-200.000.

Force Control Industries, Inc.: *See—*
Cory, Halsey W., 4,074,663, Cl. 123-41.120.

Ford Motor Company: *See—*
Stockton, Thomas R., 4,074,533, Cl. 60-620.000.

Foreman, Kenneth M.: *See—*
Oman, Richard A.; and Foreman, Kenneth M., 4,075,500, Cl. 290-55.000.

Foss, Robert Paul, to Du Pont de Nemours, E. I., and Company. Preparation of photosensitive polyaldehydes. 4,075,175, Cl. 260-67.00R.

Foster, Alan W.; and Besozzi, Alfio J., to Petro-Tex Chemical Corporation. Purification of unsaturated compounds. 4,075,256, Cl. 260-680.00E.

Foster, Charles H., to Eastman Kodak Company. Secondary antioxidants. 4,075,226, Cl. 260-327.0TH.

Fostick, Moshe A.: *See—*
Stoft, Paul E.; Bridgham, John A.; Chaney, Robert L.; Hill, Charles M.; Lazier, John K. D.; Willis, Barry G.; Wong, Jacob Y.; and Fostick, Moshe A., 4,075,481, Cl. 250-343.000.

Fox, Joel Lawrence; and Marquardt, Eugene Everett, to International Business Machines Corporation. Configuration and control unit for a heterogeneous multi-system. 4,075,693, Cl. 364-200.000.

Fradenburgh, Evan A.; and Yarm, Jay M., to United Technologies Corporation. Locking control and overtravel safety stop system for variable length rotor blades. 4,074,952, Cl. 416-87.000.

Frahm, Carl E.; and Frahm, Shirley E. Valved water container with seal. 4,074,986, Cl. 55-502.000.

Frahm, Shirley E.: *See—*
Frahm, Carl E.; and Frahm, Shirley E., 4,074,986, Cl. 55-502.000.

Francis, Robert W.; and Newman, Gerald H., to Exxon Research & Engineering Co. Cell having chalcogenide cathode and solvated alkali metal salt electrolyte. 4,075,397, Cl. 429-50.000.

Frank, Robert G., to PPG Industries, Inc. Method of shaping glass sheets by the roll forming method. 4,074,995, Cl. 65-104.000.

Franklin Manufacturing Company: *See—*
Case, Richard P., 4,074,545, Cl. 68-12.00R.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef, 4,074,631, Cl. 104-12.000.

Franzolini, Luciano, to GL.GE. Apparecchiature Elettroniche Industriali S.p.A. Device for detecting differences in angular positions of two shafts rotating in opposite directions. 4,074,579, Cl. 73-507.000.

Fratturo, Jules P., to Textube Corporation. Textile carrier. 4,074,875, Cl. 242-118.300.

Fredette, Maurice C. J.: *See—*
Rapson, W. Howard; Fredette, Maurice C. J.; and Meyers, Norman W., 4,075,308, Cl. 423-478.000.

Freed, Gerald L.: *See—*
Schneider, Richard A.; Freed, Gerald L.; and Lipnick, Richard, 4,075,699, Cl. 364-492.000.

Freitag, Dieter: *See—*
Schmidt, Manfred; Freitag, Dieter; and Nouvertne, Werner, 4,075,119, Cl. 252-182.000.

Frequency Technology, Inc.: *See—*
Wroblewski, Theodore, 4,075,547, Cl. 323-60.000.

Freyman, Robert W.: *See—*
Baldwin, Howard A.; Depp, Steven W.; Koelle, Alfred R.; and Freyman, Robert W., 4,075,632, Cl. 343-6.80R.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Frosch, Werner; and Uliczka, Wolfgang, 4,074,395, Cl. 19-163.000.

Fried Krupp Huttenwerke AG: *See—*
Koch, Heinz; Pawlowicz, Manfred; and Brams, Bernhard, 4,074,982, Cl. 51-92.00R.

Friedli, Hans R.: *See—*
Vrieland, G. Edwin; and Friedli, Hans R., 4,075,122, Cl. 252-437.000.

Friedman, Ben Joseph. Method and apparatus for constructing and grading objective examinations. 4,074,445, Cl. 35-48.00A.

Friedman, Henry: *See—*
Verge, John Pomfret; Neville, Martin Charles; and Friedman, Henry, 4,075,222, Cl. 548-336.000.

Friedman, Lee: *See—*
Doelp, Louis C.; Friedman, Lee; and Mitchell, Maurice M., 4,075,082, Cl. 208-10.000.

Frielinghaus, Klaus H.: *See—*
Clark, Gary E.; Frielinghaus, Klaus H.; and Smith, Barry L., 4,074,879, Cl. 246-37.000.

Frisbee, Claude M., to J. I. Case Company. Bulldozer blade control. 4,074,769, Cl. 172-804.000.

Frisbee, Claude M., to J. I. Case Company. Angle control for dozer blade. 4,074,770, Cl. 172-804.000.

Frisch, Kurt Charles; and Russell, Donald Henry, to Atlantic Richfield Company. Powder coating compositions based on a cyclic nitrile compound. 4,075,181, Cl. 260-77.50B.

Frisque, Alvin J.; and DuBrow, Paul L., to Nalco Chemical Company. Oil base paints containing water-soluble polymers. 4,075,144, Cl. 260-22.00R.

Fritts, David H. Over temperature battery deactivation system. 4,075,400, Cl. 429-62.000.

Fritz Eichenauer, Firma: *See—*
Lieber, Ludwig, 4,075,459, Cl. 219-375.000.

Frosch, Werner; and Uliczka, Wolfgang, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Web layering device. 4,074,395, Cl. 19-163.000.

Fuchs, Hermann; Kapaun, Gustav; and Meininger, Fritz, to Hoechst Aktiengesellschaft. Dyestuff preparations for dyeing and printing natural and synthetic polyamide fibre materials. 4,074,967, Cl. 8-54.000.

Fuchs, Julius Jakob, to Du Pont de Nemours, E. I., and Company. Bis carbamate derivatives of diazetidine diones. 4,075,201, Cl. 260-239.00A.

Fuel Research & Instrument Co.: *See—*
Brockschmidt, Willis H.; Brockschmidt, Robert W.; and Grabenbofer, John D., 4,074,561, Cl. 73-17.00R.

Fuhring, Heinrich, to Bowe Bohler & Weber Maschinenfabrik. Solvent-recovery system. 4,074,984, Cl. 55-163.000.

Fuji Photo Film Co., Ltd.: *See—*
Iwasa, Masakazu; Horikawa, Kazuo; and Matsumoto, Seiji, 4,075,011, Cl. 96-1.00R.
Munakata, Tsuneaki; and Kuboshima, Makoto, 4,075,645, Cl. 354-187.000.
Suzuki, Masaaki; and Kasuga, Akira, 4,075,384, Cl. 428-212.000.

Fuji Photo Optical Co., Ltd.: *See—*
Hosono, Tsutomu, 4,075,644, Cl. 354-173.000.

Fujii, Hitoshi: *See—*
Takamizawa, Minoru; Yamamoto, Yasushi; Inoue, Yoshio; Noshiro, Atsumi; and Fujii, Hitoshi, 4,075,167, Cl. 260-46.50E.

Fujikawa, Noboru: *See—*
Furuta, Tadaaki; Inagaki, Kenji; Mizoguchi, Yoshiyuki; Fujikawa, Noboru; and Kominami, Naoya, 4,075,100, Cl. 210-266.000.

Fujino, Takashi: *See—*
Murata, Moriyasu; Yamanaka, Makoto; and Fujino, Takashi, 4,075,129, Cl. 252-527.000.

Fujiwara, Mitsugu: *See—*
Aoki, Ren; Fujiwara, Mitsugu; and Wada, Tasaku, 4,075,664, Cl. 358-286.000.

Fujiyoshi, Kanji; Mizumura, Yutaka; and Sono, Junji, to Toyo Boseki Kabushiki Kaisha. Powder coating composition. 4,075,261, Cl. 260-850.000.

Fukuda, Hiroshi; and Kuzuo, Tooze, to Matsu Kyu Kabushiki Kaisha. Miniature slide switch assembly having flexible detent on movable actuator or fixed housing. 4,075,442, Cl. 200-16.00F.

Fulenwider, John E.; Belmonte, Carl; and Dakss, Mark L., to GTE Laboratories Incorporated. Hand-held tool for optical fiber waveguide end preparation. 4,074,840, Cl. 225-96.500.

Fuller, Matthew H.; and Deever, William R., to Texaco Inc. Apparatuses for fluidizing a filter media plug. 4,075,101, Cl. 210-275.000.

Funakoshi, Eisuke. Water film forming installation. 4,075,295, Cl. 261-36.00R.

Funk, Buddy Keith; and Tetrick, Elton Earl, to Sperry Rand Corporation. Keyboard overlay. 4,075,465, Cl. 235-145.00R.

Furuhama, Teruhide: *See—*
Koyama, Tsuneo; Sugiyama, Yuichi; Furuhama, Teruhide; Tajima, Yoshio; Kakiuchi, Hiroshi; Yamada, Kazuhiro; and Obara, Masaaki, 4,075,159, Cl. 260-42.470.

Furukawa, Yasuhiko; and Igarashi, Tsuyoshi, to Asahi Glass Company Ltd. Laminated glass windshield and method of making same. 4,075,381, Cl. 428-192.000.

Furukubo, Haruo; Takezi, Yasaburo; and Takatuka, Kenzi, to Japan Storage Battery Company Limited. High pressure sodium vapor lamp of unsaturated vapor pressure type. 4,075,530, Cl. 313-229.000.

Furuse, Mituhiro: *See—*
Ochiai, Tomoyoshi; Hayashi, Takeshi; and Furuse, Mituhiro, 4,075,697, Cl. 364-481.000.

Furuta, Tadaaki; Inagaki, Kenji; Mizoguchi, Yoshiyuki; Fujikawa, Noboru; and Kominami, Naoya, to Asahi Kasei Kogyo Kabushiki Kaisha. Dialysis unit and dialysis apparatus employing the dialysis unit. 4,075,100, Cl. 210-266.000.

Futagawa, Yoshikiyo; Kubota, Kanemitsu; and Kamakura, Hiroshi, to Kabushiki Kaisha Suwa Seikosha; and Shinshu Seiki Kabushiki Kaisha. Reference voltage circuit. 4,075,623, Cl. 340-347.0NT.

G.A.O. Gesellschaft fur Automation und Organisation mbH: *See—*
Pauli, Gunter; and Jahn, Gerhard, 4,075,507, Cl. 307-117.000.

G. D. Searle & Co.: *See—*
Mueller, Richard A., 4,075,407, Cl. 542-412.000.

Gajewski, Robert Peter: *See—*
Beck, James Richard; and Gajewski, Robert Peter, 4,075,003, Cl. 71-92.000.

Gale, Preston Lee; and Fair, Jack E., to Caterpillar Tractor Co. Aluminum piston with steel reinforced piston ring grooves. 4,074,616, Cl. 92-222.000.

Galetto, Louis Valentine; Meier, Johann Hans; Pimbley, Walter Thornton; and Wolfe, Bruce Allen, to International Business Machines Corporation. Bi-directional dot matrix printer with slant control. 4,075,636, Cl. 346-75.000.

Gall, Winrich, to Dr. -Ing. Rudolf Hell GmbH. Method and system for compensating the non-linearities in a reproduction process. 4,075,662, Cl. 358-280.000.

Gallacher, Lawrence V., to King Industries, Inc. Catalysis of amino resin cross-linking reactions with high molecular weight sulfonic acids. 4,075,176, Cl. 260-67.60R.

Galliani, Giulio: *See—*
Sale, Amedeo Omodie; Toia, Emilio; Galliani, Giulio; and Lerner, Leonard J., 4,075,342, Cl. 424-258.000.

Garbelman, David L.: *See—*
Jakob, Herbert E.; and Garbelman, David L., 4,075,710, Cl. 366-25.000.

Garcia, Beltran L., to Raymond Lee Organization, Inc., The, part interest to each. Freezer alarm. 4,075,615, Cl. 340-227.100.

Gardos, Michael N.: *See—*
Bilow, Norman; and Gardos, Michael N., 4,075,111, Cl. 252-12.000.

Garner, George H. Apparatus for lockably mounting picture frames and the like. 4,074,888, Cl. 248-475.00R.

Garner, Joseph L., to Dow Chemical Company, The. Polymerization process and vinylidene chloride microspheres produced thereby. 4,075,138, Cl. 260-2.50B.

Garofalo, Frank S., to F. Garofalo Electric Co., Inc. System for attaching pillow to X-ray table. 4,074,373, Cl. 5-325.000.

Garofano, Norman Rutledge: *See—*
Port, Eugene Baker; and Garofano, Norman Rutledge, 4,075,281, Cl. 423-206.00T.

Garrett, Charles Ronald, to American Hoist & Derrick Company. Swivel shackle. 4,074,519, Cl. 59-95.000.

Gastinne, Arnaud: *See—*
Cailliot, Serge Leon Louis, 4,074,621, Cl. 99-286.000.

Gastrock, William Henry; and Asato, Goro, to American Cyanamid Company. 1,3-Dithiolane compounds and method of preparation thereof. 4,075,228, Cl. 260-332.30P.

Gault, Terrell Wilson; and Maguire, Edward John, Jr., to Procter & Gamble Company, The. Liquid detergent compositions containing a self-emulsified silicone suds controlling agent. 4,075,118, Cl. 252-135.000.

Gebruder Ott A.G.: *See—*
Pato, Tibor, 4,075,355, Cl. 426-231.000.

Gee, Wilfred: *See—*
Gilbert, Joseph; McRobbie, Malcolm McKenzie; and Gee, Wilfred, 4,075,637, Cl. 346-153.000.

Geiger, Kenneth E., to Becton, Dickinson and Company. Syringe plunger. 4,074,715, Cl. 128-218.00P.

Geigy Chemical Corporation: *See—*
Kleiner, Eduard K.; and Knell, Martin, 4,075,237, Cl. 260-455.00R.

Gellert, Donald P. Process of and apparatus for solar heating and the like. 4,074,704, Cl. 126-270.000.

Gelotte, Karl O.; Zalay, Andrew W.; and Bell, Malcolm R., to Sterling Drug Inc. Conversion of 3-(pyridinyl)-2-cyclohexen-1-one to 3-(pyridinyl)anilines. 4,075,217, Cl. 260-296.00R.

Genequand, Pierre; and Joyeux, Didier, to Battelle Memorial Institute. Flat cathodic tube display. 4,075,535, Cl. 313-422.000.

General Battery Corporation: *See—*
DiGiacomo, Hector L.; and Sacco, John A., 4,074,423, Cl. 29-730.000.

General Cable Corporation: *See—*
Virkus, Kenneth J., 4,075,419, Cl. 174-107.000.

General Dynamics Corporation: *See—*
Hulderman, Garry N.; and Winderman, Jay B., 4,075,571, Cl. 329-104.000.

General Electric Company: *See—*
Anthony, Thomas R.; and Cline, Harvey E., 4,075,038, Cl. 148-1.500.
Brown, Edgar D., Jr.; and Traver, Frank J., 4,075,115, Cl. 252-75.000.
Castonguay, Roger N.; and Jencks, Charles L., 4,075,584, Cl. 335-20.000.
Cummings, Harold R., 4,075,527, Cl. 313-93.000.
Fisler, Charles F., 4,075,685, Cl. 363-44.000.
Krulewich, Edward B., 4,074,987, Cl. 62-128.000.
Lijewski, Robert R.; and Wiesen, Ernest J., 4,075,485, Cl. 250-369.000.
Mark, Victor, 4,075,164, Cl. 260-45.70S.
McCullough, Charles R., 4,075,421, Cl. 174-120.0SC.
Olander, Walter Karl, 4,075,174, Cl. 260-47.0ET.
Piper, William W.; Prener, Jerome S.; and Gillooly, George R., 4,075,532, Cl. 313-497.000.
Plunkett, Allan Barr, 4,075,538, Cl. 318-52.000.
Razzano, John S., 4,075,169, Cl. 260-46.50R.
Stevens, Francis Joseph, 4,075,561, Cl. 324-149.000.
Tsen, Lo Kwang; and Palkiewicz, John Louis, 4,075,260, Cl. 260-830.0TW.

General Foods Corporation: *See—*
Haag, Robert A.; Rousseau, Patrick M.; and Martin, Thom O., 4,075,356, Cl. 426-285.000.
Szczesniak, Alina Surmacka; and Mao, Wei-Wen, 4,075,357, Cl. 426-332.000.

General Motors Corporation: *See—*
Hanson, Richard J., 4,075,477, Cl. 250-227.000.
Hoffman, Robert P., 4,075,522, Cl. 310-214.000.
Milton, Thomas J., 4,074,548, Cl. 70-1.500.
Schroeder, Thaddeus, 4,075,592, Cl. 337-139.000.
Seidewand, Edward H., 4,074,547, Cl. 70-1.500.

General Signal Corporation: *See—*
Clark, Gary E.; Frielinghaus, Klaus H.; and Smith, Barry L., 4,074,879, Cl. 246-37.000.
Engle, Thomas H., 4,074,700, Cl. 137-625.270.
Walley, Everette D., Jr., 4,075,502, Cl. 307-64.000.

Gennari, Luigi, to Kartocol Anstalt. Process and apparatus for glueing carton bodies. 4,074,618, Cl. 93-49.00M.

Genoa Coal Company: *See—*
Burkett, Joseph C.; and Harshbarger, Harry L., 4,075,675, Cl. 361-48.000.

Geren, Lorenzo Dow: *See—*
Greenawalt, Eddie Lee; and Geren, Lorenzo Dow, 4,074,504, Cl. 53-22.00A.

Gergis, Isoris S., to Rockwell International Corporation. Consecutive bit access of magnetic bubble domain memory devices. 4,075,611, Cl. 365-2.000.

Gergis, Isoris S.: *See—*
Chen, Thomas T.; and Gergis, Isoris S., 4,075,709, Cl. 365-2.000.

Gerhardt, Hans Joachim: *See—*
Kramer, Carl; Stein, Heinrich; and Gerhardt, Hans Joachim, 4,074,841, Cl. 226-97.000.

Gerhardt, Wolfgang, to Tetenal Photowerk Walter Grabig. Color picture development process. 4,075,014, Cl. 96-22.000.

Gerrans, Alfred W., to Sunsweet Growers, Inc. Continuous grader for fruits or the like. 4,075,087, Cl. 209-99.000.

Gertner, Edward R.: *See—*
Clarke, John Elwood; Andrews, Austin M., II; Gertner, Edward R.; Longo, Joseph T.; and Pasko, John G., 4,075,043, Cl. 148-171.000.

Gesellschaft fur Mathematik und Datenverarbeitung mbH Bonn: *See—*
Berkling, Klaus, 4,075,689, Cl. 364-200.000.

Gewerkschaft Eisenhutte Westfalia: *See—*
Grundken, Dieter; and Temme, Helmut, 4,074,804, Cl. 198-735.000.

Gewerkschaft Eisenhutte Westphalia: *See—*
Weirich, Walter; and Kussel, Willy, 4,074,695, Cl. 137-508.000.

Geyer, Paul. Extrusion and mixing apparatus. 4,075,712, Cl. 366-79.000.

Ghisler, Walter; Marlevi, Aleksander; and Anas, Johan Olof, to Telefonaktiebolaget L M Ericsson. Device for providing phase synchronism of a transit station in a digital telecommunication network. 4,075,428, Cl. 179-15.0BS.

Gibbon, Alan, to Johnson, Matthey & Co., Limited. Method of recovering platinum group metal values from a used washcoated catalyst. 4,074,865, Cl. 241-24.000.

Gibbons, Loren Kenneth, to FMC Corporation. 3-Aminoisothiazole derivatives as herbicides. 4,075,001, Cl. 71-90.000.

Gielly, Jean-Francois, to Rhone-Poulenc Industries. Continuous process for the manufacture of phosphoric acid using process water. 4,075,305, Cl. 423-320.000.

Gilbert, Barrie, to Tektronix, Inc. Wideband differential amplifier. 4,075,574, Cl. 330-257.000.

Gilbert, Joseph; McRobbie, Malcolm McKenzie; and Gee, Wilfred, to Ozalid Group Holdings Limited. Electrostatic multi-copier. 4,075,637, Cl. 346-153.000.

Gilbert, Robert E. Earth auger. 4,074,780, Cl. 175-392.000.

Gill, Stephen H.; Knell, Harvey A.; and Tucker, Joseph M., III, to Caterpillar Tractor Co. Shovel linkage for a hydraulic excavator. 4,074,820, Cl. 214-138.00R.

Gillespie, Robert M.; and Ricks, John R., to Cypro Corporation. Sorting apparatus. 4,074,808, Cl. 209-73.000.

Gillette Company, The: *See—*
Moyer, Alan Ray, 4,075,458, Cl. 219-225.000.

Gillooly, George R.: *See—*
Piper, William W.; Prener, Jerome S.; and Gillooly, George R., 4,075,532, Cl. 313-497.000.

Gilson Brothers Company: *See—*
Enters, Edward W., 4,074,764, Cl. 172-42.000.

Girard-Perregaux S.A.: *See—*
Donze, Jean-Marie; and Vuffray, Georges, 4,074,513, Cl. 58-4.00A.

Gist-Brocades N.V.: *See—*
Marx, Arthur Friedrich; and Barendse, Nicolaas Cornelis Maria Emanuel, 4,075,233, Cl. 260-397.300.
Marx, Arthur Friedrich; Verwey, Jan; and Smid, Peter Max, 4,075,337, Cl. 424-246.000.

GL.GE. Apparecchiature Elettroniche Industriali S.p.A.: *See—*
Franzolini, Luciano, 4,074,579, Cl. 73-507.000.

Glaxo Laboratories Limited: *See—*
Fleming, Ian D.; Turner, Michael K.; and Brewer, Stephen J., 4,075,061, Cl. 195-29.000.

Gleinig, Harald E. K., to Colour-Chem Ltd. Process for manufacture of benzidine pigments. 4,075,198, Cl. 260-161.000.

Glikman, Mark Leonovich; Sapunar, Zakhar Isaevich; Avrus, Albert Vladimirovich; Gorokhovsky, Vladilen Alexandrovich; Fainberg, Evgeny Borisovich; Ivanov, Vladimir Alexandrovich; Shirkevich, Tatyana Leonidovna; and Sizov, Vadim Mikhailovich. Process and apparatus for the manufacture of ornamental sheet glass. 4,074,994, Cl. 65-44.000.

Globe Tool and Engineering Company, The: *See—*
Pearsall, Harold I., 4,074,418, Cl. 29-596.000.

Gnaedinger, Donald J., to Basler Electric Company. Power supply apparatus. 4,075,504, Cl. 307-66.000.

Goffe, Charles A., deceased (by Goffe, Patricia Anne, executrix); and Heseltine, Donald W., to Eastman Kodak Company. Photothermographic material containing a combination of energy-sensitive organic dyes and process of forming a positive or negative image with the material. 4,075,017, Cl. 96-48.0HD.

Goffe, Patricia Anne, executrix: *See—*
Goffe, Charles A., deceased; and Heseltine, Donald W., 4,075,017, Cl. 96-48.0HD.

Goitein, Michael: *See—*
Boyd, Douglas P.; and Goitein, Michael, 4,075,492, Cl. 250-445.00T.

Goldblatt, Lawrence; Weiss, Werner; and MacIntyre, Peter A., to Textron, Inc. Saw chain comprising cam links and cutter links without integral depth gauges. 4,074,604, Cl. 83-830.000.

Goldstone, Bertram J.: *See—*
Shapiro, Gerald N.; Goldstone, Bertram J.; Simone, Joseph D.; and Spignese, Edward E., 4,075,630, Cl. 343-5.0DP.

Gole, Monsieur Jean: *See—*
Graveron, Bernard Jacques; and Essel, Alain Jacques, 4,075,288, Cl. 260-879.000.

Goltermann, Wandel U.: *See—*
Harzer, Peter, 4,075,558, Cl. 324-99.00R.

Gooding, Marvin Sexton. Telescoping hood fireplace. 4,074,680, Cl. 126-142.000.

Gore, Gerald D.: *See—*
Morrell, Roger J.; Gunn, Jerome A.; and Gore, Gerald D., 4,074,778, Cl. 175-91.000.

Gorgens, Richard A., to Incoterm Corporation. Cash dispensing system. 4,075,460, Cl. 235-420.000.

Gorin, Everett, to Continental Oil Company. Coal liquefaction process with removal of agglomerated insolubles. 4,075,080, Cl. 208-8.000.

Gorog, Sandor: *See—*
Toth, Edit; Torley, Jozsef; Gorog, Sandor; Szporny, Laszlo; Palosi, Eva; and Szeberenyi, Szabolcz, 4,075,249, Cl. 260-613.00D.

Gorokhovsky, Vladilen Alexandrovich: *See—*
Glikman, Mark Leonovich; Sapunar, Zakhar Isaevich; Avrus, Albert Vladimirovich; Gorokhovsky, Vladilen Alexandrovich; Fainberg, Evgeny Borisovich; Ivanov, Vladimir Alexandrovich; Shirkevich, Tatyana Leonidovna; and Sizov, Vadim Mikhailovich, 4,074,994, Cl. 65-44.000.

Gould, Harvey Mitchell. Parallel silent communicator. 4,075,426, Cl. 179-1.00H.

Gould Inc.: *See—*
Sabatino, Anthony; and Rao, Purushothama, 4,075,399, Cl. 429-57.000.
Snyder, Daniel S.; and Luzsicza, Steven O., 4,075,603, Cl. 340-58.000.

Goulds, Anthony John, to Gunson's (Mineral & Automation) Limited. Apparatus for feeding objects to a point of use. 4,074,807, Cl. 209-73.000.

Gourley, Dennis R., to Film Cassette Inc. Long-play video tape cassette. 4,074,876, Cl. 242-199.000.

Gower, Stephen G. M.; Morris, Cyril R.; and Wright, Ernest. Leveling devices for use in high speed liquid sampling systems. 4,074,976, Cl. 23-292.000.

Grabenhofer, John D.: *See—*
Brockschmidt, Willis H.; Brockschmidt, Robert W.; and Grabenhofer, John D., 4,074,561, Cl. 73-17.00R.

Graber, Elmer A.: *See—*
Hobson, Willis S.; and Graber, Elmer A., 4,074,698, Cl. 137-614.060.

Grabowski, John J.: *See—*
Rambauske, Werner R.; and Grabowski, John J., 4,074,416, Cl. 29-527.400.

Graham Magnetics Incorporated: *See—*
Manly, William A., 4,075,672, Cl. 360-135.000.

Grakauskas, Vytautas: *See—*
Baum, Kurt; and Grakauskas, Vytautas, 4,075,246, Cl. 260-584.00C.

Graveron, Bernard Jacques; and Essel, Alain Jacques, to Gole, Monsieur Jean. Vibration-damping material. 4,075,288, Cl. 260-879.000.

Gravey, Guy; Grolla, Paul; and Roth, Andre, to Metaux Speciaux S.A. Process for recovering molybdenum values from spent catalysts. 4,075,278, Cl. 423-55.000.

Gravey, Guy: *See—*
Castagna, Herman; Gravey, Guy; and Roth, Andre, 4,075,277, Cl. 423-55.000.

Gray, Thomas J.; and Wojtowicz, Jan, to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Flexible lead chloride cathode construction. 4,074,733, Cl. 141-32.000.

Grearson, Kenneth R., to Multuloc Corporation. Panel wall construction. 4,074,486, Cl. 52-235.000.

Greenawalt, Eddie Lee; and Geren, Lorenzo Dow, to Dow Chemical Company, The. Method of forming filling and sealing an industrial size bag. 4,074,504, Cl. 53-22.00A.

Greer, Richard L., to Upjohn Company, The. Process of making a cured resole foam and product produced therefrom. 4,075,139, Cl. 260-2.50F.

Gregoli, Armand A., to Cities Service Company. Fluidized bed hydroretorting of oil shale. 4,075,081, Cl. 208-11.00R.

Grehier, Alain, to Institut Francais du Petrole. Method and device for feeding a fuel cell with a fluid reactant. 4,075,396, Cl. 429-17.000.

Greve, Heinz Gunter; and Resag, Klaus, to Cassella Farbwerke Mainkur Aktiengesellschaft. Benzophenone derivatives. 4,075,409, Cl. 560-36.000.

Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Kudryakov, Mikhail Nikolaevich; Tsipkis, Alexandr Moiseevich; Yakovlev, Vladimir Germogenovich; Averbukh, Alexandr Samoilovich; Scherbakov, Jury Ilich; Yakobson, Natalia Dmitrievna; Semikozov, Vyacheslav Fedorovich; Medvedev, Viktor Vladimirovich; Yartsev, Valery Vasilievich; Kaganov, July Davydovich; Kuznetsov, Vladimir Ivanovich; and Sinelnikov, Alexandr Iosifovich. Hole drilling machine. 4,074,773, Cl. 173-23.000.

Grill, Michael; Grohmann, Helmut; and Nossler, Franz, to Veitscher Magnesitwerke-Actien-Gesellschaft. Control system for an absorption column. 4,075,293, Cl. 261-20.000.

Grinberg, Grigory Efimovich: *See—*
Bashkovich, Alexandr Pavlovich; Zimnukhova, Evgenia Semenovna; Prokopovich, Agnessa Vladimirovna; Polatovskaya, Olga Grigorievna; Pronina, Maria Ivanovna; Kulbakh, Valter Osvaldovich; Rivkina-Pevtsova, Khasya Ionovna; and Grinberg, Grigory Efimovich, 4,075,322, Cl. 424-94.000.

Grisar, Ulrich; and Berstermann, Wilhelm, to Klockner-Werke AG. Method and apparatus for analyzing a composition of an alloy. 4,074,936, Cl. 356-81.000.

Groh, Edward F.; and Cassidy, Dale A., to United States of America, Energy. Method of sealing. 4,074,848, Cl. 228-173.00C.

Grohmann, Helmut: *See—*
Grill, Michael; Grohmann, Helmut; and Nossler, Franz, 4,075,293, Cl. 261-20.000.

Grolla, Paul: *See—*
Gravey, Guy; Grolla, Paul; and Roth, Andre, 4,075,278, Cl. 423-55.000.

Gronlie, John Peter. Dock bracket. 4,074,537, Cl. 61-48.000.

Grosch, Karl A.: *See—*
van der Burg, Sjirk; Grosch, Karl A.; and Bertrand, Marcel J., 4,074,743, Cl. 152-355.000.

Gross, William G.; Long, Henry A., Jr.; and Yamahak, John R., to Armstrong Cork Company. Edge coating applicator nozzle. 4,074,655, Cl. 118-410.000.

Grossman, Leroy W.; Collins, Jack; and Kohls, E. Eugene, to Grossman, Leroy W. Boarding handle for boats. 4,074,379, Cl. 9-1.600.

Groth, Donald L.: *See—*
Skubic, Leroy F.; Donkle, Lucius B., Jr.; and Groth, Donald L., 4,074,812, Cl. 211-192.000.

Grubis, Bernard, to Compagnie Generale de Radiologie. Hot-cathode X-ray tube having an end-mounted anode. 4,075,526, Cl. 313-56.000.

Grubman, Alan A.: *See—*
Pelton, Peter G.; Grubman, Alan A.; and Hasegawa, Gary, 4,075,099, Cl. 210-168.000.

Grumman Aerospace Corporation: *See—*
Oman, Richard A.; and Foreman, Kenneth M., 4,075,500, Cl. 290-55.000.

Grundken, Dieter; and Temme, Helmut, to Gewerkschaft Eisenhutte Westfalia. Scraper-chain conveyors. 4,074,804, Cl. 198-735.000.

Gruppo Lepetit S.p.A.: *See—*
Bellasio, Elvio; and Cristiani, Franco, 4,075,241, Cl. 560-73.000.
Omodei-Sale, Amedeo; Consonni, Pietro; and Lerner, Leonard, 4,075,341, Cl. 424-258.000.
Sale, Amedeo Omodie; Toia, Emilio; Galliani, Giulio; and Lerner, Leonard J., 4,075,342, Cl. 424-258.000.

Gruz, Boris Efimovich: *See—*
Ponomarev, Alexei Ivanovich; Sokolov, Sergei Vasilievich; Larionova, Julia Alexeevna; Rymareva, Tatyana Ivanovna; Klebansky, Alexandr Leibovich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; and Alexeeva, Ljubov Antonovna, 4,075,168, Cl. 260-46.50R.
Ponomarev, Alexei Ivanovich; Larionova, Julia Alexeevna; Ankudinov, Anatoly Kirillovich; Ryazanova, Rufina Mikhailovna; Klebansky, Alexandr Leibovich; Sokolov, Sergei Vasilievich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Rymareva, Tatyana Ivanovna; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Karlin, Alexandr Vasilievich; and Lobkov, Vasily Danilovich, 4,075,170, Cl. 260-46.50G.

GSW Limited/Limitee: *See—*
Smith, David G., 4,074,825, Cl. 220-4.00R.

GTE Laboratories Incorporated: *See—*
Fulenwider, John E.; Belmonte, Carl; and Daksa, Mark L., 4,074,840, Cl. 225-96.500.

GTE Sylvania Incorporated: *See—*
Passavant, Francis C.; and Pease, Richard R., 4,075,620, Cl. 340-324.0AD.
Pitel, Ira J., 4,075,476, Cl. 315-209.00R.

Guild, Charles L.; and Willard, Goodman B. Expansible mandrel with an external, cable actuating winch. 4,074,539, Cl. 61-53.720.

Gulett, Michael R., to NCR Corporation. Semiconductor processing of silicon nitride. 4,075,367, Cl. 427-94.000.

Gulf Research & Development Company: *See—*
Lakshmanan, Pallavoor R., 4,075,149, Cl. 260-29.40R.

Gulf & Western Industries, Inc.: *See—*
Battle, Francis L., 4,075,563, Cl. 324-236.000.

Gulf & Western Manufacturing Company: *See—*
Pim, Norman L., 4,074,558, Cl. 72-239.000.

Gunn, Jerome A.: *See—*
Morrell, Roger J.; Gunn, Jerome A.; and Gore, Gerald D., 4,074,778, Cl. 175-91.000.

Gunson's (Mineral & Automation) Limited: *See—*
Goulds, Anthony John, 4,074,807, Cl. 209-73.000.

Guschin, Alexandr Evgenievich: *See—*
Amosov, Vladimir Alexandrovich; Guschin, Alexandr Evgenievich; Efremov, Jury Nikolaevich; and Smirnov, Rudolf Evgenievich, 4,075,028, Cl. 106-186.000.

Guseva, Valentina Ivanovna: *See—*
Moiseev, Vladimir Vasilievich; Kosovtsev, Vladimir Vasilievich; Kolesnikova, Galina Prokofievna; Zimnukhov, Viktor Alexandrovich; Miroshnikova, Lidia Alexeevna; Kimel, Esfir Abramovna; Chefranova, Edit Konstantinovna; Guseva, Valentina Ivanovna; and Masagutova, Ljudmila Vladimirovna, 4,075,166, Cl. 260-45.95H.

Gutha, Edward. Portable antenna assembly for television receiver. 4,075,634, Cl. 343-742.000.

Gutner, Kenneth H. Bed canopy frame. 4,074,377, Cl. 5-362.000.

Gutowski, Gerald E.: *See—*
Katner, Allen S.; Gutowski, Gerald E.; and Miller, Jean C., 4,075,214, Cl. 260-287.00B.

GW Electronics, Inc.: *See—*
Woodward, Roger P., 4,075,549, Cl. 324-28.00R.

Haag, Robert A.; Rousseau, Patrick M.; and Martin, Thom O., to General Foods Corporation. Cereal process and product. 4,075,356, Cl. 426-285.000.

Haapala, Ray. Cake decorator's turntable. 4,074,656, Cl. 118-502.000.

Haas, Dieter, to Blaupunkt-Werke GmbH. Printed circuit coils. 4,075,591, Cl. 336-200.000.

Habelt, Gerhard: *See—*
Louzil, Friedrich; Habelt, Gerhard; and Mrazek, Gustav, 4,075,669, Cl. 360-92.000.

Haberer, Merle D. Charging system for automobile batteries. 4,075,545, Cl. 320-61.000.

Haberli, Roland: *See—*
Lacroix, Roger; and Haberli, Roland, 4,074,966, Cl. 8-41.00R.

Hacker, Walter L., Jr. Ceiling support clip. 4,074,885, Cl. 248-317.000.

Hagedorn, Floyd T.; Rahrig, Donald D.; and Revells, Robert G., to Libbey-Owens-Ford Company. Method of and apparatus for bending glass sheets. 4,074,996, Cl. 65-106.000.

Hagino, Minoru: *See—*
Hara, Katsuo; Hagino, Minoru; and Sukegawa, Tokuzo, 4,075,654, Cl. 357-30.000.

Hagiwara Denki Kabushiki Kaisha: *See—*
Hattori, Shuzo; and Hiramatsu, Tadao, 4,075,516, Cl. 310-334.000.

Hahmann, Otto: *See—*
Denzel, Horst; and Hahmann, Otto, 4,075,290, Cl. 260-897.00A.

Hailey, James L.: *See—*
Monk, James T.; Hailey, James L.; and Boyles, Tonnie M., 4,074,801, Cl. 198-304.000.

Haines, Walter E.; and Richardson, Mason E., to Estan Manufacturing Company. Sealing plug assembly. 4,074,828, Cl. 220-254.000.

Hair, Michael L.: *See—*
Ward, Anthony T.; Damjanovic, Aleksandar; and Hair, Michael L., 4,075,013, Cl. 96-1.50R.

Hajdu, Juan; and Sosnowski, Raymond A., to Enthone, Incorporated. Solar collector having selective film of improved stability to liquid water condensate. 4,074,706, Cl. 126-271.000.

Hale, Dean H. Power unit for a medical or like stool. 4,074,887, Cl. 248-404.000.

Hall, Jack F., to U-Cart Concrete Systems, Inc. Concrete mixing system. 4,075,711, Cl. 366-26.000.

Halliburton Company: *See—*
Young, Bill M., 4,074,536, Cl. 61-36.00C.

Halpert, David: *See—*
Blasnik, William; and Halpert, David, 4,074,838, Cl. 223-85.000.

Hamada, Yoshitugu: *See—*
Maruyama, Masayuki; Hamada, Yoshitugu; and Yamauchi, Ryoichi, 4,074,956, Cl. 418-178.000.

Hamalainen, Lauri: *See—*
Melaja, Asko J.; and Hamalainen, Lauri, 4,075,406, Cl. 536-1.000.

Hamamatsu Terebi Kabushiki Kaisha: *See—*
Hara, Katsuo; Hagino, Minoru; and Sukegawa, Tokuzo, 4,075,654, Cl. 357-30.000.

Hambleton, Peter: *See—*
Knill, Kenneth George; Bowler, Michael Kendal; and Hambleton, Peter, 4,075,027, Cl. 106-99.000.

Hamilton Technology, Inc.: *See—*
Nelson, John E., 4,074,433, Cl. 32-14.00E.

Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Apparatus for printing and applying pressure sensitive labels. 4,075,052, Cl. 156-384.000.

Hammann, Ingeborg: *See—*
Hoffmann, Hellmut; and Hammann, Ingeborg, 4,075,330, Cl. 424-200.000.

Hammond Corporation: *See—*
Stoiber, Alto, 4,074,846, Cl. 227-51.000.

Hammonds, James C.: *See—*
Hicks, Paul E., Jr.; and Hammonds, James C., 4,074,633, Cl. 105-368.00B.

Hamprecht, Gerhard; Schirmer, Ulrich; Wuerzer, Bruno; and Retzlaff, Guenter, to BASF Aktiengesellschaft. 2,1,3-Benzothiadiazines. 4,075,004, Cl. 71-91.000.

Handa, Minoru: *See—*
Horiie, Shigeki; Asai, Shin-Ichiro; Torikoshi, Takashi; Shirakawa, Kazuhiro; and Handa, Minoru, 4,075,253, Cl. 260-665.00R.

Handy & Harman: *See—*
Korbelak, Alexander; and King, John, 4,075,065, Cl. 204-43.00G.

Hankosky, Andrew; and Schoeneweis, E. Frederick, to Rockwell International Corporation. Coupling. 4,074,542, Cl. 64-30.00R.

Hanni, Stephen L.; and Johnson, Dudley B., to Texas Instruments Incorporated. Printed wiring board with angled portion and its method of manufacture. 4,074,419, Cl. 29-625.000.

Hanseatischer Maschinenbau G.m.b.H.: *See—*
Kunig, Helmut; and Reinke, Klaus, 4,074,394, Cl. 19-159.00R.

Hansen, Einar T.: *See—*
Cavil, David T.; Hansen, Einar T.; and Schmidt, Henry J., 4,074,669, Cl. 123-148.0CC.

Hanson, Richard J., to General Motors Corporation. Optical-electronic interface connector. 4,075,477, Cl. 250-227.000.

Hansson, Hans-Erik, to Stal-Laval Turbin AB. Composite epicyclic gear ring and method of manufacture. 4,074,583, Cl. 74-413.000.

Hanusiak, William M.: *See—*
White, Eugene W.; Hanusiak, William M.; and White, Rodney A., 4,075,092, Cl. 210-22.00R.

Hara, Katsuo; Hagino, Minoru; and Sukegawa, Tokuzo, to Hamamatsu Terebi Kabushiki Kaisha. Semiconductor photoelectron emission device. 4,075,654, Cl. 357-30.000.

Harada, Hisamitsu: *See—*
Nohara, Tomiyasu; Matsuno, Yoshiyuki; Harada, Hisamitsu; and Yamada, Akinori, 4,074,440, Cl. 34-92.000.

Harada, Jumei: *See—*
Nishimura, Kazuhiro; Harada, Jumei; Migita, Tetsuhiko; and Matsunaga, Tsutomu, 4,075,275, Cl. 264-313.000.

Haraikawa, Tetsuo: *See—*
Hayashida, Yoshihiro; and Haraikawa, Tetsuo, 4,074,532, Cl. 60-562.000.

Hardesty, Edwin Charles: *See—*
Bloxham, Gordon Foreman; Brezeale, Claude Paren; Cocco, Eugene Raymond; Hardesty, Edwin Charles; Small, Byron Lee; Steinert, Daniel Marion; and McGonigal, Charles, 4,075,299, Cl. 264-25.000.

Harig, Manfred, to N.V. Western Gear Europe S.A. Hoisting device. 4,074,582, Cl. 74-230.240.

Harken, Peter O., to Vanguard, Inc. Plural bearing and sheave assembly. 4,074,892, Cl. 254-188.000.

Harmon, Flossie G. Shampooing unit. 4,074,369, Cl. 4-159.000.

Harmony, George W., III, to Mediglas, Inc. Bathing apparatus for hospital or bedridden patients. 4,074,370, Cl. 4-173.00R.

Harrer, Paul H.: *See—*
Adams, Charles E.; Quackenbush, Harold E.; Harrer, Paul H.; Langford, Le Roy; and Cleek, Alvin L., 4,074,830, Cl. 221-266.000.

Harris, Ramsay L. Versatile hand loom. 4,074,726, Cl. 139-29.000.

Harris, Richard K.; Jewsbury, (Charles) Bill (William); and Shoup, Dale W., to Slope Indicator Company, The. Vibratory-wire strain gage. 4,074,565, Cl. 73-88.50R.

Harshbarger, Harry L.: *See—*
Burkett, Joseph C.; and Harshbarger, Harry L., 4,075,675, Cl. 361-48.000.

Hart, Lawrence: *See—*
Parker, William H.; and Hart, Lawrence, 4,074,762, Cl. 166-315.000.

Hart, Richard: *See—*
Mowbray, Warwick; Hart, Richard; and Cavey, William, 4,074,659, Cl. 119-159.000.

Harzer, Peter, to Goltermann, Wandel U. Method of and system for metering a periodically varying voltage. 4,075,558, Cl. 324-99.00R.

Hasegawa, Gary: *See—*
Pelton, Peter G.; Grubman, Alan A.; and Hasegawa, Gary, 4,075,099, Cl. 210-168.000.

Hashimoto, Hiroshi; Abe, Tetsuo; and Kato, Akira, to Sanyo Machine Works, Ltd. Apparatus for automatically feeding and setting stud bolts. 4,074,425, Cl. 29-813.000.

Hattori, Shuzo; and Hiramatsu, Tadao, to Hagiwara Denki Kabushiki Kaisha. Diffraction electroacoustic transducer. 4,075,516, Cl. 310-334.000.

Hattori, Tadashi: *See—*
Obayashi, Hideki; Kohama, Tokio; Hattori, Tadashi; and Nishida, Minoru, 4,074,566, Cl. 73-116.000.

Haven Industries, Inc.: *See—*
Dickstein, Jack, 4,075,411, Cl. 560-224.000.

Hay, Robert A., II, to Dow Chemical Company, The. Method of insulating a container. 4,075,264, Cl. 264-46.500.

Hayashi, Hideaki; and Kakuta, Susumu, to Nippon Columbia Kabushikikaisha. Tension servo apparatus. 4,074,873, Cl. 242-75.430.

Hayashi, Takeshi: *See—*
Ochiai, Tomoyoshi; Hayashi, Takeshi; and Furuse, Mituhiro, 4,075,697, Cl. 364-481.000.

Hayashida, Yoshihiro; and Haraikawa, Tetsuo, to Tokico Ltd. Hydraulic master cylinder. 4,074,532, Cl. 60-562.000.

Hayasi, Yosio: *See—*
Konno, Kazuhiko; Hayasi, Yosio; Taniyama, Eiji; and Sekiya, Tetsuo, 4,075,121, Cl. 252-407.000.

Hayenga, Godfrey B. Aerial device. 4,074,877, Cl. 244-155.00R.

Hayes, John C.: *See—*
Politzer, Ernest L.; and Hayes, John C., 4,075,259, Cl. 260-683.680.

Hayes, Robert A.: *See—*
Ambrose, Richard J.; and Hayes, Robert A., 4,075,186, Cl. 260-887.000.
Haylock, John Christopher: *See—*
Lofquist, Robert Alden; and Haylock, John Christopher, 4,075,271, Cl. 264-210.00F.
Heaps, John Bernard: *See—*
Senior, Ascanius John; and Heaps, John Bernard, 4,074,657, Cl. 119-29.000.
Heater, Guy C., Jr. Pavement mat and process. 4,074,948, Cl. 404-75.000.
Heberlein Maschinenfabrik AG: *See—*
Luthi, Walter, 4,074,544, Cl. 68-5.00E.
Heffron, Charles Buckner, to Magnavox Company, The. Automatic peaking circuit. 4,075,661, Cl. 358-166.000.
Hegel, Robert W.: *See—*
Paul, George A.; Hegel, Robert W.; Bethell, Michael R.; Branham, Charles L.; and Utter, Allan D., 4,075,098, Cl. 210-168.000.
Heinemann Electric Company: *See—*
Asdahl, Frank P., 4,075,446, Cl. 200-144.00R.
Held, Lisa: *See—*
Patton, Ann T.; Roscetti, Betty Ann; and Held, Lisa, 4,074,381, Cl. 9-310.00J.
Helfferich, Fred G.: *See—*
Hill, Harold J.; Reisberg, Joseph; Helfferich, Fred G.; Lake, Larry W.; and Pope, Gary A., 4,074,755, Cl. 166-252.000.
Hellrung, Friedrich: *See—*
Vopel, Karl Heinz; Hellrung, Friedrich; and Berendes, Otto, 4,075,292, Cl. 260-986.000.
Helversen, Frederick D.; and Rivers, Morris R., to Helversen, Frederick D. Rotary through dryer having multiple vacuum chambers and associated heaters. 4,074,441, Cl. 34-122.000.
HemoTec, Inc.: *See—*
Braun, Walter Jacob; Altshuler, John Henry; and Cherry, Peter Whitfield, 4,074,971, Cl. 23-230.00B.
Hendee, Leon Clyde, III: *See—*
Cooper, David Eugene; Hendee, Leon Clyde, III; Hill, Walter Guy, Jr.; Leshem, Adam; and Marugg, Martin Lewis, 4,074,814, Cl. 214-1.0BB.
Hendriks, Nicolaas Arie, to Bouwmaatschappij Nederhorst B. V. Safety wall for a storage tank. 4,074,485, Cl. 52-224.000.
Hepworth & Grandage Ltd.: *See—*
Cockcroft, Frederick Edward, 4,074,617, Cl. 92-228.000.
Hercules Incorporated: *See—*
Douglas, Paul S.; Patellis, Anargiros Pete; and Vredenburgh, Walter A., 4,075,404, Cl. 526-237.000.
Hereth, Ralph F. Fluid pressure actuator for producing rotational motion. 4,074,611, Cl. 91-179.000.
Herr, John Addison, to Singer Company, The. Sewing machine with programmable memory. 4,074,642, Cl. 112-158.00E.
Heseltine, Donald W.: *See—*
Goffe, Charles A., deceased; and Heseltine, Donald W., 4,075,017, Cl. 96-48.0HD.
Hesston Corporation: *See—*
White, Allen A., 4,074,623, Cl. 100-3.000.
Hester, Jackson B., Jr., to Upjohn Company, The. Process for preparing triazolobenzodiazepines. 4,075,221, Cl. 260-308.00R.
Hettche, Albert: *See—*
Scheuermann, Horst; and Hettche, Albert, 4,075,211, Cl. 260-270.00H.
Hewlett-Packard Company: *See—*
Christopher, Chris J.; Wenninger, Fred W.; Morris, Donald E.; Covington, Wayne F.; Folsom, Jerry B.; Beyers, Joseph W.; Nairn, John H.; and Osborne, Jeffrey C., 4,075,679, Cl. 364-200.000.
Stoft, Paul E.; Bridgham, John A.; Chaney, Robert L.; Hill, Charles M.; Lazier, John K. D.; Willis, Barry G.; Wong, Jacob Y.; and Fostick, Moshe A., 4,075,481, Cl. 250-343.000.
Hicklin, Denis Raymond; and Attwood, Brian William, to Karl Kroyer St. Anne's Limited. Method and apparatus for dry forming a layer of fibers. 4,074,393, Cl. 19-303.000.
Hicks, Paul E., Jr.; and Hammonds, James C., to ACF Industries, Incorporated. Trailer hitch having elastomer-in-shear cushioning in the diagonal strut. 4,074,633, Cl. 105-368.00B.
Higginbottom, Harold P.: *See—*
Burke, William D.; Higginbottom, Harold P.; and Le Blanc, John R., 4,075,403, Cl. 429-253.000.
High, Thaine. Baseball batting cages. 4,074,905, Cl. 273-26.00D.
Higley, Willard S.; Cantor, Paul A.; and Fisher, Bruce S., to United States of America, Health, Education and Welfare. Polycarbonate membranes and production thereof. 4,075,108, Cl. 210-500.00M.
Higosaki, Nobuyuki: *See—*
Kuyama, Hiroshi; and Higosaki, Nobuyuki, 4,075,326, Cl. 424-141.000.
Higuchi, Masaru, to West Electric Co., Ltd. Reflector for flash light apparatus. 4,075,472, Cl. 362-255.000.
Hill, Charles M.: *See—*
Stoft, Paul E.; Bridgham, John A.; Chaney, Robert L.; Hill, Charles M.; Lazier, John K. D.; Willis, Barry G.; Wong, Jacob Y.; and Fostick, Moshe A., 4,075,481, Cl. 250-343.000.
Hill, Harold J.; Reisberg, Joseph; Helfferich, Fred G.; Lake, Larry W.; and Pope, Gary A., to Shell Oil Company. Ion exchange controlled chemically aided waterflood process. 4,074,755, Cl. 166-252.000.
Hill, Walter Guy, Jr.: *See—*
Cooper, David Eugene; Hendee, Leon Clyde, III; Hill, Walter Guy, Jr.; Leshem, Adam; and Marugg, Martin Lewis, 4,074,814, Cl. 214-1.0BB.
Hilley, Larry L.; and Neff, Marion W., to Recognition Equipment Incorporated. Character recognition unit. 4,075,605, Cl. 340-146.3AC.
Hilti Aktiengesellschaft: *See—*
Busler, Albert, 4,074,609, Cl. 85-77.000.
Oesterle, Helmut, 4,074,843, Cl. 227-8.000.
Hinckley, William L., Jr., to Rockwell International Corporation. Averaging and peak detection circuit. 4,075,513, Cl. 307-350.000.
Hiramatsu, Tadao: *See—*
Hattori, Shuzo; and Hiramatsu, Tadao, 4,075,516, Cl. 310-334.000.
Hirano, Yutaka: *See—*
Sakurada, Ichiro; Okada, Toshio; and Hirano, Yutaka, 4,075,075, Cl. 204-159.170.
Hirata, Yasuo: *See—*
Takahata, Fumio; Inagaki, Kazunori; and Hirata, Yasuo, 4,075,429, Cl. 179-15.0BM.
Hirayama, Takanobu: *See—*
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Hirono, Yoshihiko: *See—*
Sawaki, Mikio; Iwataki, Isao; Hirono, Yoshihiko; and Ishikawa, Hisao, 4,075,239, Cl. 260-464.000.
Hirsbrunner, Pierre; Beyeler, Theodor; and Shepherd, David, to Societe d'Assistance Technique pour Produits Nestle S.A. Process for protecting organic materials using a bacteriostatic coffee extract. 4,075,329, Cl. 424-195.000.
Hirsch, Allen Frederick, to Ortho Pharmaceutical Corporation. Inhibition of male fertility with aliphatic sulfamates. 4,075,351, Cl. 424-303.000.
Hirschman, Abraham. Plant support. 4,074,461, Cl. 47-70.000.
Hishida, Yukio; Watanabe, Tomoyoshi; Hirayama, Takanobu; and Asakura, Hideo, to Brother Kogyo Kabushiki Kaisha. Ribbon cartridge having slack preventing means. 4,074,799, Cl. 197-151.000.
Hishiki, Tetsuo: *See—*
Yagi, Hideaki; and Hishiki, Tetsuo, 4,075,449, Cl. 200-315.000.
Hitachi, Ltd.: *See—*
Mukaemachi, Takuji; Takeshita, Tetsuo; Miyoshi, Tatsuru; and Kojima, Takafumi, 4,075,431, Cl. 179-18.0GF.
Hitachi Metals, Ltd.: *See—*
Matake, Naomasa; Yoshimura, Tadayoshi; and Sato, Kuniaki, 4,074,947, Cl. 403-406.000.
Hobson, Willis S.; and Graber, Elmer A., to Seymour Manufacturing Co., Inc. Hydraulic coupler. 4,074,698, Cl. 137-614.060.
Hochiki Corporation: *See—*
Masuda, Hajime; Takeuchi, Takeshi; Watanabe, Masakatsu; and Tomioka, Yukio, 4,075,628, Cl. 340-416.000.
Hochmuth, Frank William, to Combustion Engineering, Inc. Burning hydrogen and oxygen to superheat steam. 4,074,708, Cl. 126-360.00A.
Hochmuth, Walter; and Hollfelder, Hans Peter, to Robert Zapp, Werkzeug-und Maschinenfabrik GmbH. Cutting tool. 4,074,949, Cl. 407-114.000.
Hochstetler, Samuel A. C-Clamp. 4,074,899, Cl. 269-249.000.
Hodges, Jimmie Ray, to Pennwalt Corporation. Electrolytic cell. 4,075,077, Cl. 204-269.000.
Hodgson, James H., to Chromalloy American Corporation. Trailer for farm tractors with driven member powered by p.t.o. 4,074,639, Cl. 111-6.000.
Hodil, Elmer Raleigh, Jr., to Olin Corporation. Gravity feed hot top tool. 4,074,844, Cl. 227-8.000.
Hoechst Aktiengesellschaft: *See—*
Fuchs, Hermann; Kapaun, Gustav; and Meininger, Fritz, 4,074,967, Cl. 8-54.000.
Holst, Arno; and Kostrzewa, Michael, 4,075,279, Cl. 536-88.000.
Kruse, Hubert; and Sommer, Karl, 4,074,965, Cl. 8-41.00R.
Hoehn, Hans: *See—*
Denzel, Theodor; and Hoehn, Hans, 4,075,210, Cl. 260-256.40F.
Hoehn, Richard F.; Morris, Hugh C.; Therkildsen, Henry T.; and Behrends, Bertwin E., to Caterpillar Tractor Co. Adjustable sequence valve for towing winch hydraulic controls. 4,074,796, Cl. 192-3.570.
Hoeschele, Guenther Kurt, to Du Pont de Nemours, E. I., and Company. Composition for curing polyurethanes. 4,075,150, Cl. 260-30.60R.
Hofer, Kurt; and Tscheulin, Guenther, to Sandoz Ltd. Benzene phosphonous acid compounds, their production and use as stabilizers for organic materials. 4,075,163, Cl. 260-45.70P.
Hoffman, Neil R.; and Jansen, Johannes H., to Brake Engineering, Inc. Disc brake apparatus suitable for bicycles. 4,074,910, Cl. 280-289.00R.
Hoffman, Robert P., to General Motors Corporation. Self clamping armature casing for an electric motor driven fluid pump. 4,075,522, Cl. 310-214.000.
Hoffmann, Hellmut; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. O,S-Dialkyl-o-[1-alkyl-3,4-trimethylene-pyrazol(5)yl]-thionothiolphosphoric acid ester. 4,075,330, Cl. 424-200.000.
Hoffmann, Kurt, to Siemens Aktiengesellschaft. Digital differential amplifier for CCD arrangements. 4,075,515, Cl. 307-362.000.
Hoffmann-La Roche, Inc.: *See—*
Jernow, Jane Liu; and Rosen, Perry, 4,075,209, Cl. 260-256.40N.
Josse, Rene, 4,075,333, Cl. 424-237.000.
Hofmann, Fritz, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Method and circuit arrangement for adapting the measuring range of a measuring device operating with delta modulation in a navigation system. 4,075,701, Cl. 364-579.000.
Hogan, Thomas Leo: *See—*
Lang, Robert S.; Post, Rodney Morris; and Hogan, Thomas Leo, 4,074,481, Cl. 52-169.800.
Hohmann, Volker: *See—*
Storp, Klaus; Wirth, Hans; Rittinger, Gunter; and Hohmann, Volker, 4,075,282, Cl. 423-230.000.
Holler, Richard P.; and McMath, Connie W., to United States of America, Air Force. Pressure actuated collapsible curtain liners for a gas turbine engine nozzle. 4,074,523, Cl. 60-266.000.
Hollfelder, Hans Peter: *See—*
Hochmuth, Walter; and Hollfelder, Hans Peter, 4,074,949, Cl. 407-114.000.
Hollingsead-Pryor Enterprises, Inc.: *See—*
Hollingsead, Robert Allen; Kuchler, Abraham; and Pryor, Clyde Robert, 4,075,444, Cl. 200-51.090.
Hollingsead, Robert Allen; Kuchler, Abraham; and Pryor, Clyde Robert, to Hollingsead-Pryor Enterprises, Inc. Electrical connector structure. 4,075,444, Cl. 200-51.090.
Holmes, Horace D. Locking thread forming tap. 4,074,950, Cl. 408-220.000.
Holmes, Richard E., to Eli Lilly and Company. Substituted pyrroloquinoxalinones and diones. 4,075,206, Cl. 260-250.0BC.
Holst, Arno; and Kostrzewa, Michael, to Hoechst Aktiengesellschaft. Process for the manufacture of swellable cellulose ethers. 4,075,279, Cl. 536-88.000.
Honeywell G.m.b.H.: *See—*
Engel, Hans O., 4,074,889, Cl. 251-298.000.
Honeywell Inc.: *See—*
Castleman, B. Wayne; and Schluter, Bernard C., 4,075,550, Cl. 324-33.000.
Peterson, Dean M., 4,075,639, Cl. 354-25.000.
Honeywell Information Systems Inc.: *See—*
Calle, Jaime; and Chelberg, Lawrence W., 4,075,686, Cl. 364-200.000.
Honma, Kimiyasu: *See—*
Nemoto, Mitsuo; and Honma, Kimiyasu, 4,075,418, Cl. 179-100.41K.
Hood, Murray C.: *See—*
Daniels, Lawrence H.; Hood, Murray C.; and Burdzinski, Boguslaw, 4,074,487, Cl. 52-236.300.
Hooker Chemicals & Plastics Corporation: *See—*
Mark, Victor; and Zengierski, Leon R., 4,075,238, Cl. 260-458.00C.
Seedorf, Jack H.; Hruda, Robert M.; and Abell, Donald E., 4,075,448, Cl. 200-262.000.
Horanoff, Eugene V., to United States of America, Navy. Low interaction wind tunnel balance. 4,074,567, Cl. 73-147.000.
Horback, William B.: *See—*
Trapasso, Louis E.; and Horback, William B., 4,075,387, Cl. 428-288.000.
Horiie, Shigeki; Asai, Shin-Ichiro; Torikoshi, Takashi; Shirakawa, Kazuhiro; and Handa, Minoru, to Denki Kagaku Kogyo Kabushiki Kaisha. Organolithium polymerization initiators and their preparations. 4,075,253, Cl. 260-665.00R.
Horikawa, Kazuo: *See—*
Iwasa, Masakazu; Horikawa, Kazuo; and Matsumoto, Seiji, 4,075,011, Cl. 96-1.00R.
Horizons Research Incorporated: *See—*
Wainer, Eugene, 4,074,980, Cl. 48-197.00R.
Horowitz, Irving, to Teleglobe Pay-TV System, Inc. Pay television system with synchronization suppression. 4,075,660, Cl. 358-124.000.
Horrocks, Donald L., to Beckman Instruments, Inc. Quench determination in liquid scintillation counting systems. 4,075,480, Cl. 250-328.000.
Hosono, Tsutomu, to Fuji Photo Optical Co., Ltd. Motor drive means for motor driven single lens reflex camera. 4,075,644, Cl. 354-173.000.
Howard, Lawrence F.; Mills, James W.; and Shannon, James L. Carpet cleaning brush. 4,074,385, Cl. 15-180.000.
Howard, Lowell Francis, to International Business Machines Corporation. Method for injecting charge in field effect devices. 4,075,653, Cl. 357-23.000.
Howe, Ralph S., Jr., to Textron, Inc. Locking mechanism for securing a bearing ring or the like to a shaft. 4,074,923, Cl. 308-236.000.
Howton, Craig N.: *See—*
Hunter, Robert O., Jr.; and Howton, Craig N., 4,075,579, Cl. 331-94.50G.
Hruda, Robert M.: *See—*
Seedorf, Jack H.; Hruda, Robert M.; and Abell, Donald E., 4,075,448, Cl. 200-262.000.
Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, to Ciba-Geigy Corporation. Microbicidal compositions. 4,075,349, Cl. 424-301.000.
Hudis, Michael I., to Rexnord Inc. Concrete receiver and placer for road paving. 4,074,802, Cl. 198-315.000.
Hudson, Gerald E. Wind power converter. 4,074,951, Cl. 415-2.000.
Hughes Aircraft Company: *See—*
Bilow, Norman; and Gardos, Michael N., 4,075,111, Cl. 252-12.000.
Lynch, David D., Jr.; and Tower, Lee W., 4,075,688, Cl. 364-200.000.
Hulderman, Garry N.; and Winderman, Jay B., to General Dynamics Corporation. Externally biased video detector circuit for limiting clutter and noise in a detected radar signal. 4,075,571, Cl. 329-104.000.
Hundy, Guy Francis: *See—*
Clarke, Robert John; Hundy, Guy Francis; and Zimmern, Bernard, 4,074,957, Cl. 418-195.000.
Hunt, Harold R., to Phillips Petroleum Company. Oxidizing carbon black and use of it in elastomers. 4,075,140, Cl. 260-5.000.
Hunter, Robert O., Jr.; and Howton, Craig N., to Maxwell Laboratories, Inc. Gaseous laser medium and means for excitation. 4,075,579, Cl. 331-94.50G.
Hutchins, Samuel F.: *See—*
Robinson, Glen P., Jr.; Shelton, Samuel V.; and Hutchins, Samuel F., 4,074,705, Cl. 126-271.000.
Hutchison, Philip Scott: *See—*
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Hydril Company: *See—*
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Ichimura, Masao: *See—*
Kamo, Yoshihisa; Tachibana, Takeshi; and Ichimura, Masao, 4,075,425, Cl. 179-1.0GQ.
Ideal Toy Corporation: *See—*
Thorn, Herbert; and Berkin, Harvey, 4,074,460, Cl. 46-135.00R.
Idemitsu Kosan Co., Ltd.: *See—*
Narita, Yoshihiro; Mochizuki, Shigeaki; Kakimoto, Shigeru; Komori, Norio; Watanabe, Kiyoshi; and Shiota, Hideji, 4,074,864, Cl. 241-23.000.
Igaki, Hiroyuki; Shibata, Yoshiki; and Saruyama, Masao, to Toray Industries, Inc. Method and apparatus for determining total oxygen demand of combustible materials in aqueous dispersion. 4,074,973, Cl. 23-230.0PC.
Igarashi, Tsuyoshi: *See—*
Furukawa, Yasuhiko; and Igarashi, Tsuyoshi, 4,075,381, Cl. 428-192.000.
Ihara, Nobuyuki: *See—*
Kurahasi, Yutaka; and Ihara, Nobuyuki, 4,074,632, Cl. 104-130.000.
Iijima, Yukihiko; Iinuma, Kazumoto; and Ishiguro, Tatsuo, to Nippon Electric Co., Ltd. Composite feedback predictive code communication system for a color TV signal including a carrier chrominance signal. 4,075,655, Cl. 358-13.000.
Iinuma, Kazuhiro: *See—*
Takamizawa, Kinya; Itamura, Einoshin; and Iinuma, Kazuhiro, 4,075,598, Cl. 340-1.00R.
Iinuma, Kazumoto: *See—*
Iijima, Yukihiko; Iinuma, Kazumoto; and Ishiguro, Tatsuo, 4,075,655, Cl. 358-13.000.
Ikeya, Taro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Manifold reactor. 4,074,524, Cl. 60-282.000.
Iles, Michael Victor: *See—*
Underwood, Michael John; Martin, Michael Joseph; and Iles, Michael Victor, 4,075,424, Cl. 179-1.0SG.
Imperial Chemical Industries Limited: *See—*
Drewe, Nigel Wyndham; Parker, Roger John; and Tadros, Tharwat Fouad, 4,075,002, Cl. 71-92.000.
Knowles, David Alan; and Robson, Clive Gilroy, 4,075,005, Cl. 71-94.000.
Lewis, John Didwith, 4,075,511, Cl. 307-270.000.
Perelman, Arthur, 4,074,707, Cl. 126-343.50A.
Ridyard, Denis Robert Annesley, 4,075,200, Cl. 260-206.000.
Inaba, Shigeho: *See—*
Sasajima, Kikuo; Ono, Keiichi; Motoike, Yasuo; Inaba, Shigeho; and Yamamoto, Hisao, 4,075,346, Cl. 424-267.000.
Inagaki, Kazunori: *See—*
Takahata, Fumio; Inagaki, Kazunori; and Hirata, Yasuo, 4,075,429, Cl. 179-15.0BM.
Inagaki, Kenji: *See—*
Furuta, Tadaaki; Inagaki, Kenji; Mizoguchi, Yoshiyuki; Fujikawa, Noboru; and Kominami, Naoya, 4,075,100, Cl. 210-266.000.
Incoterm Corporation: *See—*
Gorgens, Richard A., 4,075,460, Cl. 235-420.000.
Indra, Jaromir, to Vysoke uceni technicke. Discharge valve for injection pumps of internal combustion engines. 4,074,668, Cl. 123-139.0AF.
Industrial Electronics Service Co.: *See—*
Cieslak, Richard F.; and Balding, John V., 4,075,625, Cl. 340-384.00E.
Ingenieursbureau Dwars, Heederik en Verhey B.V.: *See—*
Budde, Antonius Wilhelmus Hermanus; and Wiggers, Johannes Bernardus Maria, 4,074,953, Cl. 416-183.000.
Inman, Johnny K. Emergency fire net. 4,074,791, Cl. 182-138.000.
Inooka, Masayoshi: *See—*
Morimoto, Tatsuo; Nakamura, Munekazu; Inooka, Masayoshi; and Yawata, Teizaburo, 4,075,125, Cl. 252-455.00R.
Inoue, Morio: *See—*
Umebachi, Shotaro; Kano, Gota; and Inoue, Morio, 4,075,652, Cl. 357-22.000.
Inoue, Nobuyoshi; and Shimizu, Munetaka, to Copal Company Limited. Electric shutter means equipped with a self-timer mechanism. 4,075,648, Cl. 354-238.000.
Inoue, Yoshio: *See—*
Takamizawa, Minoru; Yamamoto, Yasushi; Inoue, Yoshio; Noshiro, Atsumi; and Fujii, Hitoshi, 4,075,167, Cl. 260-46.50E.
Institut de Recherches de la Siderurgie Francaise (IRSID): *See—*
Trevedy, Jean-Louis, 4,075,035, Cl. 136-210.000.
Institut Francais du Petrole: *See—*
Grehier, Alain, 4,075,396, Cl. 429-17.000.
Institute of Gas Technology: *See—*
Burns, David J.; Mohaupt, Udo H.; and Yie, Gene G., 4,074,858, Cl. 239-172.000.

International Business Machines Corporation: *See—*
Cheatham, Samuel David; and Lewkowicz, Julian, 4,075,671, Cl. 360-113.000.
Ciazek, Theodore Frank; and Schwuttke, Guenter Herbert, 4,075,055, Cl. 156-608.000.
Eichelberger, Edward Baxter; Muehldorf, Eugen Igor; Walther, Ronald Gene; and Williams, Thomas Walter, 4,074,851, Cl. 235-302.000.
Fox, Joel Lawrence; and Marquardt, Eugene Everett, 4,075,693, Cl. 364-200.000.
Galetto, Louis Valentine; Meier, Johann Hans; Pimbley, Walter Thornton; and Wolfe, Bruce Allen, 4,075,636, Cl. 346-75.000.
Howard, Lowell Francis, 4,075,653, Cl. 357-23.000.
Rideout, Vincent L., 4,075,045, Cl. 148-187.000.
Walker, Ernest L., 4,075,582, Cl. 333-72.000.
Walker, Ernest Lee, 4,075,577, Cl. 331-17.000.
International Computers Limited: *See—*
Martin, Michael Joseph; and Underwood, Michael John, 4,075,423, Cl. 179-1.0SC.
Underwood, Michael John; Martin, Michael Joseph; and Iles, Michael Victor, 4,075,424, Cl. 179-1.0SG.
International Nickel Company, Inc., The: *See—*
Fischer, John Joseph, 4,075,010, Cl. 75-235.000.
Kosalos, James George; and Cooke, Robert William, 4,075,599, Cl. 340-3.00R.
International Telephone and Telegraph Corporation: *See—*
Reines, Jose, 4,075,430, Cl. 179-18.00J.
Irick, Gether, Jr.; Kelly, Charles A.; and Martin, James C., to Eastman Kodak Company. Bichromophoric benzoxazole-styrene ultraviolet stabilizers and their use in organic compositions. 4,075,162, Cl. 260-45.8NZ.
Irick, Gether, Jr.; and Kelly, Charles A., to Eastman Kodak Company. Benzotriazole benzoate ultraviolet stabilizers. 4,075,220, Cl. 260-308.00B.
Isaoka, Shin-ichi: *See—*
Kawakami, Shigenao; Shibata, Tatsumi; Isaoka, Shin-ichi; and Shintani, Tutomu, 4,075,183, Cl. 260-79.3MU.
Ishiguro, Ginya: *See—*
Suzuki, Hideo; Ishiguro, Ginya; Mitsuhashi, Sadayuki; and Wakamatsu, Kazutoshi, 4,075,587, Cl. 335-112.000.
Ishiguro, Tatsuo: *See—*
Iijima, Yukihiko; Iinuma, Kazumoto; and Ishiguro, Tatsuo, 4,075,655, Cl. 358-13.000.
Ishikawa, Hisao: *See—*
Sawaki, Mikio; Iwataki, Isao; Hirono, Yoshihiko; and Ishikawa, Hisao, 4,075,239, Cl. 260-464.000.
Ishikawa, Masakazu: *See—*
Kondo, Toshio; Ishikawa, Masakazu; Katagiri, Masayoshi; and Kizaki, Jiro, 4,074,795, Cl. 188-73.300.
Ishikawa, Toshikatsu; Junichi, Tanaka; Teranishi, Haruo; and Kondo, Shinichiro, to Nippon Carbon Co., Ltd. Flexible graphite material containing boric acid. 4,075,114, Cl. 252-62.000.
Itamura, Einoshin: *See—*
Takamizawa, Kinya; Itamura, Einoshin; and Iinuma, Kazuhiro, 4,075,598, Cl. 340-1.00R.
Ito, Takayuki: *See—*
Kojima, Masaharu; Ogawa, Hiroshi; Maeda, Minoru; Nitta, Kazuo; and Ito, Takayuki, 4,075,334, Cl. 424-238.000.
Itoh, Kametaro: *See—*
Ueno, Masakatsu; Kato, Osamu; Kawauchi, Nobuyuki; and Itoh, Kametaro, 4,075,041, Cl. 148-12.400.
Itoh, Kunio; Takago, Toshio; Sato, Tamio; and Aoki, Hisashi, to Shin-Etsu Chemical Co., Ltd. Room-temperature curing organopolysiloxane compositions. 4,075,154, Cl. 260-37.0SB.
Ivanov, Vladimir Alexandrovich: *See—*
Glikman, Mark Leonovich; Sapunar, Zakhar Isaevich; Avrus, Albert Vladimirovich; Gorokhovsky, Vladilen Alexandrovich; Fainberg, Evgeny Borisovich; Ivanov, Vladimir Alexandrovich; Shirkevich, Tatyana Leonidovna; and Sizov, Vadim Mikhailovich, 4,074,994, Cl. 65-44.000.
Iwasa, Masakazu; Horikawa, Kazuo; and Matsumoto, Seiji, to Fuji Photo Film Co., Ltd. Electrostatic powder coating method. 4,075,011, Cl. 96-1.00R.
Iwasaki, Hikoji: *See—*
Sakaguchi, Mitsuo; Iwasaki, Hikoji; and Shimoya, Shigeo, 4,075,626, Cl. 340-388.000.
Iwataki, Isao: *See—*
Sawaki, Mikio; Iwataki, Isao; Hirono, Yoshihiko; and Ishikawa, Hisao, 4,075,239, Cl. 260-464.000.
J. I. Case Company: *See—*
Frisbee, Claude M., 4,074,769, Cl. 172-804.000.
Frisbee, Claude M., 4,074,770, Cl. 172-804.000.
Long, Elton B., 4,074,821, Cl. 214-138.00R.
Lourigan, Patrick M.; and Khatti, Ramkishan, 4,074,528, Cl. 60-422.000.
J. M. Huber Corporation: *See—*
Fitton, Robert Charles; and Fiore, Barbara Ann, 4,075,280, Cl. 423-118.000.
Jablonski, Edward R., to Appleton Electric Company. Cam operated toggle for securing a light fixture or the like to a tube. 4,074,941, Cl. 403-260.000.
Jachna, Waclaw: *See—*
Jedo, Antoni; and Jachna, Waclaw, 4,075,090, Cl. 209-173.000.
Jackson, William M. Steering and propulsion device for watercraft. 4,074,652, Cl. 115-35.000.
Jacob, Hermann. Method and apparatus for comminuting sand clods. 4,074,867, Cl. 241-30.000.
Jacobson, Arthur F.: *See—*
Jacobson, Sidney I.; Jacobson, Harold D.; and Jacobson, Arthur F., 4,074,451, Cl. 40-610.000.
Jacobson, Harold D.: *See—*
Jacobson, Sidney I.; Jacobson, Harold D.; and Jacobson, Arthur F., 4,074,451, Cl. 40-610.000.
Jacobson, Sidney I.; Jacobson, Harold D.; and Jacobson, Arthur F. Display device. 4,074,451, Cl. 40-610.000.
Jaeger, Frederick T., to Eutectic Corporation. Boiler tube coating and method for applying the same. 4,075,376, Cl. 428-36.000.
Jaeger, Frederick T., to Eutectic Corporation. Alloy-coated ferrous metal substrate. 4,075,392, Cl. 428-457.000.
Jager, Hans; and Seipp, Emil, to S.A. Metallurgie Hoboken-Overpelt N.V. Method of producing a siliceous cover layer on a semiconductor element by centrifugal coating utilizing a mixture of silica emulsions. 4,075,044, Cl. 148-175.000.
Jahn, Gerhard: *See—*
Pauli, Gunter; and Jahn, Gerhard, 4,075,507, Cl. 307-117.000.
Jakob, Herbert E.; and Garbelman, David L., to CMI Corporation. Apparatus for producing hot mix asphalt utilizing recyclable asphalt aggregate. 4,075,710, Cl. 366-25.000.
James, Lawrence W., to Varian Associates, Inc. High speed FET employing ternary and quarternary III-V active layers. 4,075,651, Cl. 357-22.000.
Janko, Bozidar, to Tektronix, Inc. Electron beam forming structure utilizing an ion trap. 4,075,533, Cl. 315-31.00R.
Jansen, Johannes H.: *See—*
Hoffman, Neil R.; and Jansen, Johannes H., 4,074,910, Cl. 280-289.00R.
Jansen, William David: *See—*
Link, William Trevor; Rugge, Henry Ferdinand; and Jansen, William David, 4,074,711, Cl. 128-2.05A.
Jansson, Bror Ingvar Erling. Device for preventing the flow of air through an opening between two rooms or spaces. 4,074,620, Cl. 98-36.000.
Jansson, Conny Erik, to AB Bahco Verktyg. Pliers. 4,074,597, Cl. 81-417.000.
Janus, Jurgen Peter. Wall structures. 4,074,538, Cl. 61-47.000.
Japan Atomic Energy Research Institute: *See—*
Muromura, Tadasumi, 4,075,306, Cl. 423-352.000.
Sakurada, Ichiro; Okada, Toshio; and Hirano, Yutaka, 4,075,075, Cl. 204-159.170.
Japan Storage Battery Company Limited: *See—*
Furukubo, Haruo; Takezi, Yasaburo; and Takatuka, Kenzi, 4,075,530, Cl. 313-229.000.
Jardinier, Pierre; Simonnot, Jack; and Lecerf, Robert, to Societe d'Etudes et de Recherches de Ventilation et d'Aeraulique. Adjustable flow air insufflation nozzle. 4,074,862, Cl. 239-515.000.
Jarm, Robert L., to Credit Industry Associates, Inc. Lock extractor. 4,074,410, Cl. 29-265.000.
Javick, Richard A.: *See—*
Ferraro, Charles F.; Javick, Richard A.; and Robertson, James A., 4,075,369, Cl. 427-185.000.
Jedo, Antoni; and Jachna, Waclaw, to Centralny Osrodek Projektowo-Konstrukcyjny Maszyn Gorniczych "Komag". Apparatus for gravity collecting and handling of products from tanks filled with liquid for dewatering devices. 4,075,090, Cl. 209-173.000.
Jegen, James M.: *See—*
Magers, Wallace F.; and Jegen, James M., 4,074,861, Cl. 239-492.000.
Jencks, Charles L.: *See—*
Castonguay, Roger N.; and Jencks, Charles L., 4,075,584, Cl. 335-20.000.
Jenkins Metal Corporation: *See—*
Jenkins, Robert B., Jr.; and Poindexter, Jack A., 4,074,391, Cl. 19-107.000.
Jenkins, Robert B., Jr.; and Poindexter, Jack A., to Jenkins Metal Corporation. Crush roll plenum for carding machines. 4,074,391, Cl. 19-107.000.
Jenoptik Jena G.m.b.H.: *See—*
Quillfeldt, Winfried, 4,075,537, Cl. 315-354.000.
Jensen, John Frank. Fireplace stove. 4,074,679, Cl. 126-121.000.
Jermyn, Arthur C. Orally receptive holder for a dental x-ray film paquette. 4,075,494, Cl. 250-479.000.
Jernow, Jane Liu; and Rosen, Perry, to Hoffmann-La Roche, Inc. Process for preparing substituted 2,4-diaminopyrimidines and isoxazole intermediate. 4,075,209, Cl. 260-256.40N.
Jewsbury, (Charles) Bill (William): *See—*
Harris, Richard K.; Jewsbury, (Charles) Bill (William); and Shoup, Dale W., 4,074,565, Cl. 73-88.50R.
Joh. A. Benckiser GmbH: *See—*
Walch, Axel; Klimmek, Albrecht; and Wollmann, Klaus, 4,075,093, Cl. 210-23.00H.
Johansson, Ake Ernst Elof; and Pahlen, Lars Christer, to Telefonaktiebolaget L M Ericsson. Rack for circuit boards. 4,075,683, Cl. 361-415.000.
Johnson, Arthur F., to R.C.M. Corporation. Process for the removal of sulfur oxides by the use of activated alumina. 4,075,284, Cl. 423-244.000.
Johnson, Bruce K., to Polaroid Corporation. Exposure counter and flash inhibiting means for a photographic apparatus. 4,075,647, Cl. 354-217.000.

Johnson, Dudley B.: *See—*
Hanni, Stephen L.; and Johnson, Dudley B., 4,074,419, Cl. 29-625.000.
Johnson, Joseph E.: *See—*
Tarneja, Krishan S.; Johnson, Joseph E.; and Bartko, John, 4,075,037, Cl. 148-1.500.
Johnson, Leslie Harold; Lo, David Shih-Fang; and Paul, Maynard Carlton, to Sperry Rand Corporation. Rounded serrated edge film strip geometry for cross-tie wall memory system. 4,075,612, Cl. 365-171.000.
Johnson, Matthey & Co., Limited: *See—*
Gibbon, Alan, 4,074,865, Cl. 241-24.000.
Johnson, Paul H., to Phillips Petroleum Company. Production of non-carcinogenic large particle carbon black. 4,075,156, Cl. 260-42.470.
Johnson, Paul H., to Phillips Petroleum Company. Production of non-carcinogenic carbon black. 4,075,157, Cl. 260-42.470.
Johnson, Paul H.: *See—*
Mills, King L.; and Johnson, Paul H., 4,075,160, Cl. 260-42.470.
Johnson, Walter G. Machine for shredding leaves and garden debris. 4,074,869, Cl. 241-55.000.
Johnston, James J., to Automatic Equipment Development Corporation. Electrical connector having releasably retained latch tab assembly. 4,074,928, Cl. 339-91.00R.
Jones, C. David; and Suarez, Tulio, to Eli Lilly and Company. Antifertility compounds. 4,075,227, Cl. 260-330.500.
Jones, C. David: *See—*
Suarez, Tulio; and Jones, C. David, 4,075,223, Cl. 260-326.50C.
Jones, Clifton Martin. Tennis ball napper. 4,074,403, Cl. 26-29.00R.
Jones, Kenneth James, to Lucas Electrical Company Limited. Lamp assembly. 4,075,471, Cl. 362-300.000.
Jones, Lewis O.: *See—*
Berg, Allan C.; Fitzpatrick, John W.; and Jones, Lewis O., 4,075,391, Cl. 428-407.000.
Jones, Rufus S., Jr.; Tan, Marshall; and Choe, Eui Won, to Celanese Corporation. Process for producing wholly aromatic polyamide fibers of high strength. 4,075,269, Cl. 264-184.000.
Jonsson, Bjorn Erik Rutger; Andersson, Ulf Ivan Gunnar; and Bergman, Gustav Ruben, to Telefonaktiebolaget L M Ericsson. Method of and arrangement for detecting faults in a memory device. 4,075,466, Cl. 235-302.300.
Jonsson, Gregg N., to Thor Power Tool Company. Torquing tool control circuit. 4,074,772, Cl. 173-12.000.
Jorg, Helmut. Arrangement for cooling a lubricant-filled, finned gear case by means of a built-in fan. 4,074,590, Cl. 74-606.00A.
Jorgensen, Erik; Roy, Dibyendu N.; and Kondo, Edward S., to Canadian Patents and Development Limited. Method for the treatment of trees subject to Dutch elm disease. 4,075,327, Cl. 424-273.00R.
Jorgenson, Clyde R.; DeBoer, Harold M.; and Jorgenson, Ronald M., to Acoustical Floors, Inc. Floor preparation and method. 4,075,374, Cl. 427-355.000.
Jorgenson, Ronald M.: *See—*
Jorgenson, Clyde R.; DeBoer, Harold M.; and Jorgenson, Ronald M., 4,075,374, Cl. 427-355.000.
Josam Manufacturing Co.: *See—*
Polster, Norman E., 4,074,530, Cl. 60-518.000.
Josse, Rene, to Hoffmann-La Roche, Inc. Stable injectable vitamin compositions. 4,075,333, Cl. 424-237.000.
Joubert, Jerauld D., to Steiger Tractor Inc. Self locking compartment for tractor. 4,074,786, Cl. 180-68.500.
Joubert, Jerauld D., to Steiger Tractor Inc. Tractor door latch. 4,074,788, Cl. 180-89.120.
Joy Manufacturing Company: *See—*
Morrison, Ward D., 4,074,771, Cl. 173-6.000.
Joyce, James V. Mining apparatus and method for an augered seam. 4,074,920, Cl. 299-18.000.
Joyce, John E. Method of and apparatus for use in generating liquid concentration gradients hydrostatically. 4,074,687, Cl. 137-266.000.
Joyeux, Didier: *See—*
Genequand, Pierre; and Joyeux, Didier, 4,075,535, Cl. 313-422.000.
Jozwiak, Edward L., Jr.; and Das, Suryya K., to PPG Industries, Inc. Method and resinous vehicles for electrodeposition. 4,075,135, Cl. 260-29.7DP.
Judt, Friedrich: *See—*
Taubert, Klaus; Benner, Reimund; and Judt, Friedrich, 4,074,518, Cl. 59-15.000.
Juergens, David A.; and Terek, Greg P., to Rubbermaid Commercial Products Inc. Combination tiered letter tray and vertical file. 4,074,810, Cl. 211-11.000.
Jun, Choll K.: *See—*
Economy, James; Jun, Choll K.; and Lin, Ruey Y., 4,075,276, Cl. 264-332.000.
Junichi, Tanaka: *See—*
Ishikawa, Toshikatsu; Junichi, Tanaka; Teranishi, Haruo; and Kondo, Shinichiro, 4,075,114, Cl. 252-62.000.
Jurca, Milos, to CKD Praha, oborovy podnik. Contactless facilities for determining the specific resistance of a test sample. 4,075,557, Cl. 324-62.000.
Kabushiki Kaisha Audio-Technica: *See—*
Nemoto, Mitsuo; and Honma, Kimiyasu, 4,075,418, Cl. 179-100.41K.
Kabushiki Kaisha Daini Seikosha: *See—*
Asano, Kazuhiro, 4,074,515, Cl. 58-23.0BA.
Kondo, Kenichi, 4,074,516, Cl. 58-38.00R.
Tatsumi, Yoshio; and Kadowaki, Tooru, 4,074,517, Cl. 58-140.00R.
Torisawa, Akira, 4,075,540, Cl. 318-138.000.
Kabushiki Kaisha Kobe Seikosho: *See—*
Nohara, Tomiyasu; Matsuno, Yoshiyuki; Harada, Hisamitsu; and Yamada, Akinori, 4,074,440, Cl. 34-92.000.
Kabushiki Kaisha Meidensha: *See—*
Ochisi, Tomoyoshi; Hayashi, Takeshi; and Furuse, Mituhiro, 4,075,697, Cl. 364-481.000.
Kabushiki Kaisha Mitutoyo Seisakusho: *See—*
Takeda, Yasuo, 4,074,438, Cl. 33-174.00P.
Kabushiki Kaisha Suwa Seikosha: *See—*
Futagawa, Yoshikiyo; Kubota, Kanemitsu; and Kamakura, Hiroshi, 4,075,623, Cl. 340-347.0NT.
Kadin, Saul B., to Pfizer Inc. Anti-allergenic 5-alkoxyimidazo[1,2-A]quinoline-2-carboxylic acids and derivatives thereof. 4,075,343, Cl. 424-258.000.
Kadowaki, Koju; Takagi, Kenji; and Tanaka, Yoshiaki, to Mitsubishi Petrochemical Company Limited. Catalyst for production of α,β-unsaturated carboxylic acids. 4,075,127, Cl. 252-470.000.
Kadowaki, Tooru: *See—*
Tatsumi, Yoshio; and Kadowaki, Tooru, 4,074,517, Cl. 58-140.00R.
Kagami, Teruo: *See—*
Kikuchi, Shoji; Endo, Takaya; Kagami, Teruo; and Sato, Ryosuke, 4,075,021, Cl. 96-95.000.
Kaganov, July Davydovich: *See—*
Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Kudryakov, Mikhail Nikolaevich; Tsipkis, Alexandr Moiseevich; Yakovlev, Vladimir Germogenovich; Averbukh, Alexandr Samoilovich; Scherbakov, Jury Ilich; Yakobson, Natalia Dmitrievna; Semikozov, Vyacheslav Fedorovich; Medvedev, Viktor Vladimirovich; Yartsev, Valery Vasilievich; Kaganov, July Davydovich; Kuznetsov, Vladimir Ivanovich; and Sinelnikov, Alexandr Iosifovich, 4,074,773, Cl. 173-23.000.
Kagerhuber, Franz: *See—*
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Kaiser Steel Corporation: *See—*
Daniels, Lawrence H.; Hood, Murray C.; and Burdzinski, Boguslaw, 4,074,487, Cl. 52-236.300.
Kaisler, Francis J.: *See—*
Folsom, Gary J.; and Kaisler, Francis J., 4,074,930, Cl. 350-33.000.
Wells, H. David; Folsom, Gary J.; and Kaisler, Francis J., 4,074,964, Cl. 8-10.200.
Kakimoto, Shigeru: *See—*
Narita, Yoshihiro; Mochizuki, Shigeaki; Kakimoto, Shigeru; Komori, Norio; Watanabe, Kiyoshi; and Shiota, Hideji, 4,074,864, Cl. 241-23.000.
Kakiuchi, Hiroshi: *See—*
Koyama, Tsuneo; Sugiyama, Yuichi; Furuhama, Teruhide; Tajima, Yoshio; Kakiuchi, Hiroshi; Yamada, Kazuhiro; and Obara, Masaaki, 4,075,159, Cl. 260-42.470.
Kakuta, Susumu: *See—*
Hayashi, Hideaki; and Kakuta, Susumu, 4,074,873, Cl. 242-75.430.
Kali und Salz Aktiengesellschaft: *See—*
Kunze, Dietmar; and Kirchner, Siegfried, 4,075,309, Cl. 423-497.000.
Kalliokoski, Aarno Iisakki: *See—*
Saari, Kaarlo Matti Juhani; and Kalliokoski, Aarno Iisakki, 4,075,089, Cl. 209-169.000.
Kamakura, Hiroshi: *See—*
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Kamiyama, Norio: *See—*
Shibata, Takehiko; Ando, Tadahiko; Kitsunai, Tokuji; Kamiyama, Norio; and Oikawa, Yoshifumi, 4,075,062, Cl. 195-103.50R.
Kamo, Yoshihisa; Tachibana, Takeshi; and Ichimura, Masao, to Nippon Columbia Kabushikikaisha. Multi-directional sound signal reproducing system. 4,075,425, Cl. 179-1.0GQ.
Kamper, Egbert B., to Kamper's Woodfire Co., Inc. Heating apparatus. 4,074,854, Cl. 236-11.000.
Kamper's Woodfire Co., Inc.: *See—*
Kamper, Egbert B., 4,074,854, Cl. 236-11.000.
Kane, Alfred J. Fabricated disc filter core. 4,075,103, Cl. 210-331.000.
Kano, Gota: *See—*
Umebachi, Shotaro; Kano, Gota; and Inoue, Morio, 4,075,652, Cl. 357-22.000.
Kanto Ishiseiyaku Co., Ltd.: *See—*
Kondo, Yasunori, 4,075,336, Cl. 424-246.000.
Kao Soap Co., Ltd.: *See—*
Murata, Moriyasu; Yamanaka, Makoto; and Fujino, Takashi, 4,075,129, Cl. 252-527.000.
Kapaun, Gustav: *See—*
Fuchs, Hermann; Kapaun, Gustav; and Meininger, Fritz, 4,074,967, Cl. 8-54.000.
Kaplan, Leopold S. Method and device for facilitating double-contrast studies of the upper gastrointestinal tract. 4,074,709, Cl. 128-2.00A.
Kaplan, Martin; and Tassone, Joseph V., to Compo Industries, Inc. Lasting machine with latex adhesive delivery. 4,074,383, Cl. 12-145.000.
Kaplan, Ronald M.: *See—*
Beane, David J.; and Kaplan, Ronald M., 4,074,559, Cl. 72-354.000.
Kappel, Gary. Stereo speaker system. 4,075,438, Cl. 179-146.00H.
Karkoski, Joseph; McGregor, Charles William; and Payette, Lionel Joseph, to Essex International, Inc. Polyesterimides and processes for preparing same. 4,075,179, Cl. 260-75.00N.
Karl Kroyer St. Anne's Limited: *See—*
Curry, Harold George; Attwood, Brian William; and White, Derek Graham Walter, 4,074,959, Cl. 425-81.100.

Hicklin, Denis Raymond; and Attwood, Brian William, 4,074,393, Cl. 19-303.000.
Karlin, Alexandr Vasilievich: *See—*
Ponomarev, Alexei Ivanovich; Larionova, Julia Alexeevna; Ankudinov, Anatoly Kirillovich; Ryazanova, Rufina Mikhailovna; Klebansky, Alexandr Leibovich; Sokolov, Sergei Vasilievich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Rymareva, Tatyana Ivanovna; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Karlin, Alexandr Vasilievich; and Lobkov, Vasily Danilovich, 4,075,170, Cl. 260-46.50G.
Karstensen, Karl W.; and Smith, Brace C., to Caterpillar Tractor Co. Speed sensor mounting for a gas turbine. 4,075,562, Cl. 324-173.000.
Karstetter, Bruce R.: *See—*
Ackerman, Roger G.; and Karstetter, Bruce R., 4,074,993, Cl. 65-30.00E.
Kartocol Anstalt: *See—*
Gennari, Luigi, 4,074,618, Cl. 93-49.00M.
Kasuga, Akira: *See—*
Suzuki, Masaaki; and Kasuga, Akira, 4,075,384, Cl. 428-212.000.
Katagiri, Masayoshi: *See—*
Kondo, Toshio; Ishikawa, Masakazu; Katagiri, Masayoshi; and Kizaki, Jiro, 4,074,795, Cl. 188-73.300.
Kates, Willard A., to W. A. Kates Company, The. Readily disassemblable fluid flow rate controller. 4,074,693, Cl. 137-454.600.
Katner, Allen S.; Gutowski, Gerald E.; and Miller, Jean C., to Eli Lilly and Company. Preparation of leurosidine and novel leurosidine 4'-ethers and esters. 4,075,214, Cl. 260-287.00B.
Kato, Akira: *See—*
Hashimoto, Hiroshi; Abe, Tetsuo; and Kato, Akira, 4,074,425, Cl. 29-813.000.
Kato, Koichi: *See—*
Takahashi, Takeshi; Yamazaki, Yoshio; and Kato, Koichi, 4,075,405, Cl. 536-1.000.
Kato, Osamu: *See—*
Ueno, Masakatsu; Kato, Osamu; Kawauchi, Nobuyuki; and Itoh, Kametaro, 4,075,041, Cl. 148-12.400.
Kaufman, Marshall. Film retrieval device. 4,074,870, Cl. 242-1.000.
Kauzal, Gabriel Peter. Veterinary lick preparation. 4,075,325, Cl. 424-140.000.
Kawabata, Yoichi; and Machida, Minoru, to Canon Kabushiki Kaisha. Calculator for determining cubic roots. 4,075,705, Cl. 364-752.000.
Kawaguchiko Seimitsu Co., Ltd.: *See—*
Sato, Hitoshi; Watanabe, Hazime; Miura, Kazumasa; and Kudo, Koji, 4,074,457, Cl. 43-113.000.
Kawakami, Hiroshi; Tsukagawa, Yukio; and Nagaoka, Isao, to Bridgestone Tire Company Limited. Suction device for an oil separation tank. 4,075,096, Cl. 210-96.00R.
Kawakami, Hiroshi: *See—*
Sawachika, Yasumasa; Kawakami, Hiroshi; and Minegishi, Shuzo, 4,075,137, Cl. 260-2.5AT.
Kawakami, Shigenao; Shibata, Tatsumi; Isaoka, Shin-ichi; and Shintani, Tutomu, to Sumitomo Chemical Company, Limited. Preparation of water-soluble high polymers. 4,075,183, Cl. 260-79.3MU.
Kawakatsu, Hisazo: *See—*
Okayama, Shigeo; and Kawakatsu, Hisazo, 4,075,488, Cl. 250-396.00R.
Kawasaki, Masahiro: *See—*
Uno, Naoyuki; Shono, Tetsuji; Urano, Fumio; and Kawasaki, Masahiro, 4,075,641, Cl. 354-43.000.
Kawauchi, Nobuyuki: *See—*
Ueno, Masakatsu; Kato, Osamu; Kawauchi, Nobuyuki; and Itoh, Kametaro, 4,075,041, Cl. 148-12.400.
Kayaba Industry Co., Ltd.: *See—*
Chano, Takashi; and Masuda, Kohji, 4,074,640, Cl. 112-121.110.
Kazuo, Arai, to Nissan Denshi Kabushikikaisha. Single side-band wave generation system. 4,075,565, Cl. 325-138.000.
Keach, Bernard C., to Educational Electronics of California Inc. Digital logic control for audio visual programs and method therefor. 4,075,668, Cl. 360-80.000.
Kedzierski, Stanley G., to Textron, Inc. Slider for slide fastener. 4,074,399, Cl. 24-205.14R.
Keishin Matsumoto: *See—*
Shibata, Takanori; and Marumoto, Katsuji, 4,075,541, Cl. 318-139.000.
Kella, Harry Y. Utility security blanket. 4,074,375, Cl. 5-336.000.
Keller, George M. Method for producing cast-in-place pipe employing permanent pipe mold. 4,075,300, Cl. 264-32.000.
Keller, James R.; and Nickerson, William A., to Wm. A. Nickerson & Co., Ltd. Fabricated wood beam. 4,074,498, Cl. 52-690.000.
Kelley Company, Inc.: *See—*
Miller, Benjamin U., 4,074,638, Cl. 110-8.00R.
Kelly, Charles A.: *See—*
Irick, Gether, Jr.; Kelly, Charles A.; and Martin, James C., 4,075,162, Cl. 260-45.8NZ.
Irick, Gether, Jr.; and Kelly, Charles A., 4,075,220, Cl. 260-308.00B.
Kelly, Ralph; and Ritter, Edmond Jean, to Cincinnati Milacron, Inc. Skin protective compositions. 4,075,318, Cl. 424-70.000.
Kemmler, Lothar, to Samson AG. Fluidic switch. 4,074,701, Cl. 137-625.660.
Kempf, Gerhard, to Evolution SA. Thread monitoring switch for textile machines having magnet biasing lever to prevent any annoying thread flutter. 4,075,445, Cl. 200-61.180.
Kenbudge Holdings Limited: *See—*
Baikie, Hugh E., 4,074,909, Cl. 280-11.120.
Kendall Company, The: *See—*
Binard, William J.; Ciarico, Anthony J.; Anglada, Leonard R.; and Patel, Bhupendra C., 4,074,714, Cl. 128-218.00P.
Smits, Donald M.; Daley, Patrick J.; and Akerley, Arnold J., 4,074,721, Cl. 128-461.000.
Kennedy, Howard L.; and Ooms, John, to Motorola, Inc. Incremental AGC signal generator with controllable increments. 4,075,573, Cl. 330-129.000.
Keren, Eitan; and Brown, Harold J., to Sealed Air Corporation. Method and apparatus for packaging articles. 4,074,505, Cl. 53-28.000.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See—*
Ringel, Helmut, 4,075,104, Cl. 210-402.000.
Kerr, George T.; and Schweizer, Albert E., to Mobil Oil Corporation. Reaction of beta platinum chloride with gaseous ammonia. 4,075,307, Cl. 423-413.000.
Kerr-McGee Chemical Corporation: *See—*
Thomas, David Charles, 4,075,032, Cl. 106-303.000.
Kershaw, Joseph E., to United States of America, Navy. Low loss tuneable filter. 4,075,583, Cl. 333-73.00R.
Kessel, Bernhard. Manually closable anti-backup trap. 4,074,686, Cl. 137-247.190.
Kessler, Theodore P., to Timron, Inc. Lock plate for an arm of a pile fabric reel frame. 4,074,874, Cl. 242-77.100.
Ketterer, Stanley Joseph; and Weisz, William, to Singer Company, The. Rail-bearing for rotary shuttles. 4,074,643, Cl. 112-181.000.
Khatti, Ramkishan: *See—*
Lourigan, Patrick M.; and Khatti, Ramkishan, 4,074,528, Cl. 60-422.000.
Kieserling & Albrecht Werkzeugmaschinenfabrik: *See—*
Weck, Karl-Gustav, 4,074,598, Cl. 82-20.000.
Kikuchi, Shoji; Endo, Takaya; Kagami, Teruo; and Sato, Ryosuke, to Konishiroku Photo Industry Co., Ltd. Photosensitive material for color photography. 4,075,021, Cl. 96-95.000.
Kikuchi, Takeshi: *See—*
Mizuno, Yukio; Kikuchi, Takeshi; and Kojima, Shuichi, 4,074,728, Cl. 139-435.000.
Kilbourn, Edward E.; Peardon, David L.; and Ware, J. Edgar, to Rohm and Haas Company. 3-Pyridylmethyl aryl urea rodenticides compositions. 4,075,345, Cl. 424-263.000.
Killen, Denis: *See—*
Dockray, Edward; and Killen, Denis, 4,074,960, Cl. 425-89.000.
Kimel, Esfir Abramovna: *See—*
Moiseev, Vladimir Vasilievich; Kosovtsev, Vladimir Vasilievich; Kolesnikova, Galina Prokofievna; Zimnukhov, Viktor Alexandrovich; Miroshnikova, Lidia Alexeevna; Kimel, Esfir Abramovna; Chefranova, Edit Konstantinovna; Guseva, Valentina Ivanovna; and Masagutova, Ljudmila Vladimirovna, 4,075,166, Cl. 260-45.95H.
Kindersley, Peter G. Drafting template. 4,074,437, Cl. 33-41.00B.
King Industries, Inc.: *See—*
Gallacher, Lawrence V., 4,075,176, Cl. 260-67.60R.
King, John: *See—*
Korbelak, Alexander; and King, John, 4,075,065, Cl. 204-43.00G.
King-Seely Thermos Co.: *See—*
Beck, Willi K., 4,075,593, Cl. 337-312.000.
Kirchner, Siegfried: *See—*
Kunze, Dietmar; and Kirchner, Siegfried, 4,075,309, Cl. 423-497.000.
Kirschbaum, Robert N. Method for the treatment of essential oils and wood particles containing essential oils. 4,075,071, Cl. 204-136.000.
Kishimoto, Jotaro: *See—*
Noguchi, Yukihide; Nishimura, Takeshi; Kishimoto, Jotaro; and Nishida, Yoshio, 4,074,654, Cl. 118-73.000.
Kiss, Kornel Dezso, to Dart Industries, Inc. Stabilized polyolefin compositions. 4,075,146, Cl. 260-23.00H.
Kitamura, Ko; Watanabe, Mamoru; Watanabe, Yojiro; and Seto, Yutaka, to Konishiroku Photo Industry Co., Ltd. Fixing device for an electrophotographic copying machine. 4,075,455, Cl. 219-216.000.
Kitsunai, Tokuji: *See—*
Shibata, Takehiko; Ando, Tadahiko; Kitsunai, Tokuji; Kamiyama, Norio; and Oikawa, Yoshifumi, 4,075,062, Cl. 195-103.50R.
Kiuru, Erkki Sakari: *See—*
Sipila, Heikki Johannes; and Kiuru, Erkki Sakari, 4,075,486, Cl. 250-374.000.
Kizaki, Jiro: *See—*
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Koch, Heinz; Pawlowicz, Manfred; and Brams, Bernhard, to Fried Krupp Huttenwerke AG. Process and means for grinding out faults in the surface of a work piece. 4,074,982, Cl. 51-92.00R.
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Koenig, Harry J., to United States of America, Navy. Multiple-channel data switch. 4,075,608, Cl. 340-166.00R.
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Kojima, Masaharu; Ogawa, Hiroshi; Maeda, Minoru; Nitta, Kazuo; and Ito, Takayuki, to Mallinckrodt, Inc. 6β-Iodomethyl-19-norcholest-5(10)-en-3β-ol and compositions containing same. 4,075,334, Cl. 424-238.000.
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Kollberg, Ture Eric, to American Defibrator, Inc. Screw conveyor having stopper bar means. 4,074,803, Cl. 198-670.000.
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Komatsu, Toshiyoshi, to Duskin Franchise Co. Ltd. Cleaning material and process for preparation thereof. 4,075,375, Cl. 427-390.00R.
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Kondo, Yoshihiko, to Nippondenso Co., Ltd. Electric circuit for selecting operational conditions of load. 4,075,501, Cl. 307-41.000.
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Kitamura, Ko; Watanabe, Mamoru; Watanabe, Yojiro; and Seto, Yutaka, 4,075,455, Cl. 219-216.000.
Konno, Kazuhiko; Hayasi, Yosio; Taniyama, Eiji; and Sekiya, Tetsuo, to Mitsubishi Petrochemical Company Limited. Wood preservatives and method for wood preservation treatment. 4,075,121, Cl. 252-407.000.
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Korbelak, Alexander; and King, John, to Handy & Harman. Gold plating bath and process. 4,075,065, Cl. 204-43.00G.
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Koziar, Joseph C.: *See—*
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Kramer, Carl; Stein, Heinrich; and Gerhardt, Hans Joachim. Method and apparatus for floatation conveyance of strip materials. 4,074,841, Cl. 226-97.000.
Kratzer, Brice L. X-ray computer. 4,074,850, Cl. 235-89.00R.
Kraus, Heinz, to Dr. Johannes Heidenhain GmbH. Electron-optically radiatable structure. 4,075,497, Cl. 250-505.000.
Kraus, James R.; and Murphy, Howard C., to Pennsylvania Wire Rope Corporation. Cable fastener assembly. 4,074,945, Cl. 403-197.000.
Kray, Raymond J., to Ciba-Geigy Corporation. N-Cyanosulfonamide resins and intermediates therefor and products thereof. 4,075,185, Cl. 260-79.30M.
Kreighbaum, William E.; and Comer, William T., to Mead Johnson & Company. 3-Alkoxyisoquinolines for hypotensive and vasodilating effects. 4,075,344, Cl. 424-258.000.
Krider, Paul Robert, to AMP Incorporated. Cable card edge connector. 4,074,929, Cl. 339-97.00R.
Krug, John A., to ACF Industries, Incorporated. Sampling assembly for taking a sample of liquid at a desired level in a tank. 4,074,577, Cl. 73-421.00B.
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Krupka, Richard W. Lawn edging. 4,074,479, Cl. 52-102.000.
Kruse, Hubert; and Sommer, Karl, to Hoechst Aktiengesellschaft. Stable monoazo dyestuff. 4,074,965, Cl. 8-41.00R.
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Kuchler, Abraham: *See—*
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Kuhle, Engelbert; Klauke, Erich; and Eue, Ludwig, to Bayer Aktiengesellschaft. N-Aryl-urea compounds and herbicidal compositions. 4,075,235, Cl. 260-453.0RW.
Kulbakh, Valter Osvaldovich: *See—*
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Kunig, Helmut; and Reinke, Klaus, to Hanseatischer Maschinenbau G.m.b.H. Apparatus for depositing a sliver in a sliver can. 4,074,394, Cl. 19-159.00R.
Kunz, Walter: *See—*
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Kunze, Dietmar; and Kirchner, Siegfried, to Kali und Salz Aktiengesellschaft. Process for the production of highly concentrated magnesium chloride solutions. 4,075,309, Cl. 423-497.000.
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Kurahasi, Yutaka; and Ihara, Nobuyuki, to SI Handling Systems, Inc. Switch for monorail track with rotary drive shaft. 4,074,632, Cl. 104-130.000.
Kurasawa, Makoto, to Taiwan Ricoh Co., Ltd. Multi-exposure device for camera. 4,075,646, Cl. 354-209.000.
Kurisu, Shingo; Oyamoto, Toshiya; Ochiai, Setumi; Miyamoto, Hiromu; and Makino, Katsuaki, to Mitsubishi Jukogyo Kabushiki Kaisha. Thermal decomposition apparatus. 4,074,979, Cl. 48-111.000.
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Kwok, Clyde Chi Kai; and Cornellier, Joseph Rene, to Cornellier, Joseph Rene. Liquid supply system and nozzle for jet weaving looms. 4,074,727, Cl. 139-435.000.
Kwoon Kwen Metal Ware Company Limited: *See—*
Yee, Li Sze, 4,074,549, Cl. 70-7.000.
L. F. Lang & Son Pools Inc.: *See—*
Lang, Robert S.; Post, Rodney Morris; and Hogan, Thomas Leo, 4,074,481, Cl. 52-169.800.
Labe, Jacob, III. Multi-purpose closure for containers. 4,074,827, Cl. 220-23.000.
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Storp, Klaus; Wirth, Hans; Rittinger, Gunter; and Hohmann, Volker, 4,075,282, Cl. 423-230.000.
Labourre, Abel S. Elevatable two-part scaffold for picking fruit. 4,074,819, Cl. 214-83.100.
Lacefield, William B., to Eli Lilly and Company. Method of controlling aquatic weeds. 4,074,998, Cl. 71-66.000.
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Laenger, Charles J., Sr.; McFarland, Sam R.; and Peel, Harry H., to Southwest Research Institute. Method and apparatus for communicating with people. 4,074,444, Cl. 35-35.00A.
Lafferty, Gary S., Sr., to Milwaukee Electric Tool Corporation. Plug-in brush cartridge. 4,075,523, Cl. 310-239.000.
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Richaud, Aime A.; Moreno, Pierre F.; and Rimbaud, Guy A., 4,074,585, Cl. 74-424.80R.
Laitram Corporation, The: *See—*
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Lake, Larry W.: *See—*
Hill, Harold J.; Reisberg, Joseph; Helfferich, Fred G.; Lake, Larry W.; and Pope, Gary A., 4,074,755, Cl. 166-252.000.
Lakshmanan, Pallavoor R., to Gulf Research & Development Company. Aqueous urea-formaldehyde resin compositions having improved storage life. 4,075,149, Cl. 260-29.40R.
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Landry, Joseph Gerard. Apparatus for teaching and playing contract bridge. 4,074,442, Cl. 35-8.00B.
Lane, Constance A.; and Koziar, Joseph C., to Rohm and Haas Company. Process for preventing hydrolytic degradation of linear saturated aromatic polyesters comprising a thermoplastic saturated aromatic polyester and a moisture scavenger polymer. 4,075,263, Cl. 260-873.000.
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Lang, Robert J., to Exxon Research & Engineering Co. Process for the production of hydrocarbons from coal. 4,075,079, Cl. 208-8.000.
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Lapeyre, James M., to Laitram Corporation, The. Remote reading compass display. 4,075,619, Cl. 340-324.00R.
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Larsen, Larry D., to Patent Development & Management Company. Ionization chamber assembly. 4,075,487, Cl. 250-385.000.
Larson, Kenneth Norman: *See—*
Davis, John Stephen; Larson, Kenneth Norman; and Phalen, Frank William, 4,075,691, Cl. 364-200.000.
Laubengayer, William C., to Rockwell International Corporation. Automatic communication system reconfiguration apparatus. 4,075,440, Cl. 175.3 S-.
Lavins, Paul N., Jr., to American Induction Heating Corporation. Induction heater for forging bar stock. 4,075,450, Cl. 219-10.710.
Lawrence, Jackson, to Cluett, Peabody & Co., Inc. Process for recovery and reuse of ammonia in a liquid ammonia fabric treating system. 4,074,969, Cl. 8-125.000.
Lawrence, John C.; and Roth, Albert, to United States of America, Navy. Variable-to-block-with-prefix source coding technique. 4,075,622, Cl. 340-347.0DD.
Lazier, John K. D.: *See—*
Stoft, Paul E.; Bridgham, John A.; Chaney, Robert L.; Hill, Charles M.; Lazier, John K. D.; Willis, Barry G.; Wong, Jacob Y.; and Fostick, Moshe A., 4,075,481, Cl. 250-343.000.
Lazzaretti, Louis G.: *See—*
Capriotti, Alfred J.; Lazzaretti, Louis G.; and O'Donnell, Brian, 4,074,439, Cl. 33-286.000.
Lebecque, Maurice G. N. G. Electrical contact system. 4,074,924, Cl. 339-20.000.
Le Blanc, John R.: *See—*
Burke, William D.; Higginbottom, Harold P.; and Le Blanc, John R., 4,075,403, Cl. 429-253.000.
Lecerf, Robert: *See—*
Jardinier, Pierre; Simonnot, Jack; and Lecerf, Robert, 4,074,862, Cl. 239-515.000.
Lee, Arthur L.; and Coval, Arthur B., to FMC Corporation. Articulated haulage vehicle. 4,074,784, Cl. 180-24.000.
Lee, Gerry A., to Fawn Engineering Corporation. Vending machine having ejector assist member. 4,074,829, Cl. 221-238.000.
Lee, Walter S., to Leemco, Inc. Pressure regulator with soft valve seat. 4,074,694, Cl. 137-505.410.
Lee, William T., to Fishing Tools, Inc. Power swivel. 4,074,775, Cl. 173-79.000.
Leemco, Inc.: *See—*
Lee, Walter S., 4,074,694, Cl. 137-505.410.
Leenhouts, Albert C., to Superior Electric Company, The. Linear velocity change stepping motor circuit. 4,075,544, Cl. 318-696.000.
Legille, Edouard, to S.A. des Anciens Etablissements Paul Wurth. Charge metering apparatus for shaft furnaces. 4,074,816, Cl. 214-2.000.
Legille, Edouard; and Mahr, Rene N., to S.A. des Anciens Etablissements Paul Wurth. Furnace charger with discharge channel having approximate oval cross-section. 4,074,835, Cl. 222-558.000.
Leigh Products, Inc.: *See—*
Antoszewski, Alex Joseph, 4,074,884, Cl. 248-289.00R.
Leinonen, Erkki Ilmari, to Outokumpu Oy. Stabilized voltage source having a series regulator on the alternating-voltage side. 4,075,548, Cl. 323-86.000.
Leland Stanford, Jr. University, The Board of Trustees of: *See—*
Boyd, Douglas P., 4,075,491, Cl. 250-445.00T.
Leland Stanford Junior University, The Board of Trustees of: *See—*
Boyd, Douglas P.; and Goitein, Michael, 4,075,492, Cl. 250-445.00T.
Lelke, Helmut, to Raytheon Company. Display processor system. 4,075,695, Cl. 364-200.000.
Lelkes, Antony: *See—*
Arato, Paul; Lelkes, Antony; and Reid, Larry Ronald, 4,074,387, Cl. 15-322.000.
Lenay, Daniel, to Societe Anonyme des Etablissements Jouvenel & Cordier. Spool valve distributor. 4,074,689, Cl. 137-270.000.
Lenmar Industries, Inc.: *See—*
Cunningham, Richard I.; and Day, Daniel E., 4,074,787, Cl. 180-82.00B.
Lentz, Brian A.: *See—*
Williams, David; Lentz, Brian A.; and Le Veque, Harold E., 4,074,856, Cl. 239-1.000.
Leo, Angelo Frank, to DeSoto, Inc. Corrosion-resistant epoxy-amine chromate-containing primers. 4,075,153, Cl. 260-37.0EP.
Leonard, Ralph William, to United States Steel Corporation. Method for the reclamation of zinc from galvanizing baths. 4,075,008, Cl. 75-86.000.
Lerner, Leonard: *See—*
Omodei-Sale, Amedeo; Consonni, Pietro; and Lerner, Leonard, 4,075,341, Cl. 424-258.000.
Lerner, Leonard J.: *See—*
Sale, Amedeo Omodie; Toia, Emilio; Galliani, Giulio; and Lerner, Leonard J., 4,075,342, Cl. 424-258.000.
Lerner Manufacturing, Inc.: *See—*
Blasnik, William; and Halpert, David, 4,074,838, Cl. 223-85.000.
Le Salver, Robert, to Automobiles Peugeot. Exhaust device for a combustion engine. 4,074,525, Cl. 60-322.000.
Leshem, Adam: *See—*
Cooper, David Eugene; Hendee, Leon Clyde, III; Hill, Walter Guy, Jr.; Leshem, Adam; and Marugg, Martin Lewis, 4,074,814, Cl. 214-1.0BB.
Lester, David Bruce: *See—*
Morse, Norman Bernard; and Lester, David Bruce, 4,075,142, Cl. 260-17.00R.
Leusden, Carl Otto Pels; Stupperich, Robert; and Weber, Hans-Bernd. Large-size plate-shaped building elements and process for making the same. 4,074,494, Cl. 52-606.000.
Leva, Joseph L.: *See—*
Leva, Max; and Leva, Joseph L., 4,075,298, Cl. 261-114.0TC.
Leva, Max; and Leva, Joseph L. Contact towers with leak-proof support of improved plate subassembly. 4,075,298, Cl. 261-114.0TC.
Le Veque, Harold E.: *See—*
Williams, David; Lentz, Brian A.; and Le Veque, Harold E., 4,074,856, Cl. 239-1.000.
Lever Brothers Company: *See—*
Duffin, Bryan, 4,075,110, Cl. 252-8.800.
Levinn, Robert N., to American Thermostat Corporation. Fail safe circuit for heat generating device. 4,075,678, Cl. 361-104.000.
Levy, Chauncey F., Jr.; and Pegis, Richard J., to said Chauncey F. Levy, Jr; by said Richard J. Pegis. Intraocular lens with high magnification. 4,074,368, Cl. 3-13.000.
Levy, Isaac I., to ESB Incorporated. Means of providing pressure relief to sealed galvanic cell. 4,075,398, Cl. 429-56.000.
Lewanoni, Dov. Collapsible container. 4,074,826, Cl. 220-6.000.
Lewis, Bernard L., to United States of America, Navy. Space adaptive coherent sidelobe canceller. 4,075,633, Cl. 343-100.0LE.
Lewis, Charles, Jr.: *See—*
Schuck, James M.; and Lewis, Charles, Jr., 4,075,197, Cl. 260-122.000.
Lewis, Irwin M., to ACF Industries, Incorporated. Control valve for bleeding fluid actuator. 4,074,702, Cl. 137-625.660.
Lewis, Jay L.: *See—*
Brakebill, Harold G.; Lewis, Jay L.; and Asbill, Clarence M., III, 4,074,855, Cl. 236-87.000.
Lewis, John Didwith, to Imperial Chemical Industries Limited. Electronic switches. 4,075,511, Cl. 307-270.000.
Lewis, Kim R.; and Corbett, William H., to NCR Corporation. Single station, plural function printer. 4,074,797, Cl. 197-1.00R.
Lewkowicz, Julian: *See—*
Cheatham, Samuel David; and Lewkowicz, Julian, 4,075,671, Cl. 360-113.000.
Leybold-Heraeus GmbH & Co. KG: *See—*
Thomas, Friedrich Werner, 4,075,414, Cl. 13-13.000.
Li, Hsin Lang; Oswald, Hendrikus Johan; and Liland, Alfred Louis, to Allied Chemical Corporation. Apparatus for texturizing yarn. 4,074,405, Cl. 28-257.000.
Liautaud, James P. Method of making a coil form by injection molding. 4,075,273, Cl. 264-250.000.
Libbey-Owens-Ford Company: *See—*
Hagedorn, Floyd T.; Rahrig, Donald D.; and Revells, Robert G., 4,074,996, Cl. 65-106.000.
Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Klank, Otto; and Rottmann, Dieter, 4,075,567, Cl. 325-453.000.
Lieber, Ludwig, to Fritz Eichenauer, Firma. Voltage tapping in electrical heating elements. 4,075,459, Cl. 219-375.000.
Lijewski, Robert R.; and Wiesen, Ernest J., to General Electric Company. Apparatus for controlling and displaying scintillation camera information. 4,075,485, Cl. 250-369.000.
Liland, Alfred Louis: *See—*
Li, Hsin Lang; Oswald, Hendrikus Johan; and Liland, Alfred Louis, 4,074,405, Cl. 28-257.000.
Lin, Kuo-Chuan: *See—*
Tsay, Yaw Jenn; and Lin, Kuo-Chuan, 4,075,063, Cl. 202-234.000.
Lin, Ruey Y.: *See—*
Economy, James; Jun, Choll K.; and Lin, Ruey Y., 4,075,276, Cl. 264-332.000.
Lindbloom, John L., to Christian Services, Inc. Motorized hide-a-bed actuating mechanism. 4,074,371, Cl. 5-13.000.
Lindsay Manufacturing Company: *See—*
Arndt, Kenneth E.; Otto, Lonnie E., Jr.; and Siekmeier, David A., 4,074,783, Cl. 180-14.00R.
Link, Donald F., to Recovery Systems, Inc. Food processing system. 4,074,868, Cl. 241-46.00R.
Link, William Trevor; Rugge, Henry Ferdinand; and Jansen, William David, to American Optical Corporation. Apparatus and process for determining systolic pressure. 4,074,711, Cl. 128-2.05A.
Lipnick, Richard: *See—*
Schneider, Richard A.; Freed, Gerald L.; and Lipnick, Richard, 4,075,699, Cl. 364-492.000.
Lipowski, Stanley A.; Dehn, Joseph W., Jr.; and Retzsch, Clinton E., to

Diamond Shamrock Corporation. Retanning and fatliquoring agent. 4,074,968, Cl. 8-94.220.

Lipschutz, Paul, to Neiman S. A. Cylinder locks having plates. 4,074,551, Cl. 70-364.00R.

Liskey Archectural Mfg. Inc.: *See*—
Ray, George F., III, 4,074,488, Cl. 52-263.000.

Little, Roger G.: *See*—
Neal, William R.; and Little, Roger G., 4,075,489, Cl. 250-401.000.

Litton Business Systems, Inc.: *See*—
Wu, Paul S.; and Reago, Robert V., 4,075,461, Cl. 235-466.000.

Litton Systems, Inc.: *See*—
Walker, Ralph Eldridge, 4,075,478, Cl. 250-231.0SE.

Liu, Daniel Ting Hsiu: *See*—
Campbell, Cyrill John; and Liu, Daniel Ting Hsiu, 4,075,193, Cl. 260-112.00B.

Lloyd, Ronald, to Smith & Nephew Plastics Limited. Melt-embossed polymer film. 4,075,379, Cl. 428-105.000.

Lo, David Shih-Fang: *See*—
Johnson, Leslie Harold; Lo, David Shih-Fang; and Paul, Maynard Carlton, 4,075,612, Cl. 365-171.000.

Lobkov, Vasily Danilovich: *See*—
Ponomarev, Alexei Ivanovich; Larionova, Julia Alexeevna; Ankudinov, Anatoly Kirillovich; Ryazanova, Rufina Mikhailovna; Klebansky, Alexandr Leibovich; Sokolov, Sergei Vasilievich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Rymareva, Tatyana Ivanovna; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Karlin, Alexandr Vasilievich; and Lobkov, Vasily Danilovich, 4,075,170, Cl. 260-46.50G.

Lochridge, Joe Cooper, to Brown & Root, Inc. Method of installing a flexible riser. 4,074,541, Cl. 61-110.000.

Lock, William E.; and Churillo, Charles J. Automated ammunition loading/downloading system. 4,074,610, Cl. 89-34.000.

Lockheed Electronics Co., Inc.: *See*—
Schneider, Richard A.; Freed, Gerald L.; and Lipnick, Richard, 4,075,699, Cl. 364-492.000.

Lode, Tenny D. Digital phase measurement system. 4,075,698, Cl. 364-483.000.

Loest, Kent W.; and Schaefer, John T., to Southwire Company; National Steel Corporation; and Earth Sciences, Inc. Process for the recovery of aluminum from alunite. 4,075,068, Cl. 204-93.000.

Lofdahl, Clyde A., to Raychem Corporation. Method and apparatus for the assembly of jacketed electronic devices. 4,074,420, Cl. 29-628.000.

Lofquist, Robert Alden; and Haylock, John Christopher, to Allied Chemical Corporation. Production of polycaproamide fiber wherein polycaproamide is reacted with phenylene bis-(3-butane-1,2-dicarboxylic anhydride). 4,075,271, Cl. 264-210.00F.

Lomax, John A.; and Martin, William J., to Ampex Corporation. Magnetic tape recorder. 4,075,666, Cl. 360-11.000.

Long, Elton B., to J. I. Case Company. Overcenter backhoe. 4,074,821, Cl. 214-138.00R.

Long, Henry A., Jr.: *See*—
Gross, William G.; Long, Henry A., Jr.; and Yamahak, John R., 4,074,655, Cl. 118-410.000.

Longo, Joseph T.: *See*—
Clarke, John Elwood; Andrews, Austin M., II; Gertner, Edward R.; Longo, Joseph T.; and Pasko, John G., 4,075,043, Cl. 148-171.000.

Lonza, Ltd.: *See*—
Oehrli, Beat; Mettler, Max; and Righetti, Bruno, 4,075,229, Cl. 260-340.000.

Lopez, Ana. Toy ballerina doll. 4,074,459, Cl. 46-47.000.

Lore, Nicola. Anti-chattering, grinding counterbalance device. 4,074,470, Cl. 51-238.00S.

Lorenzen, Cornelius, Jr. Pilfer proof display unit. 4,074,637, Cl. 109-38.000.

Lotz, Lawrence C., to Whirlpool Corporation. Oven door full front viewing panel. 4,074,677, Cl. 126-198.000.

Lourigan, Patrick M.; and Khatti, Ramkishan, to J. I. Case Company. Hydraulic control system with priority flow control. 4,074,528, Cl. 60-422.000.

Louzil, Friedrich; Habelt, Gerhard; and Mrazek, Gustav, to U.S. Philips Corporation. Index marking for a cassette magazine apparatus. 4,075,669, Cl. 360-92.000.

Loveless, John H., to United States of America, Veterans' Affairs. Prosthetic load-lift hook locking mechanism. 4,074,367, Cl. 3-1.100.

Lowe, Lawrence Alfred: *See*—
Beddell, Christopher Raymond; Lowe, Lawrence Alfred; and Wilkinson, Samuel, 4,075,191, Cl. 260-112.5LH.

Lowman, Richard M., Jr., to United States of America, Air Force. Deformable plug for an aircraft engine exhaust nozzle. 4,074,859, Cl. 239-265.330.

Lozinsky, Miron Onufrievich: *See*—
Ponomarev, Alexei Ivanovich; Sokolov, Sergei Vasilievich; Larionova, Julia Alexeevna; Rymareva, Tatyana Ivanovna; Klebansky, Alexandr Leibovich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; and Alexeeva, Ljubov Antonovna, 4,075,168, Cl. 260-46.50R.

Ponomarev, Alexei Ivanovich; Larionova, Julia Alexeevna; Ankudinov, Anatoly Kirillovich; Ryazanova, Rufina Mikhailovna; Klebansky, Alexandr Leibovich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Rymareva, Tatyana Ivanovna; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Karlin, Alexandr Vasilievich; and Lobkov, Vasily Danilovich, 4,075,170, Cl. 260-46.50G.

Lucas Electrical Company Limited: *See*—
Jones, Kenneth James, 4,075,471, Cl. 362-300.000.

Lucas Industries Limited: *See*—
Smith, Trevor Stanley, 4,074,521, Cl. 60-39.28R.

Lucero, Gerald N. Hold-down device for shirts and the like. 4,074,364, Cl. 2-117.000.

Lucifer S.A.: *See*—
Stampfli, Harald, 4,074,699, Cl. 137-625.640.

Luckenbach, Edward C., to Exxon Research & Engineering Co. Open shroud trickle valve. 4,074,691, Cl. 137-382.000.

Lummus Company, The: *See*—
Tsao, Utah, 4,074,660, Cl. 122-32.000.

Lupton, Daniel C.; Vermilion, Donn R.; and Bucher, James L., to Owens-Corning Fiberglas Corporation. Method for producing a bead for a pneumatic tire. 4,075,048, Cl. 156-136.000.

Luthi, Walter, to Heberlein Maschinenfabrik AG. Heating devices for the heat treatment of textile filaments or yarns. 4,074,544, Cl. 68-5.00E.

Luzsicza, Steven O.: *See*—
Snyder, Daniel S.; and Luzsicza, Steven O., 4,075,603, Cl. 340-58.000.

Lynch, David D., Jr.; and Tower, Lee W., to Hughes Aircraft Company. System for addressing and address incrementing of arithmetic unit sequence control system. 4,075,688, Cl. 364-200.000.

Lyng Industrier A-S Leksvikarmatur: *See*—
Saether, Gustav, 4,074,697, Cl. 137-606.000.

Lysikov, Boris Vasilievich; Shabanov, Jury Nikolaevich; Rybakov, Jury Viktorovich; and Svetlova, Valentina Ivanovna. Profiled multi-electrode thermocouple. 4,075,036, Cl. 136-225.000.

MacDonald, Harold B., to Thomas Taylor & Sons, Inc. Tipped lace. 4,075,046, Cl. 156-73.100.

Machida, Minoru: *See*—
Kawabata, Yoichi; and Machida, Minoru, 4,075,705, Cl. 364-752.000.

MacIntyre, Peter A.: *See*—
Goldblatt, Lawrence; Weiss, Werner; and MacIntyre, Peter A., 4,074,604, Cl. 83-830.000.

MacLeay, Ronald Edward; Sheppard, Chester Stephen; and Lange, Harold Carl, to Pennwalt Corporation. Tertiary aliphatic alpha-peroxyazo compounds. 4,075,199, Cl. 260-192.000.

MacLeay, Ronald Edward; and Sheppard, Chester Stephen, to Pennwalt Corporation. Preparation of block polymers using polyazo sequential free radical initiators. 4,075,286, Cl. 260-877.000.

Madl, Ronald L.; Simon, Frank J.; and Ortinau, Jerry T., to Ralston Purina Company. Process for reducing combustion product residues in products dried by a direct flame unit. 4,075,358, Cl. 426-465.000.

Maeda, Minoru: *See*—
Kojima, Masaharu; Ogawa, Hiroshi; Maeda, Minoru; Nitta, Kazuo; and Ito, Takayuki, 4,075,334, Cl. 424-238.000.

Maffrand, Jean-Pierre, to Parcor. Thieno [2,3-C] pyridine derivatives and therapeutic composition containing same. 4,075,340, Cl. 424-256.000.

Magers, Wallace F.; and Jegen, James M., to Realex Corporation. Spray pattern control structure and method. 4,074,861, Cl. 239-492.000.

Magiera, David L., to Wicks & Nemer, P.A. Game and apparatus. 4,074,906, Cl. 273-243.000.

Magnavox Company, The: *See*—
Heffron, Charles Buckner, 4,075,661, Cl. 358-166.000.

Maguire, Edward John, Jr.: *See*—
Gault, Terrell Wilson; and Maguire, Edward John, Jr., 4,075,118, Cl. 252-135.000.

Mahr, Rene N.: *See*—
Legille, Edouard; and Mahr, Rene N., 4,074,835, Cl. 222-558.000.

Maingot, John E.: *See*—
Van Bilderbeek, Bernard H.; Maingot, John E.; and Walker, James M., 4,074,912, Cl. 285-39.000.

Maki, Hiroshi: *See*—
Tabana, Minoru; Narisawa, Shizuo; Mitsuno, Tatsuyuki; and Maki, Hiroshi, 4,075,285, Cl. 260-876.00B.

Makino, Katsuaki: *See*—
Kurisu, Shingo; Oyamoto, Toshiya; Ochiai, Setumi; Miyamoto, Hiromu; and Makino, Katsuaki, 4,074,979, Cl. 48-111.000.

Makios, Vassilios: *See*—
Wight, James S.; Chudobiak, Walter J.; and Makios, Vassilios, 4,075,555, Cl. 324-58.50R.

Malchman, Franklin L.; Raddi, William J.; and Sharples, Susan, to ESB Incorporated. Cardiac pacer with rate runaway protection. 4,074,720, Cl. 128-419.0PG.

Malinowski, William J., to Chloride, Incorporated. Smoke detector with means for changing light pulse frequency. 4,075,499, Cl. 250-574.000.

Mallinckrodt, Inc.: *See*—
Kojima, Masaharu; Ogawa, Hiroshi; Maeda, Minoru; Nitta, Kazuo; and Ito, Takayuki, 4,075,334, Cl. 424-238.000.
Wolfangel, Robert G.; and Anderson, Howard A., 4,075,314, Cl. 424-1.000.

Malovik, Vladlen Vasilievich: *See*—
Ponomarev, Alexei Ivanovich; Sokolov, Sergei Vasilievich; Larionova, Julia Alexeevna; Rymareva, Tatyana Ivanovna; Klebansky, Alexandr Leibovich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; and Alexeeva, Ljubov Antonovna, 4,075,168, Cl. 260-46.50R.

Ponomarev, Alexei Ivanovich; Larionova, Julia Alexeevna; Ankudinov, Anatoly Kirillovich; Ryazanova, Rufina Mikhailovna; Klebansky, Alexandr Leibovich; Sokolov, Sergei Vasilievich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Rymareva, Tatyana Ivanovna; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Karlin, Alexandr Vasilievich; and Lobkov, Vasily Danilovich, 4,075,170, Cl. 260-46.50G.

Manchem, Limited: *See*—
Turner, John Harry Wallice, 4,075,178, Cl. 260-75.00T.

Mandy, Stephen H.; and Thompson, William D., to Dermatologics for Veterinary Medicine, Inc. Process for the treatment of acarid skin infections in animals. 4,075,353, Cl. 424-338.000.

Manly, William A., to Graham Magnetics Incorporated. Magnetic recording members. 4,075,672, Cl. 360-135.000.

Manning, Larry G.; and Zabelka, Richard J., to United States of America, Navy. Fax canister with a bottom burster charge and dispersion control ring. 4,074,628, Cl. 102-6.000.

Mansson, Martin; and Torstenfelt, Ragnar, to Stal-Laval Turbin AB. Combustion chamber for gas turbine. 4,074,520, Cl. 60-39.320.

Manufactura de Articulos para el Hogar "Aurora" S.A. Industrial, Comercial, Inmobiliaria y Financiera: *See*—
Vainer, Ernesto A., 4,074,962, Cl. 431-255.000.

Manufacture de Produits Chimiques Protex: *See*—
Bonnet, Jean-Claude; and Tesson, Gerard, 4,075,177, Cl. 260-75.00T.

Mao, Wei-Wen: *See*—
Szczesniak, Alina Surmacka; and Mao, Wei-Wen, 4,075,357, Cl. 426-332.000.

Marchetti, Michael John; and Szymansky, Edward, Jr., to Sperry Rand Corporation. Auxiliary trimmer assembly. 4,074,427, Cl. 30-34.100.

Marcus, Konrad H., to Prince Corporation. Visor and mirror assembly. 4,075,468, Cl. 362-144.000.

Mares, Frank: *See*—
Woolf, Cyril, deceased; Mares, Frank; and Oxenrider, Bryce C., 4,075,410, Cl. 560-87.000.

Marino, Armando V., to Zenith Radio Corporation. Base-socket system with arc prevention means. 4,075,531, Cl. 313-325.000.

Mark, Abraham S.: *See*—
Ainis, Herman; Lange, Charles F.; Mark, Abraham S.; and Scherr, George H., 4,075,315, Cl. 424-12.000.

Mark, Victor, to General Electric Company. Flame retardant polycarbonate composition. 4,075,164, Cl. 260-45.70S.

Mark, Victor; and Zengierski, Leon R., to Hooker Chemicals & Plastics Corporation. Polyhalobenzylic disulfooxonium compounds. 4,075,238, Cl. 260-458.00C.

Markels, Michael, Jr.: *See*—
Burlingame, Richard D.; and Markels, Michael, Jr., 4,075,370, Cl. 427-216.000.

Marlevi, Aleksander: *See*—
Ghisler, Walter; Marlevi, Aleksander; and Anas, Johan Olof, 4,075,428, Cl. 179-15.0BS.

Marquardt, Eugene Everett: *See*—
Fox, Joel Lawrence; and Marquardt, Eugene Everett, 4,075,693, Cl. 364-200.000.

Marrs, Richard E.: *See*—
Felber, Betty J.; Dauben, Dwight L.; and Marrs, Richard E., 4,074,757, Cl. 166-261.000.

Marsh, Samuel W., III; and Zumwalt, Keith E., Sr., to Owens-Illinois, Inc. Glass container handling. 4,075,086, Cl. 209-73.000.

Marshall, Harry Borden; and Vincent, Donald L., to Domtar Limited. Production of syringealdehyde from hardwood waste pulping liquors. 4,075,248, Cl. 260-600.00R.

Marshall, Kenneth Henry, to Premach Pty. Limited. Apparatus for use in shaping a tubular dental impression accessory. 4,074,436, Cl. 32-49.000.

Marshall, Robert, Jr. Emergency bathroom tissue holder. 4,074,872, Cl. 242-55.540.

Martin, Armand: *See*—
Dunham, Philip N.; Tillyer, John N.; and Martin, Armand, 4,074,977, Cl. 44-38.000.

Martin, James C.: *See*—
Irick, Gether, Jr.; Kelly, Charles A.; and Martin, James C., 4,075,162, Cl. 260-45.8NZ.

Martin, Michael Joseph; and Underwood, Michael John, to International Computers Limited. Sound analyzing apparatus. 4,075,423, Cl. 179-1.0SC.

Martin, Michael Joseph: *See*—
Underwood, Michael John; Martin, Michael Joseph; and Iles, Michael Victor, 4,075,424, Cl. 179-1.0SG.

Martin, Richard L.: *See*—
Redmore, Derek; Outlaw, Benjamin T.; and Martin, Richard L., 4,075,291, Cl. 260-933.000.

Martin, Thom O.: *See*—
Haag, Robert A.; Rousseau, Patrick M.; and Martin, Thom O., 4,075,356, Cl. 426-285.000.

Martin, William J.: *See*—
Lomax, John A.; and Martin, William J., 4,075,666, Cl. 360-11.000.

Marugg, Martin Lewis: *See*—
Cooper, David Eugene; Hendee, Leon Clyde, III; Hill, Walter Guy, Jr.; Leshem, Adam; and Marugg, Martin Lewis, 4,074,814, Cl. 214-1.0BB.

Marumoto, Katsuji: *See*—
Shibata, Takanori; and Marumoto, Katsuji, 4,075,541, Cl. 318-139.000.

Maruyama, Masayuki; Hamada, Yoshitugu; and Yamauchi, Ryoichi, to Riken Piston Ring Kogyo Kabushiki Kaisha. Sulphur and nitrogen treated iron based rotor for rotary piston engine. 4,074,956, Cl. 418-178.000.

Maruyama, Takashi; and Ueno, Katsuji, to Sumitomo Chemical Company, Limited. Process for the production of aromatic polyesters from hydroxybenzoic acid and products thereof. 4,075,173, Cl. 260-47.00C.

Maruzen Sewing Machine Co., Ltd.: *See*—
Matsuda, Kimikazu; and Yamaguchi, Yoshihiro, 4,074,644, Cl. 112-215.000.

Marx, Arthur Friedrich; and Barendse, Nicolaas Cornelis Maria Emanuel, to Gist-Brocades N.V. 16-Dehydro steroids of the androstane series. 4,075,233, Cl. 260-397.300.

Marx, Arthur Friedrich; Verwey, Jan; and Smid, Peter Max, to Gist-Brocades N.V. Methods of combatting bacterial infections in warm-blooded animal with cephalsporin R-sulfoxide. 4,075,337, Cl. 424-246.000.

Masagutova, Ljudmila Vladimirovna: *See*—
Moiseev, Vladimir Vasilievich; Kosovtsev, Vladimir Vasilievich; Kolesnikova, Galina Prokofievna; Zimnukhov, Viktor Alexandrovich; Miroshnikova, Lidia Alexeevna; Kimel, Esfir Abramovna; Chefranova, Edit Konstantinovna; Guseva, Valentina Ivanovna; and Masagutova, Ljudmila Vladimirovna, 4,075,166, Cl. 260-45.95H.

Masaki, Kenji: *See*—
Tokura, Naomi; Masaki, Kenji; and Nagaisi, Hatuo, 4,074,975, Cl. 23-288.00F.

Maschinenfabrik Benniger AG: *See*—
Schenk, Kurt, 4,074,404, Cl. 28-185.000.

Masevice, Frank V., to Towmotor Corporation. Battery enclosure. 4,074,785, Cl. 180-68.500.

Mason, Burton Hoster; and Feldman, Marvin. Tool system for submergible chamber. 4,074,540, Cl. 61-69.00R.

Massachusetts Institute of Technology: *See*—
Stern, Ernest; Williamson, Richard C.; and Smith, Henry I., 4,075,706, Cl. 364-821.000.

Mastermount Corporation: *See*—
Daly, George W.; and Rucker, Joseph R., 4,074,883, Cl. 248-286.000.

Masuda, Hajime; Takeuchi, Takeshi; Watanabe, Masakatsu; and Tomioka, Yukio, to Hochiki Corporation. Alarm system utilizing cable-TV multi-receiver systems. 4,075,628, Cl. 340-416.000.

Masuda, Kohji: *See*—
Chano, Takashi; and Masuda, Kohji, 4,074,640, Cl. 112-121.110.

Masur, Christian; and Stverak, Vaclav, to Autophon Aktiengesellschaft. Selective calling arrangement. 4,075,564, Cl. 325-55.000.

Matake, Naomasa; Yoshimura, Tadayoshi; and Sato, Kuniaki, to Hitachi Metals, Ltd. Fittings for connecting columns and beams. 4,074,947, Cl. 403-406.000.

Material Distributors Corporation: *See*—
Willdorf, Michael E., 4,075,386, Cl. 428-216.000.

Matsu Kyu Kabushiki Kaisha: *See*—
Fukuda, Hiroshi; and Kuzuo, Tooze, 4,075,442, Cl. 200-16.00F.

Matsuda, Kichiro: *See*—
Ozawa, Shuji; Nakagawa, Yasuo; Matsuda, Kichiro; Nishihara, Toshio; and Yunoki, Hideki, 4,075,172, Cl. 260-47.0CZ.

Matsuda, Kimikazu; and Yamaguchi, Yoshihiro, to Maruzen Sewing Machine Co., Ltd. Feed mechanism for sewing machine. 4,074,644, Cl. 112-215.000.

Matsuda, Yoshio; and Tsubokawa, Yoshitoki, to Yoshida Kogyo Kabushiki Kaisha. Slide fastener tape. 4,074,398, Cl. 24-205.10C.

Matsumoto, Seiji: *See*—
Iwasa, Masakazu; Horikawa, Kazuo; and Matsumoto, Seiji, 4,075,011, Cl. 96-1.00R.

Matsunaga, Tsutomu: *See*—
Nishimura, Kazuhiro; Harada, Jumei; Migita, Tetsuhiko; and Matsunaga, Tsutomu, 4,075,275, Cl. 264-313.000.

Matsuno, Yoshiyuki: *See*—
Nohara, Tomiyasu; Matsuno, Yoshiyuki; Harada, Hisamitsu; and Yamada, Akinori, 4,074,440, Cl. 34-92.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Namoto, Yoshiteru; and Sakumoto, Hideki, 4,075,670, Cl. 360-85.000.
Ohnishi, Masanori, 4,075,395, Cl. 428-542.000.
Shigeta, Junnosuke; and Munehiro, Tomiji, 4,074,605, Cl. 84-1.220.

Matsushita Electric Works, Ltd.: *See*—
Sauer, Hans, 4,075,585, Cl. 335-78.000.
Sauer, Hans, 4,075,586, Cl. 335-79.000.

Matsushita Electronics Corporation: *See*—
Umebachi, Shotaro; Kano, Gota; and Inoue, Morio, 4,075,652, Cl. 357-22.000.

Matt, Richard J., to Textron, Inc. Low-friction fabric bearing. 4,074,512, Cl. 57-140.0BY.

Mattsson, Orjan Mats; and Widl, Walter Herbert Erwin, to Telefonaktiebolaget L M Ericsson. System for phase division multiplex duplex communication over a two-wire circuit between a master terminal and a slave terminal. 4,075,427, Cl. 179-15.0BC.

Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V.: *See*—
Rabl, Carl-Roland, 4,074,939, Cl. 356-206.000.

Maxwell Laboratories, Inc.: *See—*
Hunter, Robert O., Jr.; and Howton, Craig N., 4,075,579, Cl. 331-94.50G.
McBane, Bruce N.: *See—*
Porter, Samuel, Jr.; and McBane, Bruce N., 4,075,141, Cl. 260-17.200.
McCabe Brothers Drilling, Inc.: *See—*
McCabe, William E.; McCabe, Howard W.; and McCabe, Edwin L., 4,074,735, Cl. 141-311.00R.
McCabe, Edwin L.: *See—*
McCabe, William E.; McCabe, Howard W.; and McCabe, Edwin L., 4,074,735, Cl. 141-311.00R.
McCabe, Francis J. Resettable, heat actuatable fire link. 4,074,388, Cl. 16-48.500.
McCabe, Howard W.: *See—*
McCabe, William E.; McCabe, Howard W.; and McCabe, Edwin L., 4,074,735, Cl. 141-311.00R.
McCabe, William E.; McCabe, Howard W.; and McCabe, Edwin L., to McCabe Brothers Drilling, Inc. Grouting tube. 4,074,735, Cl. 141-311.00R.
McCarthy, John J. Food dispenser having door actuated agitators. 4,074,832, Cl. 222-245.000.
McCay, Dariel. Adjustable threshold. 4,074,464, Cl. 49-468.000.
McClung, Charles E.; Schwendeman, James L.; and Salyer, Ival O., to Monsanto Research Corporation. Process for making instant shaped foams. 4,075,265, Cl. 264-53.000.
McCullough, Charles R.; to General Electric Company. Direct current cable with resistivity graded insulation, and a method of transmitting direct current electrical energy. 4,075,421, Cl. 174-120.0SC.
McDougald, Larry R., to Eli Lilly and Company. Coccidiocidal combinations. 4,075,323, Cl. 424-114.000.
McDowell, Jimmy J. Rotary engine. 4,074,522, Cl. 60-39.610.
McFarland, Sam R.: *See—*
Laenger, Charles J., Sr.; McFarland, Sam R.; and Peel, Harry H., 4,074,444, Cl. 35-35.00A.
McFatter, Myron L., to Anchortank, Inc. Welded storage tank construction including a structural fin. 4,074,847, Cl. 228-145.000.
McGonigal, Charles: *See—*
Bloxham, Gordon Foreman; Brezeale, Claude Paren; Cocco, Eugene Raymond; Hardesty, Edwin Charles; Small, Byron Lee; Steinert, Daniel Marion; and McGonigal, Charles, 4,075,299, Cl. 264-25.000.
McGregor, Charles William: *See—*
Karkoski, Joseph; McGregor, Charles William; and Payette, Lionel Joseph, 4,075,179, Cl. 260-75.00N.
McHeffey, Murray Parker, to Extrudart Metal Products, Inc. Multiposition window. 4,074,462, Cl. 49-192.000.
McMath, Connie W.: *See—*
Holler, Richard P.; and McMath, Connie W., 4,074,523, Cl. 60-266.000.
McMillan, Moses W.: *See—*
Rinehart, Kenneth L., Jr.; McMillan, Moses W.; and Sobiczewski, Wojciech, 4,075,339, Cl. 424-250.000.
McMillin, Danny Leon; and Dugan, Larry Mason, to Coors Container Company. Apparatus and methods for inspection of can bodies by use of light. 4,074,809, Cl. 209-75.000.
McRae, Dougles Charles; and Hutchison, Philip Scott, to National Research Development Corporation. Apparatus for grading objects according to size. 4,075,088, Cl. 209-106.000.
McRobbie, Malcolm McKenzie: *See—*
Gilbert, Joseph; McRobbie, Malcolm McKenzie; and Gee, Wilfred, 4,075,637, Cl. 346-153.000.
McShane, Lawrence J., to Eli Lilly and Company. Epimerization process. 4,075,219, Cl. 260-306.70C.
Mead Corporation, The: *See—*
Feliks, James J., 4,074,619, Cl. 93-55.10R.
Mead Johnson & Company: *See—*
Kreighbaum, William E.; and Comer, William T., 4,075,344, Cl. 424-258.000.
Mecklenberg, Frank Howard, to Bird Electronic Corporation. VSWR meter circuit using variable RF attenuator. 4,075,554, Cl. 324-58.00B.
Mectronic Inc.: *See—*
Roberts, Charles; and DeMichele, Ernest, 4,074,670, Cl. 123-119.00E.
Meder, Heinz, to Klockner-Humboldt-Deutz Aktiengesellschaft. Releasable compression device for use with a crushing mill or the like. 4,074,866, Cl. 241-30.000.
Mediglas, Inc.: *See—*
Harmony, George W., III, 4,074,370, Cl. 4-173.00R.
Medvedev, Viktor Vladimirovich: *See—*
Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Kudryakov, Mikhail Nikolaevich; Tsipkis, Alexandr Moiseevich; Yakovlev, Vladimir Germogenovich; Averbukh, Alexandr Samoilovich; Scherbakov, Jury Ilich; Yakobson, Natalia Dmitrievna; Semikozov, Vyacheslav Fedorovich; Medvedev, Viktor Vladimirovich; Yartaev, Valery Vasilievich; Kaganov, July Davydovich; Kuznetsov, Vladimir Ivanovich; and Sinelnikov, Alexandr Iosifovich, 4,074,773, Cl. 173-23.000.
Meier, Johann Hans: *See—*
Galetto, Louis Valentine; Meier, Johann Hans; Pimbley, Walter Thornton; and Wolfe, Bruce Allen, 4,075,636, Cl. 346-75.000.
Meininger, Fritz: *See—*
Fuchs, Hermann; Kapaun, Gustav; and Meininger, Fritz, 4,074,967, Cl. 8-54.000.
Melaja, Asko J.; and Hamalainen, Lauri, to Suomen Sokeri Osakeyhtio. Process for making xylose. 4,075,406, Cl. 536-1.000.
Melcher, Franz Josef, to Sartorius-Werke GmbH (und. vorm. Gottinger Praezisionswagenfabrik GmbH). Electromagnetically compensating weighing or dynamometer apparatus. 4,074,781, Cl. 177-212.000.
Mendenhall, Robert L. Asphalt-aggregate recycle. 4,074,894, Cl. 366-7.000.
Menikheim, Virginia C.: *See—*
Anderson, Richard M.; Caviness, Alton L.; Menikheim, Virginia C.; and Silverman, Bernard, 4,075,383, Cl. 428-198.000.
Menini, Corrado, to Lamborghini Oleodinamica S.p.A. Oleodynamic servo control. 4,074,531, Cl. 60-547.000.
Merck & Co., Inc.: *See—*
Rokach, Joshua; Atkinson, Joseph G.; and Rooney, Clarence S., 4,075,225, Cl. 260-326.310.
Mermelstein, Shmuel; and Klugmann, Nathan. Turkey loader. 4,074,658, Cl. 119-82.000.
Merritt, George Albert, Jr., to San/Bar Corporation. Key telephone privacy exclusion apparatus. 4,075,434, Cl. 179-99.000.
Merritt, James A., to United States of America, Army. Laser chemistry synthesis of NF_4BF_4. 4,075,072, Cl. 204-157.10R.
Mertzweiller, Joseph K.; and Tenney, Horace M., to Exxon Research & Engineering Co. Hydrogenation of organic compounds. 4,075,251, Cl. 260-638.00B.
Mesaros, Louis, to Produits Chimiques Ugine Kuhlmann. Mixed persalts stable in detergent compositions. 4,075,116, Cl. 252-102.000.
Mess, Richard C., to Dayton Sure-Grip & Shore Company, The. Filler plug for coil insert in concrete slab or panel. 4,074,499, Cl. 52-705.000.
Messerschmidt, Rudolph: *See—*
Snow, Conley H.; and Messerschmidt, Rudolph, 4,074,634, Cl. 105-493.000.
Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung: *See—*
Hofmann, Fritz, 4,075,701, Cl. 364-579.000.
Metallgesellschaft Aktiengesellschaft: *See—*
Fischer, Herbert, 4,075,310, Cl. 423-574.00R.
Metaux Speciaux S.A.: *See—*
Castagna, Herman; Gravey, Guy; and Roth, Andre, 4,075,277, Cl. 423-55.000.
Gravey, Guy; Grolla, Paul; and Roth, Andre, 4,075,278, Cl. 423-55.000.
Mettler, Max: *See—*
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Meyer-Ebrecht, Dietrich; and Kowalski, Gunter, to U.S. Philips Corporation. Device for measuring radiation absorption or emission. 4,075,484, Cl. 250-366.000.
Meyer, Roth & Pastor Maschinenfabrik GmbH: *See—*
Taubert, Klaus; Benner, Reimund; and Judt, Friedrich, 4,074,518, Cl. 59-15.000.
Wust, Toni, 4,075,451, Cl. 219-51.000.
Meyer, Victor E., to Dow Chemical Company, The. Process of inhibiting tannin migration in tannin-containing wood substrates. 4,075,394, Cl. 428-537.000.
Meyerand, Russell G., Jr.: *See—*
Bullis, Robert H.; Meyerand, Russell G., Jr.; and Wiegand, Walter J., Jr., 4,074,572, Cl. 73-194.00F.
Meyers, Norman W.: *See—*
Rapson, W. Howard; Fredette, Maurice C. J.; and Meyers, Norman W., 4,075,308, Cl. 423-478.000.
Meyn, Pieter. Fowl gizzard separator. 4,074,390, Cl. 17-11.000.
Michaels, Edwin B. Antimicrobial compositions employing certain betaines and certain amine oxides. 4,075,350, Cl. 424-316.000.
Migita, Tetsuhiko: *See—*
Nishimura, Kazuhiro; Harada, Jumei; Migita, Tetsuhiko; and Matsunaga, Tsutomu, 4,075,275, Cl. 264-313.000.
Mihulka, Merle C., to Essex Group, Inc. Wire stripping apparatus. 4,074,596, Cl. 81-9.510.
Milberger, Ernest C.: *See—*
Dolhyj, Serge R.; Milberger, Ernest C.; and White, James F., 4,075,231, Cl. 260-346.400.
Zagata, Robert J.; and Milberger, Ernest C., 4,075,232, Cl. 260-346.750.
Miles, Bernard. Apparatus for forming, interleaving and dispensing food patties. 4,074,509, Cl. 53-122.000.
Miller, Benjamin U., to Kelley Company, Inc. Apparatus for agitating and removing non-combustible material from an incinerator. 4,074,638, Cl. 110-8.00R.
Miller, Douglas P., to Applied Power Inc. Fluid operated hydraulic pump. 4,074,612, Cl. 91-290.000.
Miller, Jean C.: *See—*
Katner, Allen S.; Gutowski, Gerald E.; and Miller, Jean C., 4,075,214, Cl. 260-287.00B.
Miller, Orville C.: *See—*
Sauer, Louis E.; and Miller, Orville C., 4,074,595, Cl. 76-107.00C.
Millhollan, Michael Scott; and Reinschmidt, Robert Michael, to Motorola, Inc. On-chip voltage source for integrated circuits. 4,075,609, Cl. 365-154.000.
Mills, James W.: *See—*
Howard, Lawrence F.; Mills, James W.; and Shannon, James L., 4,074,385, Cl. 15-180.000.
Mills, King L.; and Johnson, Paul H., to Phillips Petroleum Company. Non-carcinogenic carbon black. 4,075,160, Cl. 260-42.470.
Milton, Thomas J., to General Motors Corporation. Lock cylinder assembly. 4,074,548, Cl. 70-1.500.
Milwaukee Electric Tool Corporation: *See—*
Lafferty, Gary S., Sr., 4,075,523, Cl. 310-239.000.

Minegishi, Shuzo: *See—*
Sawachika, Yasumasa; Kawakami, Hiroshi; and Minegishi, Shuzo, 4,075,137, Cl. 260-2.5AT.
Miner Enterprises, Inc.: *See—*
Anderson, David G., 4,074,813, Cl. 213-24.000.
Minnesota Mining and Manufacturing Company: *See—*
Montean, Samuel, 4,075,618, Cl. 340-280.000.
Sterling, Craig A., 4,075,131, Cl. 252-542.000.
Wood, William A., 4,075,049, Cl. 156-220.000.
Minolta Camera Kabushiki Kaisha: *See—*
Ueda, Hiroshi; and Yoshizaki, Akira, 4,075,640, Cl. 354-31.000.
Miroshnikova, Lidia Alexeevna: *See—*
Moiseev, Vladimir Vasilievich; Kosovtsev, Vladimir Vasilievich; Kolesnikova, Galina Prokofievna; Zimnukhov, Viktor Alexandrovich; Miroshnikova, Lidia Alexeevna; Kimel, Esfir Abramovna; Chefranova, Edit Konstantinovna; Guseva, Valentina Ivanovna; and Masagutova, Ljudmila Vladimirovna, 4,075,166, Cl. 260-45.95H.
Miskic, Franjo. Method of repairing or reinforcing tubular plastic members. 4,074,412, Cl. 29-401.00E.
Mitchell, Maurice M.: *See—*
Doelp, Louis C.; Friedman, Lee; and Mitchell, Maurice M., 4,075,082, Cl. 208-10.000.
Mitchell, Robert Lee; and Chung, William John, to Colgate-Palmolive Company. Dental cream composition. 4,075,317, Cl. 424-52.000.
Mitsubishi Chemical Industries Limited: *See—*
Tanabe, Yasuo, 4,075,413, Cl. 560-244.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Nakamura, Hirokazu; and Motoyama, Hikoichi, 4,074,589, Cl. 74-604.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Kurisu, Shingo; Oyamoto, Toshiya; Ochiai, Setumi; Miyamoto, Hiromu; and Makino, Katsuaki, 4,074,979, Cl. 48-111.000.
Nohara, Tomiyasu; Matsuno, Yoshiyuki; Harada, Hisamitsu; and Yamada, Akinori, 4,074,440, Cl. 34-92.000.
Mitsubishi Petrochemical Company Limited: *See—*
Kadowaki, Koju; Takagi, Kenji; and Tanaka, Yoshiaki, 4,075,127, Cl. 252-470.000.
Konno, Kazuhiko; Hayasi, Yosio; Taniyama, Eiji; and Sekiya, Tetsuo, 4,075,121, Cl. 252-407.000.
Takashi, Masanori; and Yoshiyasu, Mitsuo, 4,075,050, Cl. 156-229.000.
Mitsuhashi, Sadayuki; Suzuki, Norio; and Nago, Kazuyoshi, to Nippon Electric Co., Ltd. Signal switching device. 4,075,433, Cl. 179-18.0GE.
Mitsuhashi, Sadayuki: *See—*
Suzuki, Hideo; Ishiguro, Ginya; Mitsuhashi, Sadayuki; and Wakamatsu, Kazutoshi, 4,075,587, Cl. 335-112.000.
Mitsui Mining & Smelting Co., Ltd.: *See—*
Shinohara, Yukio; and Ueno, Kuniki, 4,075,069, Cl. 204-106.000.
Mitsuno, Tatsuyuki: *See—*
Tabana, Minoru; Narisawa, Shizuo; Mitsuno, Tatsuyuki; and Maki, Hiroshi, 4,075,285, Cl. 260-876.00B.
Mitter, Mathias. Screen printing machine. 4,074,625, Cl. 101-128.100.
Miura, Kazumasa: *See—*
Sato, Hitoshi; Watanabe, Hazime; Miura, Kazumasa; and Kudo, Koji, 4,074,457, Cl. 43-113.000.
Mixan, Craig E.: *See—*
Wilson, Charles A.; and Mixan, Craig E., 4,075,204, Cl. 260-250.0BC.
Wilson, Charles A.; and Mixan, Craig E., 4,075,205, Cl. 260-250.0BC.
Miyagawa Kasei Industry Co., Ltd.: *See—*
Miyagawa, Shiro, 4,075,401, Cl. 429-89.000.
Miyagawa, Shiro, to Miyagawa Kasei Industry Co., Ltd. Gas-discharging passage of storage battery and molding method thereof. 4,075,401, Cl. 429-89.000.
Miyamae, Toshiaki. Warning device. 4,075,629, Cl. 340-421.000.
Miyamoto, Hiromu: *See—*
Kurisu, Shingo; Oyamoto, Toshiya; Ochiai, Setumi; Miyamoto, Hiromu; and Makino, Katsuaki, 4,074,979, Cl. 48-111.000.
Miyoshi, Tatsuru: *See—*
Mukaemachi, Takuji; Takeshita, Tetsuo; Miyoshi, Tatsuru; and Kojima, Takafumi, 4,075,431, Cl. 179-18.0GF.
Mizoguchi, Yoshiyuki: *See—*
Furuta, Tadaaki; Inagaki, Kenji; Mizoguchi, Yoshiyuki; Fujikawa, Noboru; and Kominami, Naoya, 4,075,100, Cl. 210-266.000.
Mizumura, Yutaka: *See—*
Fujiyoshi, Kanji; Mizumura, Yutaka; and Sono, Junji, 4,075,261, Cl. 260-850.000.
Mizuno, Yukio; Kikuchi, Takeshi; and Kojima, Shuichi, to Nissan Motor Company, Limited. Apparatus for selectively inserting weft yarns into the shed of a weaving loom. 4,074,728, Cl. 139-435.000.
Mizuno, Yukio, to Nissan Motor Company, Limited. Apparatus for selectively detaining and releasing weft yarns in weaving loom. 4,074,729, Cl. 139-450.000.
Mizuno, Yukio, to Nissan Motor Company, Limited. Weft-yarn drawing-off and length-measuring apparatus of weaving loom having weft selector means. 4,074,730, Cl. 139-452.000.
Mizunuma, Susumu: *See—*
Yanagimoto, Samon; Aoyagi, Koshiro; Mizunuma, Susumu; and Nambu, Kouki, 4,074,557, Cl. 72-206.000.
Mobil Oil Corporation: *See—*
Kerr, George T.; and Schweizer, Albert E., 4,075,307, Cl. 423-413.000.
Roberts, William Walter, 4,074,954, Cl. 418-68.000.
Mochizuki, Shigeaki: *See—*
Narita, Yoshihiro; Mochizuki, Shigeaki; Kakimoto, Shigeru; Komori, Norio; Watanabe, Kiyoshi; and Shiota, Hideji, 4,074,864, Cl. 241-23.000.
Modic, Fedor: *See—*
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Moens, Joris, to N. V. Bekaert S. A. Construction panels. 4,075,380, Cl. 428-140.000.
Moffett, Robert Bruce, to Upjohn Company, The. S-triazolo-1,5-benzodiazpine-4-ones. 4,075,202, Cl. 260-239.30T.
Mohammadioun, Said: *See—*
Bolick, Fred C., Jr.; Titus, Theodore, IV; and Mohammadioun, Said, 4,075,436, Cl. 179-100.1DR.
Mohaupt, Udo H.: *See—*
Burns, David J.; Mohaupt, Udo H.; and Yie, Gene G., 4,074,858, Cl. 239-172.000.
Moiseev, Vladimir Vasilievich; Kosovtsev, Vladimir Vasilievich; Kolesnikova, Galina Prokofievna; Zimnukhov, Viktor Alexandrovich; Miroshnikova, Lidia Alexeevna; Kimel, Esfir Abramovna; Chefranova, Edit Konstantinovna; Guseva, Valentina Ivanovna; and Masagutova, Ljudmila Vladimirovna. Method of stabilization of rubbers and vulcanizates. 4,075,166, Cl. 260-45.95H.
Molenaar, Lester V. Apparatus for making a coil spring object. 4,074,958, Cl. 425-71.000.
Molex Incorporated: *See—*
Deshich, Dushan C.; Chmela, Frank P.; and Kufner, Kenneth L., 4,074,424, Cl. 29-753.000.
Monarch Marking Systems, Inc.: *See—*
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Monk, James T.; Hailey, James L.; and Boyles, Tonnie M., to Taylor Machine Works, Inc. Bulk material reclaiming apparatus. 4,074,801, Cl. 198-304.000.
Monobond Australia Pty. Limited: *See—*
Aitchison, Lindsay Matthew; Sparks, Kenneth Arnold; and Schuster, Earl Eugene, 4,075,377, Cl. 428-95.000.
Monovis B. V.: *See—*
Clarke, Robert John; Hundy, Guy Francis; and Zimmern, Bernard, 4,074,957, Cl. 418-195.000.
Monroe Auto Equipment Company: *See—*
Paul, George A., 4,075,097, Cl. 210-168.000.
Paul, George A.; Hegel, Robert W.; Bethell, Michael R.; Branham, Charles L.; and Utter, Allan D., 4,075,098, Cl. 210-168.000.
Monsanto Company: *See—*
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Burke, William D.; Higginbottom, Harold P.; and Le Blanc, John R., 4,075,403, Cl. 429-253.000.
D'Amico, John J., 4,075,216, Cl. 260-294.80C.
Schuck, James M.; and Lewis, Charles, Jr., 4,075,197, Cl. 260-122.000.
Monsanto Research Corporation: *See—*
McClung, Charles E.; Schwendeman, James L.; and Salyer, Ival O., 4,075,265, Cl. 264-53.000.
Monsod, Godofredo G., Jr. Method for lining car, trucks and ship bodies, steel tubes, plates and other metallic bodies to protect same from abrasion, corrosion and heat. 4,075,373, Cl. 427-327.000.
Montean, Samuel, to Minnesota Mining and Manufacturing Company. Magnetic asymmetric antipilferage marker. 4,075,618, Cl. 340-280.000.
Moore, Charles R. Emergency lamp. 4,075,470, Cl. 362-287.000.
Moore, Clifton Ross; and Moore, John Greydon. Anti-skid tire chain. 4,074,741, Cl. 152-237.000.
Moore, Danny R.: *See—*
Chapman, Benjamin E.; Moore, Danny R.; and Phillips, Arthur F., 4,075,382, Cl. 428-192.000.
Moore, John Greydon: *See—*
Moore, Clifton Ross; and Moore, John Greydon, 4,074,741, Cl. 152-237.000.
Morehouse, Donald S., Jr.; Bolton, Frank H., deceased; and by Bolton, Kathryn M., administratrix, to Dow Chemical Company, The. Emulsion polymerization method for preparing microspheres having liquid center and seamless rigid walls. 4,075,134, Cl. 260-29.6RW.
Moreno, Pierre F.: *See—*
Richaud, Aime A.; Moreno, Pierre F.; and Rimbaud, Guy A., 4,074,585, Cl. 74-424.80R.
Morgan Construction Company: *See—*
Woodrow, Harold E., 4,074,553, Cl. 72-66.000.
Morgan, Donald L.: *See—*
Dall, Arthur G.; and Morgan, Donald L., 4,074,594, Cl. 76-101.00A.
Morgan, Wesley W. Thermodynamic motor. 4,074,534, Cl. 60-675.000.
Morie, Gerald P.; and Sloan, Cephas H., to Eastman Kodak Company. Tobacco smoke filter rods having fibers bonded with water and glycol bonding dispersions. 4,074,724, Cl. 131-267.000.
Morimoto, Tatsuo; Nakamura, Munekazu; Inooka, Masayoshi; and Yawata, Teizaburo, to Chiyoda Chemical Engineering & Construction Co., Ltd. Catalysts for hydrodemetallization of hydrocarbons containing metallic compounds as impurities. 4,075,125, Cl. 252-455.00R.
Morrell, Roger J.; Gunn, Jerome A.; and Gore, Gerald D., to United States of America, Interior. Square hole drill. 4,074,778, Cl. 175-91.000.
Morris, Cyril R.: *See—*
Gower, Stephen G. M.; Morris, Cyril R.; and Wright, Ernest, 4,074,976, Cl. 23-292.000.

Morris, Donald E.: *See—*
Christopher, Chris J.; Wenninger, Fred W.; Morris, Donald E.; Covington, Wayne F.; Folsom, Jerry B.; Beyers, Joseph W.; Nairn, John H.; and Osborne, Jeffrey C., 4,075,679, Cl. 364-200.000.

Morris, Hugh C.: *See—*
Hoehn, Richard F.; Morris, Hugh C.; Therkildsen, Henry T.; and Behrends, Bertwin E., 4,074,796, Cl. 192-3.570.

Morrison, Charles F., Jr., to Valleylab, Inc. Improved electrosurgical instrument. 4,074,718, Cl. 128-303.140.

Morrison, Ward D., to Joy Manufacturing Company. Rock drill. 4,074,771, Cl. 173-6.000.

Morse, Norman Bernard; and Lester, David Bruce. Composition for non-equeal disc brake pads. 4,075,142, Cl. 260-17.00R.

Morton, Edgar J.; Donnan, Harold; and Wiesenfeld, Arnold, to Witco Chemical Corporation. Built detergent compositions. 4,075,117, Cl. 252-135.000.

Motoike, Yasuo: *See—*
Sasajima, Kikuo; Ono, Keiichi; Motoike, Yasuo; Inaba, Shigeho; and Yamamoto, Hisao, 4,075,346, Cl. 424-267.000.

Motorola, Inc.: *See—*
Davidson, Allen Loy; and Wanat, Ronald Joseph, 4,075,581, Cl. 333-10.000.
Dydyk, Michael, 4,075,578, Cl. 331-56.000.
Kennedy, Howard L.; and Ooms, John, 4,075,573, Cl. 330-129.000.
Millhollan, Michael Scott; and Reinschmidt, Robert Michael, 4,075,609, Cl. 365-154.000.
Scott, Paul Howard, 4,075,508, Cl. 307-213.000.

Motoyama, Hikoichi: *See—*
Nakamura, Hirokazu; and Motoyama, Hikoichi, 4,074,589, Cl. 74-604.000.

Mott, James D., to Hydril Company. Drilling tool. 4,074,761, Cl. 166-315.000.

Mowbray, Warwick; Hart, Richard; and Cavey, William, to Ciba-Geigy Corporation. Cattle dusting bag. 4,074,659, Cl. 119-159.000.

Moyer, Alan Ray, to Gillette Company, The. Compact hair curling iron. 4,075,458, Cl. 219-225.000.

Mrazek, Gustav: *See—*
Louzil, Friedrich; Habelt, Gerhard; and Mrazek, Gustav, 4,075,669, Cl. 360-92.000.

Mrcun, Ivan. Brushless alternator. 4,075,519, Cl. 310-67.00R.

Muehldorf, Eugen Igor: *See—*
Eichelberger, Edward Baxter; Muehldorf, Eugen Igor; Walther, Ronald Gene; and Williams, Thomas Walter, 4,074,851, Cl. 235-302.000.

Mueller, Richard A., to G. D. Searle & Co. Heterocyclic phosphonium salts. 4,075,407, Cl. 542-412.000.

Mukaemachi, Takuji; Takeshita, Tetsuo; Miyoshi, Tatsuru; and Kojima, Takafumi, to Hitachi, Ltd. Speech path system. 4,075,431, Cl. 179-18.0GF.

Mulcay, Michael: *See—*
Traficante, Daniel D.; and Mulcay, Michael, 4,075,552, Cl. 324-0.5AH.

Muller, Karl A., Jr., to Standard Oil Company (Indiana). Apparatus for distributing solid particles into a vertical vessel. 4,074,836, Cl. 222-564.000.

Multuloc Corporation: *See—*
Grearson, Kenneth R., 4,074,486, Cl. 52-235.000.

Munakata, Tsuneaki; and Kuboshima, Makoto, to Fuji Photo Film Co., Ltd. Folding camera. 4,075,645, Cl. 354-187.000.

Munehiro, Tomiji: *See—*
Shigeta, Junnosuke; and Munehiro, Tomiji, 4,074,605, Cl. 84-1.220.

Muntjanoff, John R., to Caterpillar Tractor Co. Variably biased control mechanism. 4,074,613, Cl. 91-413.000.

Murata, Moriyasu; Yamanaka, Makoto; and Fujino, Takashi, to Kao Soap Co., Ltd. Detergent composition. 4,075,129, Cl. 252-527.000.

Murdoch, Henry W., to Reed Tool Company. Drill bit. 4,074,922, Cl. 308-8.200.

Murman, Earll M.: *See—*
Cheung, John B.; and Murman, Earll M., 4,074,779, Cl. 175-314.000.

Muromura, Tadasumi, to Japan Atomic Energy Research Institute. Method for drying an ammonia gas stream. 4,075,306, Cl. 423-352.000.

Murphy, Howard C.: *See—*
Kraus, James R.; and Murphy, Howard C., 4,074,945, Cl. 403-197.000.

Murphy, Richard J., to Xerox Corporation. Fusing surface and method for fixing toner. 4,075,390, Cl. 428-307.000.

Myers, John D.; and Vollers, Charles S., to Kogre, Inc. Laser phosphate glass compositions. 4,075,120, Cl. 252-301.40P.

N L Industries, Inc.: *See—*
Stridde, George E., 4,075,126, Cl. 252-455.00R.

N. V. Bekaert S. A.: *See—*
Moens, Joris, 4,075,380, Cl. 428-140.000.

Nasijer, Geert Jan: *See—*
Borne, Jean Paul; and Nasijer, Geert Jan, 4,075,665, Cl. 360-8.000.

Nabisco, Inc.: *See—*
Thulin, Robert R., 4,075,359, Cl. 426-502.000.

Nagaisi, Hatuo: *See—*
Tokura, Naomi; Masaki, Kenji; and Nagaisi, Hatuo, 4,074,975, Cl. 23-288.00F.

Nagaoka, Isao: *See—*
Kawakami, Hiroshi; Tsukagawa, Yukio; and Nagaoka, Isao, 4,075,096, Cl. 210-96.00R.

Nagase, Mitsuo, to Yoshida Kogyo K. K. Decorative window sash frame assembly. 4,074,490, Cl. 52-312.000.

Nago, Kazuyoshi: *See—*
Mitsuhashi, Sadayuki; Suzuki, Norio; and Nago, Kazuyoshi, 4,075,433, Cl. 179-18.0GE.

Nairn, John H.: *See—*
Christopher, Chris J.; Wenninger, Fred W.; Morris, Donald E.; Covington, Wayne F.; Folsom, Jerry B.; Beyers, Joseph W.; Nairn, John H.; and Osborne, Jeffrey C., 4,075,679, Cl. 364-200.000.

Nakagawa, Yasuo: *See—*
Ozawa, Shuji; Nakagawa, Yasuo; Matsuda, Kichiro; Nishihara, Toshio; and Yunoki, Hideki, 4,075,172, Cl. 260-47.0CZ.

Nakamura, Hirokazu; and Motoyama, Hikoichi, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Four cylinder in-line engine with driving balancer system. 4,074,589, Cl. 74-604.000.

Nakamura, Munekazu: *See—*
Morimoto, Tatsuo; Nakamura, Munekazu; Inooka, Masayoshi; and Yawata, Teizaburo, 4,075,125, Cl. 252-455.00R.

Nakata, Yohei. Timing apparatus. 4,075,506, Cl. 307-117.000.

Nalco Chemical Company: *See—*
Frisque, Alvin J.; and DuBrow, Paul L., 4,075,144, Cl. 260-22.00R.

Nambu, Kouki: *See—*
Yanagimoto, Samon; Aoyagi, Koshiro; Mizunuma, Susumu; and Nambu, Kouki, 4,074,557, Cl. 72-206.000.

Namoto, Yoshiteru; and Sakumoto, Hideki, to Matsushita Electric Industrial Co., Ltd. Tape auto-loading recording and reproducing apparatus. 4,075,670, Cl. 360-85.000.

Narbaits-Jaureguy, Jean-Raymond: *See—*
Bouverot, Rene; and Narbaits-Jaureguy, Jean-Raymond, 4,075,553, Cl. 324-233.000.

Narisawa, Shizuo: *See—*
Tabana, Minoru; Narisawa, Shizuo; Mitsuno, Tatsuyuki; and Maki, Hiroshi, 4,075,285, Cl. 260-876.00B.

Narita, Yoshihiro; Mochizuki, Shigeaki; Kakimoto, Shigeru; Komori, Norio; Watanabe, Kiyoshi; and Shiota, Hideji, to Idemitsu Kosan Co., Ltd. Method for producing polycarbonate powder from a polycarbonate solution. 4,074,864, Cl. 241-23.000.

National Patent Development Corporation: *See—*
Barer, Sol J.; and Stockel, Richard F., 4,075,007, Cl. 71-118.000.

National Research Development Corporation: *See—*
Bellhouse, Brian John, 4,075,091, Cl. 210-19.000.
McRae, Dougles Charles; and Hutchison, Philip Scott, 4,075,088, Cl. 209-106.000.

National Semiconductor Corporation: *See—*
Davies, David C., 4,075,702, Cl. 364-705.000.
Redfern, Thomas P., 4,075,509, Cl. 307-251.000.

National Steel Corporation: *See—*
Loest, Kent W.; and Schaefer, John T., 4,075,068, Cl. 204-93.000.

National Telephone Supply Company, The: *See—*
Neale, Dory J., Sr., 4,075,417, Cl. 174-84.00C.

Naylor, Carter G.; and Yeakey, Ernest L., to Texaco Development Corporation. Polyoxypropylene polyamine derivatives as defoamers. 4,075,130, Cl. 252-548.000.

NCR Corporation: *See—*
Gulett, Michael R., 4,075,367, Cl. 427-94.000.
Lewis, Kim R.; and Corbett, William H., 4,074,797, Cl. 197-1.00R.
Wescott, Robert D.; and Christie, John B., 4,074,852, Cl. 235-463.000.

Neal, William R.; and Little, Roger G., to Simulation Physics. Method and apparatus involving the generation of X-rays. 4,075,489, Cl. 250-401.000.

Neale, Dory J., Sr., to National Telephone Supply Company, The. Crimped, insulation piercing electrical connection. 4,075,417, Cl. 174-84.00C.

Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek ten behoeve van Nijverheid, Handel en Verkeer: *See—*
Ritter, Fridolin Jacob; and Stein, Friedrich, 4,075,320, Cl. 424-84.000.

Neff, Marion W.: *See—*
Hilley, Larry L.; and Neff, Marion W., 4,075,605, Cl. 340-146.3AC.

Negre, Robert Paul, to Pont-A-Mousson S.A. Centrifugal casting machine having a device for axially placing and maintaining a core in position. 4,074,748, Cl. 164-292.000.

Neiman S. A.: *See—*
Lipschutz, Paul, 4,074,551, Cl. 70-364.00R.

Nelson, John E., to Hamilton Technology, Inc. Intermaxillary tooth moving device. 4,074,433, Cl. 32-14.00E.

Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-3,7-inter-m-phenylene-3-oxa-11-deoxy-PGE$_1$ compounds. 4,075,247, Cl. 260-590.00C.

Nelson, Paul T., to TRW Inc. Controlled thermal expansivity structure. 4,074,473, Cl. 52-1.000.

Nemoto, Mitsuo; and Honma, Kimiyasu, to Kabushiki Kaisha Audio-Technica. Stereophonic pickup cartridge. 4,075,418, Cl. 179-100.41K.

Neville, Martin Charles: *See—*
Verge, John Pomfret; Neville, Martin Charles; and Friedman, Henry, 4,075,222, Cl. 548-336.000.

New Archery Products Corporation: *See—*
Simo, Miroslav Andrew, 4,074,674, Cl. 124-41.00A.

Newman, Gerald H.: *See—*
Francis, Robert W.; and Newman, Gerald H., 4,075,397, Cl. 429-50.000.

NGK Spark Plug Co. Ltd.: *See—*
Yagi, Hideaki; and Hishiki, Tetsuo, 4,075,449, Cl. 200-315.000.

Nickell, Joe H. Survival kit container. 4,075,078, Cl. 206-546.000.

Nickerson, William A.: *See—*
Keller, James R.; and Nickerson, William A., 4,074,498, Cl. 52-690.000.

Nicolaides, Ernest D., to Parke, Davis & Company. Nonapeptides and methods for their production. 4,075,192, Cl. 260-112.5LH.

Nielsen, Milton R.; and Olsen, Robert A., to American Hospital Supply Corporation. Pressure-responsive speed control for dental handpieces. 4,074,434, Cl. 32-27.000.

Niemela, W. Wally. Hinged snowplow, conversion kit, and method therefor. 4,074,448, Cl. 37-41.000.

Niemeyer, Heinrich, to Westfalia Separator AG. Apparatus for the continuous production of standardized milk. 4,074,622, Cl. 99-456.000.

Niggeloh, Fritz. Photographic implement. 4,075,642, Cl. 354-82.000.

Nippon Carbon Co., Ltd.: *See—*
Ishikawa, Toshikatsu; Junichi, Tanaka; Teranishi, Haruo; and Kondo, Shinichiro, 4,075,114, Cl. 252-62.000.

Nippon Columbia Kabushikikaisha: *See—*
Hayashi, Hideaki; and Kakuta, Susumu, 4,074,873, Cl. 242-75.430.
Kamo, Yoshihisa; Tachibana, Takeshi; and Ichimura, Masao, 4,075,425, Cl. 179-1.0GQ.

Nippon Electric Co., Ltd.: *See—*
Iijima, Yukihiko; Iinuma, Kazumoto; and Ishiguro, Tatsuo, 4,075,655, Cl. 358-13.000.
Mitsuhashi, Sadayuki; Suzuki, Norio; and Nago, Kazuyoshi, 4,075,433, Cl. 179-18.0GE.
Suzuki, Hideo; Ishiguro, Ginya; Mitsuhashi, Sadayuki; and Wakamatsu, Kazutoshi, 4,075,587, Cl. 335-112.000.

Nippon Soda Company, Limited: *See—*
Sawaki, Mikio; Iwataki, Isao; Hirono, Yoshihiko; and Ishikawa, Hisao, 4,075,239, Cl. 260-464.000.

Nippon Soken, Inc.: *See—*
Noguchi, Masaaki; Bunda, Tsuchio; and Tanaka, Taro, 4,074,661, Cl. 123-3.000.
Obayashi, Hideki; Kohama, Tokio; Hattori, Tadashi; and Nishida, Minoru, 4,074,566, Cl. 73-116.000.

Nippon Steel Corporation: *See—*
Taketani, Osamu, 4,074,402, Cl. 24-268.000.
Ueno, Masakatsu; Kato, Osamu; Kawauchi, Nobuyuki; and Itoh, Kametaro, 4,075,041, Cl. 148-12.400.
Yanagimoto, Samon; Aoyagi, Koshiro; Mizunuma, Susumu; and Nambu, Kouki, 4,074,557, Cl. 72-206.000.

Nippon Telegraph and Telephone Public Corporation: *See—*
Suzuki, Hideo; Ishiguro, Ginya; Mitsuhashi, Sadayuki; and Wakamatsu, Kazutoshi, 4,075,587, Cl. 335-112.000.

Nippon Zeon Co. Ltd.: *See—*
Akiyama, Shinichi; and Yamamoto, Haruhisa, 4,075,244, Cl. 260-530.00N.

Nippondenso Co., Ltd.: *See—*
Kondo, Yoshihiko, 4,075,501, Cl. 307-41.000.

Nishida, Minoru: *See—*
Obayashi, Hideki; Kohama, Tokio; Hattori, Tadashi; and Nishida, Minoru, 4,074,566, Cl. 73-116.000.

Nishida, Yoshio: *See—*
Noguchi, Yukihide; Nishimura, Takeshi; Kishimoto, Jotaro; and Nishida, Yoshio, 4,074,654, Cl. 118-73.000.

Nishihara, Toshio: *See—*
Ozawa, Shuji; Nakagawa, Yasuo; Matsuda, Kichiro; Nishihara, Toshio; and Yunoki, Hideki, 4,075,172, Cl. 260-47.0CZ.

Nishimura, Kazuhiro; Harada, Jumei; Migita, Tetsuhiko; and Matsunaga, Tsutomu, to Bridgestone Tire Company Limited. Methods of casting pneumatic tires. 4,075,275, Cl. 264-313.000.

Nishimura, Sadaji: *See—*
Takasuka, Kaoru; Takahashi, Masatatsu; and Nishimura, Sadaji, 4,075,498, Cl. 250-562.000.

Nishimura, Takeshi: *See—*
Noguchi, Yukihide; Nishimura, Takeshi; Kishimoto, Jotaro; and Nishida, Yoshio, 4,074,654, Cl. 118-73.000.

Nissan Denshi Kabushikikaisha: *See—*
Kazuo, Arai, 4,075,565, Cl. 325-138.000.

Nissan Motor Company, Limited: *See—*
Mizuno, Yukio; Kikuchi, Takeshi; and Kojima, Shuichi, 4,074,728, Cl. 139-435.000.
Mizuno, Yukio, 4,074,729, Cl. 139-450.000.
Mizuno, Yukio, 4,074,730, Cl. 139-452.000.
Tokura, Naomi; Masaki, Kenji; and Nagaisi, Hatuo, 4,074,975, Cl. 23-288.00F.

Nissen, Stanley M.; and Wallach, Steven J., to Raytheon Company. Microprogram controlled digital computer. 4,075,687, Cl. 364-200.000.

Nitta, Kazuo: *See—*
Kojima, Masaharu; Ogawa, Hiroshi; Maeda, Minoru; Nitta, Kazuo; and Ito, Takayuki, 4,075,334, Cl. 424-238.000.

Noe, Oskar, to BWG Bergwerk-und Walzwerk Maschinenbau Gesellschaft mit beschrankter Haftung. Method of and apparatus for improving hot-rolled sheet-metal strips. 4,074,555, Cl. 72-128.000.

Noguchi, Masaaki; Bunda, Tsuchio; and Tanaka, Taro, to Nippon Soken, Inc. Fuel reforming system for an internal combustion engine. 4,074,661, Cl. 123-3.000.

Noguchi, Yukihide; Nishimura, Takeshi; Kishimoto, Jotaro; and Nishida, Yoshio, to Takeda Chemical Industries, Ltd. Automatic closure cleansing and coating machine. 4,074,654, Cl. 118-73.000.

Nohara, Tomiyasu; Matsuno, Yoshiyuki; Harada, Hisamitsu; and Yamada, Akinori, to Mitsubishi Jukogyo Kabushiki Kaisha; and Kabushiki Kaisha Kobe Seikosho. Automatic vacuum dehydrating apparatus in a slurry carrying vessel. 4,074,440, Cl. 34-92.000.

Nolan, Harold L. Method of making dual wall pipe with foam insulation between pipe walls. 4,075,268, Cl. 264-138.000.

Nolin, Joseph Arthur Benoit: *See—*
Anton, Anthony; and Nolin, Joseph Arthur Benoit, 4,075,378, Cl. 428-97.000.

Nonnemacher, Gerhard; Knodel, Emil; Robeller, Walter; and Bosch, Paul, to Robert Bosch GmbH. Pumping arrangement control device. 4,074,955, Cl. 417-218.000.

Nordebo, Knut Assar. Multi-phase generator without slip rings and brushes. 4,075,521, Cl. 310-184.000.

Nordhofen, Benedikt, to Bayer Aktiengesellschaft. Method and apparatus for the measurement of volumetric flowrate in pipes and ducts. 4,074,573, Cl. 73-205.00R.

Norris, Alan H.: *See—*
Chambley, Phillip W.; and Norris, Alan H., 4,074,511, Cl. 57-34.0AT.

North American Products Corporation: *See—*
Dall, Arthur G.; and Morgan, Donald L., 4,074,594, Cl. 76-101.00A.

North, Howard L., Jr., to Becton, Dickinson and Company. Method and apparatus for measuring fluid specific gravity. 4,074,562, Cl. 73-32.00A.

Northern Telecom Limited: *See—*
Straus, Jozef; and Szentesi, Otto Istvan, 4,075,474, Cl. 250-199.000.

Noshiro, Atsumi: *See—*
Takamizawa, Minoru; Yamamoto, Yasushi; Inoue, Yoshio; Noshiro, Atsumi; and Fujii, Hitoshi, 4,075,167, Cl. 260-46.50E.

Nossler, Franz: *See—*
Grill, Michael; Grohmann, Helmut; and Nossler, Franz, 4,075,293, Cl. 261-20.000.

Nouvertne, Werner: *See—*
Schmidt, Manfred; Freitag, Dieter; and Nouvertne, Werner, 4,075,119, Cl. 252-182.000.

Novotny, Rudolph J., to United Technologies Corporation. High pressure lightweight flanges. 4,074,914, Cl. 285-405.000.

Noyes, Richard Croissant, to Combustion Engineering, Inc. Articulated fuel assembly. 4,075,058, Cl. 176-21.000.

Noyes, Robert: *See—*
Brady, John K.; and Noyes, Robert, 4,075,302, Cl. 269-43.000.

Nuchman, Benjamin; and Whang, Sang Y. Apparatus for manufacturing lenses. 4,074,469, Cl. 51-217.00L.

Nuss, James W., to Ferro Corporation. Inorganic pigment comprising a solid solution of differing spinels. 4,075,029, Cl. 106-288.00B.

Nussbaum, Hans. Traveling nut assembly with low friction and automatic brake. 4,074,586, Cl. 74-424.80C.

N.V. Western Gear Europe S.A.: *See—*
Harig, Manfred, 4,074,582, Cl. 74-230.240.

O & R Inktchemie N.V.: *See—*
Schelhaas, Ealbertus Willem; and Blokker, Eduard Johannes Cornelis Marie, 4,075,143, Cl. 260-17.200.

Obara, Masaaki: *See—*
Koyama, Tsuneo; Sugiyama, Yuichi; Furuhama, Teruhide; Tajima, Yoshio; Kakiuchi, Hiroshi; Yamada, Kazuhiro; and Obara, Masaaki, 4,075,159, Cl. 260-42.470.

Obayashi, Hideki; Kohama, Tokio; Hattori, Tadashi; and Nishida, Minoru, to Nippon Soken, Inc. Intake air amount detecting device for an internal combustion engine. 4,074,566, Cl. 73-116.000.

Obenhaus, Robert E.: *See—*
Squiers, David J.; and Obenhaus, Robert E., 4,075,674, Cl. 361-27.000.

Oberg, Elmer B., to Paul Taylor Co. Process for preparing stable full fat oilseed extract. 4,075,361, Cl. 426-655.000.

Oberman, Joel Roy; and Stewart, Roger Green, to RCA Corporation. Write enhancement circuit. 4,075,690, Cl. 365-156.000.

Ochiai, Setumi: *See—*
Kurisu, Shingo; Oyamoto, Toshiya; Ochiai, Setumi; Miyamoto, Hiromu; and Makino, Katsuaki, 4,074,979, Cl. 48-111.000.

Ochiai, Tomoyoshi; Hayashi, Takeshi; and Furuse, Mituhiro, to Tokyo Denryoku Kabushiki Kaisha; and Kabushiki Kaisha Meidensha. Apparatus for monitoring two electric quantities by combining three consecutive samples of each quantity. 4,075,697, Cl. 364-481.000.

O'Donnell, Brian: *See—*
Capriotti, Alfred J.; Lazzaretti, Louis G.; and O'Donnell, Brian, 4,074,439, Cl. 33-286.000.

Oehrli, Beat; Mettler, Max; and Righetti, Bruno, to Lonza, Ltd. Process for stabilizing metaldehyde and stabilized composition. 4,075,229, Cl. 260-340.000.

Oesterle, Helmut, to Hilti Aktiengesellschaft. Fastening element feeding device for an explosive powder driven setting gun. 4,074,843, Cl. 227-8.000.

Ogawa, Hiroshi: *See—*
Kojima, Masaharu; Ogawa, Hiroshi; Maeda, Minoru; Nitta, Kazuo; and Ito, Takayuki, 4,075,334, Cl. 424-238.000.

Ogden Metals, Inc.: *See—*
Burlingame, Richard D.; and Markels, Michael, Jr., 4,075,370, Cl. 427-216.000.

Ohnishi, Masanori, to Matsushita Electric Industrial Co., Ltd. Hybrid framework consisting of metallic plate and projections made of synthetic resin. 4,075,395, Cl. 428-542.000.

Ohtani, Toshiyuki: *See—*
Sakamaki, Hisashi; and Ohtani, Toshiyuki, 4,075,456, Cl. 219-216.000.

Oikawa, Yoshifumi: *See—*
Shibata, Takehiko; Ando, Tadahiko; Kitsunai, Tokuji; Kamiyama, Norio; and Oikawa, Yoshifumi, 4,075,062, Cl. 195-103.50R.

Oil Recovery Corporation: *See—*
Scott, Harold W., 4,074,758, Cl. 166-249.000.
Okada, Toshio: *See—*
Sakurada, Ichiro; Okada, Toshio; and Hirano, Yutaka, 4,075,075, Cl. 204-159.170.
Okamoto, Shinobu. Apparatus for holding battery. 4,075,402, Cl. 429-98.000.
Okamura, Kenji: *See—*
Saito, Masaaki; and Okamura, Kenji, 4,075,294, Cl. 261-34.00A.
Okayama, Shigeo; and Kawakatsu, Hisazo, to Agency of Industrial Science & Technology. Pattern forming apparatus using quadrupole lenses. 4,075,488, Cl. 250-396.00R.
Okudaira, Sadao, to Asahi Kogaku Kogyo Kabushiki Kaisha. Variable focal length lens system. 4,074,931, Cl. 350-184.000.
Olander, Walter Karl, to General Electric Company. Promotion of manganese chelate catalyzed polyphenylene ether oxide polymerization reactions. 4,075,174, Cl. 260-47.0ET.
Olcott, Tyler Keith, to W. R. Grace & Co. Method for making blow molded generally tire shaped articles. 4,075,187, Cl. 264-89.000.
O'Leary, George P., to Floating Point Systems, Inc. Floating point data processor for high speech operation. 4,075,704, Cl. 364-748.000.
Olin Corporation: *See—*
Boudakian, Max M., 4,075,252, Cl. 260-649.00F.
Hodil, Elmer Raleigh, Jr., 4,074,844, Cl. 227-8.000.
Ollivier, Jean; and Combette, Marc. Device for inserting nail-like fasteners at difficultly accessible points. 4,074,842, Cl. 227-8.000.
Ollivier, Jean: *See—*
Combette, Marc; and Ollivier, Jean, 4,074,845, Cl. 227-10.000.
Olsen, Robert A.: *See—*
Nielsen, Milton R.; and Olsen, Robert A., 4,074,434, Cl. 32-27.000.
Olstowski, Franciszek, to Dow Chemical Company, The. Solid, rapid-setting, rigid polyurethanes. 4,075,151, Cl. 260-33.20R.
Oman, Richard A.; and Foreman, Kenneth M., to Grumman Aerospace Corporation. Variable stator, diffuser augmented wind turbine electrical generation system. 4,075,500, Cl. 290-55.000.
Omodei-Sale, Amedeo; Consonni, Pietro; and Lerner, Leonard, to Gruppo Lepetit S.p.A. 2-Substituted phenyl-5-triazols [5,1-a] isoquinoline compounds. 4,075,341, Cl. 424-258.000.
Onishi, Toshimi: *See—*
Takeda, Kouichi; Sato, Hiroshi; and Onishi, Toshimi, 4,074,556, Cl. 72-196.000.
Ono, Keiichi: *See—*
Sasajima, Kikuo; Ono, Keiichi; Motoike, Yasuo; Inaba, Shigeho; and Yamamoto, Hisao, 4,075,346, Cl. 424-267.000.
Ono, Taisaburo. Underwater trusses for breakwater structure. 4,074,497, Cl. 52-648.000.
Ooms, John: *See—*
Kennedy, Howard L.; and Ooms, John, 4,075,573, Cl. 330-129.000.
Ordorika, Imanol. Tubular dwelling construction. 4,074,476, Cl. 52-79.200.
Oroshnik, William: *See—*
Close, Ralph E.; and Oroshnik, William, 4,075,257, Cl. 260-680.00R.
Orr, Brian William Gordon: *See—*
Watt, Robert Duncan; and Orr, Brian William Gordon, 4,074,503, Cl. 52-749.000.
Orning, John Harry. Disposable saliva ejector. 4,074,435, Cl. 32-33.000.
Orsini, Ronald J.; and Universita, Joseph Della. Idle speed needle screw for carburetors. 4,075,296, Cl. 261-41.00D.
Orthman, Henry K., to Orthman Manufacturing Inc. Floating folding tool bar having a lock means. 4,074,766, Cl. 172-311.000.
Orthman Manufacturing Inc.: *See—*
Orthman, Henry K., 4,074,766, Cl. 172-311.000.
Ortho Pharmaceutical Corporation: *See—*
Hirsch, Allen Frederick, 4,075,351, Cl. 424-303.000.
Ortinau, Jerry T.: *See—*
Madl, Ronald L.; Simon, Frank J.; and Ortinau, Jerry T., 4,075,358, Cl. 426-465.000.
Osborne, Jeffrey C.: *See—*
Christopher, Chris J.; Wenninger, Fred W.; Morris, Donald E.; Covington, Wayne F.; Folsom, Jerry B.; Beyers, Joseph W.; Nairn, John H.; and Osborne, Jeffrey C., 4,075,679, Cl. 364-200.000.
Ostermayer, Franz: *See—*
Wilhelm, Max; Eichenberger, Kurt; Schroter, Herbert; and Ostermayer, Franz, 4,075,208, Cl. 260-256.40C.
Wilhelm, Max; Eichenberger, Kurt; Schroter, Herbert; and Ostermayer, Franz, 4,075,335, Cl. 424-244.000.
Oswald, Alexis A.; and Valint, Paul L., Jr., to Exxon Research & Engineering Co. Pesticidal O,S'-dialkyl S-hydrocarbylthioalkyl dithiophosphates and oxidized derivatives thereof. 4,075,332, Cl. 424-216.000.
Oswald, Hendrikus Johan: *See—*
Li, Hsin Lang; Oswald, Hendrikus Johan; and Liland, Alfred Louis, 4,074,405, Cl. 28-257.000.
Oswald, Leo Alex, to Owens-Corning Fiberglas Corporation. Method and apparatus for depositing material into a moving receptacle. 4,075,301, Cl. 264-40.700.
Otani, Akira, to Tanabe Kokoki Co., Ltd. Casting machine with mold tilting discharge means. 4,074,749, Cl. 164-326.000.
Otsu, Iwao; and Watanabe, Motohisa. Process for the marking on metal or the like surfaces. 4,075,064, Cl. 204-18.00R.
Otsuka, Yoshinao: *See—*
Takahashi, Hirohiko; Otsuka, Yoshinao; Sato, Yuichiro; and Tsukamoto, Yoshiki, 4,074,747, Cl. 164-443.000.
Otto, Joseph H., Sr. Dispensing container. 4,074,833, Cl. 222-390.000.
Otto, Lonnie E., Jr.: *See—*
Arndt, Kenneth E.; Otto, Lonnie E., Jr.; and Siekmeier, David A., 4,074,783, Cl. 180-14.00R.
Outboard Marine Corporation: *See—*
Cavil, David T.; Hansen, Einar T.; and Schmidt, Henry J., 4,074,669, Cl. 123-148.0CC.
Patis, Bruce L., 4,074,665, Cl. 123-102.000.
Outlaw, Benjamin T.: *See—*
Redmore, Derek; Outlaw, Benjamin T.; and Martin, Richard L., 4,075,291, Cl. 260-933.000.
Outokumpu Oy: *See—*
Leinonen, Erkki Ilmari, 4,075,548, Cl. 323-86.000.
Saari, Kaarlo Matti Juhani; and Kalliokoski, Aarno Iisakki, 4,075,089, Cl. 209-169.000.
Sipila, Heikki Johannes; and Kiuru, Erkki Sakari, 4,075,486, Cl. 250-374.000.
Outram, Christopher David, to CCL Systems Limited. Connecting reinforcing bars in an access hole. 4,074,493, Cl. 52-583.000.
Owens-Corning Fiberglas Corporation: *See—*
Lupton, Daniel C.; Vermilion, Donn R.; and Bucher, James L., 4,075,048, Cl. 156-136.000.
Oswald, Leo Alex, 4,075,301, Cl. 264-40.700.
Philippa, Thomas E., 4,075,155, Cl. 260-38.000.
Stotler, David V., 4,074,871, Cl. 242-42.000.
Owens-Illinois, Inc.: *See—*
Marsh, Samuel W., III; and Zumwalt, Keith E., Sr., 4,075,086, Cl. 209-73.000.
Oxenrider, Bryce C.: *See—*
Woolf, Cyril, deceased; Mares, Frank; and Oxenrider, Bryce C., 4,075,410, Cl. 560-87.000.
Oyamoto, Toshiya: *See—*
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Ozalid Group Holdings Limited: *See—*
Gilbert, Joseph; McRobbie, Malcolm McKenzie; and Gee, Wilfred, 4,075,637, Cl. 346-153.000.
Ozawa, Shuji; Nakagawa, Yasuo; Matsuda, Kichiro; Nishihara, Toshio; and Yunoki, Hideki, to Teijin Limited. Novel aromatic copolyamides prepared from 3,4' diphenylene type diamines, and shaped articles therefrom. 4,075,172, Cl. 260-47.0CZ.
P. R. Mallory & Co. Inc.: *See—*
Pearce, Godfrey R.; Breeden, William J.; and See, Francis R., 4,074,417, Cl. 29-570.000.
Packer, Eugene S.; and England, George J., to DeSoto, Inc. Low gloss radiation cure. 4,075,366, Cl. 427-44.000.
Paget, Charles J., to Eli Lilly and Company. S-triazolo[5,1-b]benzothiazoles. 4,075,218, Cl. 260-305.000.
Pahlen, Lars Christer: *See—*
Johansson, Ake Ernst Elof; and Pahlen, Lars Christer, 4,075,683, Cl. 361-415.000.
Palenscar, William J. Pipe. 4,074,723, Cl. 131-198.00R.
Palkiewicz, John Louis: *See—*
Tsen, Lo Kwang; and Palkiewicz, John Louis, 4,075,260, Cl. 260-830.0TW.
Palme, Anthony Ferdinand; and Streeter, Daniel Inott, to Smyth Manufacturing Company, The. Heating apparatus for book forming and creasing irons. 4,074,382, Cl. 11-1.0CP.
Palosi, Eva: *See—*
Toth, Edit; Torley, Jozsef; Gorog, Sandor; Szporny, Laszlo; Palosi, Eva; and Szeberenyi, Szabolcz, 4,075,249, Cl. 260-613.00D.
Paltier Corporation, The: *See—*
Skubic, Leroy F.; Donkle, Lucius B., Jr.; and Groth, Donald L., 4,074,812, Cl. 211-192.000.
Panetti, Romolo. Apparatus for the continuous on-track truing of railway rails. 4,074,468, Cl. 51-178.000.
Pangborn, Jon B.; Sharer, John C.; and Elkins, Robert H., to American Gas Association. Process for producing hydrogen and oxygen from water. 4,075,313, Cl. 423-658.000.
Panzer, Jerome, to Exxon Research & Engineering Co. Combination of asphaltenes with flow improver polymers to improve the flow properties of high boiling fuel oils. 4,074,978, Cl. 44-62.000.
Panzera, Carlino, to Brunswick Corporation. Porous ceramic seals and method of making same. 4,075,364, Cl. 427-34.000.
Parcor: *See—*
Maffrand, Jean-Pierre, 4,075,340, Cl. 424-256.000.
Pariza, George R., to Pittway Corporation. Electric horn. 4,075,627, Cl. 340-388.000.
Parke, Davis & Company: *See—*
Butler, Donald E., 4,075,408, Cl. 548-324.000.
Campbell, Cyrill John; and Liu, Daniel Ting Hsiu, 4,075,193, Cl. 260-112.00B.
Nicolaides, Ernest D., 4,075,192, Cl. 260-112.5LH.
Tinney, Francis John, 4,075,189, Cl. 260-112.50R.
Parker, David H. Recovery buoy. 4,074,380, Cl. 9-8.00R.
Parker, Roger John: *See—*
Drewe, Nigel Wyndham; Parker, Roger John; and Tadros, Tharwat Fouad, 4,075,002, Cl. 71-92.000.
Parker, William H.; and Hart, Lawrence, to Del Norte Technology, Inc. Wireline running tool. 4,074,762, Cl. 166-315.000.
Parnaby, Derek. Treatment of effluent. 4,075,095, Cl. 210-82.000.
Pascente, Joseph E. Thyristor voltage switching circuits. 4,075,510, Cl. 307-252.00B.
Pasko, John G.: *See—*
Clarke, John Elwood; Andrews, Austin M., II; Gertner, Edward R.; Longo, Joseph T.; and Pasko, John G., 4,075,043, Cl. 148-171.000.

Passavant, Francis C.; and Pease, Richard R., to GTE Sylvania Incorporated. Video display system. 4,075,620, Cl. 340-324.0AD.
Patel, Bhupendra C.: *See—*
Binard, William J.; Ciarico, Anthony J.; Anglada, Leonard R.; and Patel, Bhupendra C., 4,074,714, Cl. 128-218.00P.
Patel, Mahesh S., to Eutectic Corporation. Wear resistant alloy coating containing tungsten carbide. 4,075,371, Cl. 427-224.000.
Patellis, Anargiros Pete: *See—*
Douglas, Paul S.; Patellis, Anargiros Pete; and Vredenburgh, Walter A., 4,075,404, Cl. 526-237.000.
Patent Development & Management Company: *See—*
Larsen, Larry D., 4,075,487, Cl. 250-385.000.
Pater, Walter E.; and Rowley, James R., to PPG Industries, Inc. Front restraint device for shipping bins. 4,074,823, Cl. 214-152.000.
Patis, Bruce L., to Outboard Marine Corporation. Engine speed limiter. 4,074,665, Cl. 123-102.000.
Pato, Tibor, to Gebruder Ott A.G. Method and apparatus for regulating the fat content of milk. 4,075,355, Cl. 426-231.000.
Patton, Ann T.; Roscetti, Betty Ann; and Held, Lisa. Water scooter. 4,074,381, Cl. 9-310.00J.
Paul, George A., to Monroe Auto Equipment Company. Oil filter with oil improving dissolving body. 4,075,097, Cl. 210-168.000.
Paul, George A.; Hegel, Robert W.; Bethell, Michael R.; Branham, Charles L.; and Utter, Allan D., to Monroe Auto Equipment Company. Masking elements for dissolving oil improving body in an oil filter. 4,075,098, Cl. 210-168.000.
Paul, Maynard Carlton: *See—*
Johnson, Leslie Harold; Lo, David Shih-Fang; and Paul, Maynard Carlton, 4,075,612, Cl. 365-171.000.
Paul Taylor Co.: *See—*
Oberg, Elmer B., 4,075,361, Cl. 426-655.000.
Pauli, Gunter; and Jahn, Gerhard, to G.A.O. Gesellschaft fur Automation und Organisation mbH. Circuit arrangement for evaluating signals, particularly output signals of optical measuring devices. 4,075,507, Cl. 307-117.000.
Pauluis, Gerard J. C. A., to Atomic Energy of Canada Limited. Dual temperature isotope exchange apparatus using hot feed with liquid recycle from the humidifier. 4,074,974, Cl. 23-270.00R.
Paulus, Wilfried; and Rullmann, Karl-Heinz, to Bayer Aktiengesellschaft. Process for preparing solutions of N-methylol-chloroacetamide. 4,075,245, Cl. 260-561.0HL.
Pawlowicz, Manfred: *See—*
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Payette, Lionel Joseph: *See—*
Karkoski, Joseph; McGregor, Charles William; and Payette, Lionel Joseph, 4,075,179, Cl. 260-75.00N.
Pearce, Godfrey R.; Breeden, William J.; and See, Francis R., to P. R. Mallory & Co. Inc. Method of sealing electrical housing. 4,074,417, Cl. 29-570.000.
Peardon, David L.: *See—*
Kilbourn, Edward E.; Peardon, David L.; and Ware, J. Edgar, 4,075,345, Cl. 424-263.000.
Pearsall, Harold I., to Globe Tool and Engineering Company, The. Stator coil winding and lead wire connection. 4,074,418, Cl. 29-596.000.
Peart, Leslie Thomas, to Beckman Instruments, Inc. Variable resistor with dual ratio input shaft. 4,075,597, Cl. 338-128.000.
Pease, Richard R.: *See—*
Passavant, Francis C.; and Pease, Richard R., 4,075,620, Cl. 340-324.0AD.
Peel, Harry H.: *See—*
Laenger, Charles J., Sr.; McFarland, Sam R.; and Peel, Harry H., 4,074,444, Cl. 35-35.00A.
Pegis, Richard J.: *See—*
Levy, Chauncey F., Jr.; and Pegis, Richard J., 4,074,368, Cl. 3-13.000.
Pelton, Peter G.; Grubman, Alan A.; and Hasegawa, Gary, to Continental Group, Inc., The. Integral oil supply and filter. 4,075,099, Cl. 210-168.000.
Pember, Carleton R. Bird frightener. 4,074,653, Cl. 116-22.00A.
Pennila, Simo A. O. Thin and low specific heat ceramic coating and method for increasing operating efficiency of internal combustion engines. 4,074,671, Cl. 123-191.00A.
Pennsylvania Wire Rope Corporation: *See—*
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Pennwalt Corporation: *See—*
Hodges, Jimmie Ray, 4,075,077, Cl. 204-269.000.
MacLeay, Ronald Edward; Sheppard, Chester Stephen; and Lange, Harold Carl, 4,075,199, Cl. 260-192.000.
MacLeay, Ronald Edward; and Sheppard, Chester Stephen, 4,075,286, Cl. 260-877.000.
Wagle, Uday Dakornath; and Ramdas, Venkatram, 4,075,236, Cl. 260-453.0RZ.
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Perelman, Arthur, to Imperial Chemical Industries Limited. Melt-spinning grid. 4,074,707, Cl. 126-343.50A.
Perilhou, Jean Robert, to U.S. Philips Corporation. Gamma-radiation tomography system. 4,075,482, Cl. 250-363.00S.
Personal Information Indexing Reader: *See—*
Yevick, George J., 4,074,933, Cl. 353-27.00R.
Peter, Emil. Method for manufacturing a support framework. 4,074,502, Cl. 52-741.000.
Peterson, Dean M., to Honeywell Inc. Dual scanning focusing system. 4,075,639, Cl. 354-25.000.
Peterson, Donald John, to Procter & Gamble Company, The. Hydrated soap making. 4,075,234, Cl. 260-417.000.
Peterson, John G. Illuminated drafting instrument. 4,075,467, Cl. 362-31.000.
Petke, Frederick David: *See—*
Davis, Burns; and Petke, Frederick David, 4,075,180, Cl. 260-75.00R.
Petro-Tex Chemical Corporation: *See—*
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Petrolite Corporation: *See—*
Quinlan, Patrick M., 4,074,999, Cl. 71-67.000.
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Redmore, Derek; Outlaw, Benjamin T.; and Martin, Richard L., 4,075,291, Cl. 260-933.000.
Pfizer Inc.: *See—*
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Phalen, Frank William: *See—*
Davis, John Stephen; Larson, Kenneth Norman; and Phalen, Frank William, 4,075,691, Cl. 364-200.000.
Philippa, Thomas E., to Owens-Corning Fiberglas Corporation. Molding compounds. 4,075,155, Cl. 260-38.000.
Phillips, Arthur F.: *See—*
Chapman, Benjamin E.; Moore, Danny R.; and Phillips, Arthur F., 4,075,382, Cl. 428-192.000.
Phillips, Charles M., Jr. Interrupter. 4,075,676, Cl. 361-56.000.
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Johnson, Paul H., 4,075,157, Cl. 260-42.470.
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Pierce, Harold D.: *See—*
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Pierce, Sherman L.; and Pierce, Harold D. Carburetion system for an internal combustion engine. 4,074,666, Cl. 123-134.000.
Pillon, Daniel: *See—*
Thizy, Andre; Pillon, Daniel; Debourge, Jean-Claude; and Lacroix, Guy, 4,075,324, Cl. 424-128.000.
Pim, Norman L., to Gulf & Western Manufacturing Company. Roll changing apparatus. 4,074,558, Cl. 72-239.000.
Pimbley, Walter Thornton: *See—*
Galetto, Louis Valentine; Meier, Johann Hans; Pimbley, Walter Thornton; and Wolfe, Bruce Allen, 4,075,636, Cl. 346-75.000.
Piper, William W.; Prener, Jerome S.; and Gillooly, George R., to General Electric Company. Cool-white fluorescent lamp with phosphor having modified spectral energy distribution to improve luminosity thereof. 4,075,532, Cl. 313-497.000.
Pitel, Ira J., to GTE Sylvania Incorporated. Sinusoidal wave oscillator ballast circuit. 4,075,476, Cl. 315-209.00R.
Pitney-Bowes, Inc.: *See—*
Schubert, Keith E.; and Canevari, Louis T., 4,074,574, Cl. 74-335.000.
Pittsburgh Corning Corporation: *See—*
Rostoker, David, 4,075,025, Cl. 106-54.000.
Pittway Corporation: *See—*
Pariza, George R., 4,075,627, Cl. 340-388.000.
Plasko, Emil Robert, to Emerson Electric Co. Temperature responsive electrical switch construction and method of making the same. 4,075,595, Cl. 337-407.000.
Plasko, Emil Robert, to Emerson Electric Co. Sealed casing for a thermally actuable electrical switch. 4,075,596, Cl. 337-408.000.
Plewes, John Travis: *See—*
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Plunkett, Allan Barr, to General Electric Company. Adaptive acceleration responsive system. 4,075,538, Cl. 318-52.000.
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Jenkins, Robert B., Jr.; and Poindexter, Jack A., 4,074,391, Cl. 19-107.000.
Polaroid Corporation: *See—*
Johnson, Bruce K., 4,075,647, Cl. 354-217.000.
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Bashkovich, Alexandr Pavlovich; Zimnukhova, Evgenia Semenovna; Prokopovich, Agnessa Vladimirovna; Polatovskaya, Olga Grigorievna; Pronina, Maria Ivanovna; Kulbakh, Valter Osvaldovich; Rivkina-Pevtsova, Khasya Ionovna; and Grinberg, Grigory Efimovich, 4,075,322, Cl. 424-94.000.
Politzer, Ernest L.; and Hayes, John C., to UOP Inc. Saturated hydrocarbon isomerization utilizing a catalyst of platinum group metal, cobalt, tin and halogen on a carrier. 4,075,259, Cl. 260-683.680.
Polster, Norman E., to Josam Manufacturing Co., a part interest. Hot gas engine control. 4,074,530, Cl. 60-518.000.
Ponomarev, Alexei Ivanovich; Sokolov, Sergei Vasilievich; Larionova, Julia Alexeevna; Rymareva, Tatyana Ivanovna; Klebansky, Alexandr Leibovich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; and Alexeeva, Ljubov Antonovna. Fluorosiloxane diols and method of producing same. 4,075,168, Cl. 260-46.50R.

Ponomarev, Alexei Ivanovich; Larionova, Julia Alexeevna; Ankudinov, Anatoly Kirillovich; Ryazanova, Rufina Mikhailovna; Klebansky, Alexandr Leibovich; Sokolov, Sergei Vasilievich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Rymareva, Tatyana Ivanovna; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Karlin, Alexandr Vasilievich; and Lobkov, Vasily Danilovich. Fluorosiloxane rubbers and process for producing same. 4,075,170, Cl. 260-46.50G.

Ponsinet, Gerard: *See—*
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Pont-A-Mousson S.A.: *See—*
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Pope, Gary A.: *See—*
Hill, Harold J.; Reisberg, Joseph; Helfferich, Fred G.; Lake, Larry W.; and Pope, Gary A., 4,074,755, Cl. 166-252.000.

Popowich, Michael John, to Du Pont de Nemours, E. I., and Company. Capacitor with noble metal electrodes. 4,075,681, Cl. 361-305.000.

Port, Eugene Baker; and Garofano, Norman Rutledge, to Allied Chemical Corporation. Purification of carbonate process solutions. 4,075,281, Cl. 423-206.00T.

Porter, Samuel, Jr.; and McBane, Bruce N., to PPG Industries, Inc. Carboxylic acid amide interpolymer-based coating compositions. 4,075,141, Cl. 260-17.200.

Portlock, David Edward, to Sharp Associates. Method of preparing β-dihydrothebaine. 4,075,132, Cl. 260-285.000.

Posnansky, Mario. Method and apparatus for heating a fluid medium by means of solar energy. 4,074,678, Cl. 126-271.000.

Post, Rodney Morris: *See—*
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Powers, Mary: *See—*
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PPG Industries, Inc: *See—*
Schimmel, Karl F.; and Wismer, Marco, 4,075,240, Cl. 260-471.00R.

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Brzozowski, Stanley F.; and Cooper, Joseph E., 4,074,990, Cl. 65-27.000.
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Du Bois, Donald W.; and Darlington, William B., 4,075,070, Cl. 204-129.000.
Eilerman, George E.; and Tamosauskas, Albert E., 4,074,988, Cl. 65-3.00C.
Frank, Robert G., 4,074,995, Cl. 65-104.000.
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Pater, Walter E.; and Rowley, James R., 4,074,823, Cl. 214-152.000.
Porter, Samuel, Jr.; and McBane, Bruce N., 4,075,141, Cl. 260-17.200.
Rechlicz, Thomas A., 4,075,184, Cl. 260-79.30R.
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Price International, Inc.: *See—*
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Priem, Jan Josef; and De Winter, Walter Frans, to AGFA-GEVAERT N.V. Polymerizable unsaturated oxazolidines and tetrahydro-1,3-oxazines and polymers thereof. 4,075,023, Cl. 96-114.000.

Prince Corporation: *See—*
Marcus, Konrad H., 4,075,468, Cl. 362-144.000.

Procter & Gamble Company, The: *See—*
Chapman, Benjamin E.; Moore, Danny R.; and Phillips, Arthur F., 4,075,382, Cl. 428-192.000.
Gault, Terrell Wilson; and Maguire, Edward John, Jr., 4,075,118, Cl. 252-135.000.
Peterson, Donald John, 4,075,234, Cl. 260-417.000.

Produits Chimiques Ugine Kuhlmann: *See—*
Mesaros, Louis, 4,075,116, Cl. 252-102.000.

Prokopovich, Agnessa Vladimirovna: *See—*
Bashkovich, Alexandr Pavlovich; Zimnukhova, Evgenia Semenovna; Prokopovich, Agnessa Vladimirovna; Polatovskaya, Olga Grigorievna; Pronina, Maria Ivanovna; Kulbakh, Valter Osvaldovich; Rivkina-Pevtsova, Khasya Ionovna; and Grinberg, Grigory Efimovich, 4,075,322, Cl. 424-94.000.

Pronina, Maria Ivanovna: *See—*
Bashkovich, Alexandr Pavlovich; Zimnukhova, Evgenia Semenovna; Prokopovich, Agnessa Vladimirovna; Polatovskaya, Olga Grigorievna; Pronina, Maria Ivanovna; Kulbakh, Valter Osvaldovich; Rivkina-Pevtsova, Khasya Ionovna; and Grinberg, Grigory Efimovich, 4,075,322, Cl. 424-94.000.

Pryor, Clyde Robert: *See—*
Hollingsead, Robert Allen; Kuchler, Abraham; and Pryor, Clyde Robert, 4,075,444, Cl. 200-51.090.

Putman, Maurice W. Method for destructive distillation of hydrocarbonaceous materials. 4,075,083, Cl. 208-11.00R.

Quackenbush, Harold E.: *See—*
Adams, Charles E.; Quackenbush, Harold E.; Harrer, Paul H.; Langford, Le Roy; and Cleek, Alvin L., 4,074,830, Cl. 221-266.000.

Qualitrol Corporation: *See—*
Romanowski, Robert F., 4,074,696, Cl. 137-553.000.

Queren, James. Doorway framing. 4,074,484, Cl. 52-214.000.

Quillfeldt, Winfried, to Jenoptik Jena G.m.b.H. Ignition electrode arrangement for gas discharge lamps, particularly for flash tubes. 4,075,537, Cl. 315-354.000.

Quinlan, Patrick M., to Petrolite Corporation. Use of cyclic thiazines as microbiocides. 4,074,999, Cl. 71-67.000.

Quinlan, Patrick M., to Petrolite Corporation. Polyquaternary ammonium methylene phosphonates. 4,075,243, Cl. 260-502.500.

R.C.M. Corporation: *See—*
Johnson, Arthur F., 4,075,284, Cl. 423-244.000.

R. Gelb & Sons, Inc.: *See—*
Schlosberg, Seymour, 4,074,752, Cl. 165-96.000.

R. O. Hull & Company, Inc.: *See—*
Eckles, William Edward; and Camaris, Valerie, 4,075,066, Cl. 204-55.00R.

Raber, Marvin: *See—*
Bruno, Stephen James; Dunn, Stephen Alfred; and Raber, Marvin, 4,075,059, Cl. 176-22.000.

Rabl, Carl-Roland, to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V. Apparatus for investigating fast chemical reactions by optical detection. 4,074,939, Cl. 356-206.000.

Raddi, William J.: *See—*
Malchman, Franklin L.; Raddi, William J.; and Sharples, Susan, 4,074,720, Cl. 128-419.0PG.

Rahrig, Donald D.: *See—*
Hagedorn, Floyd T.; Rahrig, Donald D.; and Revells, Robert G., 4,074,996, Cl. 65-106.000.

Rait, Joseph M. Detector for alarm system. 4,075,616, Cl. 340-276.000.

Rakszawski, John F.: *See—*
Bradshaw, Elmo F.; and Rakszawski, John F., 4,075,524, Cl. 310-249.000.

Ralston Purina Company: *See—*
Madl, Ronald L.; Simon, Frank J.; and Ortinau, Jerry T., 4,075,358, Cl. 426-465.000.

Rambauske, Werner R.; and Grabowski, John J., to Raytheon Company. Mirror and method of making same. 4,074,416, Cl. 29-527.400.

Ramdas, Venkatram: *See—*
Wagle, Uday Dakornath; and Ramdas, Venkatram, 4,075,236, Cl. 260-453.0RZ.

Rampe, John F., to Rampe Research. Vibratory finishing system. 4,074,466, Cl. 51-163.100.

Rampe Research: *See—*
Rampe, John F., 4,074,466, Cl. 51-163.100.

Ransburg Corporation: *See—*
Bentley, Stanley L., 4,075,677, Cl. 361-93.000.

Rao, Purushothama: *See—*
Sabatino, Anthony; and Rao, Purushothama, 4,075,399, Cl. 429-57.000.

Raphael, Rouchdy B. Rotation apparatus for work pieces. 4,074,600, Cl. 83-411.00R.

Rapistan Incorporated: *See—*
Bodewes, Hermanus J. A., 4,074,805, Cl. 198-790.000.

Rapson, W. Howard; Fredette, Maurice C. J.; and Meyers, Norman W., to Erco Industries Limited. Production of chlorine dioxide at high efficiency. 4,075,308, Cl. 423-478.000.

Rast, Gustaf J., Jr.; and Barley, Thomas A., to United States of America, Army. Light pipe technique for grid pulsing. 4,075,512, Cl. 307-311.000.

Rath, Wilhelmus Johannes Franciscus; and van der Donk, Johannes Martinus Augustinus Henricus, to U.S. Philips Corporation. Slide switch having resilient movable contact arm twisted to provide efficient electrical connection. 4,075,441, Cl. 200-16.00D.

Ray, George F., III, to Liskey Archectural Mfg. Inc. Elevated floor assembly. 4,074,488, Cl. 52-263.000.

Ray, Louis F. Barge cable crane. 4,074,817, Cl. 214-13.000.

Ray, Louis F. Loading/unloading crane with buoyant counterweight system. 4,074,818, Cl. 214-13.000.

Raychem Corporation: *See—*
Lofdahl, Clyde A., 4,074,420, Cl. 29-628.000.

Raymond Lee Organization, Inc., The: *See—*
Catlett, Richard E., 4,074,458, Cl. 43-139.000.
Garcia, Beltran L., 4,075,615, Cl. 340-227.100.
Williams, E. Elaine, 4,075,457, Cl. 219-218.000.

Raytheon Company: *See—*
Das, Dilip K., 4,075,042, Cl. 148-103.000.
Davis, Warren C., 4,075,415, Cl. 174-50.520.
Lelke, Helmut, 4,075,695, Cl. 364-200.000.
Nissen, Stanley M.; and Wallach, Steven J., 4,075,687, Cl. 364-200.000.
Rambauske, Werner R.; and Grabowski, John J., 4,074,416, Cl. 29-527.400.
Shapiro, Gerald N.; Goldstone, Bertram J.; Simone, Joseph D.; and Spignese, Edward E., 4,075,630, Cl. 343-5.0DP.
Tancrell, Roger H.; Stoner, William W.; and Wilson, David T., 4,075,483, Cl. 250-363.00S.

Razzano, John S., to General Electric Company. Fluorosiloxydiphenylsiloxy block copolymers. 4,075,169, Cl. 260-46.50R.

RCA Corporation: *See—*
Crandall, Richard Seely; and Faughnan, Brian Wilfred, 4,075,610, Cl. 365-107.000.
Oberman, Joel Roy; and Stewart, Roger Green, 4,075,690, Cl. 365-156.000.
Robe, Thomas Joseph, 4,075,575, Cl. 330-259.000.

Reago, Robert V.: *See—*
Wu, Paul S.; and Reago, Robert V., 4,075,461, Cl. 235-466.000.

Realex Corporation: *See—*
Magers, Wallace F.; and Jegen, James M., 4,074,861, Cl. 239-492.000.

Rechlicz, Thomas A., to PPG Industries, Inc. Method of sulfonating fluorocarbon polymers and fluorocarbon polymer produced thereby. 4,075,184, Cl. 260-79.30R.

Recognition Equipment Incorporated: *See—*
Hilley, Larry L.; and Neff, Marion W., 4,075,605, Cl. 340-146.3AC.

Recovery Systems, Inc.: *See—*
Link, Donald F., 4,074,868, Cl. 241-46.00R.

Redfern, Thomas P., to National Semiconductor Corporation. CMOS comparator circuit and method of manufacture. 4,075,509, Cl. 307-251.000.

Redmore, Derek; Outlaw, Benjamin T.; and Martin, Richard L., to Petrolite Corporation. Pyrophosphates. 4,075,291, Cl. 260-933.000.

Reed Tool Company: *See—*
Murdoch, Henry W., 4,074,922, Cl. 308-8.200.

Reeher, John R.; Story, Michael S.; and Smith, Ronald D., to Finnigan Corporation. Focusing ion lens system for mass spectrometer for separating charged and neutral particles. 4,075,479, Cl. 250-281.000.

Rees, Norman E.: *See—*
Boyd, John B.; and Rees, Norman E., 4,074,406, Cl. 29-157.30C.

Rehnberg, Tore: *See—*
Borjesson, Anders; and Rehnberg, Tore, 4,074,422, Cl. 29-730.000.

Reid, Larry Ronald: *See—*
Arato, Paul; Lelkes, Antony; and Reid, Larry Ronald, 4,074,387, Cl. 15-322.000.

Reid, Philip Lane, to Riegel Textile Corporation. Apparatus for compressing and banding a predetermined number of articles. 4,074,508, Cl. 53-62.000.

Reid, Robert E.; and Wesner, Charles R., to Sperry Rand Corporation. Adaptive autopilot for marine vessels. 4,074,648, Cl. 114-144.0RE.

Reil, Wilhelm, to Altstadter Verpackungs-Vertriebs GmbH. Apparatus for producing containers. 4,074,961, Cl. 425-112.000.

Reilly, James J., Jr.: *See—*
Tanaka, John; and Reilly, James J., Jr., 4,075,312, Cl. 423-648.00A.

Reimann, Hans, to Schering Corporation. Monoesters of rosamicin for eliciting an antibacterial response. 4,075,331, Cl. 424-203.000.

Reines, Jose, to International Telephone and Telegraph Corporation. Line signalling over common highway for telecommunications system. 4,075,430, Cl. 179-18.00J.

Reinhard, Russell R.: *See—*
Dorawala, Tansukhlal G.; Reinhard, Russell R.; and Estes, John H., 4,075,255, Cl. 260-672.00R.

Reinke, Klaus: *See—*
Kunig, Helmut; and Reinke, Klaus, 4,074,394, Cl. 19-159.00R.

Reinschmidt, Robert Michael: *See—*
Millhollan, Michael Scott; and Reinschmidt, Robert Michael, 4,075,609, Cl. 365-154.000.

Reisberg, Joseph: *See—*
Hill, Harold J.; Reisberg, Joseph; Helfferich, Fred G.; Lake, Larry W.; and Pope, Gary A., 4,074,755, Cl. 166-252.000.

Reisdorf, Daniel: *See—*
Ducep, Jean Bernard; Farge, Daniel; Ponsinet, Gerard; and Reisdorf, Daniel, 4,075,328, Cl. 424-180.000.

Relyveld, Edgar Hans, to Agence Nationale de Valorisation de la Recherche (ANVAR). Vaccines, the process for preparing the same and the applications thereof. 4,075,321, Cl. 424-92.000.

Renaudin, Yves, to Societe Lannionnaise d'Electronique Sle-Citerel S.A. Telephone concentrator. 4,075,432, Cl. 179-18.0FC.

Rentmeester, Paul Clement: *See—*
Bergman, Mark Otho; and Rentmeester, Paul Clement, 4,074,575, Cl. 73-344.000.

Resag, Klaus: *See—*
Greve, Heinz Gunter; and Resag, Klaus, 4,075,409, Cl. 560-36.000.

Research Corporation: *See—*
White, Eugene W.; Hanusiak, William M.; and White, Rodney A., 4,075,092, Cl. 210-22.00R.

Retzlaff, Guenter: *See—*
Hamprecht, Gerhard; Schirmer, Ulrich; Wuerzer, Bruno; and Retzlaff, Guenter, 4,075,004, Cl. 71-91.000.

Retzsch, Clinton E.: *See—*
Lipowski, Stanley A.; Dehn, Joseph W., Jr.; and Retzsch, Clinton E., 4,074,968, Cl. 8-94.220.

Reutling, Rolf Torgny; and Thysk, Nils Anders Rune, to Telefonaktiebolaget L M Ericsson. Method and apparatus for connecting conductors to terminals of an apparatus. 4,074,421, Cl. 29-628.000.

Revells, Robert G.: *See—*
Hagedorn, Floyd T.; Rahrig, Donald D.; and Revells, Robert G., 4,074,996, Cl. 65-106.000.

Rex, Albert Edward. Spring rail clamp. 4,074,860, Cl. 238-349.000.

Rexnord Inc.: *See—*
Hudis, Michael I., 4,074,802, Cl. 198-315.000.

Reynolds Metals Company: *See—*
Vickstrom, Donald E., 4,074,483, Cl. 52-202.000.

Rhone-Poulenc Industries: *See—*
Ducep, Jean Bernard; Farge, Daniel; Ponsinet, Gerard; and Reisdorf, Daniel, 4,075,328, Cl. 424-180.000.
Gielly, Jean-Francois, 4,075,305, Cl. 423-320.000.

Rhum, David; and Aluotto, Patrick F., to Celanese Corporation. Low molecular weight acrylates or methacrylates. 4,075,242, Cl. 560-190.000.

Richardson, Mason E.: *See—*
Haines, Walter E.; and Richardson, Mason E., 4,074,828, Cl. 220-254.000.

Richaud, Aime A.; Moreno, Pierre F.; and Rimbaud, Guy A., to L'Agence Nationale de Valorisation de la Recherche ANVAR. Ball screw. 4,074,585, Cl. 74-424.80R.

Richter Gedeon Vegyeszeti Gyar RT.: *See—*
Toth, Edit; Torley, Jozsef; Gorog, Sandor; Szporny, Laszlo; Palosi, Eva; and Szeberenyi, Szabolcz, 4,075,249, Cl. 260-613.00D.

Ricks, John R.: *See—*
Gillespie, Robert M.; and Ricks, John R., 4,074,808, Cl. 209-73.000.

Ricoh Co., Ltd.: *See—*
Abe, Takeshi, 4,075,607, Cl. 340-152.00R.
Satomi, Toyokazu, 4,074,934, Cl. 355-14.000.

Rideout, Vincent L., to International Business Machines Corporation. Method for fabricating FET one-device memory cells with two layers of polycrystalline silicon and fabrication of integrated circuits containing arrays of the memory cells charge storage capacitors utilizing five basic pattern deliberating steps. 4,075,045, Cl. 148-187.000.

Ridyard, Denis Robert Annealey, to Imperial Chemical Industries Limited. 4(2'-Nitro-4'-sulfoanilino) phenyl azo hydroxyphenyl dyes. 4,075,200, Cl. 260-206.000.

Riegel Textile Corporation: *See—*
Reid, Philip Lane, 4,074,508, Cl. 53-62.000.

Righetti, Bruno: *See—*
Oehrli, Beat; Mettler, Max; and Righetti, Bruno, 4,075,229, Cl. 260-340.000.

Rikagaku Kenkyusho: *See—*
Shibata, Takehiko; Ando, Tadahiko; Kitsunai, Tokuji; Kamiyama, Norio; and Oikawa, Yoshifumi, 4,075,062, Cl. 195-103.50R.

Riken Piston Ring Kogyo Kabushiki Kaisha: *See—*
Maruyama, Masayuki; Hamada, Yoshitugu; and Yamauchi, Ryoichi, 4,074,956, Cl. 418-178.000.

Rimbaud, Guy A.: *See—*
Richaud, Aime A.; Moreno, Pierre F.; and Rimbaud, Guy A., 4,074,585, Cl. 74-424.80R.

Rinehart, Jay K., to PPG Industries, Inc. S-aryl N-alkynylthiolcarbamates. 4,075,006, Cl. 71-100.000.

Rinehart, Kenneth L., Jr.; McMillan, Moses W.; and Sobiczewski, Wojciech, to University of Illinois Foundation. Biologically active compounds. 4,075,339, Cl. 424-250.000.

Ringel, Helmut, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Device for separating in a continuous process particles from a first liquid and introducing the separated particles into a second liquid. 4,075,104, Cl. 210-402.000.

Risby, Terence H.; and Yergey, Alfred L., III, to Chemetron Corporation. Programmed thermal degradation-mass spectrometry analysis method facilitating identification of a biological specimen. 4,075,475, Cl. 250-282.000.

Ritter, Edmond Jean: *See—*
Kelly, Ralph; and Ritter, Edmond Jean, 4,075,318, Cl. 424-70.000.

Ritter, Fridolin Jacob; and Stein, Friedrich, to Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek ten behoeve van Nijverheid, Handel en Verkeer. Attractant for ants. 4,075,320, Cl. 424-84.000.

Ritter, Kaspar, to KOPAT Gesellschaft fur Konstruktion, Entwicklung und Patentverwertung m.b.H. & Co. KG. Winding mechanism-drive, particularly for construction cranes or like hoisting devices. 4,074,891, Cl. 254-150.0FH.

Rittinger, Gunter: *See—*
Storp, Klaus; Wirth, Hans; Rittinger, Gunter; and Hohmann, Volker, 4,075,282, Cl. 423-230.000.

RIV - SKF Officine de Villar Perosa S.p.A.: *See—*
Colanzi, Franco, 4,074,463, Cl. 49-352.000.

Rivers, Morris R.: *See—*
Helversen, Frederick D.; and Rivers, Morris R., 4,074,441, Cl. 34-122.000.

Rivkina-Pevtsova, Khasya Ionovna: *See—*
Bashkovich, Alexandr Pavlovich; Zimnukhova, Evgenia Semenovna; Prokopovich, Agnessa Vladimirovna; Polatovskaya, Olga Grigorievna; Pronina, Maria Ivanovna; Kulbakh, Valter Osvaldovich; Rivkina-Pevtsova, Khasya Ionovna; and Grinberg, Grigory Efimovich, 4,075,322, Cl. 424-94.000.

Roach, William John. Liquid metering device with adjustable stops. 4,074,831, Cl. 222-43.000.

Robe, Thomas Joseph, to RCA Corporation. Input stage for fast-slewing amplifier. 4,075,575, Cl. 330-259.000.

Robeller, Walter: *See—*
Nonnemacher, Gerhard; Knodel, Emil; Robeller, Walter; and Bosch, Paul, 4,074,955, Cl. 417-218.000.

Roberson, James H., to Crompton & Knowles Corporation. Fluid treating system for textile fibers. 4,074,546, Cl. 68-205.00R.

Robert Bosch GmbH: *See—*
Kuttner, Klaus; Kruger, Gunter; and Modic, Fedor, 4,075,416, Cl. 174-68.500.
Nonnemacher, Gerhard; Knodel, Emil; Robeller, Walter; and Bosch, Paul, 4,074,955, Cl. 417-218.000.
Zabler, Erich, 4,075,551, Cl. 324-208.000.

Robert Zapp, Werkzeug-und Maschinenfabrik GmbH: *See—*
Hochmuth, Walter; and Hollfelder, Hans Peter, 4,074,949, Cl. 407-114.000.
Roberts, Charles; and DeMichele, Ernest, to Mectronic Inc. Engine efficiency system. 4,074,670, Cl. 123-119.00E.
Roberts Corporation: *See—*
Cina, Ronald A.; and Kluge, Albert D., 4,074,744, Cl. 164-187.000.
Roberts, Paul Donald. Welding. 4,075,453, Cl. 219-125.100.
Roberts, Raymond P. Pocket razor and shave cream dispenser. 4,074,428, Cl. 30-41.000.
Roberts, Thomas G. Novel lathering device and razor assembly. 4,074,429, Cl. 30-41.000.
Roberts, William Walter, to Mobil Oil Corporation. Compressor. 4,074,954, Cl. 418-68.000.
Robertshaw Controls Company: *See—*
Brakebill, Harold G.; Lewis, Jay L.; and Asbill, Clarence M., III, 4,074,855, Cl. 236-57.000.
Cumming, Edward P., 4,074,588, Cl. 74-522.000.
Robertson, James A.: *See—*
Ferraro, Charles F.; Javick, Richard A.; and Robertson, James A., 4,075,369, Cl. 427-185.000.
Robillard, Edward George, to Cincinnati Milacron-Heald Corporation. Grinding machine control. 4,074,467, Cl. 51-165.920.
Robinson, Glen P., Jr.; Shelton, Samuel V.; and Hutchins, Samuel F., to Scientific-Atlanta, Inc. Solar collector apparatus and method. 4,074,705, Cl. 126-271.000.
Robson, Clive Gilroy: *See—*
Knowles, David Alan; and Robson, Clive Gilroy, 4,075,005, Cl. 71-94.000.
Rockwell International Corporation: *See—*
Boltinghouse, Joseph C.; and Atkinson, James L., 4,074,580, Cl. 74-5.60D.
Chen, Thomas T., 4,075,708, Cl. 365-2.000.
Chen, Thomas T.; and Gergis, Isoris S., 4,075,709, Cl. 365-2.000.
Clarke, John Elwood; Andrews, Austin M., II; Gertner, Edward R.; Longo, Joseph T.; and Pasko, John G., 4,075,043, Cl. 148-171.000.
Eden, Richard C., 4,075,576, Cl. 330-277.000.
Gergis, Isoris S., 4,075,611, Cl. 365-2.000.
Hankosky, Andrew; and Schoeneweis, E. Frederick, 4,074,542, Cl. 64-30.00R.
Hinckley, William L., Jr., 4,075,513, Cl. 307-350.000.
Laubengayer, William C., 4,075,440, Cl. 175.3 S-.
Wright, Howard O., 4,075,569, Cl. 328-58.000.
Rodeghier, John H. Golf club and golf accessory carrier. 4,074,739, Cl. 150-1.50B.
Rody, Jean: *See—*
Soma, Nobuo; Kurumada, Tomoyuki; Brunetti, Heimo; and Rody, Jean, 4,075,165, Cl. 260-45.80N.
Rohm and Haas Company: *See—*
Kilbourn, Edward E.; Peardon, David L.; and Ware, J. Edgar, 4,075,345, Cl. 424-263.000.
Kuyama, Hiroshi; and Higosaki, Nobuyuki, 4,075,326, Cl. 424-141.000.
Lane, Constance A.; and Koziar, Joseph C., 4,075,263, Cl. 260-873.000.
Rokach, Joshua; Atkinson, Joseph G.; and Rooney, Clarence S., to Merck & Co., Inc. Pyrrolo[2,1-b][3]benzazepines. 4,075,225, Cl. 260-326.310.
Roland, John F., to Kraft, Inc. Debittered protein product and method for manufacture. 4,075,195, Cl. 260-119.000.
Roll-Rite Corporation: *See—*
Christensen, Carl O., 4,074,407, Cl. 29-159.00R.
Rollei-Werke Franke & Heidecke: *See—*
Strauss, Karl-Peter; and Elke, Dietmar, 4,075,638, Cl. 354-23.00D.
Rollins, Ralph T., to Astron Innovations, Inc. Fuel control system for internal combustion engines. 4,074,664, Cl. 123-75.00B.
Rolston, George Angus: *See—*
Dorfman, Jan William; Carson, Michael David Nisbet; and Rolston, George Angus, 4,074,646, Cl. 114-39.000.
Roltra S.p.A.: *See—*
Brusasco, Enzo, 4,074,587, Cl. 74-424.80R.
Romanowski, Robert F., to Qualitrol Corporation. Pressure relief valve operation signal. 4,074,696, Cl. 137-553.000.
Rooney, Clarence S.: *See—*
Rokach, Joshua; Atkinson, Joseph G.; and Rooney, Clarence S., 4,075,225, Cl. 260-326.310.
Roscetti, Betty Ann: *See—*
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Rose, Andrew M.; and Tremaine, Brian Paul, to Sperry Rand Corporation. Method and apparatus for aligning read/write heads in a disc recorder. 4,075,667, Cl. 360-77.000.
Rose, Manning I. Safety socket for lamps and the like. 4,074,925, Cl. 339-44.00R.
Rosen, Perry: *See—*
Jernow, Jane Liu; and Rosen, Perry, 4,075,209, Cl. 260-256.40N.
Rosin, Stanley A. Device for securing cords, tubes, and the like. 4,074,397, Cl. 24-73.0AS.
Rostoker, David, to Pittsburgh Corning Corporation. Method of forming a potassium aluminoborosilicate frit. 4,075,025, Cl. 106-54.000.
Rostron, Joseph R., to Westinghouse Electric Corporation. Double-puffer-type compressed-gas circuit-interrupter constructions. 4,075,447, Cl. 200-148.00A.
Roth, Albert: *See—*
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Roth, Andre: *See—*
Castagna, Herman; Gravey, Guy; and Roth, Andre, 4,075,277, Cl. 423-55.000.
Gravey, Guy; Grolla, Paul; and Roth, Andre, 4,075,278, Cl. 423-55.000.
Rothmann, Harry Edward: *See—*
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Balz, Gunther W., 4,074,472, Cl. 51-313.000.
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Rousseau, Patrick M.: *See—*
Haag, Robert A.; Rousseau, Patrick M.; and Martin, Thom O., 4,075,356, Cl. 426-285.000.
Rowe, William Guy. Particle analyzer apparatus employing light-sensitive electronic detector array. 4,075,462, Cl. 235-92.0PC.
Rowley, James R.: *See—*
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Rowlings, James W. Vehicle ignition switch lock device. 4,074,550, Cl. 70-237.000.
Roy, Dibyendu N.: *See—*
Jorgensen, Erik; Roy, Dibyendu N.; and Kondo, Edward S., 4,075,327, Cl. 424-273.00R.
Rubber and Plastics Research Association: *See—*
Sambrook, Ronald William; and Beesley, John Harold, 4,074,569, Cl. 73-15.600.
Rubbermaid Commercial Products Inc.: *See—*
Juergens, David A.; and Terek, Greg P., 4,074,810, Cl. 211-11.000.
Rucker, Joseph R.: *See—*
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Rudolph Beaver, Inc.: *See—*
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Ruf, Walter; and Rothmann, Harry Edward, to St. Regis Paper Company. Bag filling machine for powdery material. 4,074,507, Cl. 53-59.00W.
Rugge, Henry Ferdinand: *See—*
Link, William Trevor; Rugge, Henry Ferdinand; and Jansen, William David, 4,074,711, Cl. 128-2.05A.
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Paulus, Wilfried; and Rullmann, Karl-Heinz, 4,075,245, Cl. 260-561.0HL.
Runyon, John F. Modular building structure. 4,074,477, Cl. 52-86.000.
Rushing, Jack L. Fluid vapor injector. 4,074,673, Cl. 123-198.00A.
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Frisch, Kurt Charles; and Russell, Donald Henry, 4,075,181, Cl. 260-77.50B.
Russell, Rex Hamilton. Process for producing water soluble resins. 4,075,145, Cl. 260-22.00M.
Rutherford, Barry A. Drywall bead accessory. 4,074,478, Cl. 52-98.000.
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Ponomarev, Alexei Ivanovich; Larionova, Julia Alexeevna; Ankudinov, Anatoly Kirillovich; Ryazanova, Rufina Mikhailovna; Klebansky, Alexandr Leibovich; Sokolov, Sergei Vasilievich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Rymareva, Tatyana Ivanovna; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Karlin, Alexandr Vasilievich; and Lobkov, Vasily Danilovich, 4,075,170, Cl. 260-46.50G.
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Ponomarev, Alexei Ivanovich; Larionova, Julia Alexeevna; Ankudinov, Anatoly Kirillovich; Ryazanova, Rufina Mikhailovna; Klebansky, Alexandr Leibovich; Sokolov, Sergei Vasilievich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Rymareva, Tatyana Ivanovna; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Karlin, Alexandr Vasilievich; and Lobkov, Vasily Danilovich, 4,075,170, Cl. 260-46.50G.
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LaDue, Donn; Winchurch, Robert J.; and Scaife, Gary R., 4,074,672, Cl. 123-198.0DC.
Saari, Kaarlo Matti Juhani; and Kalliokoski, Aarno Iisakki, to Outokumpu Oy. Flotation cell with eccentric rotor and stator. 4,075,089, Cl. 209-169.000.
Sabatino, Anthony; and Rao, Purushothama, to Gould Inc. Battery vent seal. 4,075,399, Cl. 429-57.000.
Sacco, John A.: *See—*
DiGiacomo, Hector L.; and Sacco, John A., 4,074,423, Cl. 29-730.000.

Sadler, James E., to United States of America, Air Force. Self-contained power subsystem. 4,074,527, Cl. 60-325.000.
Saether, Gustav, to Lyng Industrier A-S Leksvikarmatur. Dual handle mixing faucet. 4,074,697, Cl. 137-606.000.
Saffer, Harry E. Safety door latch mechanism. 4,074,915, Cl. 292-262.000.
Sagarino, Robert F.: *See—*
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Saito, Hisao; Tashiro, Norio; and Koinuma, Tokuju, to Tokyo Shibaura Electric Co., Ltd. Magnetron with holding means to support a pair of permanent magnets. 4,075,534, Cl. 315-39.710.
Saito, Masaaki; and Okamura, Kenji. Carburetor accelerating fuel circuit means. 4,075,294, Cl. 261-34.00A.
Sakaguchi, Mitsuo; Iwasaki, Hikoji; and Shimoya, Shigeo, to Kobishi Electric Co., Ltd. Alarm buzzer. 4,075,626, Cl. 340-388.000.
Sakamaki, Hisashi; and Ohtani, Toshiyuki, to Canon Kabushiki Kaisha. Heating-fixing device. 4,075,456, Cl. 219-216.000.
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Salamon, Klaus; and Eckardt, Rudolf, to Varta Batterie A. G. Battery terminal construction. 4,075,368, Cl. 429-161.000.
Sale, Amedeo Omodie; Toia, Emilio; Galliani, Giulio; and Lerner, Leonard J., to Gruppo Lepetit, S.p.A. Antireproductive imidazo[2,1-a]isoquinoline compounds. 4,075,342, Cl. 424-258.000.
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Salmon, D'Miles E., to Atari, Inc. Hand held communication aid for the dumb. 4,075,621, Cl. 340-337.000.
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Samson AG: *See—*
Kemmler, Lothar, 4,074,701, Cl. 137-625.660.
Samuelson, Charles G. Metal beam guard rail assembling clamp. 4,074,898, Cl. 269-228.000.
San/Bar Corporation: *See—*
Merritt, George Albert, Jr., 4,075,434, Cl. 179-99.000.
Sander, Bernd, to Cito Kunststoffe und Verpackungsfolien Erich Gilberg KG. Packaging apparatus. 4,074,506, Cl. 53-59.00R.
Sandoz Ltd.: *See—*
Hofer, Kurt; and Tscheulin, Guenther, 4,075,163, Cl. 260-45.70P.
Sandqvist, Sune Allan. Method of securing a sealing layer to a support. 4,074,501, Cl. 52-741.000.
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Sapunar, Zakhar Isaevich: *See—*
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Sarantakis, Dimitrios, to American Home Products Corporation. Pentapeptide with morphine-like activity. 4,075,190, Cl. 260-112.50R.
Sartorius-Werke GmbH (und. vorm. Gottinger Praezisionswagenfabrik GmbH): *See—*
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Saruyama, Masao: *See—*
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Sasajima, Kikuo; Ono, Keiichi; Motoike, Yasuo; Inaba, Shigeho; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. CNS depressant γ-(secondary amino)-ortho-nitro-butyrophenones. 4,075,346, Cl. 424-267.000.
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Sato, Hitoshi; Watanabe, Hazime; Miura, Kazumasa; and Kudo, Koji, to Kawaguchiko Seimitsu Co., Ltd. Insects catcher assembly. 4,074,457, Cl. 43-113.000.
Sato, Kuniaki: *See—*
Matake, Naomasa; Yoshimura, Tadayoshi; and Sato, Kuniaki, 4,074,947, Cl. 403-406.000.
Sato, Ryosuke: *See—*
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Sato, Tamio: *See—*
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Satomi, Toyokazu, to Ricoh Co., Ltd. Electrostatographic imaging method and apparatus for multiple copies. 4,074,934, Cl. 355-14.000.
Sauer, Hans, to Matsushita Electric Works, Ltd.; and Sauer, Hans, part interest to each. Electromagnetic relay and the manufacture thereof. 4,075,585, Cl. 335-78.000.
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Sauer, Louis E.; and Miller, Orville C., to Centenary Central, Inc. Means for producing die board and cutting rules for same. 4,074,595, Cl. 76-107.00C.
Sauter, Charles A.: *See—*
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Sawachika, Yasumasa; Kawakami, Hiroshi; and Minegishi, Shuzo, to Kohkoku Chemical Industry Co., Ltd. Process for preparing flame retarding polyurethane foams. 4,075,137, Cl. 260-2.5AT.
Sawaki, Mikio; Iwataki, Isao; Hirooo, Yoshihiko; and Ishikawa, Hisao, to Nippon Soda Company, Limited. Cyclohexane derivatives. 4,075,239, Cl. 260-464.000.
Scaife, Gary R.: *See—*
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Schaefgen, John Raymond, to Du Pont de Nemours, E. I., and Company. Copolyesters capable of forming an anisotropic melt. 4,075,262, Cl. 260-860.000.
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Scheinecker, Alois: *See—*
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Schelhaas, Ealbertus Willem; and Blokker, Eduard Johannes Cornelis Marie, to O & R Inktchemie N.V. Rapid-drying printing ink and a printing process using same. 4,075,143, Cl. 260-17.200.
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Scheuermann, Horst; and Hettche, Albert, to BASF Aktiengesellschaft. Naphthalimide compounds and optical brighteners. 4,075,211, Cl. 260-270.00H.
Scheurecker, Werner; and Scheinecker, Alois, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Starter bar for guiding and extracting cast strands of various thicknesses. 4,074,745, Cl. 164-446.000.
Scheurecker, Werner; and Kagerhuber, Franz, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Supporting and guiding stand for continuously cast strands. 4,074,746, Cl. 164-442.000.
Schilling, Kurt; Schraudolph, Manfred; Thiele, Gerd; and Weber, Jurgen, to Siemens Aktiengesellschaft. Gas-insulated thyristor assembly. 4,075,682, Cl. 361-386.000.
Schimmel, Karl F.; and Wismer, Marco, to PPG Industries, Inc. Polysalts of polycarboxylic acid esters and hydrazine or hydrazides. 4,075,240, Cl. 260-471.00R.
Schindler, Robert, to Brammall, Inc. Flag seal including flattened side-wall and oval cable. 4,074,916, Cl. 292-307.00R.
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Schmidt, Henry J.: *See—*
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Schmidt, Manfred; Freitag, Dieter; and Nouvertne, Werner, to Bayer Aktiengesellschaft. Statistical mixtures of halogenated bisphenols with halogen-free bisphenols. 4,075,119, Cl. 252-182.000.

Schmidt, Paul Joseph: *See—*
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Schmittle, Karl V.; and Starner, Keith E., to Borg-Warner Corporation. Heat transfer in pool boiling. 4,074,753, Cl. 165-184.000.
Schneider, Richard A.; Freed, Gerald L.; and Lipnick, Richard, to Lockheed Electronics Co., Inc. Power monitoring and load shedding system. 4,075,699, Cl. 364-492.000.
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Schnell, Hans Gunther, to Van Kooten B.V. Diesel pile-driving ram. 4,074,776, Cl. 173-137.000.
Schoeneweis, E. Frederick: *See—*
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Scholl, Rolland D., to Towmotor Corporation. Height indicator and control for fork lift trucks. 4,074,794, Cl. 187-29.00A.
Schoonmaker, Townsend L. Self-cleaning fixed dredge. 4,074,535, Cl. 61-2.000.
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Schroeder, Thaddeus, to General Motors Corporation. Electrical load outage detector. 4,075,592, Cl. 337-139.000.
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Schubert, Keith E.; and Canevari, Louis T., to Pitney-Bowes, Inc. Postage meter conversion apparatus. 4,074,574, Cl. 74-335.000.
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Schuessler, Walter E.; and Schuessler, Richard D. Cap and method of manufacture. 4,074,365, Cl. 2-201.000.
Schulz, Martin, Jr., to Steadley Company, Inc. Foundation unit frame. 4,074,372, Cl. 5-263.000.
Schulze, Robert R.; and Ladd, Floyd R., to said Robert R. Schulze; by said Floyd R. Ladd. Cryogenic probe. 4,074,717, Cl. 128-303.100.
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Scoggin, Jack S., to Phillips Petroleum Company. Separation process. 4,075,287, Cl. 260-878.00B.
Scott & Fetzer Company, The: *See—*
Broad, Roy M., 4,074,926, Cl. 339-60.00R.
Scott, Harold W., to Oil Recovery Corporation. Extraction method and apparatus. 4,074,758, Cl. 166-249.000.
Scott, Paul Howard, to Motorola, Inc. I^2L injector current source. 4,075,508, Cl. 307-213.000.
Sealed Air Corporation: *See—*
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Seaman, Harry V., to American Technical Ceramics, division of Phase Industries Inc. Test fixture for miniature capacitors. 4,075,556, Cl. 324-60.00C.
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See, Francis R.: *See—*
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Seedorf, Jack H.; Hruda, Robert M.; and Abell, Donald E., to Hooker Chemicals & Plastics Corporation. Cell bypass switches for electrochemical cell systems. 4,075,448, Cl. 200-262.000.
Seidel, Peter, to Dragerwerk Aktiengesellschaft. Anesthetic vaporizer. 4,075,297, Cl. 261-104.000.
Seidewand, Edward H., to General Motors Corporation. Lock cylinder assembly. 4,074,547, Cl. 70-1.500.
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Sekiguchi, Nisuke, to Sekiguchi Seisakusho Co., Ltd. Fastenings suitable for personal ornaments. 4,074,400, Cl. 24-218.000.
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Sekmakas, Kazys; and Shah, Raj, to DeSoto, Inc. Acidic copolymers based on glycidyl allyl polyethers adapted for anionic electrodeposition. 4,075,133, Cl. 260-29.300.
Sela, Michael; Arnon, Ruth; and Chaitchik, Samario, to Yeda Research and Development Co., Ltd. Novel synthetic undecapeptide and clinical assay. 4,075,194, Cl. 260-112.50R.
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Semm, Kurt. Method of and device for causing blood coagulation. 4,074,719, Cl. 128-303.100.
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Sequin, Carlo Heinrich, to Bell Telephone Laboratories, Incorporated. Sensing circuit for semiconductor charge transfer devices. 4,075,514, Cl. 307-355.000.
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Sherman, Irving R. Programmed flap system for an aircraft having wings. 4,074,878, Cl. 244-183.000.
Shibata, Takanori; and Marumoto, Katsuji, to Keihin Matsumoto. Direct current motor control device for use in battery automobiles. 4,075,541, Cl. 318-139.000.
Shibata, Takehiko; Ando, Tadahiko; Kitsunai, Tokuji; Kamiyama, Norio; and Oikawa, Yoshifumi, to Rikagaku Kenkyusho. Throw-in type colorimeter. 4,075,062, Cl. 195-103.50R.
Shibata, Tatsumi: *See—*
Kawakami, Shigenao; Shibata, Tatsumi; Isaoka, Shin-ichi; and Shintani, Tutomu, 4,075,183, Cl. 260-79.3MU.
Shibata, Yoshiki: *See—*
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Shigeta, Junnosuke; and Munehiro, Tomiji, to Matsushita Electric Industrial Co., Ltd. Keyboard operated electronic musical instrument. 4,074,605, Cl. 84-1.220.
Shimizu, Munetaka: *See—*
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Shimizu, Shinkichi: *See—*
Shiraishi, Tatsuo; Shimizu, Shinkichi; and Shindo, Tadashi, 4,075,283, Cl. 423-239.000.
Shimoya, Shigeo: *See—*
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Shin-Etsu Chemical Co., Ltd.: *See—*
Itoh, Kunio; Takago, Toshio; Sato, Tamio; and Aoki, Hisashi, 4,075,154, Cl. 260-37.0SB.
Takamizawa, Minoru; Yamamoto, Yasushi; Inoue, Yoshio; Noshiro, Atsumi; and Fujii, Hitoshi, 4,075,167, Cl. 260-46.50E.
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Shinoda, Nobuhiko; and Kusumoto, Tadao, to Canon Kabushiki Kaisha. Data control device for selectively providing data to a processing system. 4,075,696, Cl. 364-404.000.
Shinohara, Yukio; and Ueno, Kuniki, to Mitsui Mining & Smelting Co., Ltd. Processes for preventing the generation of a mist of electrolyte and for recovering generated gases in electrowinning metal recovery, and electrodes for use in said processes. 4,075,069, Cl. 204-106.000.
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Futagawa, Yoshikiyo; Kubota, Kanemitsu; and Kamakura, Hiroshi, 4,075,623, Cl. 340-347.0NT.
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Shipp, Roy L., Jr., to United States of America, Energy. Capacitance densitometer for flow regime identification. 4,075,680, Cl. 361-285.000.
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Shirakawa, Kazuhiro: *See—*
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Shivers, Norman E., Jr.; Shivers, David E.; and Shivers, Paul N., 4,074,447, Cl. 37-2.00R.
Shivers, Norman E., Jr.; Shivers, David E.; and Shivers, Paul N. Stump cutting and precision digging apparatus. 4,074,447, Cl. 37-2.00R.
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SI Handling Systems, Inc.: *See—*
Kurahasi, Yutaka; and Ihara, Nobuyuki, 4,074,632, Cl. 104-130.000.
Siebol, George, to Armco Steel Corporation. Blind spacer fastener. 4,074,608, Cl. 85-71.000.
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Simon, Paul Rene, to Societe Francaise de l'Electro-Resistance. Electroresistor and method of making same. 4,075,452, Cl. 219-121.0EM.
Simond, Ludger. Climbing wedge. 4,074,880, Cl. 248-1.000.
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Simpson, Harold G.; and Davis, Michael W., to Star Manufacturing Co. of Oklahoma. Prefabricated watertight structural system. 4,074,492, Cl. 52-419.000.
Sims, Claude C.; and Ensign, Thomas H., to United States of America, Navy. Dual resonance bender transducer. 4,075,600, Cl. 340-9.000.
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Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Kudryakov, Mikhail Nikolaevich; Tsipkis, Alexandr Moiseevich; Yakovlev, Vladimir Germogenovich; Averbukh, Alexandr Samoilovich; Scherbakov, Jury Ilich; Yakobson, Natalia Dmitrievna; Semikozov, Vyacheslav Fedorovich; Medvedev, Viktor Vladimirovich; Yartsev, Valery Vasilievich; Kaganov, July Davydovich; Kuznetsov, Vladimir Ivanovich; and Sinelnikov, Alexandr Iosifovich, 4,074,773, Cl. 173-23.000.
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Ketterer, Stanley Joseph; and Weisz, William, 4,074,643, Cl. 112-181.000.
Sipila, Heikki Johannes; and Kiuru, Erkki Sakari, to Outokumpu Oy. Method and device for diminishing the background effect in a proportional counter. 4,075,486, Cl. 250-374.000.
Siron Industries, Inc.: *See—*
Swimley, Ronald N., 4,074,396, Cl. 24-162.000.
Sisk, Hollis D. Apparatus and method for sizing stator bores. 4,074,560, Cl. 72-393.000.
Sizov, Vadim Mikhailovich: *See—*
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Skripek, Milan; and Duir, John H., to Union Oil Company of California. Manufacture of low-sulfur needle coke. 4,075,084, Cl. 208-93.000.
Skubic, Leroy F.; Donkle, Lucius B., Jr.; and Groth, Donald L., to Paltier Corporation, The. Pallet rack. 4,074,812, Cl. 211-192.000.
Slater, William L., to Texaco Inc. Partial oxidation process. 4,074,981, Cl. 48-197.00R.
Sloan, Benjamin Johnston, Jr., to Texas Instruments Incorporated. Integrated logic circuit and method of fabrication. 4,075,039, Cl. 148-1.500.
Sloan, Cephas H.: *See—*
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Smith, David G., to GSW Limited/Limitee. End cap assembly for an appliance control panel. 4,074,825, Cl. 220-4.00R.
Smith, Duane R., to Caterpillar Tractor Co. Accumulator drain. 4,074,703, Cl. 137-798.000.

Smith, Floyd S., to Brown Company. Novel filter and method of making same. 4,075,107, Cl. 210-493.00R.
Smith, Frank C. Burglar resistance lock adapter kit. 4,074,552, Cl. 70-417.000.
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Smith, Jimmie T. Compound bow string changer. 4,074,409, Cl. 29-235.000.
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SmithKline Corporation: *See—*
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Smits, Donald M.; Daley, Patrick J.; and Akerley, Arnold J., to Kendall Company, The. Breast pads. 4,074,721, Cl. 128-461.000.
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Snow, Conley H.; and Messerschmidt, Rudolph, to Brooks & Perkins, Incorporated, by said Snow; and United States of America, Army, by said Messerschmidt. Cargo container with a cargo restraint system having adjustable panels. 4,074,634, Cl. 105-493.000.
Snyder, Daniel S.; and Luzsicza, Steven O., to Gould Inc. Apparatus and method for indicating condition of a rotating body. 4,075,603, Cl. 340-58.000.
Snyder, David E., to U. S. Industries, Inc. Pilot valve. 4,074,688, Cl. 137-269.000.
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Societe d'Etudes et de Recherches de Ventilation et d'Aeraulique: *See—*
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Soma, Nobuo; Kurumada, Tomoyuki; Brunetti, Heimo; and Rody, Jean, to Ciba-Geigy Corporation. Stabilization of polymers by penta- or hexa-substituted 4-piperidinol derivatives. 4,075,165, Cl. 260-45.80N.
Sommer, Karl: *See—*
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Sons, Charles C., Jr., to Caterpillar Tractor Co. Apparatus for forming beaded radial ply tire. 4,075,054, Cl. 156-414.000.
Sorensen, Karsten; Bernstein, David H.; and Druke, Michael B., to Data General Corporation. Data path configuration for a data processing system. 4,075,692, Cl. 364-200.000.
Sosnowski, Raymond A.: *See—*
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Spence-Bate, Harry Arthue Hele. Alternative camera arrangement. 4,074,935, Cl. 355-46.000.
Spencer, Stanley E., to United States of America, Air Force. Double acting dynamic seal with E-shaped spring and L-shaped seals. 4,074,908, Cl. 277-44.000.
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White, James F.; Shaw, Wilfrid G.; and Applequist, Michael D., 4,075,124, Cl. 252-437.000.
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Muller, Karl A., Jr., 4,074,836, Cl. 222-564.000.
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Stern, Ernest; Williamson, Richard C.; and Smith, Henry I., to Massachusetts Institute of Technology. Surface wave devices for processing signals. 4,075,706, Cl. 364-821.000.
Stern, Marvin J., to Alloy Metals, Inc. Nickel base brazing alloy. 4,075,009, Cl. 75-170.000.
Stevels, Albert Leendert Nicolaas; and Schrama-de Pauw, Agnes Desiree Maria, to U.S. Philips Corporation. X-ray luminescent screen. 4,075,495, Cl. 250-483.000.
Stevens, Carlile R. Capacitor charging system. 4,075,536, Cl. 315-241.00P.
Stevens, Francis Joseph, to General Electric Company. Programmable electrical apparatus containing a battery. 4,075,561, Cl. 324-149.000.
Stevens, Robert A., to Chevron Research Company. Bottom-hole gas-liquid separator. 4,074,763, Cl. 166-325.000.
Stevens, W. Gene, to Caterpillar Tractor Co. Compact transmission having a power takeoff shaft and hydraulically actuated clutches. 4,074,581, Cl. 74-15.660.
Stevens, W. Gene; and Windish, Willis E., to Caterpillar Tractor Co. Direct drive transmission with hydraulically actuated forward and reverse clutches. 4,074,592, Cl. 74-740.000.
Stewart, John S. Wood planer cutterhead design for reduced noise level. 4,074,737, Cl. 144-117.00R.
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Stieff, Lorin R. Fiber optic seal assembly. 4,074,415, Cl. 29-520.000.
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Stifter, Francis J. Expanded scale electrical measuring circuit. 4,075,560, Cl. 324-131.000.
Stipek, Charles J., Jr., to Bates Printing Specialties, Inc. Tamper proof lottery ticket. 4,074,911, Cl. 283-6.000.
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Storp, Klaus; Wirth, Hans; Rittinger, Gunter; and Hohmann, Volker, to Laboratorium fur Adsorptionstechnik GmbH. Process for impregnating active carbon with iodine compounds. 4,075,282, Cl. 423-230.000.
Story, Michael S.: *See—*
Reeher, John R.; Story, Michael S.; and Smith, Ronald D., 4,075,479, Cl. 250-281.000.
Stotler, David V., to Owens-Corning Fiberglas Corporation. Method and apparatus for handling strands. 4,074,871, Cl. 242-42.000.
Stranahan, Robert L. Ice barrier for boats. 4,074,649, Cl. 114-219.000.
Straus, Jozef; and Szentesi, Otto Istvan, to Northern Telecom Limited. Method and apparatus for distortion reduction in optical communication systems. 4,075,474, Cl. 250-199.000.
Strauss, Karl-Peter; and Elke, Dietmar, to Rollei-Werke Franke & Heidecke. Camera with automatic exposure factor mechanism. 4,075,638, Cl. 354-23.00D.
Streeter, Daniel Inott: *See—*
Palme, Anthony Ferdinand; and Streeter, Daniel Inott, 4,074,382, Cl. 11-1.0CP.
Stridde, George E., to N L Industries, Inc. Catalyst for alkylating aromatic hydrocarbons. 4,075,126, Cl. 252-455.00R.
Stringham, Roger S.: *See—*
Toy, Madeline S.; and Stringham, Roger S., 4,075,073, Cl. 204-158.00R.
Stupperich, Robert: *See—*
Leusden, Carl Otto Pels; Stupperich, Robert; and Weber, Hans-Bernd, 4,074,494, Cl. 52-606.000.
Sturwold, Robert J., to Emery Industries, Inc. Modified triglyceride metal working lubricants. 4,075,393, Cl. 428-457.000..
Stverak, Vaclav: *See—*
Masur, Christian; and Stverak, Vaclav, 4,075,564, Cl. 325-55.000.
Suarez, Tulio; and Jones, C. David, to Eli Lilly and Company. Novel antifertility agents. 4,075,223, Cl. 260-326.50C.
Suarez, Tulio: *See—*
Jones, C. David; and Suarez, Tulio, 4,075,227, Cl. 260-330.500.
Suga, Shigeru. Xenon lamp with magnets on the electrodes. 4,075,528, Cl. 313-154.000.
Suga, Shigeru. Xenon lamp containing magnetic adsorbers inside the tube thereof. 4,075,529, Cl. 313-154.000.
Sugiyama, Tsuneyoshi, to Feather Kogyo Kabushiki Kaisha. Shears. 4,074,430, Cl. 30-260.000.
Sugiyama, Yuichi: *See—*
Koyama, Tsuneo; Sugiyama, Yuichi; Furuhama, Teruhide; Tajima, Yoshio; Kakiuchi, Hiroshi; Yamada, Kazuhiro; and Obara, Masaaki, 4,075,159, Cl. 260-42.470.
Sukegawa, Tokuzo: *See—*
Hara, Katsuo; Hagino, Minoru; and Sukegawa, Tokuzo, 4,075,654, Cl. 357-30.000.
Sulzer Brothers, Ltd.: *See—*
Bader, Hartmann; and Bolleter, Ulrich, 4,074,725, Cl. 139-1.00R.
Sumitomo Chemical Company, Limited: *See—*
Kawakami, Shigenao; Shibata, Tatsumi; Isaoka, Shin-ichi; and Shintani, Tutomu, 4,075,183, Cl. 260-79.3MU.
Maruyama, Takashi; and Ueno, Katsuji, 4,075,173, Cl. 260-47.00C.
Sasajima, Kikuo; Ono, Keiichi; Motoike, Yasuo; Inaba, Shigeho; and Yamamoto, Hisao, 4,075,346, Cl. 424-267.000.
Shiraishi, Tatsuo; Shimizu, Shinkichi; and Shindo, Tadashi, 4,075,283, Cl. 423-239.000.
Tabana, Minoru; Narisawa, Shizuo; Mitsuno, Tatsuyuki; and Maki, Hiroshi, 4,075,285, Cl. 260-876.00B.
Sumitomo Electric Industries, Ltd.: *See—*
Uehara, Kenichiro, 4,075,496, Cl. 250-492.00B.
Summerlin, Frederick Arthur, to Aerpat A.G. Fastener placing apparatus. 4,074,554, Cl. 72-114.000.
Sun, Shan C.: *See—*
Chaprnka, Anthony G.; Sun, Shan C.; and Vercellotti, Leonard C., 4,075,559, Cl. 324-115.000.
Sunkler, Anton, to Siemens Aktiengesellschaft. Microwave transistor oscillator for wide band frequency tuning. 4,075,580, Cl. 331-96.000.
Sunsweet Growers, Inc.: *See—*
Gerrans, Alfred W., 4,075,087, Cl. 209-99.000.
Suomen Sokeri Osakeyhtio: *See—*
Melaja, Asko J.; and Hamalainen, Lauri, 4,075,406, Cl. 536-1.000.
Superior Electric Company, The: *See—*
Leenhouts, Albert C., 4,075,544, Cl. 318-696.000.
Suter, Alois Joseph. Casting head with toggle lever actuated valve. 4,074,834, Cl. 222-504.000.
Suzuki, Hideo; Ishiguro, Ginya; Mitsuhashi, Sadayuki; and Wakamatsu, Kazutoshi, to Nippon Telegraph and Telephone Public Corporation; and Nippon Electric Co., Ltd. Multicontact sealed electromagnetic coordinate selection device. 4,075,587, Cl. 335-112.000.
Suzuki, Masaaki; and Kasuga, Akira, to Fuji Photo Film Co., Ltd. Magnetic recording tapes with two-layered magnetic coating. 4,075,384, Cl. 428-212.000.
Suzuki, Norio: *See—*
Mitsuhashi, Sadayuki; Suzuki, Norio; and Nago, Kazuyoshi, 4,075,433, Cl. 179-18.0GE.
Svetlova, Valentina Ivanovna: *See—*
Lysikov, Boris Vasilievich; Shabanov, Jury Nikolaevich; Rybakov, Jury Viktorovich; and Svetlova, Valentina Ivanovna, 4,075,036, Cl. 136-225.000.
Swearingen, Judson S. Shaft-rotor coupling. 4,074,946, Cl. 403-364.000.
Swimley, Ronald N., to Siron Industries, Inc. Clasp with enclosed pin. 4,074,396, Cl. 24-162.000.
Swiss Aluminium Ltd.: *See—*
Vinkovic, Josef; and Werner, Eugen, 4,075,015, Cl. 96-35.100.
Yarwood, John C.; Dore, James E.; and Preuss, Robert K., 4,075,303, Cl. 264-44.000.
Sybron Corporation: *See—*
Feigin, Robert, 4,074,970, Cl. 8-169.000.
Walsh, William J., 4,074,963, Cl. 432-250.000.
Systems Research Laboratories, Inc.: *See—*
Taylor, Francis M., 4,074,938, Cl. 356-160.000.
Szczesniak, Alina Surmacka; and Mao, Wei-Wen, to General Foods Corporation. Intermediate moisture meats. 4,075,357, Cl. 426-332.000.
Szeberenyi, Szabolcz: *See—*
Toth, Edit; Torley, Jozsef; Gorog, Sandor; Szporny, Laszlo; Palosi, Eva; and Szeberenyi, Szabolcz, 4,075,249, Cl. 260-613.00D.
Szegedy, Robert J. Inertia power system. 4,075,542, Cl. 318-161.000.
Szentesi, Otto Istvan: *See—*
Straus, Jozef; and Szentesi, Otto Istvan, 4,075,474, Cl. 250-199.000.
Szporny, Laszlo: *See—*
Toth, Edit; Torley, Jozsef; Gorog, Sandor; Szporny, Laszlo; Palosi, Eva; and Szeberenyi, Szabolcz, 4,075,249, Cl. 260-613.00D.
Szugda, Bernard. Waterproof joint. 4,074,943, Cl. 403-174.000.
Szymansky, Edward, Jr.: *See—*
Marchetti, Michael John; and Szymansky, Edward, Jr., 4,074,427, Cl. 30-34.100.
Tabana, Minoru; Narisawa, Shizuo; Mitsuno, Tatsuyuki; and Maki, Hiroshi, to Sumitomo Chemical Company, Limited. Rubber-modified polystyrene resin composition. 4,075,285, Cl. 260-876.00B.
Taccani, Riccardo. Method and apparatus for manufacturing separable sliding clasp fasteners. 4,074,413, Cl. 29-408.000.
Tachibana, Takeshi: *See—*
Kamo, Yoshihisa; Tachibana, Takeshi; and Ichimura, Masao, 4,075,425, Cl. 179-1.0GQ.
Tadros, Tharwat Fouad: *See—*
Drewe, Nigel Wyndham; Parker, Roger John; and Tadros, Tharwat Fouad, 4,075,002, Cl. 71-92.000.
Taiheiyo Kinzoku Kabushiki Kaisha: *See—*
Takahashi, Hirohiko; Otsuka, Yosuinao; Sato, Yuichiro; and Tsukamoto, Yoshiki, 4,074,747, Cl. 164-443.000.
Taiwan Ricoh Co., Ltd.: *See—*
Kurasawa, Makoto, 4,075,646, Cl. 354-209.000.

Tajima, Yoshio: *See*—
Koyama, Tsuneo; Sugiyama, Yuichi; Furuhama, Teruhide; Tajima, Yoshio; Kakiuchi, Hiroshi; Yamada, Kazuhiro; and Obara, Masaaki, 4,075,159, Cl. 260-42.470.

Takacs, James D. River ramp for hovercraft. 4,074,384, Cl. 14-1.000.

Takagi, Kenji: *See*—
Kadowaki, Koju; Takagi, Kenji; and Tanaka, Yoshiaki, 4,075,127, Cl. 252-470.000.

Takago, Toshio: *See*—
Itoh, Kunio; Takago, Toshio; Sato, Tamio; and Aoki, Hisashi, 4,075,154, Cl. 260-37.0SB.

Takahashi, Hirohiko; Otsuka, Yoshinao; Sato, Yuichiro; and Tsukamoto, Yoshiki, to Taiheiyo Kinzoku Kabushiki Kaisha. Continuous casting mold for metals. 4,074,747, Cl. 164-443.000.

Takahashi, Masatatsu: *See*—
Takasuka, Kaoru; Takahashi, Masatatsu; and Nishimura, Sadaji, 4,075,498, Cl. 250-562.000.

Takahashi, Takeshi; Yamazaki, Yoshio; and Kato, Koichi, to Takeda Chemical Industries, Ltd. β-1,3-Glucan derivatives. 4,075,405, Cl. 536-1.000.

Takahata, Fumio; Inagaki, Kazunori; and Hirata, Yasuo, to Kokusai Denshin Denwa Kabushiki Kaisha. Transmultiplexer. 4,075,429, Cl. 179-15.0BM.

Takamizawa, Kinya; Itamura, Einoshin; and Iinuma, Kazuhiro, to Tokyo Shibaura Electric Co., Ltd. Ultrasonic wave transmitting and receiving apparatus. 4,075,598, Cl. 340-1.00R.

Takamizawa, Minoru; Yamamoto, Yasushi; Inoue, Yoshio; Noshiro, Atsumi; and Fujii, Hitoshi, to Dai Nippon Printing Co., Ltd.; and Shin-Etsu Chemical Co., Ltd. Maleimido group-containing organosilicon compounds. 4,075,167, Cl. 260-46.50E.

Takashi, Masanori; and Yoshiyasu, Mitsuo, to Mitsubishi Petrochemical Company Limited. Method of making synthetic paper. 4,075,050, Cl. 156-229.000.

Takasuka, Kaoru; Takahashi, Masatatsu; and Nishimura, Sadaji, to Asahi Kasei Kogyo Kabushiki Kaisha. Non-woven fabric defect detecting device. 4,075,498, Cl. 250-562.000.

Takatuka, Kenzi: *See*—
Furukubo, Haruo; Takezi, Yasaburo; and Takatuka, Kenzi, 4,075,530, Cl. 313-229.000.

Takeda Chemical Industries, Ltd.: *See*—
Noguchi, Yukihide; Nishimura, Takeshi; Kishimoto, Jotaro; and Nishida, Yoshio, 4,074,654, Cl. 118-73.000.
Takahashi, Takeshi; Yamazaki, Yoshio; and Kato, Koichi, 4,075,405, Cl. 536-1.000.

Takeda, Kouichi; Sato, Hiroshi; and Onishi, Toshimi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Apparatus for roll working. 4,074,556, Cl. 72-196.000.

Takeda, Yasuo, to Kabushiki Kaisha Mitutoyo Seisakusho. Profile indicator. 4,074,438, Cl. 33-174.00P.

Takeshita, Tetsuo: *See*—
Mukaemachi, Takuji; Takeshita, Tetsuo; Miyoshi, Tatsuru; and Kojima, Takafumi, 4,075,431, Cl. 179-18.0GF.

Taketani, Osamu, to Nippon Steel Corporation. Pipe clamp. 4,074,402, Cl. 24-268.000.

Takeuchi, Takeshi: *See*—
Masuda, Hajime; Takeuchi, Takeshi; Watanabe, Masakatsu; and Tomioka, Yukio, 4,075,628, Cl. 340-416.000.

Takezi, Yasaburo: *See*—
Furukubo, Haruo; Takezi, Yasaburo; and Takatuka, Kenzi, 4,075,530, Cl. 313-229.000.

Taller, Robert Arthur, to Union Carbide Corporation. Process for stabilizing pigment dispersions in urethane coatings. 4,075,152, Cl. 260-37.00N.

Tamosauskas, Albert E.: *See*—
Eilerman, George E.; and Tamosauskas, Albert E., 4,074,988, Cl. 65-3.00C.

Tan, Marshall: *See*—
Jones, Rufus S., Jr.; Tan, Marshall; and Choe, Eui Won, 4,075,269, Cl. 264-184.000.

Tanabe Kokoki Co., Ltd.: *See*—
Otani, Akira, 4,074,749, Cl. 164-326.000.

Tanabe, Yasuo, to Mitsubishi Chemical Industries Limited. Process for preparation of diacetoxybutene. 4,075,413, Cl. 560-244.000.

Tanaka, John; and Reilly, James J., Jr., to United States of America, Energy. Process for recovering evolved hydrogen enriched with at least one heavy hydrogen isotope. 4,075,312, Cl. 423-648.00A.

Tanaka, Taro: *See*—
Noguchi, Masaaki; Bunda, Tauchio; and Tanaka, Taro, 4,074,661, Cl. 123-3.000.

Tanaka, Yoshiaki: *See*—
Kadowaki, Koju; Takagi, Kenji; and Tanaka, Yoshiaki, 4,075,127, Cl. 252-470.000.

Tancrell, Roger H.; Stoner, William W.; and Wilson, David T., to Raytheon Company. Multiple masking imaging system. 4,075,483, Cl. 250-363.00S.

Taniyama, Eiji: *See*—
Konno, Kazuhiko; Hayasi, Yosio; Taniyama, Eiji; and Sekiya, Tetsuo, 4,075,121, Cl. 252-407.000.

Tarbet, Cecil Sidney Charles, to Cecil Instruments Manufacturing Limited. Sample cell for use in the optical analysis of liquids. 4,074,940, Cl. 356-246.000.

Tarneja, Krishan S.; Johnson, Joseph E.; and Bartko, John, to Westinghouse Electric Corporation. Tailoring of recovery charge in power diodes and thyristors by irradiation. 4,075,037, Cl. 148-1.500.

Tasco S.p.A.: *See*—
Degasperi, Mario Marco, 4,075,604, Cl. 340-146.3AG.

Tashiro, Norio: *See*—
Saito, Hisao; Tashiro, Norio; and Koinuma, Tokuju, 4,075,534, Cl. 315-39.710.

Tassone, Joseph V.: *See*—
Kaplan, Martin; and Tassone, Joseph V., 4,074,383, Cl. 12-145.000.

Tatsumi, Yoshio; and Kadowaki, Tooru, to Kabushiki Kaisha Daini Seikosha. Gear train for a wrist watch. 4,074,517, Cl. 58-140.00R.

Taubert, Klaus; Benner, Reimund; and Judt, Friedrich, to Meyer, Roth & Pastor Maschinenfabrik GmbH. Apparatus for making a link-type conveyor belt. 4,074,518, Cl. 59-15.000.

Taylor, Donald M.: *See*—
Warren, Daniel E.; and Taylor, Donald M., 4,074,789, Cl. 182-37.000.

Taylor, Francis M., to Systems Research Laboratories, Inc. Optical dimension measuring device employing an elongated focused beam. 4,074,938, Cl. 356-160.000.

Taylor Machine Works, Inc.: *See*—
Monk, James T.; Hailey, James L.; and Boyles, Tonnie M., 4,074,801, Cl. 198-304.000.

Teagle, William Thomas. Machine for cutting hedges, grass and other arboreal growth. 4,074,510, Cl. 56-233.000.

Technical Research Affiliates, Inc.: *See*—
Ainis, Herman; Lange, Charles F.; Mark, Abraham S.; and Scherr, George H., 4,075,315, Cl. 424-12.000.

Teijin Limited: *See*—
Kobayashi, Isao; Asada, Yoshiharu; and Kumakawa, Shiro, 4,075,274, Cl. 264-290.00T.
Ozawa, Shuji; Nakagawa, Yasuo; Matsuda, Kichiro; Nishihara, Toshio; and Yunoki, Hideki, 4,075,172, Cl. 260-47.0CZ.

Tektronix, Inc.: *See*—
Gilbert, Barrie, 4,075,574, Cl. 330-257.000.
Janko, Bozidar, 4,075,533, Cl. 315-31.00R.

Telefonaktiebolaget L M Ericsson: *See*—
Ericsson, Ernst Enoch, 4,075,694, Cl. 364-200.000.
Ghisler, Walter; Marlevi, Aleksander; and Anas, Johan Olof, 4,075,428, Cl. 179-15.0BS.
Johansson, Ake Ernst Elof; and Pahlen, Lars Christer, 4,075,683, Cl. 361-415.000.
Jonsson, Bjorn Erik Rutger; Andersson, Ulf Ivan Gunnar; and Bergman, Gustav Ruben, 4,075,466, Cl. 235-302.300.
Mattsson, Orjan Mats; and Widl, Walter Herbert Erwin, 4,075,427, Cl. 179-15.0BC.
Reutling, Rolf Torgny; and Thysk, Nils Anders Rune, 4,074,421, Cl. 29-628.000.

Teleglobe Pay-TV System, Inc.: *See*—
Horowitz, Irving, 4,075,660, Cl. 358-124.000.

Temme, Helmut: *See*—
Grundken, Dieter; and Temme, Helmut, 4,074,804, Cl. 198-735.000.

Tenney, Horace M.: *See*—
Mertzweiller, Joseph K.; and Tenney, Horace M., 4,075,251, Cl. 260-638.00B.

Teranishi, Haruo: *See*—
Ishikawa, Toshikatsu; Junichi, Tanaka; Teranishi, Haruo; and Kondo, Shinichiro, 4,075,114, Cl. 252-62.000.

Terek, Greg P.: *See*—
Juergens, David A.; and Terek, Greg P., 4,074,810, Cl. 211-11.000.

Tesson, Gerard: *See*—
Bonnet, Jean-Claude; and Tesson, Gerard, 4,075,177, Cl. 260-75.00T.

Tetenal Photowerk Walter Grabig: *See*—
Gerhardt, Wolfgang, 4,075,014, Cl. 96-22.000.

Tetrick, Elton Earl: *See*—
Funk, Buddy Keith; and Tetrick, Elton Earl, 4,075,465, Cl. 235-145.00R.

Texaco Development Corporation: *See*—
Naylor, Carter G.; and Yeakey, Ernest L., 4,075,130, Cl. 252-548.000.

Texaco Inc.: *See*—
Bousaid, Issam S., 4,074,759, Cl. 166-273.000.
Dorawala, Tansukhlal G.; Reinhard, Russell R.; and Estes, John H., 4,075,255, Cl. 260-672.00R.
Flournoy, Norman E., 4,075,601, Cl. 340-15.000.
Fuller, Matthew H.; and Deever, William R., 4,075,101, Cl. 210-275.000.
Slater, William L., 4,074,981, Cl. 48-197.00R.

Texas Instruments Incorporated: *See*—
Hanni, Stephen L.; and Johnson, Dudley B., 4,074,419, Cl. 29-625.000.
Sloan, Benjamin Johnston, Jr., 4,075,039, Cl. 148-1.500.
Squiers, David J.; and Obenhaus, Robert E., 4,075,674, Cl. 361-27.000.

Textron, Inc.: *See*—
Goldblatt, Lawrence; Weiss, Werner; and MacIntyre, Peter A., 4,074,604, Cl. 83-830.000.
Howe, Ralph S., Jr., 4,074,923, Cl. 308-236.000.
Kedzierski, Stanley G., 4,074,399, Cl. 24-205.14R.
Mait, Richard J., 4,074,512, Cl. 57-140.0BY.

Textube Corporation: *See*—
Fratturo, Jules P., 4,074,875, Cl. 242-118.300.

Therkildsen, Henry T.: *See*—
Hoehn, Richard F.; Morris, Hugh C.; Therkildsen, Henry T.; and Behrends, Bertwin E., 4,074,796, Cl. 192-3.570.

Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Ballast tamping implement on a mobile track tamper. 4,074,631, Cl. 104-12.000.

Theysohn, Friedrich. Method for coating foil material. 4,075,266, Cl. 264-92.000.

Thiele, Gerd: *See*—
Schilling, Kurt; Schraudolph, Manfred; Thiele, Gerd; and Weber, Jurgen, 4,075,682, Cl. 361-386.000.

Thill, William E. Eyeglasses having shapeable weighted temples. 4,074,932, Cl. 351-111.000.

Thizy, Andre; Pillon, Daniel; Debourge, Jean-Claude; and Lacroix, Guy, to Pepro. Fungicidal compositions containing phosphorous acid and derivatives thereof. 4,075,324, Cl. 424-128.000.

Tholander, Lars Helge Gottfrid; and Skogward, Kenneth Oscar Emanuel. Sewing machine. 4,074,641, Cl. 112-158.00D.

Thom, Karlheinz: *See*—
United States of America, National Aeronautics and Space Administration; Thom, Karlheinz; and Schneider, Richard T., 4,075,057, Cl. 176-39.000.

Thomas, David Charles, to Kerr-McGee Chemical Corporation. Antimony oxide pigment and process of manufacture. 4,075,032, Cl. 106-303.000.

Thomas, Donald Richard. Water heater-fireplace grate. 4,074,676, Cl. 126-132.000.

Thomas, Friedrich Werner, to Leybold-Heraeus GmbH & Co. KG. Apparatus for regulating the immersion depth of electrodes in electrode-melting furnaces. 4,075,414, Cl. 13-13.000.

Thomas, Raymond W.: *See*—
Willard, David A.; and Thomas, Raymond W., 4,074,411, Cl. 29-267.000.

Thomas Taylor & Sons, Inc.: *See*—
MacDonald, Harold B., 4,075,046, Cl. 156-73.100.

Thompson, Donald F., to Standard Oil Company (Indiana). Polypropylene/pelargonate divalent metal salt. 4,075,147, Cl. 260-23.00H.

Thompson, William D.: *See*—
Mandy, Stephen H.; and Thompson, William D., 4,075,353, Cl. 424-338.000.

Thomson-CSF: *See*—
Bouverot, Rene; and Narbaits-Jaureguy, Jean-Raymond, 4,075,553, Cl. 324-233.000.
Dumez, Bernard, 4,075,631, Cl. 343-6.50R.

Thor Power Tool Company: *See*—
Jonsson, Gregg N., 4,074,772, Cl. 173-12.000.

Thorn, Herbert; and Berkin, Harvey, to Ideal Toy Corporation. Doll simulating sucking action. 4,074,460, Cl. 46-135.00R.

Thulin, Robert R., to Nabisco, Inc. Method of forming perforated flat dough pieces. 4,075,359, Cl. 426-502.000.

Thuries, Edmond, to Delle-Alsthom S.A. Operating system for generator circuit-breakers. 4,075,673, Cl. 361-10.000.

Thuy, Nguyen Uyen, to Anvar Agence Nationale de Valorisation de la Recherche. Method of determining the position and connection of multi-pole windings for multi-speed electric machines. 4,075,543, Cl. 318-224.00R.

Thysk, Nils Anders Rune: *See*—
Reutling, Rolf Torgny; and Thysk, Nils Anders Rune, 4,074,421, Cl. 29-628.000.

Tidwell, Robert Wayne. Pest trap. 4,074,456, Cl. 43-98.000.

Tiep, Brian L., to City of Hope National Medical Center. Intrathoracic pressure biofeedback method. 4,074,710, Cl. 128-2.05P.

Tillyer, John N.: *See*—
Dunham, Philip N.; Tillyer, John N.; and Martin, Armand, 4,074,977, Cl. 44-38.000.

Timron, Inc.: *See*—
Kessler, Theodore P., 4,074,874, Cl. 242-77.100.

Tinney, Francis John, to Parke, Davis & Company. Hexapeptides. 4,075,189, Cl. 260-112.50R.

Titus, Theodore, IV: *See*—
Bolick, Fred C., Jr.; Titus, Theodore, IV; and Mohammadioun, Said, 4,075,436, Cl. 179-100.1DR.

Toia, Emilio: *See*—
Sale, Amedeo Omodie; Toia, Emilio; Galliani, Giulio; and Lerner, Leonard J., 4,075,342, Cl. 424-258.000.

Tokico Ltd.: *See*—
Hayashida, Yoshihiro; and Haraikawa, Tetsuo, 4,074,532, Cl. 60-562.000.

Tokura, Naomi; Masaki, Kenji; and Nagaisi, Hatuo, to Nissan Motor Company, Limited. Combination exhaust-gas cleaner and muffler for an automobile engine. 4,074,975, Cl. 23-288.00F.

Tokyo Denryoku Kabushiki Kaisha: *See*—
Ochiai, Tomoyoshi; Hayashi, Takeshi; and Furuse, Mituhiro, 4,075,697, Cl. 364-481.000.

Tokyo Juki Kogyo Kabushiki Kaisha: *See*—
Chano, Takashi; and Masuda, Kohji, 4,074,640, Cl. 112-121.110.

Tokyo Shibaura Electric Co., Ltd.: *See*—
Saito, Hisao; Tashiro, Norio; and Koinuma, Tokuju, 4,075,534, Cl. 315-39.710.
Takamizawa, Kinya; Itamura, Einoshin; and Iinuma, Kazuhiro, 4,075,598, Cl. 340-1.00R.

Tomioka, Yukio: *See*—
Masuda, Hajime; Takeuchi, Takeshi; Watanabe, Masakatsu; and Tomioka, Yukio, 4,075,628, Cl. 340-416.000.

Tomoyoshi, Uchiya, to Uchiya Co., Ltd. Thermostat with reset arm. 4,075,594, Cl. 337-348.000.

Tong, Yulan C., to Dow Chemical Company, The. Microbicidal/fungicidal thiazolopyrazines. 4,075,207, Cl. 260-250.0BC.

Toray Industries, Inc.: *See*—
Igaki, Hiroyuki; Shibata, Yoshiki; and Saruyama, Masao, 4,074,973, Cl. 23-230.0PC.

Torikoshi, Takashi: *See*—
Horiie, Shigeki; Asai, Shin-Ichiro; Torikoshi, Takashi; Shirakawa, Kazuhiro; and Handa, Minoru, 4,075,253, Cl. 260-665.00R.

Torisawa, Akira, to Kabushiki Kaisha Daini Seikosha. Stepping motor for timepiece. 4,075,540, Cl. 318-138.000.

Torley, Jozsef: *See*—
Toth, Edit; Torley, Jozsef; Gorog, Sandor; Szporny, Laszlo; Palosi, Eva; and Szeberenyi, Szabolcz, 4,075,249, Cl. 260-613.00D.

Torok, Ernest James, to Sperry Rand Corporation. Logic gate for cross-tie wall memory system incorporating isotropic data tracks. 4,075,613, Cl. 365-87.000.

Torstenfelt, Ragnar: *See*—
Manasson, Martin; and Torstenfelt, Ragnar, 4,074,520, Cl. 60-39.320.

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Tower, Lee W.: *See*—
Lynch, David D., Jr.; and Tower, Lee W., 4,075,688, Cl. 364-200.000.

Towmotor Corporation: *See*—
Fatur, Richard N., 4,075,443, Cl. 200-85.00A.
Masevice, Frank V., 4,074,785, Cl. 180-68.500.
Scholl, Rolland D., 4,074,794, Cl. 187-29.00A.

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Toyo Boseki Kabushiki Kaisha: *See*—
Fujiyoshi, Kanji; Mizumura, Yutaka; and Sono, Junji, 4,075,261, Cl. 260-850.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Ikeya, Taro, 4,074,524, Cl. 60-282.000.
Takeda, Kouichi; Sato, Hiroshi; and Onishi, Toshimi, 4,074,556, Cl. 72-196.000.

Traficante, Daniel D.; and Mulcay, Michael. Wide-band nuclear magnetic resonance spectrometer. 4,075,552, Cl. 324-0.5AH.

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Bergman, Mark Otho; and Rentmeester, Paul Clement, 4,074,575, Cl. 73-344.000.

Trapasso, Louis E.; and Horback, William B., to Celanese Corporation. Non-woven fabric binders. 4,075,387, Cl. 428-288.000.

Traver, Frank J.: *See*—
Brown, Edgar D., Jr.; and Traver, Frank J., 4,075,115, Cl. 252-75.000.

Tremaine, Brian Paul: *See*—
Rose, Andrew M.; and Tremaine, Brian Paul, 4,075,667, Cl. 360-77.000.

Trevedy, Jean-Louis, to Institut de Recherches de la Siderurgie Francaise (IRSID). Temperature detecting device for a furnace. 4,075,035, Cl. 136-210.000.

TRW Inc.: *See*—
Archer, John S., 4,074,731, Cl. 140-112.000.
Nelson, Paul T., 4,074,473, Cl. 52-1.000.
Steinke, James M., 4,074,800, Cl. 197-168.000.

Tsao, Utah, to Lummus Company, The. Waste heat recovery from high temperature reaction effluents. 4,074,660, Cl. 122-32.000.

Tsay, Yaw Jenn; and Lin, Kuo-Chuan. Solar powered distilling device. 4,075,063, Cl. 202-234.000.

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Hofer, Kurt; and Tscheulin, Guenther, 4,075,163, Cl. 260-45.70P.

Tsen, Lo Kwang; and Palkiewicz, John Louis, to General Electric Company. Epoxy resin compositions and laminate made therewith. 4,075,260, Cl. 260-830.0TW.

Tsipkis, Alexandr Moiseevich: *See*—
Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Kudryakov, Mikhail Nikolaevich; Tsipkis, Alexandr Moiseevich; Yakovlev, Vladimir Germogenovich; Averbukh, Alexandr Samoilovich; Scherbakov, Jury Ilich; Yakobson, Natalia Dmitrievna; Semikozov, Vyacheslav Fedorovich; Medvedev, Viktor Vladimirovich; Yartsev, Valery Vasilievich; Kaganov, July Davydovich; Kuznetsov, Vladimir Ivanovich; and Sinelnikov, Alexandr Iosifovich, 4,074,773, Cl. 173-23.000.

Tsubokawa, Yoshitoki: *See*—
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Kawakami, Hiroshi; Tsukagawa, Yukio; and Nagaoka, Isao, 4,075,096, Cl. 210-96.00R.

Tsukamoto, Yoshiki: *See*—
Takahashi, Hirohiko; Otsuka, Yoshinao; Sato, Yuichiro; and Tsukamoto, Yoshiki, 4,074,747, Cl. 164-443.000.

Tucker, Joseph M., III: *See*—
Gill, Stephen H.; Knell, Harvey A.; and Tucker, Joseph M., III, 4,074,820, Cl. 214-138.00R.

Turner, John Harry Wallice, to Manchem, Limited. Organoaluminum compositions. 4,075,178, Cl. 260-75.00T.

Turner, Michael K.: *See*—
Fleming, Ian D.; Turner, Michael K.; and Brewer, Stephen J., 4,075,061, Cl. 195-29.000.

Turner, Sam R.; and Stolka, Milan, to Xerox Corporation. Intrachain charge transfer complexes use in electrophotographic imaging. 4,075,012, Cl. 96-1.0PC.

U-Cart Concrete Systems, Inc.: *See*—
Hall, Jack F., 4,075,711, Cl. 366-26.000.

Uchiya Co., Ltd.: *See*—
Tomoyoshi, Uchiya, 4,075,594, Cl. 337-348.000.

Ueda, Hiroshi; and Yoshizaki, Akira, to Minolta Camera Kabushiki Kaisha. Camera with exposure control mechanism. 4,075,640, Cl. 354-31.000.
Uehara, Kenichiro, to Sumitomo Electric Industries, Ltd. Charged particle irradiation apparatus. 4,075,496, Cl. 250-492.00B.
Ueno, Katsuji: *See—*
Maruyama, Takashi; and Ueno, Katsuji, 4,075,173, Cl. 260-47.00C.
Ueno, Kuniki: *See—*
Shinohara, Yukio; and Ueno, Kuniki, 4,075,069, Cl. 204-106.000.
Ueno, Masakatsu; Kato, Osamu; Kawauchi, Nobuyuki; and Itoh, Kametaro, to Nippon Steel Corporation. Combined mechanical and thermal processing method for production of seamless steel pipe. 4,075,041, Cl. 148-12.400.
Uliczka, Wolfgang: *See—*
Frosch, Werner; and Uliczka, Wolfgang, 4,074,395, Cl. 19-163.000.
Umebachi, Shotaro; Kano, Gota; and Inoue, Morio, to Matsushita Electronics Corporation. Junction gate type GaAs field-effect transistor and method of forming. 4,075,652, Cl. 357-22.000.
Underwood, Michael John; Martin, Michael Joseph; and Iles, Michael Victor, to International Computers Limited. Speech synthesizing apparatus. 4,075,424, Cl. 179-1.0SG.
Underwood, Michael John: *See—*
Martin, Michael Joseph; and Underwood, Michael John, 4,075,423, Cl. 179-1.0SC.
Underwood, Warren H.: *See—*
Blair, James M.; Sebring, Michael; Underwood, Warren H.; and Bley, William P., 4,074,389, Cl. 17-11.000.
Unice Machine Company: *See—*
Ducasse, Joseph Christophe Victor, 4,074,751, Cl. 165-92.000.
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Dockray, Edward; and Killen, Denis, 4,074,960, Cl. 425-89.000.
Union Carbide Corporation: *See—*
Taller, Robert Arthur, 4,075,152, Cl. 260-37.00N.
Williams, David; Lentz, Brian A.; and Le Veque, Harold E., 4,074,856, Cl. 239-1.000.
Union Oil Company of California: *See—*
De Beau, Gerard Anthony; and Price, Harold Arnold, 4,074,734, Cl. 141-44.000.
Skripek, Milan; and Duir, John H., 4,075,084, Cl. 208-93.000.
Young, Dean Arthur, 4,075,085, Cl. 208-253.000.
Uniroyal, AG: *See—*
van der Burg, Sjirk; Grosch, Karl A.; and Bertrand, Marcel J., 4,074,743, Cl. 152-355.000.
United States Filter Corporation: *See—*
Bakke, Even, 4,074,983, Cl. 55-118.000.
U. S. Industries, Inc.: *See—*
Snyder, David E., 4,074,688, Cl. 137-269.000.
United States of America
Air Force: *See—*
Baum, Kurt; and Grakauskas, Vytautas, 4,075,246, Cl. 260-584.00C.
Briar, Herman P.; and Bills, Kenneth W., Jr., 4,074,563, Cl. 73-35.000.
Folsom, Gary J.; and Kaisler, Francis J., 4,074,930, Cl. 350-33.000.
Holler, Richard P.; and McMath, Connie W., 4,074,523, Cl. 60-266.000.
Lowman, Richard M., Jr., 4,074,859, Cl. 239-265.330.
Sadler, James E., 4,074,527, Cl. 60-325.000.
Spencer, Stanley E., 4,074,908, Cl. 277-44.000.
Toy, Madeline S.; and Stringham, Roger S., 4,075,073, Cl. 204-158.00R.
Vieta, Hermann, 4,074,568, Cl. 73-147.000.
Wells, H. David; Folsom, Gary J.; and Kaisler, Francis J., 4,074,964, Cl. 8-10.200.
Army: *See—*
Merritt, James A., 4,075,072, Cl. 204-157.10R.
Rast, Gustaf J., Jr.; and Barley, Thomas A., 4,075,512, Cl. 307-311.000.
Snow, Conley H.; and Messerschmidt, Rudolph (said Messerschmidt assors. to), 4,074,634, Cl. 105-493.000.
Energy: *See—*
Baldwin, Howard A.; Depp, Steven W.; Koelle, Alfred R.; and Freyman, Robert W., 4,075,632, Cl. 343-6.80R.
Groh, Edward F.; and Cassidy, Dale A., 4,074,848, Cl. 228-173.00C.
Shipp, Roy L., Jr., 4,075,680, Cl. 361-285.000.
Tanaka, John; and Reilly, James J., Jr., 4,075,312, Cl. 423-648.00A.
Health, Education and Welfare: *See—*
Higley, Willard S.; Cantor, Paul A.; and Fisher, Bruce S., 4,075,108, Cl. 210-500.00M.
Interior: *See—*
Cheung, John B.; and Murman, Earll M., 4,074,779, Cl. 175-314.000.
Morrell, Roger J.; Gunn, Jerome A.; and Gore, Gerald D., 4,074,778, Cl. 175-91.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Thom, Karlheinz; and Schneider, Richard T. Non-equilibrium radiation nuclear reactor. 4,075,057, Cl. 176-39.000.
Navy: *See—*
Baer, Adrian D.; and Donovan, Terence M., 4,075,385, Cl. 428-215.000.
Dillard, George M., 4,075,703, Cl. 364-715.000.
Dyckman, Edward J.; Andersen, Deborah M.; and Fischer, Eugene C., 4,075,319, Cl. 424-78.000.
Dyjak, Richard C., 4,074,650, Cl. 114-221.00A.
Horanoff, Eugene V., 4,074,567, Cl. 73-147.000.
Kershaw, Joseph E., 4,075,583, Cl. 333-73.00R.
Koenig, Harry J., 4,075,608, Cl. 340-166.00R.
Lawrence, John C.; and Roth, Albert, 4,075,622, Cl. 340-347.0DD.
Lewis, Bernard L., 4,075,633, Cl. 343-100.0LE.
Manning, Larry G.; and Zabelka, Richard J., 4,074,628, Cl. 102-6.000.
Sims, Claude C.; and Ensign, Thomas H., 4,075,600, Cl. 340-9.000.
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Loveless, John H., 4,074,367, Cl. 3-1.100.
U.S. Philips Corporation: *See—*
Borne, Jean Paul; and Naaijer, Geert Jan, 4,075,665, Cl. 360-8.000.
Kowalski, Gunter, 4,075,490, Cl. 250-445.00T.
Louzil, Friedrich; Habelt, Gerhard; and Mrazek, Gustav, 4,075,669, Cl. 360-92.000.
Meyer-Ebrecht, Dietrich; and Kowalski, Gunter, 4,075,484, Cl. 250-366.000.
Perilhou, Jean Robert, 4,075,482, Cl. 250-363.00S.
Rath, Wilhelmus Johannes Franciscus; and van der Donk, Johannes Martinus Augustinus Henricus, 4,075,441, Cl. 200-16.00D.
Stevels, Albert Leendert Nicolaas; and Schrama-de Pauw, Agnes Desiree Maria, 4,075,495, Cl. 250-483.000.
Wolber, Jorg, 4,075,570, Cl. 328-262.000.
United States Steel Corporation: *See—*
Boodman, Norman S.; and Walter, Jack W., 4,075,254, Cl. 260-667.000.
Capriotti, Alfred J.; Lazzaretti, Louis G.; and O'Donnell, Brian, 4,074,439, Cl. 33-286.000.
Capriotti, Alfred J., 4,074,895, Cl. 266-50.000.
Leonard, Ralph William, 4,075,008, Cl. 75-86.000.
United Technologies Corporation: *See—*
Beane, David J.; and Kaplan, Ronald M., 4,074,559, Cl. 72-354.000.
Bullis, Robert H.; Meyerand, Russell G., Jr.; and Wiegand, Walter J., Jr., 4,074,572, Cl. 73-194.00F.
Fradenburgh, Evan A.; and Yarm, Jay M., 4,074,952, Cl. 416-87.000.
Novotny, Rudolph J., 4,074,914, Cl. 285-405.000.
Universita, Joseph Della: *See—*
Orsini, Ronald J.; and Universita, Joseph Della, 4,075,296, Cl. 261-41.00D.
University of Illinois Foundation: *See—*
Brady, John K.; and Noyes, Robert, 4,075,302, Cl. 269-43.000.
Rinehart, Kenneth L., Jr.; McMillan, Moses W.; and Sobiczewski, Wojciech, 4,075,339, Cl. 424-250.000.
University of Notre Dame du Lac: *See—*
D'Arelio, Gaetano F., 4,075,171, Cl. 260-47.0CP.
Uno, Naoyuki; Shono, Tetsuji; Urano, Fumio; and Kawasaki, Masahiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Automatic exposure control device in a camera. 4,075,641, Cl. 354-43.000.
Unz, Hillel. Nonuniformly optimally spaced array with specified zeros in the radiation pattern. 4,075,635, Cl. 343-844.000.
UOP Inc.: *See—*
Politzer, Ernest L.; and Hayes, John C., 4,075,259, Cl. 260-683.680.
Yates, Brian, 4,074,886, Cl. 248-394.000.
Upjohn Company, The: *See—*
Greer, Richard L., 4,075,139, Cl. 260-2.50F.
Hester, Jackson B., Jr., 4,075,221, Cl. 260-308.00R.
Moffett, Robert Bruce, 4,075,202, Cl. 260-239.30T.
Nelson, Norman A., 4,075,247, Cl. 260-590.00C.
Urano, Fumio: *See—*
Uno, Naoyuki; Shono, Tetsuji; Urano, Fumio; and Kawasaki, Masahiro, 4,075,641, Cl. 354-43.000.
Utter, Allan D.: *See—*
Paul, George A.; Hegel, Robert W.; Bethell, Michael R.; Branham, Charles L.; and Utter, Allan D., 4,075,098, Cl. 210-168.000.
Vainer, Ernesto A., to Manufactura de Articulos para el Hogar "Aurora" S.A. Industrial, Comercial, Inmobiliaria y Financiera. Electrode construction for a piezoelectric lighter. 4,074,962, Cl. 431-255.000.
Valint, Paul L., Jr.: *See—*
Oswald, Alexis A.; and Valint, Paul L., Jr., 4,075,332, Cl. 424-216.000.
Valleylab, Inc.: *See—*
Morrison, Charles F., Jr., 4,074,718, Cl. 128-303.140.
Valo, Veikko Lennart. Arrangement for a rotor barking machine. 4,074,738, Cl. 144-208.00E.
Van Kooten B.V.: *See—*
Schnell, Hans Gunther, 4,074,776, Cl. 173-137.000.
Van Bilderbeek, Bernard H.; Maingot, John E.; and Walker, James M., to Vetco Offshore Industries, Inc. Releasable rigid pile connector apparatus. 4,074,912, Cl. 285-39.000.
van der Burg, Sjirk; Grosch, Karl A.; and Bertrand, Marcel J., to Uniroyal, AG. Radial tire with bead reinforcing elements. 4,074,743, Cl. 152-355.000.
van der Donk, Johannes Martinus Augustinus Henricus: *See—*
Rath, Wilhelmus Johannes Franciscus; and van der Donk, Johannes Martinus Augustinus Henricus, 4,075,441, Cl. 200-16.00D.
van der Lely, Cornelis. Soil cultivating implements. 4,074,765, Cl. 172-59.000.
Van Doorne, Guy Camille, to Labofina S.A. Grease composition. 4,075,112, Cl. 252-35.000.

Van Doorne, Guy Camille, to Labofina S.A. Grease composition. 4,075,113, Cl. 252-35.000.
Vanguard, Inc.: *See—*
Harken, Peter O., 4,074,892, Cl. 254-188.000.
Van Poucke, Raphael Karel: *See—*
Van Wignsberghe, Leo August, deceased; Zinzen, Agnes Maria, heir; Van Poucke, Raphael Karel; and Van Vugt, Jaak Pieter, 4,075,022, Cl. 96-100.00R.
Van Vugt, Jaak Pieter: *See—*
Van Wignsberghe, Leo August, deceased; Zinzen, Agnes Maria, heir; Van Poucke, Raphael Karel; and Van Vugt, Jaak Pieter, 4,075,022, Cl. 96-100.00R.
Van Wignsberghe, Leo August, deceased; by Zinzen, Agnes Maria, heir; Van Poucke, Raphael Karel; and Van Vugt, Jaak Pieter. Aqueous dispersions of photographic ingredients. 4,075,022, Cl. 96-100.00R.
Vardell, William G., Jr., to Westvaco Corporation. Recovery of crude tall oil. 4,075,188, Cl. 260-97.700.
Varian Associates, Inc.: *See—*
Anderson, Weston A., 4,074,564, Cl. 73-596.000.
James, Lawrence W., 4,075,651, Cl. 357-22.000.
Varta Batterie A. G.: *See—*
Salamon, Klaus; and Eckardt, Rudolf, 4,075,368, Cl. 429-161.000.
Varwig, Karlheinz, to DeMag Aktiengesellschaft. Turn-over cooling bed for bar-shaped rolled material, particularly billets. 4,074,815, Cl. 214-1.0QG.
Vassiliades, Anthony E.; and Vincent, David N., to Champion International Corporation. Opaque microcapsular release sheet. 4,075,389, Cl. 428-306.000.
Vaucher, Jean M., to Dynacore, S.A. Isochronous period generator having means for adjusting the isochronous period. 4,074,514, Cl. 58-23.0AC.
VEB Polygraph: *See—*
Werner, Hans-Dieter, 4,074,626, Cl. 101-221.000.
Veitscher Magnesitwerke-Actien-Gesellschaft: *See—*
Eustacchio, Peter, 4,075,311, Cl. 423-636.000.
Grill, Michael; Grohmann, Helmut; and Nossler, Franz, 4,075,293, Cl. 261-20.000.
Vercellotti, Leonard C.: *See—*
Chaprnka, Anthony G.; Sun, Shan C.; and Vercellotti, Leonard C., 4,075,559, Cl. 324-115.000.
Verderber, Rudolph R., to Siemens Corporation. Single chip temperature compensated reference diode and method for making same. 4,075,649, Cl. 357-13.000.
Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft: *See—*
Scheurecker, Werner; and Scheinecker, Alois, 4,074,745, Cl. 164-446.000.
Scheurecker, Werner; and Kagerhuber, Franz, 4,074,746, Cl. 164-442.000.
Verge, John Pomfret; Neville, Martin Charles; and Friedman, Henry, to Eli Lilly and Company. 3-(5-Nitro-2-imidazolyl)pyrazoles. 4,075,222, Cl. 548-336.000.
Verger, Nathan; and Schmidt, Gerhard, to Alarm Device Manufacturing, Co. Switching apparatus. 4,075,588, Cl. 335-207.000.
Vermilion, Donn R.: *See—*
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Versar, Inc.: *See—*
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Vetco Offshore Industries, Inc.: *See—*
Van Bilderbeek, Bernard H.; Maingot, John E.; and Walker, James M., 4,074,912, Cl. 285-39.000.
Vickery, James R.: *See—*
Bickford, Gardner Lloyd, 4,074,881, Cl. 248-188.700.
Vickstrom, Donald E., to Reynolds Metals Company. Apparatus for holding panels in a window construction. 4,074,483, Cl. 52-202.000.
Vieta, Hermann, to United States of America, Air Force. Fluidic oscillating jet for high frequency gust tunnel. 4,074,568, Cl. 73-147.000.
Villain, Roland, to Societe Nationale Industrielle Aerospatiale. Titanium and titanium alloy surface preparation method for subsequent bonding. 4,075,040, Cl. 148-6.14R.
Vincent, David N.: *See—*
Vassiliades, Anthony E.; and Vincent, David N., 4,075,389, Cl. 428-306.000.
Vincent, Donald L.: *See—*
Marshall, Harry Borden; and Vincent, Donald L., 4,075,248, Cl. 260-600.00R.
Vinel, Rene: *See—*
Boudet, Georges; Charpentier, Jacques; Vinel, Rene; Desmoulins, Jean-Claude; and de Blic, Emmanuel, 4,074,890, Cl. 254-29.00A.
Vinkovic, Josef; and Werner, Eugen, to Swiss Aluminium Ltd. Light sensitive mass and process for its production. 4,075,015, Cl. 96-35.100.
Virkus, Kenneth J., to General Cable Corporation. Bridging tape over lap seam cable shield. 4,075,419, Cl. 174-107.000.
Vollers, Charles S.: *See—*
Myers, John D.; and Vollers, Charles S., 4,075,120, Cl. 252-301.40P.
Vollmer Werke Maschinenfabrik GmbH: *See—*
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Saleck, Wilhelm; and von Rintelen, Harald, 4,075,020, Cl. 96-94.00R.
Vopel, Karl Heinz; Hellrung, Friedrich; and Berendes, Otto, to Bayer Aktiengesellschaft. Production of O,O-dialkyl-phosphorochloridothionates. 4,075,292, Cl. 260-986.000.
Voss, Raymond O., to Corning Glass Works. Sodium ion-exchange on surface of beta-spodumene. 4,074,992, Cl. 65-30.00E.
Vredenburgh, Walter A.: *See—*
Douglas, Paul S.; Patellis, Anargiros Pete; and Vredenburgh, Walter A., 4,075,404, Cl. 526-237.000.
Vrieland, G. Edwin; and Friedli, Hans R., to Dow Chemical Company, The. Catalyst and method of oxydehydrogenation of alkyl aromatic compounds. 4,075,122, Cl. 252-437.000.
VSC Company, The: *See—*
Eppler, William G., Jr., 4,075,435, Cl. 179-100.1VC.
Vuffray, Georges: *See—*
Donze, Jean-Marie; and Vuffray, Georges, 4,074,513, Cl. 58-4.00A.
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W. A. Kates Company, The: *See—*
Kates, Willard A., 4,074,693, Cl. 137-454.600.
W-A Red Hot, Inc.: *See—*
Whiteley, Isaac C., 4,074,681, Cl. 126-164.000.
W. R. Grace & Co.: *See—*
Olcott, Tyler Keith, 4,075,187, Cl. 264-89.000.
Wada, Tasaku, to Kokusai Denshin Denwa Kabushiki Kaisha. Step-by-step reciprocating mechanism. 4,075,539, Cl. 318-135.000.
Wada, Tasaku: *See—*
Aoki, Ren; Fujiwara, Mitsugu; and Wada, Tasaku, 4,075,664, Cl. 358-286.000.
Wagle, Uday Dakornath; and Ramdas, Venkatram, to Pennwalt Corporation. Continuous manufacture of peroxyesters. 4,075,236, Cl. 260-453.0RZ.
Wahlquist, Carl D., to Building Components Research, Inc. Collapsible room module construction and method of assembly. 4,074,475, Cl. 52-70.000.
Wainer, Eugene, to Horizons Research Incorporated. Process for production of carbon monoxide and hydrogen. 4,074,980, Cl. 48-197.00R.
Wakamatsu, Kazutoshi: *See—*
Suzuki, Hideo; Ishiguro, Ginya; Mitsuhashi, Sadayuki; and Wakamatsu, Kazutoshi, 4,075,587, Cl. 335-112.000.
Walch, Axel; Klimmek, Albrecht; and Wollmann, Klaus, to Joh. A. Benckiser GmbH. Process of separating citric acid and/or isocitric acid or their salts from aqueous solutions. 4,075,093, Cl. 210-23.00H.
Walker, Ernest L., to International Business Machines Corporation. Surface acoustic wave device. 4,075,582, Cl. 333-72.000.
Walker, Ernest Lee, to International Business Machines Corporation. Analog-to-digital conversion apparatus. 4,075,577, Cl. 331-17.000.
Walker, James M.: *See—*
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Walker, Ralph Eldridge, to Litton Systems, Inc. Floating head encoder. 4,075,478, Cl. 250-231.0SE.
Wallach, Steven J.: *See—*
Nissen, Stanley M.; and Wallach, Steven J., 4,075,687, Cl. 364-200.000.
Walley, Everette D., Jr., to General Signal Corporation. Monitoring device. 4,075,502, Cl. 307-64.000.
Walsh, William J., to Sybron Corporation. Kiln. 4,074,963, Cl. 432-250.000.
Walter, Jack W.: *See—*
Boodman, Norman S.; and Walter, Jack W., 4,075,254, Cl. 260-667.000.
Walther, Ronald Gene: *See—*
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Walton, Tommy L., to Burroughs Corporation. Cover layer for flexible circuits. 4,075,420, Cl. 174-117.00F.
Wanat, Ronald Joseph: *See—*
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Ward, Anthony T.; Damjanovic, Aleksandar; and Hair, Michael L. Electrophotochemical preparation of selenium photoconductive members. 4,075,013, Cl. 96-1.50R.
Ware, J. Edgar: *See—*
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Warren, Daniel E.; and Taylor, Donald M., to Armco Steel Corporation. Mobile rolling support system for scaffolding used in building construction. 4,074,789, Cl. 182-37.000.
Warren, Lyle D.; and Brewster, Robert W. Automatic sawmill. 4,074,601, Cl. 83-425.200.
Washabaugh, Edward P. Ladder rung implanter. 4,075,272, Cl. 264-249.000.
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Watanabe, Kiyoshi: *See—*
Narita, Yoshihiro; Mochizuki, Shigeaki; Kakimoto, Shigeru; Komori, Norio; Watanabe, Kiyoshi; and Shiota, Hideji, 4,074,864, Cl. 241-23.000.
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Watanabe, Masakatsu: *See—*
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Watanabe, Motohisa: *See—*
Otsu, Iwao; and Watanabe, Motohisa, 4,075,064, Cl. 204-18.00R.
Watanabe, Tomoyoshi: *See—*
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Watkins, David Vaughan, to Fidelity Radio Limited. Electrical control device. 4,075,568, Cl. 328-1.000.
Watson, Lawrence A., to Edgewater Marine, Inc. Method of making foam filled panels. 4,075,304, Cl. 264-46.500.
Watt, Robert Duncan; and Orr, Brian William Gordon. Brick laying device. 4,074,503, Cl. 52-749.000.
Watts, William R. Chair frame furniture unit. 4,074,919, Cl. 297-233.000.
Weatherford Oil Tool Company, Ltd.: *See—*
Drury, Frederick H., 4,074,900, Cl. 269-254.00R.
Weber, Hans-Bernd: *See—*
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Weber, Jurgen: *See—*
Schilling, Kurt; Schraudolph, Manfred; Thiele, Gerd; and Weber, Jurgen, 4,075,682, Cl. 361-386.000.
Weck, Karl-Gustav, to Kieserling & Albrecht Werkzeugmaschinenfabrik. Infeed device for a turning machine for finishing the peripheral surfaces of elongated workpieces of cylindrical cross-section. 4,074,598, Cl. 82-20.000.
Weinblatt, Lee S. Eye movement monitoring apparatus. 4,075,657, Cl. 358-93.000.
Weinhold, Karl. Device for releasable fastening of tube or pipe ends. 4,074,913, Cl. 285-114.000.
Weirich, Walter; and Kussel, Willy, to Gewerkschaft Eisenhutte Westphalia. Pressure-relief valve devices. 4,074,695, Cl. 137-508.000.
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Ketterer, Stanley Joseph; and Weisz, William, 4,074,643, Cl. 112-181.000.
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Wells, H. David; Folsom, Gary J.; and Kaisler, Francis J., to United States of America, Air Force. Method of coloring hair using a pressure sensitive adhesive. 4,074,964, Cl. 8-10.200.
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Christopher, Chris J.; Wenninger, Fred W.; Morris, Donald E.; Covington, Wayne F.; Folsom, Jerry B.; Beyers, Joseph W.; Nairn, John H.; and Osborne, Jeffrey C., 4,075,679, Cl. 364-200.000.
Werner, Eugen: *See—*
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Werner, Hans-Dieter, to VEB Polygraph. Method and apparatus for continuously printing uncased folded books. 4,074,626, Cl. 101-221.000.
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Rule, Charles E.; and Werstak, Charles E., 4,075,360, Cl. 426-582.000.
Wescott, Robert D.; and Christie, John B., to NCR Corporation. Symbol decoding method and means. 4,074,852, Cl. 235-463.000.
Wesner, Charles R.: *See—*
Reid, Robert E.; and Wesner, Charles R., 4,074,648, Cl. 114-144.0RE.
West Electric Co., Ltd.: *See—*
Higuchi, Masaru, 4,075,472, Cl. 362-255.000.
West, William S. Pressure source and systems incorporating it. 4,074,526, Cl. 60-325.000.
Western Electric Company, Inc.: *See—*
Bloxham, Gordon Foreman; Brezeale, Claude Paren; Cocco, Eugene Raymond; Hardesty, Edwin Charles; Small, Byron Lee; Steinert, Daniel Marion; and McGonigal, Charles, 4,075,299, Cl. 264-25.000.
Westfalia Separator AG: *See—*
Niemeyer, Heinrich, 4,074,622, Cl. 99-456.000.
Westinghouse Electric Corporation: *See—*
Chaprnka, Anthony G.; Sun, Shan C.; and Vercellotti, Leonard C., 4,075,559, Cl. 324-115.000.
Colburn, Richard P., 4,075,060, Cl. 176-37.000.
Duncan, Robert; and Barna, Richard P., 4,075,454, Cl. 219-137.00R.
Rostron, Joseph R., 4,075,447, Cl. 200-148.00A.
Tarneja, Krishan S.; Johnson, Joseph E.; and Bartko, John, 4,075,037, Cl. 148-1.500.
Westvaco Corporation: *See—*
Vardell, William G., Jr., 4,075,188, Cl. 260-97.700.
Whang, Sang Y.: *See—*
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Whirlpool Corporation: *See—*
Lotz, Lawrence C., 4,074,677, Cl. 126-198.000.
White, Allen A., to Hesston Corporation. Method and apparatus for binding a crop bale. 4,074,623, Cl. 100-3.000.
White, Derek Graham Walter: *See—*
Curry, Harold George; Attwood, Brian William; and White, Derek Graham Walter, 4,074,959, Cl. 425-81.100.
White, Donald A. Christmas tree fire detector and alarm. 4,075,614, Cl. 340-227.100.
White, Eugene W.; Hanusiak, William M.; and White, Rodney A., to Research Corporation. High surface area permeable material. 4,075,092, Cl. 210-22.00R.
White, James F.; Shaw, Wilfrid G.; and Applequist, Michael D., to Standard Oil Company, The. Process for the preparation of unsaturated acids from unsaturated aldehydes. 4,075,123, Cl. 252-437.000.
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White, James F.: *See—*
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White, Rodney A.: *See—*
White, Eugene W.; Hanusiak, William M.; and White, Rodney A., 4,075,092, Cl. 210-22.00R.
Whiteley, Isaac C., to W-A Red Hot, Inc. Forced air circulation heating unit for fireplaces. 4,074,681, Cl. 126-164.000.
Wickersheim, Kenneth A., to Alves, Ronald, a part interest. Optical temperature measurement technique utilizing phosphors. 4,075,493, Cl. 250-461.00R.
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Magiera, David L., 4,074,906, Cl. 273-243.000.
Widl, Walter Herbert Erwin: *See—*
Mattsson, Orjan Mats; and Widl, Walter Herbert Erwin, 4,075,427, Cl. 179-15.0BC.
Wiegand, Walter J., Jr.: *See—*
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Wieland, Erich Georg: *See—*
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Wiesen, Ernest J.: *See—*
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Wiesenfeld, Arnold: *See—*
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Wiggers, Johannes Bernardus Maria: *See—*
Budde, Antonius Wilhelmus Hermanus; and Wiggers, Johannes Bernardus Maria, 4,074,953, Cl. 416-183.000.
Wight, James S.; Chudobiak, Walter J.; and Makios, Vassilios, to Canadian Patents and Development Limited. Electronic phase comparison apparatus for the remote measurement of layer thickness. 4,075,555, Cl. 324-58.50R.
Wilhelm, Max; Eichenberger, Kurt; Schroter, Herbert; and Ostermayer, Franz, to Ciba-Geigy Corporation. 1-Substituted-4-(2-oxo-hexahydro-1-pyrimidinyl)-piperidine. 4,075,208, Cl. 260-256.40C.
Wilhelm, Max; Eichenberger, Kurt; Schroter, Herbert; and Ostermayer, Franz, to Ciba-Geigy Corporation. Pharmaceutical piperidine derivatives. 4,075,335, Cl. 424-244.000.
Wilkens, Kenneth A. Wire cutting, stripping and twisting tool. 4,074,732, Cl. 140-120.000.
Wilkens, Richard W., to E-Systems, Inc. Self-memorizing data bus system for random access data transfer. 4,075,606, Cl. 340-147.00B.
Wilkerson, Edward D. Atom demonstrator. 4,074,443, Cl. 35-18.00A.
Wilkinson, Robert M., to Alton Box Board Company. Flexibility enhancing coating for boxboard, particularly of carton joints and fold lines, and method of application. 4,075,372, Cl. 427-258.000.
Wilkinson, Samuel: *See—*
Beddell, Christopher Raymond; Lowe, Lawrence Alfred; and Wilkinson, Samuel, 4,075,191, Cl. 260-112.5LH.
Willard, David A.; and Thomas, Raymond W. Ring removing wrench. 4,074,411, Cl. 29-267.000.
Willard, Goodman B.: *See—*
Guild, Charles L.; and Willard, Goodman B., 4,074,539, Cl. 61-53.720.
Willas, Raymond Zeno. Air filter. 4,074,985, Cl. 55-498.000.
Willdorf, Michael E., to Material Distributors Corporation. Security film for shatterproofing windows. 4,075,386, Cl. 428-216.000.
Wm. A. Nickerson & Co., Ltd.: *See—*
Keller, James R.; and Nickerson, William A., 4,074,498, Cl. 52-690.000.
William H. Rorer, Inc.: *See—*
Diamond, Julius, 4,075,354, Cl. 424-356.000.
Williams, David; Lentz, Brian A.; and Le Veque, Harold E., to Union Carbide Corporation. Greenhouse watering apparatus. 4,074,856, Cl. 239-1.000.
Williams, E. Elaine, to Raymond Lee Organization, Inc., The. Pedicure treatment unit. 4,075,457, Cl. 219-218.000.
Williams, Thomas Walter: *See—*
Eichelberger, Edward Baxter; Muehldorf, Eugen Igor; Walther, Ronald Gene; and Williams, Thomas Walter, 4,074,851, Cl. 235-302.000.
Williams, William O., Jr. Fishing lure. 4,074,455, Cl. 43-42.060.
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Willis, Barry G.: *See—*
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Wilmer, Michael E., to Xerox Corporation. Programmed device controller. 4,075,707, Cl. 364-900.000.
Wilson, Charles A.; and Mixan, Craig E., to Dow Chemical Company, The. (1,3)Dithiolo-(4,5-b)thiazolo(4',5'-e)pyrazin-2-ylidene-propanedinitriles. 4,075,204, Cl. 260-250.0BC.
Wilson, Charles A.; and Mixan, Craig E., to Dow Chemical Company, The. (1,3-Dithiolo-(4,5-b) (1,2,5)thiadiazolo(3',4'-e)pyrazin-6-ylidene)-propanedinitrile. 4,075,205, Cl. 260-250.0BC.
Wilson, David T.: *See—*
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Wilson, Kermit H. Elevationally adjustable folding stage. 4,074,636, Cl. 108-113.000.
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Windish, Willis E.: *See—*
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Winston, George. Cable-reinforced safety barrier. 4,075,473, Cl. 256-13.100.
Winters, Alden Bernard: *See—*
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Wireman, Wallace H. Alarm circuit for monitoring removal of plug from electrical power receptacle. 4,075,617, Cl. 340-280.000.
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Witco Chemical Corporation: *See—*
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Witt, Alvin E.: *See—*
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Wolber, Jorg, to U.S. Philips Corporation. Circuit arrangement for transmitting an alternating current oscillation having direct current components which can be changed abruptly. 4,075,570, Cl. 328-262.000.
Wolfangel, Robert G.; and Anderson, Howard A., to Mallinckrodt, Inc. Stannous pyrophosphate technetium-99m compositions. 4,075,314, Cl. 424-1.000.
Wolfe, Bruce Allen: *See—*
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Wolff, Robert. Milling gauge. 4,074,736, Cl. 144-78.000.
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Wong, Jacob Y.: *See—*
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Wood, Thomas E.; and Wood, Calvin T. Internal frame backpack. 4,074,839, Cl. 224-8.00R.
Wood, William A., to Minnesota Mining and Manufacturing Company. Method of preparing retroreflective sheeting. 4,075,049, Cl. 156-220.000.
Woodrow, Harold E., to Morgan Construction Company. Laying pipe. 4,074,553, Cl. 72-66.000.
Woodward, Roger P., to GW Electronics, Inc. Apparatus and method for testing electrical surge arresters. 4,075,549, Cl. 324-28.00R.
Woolf, Cyril, deceased (by Woolf, Helga, executrix); Mares, Frank; and Oxenrider, Bryce C., to Allied Chemical Corporation. Fluorocarbon modification of fibers. 4,075,410, Cl. 560-87.000.
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Wright, A. Francis. Prophylactic article. 4,074,712, Cl. 128-79.000.
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Wright, Howard O., to Rockwell International Corporation. Digital method and apparatus for dynamically generating an output pulse train having a desired duty cycle from an input pulse train. 4,075,569, Cl. 328-58.000.
Wroblewski, Theodore, to Frequency Technology, Inc. Voltage regulating transformer. 4,075,547, Cl. 323-60.000.
Wu, Paul S.; and Reago, Robert V., to Litton Business Systems, Inc. UPC symbol decoding system. 4,075,461, Cl. 235-466.000.
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Wust, Toni, to Meyer, Roth & Pastor Maschinenfabrik GmbH. Butt welding apparatus. 4,075,451, Cl. 219-51.000.
Xavier, Octavio Marques. Dispensing device. 4,074,944, Cl. 401-182.000.
Xerox Corporation: *See—*
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Berger, Michael A., 4,074,798, Cl. 197-53.000.
Murphy, Richard J., 4,075,390, Cl. 428-307.000.
Turner, Sam R.; and Stolka, Milan, 4,075,012, Cl. 96-1.0PC.
Wilmer, Michael E., 4,075,707, Cl. 364-900.000.
Xonics, Inc.: *See—*
Young, Robert A., 4,075,505, Cl. 307-88.300.
Xylander, Kurt. Water treatment apparatus. 4,075,076, Cl. 204-206.000.
Yabe, Akira, to Agency of Industrial Science & Technology. Method for preparing benzo[C]cinnoline and its derivatives. 4,075,074, Cl. 204-158.00R.
Yagi, Hideaki; and Hishiki, Tetsuo, to NGK Spark Plug Co. Ltd. Switch with electroluminescent indicator. 4,075,449, Cl. 200-315.000.
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Yamazaki, Masahiko. Filtering device. 4,075,106, Cl. 210-487.000.
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Yamura Shinko Seisakusho Co., Ltd.: *See—*
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Yanagimoto, Samon; Aoyagi, Koshiro; Mizunuma, Susumu; and Nambu, Kouki, to Nippon Steel Corporation. Metal extrusion process with high reduction. 4,074,557, Cl. 72-206.000.
Yara Engineering Corporation: *See—*
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Yarwood, John C.; Dore, James E.; and Preuss, Robert K., to Swiss Aluminium Ltd. Method of preparation of ceramic foam. 4,075,303, Cl. 264-44.000.
Yates, Brian, to UOP Inc. Height adjustment mechanism for a vehicle seat. 4,074,886, Cl. 248-394.000.
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Yee, Li Sze, to Kwoon Kwen Metal Ware Company Limited. Lock mechanism. 4,074,549, Cl. 70-7.000.
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Yoshida Kogyo Kabushiki Kaisha: *See*—
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Young, Bill M., to Halliburton Company. Oil well consolidation treating. 4,074,536, Cl. 61-36.00C.
Young, Dean Arthur, to Union Oil Company of California. Process for treating arsenic-containing hydrocarbon feedstocks. 4,075,085, Cl. 208-253.000.
Young, Robert A., to Xonics, Inc. Molecular emission lamp. 4,075,505, Cl. 307-88.300.
Yunoki, Hideki: *See*—
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Yurramendi Eguizabal, Jose Miguel. Device for automatically supplying drinks and foodstuffs. 4,075,463, Cl. 235-92.0AC.
Yuter, Seymour C. Restaurant dining system. 4,074,793, Cl. 186-1.00R.
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Zabler, Erich, to Robert Bosch GmbH. Inductive displacement sensor. 4,075,551, Cl. 324-208.000.
Zagata, Robert J.; and Milberger, Ernest C., to Standard Oil Company, The. Preparation of maleic anhydride from n-butene in a one-reactor, fluid-bed system using two different catalysts. 4,075,232, Cl. 260-346.750.
Zak, Thomas Stephen, to Atlantic Richfield Company. Preparation of methyl ethyl ketone. 4,075,128, Cl. 252-475.000.
Zalay, Andrew W.: *See*—
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Zanoni, Carl A., to Zygo Corporation. Optical measuring device. 4,074,937, Cl. 356-109.000.
Zatmann, Jean, to PPG Industries, Inc. Water-based coating compositions. 4,075,148, Cl. 260-23.0EP.
Zaugg, Alonzo N.; and Ellis, Richard W. Portable hanging scaffold. 4,074,792, Cl. 182-150.000.
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Blass, Symcha; and Blass, Ishajahu, to Blass, Ishajahu. Drip level irrigation. Re. 29,546, Cl. 285-14.000.
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Fitch, John C., to Energy Absorption Systems, Inc. Energy absorbing deceleration barriers. Re. 29,544, Cl. 256-13.100.
Glaser, William Frank, to Otis Elevator Company. Elevator control system. Re. 29,543, Cl. 187-29.00R.
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Payne, Dana C.; and Chandler, Jack L., to Superior Products Company, Inc. Joint sealant composition. Re. 29,548, Cl. 260-28.5AS.
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Russell, Duane K., to Western Gear Corporation. Hydraulic drilling rig and power swivel. Re. 29,541, Cl. 175-52.000.
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Grodin, Adam J., to American Cyanamid Company. Bottle or similar article. 247,280, 2-21-78, Cl. D9-71.000.
Grodin, Adam J., to American Cyanamid Company. Bottle or similar article. 247,281, 2-21-78, Cl. D9-71.000.
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111 4,074,979
197 R 4,074,980
4,074,981

CLASS 49

192 4,074,462
352 4,074,463
468 4,074,464
491 4,074,465

CLASS 51

92 R 4,074,982
163.1 4,074,466
165.92 4,074,467
178 4,074,468
217 L 4,074,469
238 S 4,074,470
295 4,074,471
313 4,074,472

CLASS 52

1 4,074,473
2 4,074,474
70 4,074,475
79.2 4,074,476
86 4,074,477
98 4,074,478
102 4,074,479
127 4,074,480
169.8 4,074,481
171 4,074,482
202 4,074,483
214 4,074,484
224 4,074,485
235 4,074,486
236.3 4,074,487
263 4,074,488
272 4,074,489
312 4,074,490
394 4,074,491
419 4,074,492
583 4,074,493
606 4,074,494
613 4,074,495
622 4,074,496
648 4,074,497
690 4,074,498
705 4,074,499
726 4,074,500
741 4,074,501
4,074,502
749 4,074,503

CLASS 53

22 A 4,074,504
28 4,074,505
59 R 4,074,506
59 W 4,074,507
62 4,074,508
122 4,074,509

CLASS 55

118 4,074,983
163 4,074,984
498 4,074,985
502 4,074,986

CLASS 56

233 4,074,510

CLASS 57

34 AT 4,074,511
140 BY 4,074,512

CLASS 58

4 A 4,074,513
23 AC 4,074,514
23 BA 4,074,515
38 R 4,074,516
140 R 4,074,517

CLASS 59

15 4,074,518
95 4,074,519

CLASS 60

39.28 R 4,074,521
39.32 4,074,520
39.61 4,074,522
266 4,074,523
282 4,074,524
322 4,074,525
325 4,074,526
4,074,527
422 4,074,528
445 4,074,529
518 4,074,530
547 4,074,531
562 4,074,532
620 4,074,533
675 4,074,534

CLASS 61

2 4,074,535
36 C 4,074,536
47 4,074,538
48 4,074,537
53.72 4,074,539
69 R 4,074,540
110 4,074,541

CLASS 62

128 4,074,987

CLASS 64

30 R 4,074,542

CLASS 65

3 C 4,074,988
27 4,074,989
4,074,990
4,074,991
30 E 4,074,992
4,074,993
44 4,074,994
104 4,074,995
106 4,074,996

CLASS 66

193 4,074,543

CLASS 68

5 E 4,074,544
12 R 4,074,545
205 R 4,074,546

CLASS 70

1.5 4,074,547
4,074,548
7 4,074,549
237 4,074,550
364 R 4,074,551
417 4,074,552

CLASS 71

24 4,074,997
66 4,074,998
67 4,074,999
88 4,075,000
90 4,075,001
91 4,075,004
92 4,075,002
4,075,003
94 4,075,005
100 4,075,006
118 4,075,007

CLASS 72

66 4,074,553
114 4,074,554
128 4,074,555
196 4,074,556
206 4,074,557
239 4,074,558
354 4,074,559
393 4,074,360

CLASS 73

15.6 4,074,569
17 R 4,074,561
32 A 4,074,562
35 4,074,563
88.5 R 4,074,565
116 4,074,566
147 4,074,567
4,074,568
182 4,074,570
194 B 4,074,571
194 F 4,074,572
205 R 4,074,573
344 4,074,575
421 B 4,074,577
425.4 R 4,074,578
507 4,074,579
596 4,074,564
702 4,074,576

CLASS 74

5.6 D 4,074,580
15.66 4,074,581
230.24 4,074,582
335 4,074,574
413 4,074,583
421 A 4,074,584
424.8 C 4,074,586
424.8 R 4,074,585
4,074,587
522 4,074,588
604 4,074,589
606 A 4,074,590
674 4,074,591
740 4,074,592

CLASS 75

86 4,075,008
170 4,075,009
235 4,075,010

CLASS 76

37 4,074,593
101 A 4,074,594
107 C 4,074,595

CLASS 81

9.51 4,074,596
417 4,074,597

CLASS 82

20 4,074,598

CLASS 83

346 4,074,599
411 R 4,074,600
425.2 4,074,601
471.2 4,074,602
596 4,074,603
830 4,074,604

CLASS 84

1.22 4,074,605
293 4,074,606
471 SR 4,074,607

CLASS 85

71 4,074,608
77 4,074,609

CLASS 89

34 4,074,610

CLASS 91

179 4,074,611
290 4,074,612
413 4,074,613
490 4,074,614
4,074,615

CLASS 92

222 4,074,616
228 4,074,617

CLASS 93

49 M 4,074,618
55.1 R 4,074,619

CLASS 96

1 PC 4,075,012
1 R 4,075,011
1.5 R 4,075,013
22 4,075,014
35.1 4,075,015
39 4,075,018
48 HD 4,075,017
48 PD 4,075,016
88 4,075,019
94 R 4,075,020
95 4,075,021
100 R 4,075,022
114 4,075,023

CLASS 98

36 4,074,620

CLASS 99

286 4,074,621
456 4,074,622

CLASS 100

3 4,074,623
35 4,074,624

CLASS 101

128.1 4,074,625
221 4,074,626
425 4,074,627

CLASS 102

6 4,074,628
23 4,074,629
24 R 4,074,630

CLASS 104

12 4,074,631
130 4,074,632

CLASS 105

368 B 4,074,633
493 4,074,634

CLASS 106

53 4,075,024
54 4,075,025
97 4,075,026
99 4,075,027
186 4,075,028
288 B 4,075,029
4,075,030
300 4,075,031
303 4,075,032

CLASS 108

27 4,074,635
113 4,074,636

CLASS 109

38 4,074,637

CLASS 110

8 R 4,074,638

CLASS 111

6 4,074,639

CLASS 112

121.11 4,074,640
158 D 4,074,641
158 E 4,074,642
181 4,074,643
215 4,074,644
229 4,074,645

CLASS 114

39 4,074,646
102 4,074,647
144 RE 4,074,648
219 4,074,649
221 A 4,074,650
255 4,074,651

CLASS 115

35 4,074,652

CLASS 116

22 A 4,074,653

CLASS 118

73 4,074,654
410 4,074,655
502 4,074,656

CLASS 119

29 4,074,657
82 4,074,658
159 4,074,659

CLASS 122

32 4,074,660

CLASS 123

3 4,074,661
41.12 4,074,662
4,074,663
75 B 4,074,664
102 4,074,665
119 E 4,074,670
134 4,074,666
139 AF 4,074,668
139 AQ 4,074,667
148 CC 4,074,669
191 A 4,074,671
198 A 4,074,673
198 DC 4,074,672

CLASS 126

41 A 4,074,674

CLASS 126

41 R 4,074,675
121 4,074,679
132 4,074,676
142 4,074,680
164 4,074,681
198 4,074,677
270 4,074,704
271 4,074,678
4,074,705
4,074,706
343.5 A 4,074,707
360 A 4,074,708

CLASS 128
2 A 4,074,709
2.05 A 4,074,711
2.05 P 4,074,710
79 4,074,712
92 C 4,074,713
218 P 4,074,714
4,074,715
287 4,074,716
303.1 4,074,717
4,074,719
303.14 4,074,718
419 PG 4,074,720
461 4,074,721

CLASS 131
8 R 4,074,722
198 R 4,074,723
267 4,074,724

CLASS 134
6 4,075,033

CLASS 135
4 R 4,074,682
67 4,074,683

CLASS 136
89 PC 4,075,034
210 4,075,035
225 4,075,036

CLASS 137
1 4,074,684
101.11 4,074,685
247.19 4,074,686
266 4,074,687
269 4,074,688
270 4,074,689
344 4,074,690
382 4,074,691
454.6 4,074,693
488 4,074,692
505.41 4,074,694
508 4,074,695
553 4,074,696
606 4,074,697
614.06 4,074,698
625.27 4,074,700
625.64 4,074,699
625.66 4,074,701
4,074,702
798 4,074,703

CLASS 139
1 R 4,074,725
29 4,074,726
435 4,074,727
4,074,728
430 4,074,729
452 4,074,730

CLASS 140
112 4,074,731
120 4,074,732

CLASS 141
32 4,074,733
44 4,074,734
311 R 4,074,735

CLASS 144
78 4,074,736
117 R 4,074,737
208 E 4,074,738

CLASS 148
1.5 4,075,037
4,075,038
4,075,039
6.14 R 4,075,040
12.4 4,075,041
32 Re.29,547
103 4,075,042
171 4,075,043
175 4,075,044
187 4,075,045

CLASS 150
1.5 B 4,074,739
35 4,074,740

CLASS 152
237 4,074,741
330 A 4,074,742
355 4,074,743

CLASS 156
73.1 4,075,046
96 4,075,047
136 4,075,048
220 4,075,049
229 4,075,050
236 4,075,051
384 4,075,052
391 4,075,053
414 4,075,054
608 4,075,055

CLASS 162
305 4,075,056

CLASS 164
187 4,074,744
292 4,074,748
326 4,074,749
442 4,074,746
443 4,074,747
446 4,074,745

CLASS 165
89 4,074,750
92 4,074,751
96 4,074,752
184 4,074,753

CLASS 166
245 4,074,754
249 4,074,758
252 4,074,755
253 4,074,756
261 4,074,757
273 4,074,759
276 4,074,760
315 4,074,761
4,074,762
325 4,074,763

CLASS 172
42 4,074,764
59 4,074,765
311 4,074,766
781 4,074,767
796 4,074,768
804 4,074,769
4,074,770

CLASS 173
6 4,074,771
12 4,074,772
23 4,074,773
44 4,074,774
79 4,074,775
137 4,074,776
138 4,074,777

CLASS 174
50.52 4,075,415
68.5 4,075,416
84 C 4,075,417
107 4,075,419
117 F 4,075,420
120 SC 4,075,421

CLASS 175
52 Re.29,541
91 4,074,778
314 4,074,779
392 4,074,780

CLASS 176
21 4,075,058
22 4,075,059
37 4,075,060
39 4,075,057

CLASS 177
212 4,074,781

CLASS 178
23 R 4,075,422
46 Re.29,549

CLASS 179
1 GQ 4,075,425
1 H 4,075,426
1 SC 4,075,423
1 SG 4,075,424
15 BC 4,075,427
15 BM 4,075,429
15 BS 4,075,428
18 FC 4,075,432
18 GE 4,075,433
18 GF 4,075,431
18 J 4,075,430
99 4,075,434
100.1 DR 4,075,436
100.1 VC 4,075,435
100.41 K 4,075,418
114 R 4,075,437
146 H 4,075,438
175 4,075,439

CLASS 180
6.48 4,074,782
14 R 4,074,783
24 4,074,784
68.5 4,074,785
4,074,786
82 B 4,074,787
89.12 4,074,788

CLASS 182
37 4,074,789
63 4,074,790
138 4,074,791
150 4,074,792

CLASS 186
1 R 4,074,793

CLASS 187
18 Re.29,542
29 A 4,074,794
29 R Re.29,543

CLASS 188
73.3 4,074,795

CLASS 192
3.57 4,074,796

CLASS 195
29 4,075,061
103.5 R 4,075,062

CLASS 197
1 R 4,074,797
53 4,074,798
151 4,074,799
168 4,074,800

CLASS 198
304 4,074,801
315 4,074,802
670 4,074,803
735 4,074,804
790 4,074,805

CLASS 200
16 D 4,075,441
16 F 4,075,442
51.09 4,075,444
61.18 4,075,445
85 A 4,075,443
144 R 4,075,446
148 A 4,075,447
262 4,075,448
315 4,075,449

CLASS 202
234 4,075,063

CLASS 204
18 R 4,075,064
43 G 4,075,065
55 R 4,075,066
67 4,075,067
93 4,075,068
106 4,075,069
129 4,075,070
136 4,075,071
157.1 R 4,075,072
158 R 4,075,073
4,075,074
159.17 4,075,075
206 4,075,076
269 4,075,077

CLASS 206
531 4,074,806
546 4,075,078

CLASS 208
8 4,075,079
4,075,080
10 4,075,082
11 R 4,075,081
4,075,083
93 4,075,084
253 4,075,085

CLASS 209
73 4,074,807
4,074,808
4,075,086
75 4,074,809
99 4,075,087
106 4,075,088
169 4,075,089
173 4,075,090

CLASS 210
19 4,075,091
22 R 4,075,092
23 H 4,075,093
62 4,075,094
82 4,075,095
96 R 4,075,096
168 4,075,097
4,075,098
4,075,099
266 4,075,100
275 4,075,101
277 4,075,102
331 4,075,103
402 4,075,104
477 4,075,105
487 4,075,106
493 R 4,075,107
500 M 4,075,108
527 4,075,109

CLASS 211
11 4,074,810
191 4,074,811
192 4,074,812

CLASS 213
24 4,074,813

CLASS 214
1 BB 4,074,814
1 QG 4,074,815
2 4,074,816
13 4,074,817
4,074,818
83.1 4,074,819
138 R 4,074,820
4,074,821
152 4,074,822
4,074,823

CLASS 215
365 4,074,824

CLASS 219
10.71 4,075,450
51 4,075,451
121 EM 4,075,452
125.1 4,075,453
137 R 4,075,454
216 4,075,455
4,075,456
218 4,075,457
225 4,075,458
375 4,075,459

CLASS 220
4 R 4,074,825
6 4,074,826
23 4,074,827
254 4,074,828

CLASS 221
238 4,074,829
266 4,074,830

CLASS 222
43 4,074,831
245 4,074,832
390 4,074,833
504 4,074,834
558 4,074,835
564 4,074,836
629 4,074,837

CLASS 223
85 4,074,838

CLASS 224
8 R 4,074,839

CLASS 225
96.5 4,074,840

CLASS 226
97 4,074,841

CLASS 227
8 4,074,842
4,074,843
4,074,844
10 4,074,845
51 4,074,846

CLASS 228
145 4,074,847
173 C 4,074,848

CLASS 229
1.5 B 4,074,849

CLASS 235
89 R 4,074,850
92 AC 4,075,463
92 EV 4,075,464
92 PC 4,075,462
145 R 4,075,465
302 4,074,851
302.3 4,075,466
420 4,075,460
463 4,074,852
466 4,075,461
477 4,074,853

CLASS 236
11 4,074,854
87 4,074,855

CLASS 238
349 4,074,860

CLASS 239
1 4,074,856
119 4,074,857
172 4,074,858
265.33 4,074,859
492 4,074,861
515 4,074,862
589 4,074,863

CLASS 241
23 4,074,864
24 4,074,865
30 4,074,866
4,074,867
46 R 4,074,868
55 4,074,869

CLASS 242
1 4,074,870
42 4,074,871
55.54 4,074,872
75.43 4,074,873
77.1 4,074,874
118.3 4,074,875
199 4,074,876

CLASS 244
155 R 4,074,877
183 4,074,878

CLASS 246
37 4,074,879

CLASS 248
1 4,074,880
188.7 4,074,881
208 4,074,882
286 4,074,883
289 R 4,074,884
317 4,074,885
394 4,074,886
404 4,074,887
475 R 4,074,888

CLASS 250
199 4,075,474
227 4,075,477
231 SE 4,075,478
281 4,075,479
282 4,075,475
328 4,075,480
343 4,075,481
363 S 4,075,482
4,075,483
366 4,075,484
369 4,075,485
374 4,075,486
385 4,075,487
396 R 4,075,488
401 4,075,489
445 T 4,075,490
4,075,491
4,075,492
461 R 4,075,493
479 4,075,494
483 4,075,495
492 B 4,075,496
505 4,075,497
562 4,075,498
574 4,075,499

CLASS 251
298 4,074,889

CLASS 252
8.8 4,075,110
12 4,075,111
35 4,075,112
4,075,113
62 4,075,114
75 4,075,115
102 4,075,116
135 4,075,117
4,075,118
182 4,075,119
301.4 P 4,075,120
407 4,075,121
437 4,075,122
4,075,123
4,075,124
455 R 4,075,125
4,075,126
470 4,075,127
475 4,075,128
527 4,075,129
542 4,075,131
548 4,075,130

CLASS 254
29 A 4,074,890
150 FH 4,074,891
188 4,074,892

CLASS 256
13.1 Re.29,544
4,075,473
21 4,074,893

CLASS 260
2 R 4,075,136
2.5 AT 4,075,137
2.5 B 4,075,138
2.5 F 4,075,139
5 4,075,140
17 R 4,075,142
17.2 4,075,141
4,075,143
22 M 4,075,145
22 R 4,075,144
23 EP 4,075,148
23 H 4,075,146
4,075,147
28.5 AS Re.29,548
29.3 4,075,133
29.4 R 4,075,149
29.6 RW 4,075,134
29.7 DP 4,075,135
30.6 R 4,075,150
33.2 R 4,075,151
37 EP 4,075,153
37 N 4,075,152
37 SB 4,075,154
38 4,075,155
42.17 4,075,158
42.47 4,075,156
4,075,157
4,075,159
4,075,160
45.7 P 4,075,163
45.7 S 4,075,164
45.8 A 4,075,161
45.8 N 4,075,165
45.8 NZ 4,075,162
45.95 H 4,075,166
46.5 E 4,075,167
46.5 G 4,075,170
46.5 R 4,075,168
4,075,169
47 C 4,075,173
47 CP 4,075,171
47 CZ 4,075,172
47 ET 4,075,174
67 R 4,075,175
67.6 R 4,075,176
75 N 4,075,179
75 R 4,075,180
75 T 4,075,177
4,075,178
77.5 B 4,075,181
78 P 4,075,182
79.3 M 4,075,185
79.3 MU 4,075,183
79.3 R 4,075,184
97.7 4,075,188
112 B 4,075,193
112.5 LH 4,075,191
4,075,192
112.5 R 4,075,189
4,075,190
4,075,194
119 4,075,195
120 4,075,196
122 4,075,197
161 4,075,198
192 4,075,199
206 4,075,200
239 A 4,075,201
239.3 T 4,075,202
250 BC 4,075,204
4,075,205
4,075,206
4,075,207
256.4 C 4,075,208
256.4 F 4,075,210
256.4 N 4,075,209
270 H 4,075,211
285 4,075,132
285.5 4,075,212
4,075,213
287 B 4,075,214
294.8 C 4,075,215
4,075,216
296 R 4,075,217
305 4,075,218
306.7 C 4,075,219
308 B 4,075,220
308 R 4,075,221
326.14 R 4,075,224
326.31 4,075,225
326.5 C 4,075,223
327 TH 4,075,226
330.5 4,075,227
332.3 P 4,075,228
340 4,075,229
345.3 4,075,230
346.4 4,075,231
346.75 4,075,232
397.3 4,075,233
417 4,075,234
453 RW 4,075,235
453 RZ 4,075,236
455 R 4,075,237
458 C 4,075,238
464 4,075,239
471 R 4,075,240
502.5 4,075,243
530 N 4,075,244
561 HL 4,075,245
584 C 4,075,246
590 C 4,075,247
600 R 4,075,248
613 D 4,075,249
621 C 4,075,250

638 B 4,075,251
649 F 4,075,252
665 R 4,075,253
667 4,075,254
672 R 4,075,255
680 E 4,075,256
680 R 4,075,257
683.44 4,075,258
683.68 4,075,259
830 TW 4,075,260
850 4,075,261
860 4,075,262
873 4,075,263
876 B 4,075,285
877 4,075,286
878 B 4,075,287
879 4,075,288
887 4,075,186
890 4,075,289
897 A 4,075,290
933 4,075,291
986 4,075,292

CLASS 261
20 4,075,293
34 A 4,075,294
36 R 4,075,295
41 D 4,075,296
104 4,075,297
114 TC 4,075,298

CLASS 264
25 4,075,299
32 4,075,300
40.7 4,075,301
44 4,075,303
46.5 4,075,264
4,075,304
53 4,075,265
89 4,075,187
92 4,075,266
94 4,075,267
138 4,075,268
184 4,075,269
209 4,075,270
210 F 4,075,271
249 4,075,272
250 4,075,273
290 T 4,075,274
313 4,075,275
332 4,075,276

CLASS 266
50 4,074,895

CLASS 267
71 Re.29,545
139 4,074,896

CLASS 269
43 4,074,897
4,075,302
228 4,074,898
249 4,074,899
254 R 4,074,900

CLASS 270
79 4,074,901

CLASS 271
34 4,074,902

CLASS 272
16 4,074,903
116 4,074,904

CLASS 273
26 D 4,074,905
243 4,074,906
282 4,074,907

CLASS 277
44 4,074,908

CLASS 280
11.12 4,074,909
289 R 4,074,910

CLASS 283
6 4,074,911

CLASS 285
14 Re.29,546
39 4,074,912
114 4,074,913
405 4,074,914

CLASS 290
55 4,075,500

CLASS 292
262 4,074,915
307 R 4,074,916

CLASS 294
7 4,074,917

CLASS 297
192 4,074,918
233 4,074,919

CLASS 299
18 4,074,920

CLASS 302
39 4,074,921

CLASS 307
41 4,075,501
64 4,075,502
66 4,075,503
4,075,504
88.3 4,075,505
117 4,075,506
4,075,507
213 4,075,508
251 4,075,509
252 B 4,075,510
270 4,075,511
311 4,075,512
350 4,075,513
355 4,075,514
362 4,075,515

CLASS 308
8.2 4,074,922
236 4,074,923

CLASS 310
13 4,075,517
49 R 4,075,518
67 R 4,075,519
168 4,075,520
184 4,075,521
214 4,075,522
239 4,075,523
249 4,075,524
329 4,075,525
334 4,075,516

CLASS 313
56 4,075,526
93 4,075,527
134 4,075,528
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229 4,075,530
325 4,075,531
422 4,075,535
497 4,075,532

CLASS 315
31 R 4,075,533
39.71 4,075,534
209 R 4,075,476
241 P 4,075,536
354 4,075,537

CLASS 318
52 4,075,538
135 4,075,539
138 4,075,540
139 4,075,541
161 4,075,542
224 R 4,075,543
696 4,075,544

CLASS 320
61 4,075,545

CLASS 323
22 T 4,075,546
60 4,075,547
86 4,075,548

CLASS 324
0.5 AH 4,075,552
28 R 4,075,549
33 4,075,550
58 B 4,075,554
58.5 R 4,075,555
60 C 4,075,556
62 4,075,557
99 R 4,075,558
115 4,075,559
131 4,075,560
149 4,075,561
173 4,075,562
208 4,075,551
233 4,075,553
236 4,075,563

CLASS 325
55 4,075,564
138 4,075,565
369 4,075,566
453 4,075,567

CLASS 328
1 4,075,568
58 4,075,569
262 4,075,570

CLASS 329
104 4,075,571

CLASS 330
10 4,075,572
129 4,075,573
257 4,075,574
259 4,075,575
277 4,075,576

CLASS 331
17 4,075,577
56 4,075,578
94.5 G 4,075,579
96 4,075,580

CLASS 333
10 4,075,581
72 4,075,582
73 R 4,075,583

CLASS 335
20 4,075,584
78 4,075,585
79 4,075,586
112 4,075,587
207 4,075,588
286 4,075,589

CLASS 336
192 4,075,590
200 4,075,591

CLASS 337
139 4,075,592
312 4,075,593
348 4,075,594
407 4,075,595
408 4,075,596

CLASS 338
128 4,075,597

CLASS 339
20 4,074,924
44 R 4,074,925
60 R 4,074,926
89 M 4,074,927
91 R 4,074,928
97 R 4,074,929

CLASS 340
1 R 4,075,598
3 R 4,075,599
9 4,075,600
15 4,075,601
58 4,075,602
4,075,603
146.3 AC 4,075,605
146.3 AG 4,075,604
147 B 4,075,606
152 R 4,075,607
166 R 4,075,608
227.1 4,075,614
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276 4,075,616
280 4,075,617
4,075,618
324 AD 4,075,620
324 R 4,075,619
337 4,075,621
347 DD 4,075,622
347 NT 4,075,623
384 E 4,075,624
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388 4,075,626
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416 4,075,628
421 4,075,629

CLASS 343
5 DP 4,075,630
6.5 R 4,075,631
6.8 R 4,075,632
100 LE 4,075,633
742 4,075,634
844 4,075,635

CLASS 346
75 4,075,636
153 4,075,637

CLASS 350
33 4,074,930
184 4,074,931

CLASS 351
111 4,074,932

CLASS 353
27 R 4,074,933

CLASS 354
23 D 4,075,638
25 4,075,639
31 4,075,640
43 4,075,641
82 4,075,642
86 4,075,643
173 4,075,644
187 4,075,645
209 4,075,646
217 4,075,647
238 4,075,648

CLASS 355
14 4,074,934
46 4,074,935

CLASS 356
81 4,074,936
109 4,074,937
160 4,074,938
206 4,074,939
246 4,074,940

CLASS 357
13 4,075,649
15 4,075,650
22 4,075,651
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CLASS 358
13 4,075,655
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93 4,075,657
96 4,075,658
108 4,075,659
124 4,075,660
166 4,075,661
280 4,075,662
283 4,075,663
286 4,075,664

CLASS 360
8 4,075,665
11 4,075,666
77 4,075,667
80 4,075,668
85 4,075,670
92 4,075,669
113 4,075,671
135 4,075,672

CLASS 361
10 4,075,673
27 4,075,674
48 4,075,675
56 4,075,676
93 4,075,677
104 4,075,678
285 4,075,680
305 4,075,681
386 4,075,682
415 4,075,683

CLASS 362
31 4,075,467
72 4,075,469
144 4,075,468
255 4,075,472
287 4,075,470
300 4,075,471
352 4,075,684

CLASS 363
44 4,075,685

CLASS 364
200 4,075,679
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CLASS 365
2 4,075,611
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87 4,075,613
107 4,075,610
154 4,075,609
156 4,075,690
171 4,075,612

CLASS 366
7 4,074,894
25 4,075,710
26 4,075,711
79 4,075,712
192 4,075,713

CLASS 401
182 4,074,944

CLASS 403
174 4,074,943
197 4,074,945
260 4,074,941
364 4,074,946
406 4,074,947

CLASS 404
75 4,074,948
121 4,074,942

CLASS 407
114 4,074,949

CLASS 408
220 4,074,950

CLASS 415
2 4,074,951

CLASS 416
87 4,074,952
183 4,074,953

CLASS 417
218 4,074,955

CLASS 418
68 4,074,954
178 4,074,956
195 4,074,957

CLASS 423
55 4,075,277
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118 4,075,280
206 T 4,075,281
230 4,075,282
239 4,075,283
244 4,075,284
320 4,075,305
352 4,075,306
413 4,075,307
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497 4,075,309
574 R 4,075,310
636 4,075,311
648 A 4,075,312
658 4,075,313

CLASS 424
1 4,075,314
12 4,075,315
49 4,075,316
52 4,075,317
70 4,075,318
78 4,075,319
84 4,075,320
92 4,075,321
94 4,075,322
114 4,075,323
128 4,075,324
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180 4,075,328
195 4,075,329
200 4,075,330
203 4,075,331
216 4,075,332
237 4,075,333
238 4,075,334
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246 4,075,336
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250 4,075,339
256 4,075,340
258 4,075,341
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263 4,075,345
267 4,075,346
273 R 4,075,327
275 4,075,347
300 4,075,348
301 4,075,349
303 4,075,351
316 4,075,350
319 4,075,352
338 4,075,353
356 4,075,354

CLASS 425
71 4,074,958
81.1 4,074,959
89 4,074,960
112 4,074,961

CLASS 426
231 4,075,355
285 4,075,356
332 4,075,357
465 4,075,358
502 4,075,359
582 4,075,360
655 4,075,361

CLASS 427
22 4,075,362
27 4,075,363
34 4,075,364
36 4,075,365
44 4,075,366
94 4,075,367
185 4,075,369
216 4,075,370
224 4,075,371
258 4,075,372
327 4,075,373
355 4,075,374
390 R 4,075,375

CLASS 428
36 4,075,376
95 4,075,377
97 4,075,378
105 4,075,379
140 4,075,380
192 4,075,381
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198 4,075,383
212 4,075,384
215 4,075,385
216 4,075,386
288 4,075,387
297 4,075,388
306 4,075,389
307 4,075,390
407 4,075,391
457 4,075,392
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537 4,075,394
542 4,075,395

CLASS 429
17 4,075,396
50 4,075,397
56 4,075,398
57 4,075,399
62 4,075,400
89 4,075,401
98 4,075,402
161 4,075,368
253 4,075,403

CLASS 431
255 4,074,962

CLASS 432
250 4,074,963

CLASS 526
237 4,075,404

CLASS 536
1 4,075,405
4,075,406
88 4,075,279

CLASS 542
412 4,075,407

CLASS 544
18 4,075,203

CLASS 548
324 4,075,408
336 4,075,222

CLASS 560
36 4,075,409
73 4,075,241
87 4,075,410
190 4,075,242
224 4,075,411
244 4,075,412
4,075,413

CLASSIFICATION OF DESIGNS

D2—	230	247,266	D7—	9	247,277	D12—	57	247,288	D22—	13	247,299			247,310		5 J	247,321
	310	247,267		181	247,278		60	247,289			247,300		64	247,311		15 AE	247,323
	400	247,268	D8—	42	247,279		97	247,290		28	247,304			247,312		15 BB	247,322
D6—	63	247,269	D9—	71	247,280		154	247,291		31	247,301	D25—	80	247,314	D48—	24 A	247,324
	85	247,270			247,281		189	247,292	D23—	18	247,302		87	247,313	D64—	11A	247,325
	105	247,271			247,282	D13—	32	247,293		34	247,303	D27—	39	247,315	D87—	1 R	247,327
	130	247,272		157	247,283	D15—	123	247,294		127	247,305			247,316		5 F	247,326
	135	247,273	D10—	11	247,284	D16—	27	247,295		142	247,306	D28—	7	247,317	D88—	3 R	247,328
	172	247,274		50	247,285		31	247,296	D24—	3	247,307	D31—	1	247,318			247,329
	177	247,275	D11—	134	247,286		50	247,297		9	247,308	D34—	5 G	247,320	D96—	12 R	247,330
	184	247,276		155	247,287	D19—	76	247,298		56	247,309		5 GH	247,319			

CLASSIFICATION OF PLANTS

P.—	69	4,216		74	4,217												

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 :	4,074,685		4,074,751		4,075,509		4,074,844		4,074,814		4,075,144						
	4,074,868		4,074,811		4,075,513		4,074,923		4,075,356		4,075,147						
	4,075,512		4,074,819		4,075,514		4,074,928		4,075,436		4,075,153						
4 :	4,074,389		4,074,831		4,075,536		4,074,937		4,075,549		4,075,195						
	4,074,396		4,074,832		4,075,569		4,074,952	16 :	4,074,679		4,075,259						
	4,074,522		4,074,856		4,075,571		4,075,058		4,074,735		4,075,273						
	4,074,662		4,074,857		4,075,576		4,075,065		4,074,792		4,075,289						
	4,075,083		4,074,877		4,075,579		4,075,176	17 :	Re.29,542		4,075,302						
	4,075,508		4,074,881		4,075,583		4,075,303		Re.29,549		4,075,313						
	4,075,573		4,074,883		4,075,597		4,075,312		4,074,365		4,075,315						
	4,075,578		4,074,893		4,075,608		4,075,343		4,074,377		4,075,339						
	4,075,649		4,074,898		4,075,609		4,075,350		4,074,381		4,075,366						
	4,075,686		4,074,904		4,075,611		4,075,364		4,074,410		4,075,389						
5 :	4,074,454		4,074,907		4,075,621		4,075,435		4,074,424		4,075,407						
6 :	Re.29,548		4,074,908		4,075,622		4,075,542		4,074,434		4,075,430						
	Re.29,550		4,074,912		4,075,651		4,075,544		4,074,449		4,075,487						
	4,074,364		4,074,918		4,075,656		4,075,584		4,074,452		4,075,503						
	4,074,375		4,074,926		4,075,666	10 :	Re.29,547		4,074,486		4,075,504						
	4,074,380		4,074,927		4,075,667		4,074,649		4,074,561		4,075,510						
	4,074,385		4,074,932		4,075,668		4,074,919		4,074,581		4,075,531						
	4,074,397		4,074,944		4,075,684		4,075,031		4,074,592		4,075,562						
	4,074,403		4,074,946		4,075,688		4,075,051		4,074,613		4,075,581						
	4,074,406		4,074,981		4,075,691		4,075,150		4,074,614		4,075,625						
	4,074,407		4,074,986		4,075,702		4,075,175		4,074,615		4,075,627						
	4,074,408		4,075,043		4,075,703		4,075,201		4,074,616	18 :	4,074,578						
	4,074,411		4,075,073		4,075,707		4,075,262		4,074,665		4,074,591						
	4,074,420		4,075,084		4,075,708		4,075,378		4,074,674		4,074,594						
	4,074,447		4,075,085		4,075,709	12 :	4,074,379		4,074,690		4,074,675						
	4,074,473		4,075,087	8 :	Re.29,545		4,074,386		4,074,693		4,074,684						
	4,074,475		4,075,108		4,074,718		4,074,451		4,074,703		4,074,698						
	4,074,478		4,075,111		4,074,809		4,074,456		4,074,714		4,074,812						
	4,074,487		4,075,139		4,074,971		4,074,481		4,074,716		4,074,813						
	4,074,526		4,075,182		4,075,068		4,074,523		4,074,767		4,074,830						
	4,074,527		4,075,207		4,075,071		4,074,559		4,074,768		4,074,830						
	4,074,535		4,075,246		4,075,438		4,074,650		4,074,772		4,074,899						
	4,074,563		4,075,267		4,075,639		4,074,800		4,074,794		4,074,915						
	4,074,564		4,075,300		4,075,671		4,074,897		4,074,796		4,074,916						
	4,074,580		4,075,347		4,075,679		4,074,914		4,074,820		4,074,972						
	4,074,606		4,075,361		4,075,698		4,074,964		4,074,836		4,074,998						
	4,074,607		4,075,385	9 :	Re.29,544		4,075,257		4,074,846		4,075,000						
	4,074,608		4,075,420		4,074,366		4,075,304		4,074,848		4,075,003						
	4,074,628		4,075,434		4,074,382		4,075,353		4,074,853		4,075,164						
	4,074,653		4,075,444		4,074,427		4,075,417		4,074,896		4,075,171						
	4,074,672		4,075,462		4,074,446		4,075,439		4,074,902		4,075,179						
	4,074,694		4,075,464		4,074,512		4,075,473		4,074,911		4,075,203						
	4,074,710		4,075,478		4,074,572		4,075,550		4,074,942		4,075,206						
	4,074,711		4,075,479		4,074,574		4,075,600		4,074,985		4,075,212						
	4,074,723		4,075,480		4,074,588		4,075,606		4,075,033		4,075,213						
	4,074,726		4,075,481		4,074,671		4,075,676		4,075,054		4,075,214						
	4,074,731		4,075,491		4,074,682	13 :	4,074,511		4,075,056		4,075,218						
	4,074,734		4,075,492		4,074,706		4,074,619		4,075,086		4,075,219						
	4,074,739		4,075,493		4,074,713		4,074,705		4,075,099		4,075,223						
	4,074,742		4,075,505		4,074,758		4,074,791		4,075,133		4,075,227						

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28 : 4,074,652
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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

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PATENT AND TRADEMARK OFFICE NOTICES

Board of Appeals Decisions Rendered in the Month of January 1978

Affirmed	243
Affirmed in Part	39
Reversed	86
Total	368

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,454,081, Re. S.N. 862,218, Filed Dec. 19, 1977, Cl. 165/133, SURFACE FOR BOILING LIQUIDS, Leslie Charles Kun, et al., Owner of Record: *Union Carbide Corp., New York, N.Y.,* Attorney or Agent: James C. Arvantes, et al., Ex. Gp.: 342

3,856,873, Re. S.N. 861,814, Filed Dec. 19, 1977, Cl. 260/668 A, XYLENE ISOMERIZATION, George T. Burress, Owner of Record: *Mobil Oil Corporation, New York, N.Y.,* Attorney or Agent: Charles A. Huggett, et al., Ex. Gp.: 116

PATENT NOTICES

Certificates of Correction for the Week of Feb. 28, 1978

P.P. 4,101	4,034,291	4,048,947	4,055,292
Re. 29,446	4,035,365	4,049,485	4,055,424
3,777,166	4,035,753	4,049,674	4,055,509
3,807,407	4,036,150	4,049,772	4,055,523
3,813,996	4,036,162	4,049,821	4,055,680
3,827,800	4,036,261	4,049,894	4,055,804
3,893,056	4,037,315	4,049,896	4,055,917
3,953,370	4,038,359	4,050,198	4,055,989
3,954,273	4,038,483	4,050,443	4,056,114
3,958,384	4,039,422	4,050,472	4,056,160
3,969,571	4,039,669	4,050,635	4,056,296
3,973,188	4,039,734	4,050,899	4,056,340
3,987,623	4,039,740	4,050,995	4,056,465
3,988,883	4,039,961	4,051,214	4,056,506
3,997,539	4,040,507	4,051,766	4,056,905
3,998,763	4,040,863	4,051,801	4,057,176
3,999,128	4,040,940	4,052,220	4,057,354
3,999,653	4,041,512	4,052,284	4,057,563
4,002,678	4,042,090	4,052,320	4,057,801
4,006,146	4,042,404	4,052,325	4,058,328
4,006,369	4,043,165	4,052,899	4,058,463
4,009,168	4,043,584	4,052,900	4,058,569
4,011,227	4,044,200	4,052,933	4,058,742
4,015,372	4,044,325	4,053,115	4,058,862
4,019,009	4,044,537	4,053,127	4,058,870
4,019,929	4,045,368	4,053,157	4,058,905
4,020,849	4,046,278	4,053,219	4,058,956
4,022,992	4,046,293	4,053,532	4,059,023
4,025,877	4,046,399	4,053,552	4,059,123
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4,027,660	4,047,982	4,054,408	4,060,111
4,027,731	4,048,319	4,054,461	4,061,298
4,028,385	4,048,656	4,054,713	4,061,368
4,028,933	4,048,666	4,054,751	4,062,308
4,029,760	4,048,761	4,054,869	
4,033,013	4,048,777	4,054,984	
4,033,930	4,048,808	4,055,273	

Disclaimer

Reissue No. 28,571.—*Kai Lange,* Copenhagen, Denmark. ATTENUATED LIGHT COUPLING BETWEEN SCINTILLATION AND PHOTOMULTIPLIER. Patent dated Oct. 14, 1975. Disclaimer filed Oct. 13, 1977, by the assignee, *General Electric Company.*

Hereby enters this disclaimer to claims 1 to 8, inclusive, of said patent.

Errata

All reference to Patent No. 4,066,612 to Anthony L. Lemper, Gilbert Witschard and Victor A. Pattison of the United States for POST BULK POLYMERIZATION PROCESS FOR POLYVINYL HALIDE AND COMPOSITION THEREOF appearing in the OFFICIAL GAZETTE of January 3, 1978 should be deleted since no patent was granted.

All reference to Patent No. 4,066,703 to Tsutomu Shintani, Azuhiro Ozeki, Haruo Kunihiro and Kosuke Shigehiro of Japan for METHOD FOR PRODUCING AROMATIC HYDROXIDE AND ALIPHATIC KETONE appearing in the OFFICIAL GAZETTE of January 3, 1978 should be deleted since no patent was granted.

All reference to Patent No. 4,070,725 to Henry Von Den Benken and Elisabeth Von Den Benken of Massachusetts for MACHINE TO WORK ON SHOE SOLES appearing in the OFFICIAL GAZETTE of January 31, 1978 should be deleted since no patent was granted.

All reference to Patent No. 4,071,117 to Elmer Chensheng Yang of the United States for MECHANICAL SHOCK ARRESTOR appearing in the OFFICIAL GAZETTE of January 31, 1978 should be deleted since no patent was granted.

All reference to Patent No. 4,071,485 to Walter L. Garrett and Ralph G. Czerepinski of the United States for FOUNTAIN SOLUTIONS AND FOUNTAIN CONCENTRATES FOR LITHOGRAPHIC PRINTING COMPRISING AQUEOUS SOLUTIONS OF POLYACRYLAMIDE BASED POLYMERS, AND BLEND OF POLYACRYLAMIDE AND POLYACRYLIC ACIDS appearing in the OFFICIAL GAZETTE of January 31, 1978 should be deleted since no patent was granted.

National Technical Information Service

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DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

NATIONAL BUREAU OF STANDARDS
Patent Advisor's Office, Room A–419, Admin. Bldg.
Washington, D.C. 20234

Patent application 774,094. Magnetic Resonance Detection Method and Apparatus. Filed Mar. 3, 1977.

Patent application 829,381. Six-Port Measuring Circuit. Filed Aug. 31, 1977.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

Patent application 767,233. Aluminum-Chlorine Thermal Battery. Filed Feb. 9, 1977.

Patent application 800,985. Diffraction Grating Coupled Optically Pumped Laser. Filed May 26, 1977.

Patent application 804,488. Separable Coupling for Plural Pressure Lines. Filed June 7, 1977.

Patent application 806,434. Clutch Protection Circuit. Filed June 14, 1977.

Patent application 806,437. Flared Sonic End Nozzle Velocity Coupling Test Burner. Filed June 14, 1977.

Patent application 817,641. Electronic Indirect Measuring System. Filed July 21, 1977.

Patent application 817,657. Hybrid Perfluoroalkylene Ether Thioimidate Ester Monomers. Filed July 21, 1977.

Patent application 823,556. Improved Method of Using Embedded Normal Stress Sensors in Propellant Grains. Filed Aug. 11, 1977.

Patent application 823,562. Liquid Nitrogen Level Controller. Filed Aug. 11, 1977.

Patent application 826,081. A Load Impedance Intrusion Detection System. Filed Aug. 19, 1977.

Patent application 826,082. Radar Intrusion Detection System. Filed Aug. 19, 1977.

Patent application 826,083. Multiband High Frequency Communication Antenna. Filed Aug. 19, 1977.

Patent application 826,084. Double Acting Locking-Unlocking Actuator. Filed Aug. 19, 1977.

Patent application 826,106. Method of Joining a Fine Wire Filament to a Connector. Filed Aug. 19, 1977.

Patent application 826,107. High Piezoelectric Coupling-Temperature Compensated Berlinite Substrate Member for Surface Acoustic Wave Devices. Filed Aug. 19, 1977.

Patent application 826,108. High Piezoelectric Coupling, Low Diffraction Loss, Temperature Compensated Berlinite Substrate Members for Surface Acoustic Wave Devices. Filed Aug. 19, 1977.

Patent application 826,221. Foil Moderated Radioactive Preionization System for Gas Lasers. Filed Aug. 19, 1977.

Patent application 826,226. Improved Durability Flap and Seal Liner Assembly for Exhaust Nozzles. Filed Aug. 19, 1977.

Patent 4,039,251. Tapered Crystal Modulator for Lasers. Filed Apr. 19, 1976. Patented Aug. 2, 1977. Not available NTIS.

Patent 4,043,147. Intershaft Balance Weight. Filed June 15, 1976. Patented Aug. 23, 1977. Not available NTIS.

Patent 4,043,377. Method for Casting Metal Alloys. Filed Aug. 20, 1976. Patented Aug. 23, 1977. Not available NTIS.

Patent 4,043,653. Holographic High Resolution Contact Printer. Filed Jan. 8, 1976. Patented Aug. 23, 1977. Not available NTIS.

Patent 4,044,316. Stabilized Cavity-Dumped Nd:YAG Laser. Filed Apr. 19, 1976. Patented Aug. 23, 1977. Not available NTIS.

Patent 4,044,397. Integrated Circuit Wiring Bridge Apparatus. Filed Aug. 12, 1976. Patented Aug. 23, 1977. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE
Research Agreements and Patent Branch,
General Services Div., Federal Bldg.,
Agricultural Research Service, Hyattsville, Md. 22161

Patent application 833,883. Tetrasulfide Extreme Preasure Lubricant Additives. Filed Sept. 16, 1977.

Patent application 835,103. Preparation of Isopropenyl Esters of Dicarboxylic Acids. Filed Sept. 21, 1977.

Patent 4,039,586. Oxidation of Thiols to Disulfides. Filed Aug. 30, 1973. Patented Aug. 2, 1977. Not available NTIS.

Patent 4,045,554. Process for Preserving Wood Chips During Storage. Filed Sept. 30, 1975. Patented Aug. 30, 1977. Not available NTIS.

U.S. DEPARTMENT OF ENERGY
Assist. General Counsel for Patents,
Washington, D.C. 20545

Patent application 617,126. Adhesive Plasters. Filed Sept. 26, 1975.

Patent 3,984,283. Reactor. Filed Feb. 21, 1946. Patented Oct. 5, 1976. Not available NTIS.

Patent 3,993,539. Method and Device for Measuring Fluid Flow. Filed Aug. 7, 1975. Patented Nov. 23, 1976. Not available NTIS.

Patent 3,994,775. Control Rod System Useable for Fuel Handling in a Gas-Cooled Nuclear Reactor. Filed Feb. 25, 1976. Patented Nov. 30, 1976. Not available NTIS.

Patent 3,994,777. Nuclear Reactor Overflow Line. Filed Feb. 12, 1976. Patented Nov. 30, 1976. Not available NTIS.

Patent 3,994,778. Liquid Metal Hydrogen Barriers. Filed July 15, 1971. Patented Nov. 30, 1976. Not available NTIS.

Patent 4,002,912. Electrostatic Lens to Focus an Ion Beam to Uniform Density. Filed Dec. 30, 1975. Patented Jan. 11, 1977. Not available NTIS.

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Patent 4,011,462. Pulsed Infrared Difference Frequency Generation in CdGeAs sub. 2. Filed Nov. 26, 1975. Patented Mar. 8, 1977. Not available NTIS..

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Institutes of Health, Chief, Patent Branch,
Westwood Building, Bethesda, Md. 20014

Patent 4,045,630. Chin Activated Switch. Filed Sept. 8, 1975. Patented Aug. 30, 1977. Not available NTIS.

Patent 4,045,815. System for Combining Analog and Image Signals Into a Standard Video Format. Filed Feb. 4, 1976. Patented Aug. 30, 1977. Not available NTIS.

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Assistant Chief for Patents, Office of Naval Research, Code 302
Arlington, Va. 22217

Patent application 734,916. High Input Power Laser Device. Filed Dec. 28, 1976.

Patent application 755,710. Calibration Circuit for Expandable Sonobuoys. Filed Dec. 30, 1976.

Patent application 784,186. Frequency Independent Acoustic Antenna. Filed Apr. 4, 1977.

Patent application 807,863. Transversal Filter Discrete Chirp Frequency Synthesizer. Filed June 20, 1977.

Patent application 816,561. A Fiber-Optic Acoustic Array. Filed July 18, 1977.

Patent application 819,037. Piezoelectric Polymer Flexural Disc Hydrophone. Filed July 25, 1977.

Patent application 821,275. The Improvement of Plaque Dispersing Enzymes as Oral Therapeutic Agents by Molecular Alteration. Filed Aug. 3, 1977.

Patent application 823,568. Holographic Lens Binocular System. Filed Aug. 11, 1977.

Patent application 823,792. Driver for Reactive Load. Filed Aug. 11, 1977.

Patent application 823,907. Single-Sloted Positive Circulation Flap Apparatus for Vectored Thrust Aircraft. Filed Aug. 12, 1977.

Patent application 826,280. Folding Fin Assembly Detent. Filed Aug. 22, 1977.

Patent application 826,608. Modular Guyline Insulator. Filed Aug. 22, 1977.

Patent application 829,756. Radio Frequency Signals Analyzer. Filed Sept. 1, 1977.

Patent application 830,721. Presettable Integrating Timing Circuit. Filed Sept. 6, 1977.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assist. Gen. Coun. for Patent Matters, NASA Code GP-2,
Washington, D.C. 20546

Patent application 730,780. Variable Dihedral Shuttle Orbiter. Filed Oct. 8, 1976.

Patent application 779,429. Vortex-Lift Roll-Control Device. Filed Mar. 21, 1977.

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Patent application 817,413. A Complementary DMOS-VMOS Integrated Circuit Structure. Filed July 20, 1977.

Patent application 817,415. Low Intensity X-Ray and Gamma-Ray Imaging Device. Filed July 20, 1977.

Patent application 820,499. Production of Crystals from Molten Solutions. Filed July 29, 1977.

Patent application 823,061. Horizontally Mounted Solar Collector. Filed Aug. 9, 1977.

Patent application 823,566. Partial Polarizer Filter. Filed Aug. 11, 1977.

Patent application 824,024. A Thermal Energy Transformer. Filed Aug. 12, 1977.

Patent application 826,202. An Improved Controller Arm for a Remotely Related Slave Arm. Filed Aug. 19, 1977.

Patent application 826,204. An Improved Vehicular Impact Absorption System. Filed Aug. 19, 1977.

Patent application 829,314. A Seat Cushion to Provide Realistic Acceleration Cues for Aircraft Simulator Pilots. Filed Aug. 31, 1977.

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Patent application 829,317. Intra-Ocular Pressure Normalization Technique and Equipment. Filed Aug. 31, 1977.

Patent application 829,318. Intra-Ocular Pressure Normalization Apparatus. Filed Aug. 31, 1977.

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Patent application 831,634. An Improved Free Wing for an Aircraft. Filed Sept. 8, 1977.

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Patent 4,038,705. Rotational Joint Assembly for the Prosthetic Leg. Filed July 30, 1976. Patented Aug. 2, 1977. Not available NTIS.

Patent 4,039,000. Accumulator. Filed Dec. 18, 1975. Patented Aug. 2, 1977. Not available NTIS.

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Patent 4,042,926. Automatic Transponder. Filed Mar. 27, 1975. Patented Aug. 16, 1977. Not available NTIS.

U.S. DEPARTMENT OF ENERGY
Asst. General Counsel for Patents,
Washington, D.C. 20545

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Patent 3,992,257. Neutron-Absorber Release Device. Filed Aug. 13, 1975. Patented Nov. 16, 1976. Not available. NTIS.

Patent 3,999,067. High Speed Radiation Scanning Technique for Simultaneously Determining the Pitch and Eccentricity of an Encased Coil. Filed Oct. 14, 1975. Patented Dec. 21, 1976. Not available NTIS.

Patent 4,006,034. Method of Preparing an Electrochemical Cell in Uncharged State. Filed Mar. 11, 1976. Patented Feb. 1, 1977. Not available NTIS.

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Patent 4,011,373. Uncharged Positive Electrode Composition. Filed Apr. 29, 1976. Patented Mar. 8, 1977. Not available NTIS.

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U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research, Code 302
Arlington, Va. 22217

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Patent 4,040,060. Notch Fed Magnetic Microstrip Dipole Antenna with Shorting Pins. Filed Nov. 10, 1976. Patented Aug. 2, 1977. Not available NTIS.

Patent 4,041,580. Separable Link Connector. Filed Jan. 12, 1975. Patented Aug. 16, 1977. Not available NTIS.

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Patent 4,042,449. Method of Making a Reticle-Lens. Filed Sept. 20, 1976. Patented Aug. 16, 1977. Not available NTIS.

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assist. General Counsel for Patent Matters, NASA Code GP-2,
Washington, D.C. 20546

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U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patents,
Washington, D.C. 20545

Conf. 770,106. Public Colloquium on Mandatory Patent Licensing. Jan. 12, 1977. Not available NTIS.

U.S. DEPARTMENT OF TRANSPORTATION
Patent Counsel, 400 7th Street, S.W.,
Washington, D.C. 20590

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U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patents,
Washington, D.C. 20545

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Patent 4,005,178. Method for Converting UF sub 5 to UF sub 4 in a Molten Fluoride Salt. Filed July 10, 1975. Patented Jan. 25, 1977. Not available NTIS.

Patent 4,005,289. Method for Identifying Anomalous Terrestrial Heat Flows. Filed Jan. 5, 1976. Patented Jan. 25, 1977. Not available NTIS.

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U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Institutes of Health, Chief, Patent Branch,
Westwood Building, Bethesda, Md. 20014

Patent application 804,601. The Synthesis of 6-Amino-4-Methyl-8-(beta-D-Ribo-Furanosyl) Pyrrolo(4, 3, 2-DE) Pyrimido(4, 5-C) Pyridazine-5'-Phosphate as a Novel Compound and Its Utility Against L-1210 Mouse Leukemia. Filed June 8, 1977.

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Patent 4,035,150. Test for Occult Blood in an Emulsified Aqueous/Organic System. Filed July 7, 1976. Patented July 12, 1977. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th and C Streets, N.W.,
Washington, D.C. 20240

Patent 4,009,649. Mine Ventilation Control Device. Filed Apr. 2, 1976. Patented Mar. 1, 1977. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research,
Code 302, Arlington, Va. 22217

Patent 3,982,819. Fluid Gap Glan-Laser Prism. Filed May 22, 1975. Patented Sept. 28, 1976. Not available NTIS.

Patent 4,031,534. Noise Resistant Zone Penetration Detection System. Filed June 1, 1976. Patented June 21, 1977. Not available NTIS.

Patent 4,032,863. Metal Vapor Laser Tube. Filed Apr. 19, 1976. Patented June 28, 1977. Not available NTIS.

Patent 4,037,959. Means for Real-Time Laser Source Characterization. Filed Dec. 15, 1975. Patented July 26, 1977. Not available NTIS.

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Patent 4,042,892. Hypersonic Gas Laser. Filed July 22, 1976. Patented Aug. 16, 1977. Not available NTIS.

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Patent 4,047,120. Transient Suppression Circuit for Push-Pull Switching Amplifiers. Filed July 15, 1976. Patented Sept. 6, 1977. Not available NTIS.

Patent 4,048,048. Apparatus for Making a Memory Wire. Filed Apr. 7, 1976. Patented Sept. 13, 1977. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters,
NASA Code GP-2, Washington, D.C. 20546

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Patent application 833,637. Circuit for Automatic Load Sharing in Parallel Converter Modules. Filed Sept. 15, 1977.

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Patent 4,044,821. Low to High Temperature Energy Conversion System. Filed Dec. 27, 1974. Patented Aug. 30, 1977. Not available NTIS.

Patent 4,045,063. Load Regulating Latch. Filed Dec. 18, 1975. Patented Aug. 30, 1977. Not available NTIS.

Patent 4,045,149. Platform for a Swing Root Turbomachinery Blade. Filed Feb. 3, 1976. Patented Aug. 30, 1977. Not available NTIS.

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Patent 4,045,255. Directionally Solidified Eutectic gamma Plus beta Nickel-Base Superalloys. Filed June 1, 1976. Patented Aug. 30, 1977. Not available NTIS.

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Patent 4,045,359. Apparatus for Photon Excited Catalysis. Filed Jan. 29, 1976. Patented Aug. 30, 1977. Not available NTIS.

Patent 4,045,728. Direct Reading Inductance Meter. Filed Apr. 15, 1976. Patented Aug. 30, 1977. Not available NTIS.

Patent 4,045,792. Analog to Digital Converter for Two-Dimensional Radiant Energy Array Computers. Filed Feb. 13, 1976. Patented Aug. 30, 1977. Not available NTIS.

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Patent 4,046,012. Fluid Sampling Device. Filed Nov. 19, 1976. Patented Sept. 6, 1977. Not available NTIS.

Patent 4,046,190. Flat-Plate Heat Pipe. Filed May 22, 1975. Patented Sept. 6, 1977. Not available NTIS.

Patent 4,046,262. Anthropomorphic Master/Slave Manipulator System. Filed Jan. 24, 1974. Patented Sept. 6, 1977. Not available NTIS.

Patent 4,046,434. Deformable Bearing Seat. Filed July 14, 1975. Patented Sept. 6, 1977. Not available NTIS.

Patent 4,046,435. Bearing Seat Usable in a Gas Turbine Engine. Filed July 14, 1975. Patented Sept. 6, 1977. Not available NTIS.

Patent 4,046,462. Three-Dimensional Tracking Solar Energy Concentrator and Method for Making Same. Filed Apr. 28, 1976. Patented Sept. 6, 1977. Not available NTIS.

Patent 4,046,529. Regenerable Device for Scrubbing Breathable Air of CO2 and Moisture Without Special Heat Exchanger Equipment. Filed May 21, 1976. Patented Sept. 6, 1977. Not available NTIS.

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Patent 4,046,617. Method of Crystallization. Filed Sept. 5, 1975. Patented Sept. 6, 1977. Not available NTIS.

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U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

Patent application 832,708. Environmental Test Chamber System. Filed Sept. 12, 1977.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patent,
Washington, D.C. 20545

Patent 4,024,399. Method and Apparatus for Measuring Vapor Flow in Isotope Separation. Filed Jan. 6, 1975. Patented May 17, 1977. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research,
Code 302, Arlington, Va. 22217

Patent application 771,594. Digital To Graphic Character Generator. Filed Feb. 24, 1977.

Patent application 780,571. Dry Cooled Jet Aircraft Runup Noise Suppression System. Filed Mar. 23, 1977.

Patent application 809,599. Improved Aluminum Alloy for Primary Alkaline Fuel Cells and Batteries. Filed June 24, 1977.

Patent application 818,643. Diver Navigation System. Filed July 25, 1977.

Patent application 821,269. Optical Beam Steering System. Filed Aug. 3, 1977.

Patent application 825,007. Surface Passivation of IV-VI Semiconductors with As2S3. Filed Aug. 16, 1977.

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Patent application 827,393. System for Transporting Wastewater by Vacuum. Filed Aug. 23, 1977.

Patent application 829,700. Square and Rectangular Electroacoustic Bender Bar Transducer. Filed Sept. 1, 1977.

Patent application 833,121. Breakaway Link Assembly for Maintaining a Structural Alignment of Shock-Sensitive Equipment. Filed Sept. 14, 1977.

Patent application 833,325. An Automated Flash-Bang Method and Apparatus for Determining Lighting Stroke Distances. Filed Sept. 14, 1977.

Patent application 833,798. Narrowband Infrared Detector. Filed Sept. 16, 1977.

Patent application 836,255. Pressure-Resistant Housing. Filed Sept. 23, 1977.

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Patent application 840,703. Mean-Level Detector for Multiple Target Environments. Filed Oct. 18, 1977.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

Patent application 833,788. Boundary Layer Scoop for the Enhancement of Coanda Effect Flow Deflection over a Wing/Flap Surface. Filed Sept. 16, 1977.

Patent application 840,334. Potential Troughs for Charge Transfer Devices. Filed Oct. 7, 1977.

Patent application 840,353. RF Excited Mercury Laser Lamp. Filed Oct. 7, 1977.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patents,
Washington, D.C. 20545

Patent 3,988,178. Method for Preparing Superconductors. Filed Nov. 29, 1974. Patented Oct. 26, 1976. Not available NTIS.

Patent 3,994,279. Solar Collector with Improved Thermal Concentration. Filed July 24, 1975. Patented Nov. 30, 1976. Not available NTIS.

Patent 3,995,485. Dry, Portable Calorimeter for Nondestructive Measurement of the Activity of Nuclear Fuel. Filed Oct. 20, 1975. Patented Dec. 7, 1976. Not available NTIS.

Patent 4,009,614. Apparatus for Monitoring Two-Phase Flow. Filed Dec. 19, 1975. Patented Mar. 1, 1977. Not available NTIS.

Patent 4,012,282. Multiple Lead Seal Assembly for a Liquid-Metal-Cooled Fast-Breeder Nuclear Reactor. Filed May 17, 1976. Patented Mar. 15, 1977. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research,
Code 302, Arlington, Va. 22217

Patent application 745,758. Stable Alkaline Zinc Electrode. Filed Nov. 29, 1976.

Patent application 822,475. Non-Linear Acoustic Transducer. Filed Aug. 8, 1977.

Patent application 828,809. Composite Video Signal Field Recognition Circuit. Filed Aug. 29, 1977.

Patent application 829,542. Optical Photoemissive Detector and Photomultiplier. Filed Aug. 31, 1977.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF FEBRUARY 11, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	7-11-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	6-1-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	7-20-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	1-6-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	3-7-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	12-10-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	8-9-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	2-28-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	7-5-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-3-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	5-6-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-28-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	5-17-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	1-6-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	2-9-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	5-9-77

Expiration of patents: The patents within the range of numbers indicated below expire during February 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,970,313 to 2,973,516, inclusive
Plant Patents... ..... Numbers 2,019 to 2,031, inclusive

REISSUES

FEBRUARY 28, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

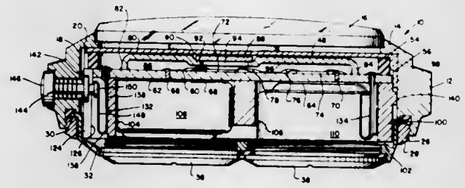
Re. 29,551
ELECTRONIC WATCH MOVEMENT MOUNTING AND CONNECTION

Rudolf F. Zurcher, and I. Benjamin Merles, both of Newport Beach, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Original No. 3,838,568, dated Oct. 1, 1974, Ser. No. 343,319, Mar. 21, 1973. Application for reissue Nov. 17, 1975, Ser. No. 632,612

Int. Cl.[2] **G04B** *37/00*

U.S. Cl. 58—88 C **23 Claims**



4. [The electronic watch of claim **1** wherein] *An electronic watch;*

said electronic watch having a case and a crystal mounted on the front of said case, said case having an axis extending through said crystal and normal to the body of said case;

a substrate within said case, an electronically controlled display device for digitally displaying the time signal of said electronic watch, said substrate carrying said display device;

said case having an opening therein below said crystal;

the improvement comprising:

said substrate being radially and axially smaller than said opening within said case so that said substrate can move with respect to said case, said substrate having a face, and a back, a first resilient body on the face of said substrate between said substrate and said case and a second resilient body between said substrate and said case on said back of said substrate for permitting axial motion of said substrate with respect to said case by resilient deflection of said resilient body, said second resilient body comprising a battery spring; said substrate [has] *also having* a plurality of *radially positioning* springs between said substrate and said case to radially urge said substrate to a central position with respect to said case.

Re. 29,552
MAGNETIC GAME STRUCTURE

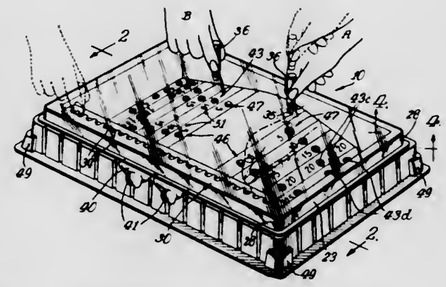
Douglas R. Bolton, Palatine, Ill., assignor to Cadaco, Inc., Chicago, Ill.

Original No. 3,734,502, dated May 22, 1973, Ser. No. 149,646, Jun. 3, 1971. Application for reissue Oct. 30, 1974, Ser. No. 519,127

Int. Cl.[2] **A63B** *71/02;* **A63F** *7/00*

U.S. Cl. 273—95 R **30 Claims**

1. A game structure comprising: a flat, transparent panel; means for peripherally supporting said panel to extend horizontally; a plurality of magnetizable playing pieces; support means for receiving and removably storing said magnetizable playing pieces closely subjacent said panel; magnetic means for manipulation superjacent said panel for attracting said pieces, said support means being disposed sufficiently close to said panel to permit said magnetic means to attract said playing pieces on said support means seriatim with said panel disposed therebetween, and permitting lateral movement of said pieces from said support means along the underside of the panel as a result of corresponding lateral movement of said magnetic means along the top side of the panel; and a plurality of upwardly opening cup elements disposed in a preselected arrangement spaced at different distances below said panel



adapted to catch a playing piece dropped respectively accurately into the center of the elements.

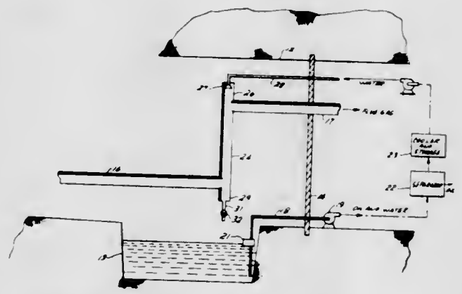
Re. 29,553
OIL SHALE RETORT FLUE GAS COOLING AND CLEANING

Robert S. Burton, III, Grand Junction, Colo., and Gordon B. French, Bakersfield, Calif., assignors to Occidental Oil Shale, Inc., Grand Junction, Colo.

Original No. 3,915,498, dated Oct. 28, 1975, Ser. No. 505,100, Sep. 11, 1974. Application for reissue Jul. 18, 1977, Ser. No. 816,798

Int. Cl.[2] **E21C** *41/10;* **E21B** *43/24*

U.S. Cl. 299—2 **7 Claims**



1. Apparatus for cleaning and cooling flue gas from an in situ oil shale retort comprising:

a tunnel at the bottom of the retort;

a sump in the floor of the tunnel for collecting oil and water from the retort;

a gas tight bulkhead in the tunnel beyond the sump for preventing escape of flue gas from the retort;

a conduit for collecting flue gas from the bottom of the retort having at least a vertical portion in the tunnel through which collected flue gas flows upwardly and a portion passing through the bulkhead for withdrawing flue gas from the retort;

a sparger [at the top of] *in* the vertical portion of the conduit for spraying water downwardly through the vertical portion countercurrent to the flue gas; and

means for draining the sparged water into the sump.

Re. 29,554

ORGANIC PHOTOCONDUCTIVE MEMBERS COMPRISING DICYANOMETHYLENE SUBSTITUTED FLUORENE SENSITIZERS

Evan S. Baltazzi, Brookfield, Ill., assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Original No. 37,526,688, dated Aug. 14, 1973, Ser. No. 830,879, Jun. 5, 1969. Continuation-in-part of Ser. No. 679,246, Oct. 30, 1967, abandoned. Application for reissue Apr. 1, 1976, Ser. No. 672,702

Int. Cl.² G03G *5/06, 13/22*

U.S. Cl. 96—1.5 R **2 Claims**

16. A photoelectrostatic member comprising a conductive base support coated with a photoconductive film comprising an organic photoconductive polymer of the electron donor type and incorporating therein one or more of the following sensitizers:

9-(dicyanomethylene)-2,4-dicyanofluorene
9-(dicyanomethylene)-2,4,7-tricyanofluorene
9-(dicyanomethylene)-2,4,5,7-tetracyanofluorene
9-(dicyanomethylene)-2,4-ditrifluoromethylfluorene
9-(dicyanomethylene)-2,4,7-tritrifluoromethylfluorene
9-(dicyanomethylene)-2,4,5,7-tetratrifluoromethylfluorene
9-(dicyanomethylene)-2,4-dimethylfluorene
9-(dicyanomethylene)-2,4,7-trimethylfluorene
9-(dicyanomethylene)-2,4,5,7-tetramethylfluorene
9-(dicyanomethylene)-2,4-dibutoxyfluorene
9-(dicyanomethylene)-2,4,7-tributoxyfluorene
9-(dicyanomethylene)-2,4,5,7-tetrabutoxyfluorene
9-(dicyanomethylene)-2,4-dichlorofluorene
9-(dicyanomethylene)-2,4,7-trichloro-fluorene
9-(dicyanomethylene)-2,4,5,7-tetrachloro-fluorene.

Re. 29,555

LOW SHRINK THERMOSETTING POLYESTERS

John L. Canning, Parma, and Robert W. Lottig, North Olmsted, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Original No. 3,986,992, dated Oct. 19, 1976, Ser. No. 568,591, Apr. 16, 1975. Application for reissue Feb. 14, 1977, Ser. No. 768,439

Int. Cl.² C08L *67/08*

U.S. Cl. 260—22 CB **4 Claims**

1. In a low-profile molding resin composition for thickening with Group II metal oxides, hydroxides, or alkoxides, the resin system comprising by weight a mixture of (a) at least 25% of a dicyclopentadiene terminated ethylenically unsaturated polyester polymer being the esterification product of an alpha, beta-ethylenically unsaturated dicarboxylic acid, dicyclopentadiene, and glycol, said dicarboxylic acid esterified with about 0.1 to 0.4 moles of dicyclopentadiene per mole of dicarboxylic acid, said polyester produced by first reacting a molar excess of said dicarboxylic acid with said glycol to produce an acid terminated prepolymer and then reacting the dicyclopentadiene with said prepolymer, (b) about 5% to 20% of an acid functional thermoplastic polymer, and (c) about 30% to 60% of an ethylenically unsaturated monomer, the improvement comprising:

said thermoplastic polymer being a fatty acid modified branched, thermoplastic alkyd condensation polymer, said alkyl being the esterification product of glycol and minor amounts of polyol preferentially esterified with linear saturated dicarboxylic acids having between about 4 to 10 carbon atoms and monocarboxylic fatty acid, said alkyl containing between about 4% to 20% of said fatty acid by weight and having a hydroxyl equivalent branching functionality of between about 2.02 and 2.2.

Re. 29,556

1,1-DIARYL-1-OXADIAZOL-ALKYLAMINES

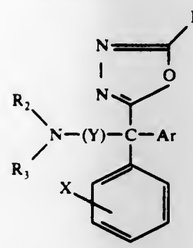
Gilbert W. Adelstein, Evanston, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Original No. 3,917,615, dated Nov. 4, 1975, Ser. No. 456,755, Apr. 1, 1974. Application for reissue Sep. 2, 1976, Ser. No. 719,775

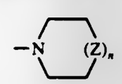
Int. Cl.² C07D *413/10*

U.S. Cl. 260—293.54 **15 Claims**

1. A compound of the formula



and acid addition salts thereof wherein Y is alkylene containing 1–4 carbon atoms; R_1 is lower alkyl; X is hydrogen, halo or lower alkyl; Ar is phenyl, halo-substituted phenyl, lower alkyl substituted phenyl, or 2-pyridyl; and [R_2 and R_3 are lower alkyl, or] R_2 and R_3 together with N is a heterocyclic ring system consisting of azamonocyclic ring of the formula



wherein n is 0 or 1 and Z is oxygen, methylene, phenylhydroxymethylene, phenylcarboxymethylene, phenylcarbloweralkoxymethylene or azabicycloalkane containing 6 to 9 carbon atoms and containing at least 5 atoms in each ring of the azabicycloalkane.

Re. 29,557

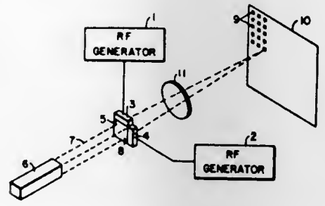
Tl_3PSe_4 COMPOUND, SINGLE CRYSTALS, AND ACOUSTO-OPTICAL DEVICES

Thelma J. Isaacs, Murrysville; Milton S. Gottlieb, Pittsburgh; John D. Feichtner, Murrysville, and Andrea A. Price, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Original No. 3,929,970, dated Dec. 30, 1975, Ser. No. 392,693, Aug. 29, 1973. Application for reissue Aug. 3, 1976, Ser. No. 711,020

Int. Cl.² C01B *25/00*

U.S. Cl. 423—299 **7 Claims**



1. A compound having the general formula Tl_3XSe_4 where X is about 50 to about 100% phosphorus and about 0 to about 50% arsenic.

Re. 29,558

LINCOMYCIN ANALOGS

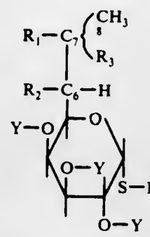
Brian Bannister, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Original No. 3,870,699, dated Mar. 11, 1975, Ser. No. 338,459, Mar. 6, 1973. Application for reissue Oct. 8, 1976, Ser. No. 730,835

Int. Cl.² C07H *15/16*

U.S. Cl. 536—11 **21 Claims**

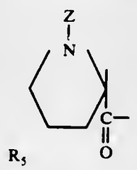
1. A compound of the formula:



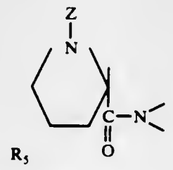
wherein R_1 when taken independently represents hydrogen; R_2 when takene independently represents the monovalent moiety



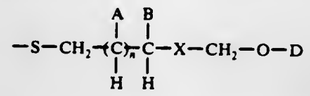
wherein Ac is selected from carboxyacyl of from 2 to 18 carbon atoms, inclusive, and an acyl radical of formula:



wherein Z is selected from hydrogen, lower alkyl and an amino protecting group removable by hydrogenolysis; R_5 is lower alkyl; R_1 and R_2 when taken together form the divalent group of the formula:



wherein Z and R_5 are as defined above; R_3 is hydrogen when R_1 and R_2 are taken together and when R_1 and R_2 are taken independently, R_3 is a monovalent thio group in the 7(S)-position, having the formula:



wherein A is selected from hydrogen and hydroxy, B is selected from hydrogen and monohydroxyloweralkyl, n is the integer 0 when B is monohydroxyloweralkyl and an integer of from 0 to 1 when B is hydrogen, X is [selected from] oxygen [and sulfur], D is an acyl radical of a lower hydrocarbon carboxylic acid; R_4 represents lower alkyl; and Y is selected from carboxyacyl of from 2 to 18 carbon atoms, inclusive, and hydrogen.

Re. 29,559

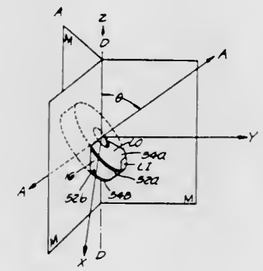
COMPRESSION ACCELEROMETER UTILIZING A LITHIUM NIOBATE PIEZOELECTRIC CRYSTAL

Howard C. Epstein, Arcadia, Calif., assignor to Becton, Dickinson Electronics Company, San Juan Capistrano, Calif.

Original No. 3,714,476, dated Jan. 30, 1973, Ser. No. 111,051, Jan. 29, 1971. Application for reissue Jan. 16, 1974, Ser. No. 433,715

Int. Cl.² H01L *41/18*

U.S. Cl. 310—360 **20 Claims**



9. In a piezoelectric device including at least one transducer element comprising a piezoelectric crystal, the improvement according to which said piezoelectric crystal is cut from a larger crystal of lithium niobate, said crystal having a crystal orientation selected from the following:

(yxl) +38.6° (±1°), (zxtl) +60° (±1°)/+51.4° (±1°),

or a symmetrical equivalent thereof.

Re. 29,560

PEAK LOAD LEVELLING SYSTEM

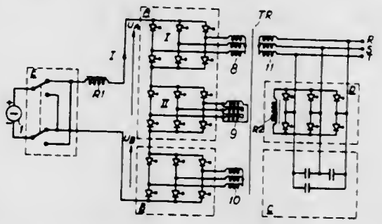
Kjell Frank, and Kjeld Thorborg, both of Vasteras, Sweden, assignors to ASEA Aktiebolag, Vasteras, Sweden

Original No. 3,932,799, dated Jan. 13, 1976, Ser. No. 515,358, Oct. 16, 1974. Application for reissue May 17, 1976, Ser. No. 686,898

Claims priority, application Sweden, Oct. 23, 1973, 7314350

Int. Cl.² H02M *7/00*

U.S. Cl. 363—71 **4 Claims**



1. Load levelling system for connection to an alternating current network (RST), said system comprising electrochemical direct current energy supply means (1), line-commutated controllable electronic power convertor means (A, B) having DC terminals connected to said energy supply means and AC terminals for connection to said AC network, and continuously controllable reactive power generating means (C, D) connected to said AC terminals, said reactive power generating means comprising a fixed capacitor battery (C) and a line-commutated reactive power convertor (D), [the convertor means comprising a first (A) and a second (B) line-commutated thyristor convertor connection, each convertor connection hav-

ing DC and AC terminals, said convertor connection being series-connected through their DC terminals and having transformer means (TR) connecting their AC terminals, said first convertor connection (A) having a higher rated voltage than the second convertor connection (B), means for setting the control angle of said first convertor connection (A) to either one of two substantially fixed values, corresponding to full direct voltage in rectifying and in inverting operation, respectively, and means for controlling said second convertor connection (B) with a variable control angle], *said system including means for connecting the DC terminals of said reactive power convertor (D) to the energy supply means for supplying power to or from said energy supply means in parallel with said controllable electronic power convertor means (A, B).*

PATENTS

GRANTED FEBRUARY 28, 1978

ERRATA

For CLASS	See PATENT NO.
260-018 N	4,075,830
118-007	4,075,968
112-033	4,075,978
366-069	4,076,220
418-123	4,076,261
354-165	4,076,395
156-053	4,076,543
423-544	4,076,545
544-048	4,076,709
424-267	4,076,714
423-328	4,076,842
536-059	4,076,918
542-447	4,076,940
526-062	4,076,951
362-104	4,076,976
365-049	4,077,029
365-205	4,077,031

PATENTS

GRANTED FEBRUARY 28, 1978

NOTE—Cross reference listings of applications published under the first and second Trial Voluntary Protest Programs are located in the back of this Issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

4,075,714

HELMET CHARACTERIZED BY NEGATIVE LIFT

James H. Ryder, Sierra Madre; David C. Brown, Pasadena, and Johannes A. Van Haastert, Temple City, all of Calif., assignors to Sierra Engineering Co., Sierra Madre, Calif.

Filed Nov. 15, 1976, Ser. No. 742,007
Int. Cl.[2] A42B 3/00
U.S. Cl. 2—6 **15 Claims**



1. In a helmet adapted for use in aircraft and during ejection therefrom, said helmet being of the type having a shell covers the wearer's head, a visor housing spaced from and covering, an upper part of the shell, a visor retractable within the space between the shell and the visor housing and strap means for securing the helmet to the head of a wearer:

ridge means extending laterally and protruding upwardly at the top of the visor housing;

whereby when a wearer is ejected from an aircraft moving through the air there is created a disruption of the flow of air over the top of the helmet, resulting in reduction of the lift which would otherwise occur.

4,075,715

HELMET HAVING ANTI-LIFT DEVICE

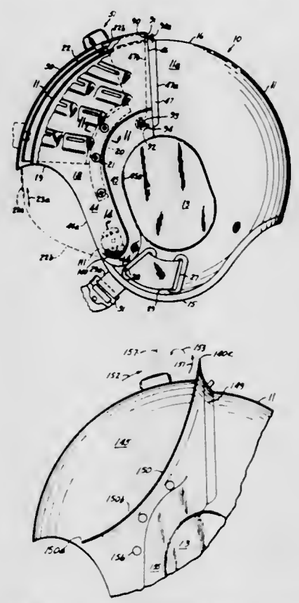
Duane W. Cowgill, Altadena, Calif., assignor to Sierra Engineering Co., Sierra Madre, Calif.

Filed Nov. 15, 1976, Ser. No. 742,006
Int. Cl.[2] A42B 3/00
U.S. Cl. 2—6 **4 Claims**

1. In a helmet adapted for use in aircraft and during ejection therefrom, said helmet being of the type having a shell which covers the wearer's head, a visor housing spaced from, and covering, an upper part of the shell, a visor retractable within the space between the shell and the visor housing and strap means for securing the helmet to the head of a wearer:

an anti-lift device attached at the upper surface of said visor housing, said anti-lift device comprising a flange outstanding from the visor housing and extending from a position near a forward side edge of the visor housing at the forehead area of the wearer and passing around the top crown area to a position near the forward side edge of the visor housing at the opposite side of the wearer's forehead said flange rising from a lowest elevation near said forward side edges to a highest elevation at the top crown area and having two opposite surfaces a first of which faces and receives wind blast during ejection and the second of which faces away from the wind blast,

the regions at and adjacent said forward side edges constituting wings positioned at a negative angle of attack against the wind blast, thus producing negative lift, and



the region at and adjacent the top crown area constituting a spoiler producing turbulence which disrupts skin effect at the region of the top crown area, thus spoiling upward lift.

4,075,716

DISPOSABLE GARMENT WITH RETAINED BELT ASSEMBLY

Robert F. Collins, Barrington, Ill., assignor to The Kendall Company, Boston, Mass.

Continuation-in-part of Ser. No. 542,999, Jan. 22, 1975, Pat. No. 3,987,518. This application May 6, 1976, Ser. No. 683,989
Int. Cl.[2] A41B 9/00
U.S. Cl. 2—114 **18 Claims**



1. A disposable garment, comprising:

a sterile gown having a back, a pair of side edges defining an opening on the back of the gown;

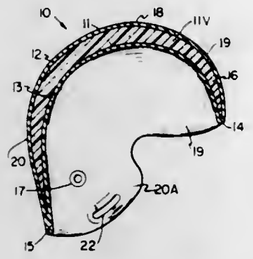
an elongated belt having at least one end section for placement around said opening to close the gown about a wearer;

means for bonding a mid-portion of the belt on an outer surface of the gown in close proximity to one of said side edges;

a protective member removably positioned on and covering an outer end of said one end section to prevent contamination of the one end section while handling the belt; and

means for releasably attaching the protective member against the garment adjacent said one side edge and preventing premature movement of the protective member relative the gown, said attaching means being separate from the bonding means and directly connecting an outer surface of the protective member against a surface of the garment.

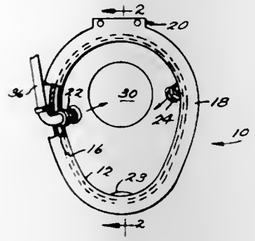
4,075,717
HELMATE
Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840
Continuation-in-part of Ser. No. 553,914, Feb. 28, 1975, abandoned, which is a continuation-in-part of Ser. No. 300,248, Oct. 24, 1972, Pat. No. 3,875,275, which is a continuation of Ser. No. 744,048, Jul. 11, 1968, abandoned. This application Jan. 22, 1976, Ser. No. 651,566
Int. Cl.² A42B *3/02*
U.S. Cl. 2—412 **9 Claims**

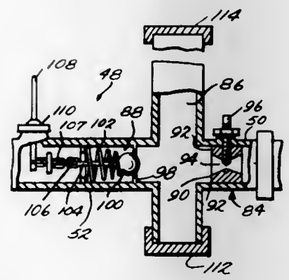


1. A headgear for use in protecting the head of the wearer comprising:
- a bowl-shaped shell-like molding formed of a plurality of layers of plastic materials including:
- a first outer layer defining a relatively hard outer shell,
- a second layer of cellular plastic disposed within said outer layer and supporting same,
- a third layer of non-cellular plastic abutting the inside surface of said second layer and peripherally joined by molding to the peripheral portions of said first layer so as to form an enclosure for said cellular plastic with said first layer,
- said third layer being shaped to substantially conform to the shape of the skull of the wearer and defining a unitary molded structure with said first and second layers, and
- said first and third layers being formed of a unitary hollow plastic molding containing an interior volume enclosed by said first and third layers, said second layer being formed of a self expanding plastic resin which is molded in-situ within said volume enclosed within said hollow molding.

4,075,718
NOZZLE FLUSH SYSTEM
William J. Hargraves, 515 S. Paula Drive, Dunedin, Fla. 33528
Filed Apr. 3, 1975, Ser. No. 564,896
Int. Cl.² E03D *11/00, 5/10;* B67D *5/54*
U.S. Cl. 4—300 **5 Claims**

1. Apparatus for flushing a toilet bowl of the type having a substantially horizontally disposed rim, a drain outlet located vertically below said rim and a smooth interior surface between said rim and drain outlet, said apparatus comprising in combination: liquid nozzle means having an inlet and an outlet, said nozzle means being disposed adjacent the rim of said bowl so that liquid discharged from said nozzle means will impinge upon all portions of the interior surface of said bowl, manually operable liquid flow control means including an outlet, conduit means for connecting said control means outlet to said inlet of said nozzle means, said flow control means having a flow passage of predetermined cross-sectional area and valve means for closing said flow passage, said valve means being manually movable to open said flow passage and movable to close said flow passage in response to a drop in pressure in said flow passage, said control means including a pressure chamber, an inlet connecting said pressure chamber to a source of liquid under pressure, and means for restricting the flow of liquid from the source to said pressure chamber so that, when said valve means is moved to open said flow passage, a predetermined quantity of liquid will discharge from said pressure chamber to said nozzle means causing a pressure drop sufficient to result in the closing of said flow passage by said valve means before pressure in said pressure chamber is restored by flow from the liquid source, said means for restricting the flow of liquid from the liquid source to said pressure chamber comprises an inlet orifice having one side communicating directly with said liquid source and its other side communicating directly with said pressure chamber, said means connecting said pressure chamber to the liquid source having a predetermined





cross-sectional area and said pressure chamber having a predetermined cross-sectional area, said inlet orifice having a cross-sectional area that is substantially dimensionally smaller than said predetermined cross-sectional areas of said pressure chamber and said means connecting said pressure chamber to the liquid source, said inlet orifice including means for adjusting the cross-sectional area thereof to vary the rate of liquid flow therethrough, said pressure chamber having a vertical axis, an upper end portion and a lower end portion, said means connecting said pressure chamber to a source of liquid under pressure comprising an inlet located between said upper and lower end portions, and said inlet of said flush valve being connected to said lower end portion of said pressure chamber so that, when said pressure chamber is filling with liquid, any atmospheric gases in said pressure chamber will be compressed in said upper end portion thereof to a pressure substantially equal to the pressure of said liquid source.

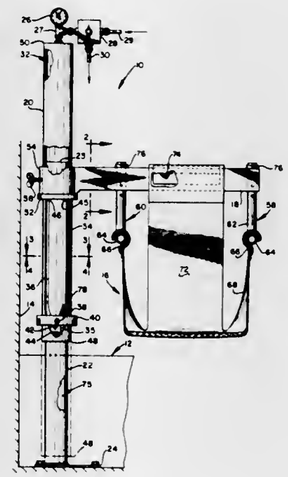
4,075,719
CHAIR LIFT APPARATUS
Lawrence J. Sullivan, 2688 E. 25th St., Odessa, Tex. 79761
Filed Sep. 1, 1976, Ser. No. 719,619
Int. Cl.² A47B *83/04;* A47K *3/12*
U.S. Cl. 5—81 R **14 Claims**

1. Lift apparatus by which wheelchair invalids are lifted from one location, through a spiral of several degrees, and to a second location, comprising:

a stationary vertical support member, a movable vertical support member, said stationary member being telescopingly received within said movable member to form a concentrically arranged coacting piston and a cylinder; means by which one of said members is received in sealed relationship within the other to provide a variable chamber which effects reciprocatory motion therebetween when fluid is forced to flow into and out of said variable chamber;

cam means jointly connected to said stationary and movable members for causing relative axial rotation therebetween when said members are reciprocated;

said cam means includes two parallel, radially spaced slots cut longitudinally through the wall of said movable member, with the slots each commencing at a medial part of the movable member and extending down toward one marginal end thereof where the slots converge together to form a camway in the form of a continuous slot, thereby leaving an elongated tab between the slots, said tab having a free end and a connected end;



a bridge connected to said free end of said tab and two radially spaced locations on the lower marginal end of said movable member to thereby rigidify the free end of the tab; a switch means pivotally affixed to the connection effected at said tab, a cam follower connected to said fixed member and received within said camway;

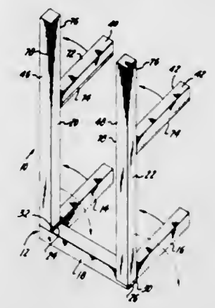
said switch means being positioned to engage said cam follower and force the follower to be changed from one to the other of said two spaced slots when one support member reciprocates within the other;

a cantilever arm having opposed ends, one end being in the form of a boss which is slidably received about said movable member, lock means by which said cantilever arm is secured to said movable member;

chair engaging assemblies connected to said cantilever arm for releasably engaging a chair; and,

a control valve means flow connected to said variable chamber, and adapted to be connected to a source of pressure and to a discharge, so that said control valve means can be actuated to connect the source of pressure or the discharge to the variable chamber, thereby reciprocating the fixed and movable members respective to one another.

4,075,720
SUPPORT FRAMES ADAPTED FOR USE WITH CAR SEATS AND BEDS
Henry Fleischer, 18 Notch Park Road, Little Falls, N.J. 07424
Filed Jan. 12, 1977, Ser. No. 758,846
Int. Cl.² A47D *7/04*
U.S. Cl. 5—94 **13 Claims**

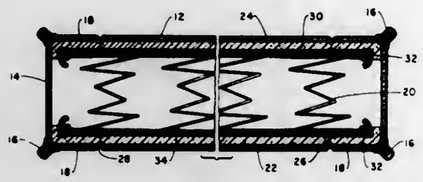


1. A universal-type locking frame for supporting or limiting movement of a car bed or car seat, said frame being adapted to be employed in an automobile, comprising, in combination, a support base, at least a portion of which is adapted to extend under an automobile seat, at least a pair of longitudinal spaced apart members, the space between said members being sufficiently large to allow a car bed or car seat to be disposed between said members, each of said members being pivotally connected at their lower portions to said support base so that said longitudinal members extend up from said support base and are adapted to be deployed in close proximity to and extending above the bench portion of an automobile seat in their use position and pivoted downwardly to a folded position substantially transverse to the fore and aft direction of the automobile, and a pair of normally horizontally disposed arm members, an arm member being pivotally connected to each of the longitudinal members, said arm members in their working position being disposed above said support base and extending out from the longitudinal members over the bench portion of an automobile seat for supporting or restricting movement of a car bed or car seat deployed on said automobile seat, whereby a car bed or car seat may be positioned on the automobile seat in a manner such that the car bed or car seat extends between and through the space between the longitudinal members so that the longitudinal members and horizontally disposed arm members in conjunction with the backrest portion of the automobile seat may limit movement of the car bed or car seat from side to side and/or front to back and means for holding said longitudinal members in their use position.

4,075,721
MATTRESS CONSTRUCTION AND METHOD OF MAKING
William L. Autrey, 13612 Carroll Way, Tustin, Calif. 92680, assignor to William L. Autrey, Tustin, Calif.
Division of Ser. No. 638,564, Dec. 8, 1975, Pat. No. 4,019,451. This application Apr. 25, 1977, Ser. No. 790,518
Int. Cl.² A47C *23/00*
U.S. Cl. 5—345 R **2 Claims**

1. A compact, unitary mattress construction comprising:
- a coil spring assembly;
- a pair of covers attached to said spring with a flange material stitched to said cover to provide a wide flange;
- a thick foam pad between the cover and the flange material, the thickness of said pad producing a deep channel stitch when the flange material is sewn to the cover; and
- a side cover stitched to said pair of covers around the periph-

ery of said wide flange with a binding tape to produce a unitary squared construction;



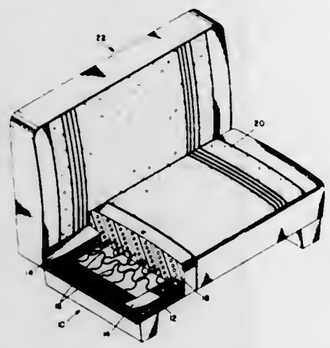
said wide flange causing said covers and foam pads to be stretched laterally flat over said coil spring assembly.

4,075,722

SPACE FRAME SEAT ASSEMBLY

James Franklin Rinard, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Dec. 27, 1976, Ser. No. 754,374
Int. Cl.² A47C *23/00*
U.S. Cl. 5—351 **10 Claims**



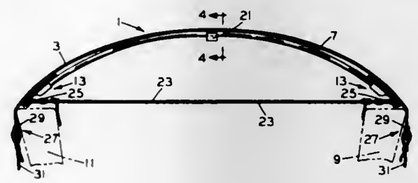
1. A unitary space frame suitable for forming in a simple two peice mold having a direction of mold opening travel, said frame comprising a plurality of cells, each cell comprising:
- an upper and a lower grid composed of grid members, said upper grid being offset from said lower grid in plan, said plan being defined by a lateral and longitudinal direction;
- a plurality of first connecting members, each inter-connecting a grid member in said upper grid and a grid member in said lower grid that are angularly askew, said first connecting members being oriented parallel to the direction of mold opening travel;
- a pair of side "Z" shaped member means interconnecting said upper grid to said lower grid to resist shear movement of said upper and lower grids in the longitudinal direction; and
- a center diagonal "V" shaped member means connecting said upper grid and said lower grid to resist shear movement in the lateral direction, the surfaces of said pair of side "Z" shaped member means and said "V" shaped member means being entirely exposed along the direction of mold opening travel for molding through either said upper or said lower grid.

4,075,723

BOAT COVER MEANS

Marvin A. Bareis, New Haven, Mo., and George C. Nisbet, Mount Prospect, Ill., assignors to Kellwood Company, St. Louis, Mo.

Filed Sep. 20, 1976, Ser. No. 724,711
Int. Cl.² B63B *17/02*
U.S. Cl. 9—1.5 **7 Claims**



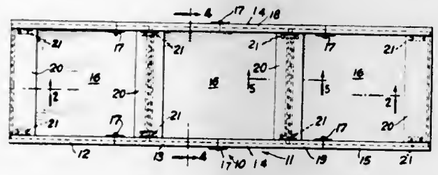
1. Boat cover means comprising:
- a cover of flexible sheet material;
- a flexible resilient rib constituting a cover support adapted to extend in arched configuration over a boat from adjacent one gunwale of the boat to the other for supporting the cover arched over the boat;
- a pair of pockets on the inside of the cover at opposite sides thereof for receiving the ends of the rib thereby to secure said rib to the cover with the cover extending down beyond the ends of said rib on the sides of the boat;
- said rib being adapted to be bent to various arched configurations depending on the beam of the boat on which the boat cover means is used in the transverse plane of the boat where the rib is located and said cover having means attached thereto for holding the rib in any of said arched configurations; and
- means for fastening the cover to the boat.

4,075,724

FOLDING BOAT

William Russell Hire, 940 W. Main St., Newark, Ohio 43055

Filed Dec. 28, 1976, Ser. No. 754,947
Int. Cl.² B63B *7/04*
U.S. Cl. 9—2 F **15 Claims**



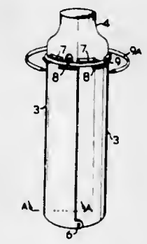
1. A folded boat comprising,
- in combination, a foldable frame made of a plurality of sections and a plurality of open-topped containers,
- said frame comprising laterally-spaced side rails and a plurality of lateral members extending generally perpendicular to said side rails,
- each said side rail comprising a plurality of rail members hingedly connected together,
- each said side rail having an upwardly facing shoulder formed thereon,
- each said container comprising a bottom, side walls and end walls,
- each said side wall of said container terminating in a laterally-extending flange extending generally perpendicular to said side walls,
- said longitudinally-extending flanges being integrally attached to each said container and extending generally perpendicular thereto,
- a second hinge means on each lateral member whereby said lateral members are hingedly connected to said side rails,
- said second hinge means being swingably connected to said side rails,
- said second hinge means being swingably connected about an axis generally perpendicular to the axis of said first mentioned hinge means whereby said side rails may be swung to underlie said lateral members and said side rails can then be swung toward each other,
- said shoulder being disposed substantially in a common plane when said side rails are in extended position whereby said shoulders may support said flanges of said containers.

4,075,725

SONOBUOY CASING

John Mar, Ottawa; Todd Garrett, Dartmouth, and Petrus Jacques, Ottawa, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed May 24, 1976, Ser. No. 689,492
Claims priority, application Canada, Jun. 3, 1975, 228305
Int. Cl.² B63B *21/52*
U.S. Cl. 9—8 R **6 Claims**



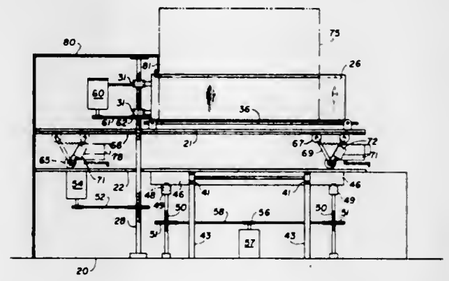
1. In a sonobuoy, a cylindrical casing comprising
- a. a plurality of longitudinal cylinder sections which meet at longitudinal edges extending upwardly from the bottom end of the cylinder,
- b. means hinging the sections together at each of said edges adjacent the bottom thereof at the bottom of the cylinder,
- c. means temporarily retaining the sections together at each of the other edges adjacent the other end of the casing, whereby upon release of said other edges, the bottom of each of the cylindrical sections can swing below the bottom and clear of the cylinder.

4,075,726

METHOD AND APPARATUS FOR BINDING A BOOK

Jens Korsgaard, 8650 Boulevard East, North Bergen, N.J. 07047

Filed Jan. 20, 1976, Ser. No. 649,541
Int. Cl.² B42C *19/00, 11/00*
U.S. Cl. 11—1 R **9 Claims**



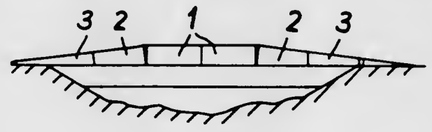
1. A book binding apparatus comprising means for determining the thickness of a book to be bound comprising clamping means for holding said book, means for grooving a cover to be bound to said book comprising a pair of parallel groove bars mounted to engage one side of said cover and a backup roll mounted to engage the other side of said cover, and means responsive to said thickness determining means for spacing said groove bars apart a distance dependent upon the thickness of said book, and a glue-applying means mounted for movement with said roll, said glue-applying means comprising glue tube movable across said cover transversely of the direction of movement of said roll, means responsive to said thickness determining means for limiting the transverse movement of said glue tube, and positive displacement pump means for directing glue through said glue tube.

4,075,727

FRAME STRUCTURE, ESPECIALLY FOR A PORTABLE BRIDGE

Hugo Sedlacek, Duisburg, and Gerhard Sedlacek, Kamp-Lintfort, both of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Sep. 8, 1976, Ser. No. 721,405
Claims priority, application Germany, Sep. 10, 1975, 2540267
Int. Cl.² F01D *19/00*
U.S. Cl. 14—14 **13 Claims**



2. A framework especially for a portable bridge, which includes: at least two supporting members arranged in spaced relationship to and one above the other, first and second coupling means respectively connected to said at least two supporting members, strut means detachably interconnecting said at least two supporting members, one portion of said strut means being operable so as to positively engage one of said coupling means to permit the latter to transmit forces in all directions, and the other one of said coupling means being operable when said one coupling means is in positive engagement with said one portion of said strut means to prevent said strut means from disengaging said one coupling means, said one portion of said strut means being provided with a bead and opposite said bead and in spaced relationship thereto has a surface section, said one coupling means comprising at least two elevations, one of which is hook-shaped for coupling engagement with said bead and forms therewith a swivel joint whereas the other elevation is arranged and designed for engagement with said surface section when said hook-shaped elevation is in coupling engagement with said bead.

4,075,728

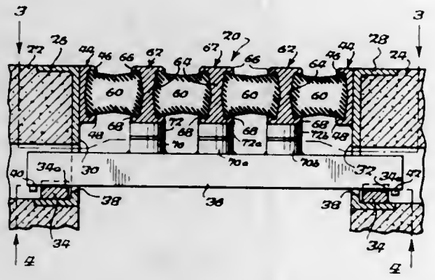
ADJUSTABLE EMBOSSMENT CONNECTOR FOR A COMPOSITE EXPANSION JOINT ASSEMBLY

Guy S. Puccio, Lancaster, N.Y., assignor to Acme Highway Products Corporation, Buffalo, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,129
Int. Cl.² E01D *19/06*
U.S. Cl. 14—16.5 **19 Claims**

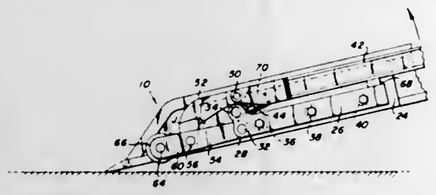
1. In a composite expansion joint assembly for a bridge and the like, said assembly having a pair of edge members adapted to define the opposite sides of an expansion groove between bridge sections, said edge members having oppositely directed elongated openings extending lengthwise of said groove, laterally spaced support bars extending transversely of said groove with the opposite ends of said bars extending through said openings beyond the opposite side of said groove, a plurality of elongated resiliently yieldable sealing elements in a side-by-side relation extending longitudinally of said groove, at least one elongated rigid structural member interposed between said

sealing elements and extending lengthwise thereof, said structural member being supported above and mounted to at least one of said support bars; means for mounting said structural member to said support bar, said mounting means comprising swivel connector means disposed between said structural



member and said support bar for operatively restraining said structural member against any substantial vertical or translational movement relative to said support bar while allowing at least limited relative rotational movement between said support bar and said structural member about said swivel connector.

4,075,729
LIFTING MECHANISM FOR A PORTABLE DOCKBOARD
John R. Conner, 3003 Bluffwood Terrace, St. Joseph, Mich. 49085
Filed Feb. 14, 1977, Ser. No. 768,694
Int. Cl.² E01D *15/00*
U.S. Cl. 14—72.5 **7 Claims**



5. A lifting mechanism for raising and temporarily supporting a heavy rectangular portable dockboard structure or the like to enable the forks of a lifting truck to move under the dockboard, said dockboard including a rectangular substantially planar plate means having a surface for bridging the gap between the edge of a horizontal floor of a loading dock and the bed of a vehicle, said plate means also having integral side rails extending above its surface, comprising

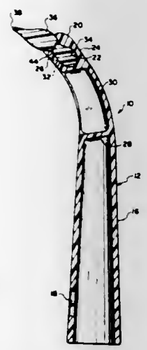
a. means mounted adjacent at least one corner of said dockboard, said means including
(i) first pivot bearing means integral with said dockboard,
(ii) an elongated bracket movable between an inactive position above said floor and an active position below said plate, said movable bracket being supported on said first pivot bearing means at a pivot connection to be moved from one of said positions to the other, said bracket being adapted in said active position to hold said at least one corner of said dockboard in a raised position,
(iii) a support means to carry said first pivot bearing means on the outside of at least one of said side rails,
(iv) a second pivot bearing means on the support means on the outside of said at least one side rail, said second pivot bearing means being spaced above said first pivot bearing means,
(v) a third pivot bearing means centrally disposed on the elongated bracket;

b. means to move said bracket from said inactive position to said active position including
(i) an elongated handle, said handle having two rotary bearing means integral with one end thereof, the first of said rotary bearing means of the handle being adapted to be mounted on said second pivot bearing means;
(ii) an L-shaped arm having connecting bearing means at each end thereof, one of said connecting bearing means of the L-shaped arm being connected to the second of said rotary bearing means on the handle and said other connecting bearing means at the other end of the L-shaped arm being connected to the third pivot bearing means;

said bracket, L-shaped arm and handle together with their bearing means being so proportioned and positioned as to allow the bracket to be substantially aligned with the surface of the plate means and above the floor of the dock when said bracket is in the inactive position and so as to allow the handle to be substantially parallel to the plane of the surface of the plate means when said bracket is in the inactive position; and said pivotally joined elements including said L-shaped arm forming a system providing a leverage means rotatable around said second pivot bearing means to drive said bracket into an over-the-center active position and lock the bracket against a return to the inactive position while said at least one corner of said dockboard is supported on said bracket;

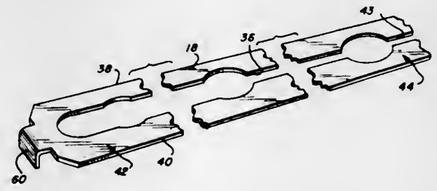
c. means to return said bracket to said inactive position.

4,075,730
NON-METALLIC SQUEEGEE FOR SHOWERBATH SURFACES AND THE LIKE
Herbert A. Siemund, Chicago, Ill., assignor to Greenview Manufacturing Company, Chicago, Ill.
Filed Sep. 20, 1976, Ser. No. 724,607
Int. Cl.² A47L *1/08, 13/11*
U.S. Cl. 15—245 **3 Claims**



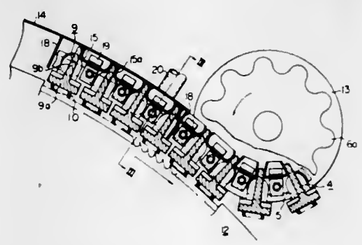
1. A squeegee construction comprising a relatively rigid plastic handle of T-shaped configuration providing a gripping portion and a crossbar, said crossbar having upper and lower rigid non-spreadable jaws defined by an undercut groove of a particular internal configuration along the entire length of said crossbar, an integral extruded squeegee mounted in said crossbar jaws, said squeegee formed of a synthetic plastic resin, said squeegee having a rigid backbone of cross-sectional configuration capable matingly to engage within said undercut groove but requiring an endwise entry and sliding movement to effect such engagement, said squeegee further having a flexible and resilient squeegee blade of synthetic plastic resin connected with said backbone along one edge thereof at a junction which provides for substantial portion of the squeegee blade to extend laterally of an be free to flex relative to the crossbar, said squeegee blade being of a durometer hardness which is substantially different from the durometer hardness of the backbone part such that said squeegee blade is elastomeric in character, the length of said squeegee blade and backbone being substantially greater than the length of the crossbar jaws, the squeegee extending beyond the ends of the jaws, the backbone supporting the squeegee blade sections extending beyond the crossbar, and means on the crossbar and backbone preventing endwise disengagement of the squeegee.

4,075,731
WINDSHIELD WIPER REFILL UNIT
William H. Harbison, Merrillville; Michael G. Mohnach, Valparaiso, and John J. Plisky, Munster, all of Ind., assignors to The Anderson Company, Gary, Ind.
Filed Oct. 28, 1975, Ser. No. 626,077
Int. Cl.² B60S *1/04*
U.S. Cl. 15—250.42 **2 Claims**



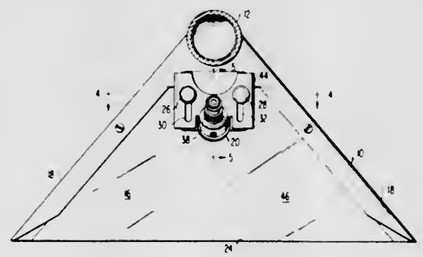
1. A windshield wiper blade having an articulated superstructure, a wiper refill unit, means on said superstructure for slidably engaging said wiper refill unit, said wiper refill unit having a resilient wiping element and a backing strip, said wiping element having a pair of oppositely facing grooves separated by a web, said backing strip having a slot extending lengthwise thereof with the end portions of said slot having a width substantially equal to the width of said web in the wiping element, the width of said slot tapering toward the midportion of the backing strip so that said slot is narrower at the midportion than at said end portions, said backing strip being seated in said grooves in said wiping element with said web nesting in said slot, the walls of said narrower portion of the slot in the backing strip compacting the midportion of said web in said wiping element, said backing strip having spaced apart outer edges with each outer edge lying in a plane, and said web urging said midportion of the backing strip outward so that the outer edges of the backing strip at said midportion project outward beyond said planes of said outer edges, and seat in said means on said superstructure.

4,075,732
CLEANING DEVICE APPLIED TO FLATS OF A REVOLVING FLAT CARD
Hidejiro Araki, Toyoake, and Susumu Otani, Obu, both of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Japan
Filed Dec. 31, 1975, Ser. No. 645,519
Claims priority, application Japan, Jan. 8, 1975, 50-4799
Int. Cl.² D01G *15/76*
U.S. Cl. 15—301 **7 Claims**



1. A cleaning device for preventing discharge of short fibers and dust from a revolving flat card into the atmosphere of the carding room by an air stream emerging from spaces between adjacent ones of a plurality of flat bars, said flat bars being carried by a pair of spaced link chains revolving at positions above the cylindrical working surface of a main cylinder of said card, so that said flat bars move through a working path having a portion adjacent said cylindrical working surface, each of the link chains being provided with a plurality of link members, a pair of curved bars mounted on corresponding side frames of said card so that each flat bar slides on a corresponding curved bar at both end portions thereof, said cleaning device comprising cover plates rigidly held by each of said curved bars in such a manner that said cover plates define curved spaces along the path of movement of the end portions of the flat bars adjacent said cylindrical working surface, resilient sealing members rigidly held by said link members in such a manner that said resilient sealing members seal open spaces between adjacent flat bars, said cover plates, offset portions thereof, and part of said revolving card cooperating to form corresponding ducts, said resilient sealing members and said flat bars cooperating to form conduits communicating with said ducts, and discharge pipes connected to said ducts whereby said short fibers and dust in the air stream emerging from said conduits between adjacent flat bars to said ducts are discharged from said card through said discharge pipes.

4,075,733
CLEANING HEAD
Carl Parise, Reno, and James M. Wimsatt, Carson City, both of Nev., assignors to Parise & Sons, Inc., Reno, Nev.
Filed Apr. 7, 1976, Ser. No. 674,696
Int. Cl.² A47L *7/00*
U.S. Cl. 15—322 **1 Claim**



1. In a cleaning head for a hot water extraction system which comprises:

(a) walls defining a vacuum chamber one side of which is open to the exterior and

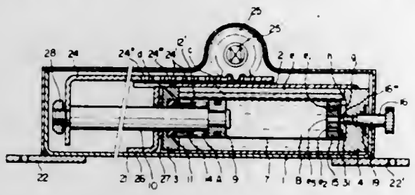
(b) means for spraying a jet of atomized hot water against the plane defined by the open side of the vacuum chamber defined by said walls, the improvement wherein said means is mounted on one of said walls by means of two screws which pass through slots in said means and thread into one of said walls, the major axes of said slots being perpendicular to the plane defined by the open side of the vacuum chamber defined by said walls, whereby the distance of said means from the plane defined by the open side of the vacuum chamber defined by said walls can be varied, thereby varying the area of impact of the jet of atomized hot water on the plane defined by the open side of the vacuum chamber defined by said walls.

4,075,734

DOOR CLOSER

Tosiro Nagase, Sagamihara, Japan, assignor to Tokico Ltd., Japan

Filed Jul. 21, 1976, Ser. No. 707,290
Int. Cl.² E05F *3/22*
U.S. Cl. 16—58 **4 Claims**



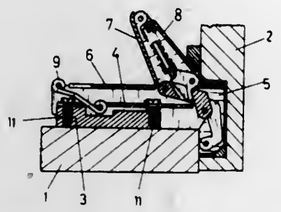
1. A door closer comprising a horizontally disposed inner cylinder, a piston slidable in the inner cylinder, an outer cylinder surrounding the inner cylinder and spaced therefrom for defining an annular space therebetween, the wall of the inner cylinder having holes therein at the opposite ends thereof connecting the interior of the inner cylinder with said annular space, a piston rod extending from said piston out through one end of the cylinders and being adapted to operate a door for moving the door in the closing direction when the rod moves out of the cylinder, hydraulic fluid filling the interior of said inner cylinder, said holes and a part of said annular space, a high pressure gas filling the remaining part of said annular space, and resisting force generating means in the flow path of the hydraulic fluid from the other end of the inner cylinder to the outer cylinder for generating a resisting force to flow of hydraulic fluid when the rod moves in the door closing direction.

4,075,735

SNAP-TOGGLE HINGE

Erich Röck, Hochst, and Bernhard Mages, Dornbirn, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Hochst, Austria

Filed Nov. 8, 1976, Ser. No. 740,242
Claims priority, application Austria, Nov. 13, 1975, 8673/75
Int. Cl.² E05D *11/10*; E03D *3/06*; E05F *1/14*
U.S. Cl. 16—145 **6 Claims**



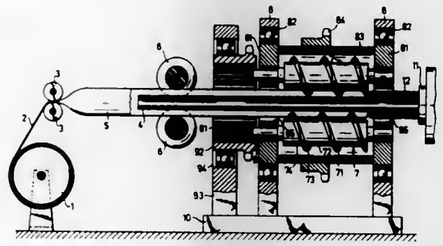
1. A snap-toggle hinge for connecting the door of an article of furniture to a side wall of the article of furniture, wherein said door is capable of swinging more than 90° between closed and opened positions thereof, said hinge comprising:
- a first abutment member attachable to a door of an article of furniture;
- a second abutment member attachable to a side wall of said article of furniture;
- a plurality of pivot arm means, connected seriatim, for connecting said first and second abutment members such that said door is swingable with respect to said side wall by an angle of more than 90° between closed and fully opened positions of said door;
- a toggle segment pivotally connected to said first abutment member, said toggle segment having a projection extending therefrom;
- a guide member pivotally connected to said second abutment member, said guide member having extending therethrough an opening, said opening being completely laterally enclosed and defined by internal wall surfaces;
- said projection extending into said opening when said door is in said closed position, and said projection being without said opening when said door is in said opened position;
- one of said internal wall surfaces defining said opening being convex and dimensioned such that a surface of said projection slides against said convex internal surface during movement of said door into and out of said closed position; and
- spring means for urging said projection into said opening when said door is in said closed position.

4,075,736

PROCESS AND APPARATUS FOR SHIRRING TUBULAR CASINGS

Ernst Riegler, Walluf, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Filed Feb. 26, 1974, Ser. No. 445,982
Claims priority, application Germany, Feb. 27, 1973, 2309721
Int. Cl.² A22C *13/00*
U.S. Cl. 17—42 **3 Claims**



1. In the process for shirring cylindrical tubular casings, especially artificial sausage casings of synthetic material, in which an inflated casing is conveyed in the direction of its longitudinal axis and shirred, with pleating, against a counterforce by shirring forces acting upon the circumference of the casing,

the improvement which comprises applying the shirring forces by at least two worm means, the longitudinal axes of which extend parallel to the longitudinal axis of the inflated casing and the teeth of which are in frictional contact with the inflated tube and depress it, said worm means rotating about their longitudinal axes and simultaneously revolving at a radial distance around the circumference of the inflated tubular casing.

4,075,737

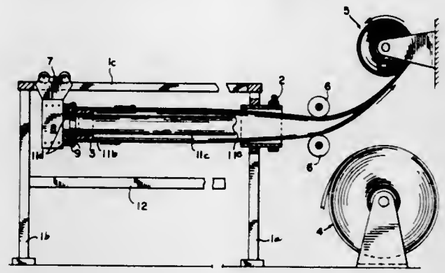
METHOD AND DEVICE FOR EVERTING TUBULAR CASINGS

Alfred Donald Story, Danville, Ill., assignor to Teepak, Inc., Chicago, Ill.

Filed Sep. 20, 1976, Ser. No. 724,893
Int. Cl.² A22C *13/00*
U.S. Cl. 17—45 **11 Claims**

1. A device for everting a thin-walled flexible tubular casing or the like, comprising a support frame, clamping means mounted on the frame for gripping a distal end portion of an everted portion of the casing, a ring for placement in a loop formed by a juncture between said everted portion and a following noneverted portion attendant to said portions being

telescoped with respect to each other, and means external of said casing for displacing said ring relative to said clamping



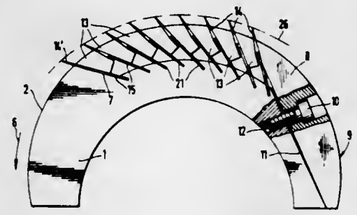
means lengthwise of the casing for thus everting said noneverted portion of the casing.

4,075,738

CIRCULAR COMB FOR COMBING MACHINES

Josef Egerer, Schwabach, Germany, assignor to Staedtler & UHL, Schwabach, Germany

Filed Jul. 6, 1976, Ser. No. 703,109
Claims priority, application Germany, Jul. 10, 1975, 2530839
Int. Cl.² D01G *19/10*
U.S. Cl. 19—234 **7 Claims**



1. A circular comb for combing machines comprising a segment-shaped member having a cutout accommodating individual needle strips located parallel to each other and pressure strips inside said cutout of said segment-shaped member, said pressure strips comprising a pressure member and a flexible lamination connected to said pressure member, each of said pressure members being located between said needle strips and fastened to said segment-shaped member, fastening means for fastening a free end of said lamination to said segment-shaped member, a clamping strip at one end of said cutout and detachably connected to said segment-shaped member, said clamping strip pressing all needle strips and pressure members against one another and against an opposite lateral surface at the other end of said cutout, said lateral surface being a support surface for the adjacent needle strip.

4,075,739

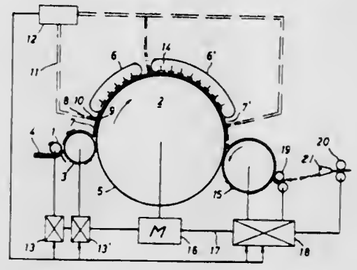
METHOD AND APPARATUS FOR CONTROLLING A CARD

Paul Staheli, CH-9535 Wilen near Wil, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Oct. 29, 1975, Ser. No. 626,864
Claims priority, application Switzerland, Nov. 1, 1974, 14652/74
Int. Cl.² D01H *5/32*
U.S. Cl. 19—240 **11 Claims**

1. A method of controlling a card having a plurality of operating elements for producing a sliver including a rotating main cylinder receiving and conveying a fiber layer thereon, a plurality of flats disposed about the cylinder, a licker-in roll for transferring a fiber layer to the cylinder and doffing rolls downstream of said main cylinder for doffing the fiber layer from the main cylinder; said method comprising the steps of

measuring pressure differences caused by air contained in the fiber layer on the main cylinder due to variations in fiber layer thickness and independently of any outside air



source, the amount of contained air being correlated to the thickness of the fiber layer; and

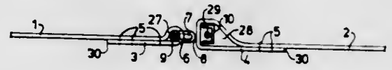
controlling at least one of the operating rolls in the path of the fiber layer in response to predetermined measured pressure differences to obtain a uniform sliver.

4,075,740

WIRE CLOTH JOINT AND A METHOD AND MEANS FOR MAKING THE SAME

Einar Gustav Vilhelm Svensson, Box 61, S 310 33 Holm, Sweden

Division of Ser. No. 660,933, Feb. 24, 1976. This application Jul. 27, 1976, Ser. No. 708,983
Claims priority, application Sweden, Mar. 10, 1975, 7502616
Int. Cl.² F16G *3/02*
U.S. Cl. 24—31 B **1 Claim**



1. A wire cloth joint comprising the joined confronting ends of two wire cloths including warp and weft threads, respective wire cloth ends having a folded portion secured by seams, characterized in that one wire cloth has, along its end, a wire screw rigidly attached thereto, said wire screw extending along the entire length of said one wire cloth end and including free loops projecting beyond the one wire cloth end, the other wire cloth having weft threads removed at an outer edge of said fold and defining intermittent spaces between warp threads where the weft threads have been removed, said free loops penetrating said spaces between the warp threads at the edge of said other wire cloth end and extending into the space within the fold of said other wire cloth, and a locking wire penetrating all of the free loops in said space of the other wire cloth and retaining the two wire cloth ends together as a wire cloth joint.

4,075,741

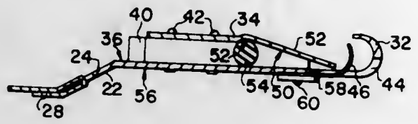
AUTOMATICALLY DISENGAGABLE SAFETY BUCKLE

Andrew Barbal, 147-29 16th Road, Whitestone, N.Y. 11357

Filed Nov. 2, 1976, Ser. No. 738,071
Int. Cl.² A44B *11/00*
U.S. Cl. 24—201 TR **2 Claims**

1. An automatically disengagable safety buckle comprising a C-shaped rod being disposed pivotably secured to one end of a first flexible strap, a plate being disposed pivotably secured to one end of a second flexible strap, a portion of the marginal edge of the plate being disposed forming a hook, the plate having an opening adjacent the hook, a resilient spring-like member being disposed passing through the opening in the plate and having a hook-like end disposed adjacent to and

parallel with the hook and located intermediate the hook and said one end of the second flexible strap, a sheet being disposed fixedly secured to the plate and spaced outwardly therefrom on a lateral surface of the plate, the sheet having a first portion thereof being disposed a fixed distance apart from said lateral surface of the plate, the sheet having a second portion thereof being disposed extending arcuately outwardly from said first portion of the sheet, the sheet having a third portion thereof angularly displaced towards said lateral surface and said opening, said third portion of the sheet being disposed adjacent said



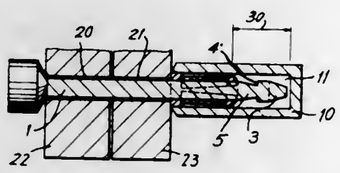
opening, said first portion of the sheet being disposed adjacent said one end of the second flexible strap, said second portion of the sheet being disposed intermediate said first and said third portions of the sheet, a bar, said bar being disposed intermediate said lateral surface of the plate and the adjacent lateral surface of the sheet, one end of the bar being wedge-shaped and being disposed intermediate the sheet and said one end of the second flexible strap, the other end of the bar being disposed in touching engagement with said third portion of the sheet and said first portion of the sheet.

4,075,742

ENGAGEMENT LOCK HAVING TWO STAGES OF ENGAGEMENT AND ASSOCIATED METHOD

Preben Michael Remark, Tjornevej 10, DK-2800 Lyngby, Denmark. and Aksel Johannes Jensen, Copenhagen, Denmark, assignors to Preben Michael Remark, Lyngby, Denmark

Continuation-in-part of Ser. No. 546,895, Feb. 4, 1975, abandoned. This application Aug. 4, 1976, Ser. No. 711,687
Claims priority, application Denmark, Feb. 5, 1974, 609/74
Int. Cl.² E05C *19/18*
U.S. Cl. 24—211 R **9 Claims**



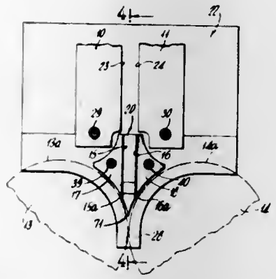
1. An engagement lock in combination with a pair of locking members of given thickness having aligned apertures, the lock comprising first and second members adapted for automatic interlocking engagement after the first member has been passed through the locking members of the container and is introduced into a cavity provided in the second member, said first member being a rod-shaped body having a head at one end and tapered insertion end at the other end, said tapered end having an abruptly reduced cross-sectional area slightly rearwards of the tapered section so as to form a shoulder, a further tapered section extending from said shoulder on the rod-shaped body, said second member including a casing with a bore, a tubular sleeve open at both ends disposed in said bore with substantially no mobility in the axial direction, said sleeve being slit at the end located innermost within said casing and having a sectional area at that end permitting the shoulder of the rod-shaped body to pass through the tubular sleeve only as a result of the elasticity of the slit end of the sleeve, and wherein in the locked position when the shoulder has passed through the sleeve a clearance is provided between the casing or head and a respective one of the locking members sufficient to permit the insertion of a cutting tool, at least an equal clearance being provided between the insertion end of the rod and the bottom of the casing, so that the rod-shaped body after the locking and against resistance from an expansion of the slit sleeve can be further advanced into the casing to a fully inserted position by sliding contact of the further tapered section in said sleeve until the casing and the head of the body engage respective locking members and completely take-up said clearance, whereby said rod-shaped body will be entirely concealed by the locking members of the container, said head being engageable to retract the rod-shaped body to return the same to said loaded position and thereby provide clearance between the casing or head and one of the locking rings to provide access to said rod-shaped body and enable the same to be cut.

4,075,743

COMPRESSION CRIMPING APPARATUS

John S. Roberts, Ellicott, Md., assignor to Kling-Tecs, Inc., Columbia, Md.

Filed Jun. 16, 1976, Ser. No. 696,698
Int. Cl.² D02G *1/12*
U.S. Cl. 28—263 **3 Claims**



1. In apparatus for compression crimping fibrous material comprising a pair of feed rollers forming a nip therebetween to engage the fibrous material for advancing the fibrous material and stationary walls defining a chamber for receiving the fibrous material from the rollers and in which chamber the fibrous material is compressed to form a plug of yarn, the trailing end of which becomes situate downstream of the nip of the rollers and against which the yarn entering the chamber impinges, said chamber having corners, the periphery of the rollers along the sides thereof intercepting said corners downstream and outwardly of the nip formed by the rollers, the improvement comprising said stationary walls forming stationary surface means in said chamber immediately adjacent said roller sides for keeping the fibrous material entering said chamber at a location upstream of the trailing end of the plug towards said roller sides away from the intercepted corners, said stationary surface means comprising two opposing surfaces extending within and being formed along the lines of the cusp between and on both sides of said rollers from adjacent the nip of the rollers and downstream to adjacent said corners, and inclining inwardly towards one another from the nip in the direction in which the fibrous material is advanced, whereby the catching of fibers from the fibrous material at the intercepted corners is prevented.

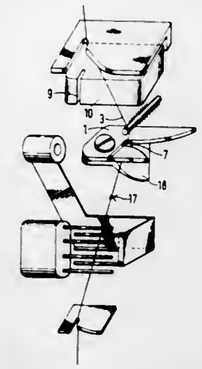
4,075,744

THREAD TESTING APPARATUS FOR TEXTILE MACHINES

Kresimir Mista, and Ditmar Gerstner-Stevens, both of Obertshausen, Germany, assignors to Karl Mayer Textilmaschinenfabrik GmbH, Obertshausen, Germany

Filed Sep. 20, 1976, Ser. No. 724,505
Claims priority, application Germany, Oct. 2, 1975, 2543983
Int. Cl.² D01H *13/22*
U.S. Cl. 28—224 **7 Claims**

1. In a thread testing apparatus having a fault sensing zone operable to receive a strand of thread and detect faults in said thread as the strand moves through the zone along a usual strand path, the strand being removable from said zone, the improvement comprising:



a thread inserter located before said fault sensing zone and adapted to insert said thread into said fault sensing zone, said thread inserter including a knot detecting means for detecting knots of predetermined dimensions in said thread.

4,075,745

APPARATUS FOR MANUFACTURING FILAMENTS OF VARYING DENIER

Alan H. Norris, and Phillip W. Chambley, both of Rome, Ga., assignors to Champion International Corporation, Stamford, Conn.

Filed Feb. 25, 1977, Ser. No. 771,954
Int. Cl.² D02J *1/22*
U.S. Cl. 28—243 **4 Claims**



1. An apparatus for fabricating filaments exhibiting variations in denier along its length comprising:

a. means to propel a running length of filament from a feed roller to a draw roller, and

b. electrically activated tension means disposed between said feed roller and said draw roller engaging said filament for providing variable tension thereon, said electrically activated tension means comprising electrically rotatable means having an output shaft coupled thereon, said output shaft being provided with engaging means for engaging said filament and slidably capturing said filament for entwinement on said output shaft.

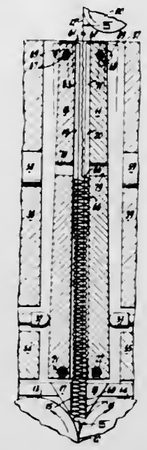
4,075,746

COMPRESSION CRIMPING APPARATUS

John S. Roberts, Ellicott, Md., assignor to Kling-Tecs, Inc., Columbia, Md.

Filed Jun. 16, 1976, Ser. No. 696,697
Int. Cl.² D02G *1/12*
U.S. Cl. 28—264 **3 Claims**

1. Apparatus for compression crimping filamentary yarn comprising means defining a compression crimping zone, means for feeding filamentary yarn into the compression crimping zone, a pair of movable members each having a face substantially opposed to a face of the other, said faces defining lateral walls of the zone, means for positively biasing said members toward each other to restrict egress of the yarn from the zone and thereby constituting said members as means for exerting a back pressure on the yarn, causing the yarn to buckle, form a plug in the zone and thereby crimp in the zone, opposing surface means downstream of said feeding means and upstream of said movable members for initially guiding and establishing the lateral cross-sectional dimension of the plug, said members extending downstream from the downstream



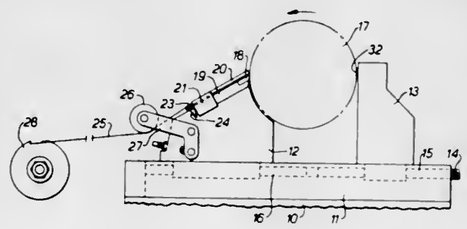
ends of said opposing surfaces for substantially the length of said zone, each said face of each of the members being restricted by opposing wall means extending from the member for preventing filaments of the plug from escaping from between the members.

4,075,747

MANUFACTURE OF METAL STRIP

David P. Hague; Dalip T. Malkani; Andrew Middlemiss, and Stuart Scholey, all of Sheffield, England, assignors to British Steel Corporation, London, England

Filed Nov. 29, 1976, Ser. No. 745,559
Claims priority, application United Kingdom, Nov. 28, 1975, 49056/75
Int. Cl.² B21D *33/00*
U.S. Cl. 29—18 **9 Claims**



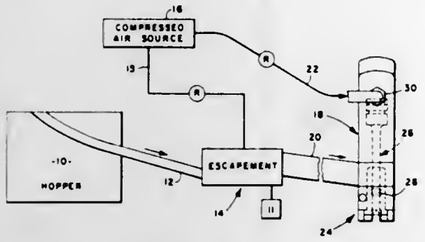
1. Apparatus for manufacturing metal strip from a cylindrical metal workpiece including means for rotating the workpiece about its longitudinal axis, a cutting tool together with means for feeding said cutting tool continuously into the peripheral surface of the workpiece so as to produce a continuous metal strip peeled from the surface of the workpiece, coiler means for collecting the peeled strip, clamp means positioned to receive the leading portion of the strip peeled from the workpiece and connected to the coiler means, means for guiding and leading portion of peeled strip towards and into the mouth of the clamp means, and means responsive to the leading portion of the strip entering the mouth of the clamp means to actuate the clamp means to grip the leading portion of the peeled strip and to cause the coiler means to pull the clamped strip around the coiler.

4,075,748

FASTENER EMPLACEMENT MECHANISM

Albert T. Buttriss, Fairview Park, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Jan. 28, 1977, Ser. No. 763,373
Int. Cl.² B23P *19/04*; B25D *9/18*
U.S. Cl. 29—225 **16 Claims**



1. An automatic fastener emplacement device for applying fasteners one at a time to a work piece, said device comprising:
a source of oriented fasteners;
an assembly tool having a nose piece for receiving the work piece therein and a ram for driving fasteners from the nose piece onto the work piece, said nose piece having an open end for receipt of the work piece therein and ejection of fasteners therefrom;
a delivery system for conveying fasteners one at a time from said source to said nose piece;
an escapement assembly for controlling said delivery system; and
a trigger activated control mechanism including a trigger located within said nose piece, said control upon contact of said trigger effective to cause said escapement assembly to release a single fastener from said source to said delivery system and to cause said delivery system to convey said released fastener to said nose piece and upon termination of contact with said trigger effective to cause said ram to drive said delivered fastener from said nose piece.

4,075,749

TOOL FOR CLOSING A WALL OPENING

Jerry Hubeny, 2229 S. Elmwood Ave., Berwyn, Ill. 60402

Filed Dec. 15, 1975, Ser. No. 640,955
Int. Cl.² B23P *19/04*
U.S. Cl. 29—268 **1 Claim**



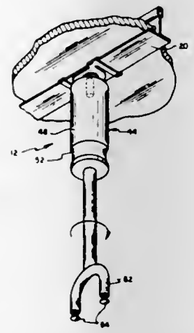
1. A tool for closing an opening in a wall comprising a pair of pliers pivotally connected at their central portions, said pliers providing handles at the rearward portions and providing at their forward portions a pair of jaws, a magnet at the forward end of one of said jaws, said magnet being cylindrical and having its longitudinal axis transverse with the longitudinal axis of said one jaw and having a flat circular magnetized surface facing the other of said jaws, a metallic plug having a circular flat metallic disc which is adjacent said magnetized surface and held thereon by the force of said magnet, the other of said jaws having a backing piece having a pair of backing members aligned with areas of said wall on opposite sides of said opening, said backing piece being pivotally attached at its center with said other jaw, whereby when said jaws are on opposite sides of said wall and said plug is aligned with said opening and said handles are moved toward each other, said plug is moved into said opening.

4,075,750

CONNECTOR TOOL APPARATUS FOR CEILING CLIPS

Ronald E. Collumber, 823 N. Chautauqua, Wichita, Kans. 67214

Filed May 13, 1976, Ser. No. 686,175
Int. Cl.² B25B *27/14*
U.S. Cl. 29—278 **2 Claims**



1. A connector tool apparatus operable to secure a hanger clip to a bottom wall of a T-bar member; comprising:
(a) a handle assembly secured to an actuator assembly;
(b) said handle assembly having a clip connector assembly connectable to an anchor assembly of the hanger clip to secure the anchor assembly to the T-bar member;
(c) said actuator assembly having a connector arm;
(d) said connector arm having parallel arm sections;
(e) each arm section having an outer connector head connectable to a connector nut of the hanger clip; whereby said connector arm is rotatable to place the connector nut on the anchor assembly;
(f) said clip connector assembly having a connector coupling connected to a shaft member;
(g) said connector coupling having a threaded opening to threadably receive a connector shaft of the hanger clip in order to rotate the anchor assembly;
(h) said shaft member having an externally threaded end section with a central hole therein;
(i) said clip connector assembly having a set screw member threadably mounted in said threaded opening in said connector coupling; and
(j) said set screw member having a conical end section mounted in said central hole to secure said shaft member to said connector coupling.

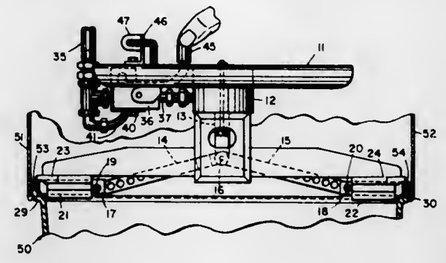
4,075,751

METHOD OF SECURING SHEET METAL TO PLASTIC

Lincoln Paul Tschoop, and Marcel Alfred Steiner, both of Wichita, Kans., assignors to The Coleman Company, Inc., Wichita, Kans.

Filed Nov. 8, 1976, Ser. No. 739,636
Int. Cl.² B23P *11/00*
U.S. Cl. 29—432.1 **1 Claim**

1. A method of securing first and second metal wall portions to first and second plastic base wall portions comprising: forming an elongated groove at one edge of each of said first and second metal wall portions and assembling said grooves respectively to conforming edges of said plastic wall portions; placing first and second punch heads between said first and second metal wall portions and adjacent the opposing surfaces of the grooves thereof; said punch heads being mounted to a frame for sliding motion in opposing directions; and using pneumatic pressure to actuate a cylinder and linkage to urge said punch heads apart in linear motion, the punch points thereof indenting and at least partially tearing opposing portions of said grooves respectively, the torn portions being embedded in plastic received in said groove.

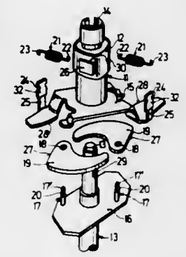


4,075,752

METHOD OF MAKING DISTRIBUTOR ASSEMBLY BEARING STRUCTURES AND THE LIKE

Hartmut Brammer; Karl Ehrmann; Heinz Haug; Jörg Issler; Günter Kiss, all of Stuttgart; Harald Kalippke, Hobenacker; Herbert Mägdefrau, and Karl-Heinz Schneider, both of Sonthofen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Continuation of Ser. No. 307,387, Nov. 17, 1972, abandoned.
This application Apr. 15, 1974, Ser. No. 460,753
Claims priority, application Germany, Nov. 20, 1971, 2157658
Int. Cl.² B23P *15/00*
U.S. Cl. 29—434 **2 Claims**



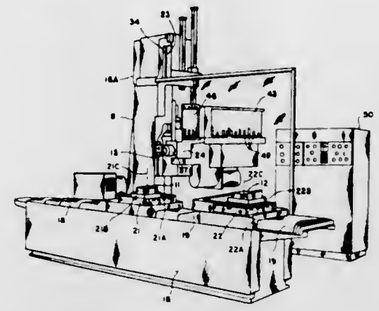
1. Method of manufacturing a mechanical assembly of the shaft and the shift plate bushing of an ignition distributor of an internal combustion engine, which assembly provides for relative movement of said shaft and shift plate bushing with reduced frictional wear, comprising the steps of:
cutting into short pieces a length of wear-resistant tubing of substantially uniform wall thickness and made of a resin material having a cross-linked molecular structure;
putting one of said pieces, in the form in which it is obtained after the aforesaid step of cutting said length of tubing, over a distributor shaft so as to produce a tight-fitting coating over a surface of said shaft in position to bear against a distributor shift plate bushing during relative movement of said shaft and bushing;
shrinking said piece of tubing in place on said distributor shaft by application of heat thereto, and
assembling said shaft so coated together with said bushing in such a way as to constrain said bushing to move in frictional contact with said coating of said shaft.

4,075,753

PLURAL SLIDE MACHINE

Nagle V. Gusching, and Kermit T. Kuck, both of Sidney, Ohio, assignors to The Monarch Machine Tool Company, Sidney, Ohio

Filed Oct. 17, 1975, Ser. No. 623,435
Int. Cl.² B23C *1/14*; B23Q *3/157*
U.S. Cl. 29—568 **15 Claims**



1. A plural slide machine for machining a first and a second workpiece by a workpiece tool, comprising in combination:
a frame;
first and second slide means;
first and second mountings on said first and second slide means for securing the first and the second workpiece, respectively;
way means mounted relative to said frame receiving said first and second slide means enabling movement thereof along a substantially horizontal plane;
third slide means;
means mounting said third slide means for movement relative to said frame in a substantially vertical plane;
means connected for moving said third slide means;
a toolholder for holding the workpiece tool;
means mounting said toolholder for movement with said third slide means;
fourth slide means enabling third dimensional movement between said toolholder and the first and second workpieces on said first and second slide means;
means connected to move said fourth slide means;
first drive means connected continuously to said first slide means for moving said first slide means on said way means for machining movements and to a standby position remote from said toolholder;
second drive means connected continuously to said second slide means for moving said second slide means on said way means for machining movements and to a standby position remote from said toolholder;
and control means connected to said slide means for enabling machining of the first workpiece through movement of said first, third, and fourth slide means and for enabling machining of the second workpiece through movement of said second, third, and fourth slide means.

4,075,754

SELF ALIGNED GATE FOR DI-CMOS

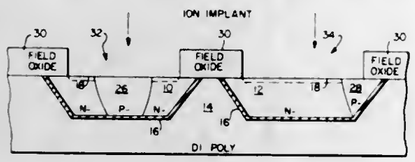
Koy B. Cook, Jr., Mount View, Calif., assignor to Harris Corporation, Cleveland, Ohio

Continuation of Ser. No. 445,861, Feb. 26, 1974, abandoned.
This application Mar. 30, 1976, Ser. No. 671,772
Int. Cl.² B01J *17/00*
U.S. Cl. 29—571 **20 Claims**

1. A process for fabricating complementary metal oxide field effect devices in a substrate of a first conductivity type having a flat surface comprising the steps of:
selectively doping a portion of a first region of said substrate in which a channel of a first device is to be formed with impurities opposite to said first conductivity type of an

amount sufficient to change the conductivity type of the selectively doped portion for determining the threshold voltage of said first device;

doping a second region of said substrate, spaced from said first region, in which a channel of a second device, of a channel type opposite the channel type of said first device, is to be formed with impurities of said opposite conductivity type of an amount sufficient to only reduce the impurity concentration without changing the conductivity type of said second region for determining the threshold voltage of said second device; and



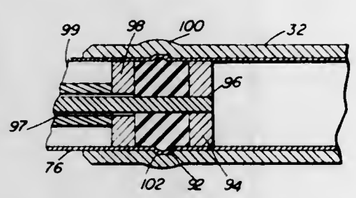
thereafter forming a gate oxide layer on each of said regions, forming a channel defining gate on each layer of said gate oxide layer and forming source and drain zones for said devices using said gates as alignment masks.

4,075,755

HIGH VOLTAGE FUSE AND METHOD OF ATTACHING TUBULAR MEMBERS THEREIN

Joseph Bernatt, Arlington Heights, and Alfred Steegmueller, Skokie, both of Ill., assignors to S&C Electric Company, Chicago, Ill.

Filed Nov. 11, 1976, Ser. No. 741,026
Int. Cl.² H01H *69/02*
U.S. Cl. 29—623 **15 Claims**



1. A method of attaching a hollow metallic tube to a hollow insulator tube in the manufacture of a high voltage circuit interrupter comprising the steps of:

a. forming a groove on the interior of the insulator tube;

b. inserting the metallic tube into the insulator tube to a desired location; and

c. expanding the metallic tube at a position where attachment is desired until the metallic tube engages the groove and the insulator tube is slightly, exteriorly, and outwardly deformed adjacent the expansion of the metallic tube.

4,075,756

PROCESS FOR FABRICATING ABOVE AND BELOW GROUND PLANE WIRING ON ONE SIDE OF A SUPPORTING SUBSTRATE AND THE RESULTING CIRCUIT CONFIGURATION

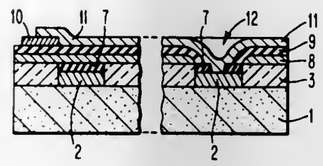
Charles John Kircher, Yorktown Heights, and Hans Helmut Zappe, Granite Springs, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1976, Ser. No. 701,059
Int. Cl.² H05K *3/00*
U.S. Cl. 29—625 **24 Claims**

1. A process for fabricating above and below ground plane wiring on one side of a supporting substrate comprising the steps of:

forming a plurality of anodizable metallic conductors surrounded by insulation on the surface of a substrate which is conductive at room temperature,

forming a conductive ground plane of anodizable metallic material on said insulation in insulated spaced relationship with said anodizable metallic conductors,



forming at least a single via hole in said ground plane in registry with at least a single one of said anodizable metallic conductors,

forming insulation on said ground plane, and,

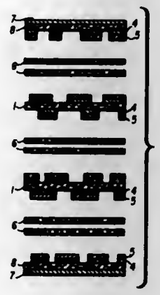
forming a plurality of metallic conductors on said ground plane insulation.

4,075,757

PROCESS IN THE PRODUCTION OF A MULTILAYER PRINTED BOARD

Hans R. Malm; Peter J. Nilsson, both of Perstorp, Sweden, and Jiri K. Konicek, Broad Brook, Conn., assignors to Perstorp AB, Perstorp, Sweden

Filed Aug. 9, 1976, Ser. No. 712,863
Claims priority, application Sweden, Dec. 17, 1975, 7514242
Int. Cl.² H05K *3/06, 3/36*
U.S. Cl. 29—625 **7 Claims**



1. A process for the production of a multilayer printed board with plated-through holes for electronic use having a desired conductive pattern in each layer with increased adhesion between the layers, comprising:

a. forming a plating resist layer in the shape of a negative of the desired conductive pattern on the inner surfaces of a desired number of insulating bases having both sides coated with an unpatterned metal layer of copper or a copper alloy to leave remaining visible parts forming the desired conductive pattern,

b. electroplating said remaining visible parts of the metal coated layers with a thin, rough, adhesion-promoting metal layer comprising at least one metal selected from the group consisting of copper, zinc, nickel, tin, and alloys thereof, and in the event copper, zinc or an alloy thereof is electroplated, then further electroplating on top of this adhesion-promoting layer an etch resist layer of nickel, tin or an alloy thereof,

c. removing the negative plating resist layer applied in step (a),

d. etching away the parts of the metal layer uncovered by step (c),

e. placing between the insulating bases provided with the conductive patterns at least one layer of plastic or a fiber material impregnated with partially cured or hardened plastic to form a composite,

f. laminating under heat and pressure the composite article of step (e) to form a multilayer printed board having an extremely good adhesion between the metal patterns and the plastic layers,

g. producing holes in the multilayer printed board in a desired pattern, and

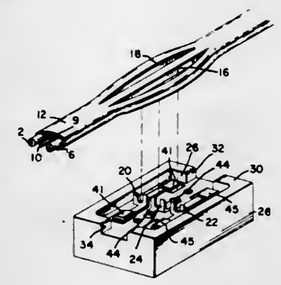
h. plating through the holes and providing the surface layers on the multilayer printed board with a desired conductive pattern.

4,075,758

METHOD FOR TERMINATING SHEATH COVERED CABLE AND FOR PROVIDING A WIRING SYSTEM

Stuart L. Parsons, Belleair Beach, Fla., and George Henry Vigeant, deceased, late of St. Petersburg, Fla. (by Mrs. George Henry Vigeant, heir), assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 337,513, March 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 84,009, Oct. 26, 1970, abandoned. This application Aug. 26, 1976, Ser. No. 717,820
Int. Cl.² H01R *43/00*
U.S. Cl. 29—628 **4 Claims**



1. In a method for preparing a sheath covered three conductor cable, including two outer conductors individually covered with insulation and a centrally located uninsulated ground conductor, for assembly with electrical terminals contained in a housing, the improvement comprising the steps of:

piercing said sheath on opposite sides of said ground conductor,

slicing entirely through said cable intermediate the ends thereof and longitudinally on both sides of said ground conductor and between said ground conductor and each of said insulation covered conductors to divide said sheath into longitudinal slitted portions overlying said conductors,

spreading apart said insulation covered conductors laterally from said ground conductor while maintaining said slitted portions of said sheath over said insulation covered conductors,

locating said ground conductor and said spread apart insulation covered conductors together with said slitted portions of said sheath over corresponding electrical terminals in said housing, with said conductors and with said outer sheath extending uninterrupted from one open end of said housing to another open end thereof,

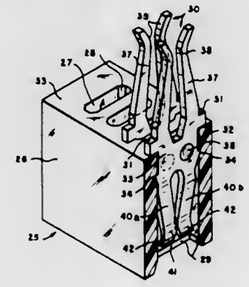
forcibly inserting said spread apart conductors together with said slitted portions of said sheath in between two slicing edges of corresponding spaced apart electrical terminals, thereby forcing the slicing edges to slice through the slitted portions of said sheath and the insulation covering said outer conductors, resulting in a high speed termination of said three conductor cable without interrupting either the conductors or the outer sheath.

4,075,759

TRANSVERSE CONNECTOR ASSEMBLY METHOD

Jerzy R. Sochor, Manhattan Beach, Calif., assignor to Elco Corporation, El Segundo, Calif.

Division of Ser. No. 569,100, Apr. 17, 1975, Pat. No. 4,004,845. This application Jul. 19, 1976, Ser. No. 706,385
Int. Cl.² H02G *15/00*
U.S. Cl. 29—629 **7 Claims**



1. A method for assembling contacts into elongated insulator housings to form connectors, comprising:

providing a plurality of insulator housings having a line of contact-receiving apertures along the length of each housing,

positioning said plurality of elongated insulator housing in side-by-side, parallel relationship so that corresponding apertures of said respective housing are aligned in rows intersecting the line of apertures of each housing,

providing an integral elongated strip of contacts including an integral carrier portion, with the spacings between said contacts along said carrier strip corresponding to the spacings between respective apertures of said rows of corresponding apertures,

aligning said contacts with the apertures of one of said rows of corresponding apertures,

inserting said contacts of said strip substantially simultaneously into said one row of corresponding apertures, and

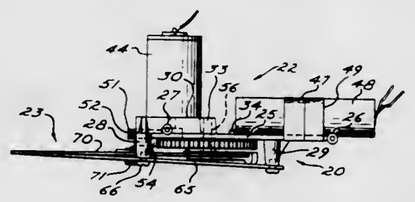
severing said elongated carrier strip from said contacts.

4,075,760

BATTERY OPERATED SHEARS

Robert A. Germain, Ashtabula, Ohio, assignor to True Temper Corporation, Cleveland, Ohio

Continuation of Ser. No. 270,608, July 11, 1972, abandoned. This application Jan. 16, 1974, Ser. No. 433,669
Int. Cl.² B26B *19/02*
U.S. Cl. 30—220 **7 Claims**



1. A shearing device comprising a housing; a motor mounted within said housing; a fixed blade made of flat, heavy gage sheet metal of substantial stiffness and limited flexibility securely mounted with respect to said housing, said fixed blade having a plurality of laterally spaced, forwardly directed teeth; a movable blade made of flat, heavy gage sheet metal of substantially the same stiffness and limited flexibility as said fixed blade, said movable blade having a plurality of laterally spaced, forwardly directed teeth; pivot means mounting said

blades to each other for laterally oscillating shearing movements; transmission means connecting said motor to said movable blade whereby said motor causes lateral oscillation of said movable blade and teeth with respect to said fixed blade and teeth in rapid shearing movements; said means mounting said blades to each other including means disposing said blades with the flat planes thereof tilted at a set angle convergently in the forward direction whereby the medial and rear portions of said blades are spaced apart and the teeth of each blade tend to project at least partially into the plane of the teeth of the other blade whereby only the cutting edges of said teeth engage during relative shearing movements thereof; the stiffness of said blades ensuring a positive cutting action; said movable blade having an elongated slot therein rearwardly of said pivot means; said transmission means including an eccentric drive pin slidably disposed within said slot for oscillating said movable blade; an insert member engaging said slot and providing wear surfaces at the edges of said slot; said insert member including integrally formed downwardly directed projection means adjacent to the rear of said movable blade in sliding contact with a flat surface portion of said fixed blade whereby said movable blade is supported at its upwardly spaced rear end portion.

4,075,761

DENTAL HANDPIECE

Ernst-August Behne, Bensheim-Auerbach, and Reinhard Straihammer, Kirschhausen, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jun. 22, 1976, Ser. No. 698,795
Claims priority, application Germany, Jul. 24, 1975, 2533189
Int. Cl.² A61C *1/10*
U.S. Cl. 32—27 **7 Claims**



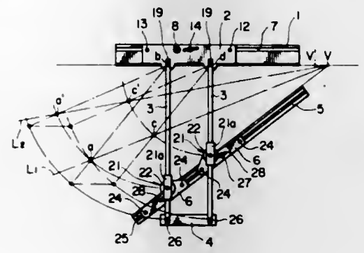
1. In a dental handpiece comprising a handle member which is formed of first and second parts, means interconnecting the two parts for relative rotation therebetween, a supply hose having a plurality of feed channels for a liquid and/or gaseous media being connected to the first part, a head section with a dental tool being connected to the second part, each of the two parts having connecting nipples arranged in the interior thereof, and hollow flexible tubes extending from the nipples of the first part to the nipples of the second part for conveying each of the media from the feed channels of the supply hose to the head section, said means for interconnecting the two parts enabling rotation of the second part of the handle member about a longitudinal axis of the handle member and relative to the supply hose with the flexible tubes compensating for the relative rotation between said two parts, the improvements comprising the second part having a length which amounts to at least one third of the overall length of the handle member, said second part at a free end having a hollow sleeve portion telescopically received in a hollow sleeve portion of the first part, said sleeve portions of the first and second parts forming a bearing disposed in a central axial region of the handle member for supporting the second part and head section for rotation on the first part, and said flexible tubes extending through said central region without support so that the first part is in contact with a hand as the second part and head section are rotated during manipulation of the handpiece.

4,075,762

INSTRUMENT FOR MAKING PERSPECTIVE DRAWING

Kazuomi Ohtake, 6-13, 2 chome, Tenjincho, Fuchu, Tokyo, Japan

Filed Sep. 28, 1976, Ser. No. 727,340
Claims priority, application Japan, Oct. 1, 1975, 50-119171
Int. Cl.² B43L *13/14*
U.S. Cl. 33—77 **3 Claims**



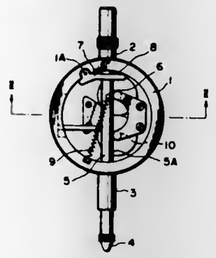
1. An instrument for making perspective drawings comprising a base plate to be located on a drawing board, a slider, means mounting said slider on said base plate for rectilinear sliding movement thereon, means for clamping said slider to said base plate in any desired position therealong, a parallelogram lever-and-link arrangement comprising a pair of parallel levers pivotally mounted at one end thereof on said slider and a link extending between and pivotally connected to the opposite ends of said levers, a ruler, and a pair of joint structures respectively interconnecting said ruler with said levers, each said joint structure including a sleeve establishing a sliding fit on said lever together with means for releasably fastening them together, a bracket pivotally mounted on said sleeve, and shoe means carried by said bracket, said ruler being provided with a longitudinally extending slotted portion with which said shoe means are engaged for slidingly guiding longitudinal movement of said ruler, and means for clamping said shoe means to said slotted portion at any desired position along said ruler.

4,075,763

DIAL INDICATOR GAUGE

Yasuyuki Yamaryo, Utsunomiya, Japan, assignor to Kabushiki Kaisha Mitutoyo Seisakusho, Tokyo, Japan

Filed Jun. 9, 1976, Ser. No. 694,370
Claims priority, application Japan, Jan. 8, 1976, 51-000936[U]
Int. Cl.² G01B *3/22*
U.S. Cl. 33—172 R **2 Claims**



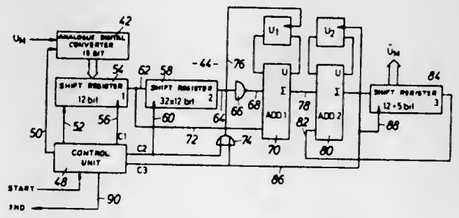
1. In a dial indicator gauge comprising a ring-shaped frame member, a spindle mounted for translational movement diametrically of said frame member, and a stopper pin projecting transversely from said spindle and positioned to strike the inner surface of said frame member when said spindle moves more than a predetermined distance relative thereto, the improvement which comprises an elongated buffer member extending across the path of travel of said stopper pin between said stopper pin and said inner surface so as to be struck by said stopper pin before it reaches said inner surface and delimiting an open space between said buffer member and inner surface, said buffer member being both resilient and compressible so that when struck by said stopper pin said buffer member first deforms into said space and is then compressed when further movement of said stopper pin squeezes said buffer member against said inner surface.

4,075,764

DEVICE FOR DETERMINING THE NORTH DIRECTION

Uwe Krogmann, and Uwe Wurditsch, both of Uberlingen, Germany, assignors to Bodenseewerk Geratetechnik GmbH, Uberlingen (Bodensee), Germany

Filed Oct. 8, 1976, Ser. No. 731,024
Claims priority, application Germany, Apr. 29, 1976, 2618868
Int. Cl.² G01C *19/38*
U.S. Cl. 33—324 **3 Claims**



1. In an apparatus for determining the north direction comprising a gyro including a housing suspended by a wire, a pickoff responding to deviations of the gyro from a zero position of the wire suspension and producing pickoff signals, a torquer fixed to the gyro housing, means connecting the torquer and the pickoff to apply the pickoff signal highly-amplified to the torquer, said torquer exerting a torque on the gyro about the suspension wire axis counteracting the gyro directing torque, and a measuring device sensitive to the amplified pickoff signal to produce a signal indicative of angle between the gyro axis and north, said measuring device including an analogue-digital converter for producing a timed sequence of digital signals, each digital signal being proportional to the pickoff signal at the time of sampling, and digital filter means connected to said converter for forming a recurrent average value of the sequence of digital signals and for the immediate output of the last average value formed each time, the improvement comprising:

said filter means forms the average value of the digital signals sampled at time intervals T according to the equation

$$\overline{U}_M(nT) = \overline{U}_M((n-1)\cdot T) + 1/N\,[\,U_M(nT) - \overline{U}_M((n-N)\cdot T)\,]$$

where
n is a consecutive whole number,
$\overline{U}_M(jT)$ the average value output at the time JT,
$U_M(jT)$ the digitalized measuring value at the time jT, and
N a fixed whole number.

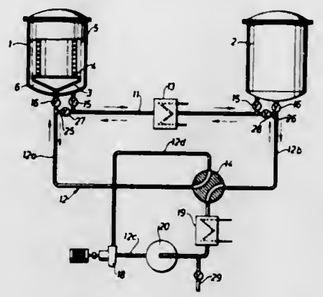
4,075,765

PROCESS AND DEVICE FOR DRYING FIBROUS MATERIAL

Friedrich Wilhelm Johann Karrer, Stockholm, Sweden, and Per Gustaf Mellgren, Montreal, Canada, assignors to Karrer System AG, Zurich, Switzerland

Filed Dec. 12, 1975, Ser. No. 640,390
Claims priority, application Switzerland, Dec. 16, 1974, 16667/74
The portion of the term of this patent subsequent to Dec. 23, 1992, has been disclaimed.
Int. Cl.² F26B *3/00*
U.S. Cl. 34—20 **7 Claims**

1. A process for drying two separate units of moist fibrous material, in particular in the form of reels of yarn, comprising flowing under a pressure greater than one atmosphere in a closed circuit a gaseous medium through both units of material, such that the gaseous exhaust from one unit is the gaseous intake of said other unit, and heating the gaseous medium subsequent to its passage through the units of fibrous material by compressing the gaseous medium.

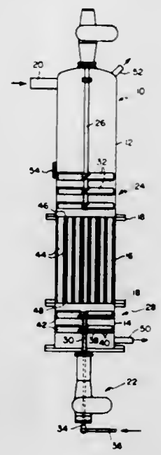


4,075,766

APPARATUS FOR THE TREATMENT OF DIVIDED SOLID MATERIAL

Basil J. Michel, Rochester; Gary P. Morse, Spencerport, both of N.Y., and Alfred L. Wilcox, Arlington Heights, Ill., assignors to General Signal Corporation, Rochester, N.Y.

Filed Jul. 19, 1976, Ser. No. 706,986
Int. Cl.² F26B *17/14*
U.S. Cl. 34—57 D **4 Claims**



1. An apparatus for the treatment of divided solid material comprising:

(a) a chamber disposed about a generally vertical axis;

(b) means for introducing said divided solid material into the top portion of said chamber;

(c) means for introducing a pressurized gas into the bottom portion of said chamber; and

(d) impeller means adapted to rotate about said axis for radially dispersing said pressurized gas and for fluidizing said divided solid material, said means for introducing pressurized gas being adapted to rotate with said impeller means to thereby aid in the radial distribution of said pressurized gas, wherein said impeller means is supported by a hollow shaft adapted to receive said pressurized gas and wherein said means for introducing pressurized gas comprises a plurality of perforated tubes affixed to said

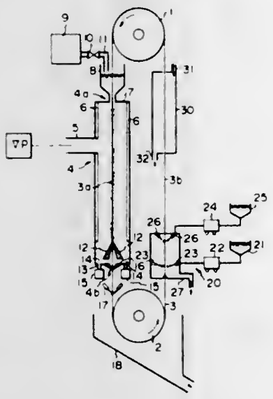
impeller means and adapted to rotate therewith, said perforated tubes being in fluid communication with said hollow shaft to thereby aid in the radial distribution of said pressurized gas.

4,075,767

POWDER PRODUCING APPARATUS

Fumindo Kai, Tachikawa; Eitaro Kumazawa, Sayama, and Yozo Ishioka, Higashikurume, all of Japan, assignors to Snow Brand Milk Products Co., Ltd., Sapporo, Japan

Filed Jul. 22, 1976, Ser. No. 707,558
Claims priority, application Japan, Aug. 7, 1975, 50-96168
Int. Cl.² F26B *13/30*
U.S. Cl. 34—92 **5 Claims**



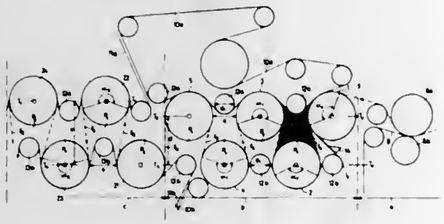
1. Vacuum type powder producing apparatus comprising endless belt means passing around at least a pair of spaced roller means to provide at least two belt runs, vacuum chamber means encircling one of the belt runs and having inlet and outlet means for allowing the belt means to pass therethrough into and out of the vacuum chamber means, means for applying a vacuum to the vacuum chamber, slurry tank means provided in said inlet means of the vacuum chamber means so that said belt means is passed through the slurry tank means whereby slurry is deposited on both sides of the belt means when it passes through the slurry tank means, means for applying slurry to the tank means so that the slurry is maintained therein to a level sufficient to provide a sealing effect at the inlet means of the vacuum chamber means, means for scraping the dried material off the belt means, means provided outside the vacuum chamber for cleaning the belt means.

4,075,768

MULTICYLINDER DRYER

Erkki Koski; Lassi Veijonen, and Martti Koponen, all of Jyvaskyla, Finland, assignors to Valmet Oy, Helsinki, Finland

Continuation-in-part of Ser. No. 259,521, Jun. 5, 1972, abandoned. This application Mar. 31, 1976, Ser. No. 672,469
Int. Cl.² F26B *13/08*
U.S. Cl. 34—116 **6 Claims**



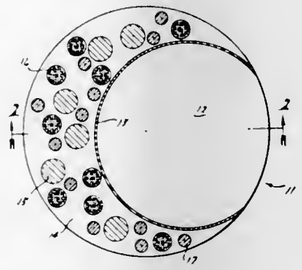
1. A multicylinder dryer for the drying of a web, particularly a paper web, comprising cylinders located alternately in two rows one above the other, drying fabrics and guiding rolls, for said drying fabrics said guiding rolls being situated between adjacent cylinders in both said rows and being positioned so as to cause said fabrics to wrap the web on said cylinders at a central angle, which is substantially smaller than that central angle in which the web wraps the same cylinder, a first one of said cylinders in the direction of travel of said web being a lead-in cylinder, and other cylinders being heated drying cylinders of equal diameters, said web wrapping said drying cylinders at an angle larger than 180°, said web having free and unsupported runs between said two rows, said free runs, drying fabrics and free surface of said drying cylinders bounding a row of pockets through which water vapor flashed from the web is conducted away, the distance between a plane extending through the axes of said drying cylinders located in the upper row and a plane extending through the axes of said drying cylinders located in the lower row being substantially smaller in connection with a plurality of drying cylinders which are first in the direction of travel of the web than in the remaining part of the dryer, said web having a smaller free run between said closer spaced planes than between said further spaced planes in order to reduce the detriments arising from the fluttering of the web at said free runs, which fluttering causes the risk of wrinkling and rupture of the web, said greater distance being fixed so that the dryer has in respect to the length of said longer runs and geometry of said pockets a maximum drying effect.

4,075,769

METHOD AND ARTICLE FOR WEIGHT REDUCTION

Julius Young, 2759 Mackintosh, Bloomfield Hills, Mich. 48013

Filed Aug. 25, 1975, Ser. No. 607,213
Int. Cl.² G09B *19/00*
U.S. Cl. 35—1 **3 Claims**



1. In a weight reduction method, the steps of providing a plate having a relatively large area marked off for a meal and at least one small adjacent measuring area, picking up a portion of the meal such as meat, potatoes or peas with a utensil, matching said portion against said measuring area, reducing the quantity of said portion if necessary by removal of part of said portion until the portion is no larger than the measuring area, and ingesting the portion as so reduced.

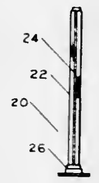
4,075,770

METRIC SYSTEM TEACHING AND MEASURING DEVICE

Deryl L. Lill, 107 San Marcos, Fenton, Mo. 63026

Filed Feb. 4, 1976, Ser. No. 655,095
Int. Cl.² G09B *19/02*; G01N *9/00*
U.S. Cl. 35—30 **8 Claims**

1. A device for teaching and use of metric measurements comprising an elongated tube having opposed open ends, said tube having a uniform cross-section area of 10 square centimeters and a length of one meter, means for closing said tube at a first end, a scale extending from said first end to a second open end, said scale starting at zero at the first end and ending at 100 centimeters at the second open end whereby the tube may be used as a linear measure and a volumetric measure to indicate volume in milliliters at scale measurements in milliliters when



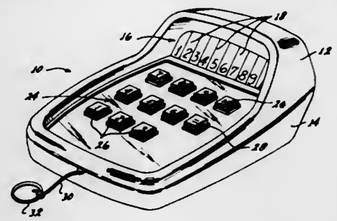
filled with liquid, the first end of the tube being closed by a member having a flat base extending beyond the sides of the tube whereby the tube may be supported in an upright position on a horizontal surface, said member having a socket receiving said first end in fluid sealing relationship.

4,075,771

TOY SIMULATING A CALCULATOR

Edmund Emil Landsinger, Torrance; Richard Shih-Teng Chang, Rolling Hills Estates, and William Joseph Gross, Rancho Palos Verdes, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 12, 1977, Ser. No. 758,597
Int. Cl.² G09B *19/02*; A63H *33/30*
U.S. Cl. 35—31 R **20 Claims**



1. In a toy, the combination comprising:
a housing having a display window;
a strip mounted within said housing, said strip having a plurality of stations, each of said stations having indicia viewable through said display window;
a keyboard mounted on said housing, said keyboard having an actuating key and a plurality of indicating keys equal in number to the number of said stations, each of said indicating keys having indicia thereon corresponding to a predetermined one of said stations;
manually operable means for removing all of said stations from said display window; and
means within said housing operatively coupling said manually operable means, said keyboard and said strip for permitting a preselected one of said stations to appear at a predetermined location in said display window upon sequential depression of one of said indicating keys and said actuating key.

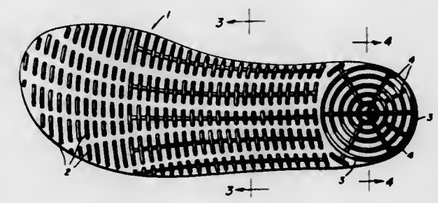
4,075,772

INSOLE FOR FOOTWEARS

MariaRosa Sicurella, Parabiago, Milan, Italy, assignor to Amilcare Cavalieri, Italy

Filed Apr. 21, 1975, Ser. No. 569,620
Int. Cl.² A43B *13/38*
U.S. Cl. 36—43 **4 Claims**

1. An insole for human footwear having defined thereon a first area corresponding to the heel of the foot and a second area corresponding to the remaining part of the foot, said first area having a plurality of upwardly protruding concentric rings of varying height to accommodate the anatomical form of the heel, and said second area having a plurality of upwardly protruding tabs of varying height each positioned substantially



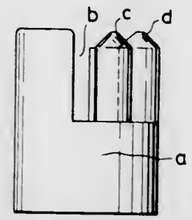
transversely to the longitudinal axis of the sole and aligned in rows parallel to said axis, the height of the tabs defining a bearing surface to accommodate the anatomical configuration of the foot.

4,075,773

SHEET-SUPPORTING DEVICE

Oskar Dister, Oltnerstrasse 125, 4663 Aarburg, Switzerland

Filed May 5, 1975, Ser. No. 574,714
Claims priority, application Switzerland, May 9, 1974, 6468/74
Int. Cl.² G09F *3/18*
U.S. Cl. 40—11 R **7 Claims**



1. A device for interchangeably supporting sheets in an upright position, particularly for displaying menu cards and the like, comprising a horizontal base and wall portions projecting vertically upwardly from said base and defining three vertically extending sheet-contacting surfaces, said wall portions comprising a first curved wall portion having opposite end portions defining two of said sheet-contacting surfaces located in one plane, the third of said sheet-contacting surfaces being located intermediate said two sheet-contacting surfaces equally spaced from said end portions and displaced in a direction normal to said plane so that a sheet inserted between said sheet-contacting surfaces is flexed and its rigidity increased in the longitudinal direction of the flexure.

4,075,774

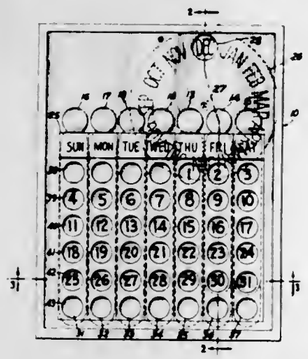
PERPETUAL CALENDAR

Bernard L. Day, 6300 Washington Ave., Erie, Pa. 16509

Filed Jun. 4, 1976, Ser. No. 692,723
Int. Cl.² G09D *3/10*
U.S. Cl. 40—109 **1 Claim**

1. A calendar comprising a first sheet and a second sheet,
means holding said first sheet and said second sheet together,
seven vertical rows of six holes in each row in said first sheet,
said holes in said vertical rows being disposed in six horizontal rows,
each said vertical row having a day of the week printed above it,
seven slides, each said slide positioned behind one of said

vertical rows and sandwiched between said first and second sheets, said slides being frictionally held in position,
said second sheet extending above said first sheet a substantial distance and an opening in the upper part of said second sheet and a disc having its center supported on said first sheet,
said disc having the names of the months arranged on its front side,
said disc being adapted to be rotated about its center to successively display the name of each month in said opening in said second sheet,
said slides each terminating in an upper end having the rounded portion thereon,
said rounded portion of said slides being aligned above the upper end of said first sheet when said numbers on one side of said slides are displayed in said openings in said first sheet,
said rounded portions being adapted to be grasped by a hand to facilitate moving said slides,



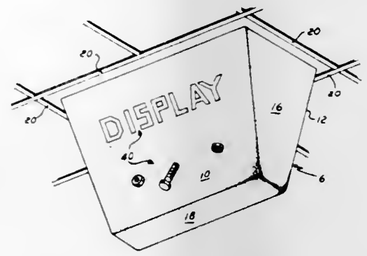
first said slide having numbers 1, 8, 15 and 22 on the one side thereof and numbers 1, 8, 15, 22 and 29 on the back side thereof,
second said slide having numbers 2, 9, 16 and 23 on the first side thereof and number 1, 8, 15, 22 and 29 on the back side thereof,
third said slide having numbers 3, 10, 17 and 24 on the first side thereof and numbers 3, 10, 17, 24 and 31 on the back side thereof,
fourth said slide having numbers 4, 11, 18 and 25 on both sides thereof,
fifth said slide having numbers 5, 12, 19 and 26 on both sides thereof,
sixth said slide having numbers 6, 13, 20 and 27 on both sides thereof,
seventh said slide having numbers 7, 14, 21 and 28 on both sides thereof.

4,075,775
LIGHT DIFFUSER AND ILLUMINATING CEILING DISPLAY

Richard A. Shorette, Crest Road, Monson, Mass. 01057

Continuation-in-part of Ser. No. 530,985, Dec. 9, 1974, abandoned. This application Jun. 28, 1976, Ser. No. 700,221
Int. Cl.[2] G09F *13/00*
U.S. Cl. 40—553 **1 Claim**

1. In combination with a suspended ceiling having generally rectangular ceiling tiles supported on a framework of mutually perpendicular support bars having a horizontal flange portion, one or more light sources disposed above the plane of the support bars at one or more spaced locations, at least one of said ceiling tiles below said light sources being removed for environmental illumination of the area in which the suspended ceiling is located, a visual display and a light diffuser for said area comprising an integral hollow body of translucent sheet material, said body having an upward opening, an outwardly extending annular rim portion dimensioned to supportively engage said support bars arranged about the periphery of one of said light sources, said body with the exception of said upward opening being continuous and wholly enclosing the illumination from said light source, said body diffusing said illumination and having a visual display thereon which is illuminated by said light source, said body is a thermoformed synthetic plastic material which is resiliently flexible enabling



substantial flexure of said body and in which said rim portion is severable to reduce its width, said translucent body includes side wall portions which extend downwardly a substantial distance from said rim portion one of said side wall portions being inclined toward the other, said visual display being disposed on at least one of said side wall portions, said rim portion before being severed is of a width substantially greater than the horizontal flange portion of the support bars of said suspended ceiling.

4,075,776
JIGGING POLE

Robert J. Fiebig, 1818 Fremont, NW., Grand Rapids, Mich. 49504

Filed May 28, 1976, Ser. No. 690,957
Int. Cl.[2] A01K *87/00*
U.S. Cl. 43—24 **2 Claims**



1. A jigging pole for fishing comprising:
a curved, stiffly resilient wooden rod shank of rectangular cross section and having handle means at one end and an integral line guiding eyelet formed through said shank at the opposite tip end; said shank being curved only at the tip half of the shank such that said tip end is oriented at an acute angle to the horizontal; said integral line guiding eyelet comprises an aperture formed through said rod shank at an angle to the longitudinal axis of said shank which is generally complementary to said acute angle such that line extending through said aperture will depend vertically from said rod shank when said handle means is horizontally disposed;
line guiding means located on top of said shank whereby fishing line is supported on said solid upper surface of said shank; and
wherein said handle means comprises a pair of gripping members overlaying said rod shank on opposite sides at said one end and co-extensive with a portion of said rod shank.

4,075,777
BAIT CASTING FLOAT

Robert D. Dalton, 3819 Maryland Drive, Doraville, Ga. 30340

Filed Jul. 16, 1976, Ser. No. 705,788
Int. Cl.[2] A01K *97/04*
U.S. Cl. 43—41.2 **2 Claims**

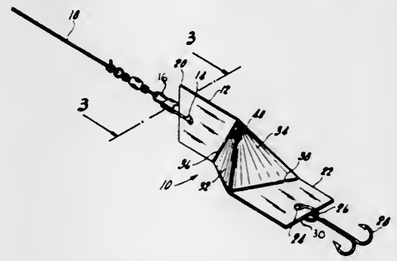


1. A combination bait casting and fishing float comprising an elongated thin walled tube adapted to be closed at the distal end and open at the proximal end, said tube being divided into a bait cup section and a float chamber section, the proximal end of the said tube being flared outwardly with respect to the longitudinal center line of said tube to form a lip, aperture means in the wall of said cup section tube adapted to admit a fishing line therethrough, said aperture means further comprising an air vent adapted to allow discharge of entrapped air within the cup section to escape to the ambient atmosphere, the distal end of said tube having a retaining ring integral therewith, said retaining ring being formed in the wall of said tube and projecting through said wall to form a retaining dimple within the interior of said tube, said retaining dimple disposed about the entire interior circumference of said tube, the distal end of said tube forming the float chamber section, said float chamber section comprising a housing of the same tubular configuration as the said tube and terminating in a rounded nose, the rounded nose having an aperture therethrough from which there projects an elongated closed ended tube along the axial center line of the fishing float and whose diameter is substantially less than that of the bait cup section, floatation means retained within the float chamber section by means of the retaining ring and so positioned against the rounded nose so as to block the aperture to the elongated close-ended tube thereby forming a dead air space within said close-ended tube, said floatation means being a spherical ball.

4,075,778
FISHING LURE

Charles R. Howard, 404 Newcomb St., Whitewater, Wis. 53190

Filed Sep. 8, 1976, Ser. No. 721,553
Int. Cl.[2] A01K *85/01*
U.S. Cl. 43—42.31 **6 Claims**

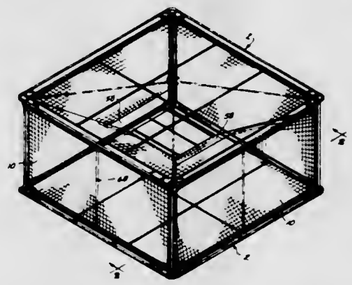


1. A fish lure formed of an elongated rectangular strip of material, said lure having planar leading and trailing end portions located at opposite ends of a central axis of elongation of said strip, said end portions being trapezoidal in shape, the planes in which said leading and trailing end portions lie being parallel to the axis of elongation, the projection of the leading end portion in its plane and the projection of the trailing end portion in its plane intersecting at a point removed from the central axis of the strip and being angularly displaced from each other by an angle of 90°, the medial portion of said lure being comprised of a pair of generally planar triangular sections, one of said triangular sections being contiguous with said leading end portion and being bent out of the plane of said leading end portion along a first sharp crease common to said leading end portion and said triangular section, the other of said triangular sections being contiguous with the trailing end portion and bent out of the plane of said trailing end portion along a second sharp crease common to said trailing end portion and said other triangular section, said triangular sections being joined along a third sharp mutual crease, said third crease converging toward opposite sides of said strip of material forming said lure, said first and second creases lying non-parallel to the forward and rear edges of said rectangular strip of material by an amount commensurate with the convergence with said third crease for forming said trapezoidal leading and trailing end portions, the bends occurring at first, second and third creases, when taken with the angular orientation of said creases in said strip being sufficient to establish the aforesaid relationship of said leading and trailing end portions, said leading end portion having means for connecting said lure to a fishing line and said trailing end portion having means for connecting a fish hook to said lure.

4,075,779
CRAB POT

Theodore T. Olafson, Box 251, Kodiak, Ak.

Filed Jun. 21, 1976, Ser. No. 697,880
Int. Cl.[2] A01K *69/08*
U.S. Cl. 43—100 **15 Claims**



1. A multi-component crab trap adapted to be stripped down to its respective components for storage, comprising a pair of spaced quadrilateral closure members which are superposed over one another with corresponding edges thereof oriented in substantially the same directions, and have spaced posts removably interposed therebetween, adjacent corresponding corner portions thereof, said posts having pairs of angularly spaced arms thereon, adjacent the respective ends thereof, and said arms extending substantially on parallels to the edges of the closure members at the respective corners thereof, and there being releasable clamping means interconnected with the respective arms and closure members on opposite sides of the posts to integrate the posts and closure members in the form of a cage having openings about the sides thereof in the spaces between the members and the posts, normally open crab entry means including tunnel rings attached to the cage adjacent openings on opposite sides of the cage, and having relatively inclined entry tunnels extending therebetween within the cage, which open into the interior of the cage, normally closed

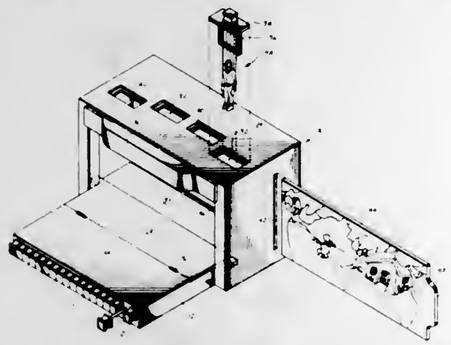
operator entry means attached to the cage adjacent one of the remaining openings in the same, and closure means attached to the cage adjacent the balance of the openings, to close the periphery of the cage to the movement of crabs, so that crabs entering the cage through the tunnels, remain trapped therein, the crab entry means, operator entry means, and closure means, being removably interposed in the spaces between the members and the posts, so that on detaching the posts from the members, and removing the crab entry means, operator entry means, and closure means, the members can be stacked on top of one another in a pile.

4,075,780

MARIONETTE ACTUATION

David T. Linebaugh, 7110 Sante Fe, Houston, Tex. 77061

Filed Oct. 21, 1976, Ser. No. 734,551
Int. Cl.² A63J 19/00; A63H 7/00
U.S. Cl. 46—13 **15 Claims**



1. The method of actuating marionettes on a stage, each marionette having
   a. movable parts with
   b. a plurality of strings, one string attached to each of the movable parts,

comprising the steps of:
   c. suspending each of the marionettes from a suspension unit,
   d. inserting one of the suspension units into the stage,
   e. manipulating individual keys on a keyboard on the stage, thus individually
   f. raising the strings below the suspension unit responsive to the manipulation by
   g. moving a striker mounted on the stage from a first position which is clear of the suspension unit to a second position against a part of the suspension unit to raise a string on the suspension unit, and
   h. removing and replacing one of the suspension units, thus changing a marionette.

3. In a marionette assembly adapted to be placed into a stage of same, said assembly having
   a. a marionette with movable parts,
   b. a plurality of strings, one string attached to each of the movable parts;

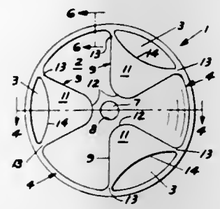
the improved structure for holding the strings to be manipulated comprising:
   c. a top plate to which the strings are attached and
   d. a bottom plate
      (i) attached to the top plate,
      (ii) spaced below the top plate and
      (iii) having a plurality of holes spaced therethrough,
   e. said top and bottom plates forming a suspension unit,
   f. each of said strings extending through one of the holes so that lateral displacement of the string will be translated into vertical displacement of the string below the bottom plate, thereby actuating the moving parts of the marionette.

4,075,781

FLYING DISK

Richard D. Hill, II, 2933 Mun Pier Road, Shreveport, La. 71119, and Carl T. Mastronuzzi, Jr., 1163 Gilbert St., Bossier City, La. 71112

Filed Jan. 10, 1977, Ser. No. 758,077
Int. Cl.² A63H 27/00
U.S. Cl. 46—74 D **11 Claims**



1. A flying disk comprising a generally saucer-shaped hull having a convex upper surface, a concave lower surface, and a rim defining the peripheral outer edge of said hull; a central port or opening defined by a central port tube extending through said hull downwardly from said concave lower surface, the bottom end of said tube in planar relationship with the bottom edge of said rim; three cupped airfoils mounted in spaced relationship on said rim and on said concave lower surface, and each having a convex top surface and a concave bottom surface narrowing to form a tip, said tip of said airfoils projecting toward said central port tube; and three side ports disposed in spaced relationship in said hull adjacent said rim and defined by said rim and said airfoils.

4,075,782

DOLL SHOWING SICKNESS, AND MEANS FOR "CURING"

Joseph J. Neuschatz, 42 Old Homestead Road, Port Jefferson, N.Y. 11777

Filed Nov. 25, 1975, Ser. No. 635,031
Int. Cl.² A63H 13/00
U.S. Cl. 46—118 **8 Claims**



1. A doll and, in combination therewith,
first means mounted in said doll for exhibiting simulation of an objective symptom of illness in a fashion detectable by the senses of a child,
the doll being constructed and arranged to accommmodate a simulated treatment for the illness characterized by the simulated symptom; and
second means mounted in said doll operatively connected to said first means, and responsive to occurrence of said simulated treatment, for deactivating said first means and thereby causing the exhibition of the simulated symptom to at least diminish;
wherein said first means includes electrical resistance heater means for generating heat observable as a simulation of fever; and
said second means comprises switch means connected to said resistance heater means to deactivate the same when said switch means is actuated as a result of occurrences of said simulated treatment and includes a member movable between a first position adjacent an orifice in the doll wherein said first means is activated and a second position away from said orifice wherein said first means is deactivated;
and wherein said combination further comprises a simulated thermometer having relatively movable means therein insertable into said orifice and responsive to the presence of said member in said first position to indicate a simulated fever condition.

4,075,783

BEE ATTRACTING COMPOSITION AND METHOD OF USE

Ivor R. Burden, Aptos, and George W. Reilly, Clovis, both of Calif., assignors to Custom Chemicides, Inc., San Leandro, Calif.

Filed Jun. 21, 1976, Ser. No. 698,154
Int. Cl.² A01G 7/00
U.S. Cl. 47—1.41 **3 Claims**

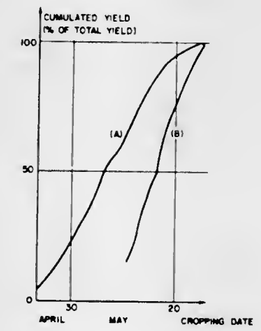
1. A method for increasing the productivity of a crop area requiring honey bee pollination, comprising the step of spraying an aqueous bee attracting spray composition over the crop area during the blooming period in sufficient quantity to attract bees and to maintain them in the crop area for pollination, said bee attracting composition comprising a dilute aqueous dispersion of about 10 to 25% by weight milk protein, about 60 to 75% by weight sugar, and wetting and dispersing agents for said milk protein.

4,075,784

METHOD FOR INCREASING THE PRODUCTIVE YIELD OF CROPS WITH POLYOLEFIN FILMS

Jean-Philippe Pied, Verneuil en Halatte, France, assignor to Societe des Plastiques de Carmaux Scasar, Saint Benoit de Carmaux, France

Division of Ser. No. 611,815, Sept. 8, 1975. This application May 19, 1976, Ser. No. 687,882
Int. Cl.² A01G 7/00
U.S. Cl. 47—9 **16 Claims**



1. In a method for increasing the productive yield of crops by covering the crops with plastic film, the improvement comprising retaining heat by covering said crops with a polyolefin film containing from about 1 to 15% based on the weight of the polyolefin of an essentially dehydrated kaolinite containing from about 51 to 57% by weight silica, 40 to 46% by weight alumina and less than 3% impurities.

4,075,785

METHOD FOR HYDROPONIC GROWING OF LETTUCE

John L. Jones, San Angelo, Tex., assignor to CanDu, Inc., Glendale, Ariz.

Continuation of Ser. No. 297,323, Oct. 13, 1972, abandoned. This application Jan. 8, 1975, Ser. No. 539,498
Int. Cl.² A01G 31/02
U.S. Cl. 47—64 **4 Claims**



1. A method for growing lettuce from seeds to commercial maturity, comprising:
   a. implanting a lettuce seed within a porous root-permeable shaped support body;
   b. moistening said shaped support body until said seed germinates, the stem and leaves of said lettuce plant growing generally upwardly therefrom and the roots of said lettuce plant growing through and outside said support body and generally outwardly and downwardly therefrom;
   c. positioning said shaped support body and lettuce plant growing therein for application of a hydroponic nutrient solution to the lettuce plant roots growing outside and outwardly and downwardly from said support body and for application of actinic radiation to the lettuce plant foliage;
   d. periodically
      1. feeding said lettuce plant by applying hydroponic nutrient solution to the roots growing outside and depending outwardly and downwardly from said shaped support body, and
      2. exposing said lettuce plant foliage to actinic radiation, at least until said plant reaches commercial maturity;

and
   e. harvesting said commercially mature plant prior to bolting by removing said plant from the growing position without separating said support body and roots growing therethrough from said commercially mature plant, and enclosing said shaped body and at least a portion of said plant in a vapor-barrier integument.

4,075,786

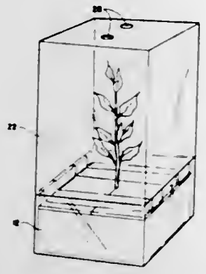
CONTAINER FOR SAFELY RETAINING A LIVING PLANT DURING TRANSIT AND DISPLAY

Bernard van Zyl, 105 Pineneedle Lane, Altamonte Springs, Fla. 32701

Filed Jul. 23, 1976, Ser. No. 708,271
Int. Cl.² A01G 9/02
U.S. Cl. 47—84 **13 Claims**

1. A shipping and display arrangement for a small rooted plant comprising:
   a. a box of transparent material having separate top and bottom portions, said portions each being equipped with interfitting edge members.
   b. planting material as well as the roots of the plant, disposed in the bottom portion of said box,
   c. a pad covering the planting material, for retaining same in the bottom portion of the box,
   d. at least one strip of tape for securing said pad to the bottom portion of said box, with the ends of said strip of tape extending out between said interfitting edge members,
   e. the interception of said tape ends by said interfitting edge

members causing adherent portions of tape to adhere tightly to the bottom portion of the box, thus to prevent



displacement of the pad and the planting material during transit.

4,075,787

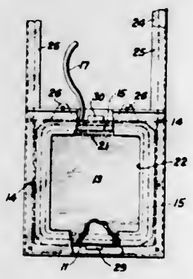
INFLATABLE POUCH TO SEAL

James B. Krahe, Erie, Pa., assignor to American Sterilizer Company, Erie, Pa.

Continuation of Ser. No. 592,920, July 7, 1975, abandoned. This application Nov. 17, 1976, Ser. No. 742,497

Int. Cl.² E05D *15/10*

U.S. Cl. 49—209 **2 Claims**



1. In combination, a chamber comprising a steam jacket having an inner shell and an outer shell terminating at an end in a door opening,

a plate-like flange fixed to said shells around said opening and said flange forming a closure for said steam jacket and presenting an outwardly directed surface,

an end frame fixed to said flange,

a sealing member on said flange on said outwardly directed surface extending entirely around said door opening,

said end frame being disposed outwardly in spaced relation to said flange and providing a space therebetween, said flange having an opening registering with said chamber opening,

a door member disposed between said flange and said end frame,

said door member comprising an outer door and an inner door defining a space therebetween and disposed in said space between said flange and said frame,

said inner door having laterally spaced guide pins along the lower edge thereof slidably engaging said outer door,

an inflatable pouch disposed between said outer door and said inner door and overlying said outer door and said inner door, and said opening and being substantially larger than said opening whereby the edges of said pouch extend outwardly beyond the flange defining said opening,

said pouch being adapted to be inflated whereby said outer door and said inner door are forced away from each other forcing said outer door against said frame and bringing said inner door into sealing engagement with said sealing member on said end flange and means for moving said door between said frame and said flange from a position overlying said opening to a position away from said opening,

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4,075,788

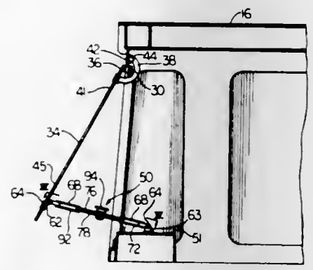
LINKAGE ASSEMBLY FOR A WINDOW

Howard R. Anderson, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 13, 1976, Ser. No. 750,095

Int. Cl.² E05F *11/00*

U.S. Cl. 49—324 **1 Claim**



1. In a window actuating mechanism comprising a frame having an opening therein with a flat deck extending laterally inwardly from one edge of said opening, hinge means fastened to an edge of said opening in the frame opposite to said edge with said flat deck, said hinge means hingedly mounting said window on said frame in closing relation to said opening, and linkage means extending between said panel and the deck on said frame, a pair of mounting members at each end of said linkage means with each mounting member having a pivot axis lying parallel to the axis of the hinge means of said window to said frame, one of said mounting members being mounted on said window and the other of said mounting members being mounted on said flat deck, a pair of short links pivotally mounted to each one of said mounting members for pivotal movement about an axis perpendicular to the pivot axis of said mounting members, a pair of long links crossing each other at the midportion of each long link and having one end portion of each long link pivotally connected to one end portion of one of said short links, each said last-named pivotal connection having an axis lying parallel to the axis of said pivotal mounting of said short links to said mounting members, a pivot passing through the crossover midportions of said long links, and a locking and actuating knob threaded onto said last-named pivot whereby loosening said knob on said pivot makes it possible to push and pull on said knob parallel to a plane containing said short links and said long links for elongating and foreshortening said linkage means as said window is opened and closed over said opening in the frame, and whereby tightening said knob locks said long links together thereby locking the linkage means and preventing further elongation or foreshortening of said linkage means.

4,075,789

ABRASIVE BLAST SYSTEM HAVING A MODULATION FUNCTION

George H. Dremann, 1940 Hopkins St., Berkeley, Calif. 94707

Filed Jul. 19, 1976, Ser. No. 706,510

Int. Cl.² B24C *3/00*

U.S. Cl. 51—436 **33 Claims**

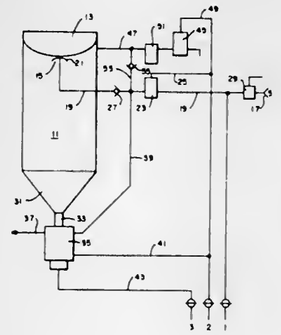
1. An abrasive flow control valve for regulating the flow of abrasive media to the blast nozzle of an abrasive blast system comprising, in combination,

a housing having a first and second chamber formed therein, said first chamber having at least one abrasive media inlet port and at least one abrasive media outlet port, and said second chamber adapted to pneumatically communicate with a remotely controllable air supply,

a reciprocable plunger assembly extending between said first and second chambers and having first and second ends, the first end of said plunger assembly being disposed to be reciprocated in relation to said abrasive media inlet port for regulating the flow of abrasive media therethrough, the second end of said plunger assembly having a deflectable wall fixedly secured thereto, said deflectable wall forming one of the walls of said second chamber and being adapted to move said plunger assembly for opening said abrasive media inlet port when said second chamber is pressurized by said remotely controllable air supply,

means for sealing said plunger assembly to said housing substantially where said plunger assembly passes between said first and second chambers whereby pneumatic integrity is maintained therebetween, said sealing means being adapted to substantially prevent air pressure on said sealing means from being transmitted to said plunger assembly,

means for biasing said plunger assembly to a position for keeping said abrasive media inlet valve closed, the biasing force of said biasing means being chosen so that it can be



overcome by normal operating pilot pressure in said second chamber,

air inlet means for permitting air to be introduced under pressure into said first chamber for propelling abrasive media flowing in through said abrasive media inlet port out through said abrasive media outlet port, and

means for modulating the position of said plunger assembly with respect to said abrasive media inlet port when said second chamber is pressurized whereby the flow of said abrasive media in through said abrasive media inlet port can be selectively regulated, said modulation means comprising

a variable pressure chamber formed in said housing adjacent said second chamber and having said deflectable wall of said second chamber in common therewith, said deflectable wall being of a relatively large size in relation to the dimensions of said second chamber whereby movement of said plunger assembly is substantially controlled by said deflectable wall by the relative pressures in said second chamber and variable pressure chamber, and

modulating air pressure inlet means for controllably pressurizing said variable pressure chamber for modulating the position of said plunger assembly.

4,075,790

SCREW THREAD TAP GRINDING WITH AUTOMATIC LOADING MEANS

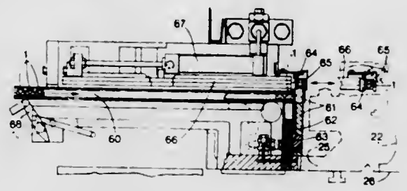
Raymond Leslie Palmer, Solihull, England, assignor to Coventry Gauge & Tool Company Limited, England

Division of Ser. No. 577,424, May 14, 1975, Pat. No. 3,994,099, which is a continuation of Ser. No. 349,623, Apr. 9, 1973, abandoned. This application Nov. 23, 1976, Ser. No. 744,272

Claims priority, application United Kingdom, May 6, 1972, 21227/72

Int. Cl.² B24B *3/18*

U.S. Cl. 51—94 CS **1 Claim**



1. Screw thread tap grinding apparatus comprising a support mountable in a grinding machine in relation to a thread grinding wheel of the latter for relative transverse of said support and grinding wheel, the support carrying headstock and tailstock means for rotatably receiving a tap workpiece between a centre of a driving centre spindle of the headstock and a centre of the tailstock whereby a said tap workpiece received therebetween is mounted in relation to a said grinding wheel for grinding thereby; operating means for effecting axial retraction of at least one of said centres relative to the other for obtaining release and discharge of a ground tap workpiece from between said headstock spindle centre and tailstock centre; a magazine for receiving uniformly arranged tap workpieces to be ground for sideways sliding feed movement therealong and axially parallel with the axis of said centres; a lifter member for receiving a tap workpiece directly thereon as it issues from the magazine and operable for raising a said tap workpiece supported thereby, a transfer holder having a spring latch for receiving and holding a said tap workpiece raised therein by the lifter member, said transfer holder being operable for operative movement in order to position a said tap workpiece to be ground between said centres for holding thereby on relative axial return movement of the centres, the spring latch being yiedable so as to ride over the said tap workpiece when the latter is held between the centres in order to permit empty return movement of the transfer holder.

4,075,791

AUTOMATIC COPYING BELT GRINDING MACHINE

Sakae Koide, Tokyo; Shigeo Aoki, Habikino, and Tetsutaro Uematsu, Fuchu, all of Japan, assignors to Tahara Shoyei Kiko K.K., Tokyo and Hoshiden Electronics, Co., Ltd., Osaka, both of, Japan

Filed Nov. 13, 1975, Ser. No. 631,659

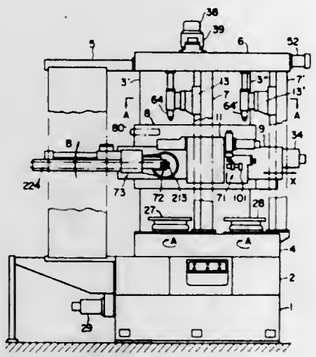
Claims priority, application Japan, Nov. 14, 1974, 49-131779

Int. Cl.² B24B *21/02, 17/00*

U.S. Cl. 51—142 **1 Claim**

1. An automatic copying belt grinding machine, comprising a Z-axis slide movable in a vertical direction, an X-axis slide slidably mounted on said Z-axis slide to shift horizontally, a swivelling grinding head mechanism mounted on said X-axis slide, a duplex electronic copying sensor having a portion for sensing the contour of a model and a swivelling portion for sensing the inclination of a surface of said model mounted on said X-axis slide, a pair of fixture tables rotatable in synchronization with each other upon which a model related to the duplex electronic copying sensor and a workpiece related to said swivelling grinding head mechanism are respectively vertically installed, and an electronic control unit for controlling said Z-axis slide and said X-axis slide and said copying

sensor and said grinding head so that they function in a copying mode, whereby the grinding machine copy grinds the workpiece continuously and spirally along the peripheral direction over its entire length, while the tangential speed of the grinding head relative to the workpiece is kept constant and the grinding head is positioned normal to the surface of the workpiece at the point of contact.

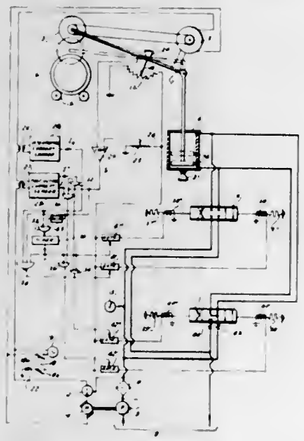


4,075,792

SYSTEM FOR CONTROLLING THE ADVANCE OF A ROTARY MACHINE TOOL

Jürgen Schreiber, Wetzlar, Germany, assignor to Buderus'sche Eisenwerke Aktiengesellschaft, Wetzlar, Germany

Filed Apr. 15, 1976, Ser. No. 677,121
Claims priority, application Germany, Apr. 17, 1975, 2517001
Int. Cl.[2] B24B *47/06*
U.S. Cl. 51—165.92 2 Claims



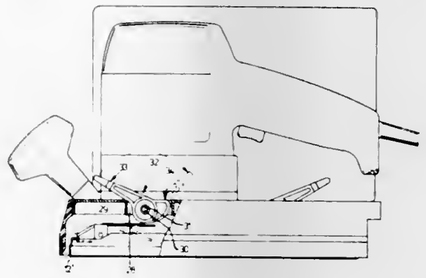
1. A system for machining a workpiece, comprising:
a workpiece holder;
a rotary machine tool engageable with a workpiece on said holder; p1 a support for said tool movable relatively to said holder for advancing said tool toward said workpiece;
an electric motor coupled with said tool for rotating same about an axis;
current-sensing means in circuit with said motor;
a reversible hydraulic servomotor linked with said support and provided with a high-rate fluid-supply circuit including a first valve and with a low-rate fluid-supply circuit including a second valve, each of said valves having a forward-flow position, a neutral position and a reverse-flow position;
control means responsive to said current-sensing means for placing said first valve in its forward-flow position to advance said tool rapidly toward the workpiece under low-current conditions during an approach phase and for actuating said second valve while maintaining said first valve in its neutral position to displace said tool more slowly under high-current conditions, indicative of an engagement of the tool with the workpiece, at speeds tending to maintain the motor current in a predetermined range during a working phase following said approach phase, with reversal of the flow in said low-rate fluid-supply circuit upon detection of an overload condition by said current-sensing means; and
switchover means responsive to a predetermined advance of said tool from a starting position for modifying the operation of said control circuit to hold said second valve in its neutral position while shifting said first valve into its reverse-flow position upon a recurrence of said low-current conditions due to severance of the workpiece for rapidly retracting said tool to said starting position in a withdrawal phase following said working phase.

4,075,793

POWER SANDER

Eberhard Vogel, Dettenhausen; Herbert Glaser, Leinfelden; Albert Kleider, Waldenbuch, and Klaus Dietz, Musberg, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 8, 1976, Ser. No. 664,808
Claims priority, application Germany, Mar. 15, 1975, 2511392
Int. Cl.[2] B24B *23/00*
U.S. Cl. 51—170 TL 8 Claims



1. A power sander comprising, in combination, a support means including a casing having an axis, a circumferential wall surrounding said axis with spacing therefrom and having axially spaced ends, and a transverse wall at one of said ends and having at least one opening of predetermined dimensions, said walls bounding a space; a sanding body accommodated in said space and having a support surface at the other end of said circumferential wall; drive means mounted on said support means and operative for cyclically moving said sanding body in a plane which is normal to said axis; means for interchangeably attaching a sanding element to said sanding body so that the former is supported on and covers said support surface, including clamping means mounted on said sanding body for pivoting between an engaging position and a disengaging position, and biasing means urging said clamping means toward said engaging position; and actuating means including at least one actuating lever mounted in said opening of said transverse wall for pivoting about a pivot axis normal to said axis between a retracted position and an extended position and having an actuating portion accessible from the exterior of said casing, and a cam portion in said space which is operative for abutting against and pivoting said clamping means toward said disengaging position durng pivoting of said actuating lever toward said extended position, said actuating lever having such dimensions as to close said opening in said retracted position

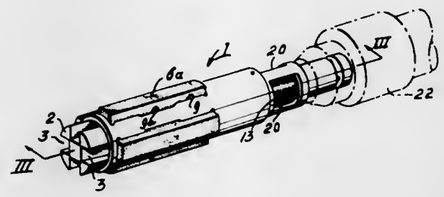
thereof to thereby prevent air from passing through said opening past said actuating lever during the operation of the sander.

4,075,794

HONING TOOL

John A. Blaylock, 7983 Blackshire Drive, Huber Heights, Dayton, Ohio 45424

Filed Apr. 6, 1976, Ser. No. 674,212
Int. Cl.[2] B24B *33/04;* B24D *17/00*
U.S. Cl. 51—340 9 Claims



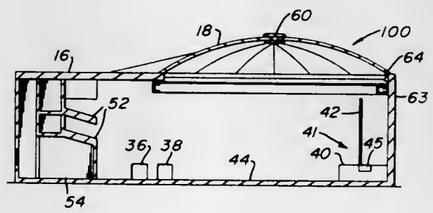
9. A longitudinally shaped honing element for use in a portable honing tool which honing element is wedge-shaped and has an abrasive section with an abrasive outer surface and also has a longitudinally shaped carrier member firmly connected to said abrasive section and provided on its longitudinal sides with longitudinally extending plane flat projections arranged between and in spaced relationship to the ends of said carrier member.

4,075,795

THEATER STRUCTURE

Anthony Thomas, 104 N. Ninth Ave., Coatesville, Pa. 19320

Filed Oct. 7, 1976, Ser. No. 730,562
Int. Cl.[2] E04H *14/00*
U.S. Cl. 52—8 8 Claims



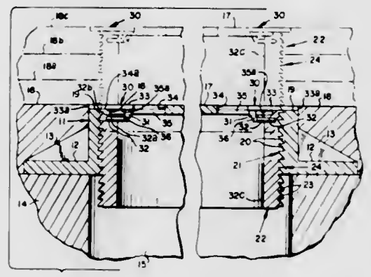
1. A theater structure, comprising:
a building provided with a driveway entrance for automobiles and a roof structure having a substantially flat portion and an openable dome structure;
a performance viewing area located at one end of the building;
an area in front of said performance viewing area for parking a plurality of automobiles whereby persons within said automobiles may view performances;
said openable dome structrue covering said automobile parking area which may be closed to keep out light and/or inclement weather and which may be opened during ambient darkness and fair weather conditions; and
a plurality of seats in front of said performance viewing area and behind said automobile parking area for persons to sit and view performances, said plurality of seats being under said substantially flat portion of said roof structure.

4,075,796

ADJUSTABLE HEIGHT MANHOLE WITH LOCKING MEANS

Benjamin D. Cuozzo, 15 Mackey Road, Garnerville, N.Y. 10923

Filed Mar. 25, 1977, Ser. No. 781,436
Int. Cl.[2] E02D *29/14*
U.S. Cl. 52—20 5 Claims



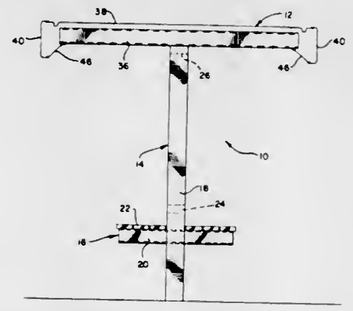
1. An adjustable height manhole with locking means, comprising a hollow cylindrical and internally threaded main body having an annular base flange integral of the exterior of said main body, for supporting said main body within a ground opening, a hollow cylindrical, externally threaded sleeve rotatably received within said main body, providing adjustable elevation means for the top portion of said manhole, said sleeve having a cover removably received therein, said cover and said sleeve having adjacent openings removably receiving a spanner wrench, thus providing a means for raising and lowering said sleeve to various pavement levels, and said locking means comprising a pair of locking plates which are slidable in a pair of channel openings provided in said cover, said sleeve and said main body, so as to lock said cover and said sleeve against rotation within said main body at a first pavement level, said locking plates also including pin means integral therewith, which are removably received within opening means on the inner periphery of said sleeve, so as to lock and retain said cover in the top of said sleeve.

4,075,797

SHELTER CONSTRUCTION

James E. Shaw, Crown Point, Ind., assignor to White Advertising Company, Shelby, Ind.

Filed Sep. 13, 1976, Ser. No. 722,789
Int. Cl.[2] G09F *7/18;* E04B *1/34*
U.S. Cl. 52—36 8 Claims



1. In a shelter construction including a roof section, vertically disposed legs for supporting the roof section, and a vertical wall extending between said legs, said legs comprising vertical tubes having a rectangular cross section, horizontally disposed tubes having a rectangular cross section extending between said vertical tubes, said vertical and horizontal tubes defining a border or said wall, the improvement comprising

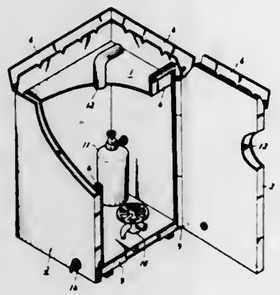
display means for advertising material and the like associated with the construction, said display means including a pair of transparent panels, and means for releasibly supporting said panels on a surface of said wall, said advertising material comprising separate sheets disposed between said panels and the respective wall surfaces, said means for releasibly supporting the panels comprising stops extending into engagement with panel edges whereby the stops resist any attempt to remove said panel, the stops comprising pairs of spaced-apart bars positioned on the inside facing surfaces of said tubes, the edges of said wall being retained in the spaced defined between the respective pairs of bars, the panel edges and the edges of the advertising material also being located in said space between the wall edges and the bars whereby said bars operate as said stops, and means for removing the bars on one side of said wall, said panels, said wall and said advertising material being unattached to said tube surfaces whereby the panels, wall and advertising material can be released.

4,075,798

WATER COOLING JACKET FOR FIRE

Michiji Tazaki, 3-3-46, Haraichi, Annaka, Gunma, Japan (379-01)

Filed May 10, 1976, Ser. No. 684,832
Int. Cl.² E04B *1/92*
U.S. Cl. 52—168 **8 Claims**



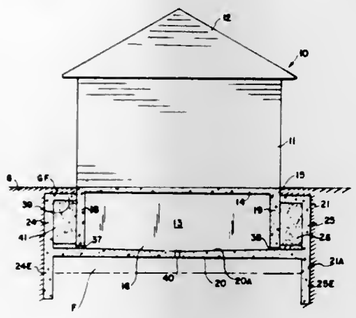
1. A water cooling jacket for the protection of persons from fire comprising, an inner casing having enclosed top and bottom surfaces and side surfaces, one of said side surfaces being opened, an outer casing having an enclosed bottom surface, an open top surface, and side surfaces, one of said side surfaces being opened, the top, side, and bottom surfaces of said outer casing having dimensions greater than the top, side, and bottom surface dimensions of said inner casing, means for supporting said inner casing within said outer casing so that a space is formed between the bottom surfaces of said inner and outer casing, and between the side surfaces of said inner and outer casing, and wherein the open side surface of said inner casing is within the open surface of said outer casing, a door having an inner surface and an outer surface, and a space therebetween, means for hingedly mounting said door to enclose the open side surfaces of said inner and outer casings, means within said inner casing for supplying water to the space between the inner and outer casing and to the space between the inner and outer surfaces of said door, and to the outside of the top surface of said inner casing, means for supplying air or oxygen into the inner casing and water cooling means for providing water to the outside side surfaces of said outer casing for cooling the outside side surfaces of said outer casing.

4,075,799

BUILDING INSULATION SYSTEM AND METHOD

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Filed Aug. 30, 1976, Ser. No. 718,930
Int. Cl.² E02D *27/32;* E04B *1/64, 1/76*
U.S. Cl. 52—169.5 **20 Claims**



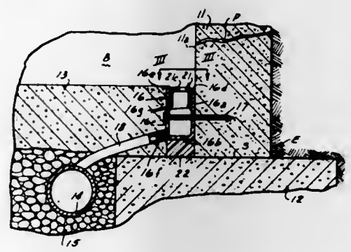
1. A building structure comprising in combination:
a building having a foundation portion including a subterranean vertical inner wall circumscribing a subterranean volume, such as a cellar, a floor disposed across said circumscribing inner wall and connected thereto near the bottom thereof, an outer wall circumscribing and spaced-apart from said inner wall and extending to at least the depth of said inner wall beneath the surface of the ground, said outer wall defining an annular volume with said inner wall, and a circumscribing top wall joining said outer and inner walls to enclose said annular volume, and a solid, air-entrapping insulating material disposed within and substantially filling said annular volume for retarding the transfer of heat between the volume located inwardly of said inner wall and the soil exterior of said outer wall.

4,075,800

FOUNDATION AQUADUCT AND EXPANSION JOINT

Medea Molick, 8001 Mulligan Ave., Burbank, Ill. 60459

Filed Feb. 9, 1977, Ser. No. 766,874
Int. Cl.² E04B *1/70;* E04F *17/00*
U.S. Cl. 52—169.5 **5 Claims**



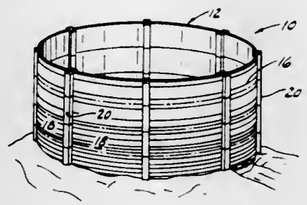
1. In combination with a building structure having a foundation wall supported on a footing and surrounding a floor, the improvement of an open top resilient duct, means mounting said duct on the inner face of the foundation wall with the top of the duct level with the top surface of the floor and surrounding the floor to act as an expansion joint between the foundation wall and the floor, and a drain for said duct at a lower level than the bottom of the duct.

4,075,801

STORAGE TANKS

Marc H. Alper, Creve Coeur, and Ernest J. Koestering, Kirkwood, both of Mo., assignors to Philip D. Mogler, Lester, Iowa

Filed Nov. 15, 1976, Ser. No. 741,962
Int. Cl.² E04H *12/16*
U.S. Cl. 52—196 **21 Claims**



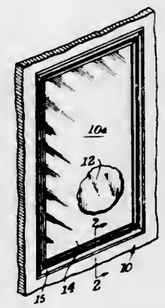
1. A tank structure comprising:
a plurality of wall panels having vertically extending end edges and horizontally extending top and bottom surfaces:
said wall panels being arcuate in horizontal cross section:
a plurality of vertical pilasters;
said wall panels being placed edge to edge with one of said pilasters located therebetween to form a substantially cylindrical tank wall;
a plurality of vertically spaced tensioned tendons on the exterior of said panels for prestressing said tank wall;
said wall panels being formed of a plurality of substantially-identical, vertically-stacked, precast-concrete wall panel sections, and said pilasters being formed of substantially-identical, vertically-stacked, precast-concrete pilaster sections; and,
each of said pilaster sections having a vertical height substantially equal to the height of said wall panel sections.

4,075,802

BURGLAR-PROOF WINDOW AND LIKE PANES OF GLASS

Marvin H. Gross, Northridge, and Alfred Kolb, Sherman Oaks, both of Calif., assignors to Transparent Glass Coatings Co., Inc., Los Angeles, Calif.

Filed Oct. 18, 1976, Ser. No. 733,138
Int. Cl.² E06B *3/28*
U.S. Cl. 52—203 **2 Claims**



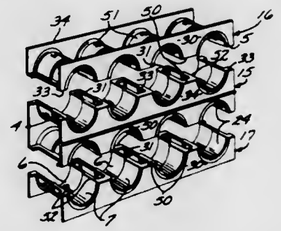
1. A burglar-proof window construction comprising:
(a) a circumscribing frame surrounding a window space and providing a circumscribing seat adjacent said window space;
(b) a window positioned in said window space and having its outer edges position positioned on said seat;
(c) a molding secured to said frame and providing a holding flange for securing said window in place;
(d) a strong transparent shatter-proof film having qualities to exclude ultra-violet light covering that portion of said window within said window space, the outer edge of said transparent film extending onto said molding on the side opposite from said glass; and
(e) an adhesive positioned between said window and said transparent film and edge of said transparent film and said molding, said adhesive securedly fixing said transparent film to said window, and the edge of transparent film to said molding, the securing of the edge of said transparent film to said molding restraining the edges of said transparent film from moving inwardly toward said window space.

4,075,803

SPLIT DUCT TERMINATOR

John Alesi, Jr., Topanga, Calif., assignor to Formex Manufacturing, Inc., Venice, Calif.

Filed Jun. 24, 1976, Ser. No. 699,507
Int. Cl.² E04C *1/39;* E04B *5/48*
U.S. Cl. 52—220 **6 Claims**



1. Split duct terminator apparatus for terminating a plurality of subterranean cables comprising a plurality of module members, each member including a pair of longitudinally extending upright opposing wall elements having at least one pair of mutually coextensive module interface edges which lie in a common laterally extending modular element interface plane that intersects said wall elements, a plurality of symmetrical longitudinally spaced parallel channel elements extending between said opposing wall elements and the edges of which lie in said modular element interface plane to define a plurality of spaced apart channels concave with respect to said modular element interface plane and wherein the longitudinal spacing between said channel elements defines symmetrical openings therebetween, and further including alignment projections uniformly spaced in the direction of spacing between said channel and extending outwardly from at least some of said modular members normal to said module interface plane, and which are received by corresponding recesses in others of said module members positioned adjacent thereto, whereby the disposition of modular members in face to face relationship with modular interface edges of the wall elements of each member in mutual contact and modular interface edges of channel element of each member in mutual contact and the provision of said alignment projections disposed within said recesses to laterally immobilize said modular elements relative to each other creates a composite structure having passageways formed by adjacent channels in said members and extending between the aforesaid wall elements.

4,075,804

FIRE RESISTANT ASBESTOS-FREE DOOR, PANEL OR BUILDING ELEMENTS, AND METHOD OF MANUFACTURE USING UNIQUE COMPOSITIONS

Herbert E. Zimmerman, Algoma, Wis., assignor to Champion International Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 437,727, Jan. 30, 1974, abandoned. This application Sep. 22, 1975, Ser. No. 615,727
Int. Cl.² E04C *2/00*
U.S. Cl. 52—232 **5 Claims**

1. A fire resistant door comprising a core framed within fire

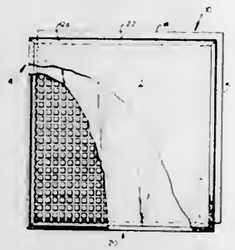
resistant stiles and rails, and wherein said core has veneer sheetings, said core having a composition consisting essentially of by weight calcium silicates in an amount within the range of 78.0 to 88.0 percentage; vermiculite, 7.5 to 10.0 percentage; sisal fibers 0.5 to 5.0 percentage; glass fibers 0.1 to 1.0 percentage; and moisture 2.0 to 15.0 percentage.

4,075,805

BUILDING PANEL WITH ATTACHED SEALING MEANS

John P. Bongiovanni, 19 Bates Road, Chester, Conn. 06412

Filed Feb. 23, 1977, Ser. No. 771,085
Int. Cl.² E04B *1/62;* E04C *1/10*
U.S. Cl. 52—309.12 **9 Claims**



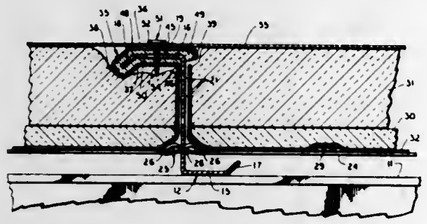
1. An exterior wall panel for assembly with other identical panels, and comprising a base of heat insulating material, said base having a rear face adapted for attachment to a wall structure or the like, and said base having a front face defining grooves, said base being of generally regular polygonal outline with at least two adjacent sides defining projecting edges and located adjacent the rear face of the base, said adjacent sides having portions adjacent the front face of the base which portions are of a thickness approximately equal to the thickness of said projecting edges, said panel edges opposite said adjacent edges defining undercut relieved cavities to receive the projecting edges of at least two adjacent panels, a polymer fortified cementitious facing on said grooved front face, and a strip of nonporous compressible foam type tape with adhesive on both sides applied to said adjacent two sides so that a paper peel-off strip may be provided on the outside of said foam tape to be peeled off after the panel has been attached to such wall structure and before the two adjacent panels are attached to said wall structure.

4,075,806

ROOF WITH INSULATED PURLIN

Robert Joe Alderman, 812 59th St., NW., Bradenton, Fla. 33505

Continuation-in-part of Ser. No. 494,097, Aug. 2, 1974, Pat. No. 3,969,863, and Ser. No. 638,329, Dec. 8, 1975. This application Jan. 5, 1976, Ser. No. 646,648
Int. Cl.² E04B *2/28, 2/60*
U.S. Cl. 52—403 **10 Claims**



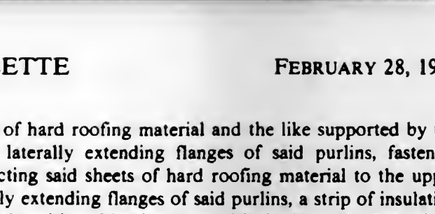
1. A roof structure comprising a plurality of rafters and the like oriented in spaced approximately parallel relationship with respect to one another, a plurality of purlins supported by said rafters in spaced approximately parallel relationship with respect to one another and extending across said rafters, each of said purlins including an upper laterally extending flange, sheets of hard roofing material and the like supported by the upper laterally extending flanges of said purlins, fasteners connecting said sheets of hard roofing material to the upper laterally extending flanges of said purlins, a strip of insulation material positioned in abutment with the lower surface of the upper flanges of said purlins and extending along the length of the purlins, and a strip of hard material supported by said purlin and juxtaposed the lower surface of the layer of insulation material and extending along the length of the purlins, the upper flange of each of said purlins defining a series of openings therethrough, and said fasteners comprising rivet members each including a shank of a diameter smaller than the openings in the upper flanges of said purlins extending from the sheets of hard roofing material down through the openings of the upper flanges of said purlins without contacting the purlins, and through the layer of insulation material and into the layer of hard material, whereby said fasteners can be inserted into the roof structure from above the sheets of hard roofing material without requiring access to the space below the sheets of hard roofing material.

4,075,807

METHOD AND APPARATUS FOR APPLYING SHEET MATERIAL TO A ROOF STRUCTURE

Robert Joe Alderman, 812 59th St. NW., Bradenton, Fla. 33505

Filed Jan. 16, 1976, Ser. No. 649,911
Int. Cl.² E04B *2/28, 2/60;* E04F *21/00*
U.S. Cl. 52—407 **20 Claims**



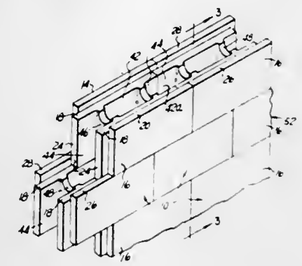
14. In a roof structure comprising a plurality of spaced rafters oriented parallel to one another, a plurality of approximately equally spaced purlins mounted on said rafters and oriented parallel to one another and perpendicular to said rafters, each of said purlins including an upwardly extending central web and oppositely laterally extending upper and lower flanges, the improvement therein of each of said purlins defining a plurality of openings along its length through its central web with the openings of the purlins spaced at varying heights in the web of the purlins and with the openings of each purlin being in approximate alignment with the openings of the purlins on opposite sides thereof, a plurality of support straps oriented parallel to one another and extending through aligned ones of the openings of the central webs of said purlins, elongated sheets of material of a width sufficient to substantially span the space between the central webs of adjacent ones of said purlins positioned between and extending parallel to said purlins and resting on said support straps and above the lower flanges of said purlins, sheets of roofing material mounted on said purlins and extending over said sheets of material, and loose insulation material of a thickness approximately equal to the height of the space between said elongated sheets of material and said sheets of roofing material supported by said sheets of material and substantially filling the space between said support straps and said sheets of roofing material.

4,075,808

BUILDING CONSTRUCTION SYSTEM USING MORTAR-LESS MODULAR BUILDING BLOCK ELEMENTS

Sanford Pearlman, 25218 Parkwood, Huntington Woods, Mich. 48060

Continuation of Ser. No. 527,088, Nov. 25, 1974, abandoned. This application Apr. 28, 1976, Ser. No. 681,134
Int. Cl.² E04B *2/00, 5/48*
U.S. Cl. 52—439 **21 Claims**



1. A modular system of building construction comprising full blocks, half blocks, adaptor blocks, wall end blocks, corner blocks and wall junction blocks, each consisting of an interlocking block element comprising a main body portion vertically offset a predetermined substantially constant amount relative to a pair of opposed side slab portions integrally formed with said main body portion, said side slab portions being substantially mutually parallel and of equal dimensions, said main body portions being horizontally offset at least at one lateral end thereof relative to said side slab portions, whereby a plurality of said block elements are horizontally and vertically interlocked by overlapping stepped joints in surface to surface engagement when laid end to end in superimposed courses, each of said stepped joints being defined relative to a block element by at least a pair of edge surfaces disposed substantially one at right angle to the other, said main body portion of each block element being hollow and provided with at least one recess extending vertically from upper face to lower face of said main body portion and open to at least one lateral end of said body portion, said recess continuously extending horizontally and vertically behind said overlapping stepped joints and being adapted to receive mortar or cement poured within said wall structure for uniting each of said block elements with each other by allowing said concrete or cement to flow vertically and horizontally within said wall structure only and to set to a solid from whereby set mortar or cement is present within said wall structure behind each horizontal and vertical overlapping stepped joint forming an uninterrupted moisture, heat and wind barrier and said overlapping stepped joints forming a dam preventing seepage of mortar or cement through said joints to the exterior of said wall structure.

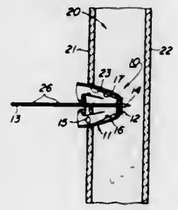
4,075,809

HOLE REPAIR DEVICE

Theodore M. Sirkin, 15401 Saticoy St., Van Nuys, Calif. 91406

Filed Jan. 2, 1976, Ser. No. 646,065
Int. Cl.² E04G *23/02*
U.S. Cl. 52—514 **1 Claim**

1. A device for use in repairing a hole in a hollow structure such as a wall, comprising an elastomeric concavo-convex circular member, said member having a plurality of holes therethrough, a plurality of radially extending ribs on the concave side of



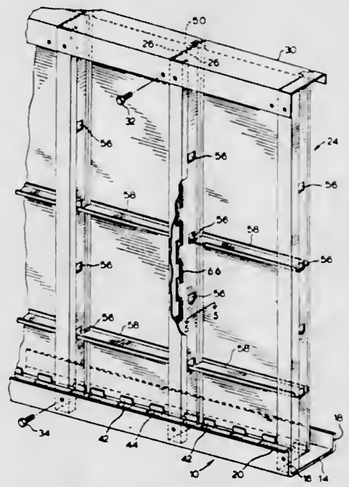
said member, said ribs terminating a substantial distance from the perimeter of said member.

4,075,810

METAL WALL CONSTRUCTION FOR BUILDINGS

Andrew Steven Zakrzewski, Burlington; Roderick William Eastman, Millgrove; George Steven Ashby, Port Credit, and Douglas Mel Clarkson, Brantford, all of Canada, assignors to Dominion Foundries and Steel, Limited, Burlington, Canada

Filed May 6, 1976, Ser. No. 683,767
Int. Cl.² E02D *27/00;* E04C *2/38*
U.S. Cl. 52—585 **8 Claims**



1. A metal building wall construction comprising:

a plurality of vertically-extending panels, each comprising a body portion having inner and outer faces and inwardly-extending edge webs at each vertical edge of the body portion, the panels being disposed side by side with their edge webs abutting, the said abutting panel edge webs having registering holes therein;

at least one of the said edge webs having formed therein a vertical ridge spaced from the adjacent inner panel face; and

at least one channel-section stiffening member for each panel extending between the two vertical edge webs of a panel for bracing the said abutting edge webs into contact with one another with a flange thereof engaging the inner face of the panel body portion for stiffening thereof against inwards bulging;

each stiffening member having one end shaped to fit within two registering edge web holes and to wedge against the immediately adjacent edge web in the neighbourhood of the respective web hole, and having its other end shaped to be engaged between the said vertical ridge in the other edge web of the same panel and the panel inner face upon displacement of the said other end of the stiffening mem-

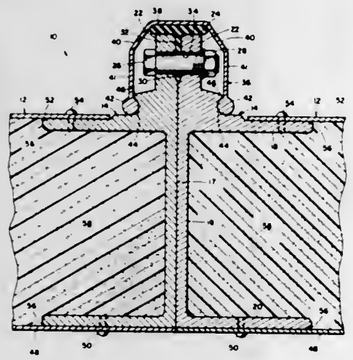
ber downward with its said one end engaged in the respective two registering holes, so as to be retained against the panel inner face by its engagement with the said registering apertures and vertical ridge, and so as to brace the engaged edge webs of its panel against the abutting edge webs of the immediately adjacent panels.

4,075,811

BUILDING ROOF PANEL

Donald B. Keith, Owasso, Okla., assignor to Nordam, Tulsa, Okla.

Filed Nov. 11, 1976, Ser. No. 740,865
Int. Cl.² F04D *3/36*
U.S. Cl. 52—395 **14 Claims**



1. A roof panel for a sectional building that can be transported and joined to other roof panels to form an extended area roof, with all joints sealed and protected from the weather, comprising:

(a) a rectangular frame made of sections of an extruded metal form, in the shape of a U channel, turned on its side, comprising:

(1) a base portion, which forms the outer surface of said frame,

(2) a bottom leg perpendicular to said base portion which forms the bottom of said frame;

(3) a top leg perpendicular to said base and spaced from said bottom leg by the width of said base portion, which forms the top of said frame;

(4) a support flange which forms a vertical extension of said base portion above said top leg; and

(5) means to attach lengths of said channel to each other to form a rectangular frame;

(b) a first rectangular sheet of metal of substantially the outside shape and area of said frame, and means to attach said sheet to the outside of said bottom legs of said frame;

(c) a second rectangular sheet of metal of the shape and area of the top of said frame inside of said upwardly extending flange, and means to attach said second sheet to the top surfaces of said top legs of said frame;

(d) means to fill the inside volume of said frame and said first and second sheets with a foamed plastic of selected composition; and

(e) a resilient gasket of T section, the leg portion being placed between abutting flange surfaces when two panels are placed edge to edge, the top portion covering the tops of the flanges and the joint; and

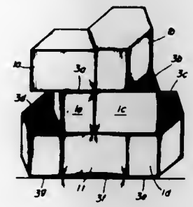
(f) means to press said two flanges together, compressing said gasket and sealing the joint between said two flanges.

4,075,812

REFRACTORY CHECKERWORK

Yasujiro Koyama, Yokohama; Fukuichi Kitani, Kawasaki, and Masaaki Nishi, Fukuyama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1975, Ser. No. 629,115
Claims priority, application Japan, Nov. 8, 1974, 49-128093
Int. Cl.² F23M *5/00*
U.S. Cl. 52—747 **6 Claims**



1. A method of determining the thickness of a compressible layer of material between overlapping faces of checker work bricks, comprising the steps of

(A) determining the compressibility of the material to be used in said layer;

(B) obtaining the amount of compressibility of said layer at 1.5 to 2.0 times the tensile strength of said bricks;

(C) measuring the maximum dimensional tolerance between overlapping bricks;

(D) determining the amount of compressibility required to disperse a maximum safety load throughout the maximum dimensional tolerance; and

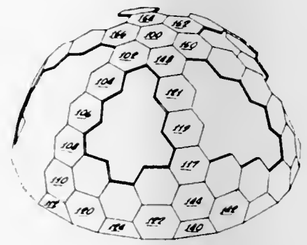
(E) letting the thickness of said layer equal the said dimensional tolerance times the said amount of compressibility required to disperse a maximum safety load divided by the said amount of compressibility at 1.5 to 2.0 times the tensile strength.

4,075,813

DOME CONSTRUCTION METHOD

David L. Nalick, 10789 Freer St., Temple City, Calif. 91780

Filed Jul. 14, 1976, Ser. No. 705,074
Int. Cl.² E04B *1/32*
U.S. Cl. 52—747 **8 Claims**



1. The method of building a dome structure comprising the steps of constructing a plurality of regular, identical, hexagonal structural units of rigid interconnected arms,

interconnecting said units in side to side abutting relation to form a dome structure,

said last mentioned step comprising distorting at least some of said units after other units have been assembled and interconnected with each other so as to improve the interfitting relations of unconnected units to the already connected units, and

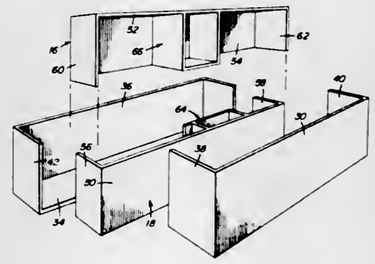
connecting said distorted units to units that have been connected.

4,075,814

MODULAR HOUSING SYSTEM WITH PART OF THE MODULE SERVING AS A SHIPPING CONTAINER FOR THE REMAINDER OF THE MODULE

John Theurer, Alpine, N.J.; Orville F. Beck, Downingtown, Pa., and James T. Doherty, Pelham, N.Y., assignors to Nesters Housing Company, Inc., Newark, N.J.

Filed May 24, 1976, Ser. No. 689,341
Int. Cl.² E04B *1/348*
U.S. Cl. 52—79.5 **6 Claims**



1. A housing system designed to be transported as a single package, comprising, in combination:

a. a first section including a floor and at least one wall;

b. a second section also including a floor and at least one wall, the second section cooperating with the first section during transport to form a container substantially in the form of a parallelepiped, the first section and second section being of substantially equal size, with each of the first section and second section having the floor and wall thereof disposed perpendicularly along respective peripheral side edges thereof and further including a pair of end walls disposed along end portions of the floor and wall at perpendicular angles thereto, one of the end walls of each of the first section and second section being disposed adjacent to and overlying an end wall of the other section, with the walls of the first section and second section being side walls, the first section and second section interfitting with respect to one another to form a rectangular parallelepiped and the end walls being disposed in the planes of the ends of the parallelepiped;

c. a third section including a floor and at least one wall; and

d. a fourth section including a floor and at least one wall, the fourth section cooperating with the third section during transport to form a package substantially in the form of a parallelepiped, the package formed by the third section and the fourth section being smaller in size than the container formed by the first section and the second section and disposed within the container, each of the first section and second section being provided with openings variously forming doors and windows of a building constructed partially from each section, the third section and fourth section being provided with partitions offset from one another when the third section and fourth section are arranged cooperating with one another during transport to form a package substantially in the form of a parallelepiped.

4,075,815

AUTOMATIC PACKAGE WRAPPING MACHINE

Herbert K. Carver, Jr., Cornwells Heights; Albert H. Chant, Holland; James F. Hall, Ardsley; Omar Hansen, Jr., Yardley, and John G. Lord, Swarthmore, all of Pa., assignors to Franklin Electric Subsidiaries, Inc., Fallsington, Pa.

Filed Apr. 30, 1976, Ser. No. 681,828
Int. Cl.² B65B *11/26*
U.S. Cl. 53—32 **32 Claims**

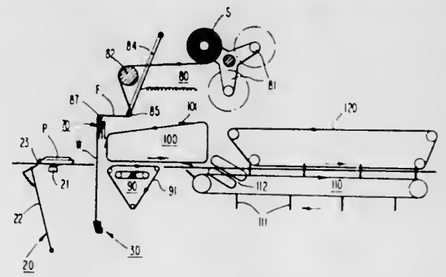
32. A method of wrapping a package in heat-sealable thingage film comprising the steps of:

a. providing a straight in-line horizontal support path for said package;

b. providing a substantially vertical curtain of continuous seamless film across said path, said film having a severed end off the path and a continuous seamless length extending back across the path to the supply source;

c. moving said package toward and into said curtain of film;

d. gripping the severed end of film and moving said end toward said package path at all times during the period that said package is being moved toward and into said curtain, thereby to form one portion of a tubular loop of film about the package, the forming of said loop being characterized by substantially no relative movement between the film and the package at the forward edge of the package;



e. pressing against the continuous length of film along a line located substantially at said original curtain line to assist in forming the other portion of said tubular loop of film;

f. servering the film behind the rearward edge of the package after the package has advanced beyond the original curtain line;

g. pressing the one and other portions of film together behind the package to close the loop;

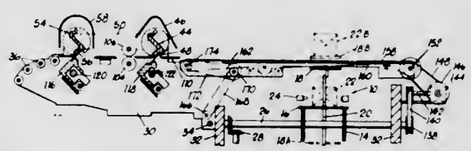
h. sealing the pressed-together portions behind the package while continuing to advance the package along said in-line horizontal path.

4,075,816

WRAPPER SHEET FEED FOR WRAPPING MACHINE

Ronald Holt, Battle Creek, and Daniel J. Smith, Kalamazoo, both of Mich., assignors to Franklin Electric Subsidiaries, Inc., Bluffton, Ind.

Filed Jan. 6, 1977, Ser. No. 757,365
Int. Cl.² B65B *57/12*; B65H *7/02*
U.S. Cl. 53—74 **8 Claims**



1. In a wrapping machine having a vertically reciprocating elevator for lifting articles to be wrapped from a supply conveyor having article advancing flights, wrapper sheet locating belts for locating a sheet of wrapper film over the path of articles elevated by said elevator, feed rolls for delivering wrapper film stock to said locating belts, a rotating cutter bar located over the film stock between said feed rolls and said locating belts, means for coordinating the action of said elevator, said supply conveyor, said feed rolls, said locating belts, and said cutter bar comprising:

first drive connections connected to continuously rotate said cutter bar through one revolution and reciprocate said

elevator in timed relation to the advance of each flight of said conveyor,

a normally engaged single position mechanical clutch rotatable through one cycle with each rotation of said cutter bar and having a disengaging pawl adapted to disengage the clutch at the start of any rotational cycle thereof,

an article sensing switch connected to close a first solenoid switch responsive to presence of an article to be wrapped,

a first timing cam driven continuously with said conveyor and arranged to close an energizing switch in series with said sensing switch prior to and during the start of each cycle of said clutch, said switches being connected to energize a solenoid adapted to retract the disengaging pawl of said clutch whereby the clutch remains engaged for a following full cycle,

a holding solenoid and circuit energized by said cam operated switch,

a second normally closed and continuously driven cam operated switch connected in series in said holding circuit and arranged to momentarily open the holding circuit to the solenoid of said clutch pawl during the latter part of the closed cycle of said first cam driven switch,

said feed rolls being connected to be driven through said clutch,

a striker bar rockably supported under the incoming film of wrapper stock and movable into coacting relation with said cutter bar,

a solenoid operated valve connected to a cylinder to swing said striker bar into coacting cutting relation to said cutter bar, the solenoid of said valve being connected to said energizing switch for actuation of said striker bar with said solenoid for retracting said clutch pawl,

a sequence switch driven with said conveyor and making one revolution during each revolution of the mechanical clutch and arranged to successively and momentarily open one switch and close two switches during each cycle,

a shaft having a sprocket rotatable thereon, the sprocket being driven continuously with said cutter bar,

an electric clutch adapted to connect said sprocket to said shaft, said wrapper locating belts being driven from said shaft,

an electric brake arranged when energized to stop said shaft and said locating belts,

pressure rollers swingably positioned over said locating belts and biased against said locating belts and wrapper sheets thereon,

solenoids connected to raise said pressure rollers from said belts,

sensing means positioned to sense the arrival of the leading edge of a wrapper sheet in said belts at the desired position over said elevator,

a normally open switch connected in the energizing circuit to said brake and arranged to be closed by actuation of said sensing means,

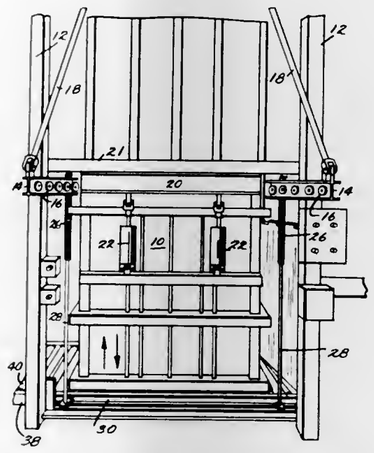
and circuit control means connected to be activated by said sequence switch to successively (a) de-activate the energizing circuit to said brake, and open a holding circuit to deenergize the solenoids holding said pressure rollers raised and to simultaneously close the energizing circuit to said electric clutch to start said wrapper locating belts at the end of one cycle and the start of a succeeding cycle, then (b) close a first normally open switch to a solenoid to open the energizing circuit to said electric clutch whereby said locating belts start to decelerate, and close one switch in the energizing circuit to said brake, and then (c) close a second normally open switch to the solenoid to energize the solenoids to raise said pressure rollers from said wrapper sheet locating belts, and reenergize said electric clutch to drive said locating belts.

4,075,817

APPARATUS FOR BALING COMPRESSIBLE MATERIAL

Edward T. Gieske, Jr., Chattolanee Hill, Owings Mills, Md. 21117

Filed Apr. 14, 1976, Ser. No. 676,675
Int. Cl.[2] B65B *13/20, 63/02*
U.S. Cl. 53—124 A **9 Claims**



1. Apparatus for baling a compressible material between bottom and top bale boards comprising:

means for supporting said bottom board, said supporting means including a frame and a plurality of spaced parallel rollers mounted in said frame;

a chamber movable between a retracted position and a position at which said supporting means is engaged and said bottom board is enclosed;

a door in said chamber to permit insertion of the bale boards within the chamber;

a ram movable within said chamber, said ram having a material and top board-contacting surface comprising a plurality of spaced parallel ribs extending in a direction perpendicular to the axes of rotation of said rollers;

means for introducing material to be compressed to said chamber when said chamber engages the support means, a bottom board is supported by the support means, and said ram is in a withdrawn position within the chamber;

means for moving said ram from the withdrawn position to compress material introduced into the chamber onto the bottom board;

means for controlling movement of said ram within the chamber for first compressing material, then retracting said ram to a position adjacent the door to allow the top board to be inserted within the chamber between the ram and the compressed material, and then moving the ram in a single direction to engage and displace said top board to a bale forming position at which the material and the boards are formed into a bale having a predetermined dimension;

means for moving said chamber to its retracted position when the bale is formed to said dimension;

ejector means operable when said chamber moves to the retracted position and while said ram is retained in its bale forming position for displacing the bale from said supporting means, in a direction perpendicular to said roller axes, to a location between sets of additional rollers spaced to the dimension of said bale; and

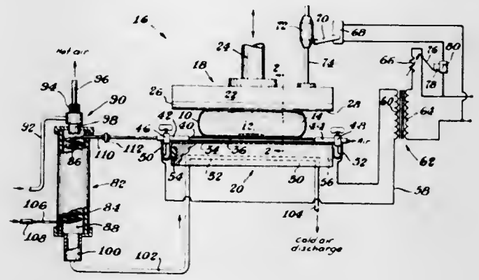
means responsive to the position of the ejector means follownng displacement of the bale for returning the ram to the withdrawn position and the chamber to the supporting means-engaging position.

4,075,818

IMPULSE SEALING APPARATUS

Donald R. Wright, Midland, Mich., and Henry D. Swartz, Chestnut Hill, Mass., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 4, 1976, Ser. No. 693,070
Int. Cl.[2] B65B *51/30, 51/14, 9/12*
U.S. Cl. 53—180 R **1 Claim**



1. Apparatus for heat sealing of thermoplastic web materials in form-fill and seal fluid pouch packaging machines comprising, in combination: opposed sealing jaws faced with a release material, at least one sealing jaw containing a first internal cooling channel and a second internal cooling channel, one of said cooling channels being located closely adjacent the face of said jaw, a single vortex tube in open communication with a heat exchanger and one of said cooling channels, said heat exchanger having a cooling coil and an exhaust means, one of said cooling channels being supplied cooled gas from the coil of said heat exchanger, the other of said channels being supplied cooled gas from said vortex tube through the exhaust means of said heat exchanger, whereupon after the thermoplastic web is sealed the same is cooled rapidly by the plural fluid flows contained in jaw.

4,075,819

FINGER ASSEMBLY FOR PACKER GRID

John L. Raudat, North Madison, and Lloyd D. Johnson, Portland, both of Conn., assignors to Emhart Industries, Inc., Farmington, Conn.

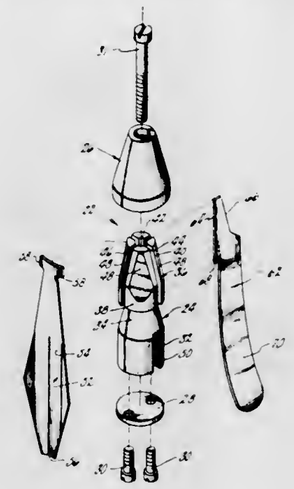
Filed Mar. 8, 1977, Ser. No. 775,669
Int. Cl.[2] B65B *39/02*
U.S. Cl. 53—248 **10 Claims**

1. A finger assembly for use in a packer grid, said finger assembly comprising:

a. a body having an upper frustoconical section having at least one flat thereon;

b. at least one flexible finger extending downwardly and outwardly from said body, said finger having an upper portion positioned against said flat, said upper portion having at least one ear extending therefrom; and

c. cap means attached to said body for holding the upper portion of said finger against said flat, said cap having a



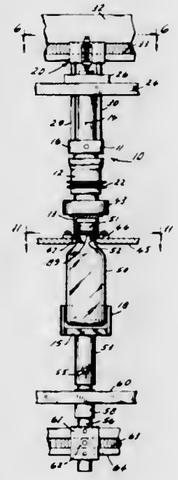
circumferential groove in its interior surface, the ear of said finger extending into said groove.

4,075,820

SPIN WELDING APPARATUS

Wendell Evert Standley, Lake Forest, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Jul. 28, 1976, Ser. No. 709,362
Int. Cl.[2] B65B *7/28;* **B67B** *3/08;* **B29C** *27/08;* **B23K** *28/00*
U.S. Cl. 53—329 **34 Claims**



17. An apparatus for frictionally joining a cap member to the neck of a container comprising:

a rotatable spindle member having a head portion adapted to releasably engage said cap member;

means to support said container and prevent said container from rotating;

means to rotatably support said spindle member;

means to move said spindle member toward and away from said container;

biasing means operatively associated with said means to move said spindle member toward and away from said container to effect a predetermined tension on said spindle

member prior to and during contact of said cap member on said container neck and limiting the stroke of travel of said spindle member as said cap member is moved toward said container neck;

a pair of oppositely disposed jaw members each having a surface constructed and arranged to substantially surround said neck of said container and said container neck includes a rib member supported by said jaw members; and

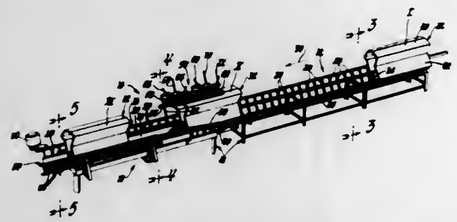
means to rotate said spindle member so as to effect frictional engagement and securing of said cap member on said neck.

4,075,821

APPARATUS FOR CLOSING AN ARTICLE WRAPPER

Raymond J. Cavell, Grand Blanc, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 24, 1977, Ser. No. 771,434
Int. Cl.[2] B65B *7/20*; B65C *11/04*
U.S. Cl. 53—376 **3 Claims**



1. An apparatus for closing an article wrapper having a lower tubular portion integrally formed with an upper flap that terminates with a straight edge, said apparatus including an elongated frame divided into an entrance section and a conveyor section, said entrance section having means for supporting said article wrapper for movement towards said conveyor section while maintaining said flap spaced from said tubular portion, said conveyor section being axially aligned with said entrance section and having a power driven belt for moving said article wrapper along said conveyor section, means carried by said conveyor section for applying adhesive to said tubular portion as said article wrapper moves into said conveyor section, a positioner member located adjacent said conveyor section for receiving the flap of said article wrapper and for guiding the flap into contact with said tubular portion after the adhesive is applied thereto, said positioner member having a flat floor, means for engaging said flap and for maintaining the straight edge thereof in contact with said flat floor prior to the flap contacting said tubular portion, and said conveyor section having means formed therewith for maintaining said flap in contact with said tubular portion to assure that said adhesive is substantially cured so that said flap is bonded to said tubular portion.

4,075,822

CROP CONDITIONER ROLL STRUCTURE

Warner M. Heckley, Rockford, and Gerald F. Richards, Celina, both of Ohio, assignors to Avco Corporation, Coldwater, Ohio

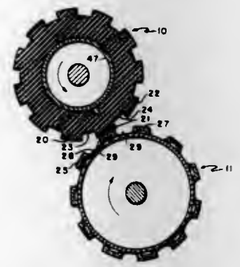
Continuation of Ser. No. 514,213, Oct. 11, 1974, abandoned.
This application Dec. 3, 1975, Ser. No. 637,190
Int. Cl.[2] A01D *49/00*
U.S. Cl. 56—1 **3 Claims**

1. In a hay conditioner, the improvement which provides, in combination:

an upper conditioner roll having an axis and circumferentially spaced radially extending rib formations running at an angle relative to its axis,

a lower conditioner roll having an axis and circumferentially spaced radially extending ribs running at an angle to the axis of said second roll,

the formations on the first roll and ribs on the second roll being complementary and in face-to-face symmetrical peripheral registry, the upper roll being of resilient material and the lower roll being of rigid material, the rolls being adjacently disposed,



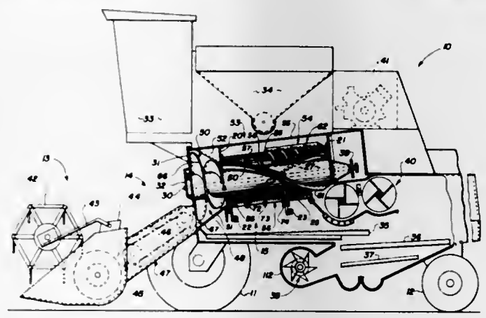
and gear means for driving the rolls in timed synchronism so as to maintain said registry.

4,075,823

COMBINE HARVESTER

Edward W. Rowland-Hill, Lancaster, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Jul. 14, 1976, Ser. No. 705,379
Int. Cl.[2] A01D *45/02*
U.S. Cl. 56—14.6 **12 Claims**



1. A combine harvester comprising

(a) a mobile frame adapted to be propelled over a field of grain bearing crop material,

(b) a header carried by the frame and extending forwardly therefrom, said header having means for removing the crop material from the field and delivering it in a generally rearward direction,

(c) infeed means mounted on the frame for receiving crop material from said header and conveying it in a generally rearward direction,

(d) two generally cylindrical units for receiving material from said infeed means, said units mounted in spaced relation on said frame and extending in a generally fore-and-aft direction, each unit comprising a threshing section having a transversely curved concave and a separating section rearward of said concave,

(e) means mounted on said frame for enclosing said cylindrical units, said enclosing means including side and top wall members extending substantially the full length of said separating sections, said side wall members being spaced from and outboard of said separating sections,

(f) grain receiving means extending between said side members and underneath at least a portion of said cylindrical units, and

(g) two fore-and-aft extending rotors, one rotatably mounted in each of said cylindrical units, means for rotating said rotors in opposite directions wherein the peripheries thereof pass downwardly with respect to each other at adjacent sides, said rotors each including threshing means adjacent said concave and crop engaging means for imparting centrifugal force to crop material in said separating section for effecting separation of grain from the crop material under conditions where said rotors are rotated,

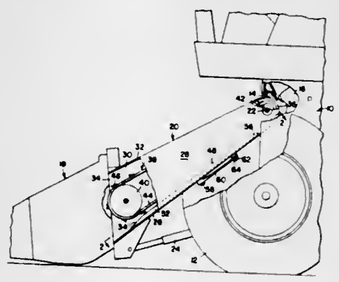
(h) said separating sections each include a configuration of apertures permitting discharged grain to pass therethrough over substantially the full 360° circumference of said cylindrical units whereby the grain centrifugally separated from said crop material is discharged outwardly therethrough toward said side and top walls of said enclosing means and downward in the direction of said grain receiving means the direction thereof being determined by the radial position at which grain is dislodged from the crop material as it is being conveyed rearwardly through said separating section, all of said grain so discharged being free to eventually gravitate to said grain receiving means by virtue of the spaced relation of the cylindrical units and said enclosing means, the portion of said grain discharged in the direction of the adjacent unit is intermingled and distributed substantially evenly in the central portion of the grain receiving means.

4,075,824

HARVESTING MACHINE FEED MECHANISM

Edward John Hengen, Bettendorf, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Oct. 26, 1976, Ser. No. 735,380
Int. Cl.[2] A01D *45/00*
U.S. Cl. 56—14.6 **12 Claims**



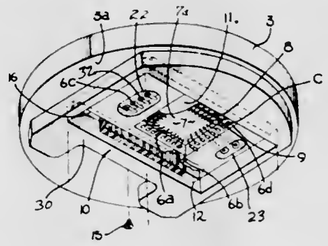
1. In a harvesting machine having a mobile body with a crop inlet opening and a crop treating mechanism disposed in the body and a forward harvesting header adapted to remove crop material from the field as the machine advances, the combination therewith of an improved mechanism for feeding crop material from the header to the crop inlet opening comprising: a housing having a floor, opposite generally fore and aft sides extending upwardly from the floor, a forward inlet in crop receiving relationship with the header and a rearward outlet in crop transfer relationship with the body inlet opening; a conveyor means mounted in the housing above the floor and operative to move crop material rearwardly, along the floor from the housing inlet to the outlet; a crop directing means mounted in the housing between the conveyor means and the floor and including a plurality of generally upright vanes, the crop directing means being shiftable between alternate positions wherein the vanes are inclined toward one side of the housing or the other to respectively direct crop material being moved rearwardly through the housing by the conveyor means toward one side of the body crop inlet opening or the other; and control means for selectively controlling the position of the crop directing means.

4,075,825

ELECTRONIC TIMEPIECE SUBSTRATUM

Tomomi Murakami, Yamato; Masaru Yoshida, Murayama; Satoshi Kimura, Tokorozawa; Tetuya Yasuda, Tokyo, and Yoshio Iinuma, Kodaira, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jun. 30, 1975, Ser. No. 592,099
Claims priority, application Japan, Jun. 28, 1974, 49-073420; Aug. 27, 1974, 49-098153; Jul. 22, 1974, 49-087116[U]
Int. Cl.[2] G04C *3/00*; G04B *37/00*
U.S. Cl. 58—23 R **21 Claims**



1. A watch body for an electronic watch comprising:

a. an upper case and a bottom watch cover, said upper case and bottom cover each containing means for selectively interlocking one with the other thereby forming a discrete watch body;

b. a lead package frame sandwiched between said upper case and said bottom cover, said lead frame having first and second sides, said first side having a first cavity disposed therein arranged and configured to receive an integrated circuit chip, and said second side of said lead frame arranged and configured to detachably engage a printed circuit board; and

c. a liquid crystal cell disposed in an associated holder member such that said liquid crystal cell is adjacent said first cavity on said lead frame, said holder member extending downward from said lead frame.

4,075,826

TIMING CIRCUIT FOR DIGITAL WRISTWATCH

Norman E. Moyer, Newport Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 19, 1975, Ser. No. 578,689
Int. Cl.[2] G04C *3/00*; G04B *19/00*
U.S. Cl. 58—23 R **3 Claims**

1. A digital timing circuit in a digital watch with two electro-optical display elements, when said circuit is activated by a manually operable switch, the two display elements first display the hours information, for as long as the switch is closed and after the switch is opened, the display elements show the minutes information and then turn off, comprising:

a clock pulse source;

first gate means having first and second input connections and an output connection;

second gate means having first and second input connections and an output connection;

said second input of said second gate connected to said output of said first gate;

third gate means having first and second input connections and an output connection;

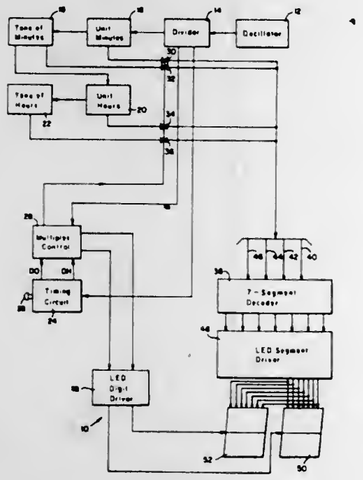
said output of said second gate connected to said second input of said third gate;

said first input of said second gate connected to said output of said third gate;

a manually operable switch for activiating said digital timing circuitry, said switch connected to said first input to said third gate;

first flip-flop having first and second input connections and first and second output connections;

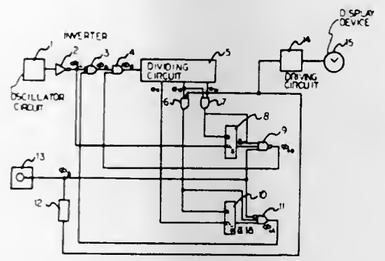
second flip-flop having first and second input connections and first and second output connections;
said clock pulse source connected to said first input to said first flip-flop;
said first output of said first flip-flop connected to said second input to said first gate;
said first output of said second flip-flop connected to said first input of said first gate;
said first input to said third gate connected to the resets of said first and second flip-flop;
first and second electro-optical display elements which display the digits of first and second sets of horological information;



said first input to said third gate being connected to said first electro-optical display element;
said output of said second gate being connected to said second electro-optical display element;
said second set of horological information is displayed on said electro-optical display when said output of said second gate is at a logical binary high level and said input to said third gate is at a logical binary low level; and
said first set of horological information is displayed on said electro-optical display when said output of said second gate and said input to said third gate are at a logical binary high level.

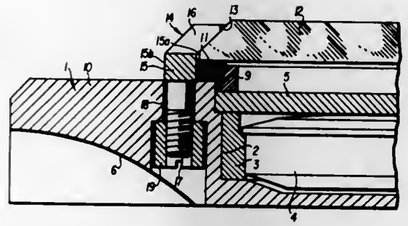
4,075,827
ADJUSTABLE CIRCUIT FOR AN ELECTRONIC TIMEPIECE
Makoto Yoshida; Yoshifumi Mochizuki, both of Tokorozawa; Masamichi Yamauchi, Ichikawa, and Hideyuki Kawashima, Higashi Kurume, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Jul. 23, 1976, Ser. No. 708,221
Claims priority, application Japan, Aug. 1, 1975, 50-94010
Int. Cl.[2] G04C *3/00;* **H03K** *5/159;* **H03B** *3/04*
U.S. Cl. 58—23 AC **13 Claims**

1. A circuit for an electronic timepiece of the type having a piezo-electric reference oscillator, an oscillator circuit coupled to said reference oscillator for producing an electrical oscillation of a predetermined frequency, a divider circuit that divides the frequency of said oscillation, and a driving circuit which drives a display unit using the output of said divider circuit, characterized by the inclusion in said divider circuit of an adder circuit comprising an adder gate and a subtraction



circuit comprising a subtraction gate arranged in series with said adder circuit.

4,075,828
FOUR-SIDED WATER-RESISTANT WATCH-CASE
Hans Ulrich Klingenberg, St. Niklaus near Merzligen, Switzerland, assignor to Century Time Limited, Switzerland
Continuation of Ser. No. 519,293, Oct. 30, 1974, Pat. No. 4,002,020. This application Aug. 23, 1976, Ser. No. 716,710
Claims priority, application Switzerland, Nov. 9, 1973, 15758/73
The portion of the term of this patent subsequent to Jan. 11, 1994, has been disclaimed.
Int. Cl.[2] G04B *37/08*
U.S. Cl. 58—90 R **3 Claims**

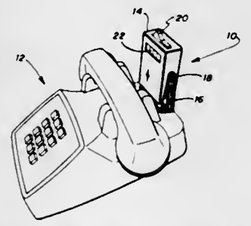


1. In a four-sided watch-case comprising a crystal made of an inorganic material such as sapphire, a bottom and a middle part having a plane upper face, and a lodging of its lower face for receiving a movement, a frame (**30**) resting on said upper face, a pair of opposed claw members projecting upwardly and inwardly from said frame, a pair of feet projecting downwardly from said frame at the location of said claw members, and a gasket arrangement resting on said upper face inwardly of said frame, said gasket supporting said crystal, said crystal having beveled side edges, said claw members contacting portions of said beveled side edges and leaving other portions of said beveled side edges uncovered and said feet engaging openings through said middle part and said bottom for securing said frame, said crystal and said bottom on both sides of said middle part, thus providing a rigid hollow body wherein the crystal and the bottom act as stiffening parts.

4,075,829
SELF-CONTAINED MINIATURE TIMER
Mark D. Goff, Dallas, Tex., assignor to GRS Instruments, Inc., Dallas, Tex.
Filed Jun. 11, 1976, Ser. No. 695,191
Int. Cl.[2] G04B *47/00;* **G04F** *7/04;* **A47F** *7/00*
U.S. Cl. 58—152 T **16 Claims**

1. A telephone set timer comprising:
a housing having a display aperture in the front surface thereof,

display means mounted within said display aperture for displaying multiple digits,
a bracket having a base surface connected to upwardly extending arms,
pivot means on said arms for connecting said housing between said arms for enabling the attitude of said housing to be adjusted pivotally to any one of a number of fixed positions relative to the telephone set to facilitate viewing of said display by a telephone user,



means for attaching said base surface to a surface of a telephone set such that said display means may be observed by the telephone user,
timing circuitry within said housing for generating periodic timing signals and for driving said display means to display time intervals to the telephone user, and
switch means positioned on said housing for actuation by the telephone user to start and stop operation of said circuitry in order to provide an indication of the time of telephone calls by the user.

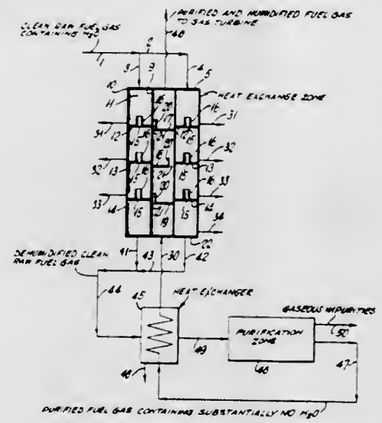
4,075,830
SOLID ADHESIVE COMPOSITIONS
Shigeru Nagasawa, Ageo, and Toshinao Okitsu, Tokyo, both of Japan, assignors to Konishi Co., Ltd., Osaka, Japan
Filed Apr. 26, 1976, Ser. No. 680,393
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—18 N **21 Claims**

1. An adhesive composition comprising:
(a) a water soluble or water dispersible polymer having adhesive properties present in an amount of about 5 to 50% by weight of the total weight of the adhesive composition;
(b) an N-fatty acid acylated amino acid or a salt thereof present in an amount of about 2 to about 30% by weight of the total amount of the adhesive composition; and
(c) water or a mixture of water and one or more organic solvent(s) and/or one or more plasticizer(s), wherein the proportion of said water or said mixture of water and one or more organic solvent(s) and/or one or more plasticizer(s) contained in the adhesive composition is about 30 to 80% by weight of the total adhesive composition, but the proportion of the one or more organic solvent(s) and/or one or more plasticizer(s) is less than the amount of water together therewith.

4,075,831
PROCESS FOR PRODUCTION OF PURIFIED AND HUMIDIFIED FUEL GAS
Rodney McGann, Santa Cruz, Calif., assignor to Texaco Inc., New York, N.Y.
Filed Oct. 27, 1976, Ser. No. 735,926
Int. Cl.[2] F02G *3/00;* **C10K** *1/00*
U.S. Cl. 60—39.05 **14 Claims**

1. A continuous process for producing a stream of purified and humidified fuel gas comprising: (1) passing a clean raw feed gas stream comprising H_2, CO, H_2O, and at least one gas from the group CO_2, H_2S, COS, CH_4, A and N_2 through a heat exchange zone in indirect countercurrent heat exchange with a stream of purified fuel gas which enters said heat exchange zone containing substantially no H_2O and which is produced subsequently in a purification zone at a lower temperature thereby cooling said raw feed gas stream below its dew point, separating out condensed water from said raw feed gas stream in a plurality of vertically spaced horizontal collecting means, and producing a cooled substantially dry raw gas stream; (2) simultaneously in a plurality of vertically spaced horizontal revaporizing means introducing at least a portion of said condensed water into said stream of purified fuel gas passing through said heat exchange zone in (1) to produce a separate product gas stream of purified and humidified fuel gas; (3) purifying the cooled substantially dry raw gas stream from (1) in a purification zone by separating therefrom at least one gas from the group H_2O, CO_2, H_2S, and COS and thereby producing a stream of purified fuel gas containing substantially no H_2O; and (4) introducing at least a portion of said stream of purified fuel gas from (3) into said heat exchange zone in (1) as said stream of purified fuel gas.

5. In a process for the production of fuel gas by the partial oxidation of a hydrocarbonaceous fuel with a free-oxygen containing gas optionally in the presence of a temperature moderator in a free-flow noncatalytic partial oxidation generator to produce a raw fuel gas stream at a temperature in the range of about 1300 to 3500° F and a pressure in the range of about 250 to 1200 psia, said raw fuel gas stream comprising H_2, CO, H_2O, and at least one gas from the group CO_2, H_2S, COS, CH_4, A and N_2, along with entrained solid particles; cooling and cleaning said raw fuel gas stream by direct contact with



water in a cleaning zone thereby removing substantially all of said entrained solid particles; purifying the cleaned fuel gas stream by removing at least one gas from the group CO_2, H_2S, COS, CH_4, H_2O, A and N_2; and burning the resulting product gas in a gas turbine as fuel, the improvement comprising: (1) passing the raw fuel gas stream from the cleaning zone having a percentage humidity in the range of about 30–100, a temperature in the range of about 200 to 400° F, and a pressure substantially that of the gas generator less ordinary pressure drop in the line through a heat exchange zone in indirect countercurrent heat exchange with a stream of substantially dry purified fuel gas produced subsequently in a purification zone at a temperature in the range of about 60 to 180° F, thereby cooling said raw fuel gas stream to a temperature in the range of about 80 to 200° F and below its dew point and condensing and separating out water therefrom in a plurality of vertically spaced horizontal collecting means to produce a cooled substantially dry raw fuel gas stream; (2) in a plurality of vertically space horizontal revaporizing means introducing at least a portion of said condensed water into said stream of purified fuel gas passing through said heat exchange zone in (1) to produce a separate product gas stream of purified and humidified fuel gas; (3) purifying the cooled cleaned substantially dry raw fuel gas stream leaving (1) in a purification zone by separating therefrom at least one gas from the group CO_2, H_2S, COS, and H_2O, thereby producing a stream of substantially dry purified fuel gas; (4) introducing at least a portion of said

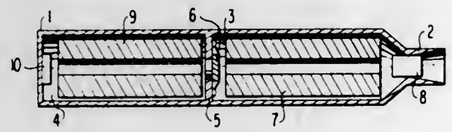
stream of purified fuel gas from (3) into said heat exchange zone in (1) as said stream of substantially dry purified fuel gas; and (5) burning at least a portion of said stream of purified and humidified fuel gas from (2) in a gas turbine.

4,075,832

PARTITION FOR ROCKET MOTORS

Walter Helmut Diesinger, Bergisch Gladbach, and Klaus Peter Kosiolek, Konigswinter, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Filed Dec. 5, 1975, Ser. No. 637,958
Claims priority, application Germany, Dec. 9, 1974, 2458180
Int. Cl.[2] F02K *9/04*; F16K *15/03*
U.S. Cl. 60—245 **19 Claims**



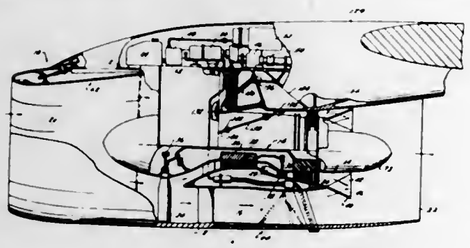
1. A partition arrangement for rocket motors having an axis with at least two mutually independent longitudinally spaced thrust stages and nozzle and nose sides, the partition arrangement including a partition means extending substantially transversely to the axis for separating a combustion chamber on the nozzle side having a solid propellant charge therein from another chamber on the nose side, the partition means being provided with at least one flow aperture therein, and sealing means disposed on the nozzle side for sealing the at least one flow aperture of the partition means, the sealing means being displaceable for freeing the at least one flow aperture of the partition means and being maintained within the another chamber on the nozzle side upon displacement, at least one of the partition means and the sealing means being provided with only one flow aperture along the axis of the rocket motor for being completely uncovered by displacement of the sealing means and for effecting at least one of a concentration and focusing of the propellant gases from the nose side combustion chamber to enter the another chamber on the nozzle side only in a central direction whereby locally excessive thermal stresses are avoided and turbulence in the propellant gas stream is reduced.

4,075,833

VARIABLE AREA INLET FOR A GAS TURBINE ENGINE

Donald Farley Sargisson, Cincinnati, Ohio, assignor to General Electric Company, Lynn, Mass.

Filed Jan. 2, 1976, Ser. No. 646,075
Int. Cl.[2] F02K *3/06, 11/00*
U.S. Cl. 60—262 **4 Claims**



1. A variable area inlet for a gas turbine engine which includes an outer nacelle circumscribing a core engine comprising a hinged wall assembly forming the interior face of the outer nacelle and extending from the upstream end of the inlet to a point upstream of the core engine said hinged wall assembly comprising:

a plurality of circumferentially spaced acoustically absorbent panels pivotally mounted to the upstream end of the outer nacelle and separated by a plurality of circumferentially spaced wedge members,

a plurality of circumferentially spaced acoustically absorbent aft panels separated by the wedge members, pivotally mounted at their upstream ends to the downstream end of axially aligned respective forward panels and having their downstream ends pivotally mounted to the interior of the nacelle, and

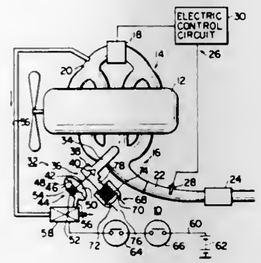
actuating means for selectively moving the panels away from or toward the nacelle thereby to decrease or increase respectively the cross-sectional flow area of the inlet throat.

4,075,834

AIR-FUEL RATIO CONTROL ADJUSTING SYSTEM IN AN INTERNAL COMBUSTION ENGINE

Masaaki Saito, and Hidehiro Minami, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Dec. 3, 1975, Ser. No. 637,311
Claims priority, application Japan, Dec. 6, 1974, 49-140253
Int. Cl.[2] F02B *75/10*
U.S. Cl. 60—276 **5 Claims**



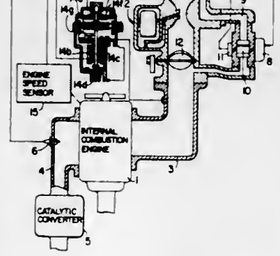
1. An air-fuel ratio control adjusting system in combination with an internal combustion engine and a motor vehicle equipped with said engine, said engine including an intake passageway for feeding air into said engine, a throttle valve rotatably mounted in said intake passageway, an air-fuel mixture forming device communicating with said intake passageway for feeding fuel into air fed through said intake passageway to form an air-fuel mixture to be burned in said engine, and an exhaust gas passageway for conducting exhaust gas from said engine, said system comprising a device for electrically controlling the air-fuel ratio of said air-fuel mixture to a desired air-fuel ratio, a sensor located in said exhaust gas passageway for sensing a concentration of oxygen contained in the engine exhaust gas which concentration is a function of the air-fuel ratio of said air-fuel mixture burned in said engine, said sensor having means to generate an output signal having a value representative of the sensed concentration of said oxygen, an electric control circuit which is electrically connected to said sensor and compares the value of said output signal of said sensor with a reference value representative of said desired air-fuel ratio, and has means to generate an error signal representative of a difference between the value of said output signal and said reference value, and fuel flow control means which is integral with said air-fuel mixture forming device and is electrically connected to said control circuit to receive said error signal thereof and controls in accordance with said error signal the flow of fuel fed into said air to thereby control, to said desired air-fuel ratio, the air-fuel ratio of said air-fuel mixture formed by said air-fuel mixture forming device, and a secondary air supply device for feeding secondary air into said exhaust gas passageway during idling and slow speed running of said engine for increasing the concentration of said oxygen in said engine exhaust gas sensed by said sensor, said secondary air supply device thereby causing said fuel flow control means to temporarily increase the flow of fuel fed into said air to enrich said air-fuel mixture formed by said air-fuel mixture forming device, said secondary air supply device comprising passage means opening into said exhaust gas passageway in a position upstream of said sensor for supplying secondary air into said exhaust gas passageway, a throttle switch opened in response to a first degree of opening of said throttle valve which is above a predetermined value and closed in response to a second degree of opening of said throttle valve which is below said predetermined value and representative of idling and slow speed running of said engine, a vehicle speed switch opened in response to a first speed of said motor vehicle which is above a predetermined value and closed in response to a second speed of said motor vehicle which is below said predetermined value and is representative of idling and slow speed running of said engine, a flow control valve located in said passage means, and operating means connected to said throttle and vehicle speed switches for causing, in response to opening of at least one of said throttle and vehicle speed switches, said flow control valve to close said passage means to inhibit supply of said secondary air into said exhaust gas passageway and further causing, in response to closing of both said throttle and vehicle speed switches, said flow control valve to open said passage means to permit supply of said secondary air into said exhaust means to increase the concentration of said oxygen sensed by said sensor.

4,075,835

ADDITIONAL AIR CONTROL DEVICE

Tadashi Hattori, Okazaki; Takamichi Nakase, Gamagori, and Hiroaki Yamaguchi, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Nov. 9, 1976, Ser. No. 740,173
Claims priority, application Japan, Nov. 11, 1975, 50-135394
Int. Cl.[2] F02B *75/10*
U.S. Cl. 60—276 **4 Claims**



2. An additional air control device for an internal combustion engine which has an intake system, an exhaust system, and a catalytic converter for purifying exhaust gases comprising:

a carburetor connected to the intake system of said internal combustion engine and including a passage for supplying substantially rich air-fuel mixture, said passage being provided with a throttle valve for controlling an amount of air-flow;

means defining a bypass passage for supplying additional air to the downstream side of said throttle valve;

a control valve mounted in said bypass passage for controlling the amount of additional air flowing therethrough;

drive means coupled to said control valve for driving said control valve to open and close;

gas sensing means mounted in the exhaust system of said engine upstream of said catalytic converter for producing a gas sensing signal corresponding to the composition of exhaust gases flowing through said exhaust system;

rotational speed sensing means for sensing the rotational speed of said engine and thereby producing an electrical digital rotational speed signal;

pressure sensing means for sensing the vacuum produced in said intake system of said engine and thereby producing an electrical vacuum signal; and

electronic control means operatively connected to said gas sensing means, said rotational speed sensing means, said pressure sensing means and said drive means;

said electronic control means being responsive to said gas sensing signal, said digital rotational speed signal and said vacuum signal for alternately driving and stopping said drive means repeatedly in a selected direction; and

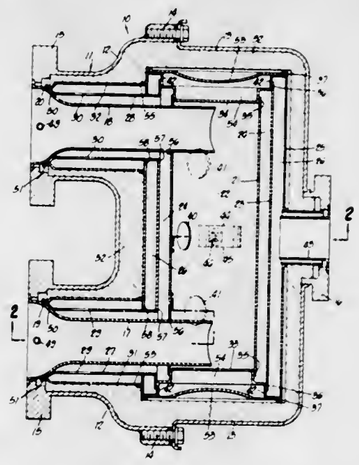
said electronic control means including a comparison circuit for receiving said gas sensing signal and comparing the same with a preset value to determine whether said gas sensing signal is greater or smaller than said preset value and thereby determine the direction of operation of said drive means, a D-A converter circuit for converting said digital rotational speed signal into an analog signal by D-A conversion, a timing control circuit for receiving said analog signal and said vacuum signal to determine the running time and stopping time of said drive means, and a switching circuit responsive to the signals from said comparison circuit and said timing control circuit for producing a drive means driving signal, whereby the air-fuel ratio of mixture supplied to said engine is maintained at a stoichiometric air-fuel ratio to properly adjust the composition of exhaust gases flowing into said catalytic converter.

4,075,836

EXHAUST MANIFOLD FOR INTERNAL COMBUSTION ENGINE

Shuichi Yamazaki, Kamifukuoka; Ikuo Kajitani, Niiza, and Michio Kawamoto, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 16, 1976, Ser. No. 677,668
Claims priority, application Japan, Apr. 22, 1975, 50-54081[U]; May 28, 1975, 50-70993[U]; May 28, 1975, 50-70994[U]; May 28, 1975, 50-70995[U]
Int. Cl.[2] F01N *3/10*
U.S. Cl. 60—282 **8 Claims**



1. An exhaust manifold for use with a multicylinder internal combustion engine having exhaust ports, comprising, in combination: an external housing, a plurality of laterally spaced parallel exhaust inlet pipes positioned to receive exhaust gases from the exhaust ports of the engine, first, second and third concentric shells extending at substantially right angles to said

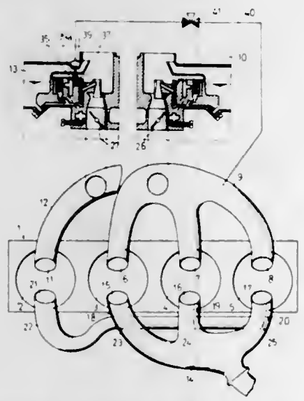
exhaust inlet pipes and defining first, second and third reaction chambers, means closing the ends of said chambers, said second shell encircling the first shell and the third shell encircling the second shell, said exhaust inlet pipes discharging into the first reaction chamber within said first shell, said first shell having an opening communicating with the second reaction chamber between said first shell and said second shell, said second shell having openings communicating with the third reaction chamber between the second shell and the third shell, a first tube concentric with and encircling each exhaust inlet pipe, respectively, and communicating with said second reaction chamber, a second tube encircling each said first tube, respectively, and communicating with the third reaction chamber between said second and third shells, port means in each first tube establishing communication between the interior thereof and the interior of the encircling second tube, and a discharge pipe communicating with said third reaction chamber.

4,075,837

EXHAUST GAS PURIFYING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Masanori Hanaoka, Toyoda, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation-in-part of Ser. No. 622,975, Oct. 16, 1975, abandoned. This application Sep. 14, 1976, Ser. No. 723,289
Claims priority, application Japan, Jun. 18, 1975, 50-74178
Int. Cl.² F02B *75/10*
U.S. Cl. 60—282 **4 Claims**



1. In an internal combustion engine having a plurality of cylinders, main suction conduit means connected to a main carburetor, a throttle valve in said main carburetor and main exhaust conduit means, the improvement which comprises:

second suction conduit means separate from said main suction conduit means and opening into one of said cylinders, said main suction conduit means opening into the remaining cylinders;

a sub-carburetor connected to said second suction conduit means;

a second throttle valve provided in said sub-carburetor and mounted on a shaft on which said throttle valve in said main carburetor is mounted;

second exhaust conduit means having one end connected to said one cylinder and another end connected to said main exhaust conduit means connected to said remaining cylinders; and

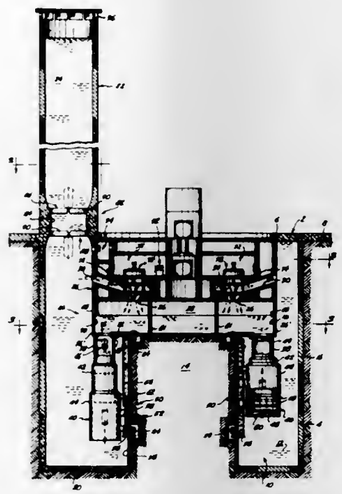
means connected between said sub-carburetor and said main suction conduit means and responsive to a negative pressure prevailing in said main suction conduit means for controlling supply of fuel through said second suction conduit means, whereby fluid flow through said one cylinder into said main exhaust conduit means is restricted to atmospheric air.

4,075,838

CLOSED SYSTEM, STANDPIPE OPERATED HYDROELECTRIC POWER PLANT

Charles Pelin, R.R. 1, Box 1460, Eastsound, Wash. 98245

Filed Jul. 22, 1977, Ser. No. 817,913
Int. Cl.² F16D *33/00*
U.S. Cl. 60—325 **14 Claims**



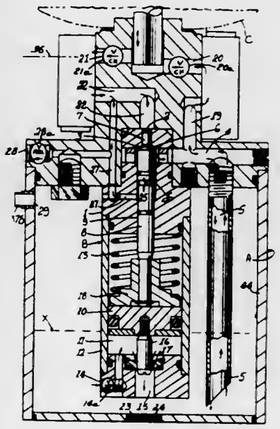
1. In combination, casing means defining a pressure chamber filled with a body of water and a standpipe relatively upstanding thereabove having a column of water therein communicating with the water in the chamber, a housing enclosed in the pressure chamber and defining a subchamber therein and a series of penstocks which open into the body of water in the pressure chamber at points about the perimeter of the housing below the column of water in the standpipe, and which discharge into the subchamber, hydroelectric power generating means including turbines in the penstocks and means for discharging the tailwater from the respective turbines including nipples on the housing which communicate with the subchamber and open into the body of water in the pressure chamber at levels below that of the subchamber, and which have open-ended thimble-like vessels telescopically engaged thereon, to be extended and retracted in relation to the respective nipples axially thereof, said nipples and vessels having float-operated check valves therein adjacent the subchamber and the end openings of the vessels, respectively, each of which valves is adapted to permit flow in the direction relatively from the subchamber toward the body of water in the pressure chamber when open, and to prevent flow in the opposite direction when closed, there being additional valve means in the tailwater discharge means which are adapted to equalize the pressure in the vessels with that in the body of water in the pressure chamber when the respective check valves in the vessels are closed, drive means for extending and retracting the respective vessels, and control means which are connected to the drive means and operative through the same (1) to extend and retract the respective vessels in staggered sequence about the circumference of the housing, with each vessel undergoing an at-rest period between the respective retraction and extension stages thereof when the vessel is fully retracted, and (2) to control the rate of extension and retraction of the respective vessels and the length of their respective rest periods, as a function of the water level in the subchamber, the height of the column of water in the standpipe being adapted to drive the turbines, the vessels each being adapted in buoyancy to hover in equilibrium in the body of water in the pressure chamber when at rest, and the number of nipples and vessels being adapted in relation to the number of penstocks and turbines so that the vessels collectively discharge the tailwater from the turbines at a rate adapted to maintain the water level in the subchamber between predetermined limits.

4,075,839

DECOMPRESSION OF PRESSURE CHAMBERS, PARTICULARLY THE DECOMPRESSION OF ACTUATING PRESSURE CHAMBERS OF MINE CAGE HOLDING MEANS

Peter Nesbitt Horne, Sandton, South Africa, assignor to Patent Products Hydraulics (Proprietary) Limited, Edenvale, South Africa

Filed Oct. 4, 1976, Ser. No. 729,365
Claims priority, application South Africa, Oct. 7, 1975, 75/6335
Int. Cl.² F15B *15/22*
U.S. Cl. 60—327 **13 Claims**



1. A method of controlling the decompression of a pressure chamber, including the steps of applying control fluid under pressure to shut off an outlet from the pressure chamber; releasing the control fluid to allow the outlet to open; resisting the release of fluid pressure from the pressure chamber through the outlet; and decreasing the resistance to the release of fluid pressure through the outlet with decreasing pressure in the chamber as control fluid is released, the decrease in the resistance to the release of fluid pressure being controlled by the release of the control fluid, wherein the resistance to the release of fluid pressure is initially decreased at a predetermined rate until a predetermined pressure is reached, whereafter the resistance to the release of fluid pressure is decreased at a higher rate to increase the rate of pressure release, and wherein the outlet is obstructed partially during the initial release of pressure until the predetermined pressure is reached, whereafter the obstruction is removed substantially completely.

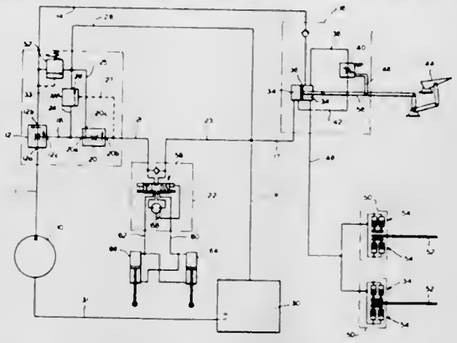
4,075,840

BRAKE AND STEERING SYSTEM

Ronald M. Jesswein, Berrien Springs, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Oct. 6, 1976, Ser. No. 729,927
Int. Cl.² F15B *13/06*
U.S. Cl. 60—422 **7 Claims**

1. A combined brake and steering hydraulic system for a vehicle, comprising a hydraulic pump on the vehicle having an output of a predetermined maximum amount of fluid in a normal operating range, a first priority valve having a first inlet and a first regulated outlet and a first by-pass outlet, the said first inlet connected to receive the entire output of the said pump, the said first regulated outlet during normal operation discharging an approximately constant flow of fluid, an open center hydraulic brake mechanism on the vehicle, first conduit means directing fluid from the said first regulated flow outlet to the said brake mechanism, a second priority valve having a second inlet and a second regulated outlet and a second by-pass outlet, second conduit means directing the flow from the said first by-pass outlet to the said second inlet, an open center hydraulic steering mechanism on the vehicle, the said second



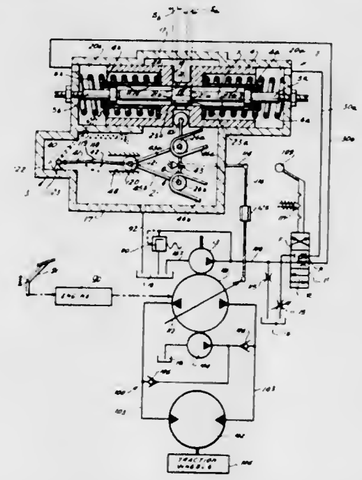
regulted outlet discharging fluid during some conditions of operation at a second approximately constant flow, means directing the flow from the said second regulated outlet to the said steering mechanism, the total of the said first and second constant flows being less than the said predetermined maximum amount, and the said second by-pass outlet discharging the remainder of the fluid output of the said pump.

4,075,841

CONTROL SYSTEM FOR HYDROSTATIC TRANSMISSION

Karlmann Hamma, Tettnang, and Willy Holdenried, Immenstaad, both of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany

Filed Jan. 14, 1977, Ser. No. 759,270
Claims priority, application Germany, Jan. 14, 1976, 2601226
Int. Cl.² F16H *39/46*
U.S. Cl. 60—444 **12 Claims**



1. In a hydrostatic transmission including an engine-driven hydrostatic pump, a hydrostatic motor coupled with a load and fluidically linked with said hydrostatic pump, and setting means on said pump for varying the magnitude and sign of a torque fluidically transmitted to said hydrostatic motor, the combination therewith of:

a switchover member mechanically linked with said setting

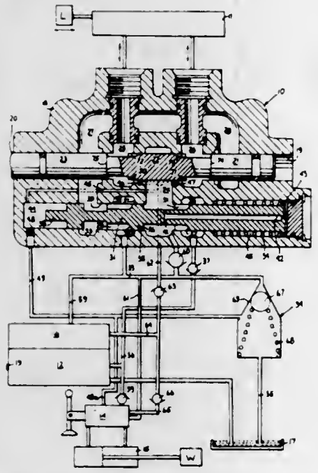
means, said switchover member having a normal position coinciding with zero torque and being shiftable to either side of said normal position for transmitting a torque of a corresponding sign to said hydrostatic motor;
biasing means urging said switchover member into said normal position;
normally de-energized first actuating means operatively coupled with said switchover member for exerting thereon a directive force displacing said switchover member to one side from said normal position with resulting rotation of said hydrostatic motor in a first direction;
normally de-energized second actuating means operatively coupled with said switchover member for exerting thereon a directive force displacing said switchover member to the opposite side from said normal position with resulting rotation of said hydrostatic motor in a second direction;
selector means with a neutral position and with two working positions for respectively connecting said first and second actuating means to an energy source; and
inhibiting means effective upon displacement of said switchover member by a predetermined minimum distance from said normal position by one of said actuating means for preventing energization of the other of said actuating means whereby a change in sign of said torque upon a subsequent changeover of said selector means from one working position to the other can occur only after a reverse displacement of said switchover member by said biasing means.

4,075,842

LOAD RESPONSIVE FLUID CONTROL SYSTEM

Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022

Continuation of Ser. No. 729,696, Oct. 5, 1976, Pat. No. 4,028,889, and a continuation-in-part of Ser. No. 559,818, Mar. 19, 1975, Pat. No. 3,984,979, and Ser. No. 655,561, May 2, 1976.
This application Feb. 23, 1977, Ser. No. 771,080
Int. Cl.² F16H *39/46*
U.S. Cl. 60—445 **13 Claims**



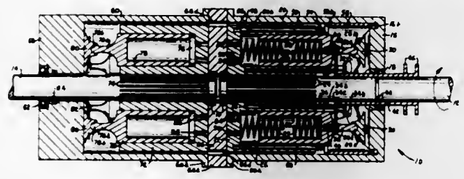
1. A valve assembly supplied with pressure fluid by a pump, said valve assembly comprising a housing having a fluid inlet chamber, a fluid supply chamber, first and second load chambers, load pressure sensing means operable to transmit a control signal to control means operable to vary flow delivered from said pump to said inlet chamber, and fluid exhaust means, first valve means for selectively interconnecting said fluid load chambers with said load pressure sensing means, said fluid supply chamber and said fluid exhaust means, variable metering orifice means responsive to movement of said first valve means and operable to throttle fluid flow between said fluid supply chamber and said load chambers, second valve means having inlet fluid throttling means and inlet fluid isolating means between said fluid inlet chamber and said fluid supply chamber, said second valve means having means responsive to pressure differential across said variable metering orifice means, and fluid replenishing means operable to supply fluid flow from said fluid exhaust means to one of said load chambers which is not pressurized when said fluid isolating means isolates said fluid supply chamber from said fluid inlet chamber.

4,075,843

HYDRAULIC TRANSMISSION

Richard E. Leker, 520 N. 73rd St., Lincoln, Nebr. 68502

Filed Oct. 6, 1976, Ser. No. 729,895
Int. Cl.² F15B *15/18*; F16H *39/46*
U.S. Cl. 60—487 **28 Claims**



1. A hydraulic transmission comprising:
an input shaft adapted to be rotated;
a first hydralic pump presenting a plurality of bores;
pistons disposed for reciprocating movement in the respective bores of said first pump to displace hydraulic fluid therein;
a first cam member for interaction with said pistons to effect reciprocating movement thereof, one of said first pump and first cam member being coupled with said input shaft for rotation therewith;
a second hydraulic pump presenting a plurality of bores and arranged with said first pump in a substantially closed hydraulic circuit, whereby fluid displaced in each pump is directed to the other pump;
pistons disposed for reciprocating movement in the respective bores of said second pump;
valve means in said hydraulic circuit for controlling the fluid flow between said first and second pumps;
a second cam member disposed to interact with the pistons of said second pump;
a rotatable output shaft, one of said second pump and second cam member being coupled with said output shaft to effect rotational driving thereof; and
control means independent of said first and second cam members for controlling the relative fluid displacement of said first and second pumps, thereby controlling the relative rotational speed of said input and output shafts.

4,075,844

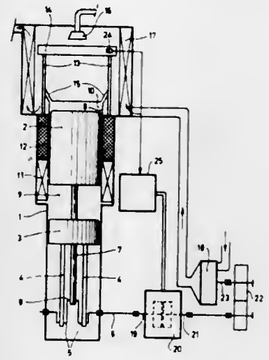
HOT-GAS RECIPROCATING ENGINE HAVING CONTROLLED COUPLING OF A COMBUSTION AIR FAN

Johannes W. Schiferli, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 15, 1976, Ser. No. 696,426
Claims priority, application Netherlands, Jul. 7, 1975, 7508053
Int. Cl.² F02G *1/06*
U.S. Cl. 60—524 **3 Claims**

1. A hot-gas reciprocating engine, comprising at least one working space in which a working medium performs a thermodynamic cycle, a burner device, a heater for applying heat from the burner to the working medium, a fan on a fan shaft for applying combustion air to the burner device, and a variable transmission coupling a shaft of the engine to the fan, the transmission including an input shaft coupled to the engine

shaft and an output shaft coupled to the fan shaft, the transmission ratio of said variable transmission being influenced by a control signal which represents an engine parameter, wherein between the output shaft to the variable transmission and the fan shaft a transmission having a fixed transmission ratio is



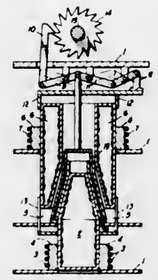
coupled, the variable transmission is constructed as a slip coupling, and the engine comprises means for maintaining the degree of slip of the slip coupling inversely proportional to the heater temperature, said means including a temperature sensor for sensing temperature as the engine parameter.

4,075,845

FREEZE/THAW POWER SYSTEM

Milton Frank Allen, 2989 McCully Drive NE., Atlanta, Ga. 30345

Filed Mar. 25, 1976, Ser. No. 670,455
Int. Cl.² F03G *7/06*
U.S. Cl. 60—527 **6 Claims**



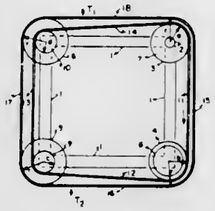
1. A method of driving a device using a piston slidably carried in a chamber with the chamber filled with a freezable liquid which experiences a change of volume upon freezing from a liquid state to a solid state comprising the steps of:
(a) associating the piston with the fluid so that the piston is moved in response to a change in volume of the fluid;
(b) freezing the fluid to a substantially solid state to change its volume and move the piston in a first direction by operatively associating a heat pipe with the fluid to withdraw heat from the fluid and freeze the fluid; and,
(c) subsequently thawing the frozen fluid from its solid state to its liquid state to change the volume of the fluid and move the piston in a second direction opposite the first direction by operatively associating a second heat pipe with the frozen fluid to add heat thereto and thaw the fluid to its liquid state.

4,075,846

THERMAL ENGINE WITH ENTRAPPED WORKING MEDIUM

Yao Tzu Li, Lincoln, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 4, 1976, Ser. No. 683,167
Int. Cl.² F03G *7/06*
U.S. Cl. 60—527 **9 Claims**



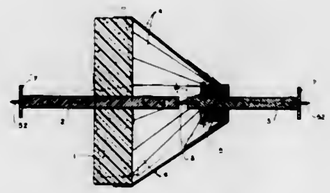
1. A thermal engine comprising a frame, a first set of rollers coupled to said frame, a non-yieldable drive system coupled to each roller of said first set to cause the rollers to rotate with fixed speed ratios, a second set of rollers having rollers in fixed relationship to said first set of rollers, a continuous yieldable belt coupled to each roller of said second set, at least one of said rollers being of a different diameter, at leat one of the rollers being coupled to a shaft to deliver mechanical power as an output, said belt changing its length and tension in response to temperature variation, a heat source, a heat sink of temperature lower than said heat source, a section of said belt being exposed to the heat source to cause a change in tension, a second section of said belt being exposed to the heat sink to cause a different change in the tension, the changes in tension within portions of said belt in combination with the non-yieldable drive coupled to the rollers of the first set producing a mechanical energy output at said output shaft.

4,075,847

DIRECT CONVERSION OF SOLAR ENERGY TO MECHANICAL ENERGY

Edward D. Ray, 2615 NW. 46th Place, Lawton, Okla. 73505

Filed May 7, 1976, Ser. No. 684,298
Int. Cl.² F03G *7/06*
U.S. Cl. 60—527 **10 Claims**



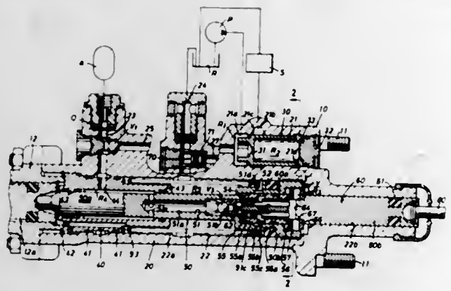
4. An apparatus for converting heat energy to mechanical energy comprising:
a load;
synthetic polymer means attached to said load;
said synthetic polymer being an elongated polymer with highly aligned molecules;
heat means for heating said synthetic polymer;
whereby said polymer contracts when heated and relaxes when cooled, thereby doing work against such load.

4,075,848

HYDRAULIC BRAKE BOOSTER

Atsumi Ueda, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed Feb. 6, 1976, Ser. No. 656,072
Claims priority, application Japan, Feb. 7, 1975, 50-16527
Int. Cl.[2] B60T *13/12*
U.S. Cl. 60—548 7 Claims



1. In combination with a hydraulic brake booster for a vehicle having a brake activating means, a master cylinder for supplying pressure to the wheel cylinders of the vehicle, a hydraulic circuit for circulating pressurized fluid from a fluid pressure source to a reservoir by way of a hydraulic power control device comprising:

a housing for interposition within said hydraulic circuit between said pressure source and said power control device said housing being provided therein with a cylindrical bore and thereon with an inlet port, an outlet port and a drain port respectively in communication with said pressure source, said power control device and said reservoir;

a power piston reciprocable within said cylindrical bore of said housing for forming at one side thereof a power chamber and at the other side thereof a drain chamber in communication with said drain port, said power piston being operatively connectible at one end thereof with said master cylinder and being provided therein with a bore opening toward said power chamber;

a control piston reciprocable within said bores of said housing and said power piston to control interconnection between said power chamber and said drain chamber, said control piston being operatively connectible to said brake activating means;

a first passage means for connecting said inlet port to said power chamber through said bore of said power piston;

a control means for selectively closing and opening the interconnection between said power chamber and said drain chamber in response to movement of said control piston; and

means disposed within said first passage means for closing the communication between said power chamber and said inlet port when said power chamber is communicated with said drain chamber and opening the communication between said power chamber and said inlet port when said power chamber is isolated from said drain chamber by means of said control means;

the improvement which comprises

a second passage means for connecting said inlet port with said power chamber independently of said first passage means;

a first flow regulating means disposed within said second passage means for throttling the flow of fluid supplied from said inlet port to said power chamber when said power chamber is isolated from said drain chamber by means of said control means in response to movement of said control piston; and

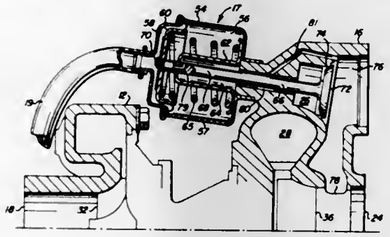
a second flow regulating means disposed within said second passage means between said inlet port and said first flow regulating means for controlling the flow of fluid from said inlet port to said outlet port and the flow of fluid from said inlet port to said power chamber through said first flow regulating means.

4,075,849

TURBOCHARGER REGULATOR

Neil Ray Richardson, Palos Verdes Estates, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Sep. 1, 1976, Ser. No. 719,633
Int. Cl.[2] F02D *23/00*
U.S. Cl. 60—602 22 Claims



1. A turbocharger for an internal combustion engine having an inlet manifold and an exhaust manifold, said turbocharger comprising:

a compressor housing having an inlet opening and an outlet opening, said outlet opening being connected to the inlet manifold of said engine for supplying charge air to said engine;

a turbine housing having an inlet opening and an outlet opening and a chamber intermediate said inlet and outlet openings forming a bypass conduit therebetween, the inlet opening of said turbine housing being connected to the exhaust manifold of said engine for receiving exhaust gases therefrom;

a center housing connecting said compressor housing with said turbine housing in spaced relationship and having a shaft mounted for rotation therein;

a compressor wheel mounted on said shaft in said compressor housing between said compressor inlet and outlet openings;

a turbine wheel mounted on said shaft in said turbine housing between said turbine inlet opening and said turbine outlet openings;

valve means slidably mounted in an opening in said turbine housing, said valve means having a head portion, and a stem portion received through the openings, said head portion forming selective sealing means for said bypass conduit;

actuator means including a source of control fluid, an actuator housing having a control fluid inlet and a control fluid outlet, flexible wall means separating said actuator housing into first and second chambers and connected to said stem portion of said valve means for selectively moving said valve head portion with respect to said bypass conduit, said first chamber being connected to said fluid inlet and said second chamber being connected to said fluid outlet, said actuator means being connected to said turbine housing and lying intermediate said turbine housing and said compressor housing, means connected between said fluid inlet and said source of control fluid for effecting a pressure differential between said first and second chambers for controlling the position of said valve, inner housing means forming a third chamber within said second chamber of said actuator housing, first conduit means connected between said first chamber and said third chamber, and second conduit means connected between said third chamber and said turbine housing outlet; and

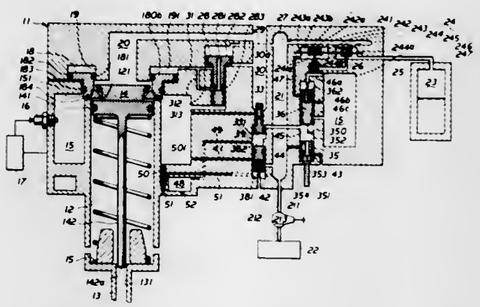
control means for controlling said actuator means in response to engine parameters.

4,075,850

STRIKING TOOL

Takashi Nakazato, Maibashi; Chikamitsu Sewada, Takasaki; Shigeyuki Umino, Maebashi, and Mitsuhiro Takatsuru, Takasaki, all of Japan, assignors to Max Co., Ltd., Tokyo, Japan

Filed Nov. 21, 1975, Ser. No. 634,185
Claims priority, application Japan, Jun. 7, 1975, 50-73602; Jun. 28, 1975, 50-90824[U]
Int. Cl.[2] F01B *29/08;* B25C *1/08*
U.S. Cl. 60—633 10 Claims



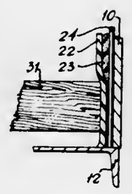
1. A striking tool of an internal combustion type comprising a valve opening communication between a piston upper chamber of a cylinder, which is assembled in a housing and slidably provides a piston for driving a driver and a combustion chamber disposed around a side wall of said cylinder when an explosion is generated in said combustion chamber.

4,075,851

PENSTOCKS

Frederick Basil Gardner, Redditch, England, assignor to Simon-Hartley Limited, England

Filed Apr. 23, 1976, Ser. No. 679,730
Claims priority, application United Kingdom, May 6, 1975, 19037/75
Int. Cl.[2] E02B *7/54*
U.S. Cl. 61—22 A 13 Claims



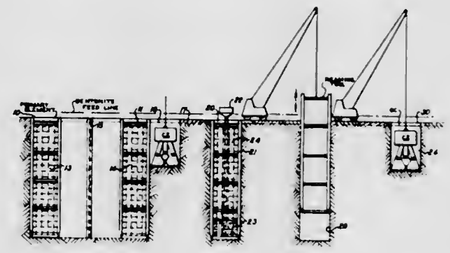
1. A method of producing a base invert seal in a penstock of the type comprising a frame having an opening therein and a door slidable within the frame across said opening to close same by vertical movement between fixed vertical guide members slidably engaging the side edge regions of said door until its lower end seats on a base member of the frame extending transversely between the lower ends of said guide members and wherein at least one of said guide members at each side forms a compressed resilient vertical seal with the door side region engaged thereby, the method comprising the steps of positively applying a compressive force for compressing the lower end region of each said one guide member to a condition approximating that to which it would be compressed by the lowered door, forming along said base member a pad of resilient material onto which the lower edge of said door will seat when closed with said resilient material bonding to and forming a seal around the compressed lower end region of each said one guide member, and releasing said positive compressive force.

4,075,852

STEEL REINFORCED UNDERGROUND WALL

George John Tamaro, Leonia, N.J., assignor to ICOS Corporation of America, New York, N.Y.

Division of Ser. No. 603,982, Aug. 12, 1976, Pat. No. 4,005,582.
This application Jul. 2, 1976, Ser. No. 716,151
Int. Cl.[2] E02D *5/10, 27/00*
U.S. Cl. 61—35 2 Claims



1. A steel reinforced concrete underground wall comprising, a plurality of horizontally elongated steel reinforced concrete primary wall panel elements formed along the line of the wall, the ends of two consecutive of said primary wall elements being spaced apart about double the length of one of said horizontally elongated primary wall elements, each said horizontally elongated primary element being constituted by a lattice work connected flanged steel H-beam pair and a steel reinforcement cage assembly secured to said lattice work in interfitted relation between the facing flanges of the pair of H-beams and concrete, and

a pair of secondary, steel reinforced concrete elements occupying the double space between said primary panel elements, each said secondary element including a steel reinforcing cage which extends between the outer facing vertical channels on each flanged steel H-beam of two consecutive ones of said primary wall panel elements and a vertical H-beam member common to the reinforcing cage of each said pair of secondary, steel reinforced concrete elements, the said facing vertical channels of two consecutive ones of said primary elements serving the functions of (1) excavation guides for excavating the space for said pair of secondary elements to maintain verticality of the secondary elements, (2) interlocking with the steel reinforcing cage and the vertical common H-beam flanges, respectively, and (3) a water stop element and concrete barrier; each said pair of secondary elements having the concrete inserted simultaneously so as to assure verticality of the common vertical H-beam.

4,075,853

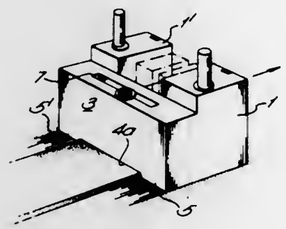
SOIL INJECTION MACHINE

Pierre J. de Larosiere de Champfeu, Lisbon, Portugal, assignor to The International Synthetic Rubber Company, Ltd., Southampton, England

Filed Sep. 29, 1976, Ser. No. 727,776
Int. Cl.[2] E02D *3/12*
U.S. Cl. 61—36 R 5 Claims

1. A machine for the injection of a stabilizing liquid into the surface of soil comprising a sledge having a surface compacting base, the base having a forward end and a rear end, a transverse slot located adjacent said rear end, a hollow pessurizable injection bar disposed in said slot, said bar having a

lower face equipped with injection orifices, said lower face of said bar being flush with said compacting surface of said base



so that, in use, a strip of compacted soil bonded with the stabilizing liquid is produced.

4,075,854

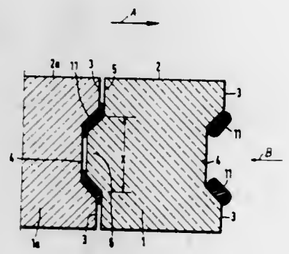
Patent Not Issued For This Number

4,075,855

TUNNEL CONSTRUCTION AND TUNNEL TUBBING

Volker Otto Meldner, Frankfurt am Main, Germany, assignor to Wayss & Freytag Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jun. 14, 1976, Ser. No. 695,938
Claims priority, application Germany, Jun. 21, 1975, 2527743
Int. Cl.² E21D *11/05*
U.S. Cl. 61—45 R **13 Claims**



1. A tunnel construction having a longitudinal axis, comprising a plurality of tubbings forming a number of rings arranged side by side along said longitudinal axis, said rings having interfaces between adjacent rings, connecting contact means inserted between said interfaces between tubbings of adjacent rings, said connecting contact means providing the only force transmitting connections between the tubbings of adjacent interconnected tubbing rings, said connecting contact means being located at calculated, predetermined points along said interfaces between the tubbings of adjacent rings, whereby the force transmission between adjacent rings is localized at said predetermined points.

4,075,856

DEVICE FOR CONSECUTIVELY SUPPORTING A DRIFT

Siegfried Sigott; Alfred Zitz, both of Zeltweg; Wilhelm Althaler, Vienna, and Helmut Wlach, Zeltweg, all of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Vienna, Austria

Filed Oct. 14, 1976, Ser. No. 732,376
Claims priority, application Austria, Oct. 14, 1975, 7839/75
Int. Cl.² E21D *15/582, 15/58*
U.S. Cl. 61—45 C **14 Claims**



1. Device for supporting a drift by means of caps and posts comprising

a breast frame, suspension means carried by said breast frame for suspending said breast frame from already installed caps so as to be movable relative to the installed caps toward the face of the drift, said breast frame including two girders disposed to extend in the longitudinal direction of the drift, and laterally spaced from each other, said girders being mutually connected by a plurality of transverse bars,

lifting beams supported on said breast frame for movement toward and away from said breast frame whereby caps carried on said lifting beams are movable toward the ceiling of the drift,

a rotary crane carried by said breast frame, means for moving said rotary crane on said breast frame toward and away from the face of the drift, said rotary crane having an extensible jib.

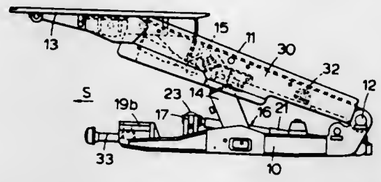
4,075,857

SHIELD-TYPE SUPPORT ASSEMBLIES FOR MINE WORKINGS

Burckhardt Eisner; Gunter Lagodka, both of Lunen; Lubomir Plevak, Lunen, Horstmar, and Harry Rosenberg, Ludinghausen, all of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Germany

Filed Oct. 22, 1976, Ser. No. 734,934
Claims priority, application Germany, Oct. 25, 1975, 2547853
Int. Cl.² E21D *15/44*
U.S. Cl. 61—45 D **12 Claims**

1. A shield support assembly comprising three frames arranged in side-by-side relationship, the frames having a floor sill structure carrying hydraulic props capable of bracing the individual frames between the roof and floor of a mine working, means for guiding the frames for relative shifting displacement, means for effecting relative shifting displacement between the central frame and the outer frames and transverse coupling means extending between the central frame and the outer frames and supported by the central frame, said transverse coupling means being connected to the guide means, wherein the transverse coupling means and the guide means permit relative vertical mobility to occur between the floor sill



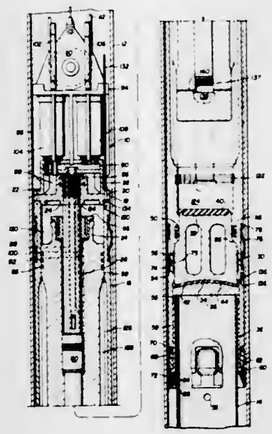
structures of the frames, wherein the transverse coupling means is a transversally extending arm rigidly fixed to the central frame, the guide means comprises guide bars extending in the shifting direction and connected to the ends of the arm and slidably engaging in guide blocks carried by the outer frames, the engagement between the guide bars and guide blocks permitting relative pivotal movement and limited vertical movement therebetween.

4,075,858

HYDRAULIC PILE DRIVING APPARATUS AND METHOD

Leonard L. Frederick, 15 Crestview Terrace, Whippany, N.J. 07981

Filed May 17, 1976, Ser. No. 687,195
Int. Cl.² E02D *7/10*
U.S. Cl. 61—53.5 **34 Claims**



1. A hydraulic pile driving apparatus, which comprises:

an elongated tubular housing member;

closure means for sealing a top end of said tubular member;

an anvil means for sealing an opposite bottom end of said tubular member and transmitting a driving force to the pile, said anvil means being in sealing, sliding contact with said tubular member for limited motion therein, whereby said housing member, closure means and anvil means define a gas-filled chamber;

an elongated ram means, which is slidably disposed within said gas-filled chamber for movement in a generally upward loading direction to a top position and movement in an opposite, generally downward, firing direction to a bottom position, and which includes

a top end surface defining an interior recessed space, and

a bottom end which strikes against said anvil means when said ram means is moved to said bottom position, said ram means being supported by said anvil means when said ram means is at rest;

a piston means, which is mounted to said closure means and extends through said gas-filled chamber into said interior space of said ram means, for defining therein

a loading chamber means, continuously connected to receive high pressure working liquid, for exerting a loading force on an interior bottom-facing surface of said ram means to move same upward to said top position, and

a firing chamber means, alternately connected to receive high pressure working liquid for exerting a firing force on an interior, top-facing surface of said ram means to move same downward to said bottom position, and then connected to exhaust working liquid at low pressure, to permit said loading chamber means to move said ram means in said upward loading direction, the area of said top-facing surface being larger than the area of said bottom-facing surface, so that the net force exerted on said ram means when both said loading and firing chamber means are connected to receive high pressure working liquid is a force to move said ram means in said firing direction;

means for pressurizing said working liquid;

means for delivering high pressure working liquid from an outlet of said liquid pressurizing means to said piston means;

means for returning exhaust, low pressure working liquid from said piston means to an inlet of said liquid pressurizing means; and

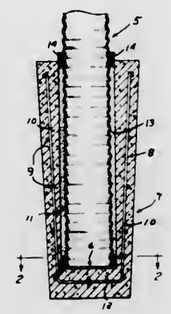
means for positioning said housing member relative to the pile to enable said anvil means to transmit said driving force to the pile.

4,075,859

COMPOSITE PILE AND TAPERED CONCRETE TIP THEREFOR

Charles L. Guild, 7 Stone Tower Lane, Barrington, R.I. 02806

Filed Jul. 12, 1976, Ser. No. 704,427
Int. Cl.² E02D *5/30, 5/72*
U.S. Cl. 61—53 **6 Claims**



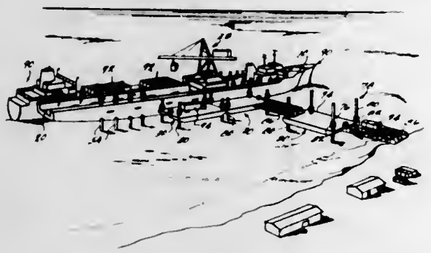
1. A composite pile comprising a tubular pile including a member closing its bottom end, a tapered, reinforced concrete tip, its larger end the upper end, said tip having a central, upwardly opening lengthwise passage and a seat exposed at the bottom of said passage, the cross sectional area and depth of the entire length of the passage being such as to accommodate the bottom end of the pile as a free fit therein with the pile-closing member resting on said seat, and means interposed between said tip and said pile end centering said pile end in said passage and including a fluent body substantially filling the space between said pile end and said tip to complete and ready said pile for driving and to maintain the pile and tip concentric throughout the driving of said pile.

4,075,860

MOBILE SHIP LOADING AND UNLOADING FACILITY

John H. Hansen, Mount Sinai, N.Y., assignor to Delong Corporation, New York, N.Y.

Filed Mar. 15, 1976, Ser. No. 667,014
Int. Cl.² E02B *17/00*; B63B *35/40*
U.S. Cl. 61—87 **10 Claims**



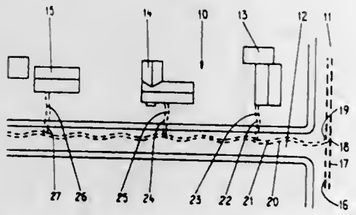
1. A method of establishing a ship loading or unloading pier facility comprising: providing a buoyant vessel having a plurality of jack-up legs insertable in and removable from vertically extending jack holes in the vessel, the vessel having storage space carrying at least one buoyant jack-up platform; floating the vessel with the legs stored in horizontal positions on the deck to an offshore site adjacent a shore line; removing at least one buoyant platform from the vessel and arranging the platform in a floating mode in the water adjacent the vessel; inserting the legs into the jack holes and jacking-up the vessel by means of said legs to render the vessel stationary; floating the platform into a position between the vessel and the shore line and jacking-up the platform; and forming a roadway, which includes the jacked-up platform, between the shore and the vessel.

4,075,861

METHOD OF LAYING PIPES OR CONDUITS IN THE GROUND AND PIPE ARRANGEMENT PRODUCED THEREBY

Filip Bertil Thyberger, and Kurt Olle Ragnvald Lindstrom, both of Vasteras, Sweden, assignors to Granges Essem Aktiebolag, Sweden

Continuation of Ser. No. 300,406, Oct. 20, 1972, abandoned.
This application Jan. 21, 1976, Ser. No. 650,998
Int. Cl.² F16L *1/00, 9/14*
U.S. Cl. 61—105 **7 Claims**



1. Method of laying pipe means in the ground for substantially fluid stress-free conveying of flowing media therethrough at variable temperatures at which the pipe means is subjected to thermal expansion and contraction and for substantially mechanically stress-free thermal expansion and contraction of the pipe means at such variable termpatures, which comprises

laying a precovered pipe means of selective length in a pipe means-receiving ground trench in wave form along the trench for operative connection at a pair of pipe means connecting points spaced apart a linear distance along the trench,

the selective length of the precovered pipe means being sufficient for the precovered pipe means to be distributed along and within such linear distance in wave form for substantially fluid stress-free conveying of flowing media therethrough,

said precovered pipe means being in the form of a pipe means provided with a relatively elastic heat insulating jacket which is capable of being bended into wave form and which in wave form permits relative axial and radial movements of the pipe means with respect to the jacket in response to thermal expansion and contraction of the pipe means, and

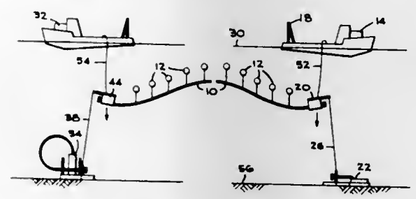
filling in the trench to cover and immobilize the jacket in wave form therein while permitting the pipe means therewithin to execute such relative axial and radial movements with respect to the jacket for substantially mechanically stress-free thermal expansion and contraction of the pipe means along and within the linear distance between the pipe means connecting points.

4,075,862

METHOD AND APPARATUS FOR INSTALLING UNDERWATER FLOWLINES

Thomas J. Ames, Houston, Tex., assignor to FMC Corporation, San Jose, Calif.

Filed Sep. 15, 1976, Ser. No. 723,379
Int. Cl.² F16L *1/00*
U.S. Cl. 61—110 **11 Claims**



1. A method for installing a flowline underwater at a subsea station, comprising the steps of

a. establishing a downhaul cable between the subsea station and a location above said station,

b. attaching the downhaul cable to a flowline mating vehicle connected to an end of the flowline,

c. hauling down the flowline and the flowline mating vehicle to the subsea station by reeling the downhaul cable into the flowline mating vehicle, and

d. connecting the flowline to the subsea station.

4,075,863

FREEZE-HARVEST CONTROL SYSTEM FOR A TUBULAR ICE MAKER

William H. Wilson, Carthage, Mo., assignor to Storm King Products, Inc., Carterville, Mo.

Filed Aug. 23, 1976, Ser. No. 716,596
Int. Cl.² F25C *1/06*
U.S. Cl. 62—138 **5 Claims**

2. An improved cycle control apparatus for a tubular type ice maker having a water level control pan, a hot gas valve solenoid that when energized opens a normally closed hot gas valve to initiate the harvest cycle, a power source, and a water freezing tube, wherein the improvement comprises:

a first switch, normally open, but when closed operably connects the power source to the hot gas valve solenoid;

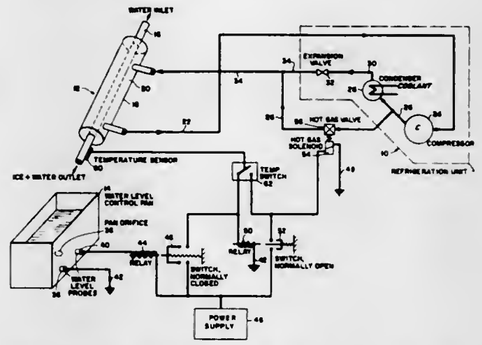
a first relay, when energized, closes the first switch;

a second switch, normally closed, that operably connects the power source to the first relay;

a second relay, that when energized, opens the second switch;

means for detecting a low water level in the water level control pan and for energizing the second relay when said level is above a predetermined level;

a temperature switch, normally closed, operably connected between the juncture of the first relay and the second switch and the juncture of the first switch and the hot gas valve solenoid; and



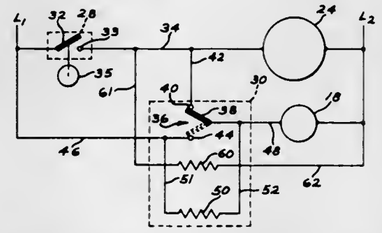
means for detecting the temperature at the discharge end of the water freezing tube and opening the temperature switch for temperatures above a predetermined level.

4,075,864

AIR CONDITIONING FAN CONTROL

Paul D. Schrader, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Apr. 29, 1977, Ser. No. 792,450
Int. Cl.² F25D *17/06*
U.S. Cl. 62—180 **6 Claims**



1. In an air conditioner including means for conditioning air, air circulation means for circulating ambient air in association with said conditioning means, temperature responsive means for sensing the condition of air to be conditioned for terminating operation of said air circulating means and said air conditioning means at a preselected low ambient air temperature, control means for controlling the operation of said air circulating means when said temperature responsive means senses temperatures above said preselected temperature, comprising:

said control including switch means having a first position for energizing said air circulating means when the temperature sensed by said temperature responsive means is above said preselected low temperature and a second position for energizing said air circulating means when said temperature responsive means senses said preselected low temperature;

a first actuating means associated with said switch means being operable when the temperature sensed by said temperature responsive means is above said preselected temperature for causing said switch to move to said second position to operate said air circulating means through said control means so that said air circulating means will continue to operate for a predetermined time subsequent to each stoppage of said air condition means after said temperature responsive means senses said preselected low temperature;

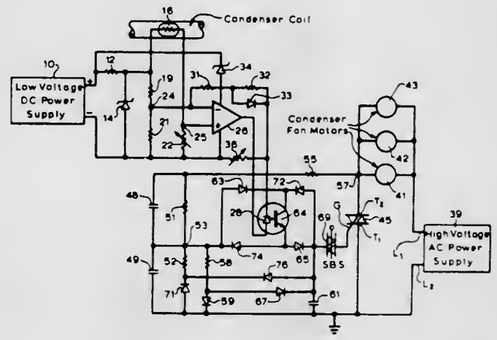
a second actuating means associated with said switch means being operable for actuating said switch means between said first and second position for periodically operating said air circulating means to sample the ambient air by bringing ambient air periodically to said temperature responsive means when the temperature sensed by said temperature responsive means is below said preselected low ambient temperature.

4,075,865

APPARATUS FOR CONTROLLING CONDENSER PRESSURE IN A REFRIGERATION SYSTEM

Frank E. Wills, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 5, 1975, Ser. No. 637,927
Int. Cl.² F25D *17/00*
U.S. Cl. 62—183 **1 Claim**



1. A control system for modulating the speed of a plurality of parallel-connected, variable speed fan motors, of an air-cooled condenser coil in a refrigeration system, in response to the temperature of the refrigerant in the condenser coil in order to maintain a substantially constant condenser pressure despite wide variations in condenser cooling air temperature, comprising:

an AC power supply for providing an alternating line voltage of relatively high magnitude;

a triac for coupling said AC power supply to the condenser fan motors to effect simultaneous operation thereof in response to gate current supplied to said triac;

a variable resistance network including a full wave bridge rectifier, having a pair of AC terminals and a pair of DC terminals, and a photosensitive transistor having its collector and emitter connected respectively to the two DC terminals of said bridge rectifier, the resistance between the AC terminals of said network being determined by and being inversely proportional to the amount of light received by said transistor;

a timing capacitor coupled in series with the AC terminals of said bridge rectifier;

a frequency compensated capacitive voltage divider coupled to said AC power supply, via a series-connected resistor, for providing a small replica of the line voltage from said AC power supply, said capacitive voltage divider in conjunction with said resistor constituting a dv/dt suppression circuit across said triac;

means for coupling said variable resistance network and said timing capacitor to said capacitive voltage divider to derive therefrom the small replica of the AC line voltage, said capacitor charging during each half cycle of the alternating voltage in response to charging current flowing through said network and of an amplitude determined by the resistance of said network;

a DC power supply, isolated from said AC power supply, for providing a direct voltage of relatively low magnitude;

a temperature sensing thermistor for sensing the refrigerant temperature in the condenser coil;

means, including a differential amplifier, coupled to said DC

power supply and to said temperature sensing thermistor for developing a control signal which varies as a function of the difference between a desired set point temperature and the actual sensed temperature of the refrigerant in the condenser coil;

a light emitting diode optically coupled to said photosensitive transistor;

means responsive to said control signal for translating current through said light emitting diode to effect illumination thereof in an amount directly proportional to the sensed temperature of the refrigerant, said timing capacitor thereby charging at a rate directly proportional to the sensed temperature;

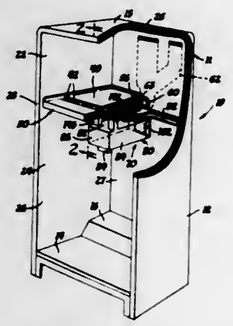
and means coupled to said timing capacitor for supplying gate current to said triac during each half cycle at a phase angle inversely proportional to the amplitude of the charging current, thereby simultaneously driving each of the condenser fan motors at a speed directly proportional to the temperature of the refrigerant in the condenser coil.

4,075,866

REFRIGERATOR DEFROSTER-HUMIDIFIER

Victor A. Williamitis, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 7, 1977, Ser. No. 757,679
Int. Cl.² F25D *23/06, 11/02;* B01D *47/16;* F02M *17/28*
U.S. Cl. 62—274 **3 Claims**



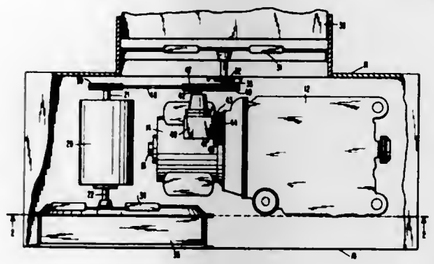
1. A refrigerator comprising, a thermally insulated cabinet having partition means separating said cabinet into an above-freezing food compartment and a below-freezing compartment, evaporator means within said below-freezing food compartment, fan means for circulating air through an air flow system in said refrigerator, said air flow system including an air humidifier-defroster apparatus in said above-freezing food compartment enclosed by housing means, said housing means including a plurality of layered sets of parallel air flow passages formed by corrugated hydrophilic material comprising alternating flat sheets and intermediate corrugated sheets holding the flat sheets in spaced relationship, first header means at one end of said housing means and second header means at the opposite end of said housing means, means for supplying chilled relatively dry air to said first header means, first alternate layered sets of said parallel air passages each having inlet ends connected to said firt header means and outlet ends connected to said second header means, second intermediate layered sets of parallel air passages having inlet ends adjacent said outlet ends of the first sets of air passages and having outlet ends adjacent said inlet ends of the first sets of air passages, means for supplying relatively moist above-freezing air from said above-freezing compartment to the inlet ends of said second intermediate sets of parallel air flow passages, whereby said air flow system causes the circulation of the relatively dry chilled air stream in said alternate sets of passages and the circulation of the relatively moist above-freezing air stream in the intermediate sets of passages to be in opposite directions such that an exchange of moisture between the streams occurs by both diffusion and capillary flow of moisture through the fibrous material from the second intermediate sets of air passages to the first alternate sets of air passages as a result of the moisture vapor pressure difference of the opposite flowing air streams therein, duct means communicating with said second header means, whereby above-freezing relatively dry air is circulated over said evaporator means for chilling thereof, and whereby the chilled relatively moist air exiting from the outlet ends of the first alternate sets of air passages is circulated by duct means of said air flow system to said above-freezing food compartment.

4,075,867

COMPACT REFRIGERATION UNIT

Ronald W. Seipp, Apple Valley, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Dec. 30, 1976, Ser. No. 755,771
Int. Cl.² F25B *27/00;* B60H *3/04*
U.S. Cl. 62—323 **6 Claims**



1. A compact refrigeration unit comprising, a generally rectilinear frame structure having front and back frame members with their axial planes spaced apart parallel to the long axis of the frame, a first selectively energizable prime mover having a relatively long rotary shaft and positioned along the long axis between said front and back frame members, a second selectively energizable rotary prime mover having a relatively short rotary shaft and positioned between said front and back frame members with its shaft extending from front to back frame member planes at right angles to the long axis of said frame, a refrigerant compressor positioned between said frame members and having a rotary drive shaft in alignment with the shaft of said first prime mover, clutch means to selectively connect the shaft of said first prime mover to the shaft of said compressor, a right angle drive transmission mounted within said frame over said compressor with a first drive shaft in generally axial alignment with said compressor shaft and a second drive shaft extending from front to back frame member planes at right angles to the long axis of said frame, flexible drive means interconnecting said first drive shaft of said transmission and the shaft of said compressor, and flexible drive means interconnecting the shaft of said second prime mover to the second drive shaft of said right angle drive transmission whereby said first prime mover may be energized to drive said compressor with said clutch engaged and said second prime mover may be energized to drive said compressor when said clutch is disengaged.

4,075,868

ICE MAKING MACHINE WITH IMPROVED DRIP SHIELD

Don S. Bartholmey, Bellevue, Wash., assignor to North Star Ice Equipment Company, Seattle, Wash.

Filed Jul. 8, 1976, Ser. No. 703,518
Int. Cl.² F25C *1/14*
U.S. Cl. 62—347 **11 Claims**

1. An ice making apparatus including:

a. a substantially vertical drum having an inner freezing surface;

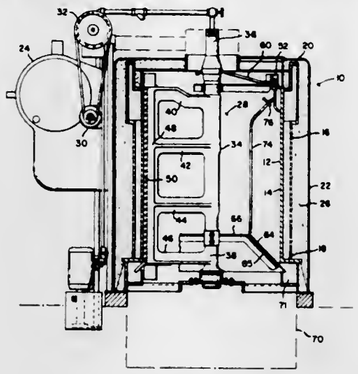
b. rotor means at least partially disposed within said drum and capable of rotating within said drum;

c. water distributing means communicating with said rotor means for distributing water to at least a portion of the inner surface of said drum;

d. cooling means interconnected with said drum for maintaining the inner surface of said drum at a predetermined temperature below the freezing temperature of water whereby water distributed onto the inner surface of said drum is caused to form ice;

e. ice removal means mounted on said rotor means for removing ice from the inner surface of said drum when said rotor means rotates;

f. deflector means mounted on said rotor means for deflecting water dripping from the inner freezing surface of said



drum, with the outer edge of said deflector means extending more radially outwardly than the inner freezing surface of said drum, said deflector means having a portion removed therefrom so that ice scraped from the inner surface of said drum by said ice removalmeans falls from said drum without striking said deflector means;

g. water receiving means surrounding said drum for receiving water deflected by said deflector means; and

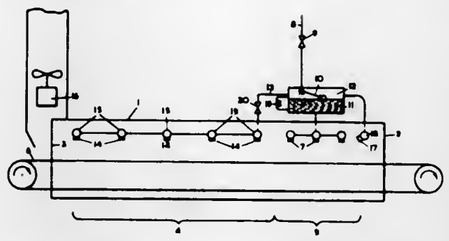
h. tube means communicating with said water distributing means for distributing a portion of the water from said water distributing means to a spray tube means, said spray tube means being annular in shape with a portion removed therefrom, and having a plurality of holes therein for distributing water onto substantially the entire surface of said deflector means.

4,075,869

COOLING OR FREEZING ARTICLES

Robert Alan Fitsall, Wallington, England, assignor to BOC International Limited, London, England

Filed Jan. 27, 1976, Ser. No. 652,743
Claims priority, application United Kingdom, Feb. 10, 1975, 05639/75
Int. Cl.² F25D *17/02*
U.S. Cl. 62—374 **11 Claims**



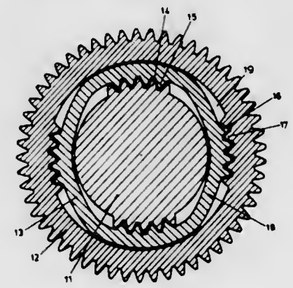
1. Apparatus for cooling articles, which apparatus comprises a tunnel having an inlet end an and outlet end, a gas contacting zone and a liquid contacting zone within said tunnel, conveyor means for moving articles through the tunnel from said inlet to said outlet, said articles passing through the gas contacting zone before passing through the liquid contacting zone, supply means for supplying a vaporisable cryogenic medium initially in the liquid state to the liquid contacting zone to contact said articles passing through that zone and simultaneously vaporising a portion of said medium, gas discharge means in said gas contacting zone for creating a flow of the vaporised portion of said cryogenic medium from the liquid contacting zone through the gas contacting zone, said gas discharge means including a plurality of jets in the gas contacting zone, means connecting the to a supply of pressurised gas, said jets being configured to direct said pressurised gas into contact with said articles passing through said gas contacting zone and to cause turbulence of the said flow of the vaporised portion of the cryogenic medium passing through the gas contacting zone.

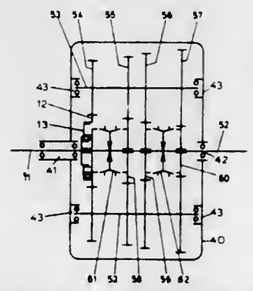
4,075,870

RADIALLY SHIFTABLE GEAR FOR SPEED-CHANGING MECHANISM

Alfred Seifried, Friedrichshafen, Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany

Filed Oct. 6, 1975, Ser. No. 620,219
Claims priority, application Germany, Oct. 5, 1974, 2447582
Int. Cl. F16H *1/26*
U.S. Cl. 64—9 R **4 Claims**





1. In a gear transmission comprising a main shaft, a transfer gear on said main shaft, a plurality of ancillary shafts peripherally arrayed about said main shaft, and a coacting gear on each of said ancillary shafts in mesh with said transfer gear, the improvement wherein said transfer gear has an externally toothed annular body surrounding said main shaft with clearance, said clearance being occupied by a unitary elastic ring substantially coaxial with said main shaft and said body, said ring having a pair of diametrically opposite outer coupling formations and a pair of diametrically opposite inner coupling formations positively engaging respective complementary formations on the inner surface of said body and on the outer surface of said shaft whereby said body and said shaft are interconnected for joint rotation, said outer and inner coupling formations being peripherally offset from one another by 90°

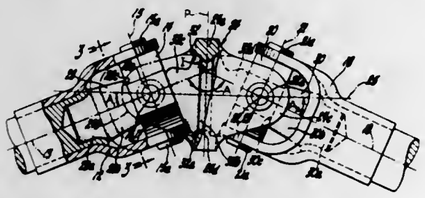
and separated by ring sections freely deformable in said clearance, the combined radial thickness of said ring and either of said coupling formations exceeding the width of the clearance at the respective coupling formation, thereby facilitating radial displacement of said transfer gear relative to said main shaft without disengagement of said coupling formation from said complementary formation.

4,075,871

DOUBLE CARDAN JOINT WITH ELASTOMERIC CENTERING MEANS

Harold J. Burke, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 27, 1976, Ser. No. 662,121
Int. Cl.² F16D *3/26*
U.S. Cl. 64—17 R **9 Claims**



1. A universal joint comprising,
an input yoke having an input axis of rotation,
an output yoke having an output axis of rotation,
an intermediate yoke having an intermediate axis of rotation,
an input cross connecting said input yoke to an end of said intermediate yoke,
an output cross connecting another end of said intermediate yoke to said output yoke, and
centering means comprising,
first resilient means engaging said input yoke and said input cross and biasing said input cross toward a position where said input cross is perpendicular to said input axis,
second resilient means engaging said output yoke and said output cross and biasing said output cross toward a position where said output cross is perpendicular to said output axis and,
third resilient means engaging said intermediate yoke and said input and output crosses biasing said input and output crosses toward positions where said input and output crosses are perpendicular to said intermediate axis.

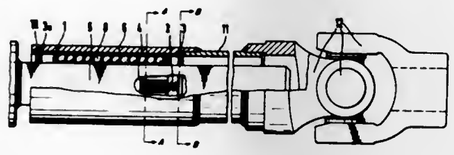
4,075,872

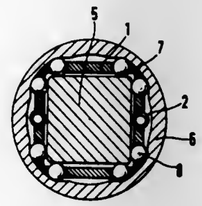
TELESCOPING TORQUE TRANSMITTING SHAFT

Hubert Geisthoff, Lohmar, Germany, assignor to Jean Walterscheid GmbH, Lohmar, Germany

Filed Jul. 20, 1976, Ser. No. 707,105
Claims priority, application Germany, Jul. 22, 1975, 2532674
Int. Cl.² F16D *3/06*
U.S. Cl. 64—23.7 **4 Claims**

1. A telescoping torque transmitting shaft particularly for agricultural machinery and the like comprising an inner shaft element having a polygonal cross-section to define a plurality of outer surfaces, an outer tubular shaft element having a plurality of longitudinal extending grooves in the inner face thereof, at least one axially disposed row of torque transmitting balls between said grooves and said surfaces of said inner shaft element, said balls capable of rolling movement between said shaft elements, abutment means comprising a pair of longitudinally spaced annular members on the inner surface of said outer shaft element and having openings therein to receive slidably said inner shaft element, means between said annular members for retaining and guiding said balls, said retaining means comprising a tubular element having a cross-section conforming to the cross-section of said inner shaft element and having a plurality of axially extending slots therein to receive rows of balls, and spring means comprising compression springs at both ends of said tubular retaining member and acting upon said annular members to bias said retaining means





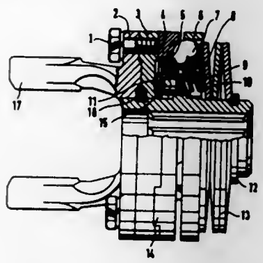
to a predetermined position with respect to one of said shaft elements, said inner shaft element being slidable upon its outer surfaces within said balls.

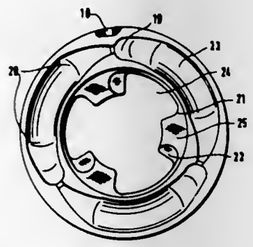
4,075,873

FREE-WHEELING OVERLOAD COUPLING

Hubert Geisthoff, Lohmar, Germany, assignor to Jean Walterscheid GmbH, Lohmar, Germany

Filed Aug. 31, 1976, Ser. No. 719,321
Claims priority, application Germany, Sep. 11, 1975, 2540489
Int. Cl.² F16D *43/20*
U.S. Cl. 64—29 **2 Claims**





1. An overload coupling comprising a first coupling member, a second rotatable coupling member fixed axially with respect to said first coupling member, a third coupling member rotatably disposed between said first and second coupling members, inter-engageable torque transmitting means on said second and third coupling members, said third coupling member being axially displaceable between a torque transmitting

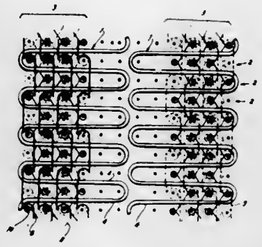
position and a disengaged position with respect to said second coupling member, a plurality of torque transmitting roller elements circumferentially spaced in said first coupling member and means for resiliently urging said roller elements toward said third coupling member, a radial face of said third coupling member having a plurality of arcuate recesses therein receiving said roller elements and each recess having a torque transmitting portion and a free-wheeling portion, the axial distance between said torque transmitting and free-wheeling portions being greater than the axial distance between the engaged and disengaged positions of said third coupling member such that when said torque transmitting roller elements are in the free-wheeling portions of said recesses said second and third coupling members are disengaged, and spring biased means engageable with said third coupling member for urging said third coupling member into its torque transmitting position during movement of said torque roller elements from the free-wheeling to the torque transmitting portions in said recesses, said spring biased urging means comprise a plurality of spring-loaded bolts circumferentially spaced on said first coupling member, there being second arcuate recesses on said third coupling member receiving said bolts, each second recess having an inclined guide surface at one end and a torque transmitting portion at its other end.

4,075,874

SLIDE-FASTENER STRINGER HALF WITH KNITTED-IN COUPLING ELEMENTS AND METHOD OF MAKING SAME

Helmut Heimberger, Locarno, Switzerland, assignor to Optilon W. Erich Heilmann GmbH, Cham, Switzerland

Filed Sep. 30, 1976, Ser. No. 726,034
Claims priority, application Germany, May 20, 1976, 2622529
Int. Cl.² D04B *23/08, 23/10*
U.S. Cl. 66—192 **2 Claims**



1. A slide-fastener stringer half comprising a full tricot ground knit tape and a monofilament coupling element on said tape having a series of turns each having a pair of shanks and projecting transversely beyond a longitudinal edge of said tape, and securing warp filaments warp-knitted into said tape and overlying said shanks, said turns each comprising a pair of such shanks lying along alternate courses of said tape and said warp filament constituting warp pillars chain-knitted into said tape at the remaining courses.

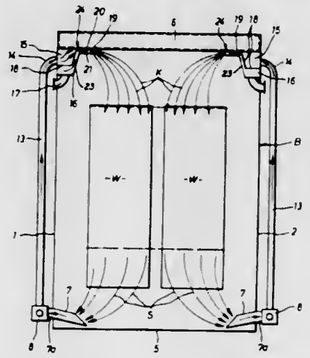
4,075,875

APPARATUS FOR TREATING WEBS OF TEXTILE GOODS WITH HOT AIR OR STEAM

Klaus Heidan, Roonstrasse 84, 415 Krefeld 1, Germany

Filed Apr. 21, 1976, Ser. No. 679,079
Claims priority, application Germany, Apr. 23, 1975, 2517972
Int. Cl.² D06B *3/12*
U.S. Cl. 68—5 D **4 Claims**

1. An apparatus for treating in a continuous manner webs of textile goods which includes: a container having an upper portion as well as a major width and length, supporting means arranged in said container for supporting webs of textile material to be treated by a gaseous treating medium, slot-nozzle means arranged in the upper portion of said container and extending at least over the major width and length of said container, said supporting means being provided for the textile material having a first section adjacent said nozzle means and also having a second section remote from said nozzle means, said nozzle means being adapted to receive and release a gaseous treating medium onto said first section for treating a web of materials whenever placed correspondingly on said supporting means, said nozzle means being provided with first inlet means connectable to a supply of a fresh gaseous treating medium and also being provided with second inlet means, and means for withdrawing gaseous treating medium from said second section whenever treating medium is released by said nozzle onto said first section and for conveying said withdrawn gaseous



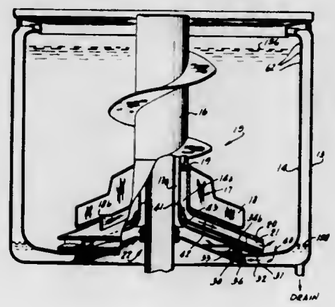
treating medium to said second inlet means, said means for withdrawing gaseous treating medium from said second section including blower means communicating with said nozzle means, said nozzle means having associated therewith and communicating with first accumulating and distributing chamber means for receiving treating medium withdrawn from said second section and also having associated therewith and communicating with said accumulating and distributing chamber means for receiving fresh treating medium from said first inlet means, said nozzle means including two substantially parallel outer walls and a first partition, said first and second accumulating and distributing chamber means being separated from each other by a second partition, said first partition merging with said second partition.

4,075,876

FILTER SYSTEM FOR WASHING MACHINE

Clark I. Platt, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Apr. 27, 1976, Ser. No. 680,675
Int. Cl.² D06F *13/02, 39/10*
U.S. Cl. 68—18 F **16 Claims**



1. In a washing machine of the vertical axis type having a tub having a lower wall for containing wash liquid, a basket

mounted in the tub on said vertical axis for containing articles to be washed and having a lower wall spaced adjacent said wall of the tub, and pump means for circulating wash liquid to said basket from said tub; filter means for filtering the circulating wash liquid, said filter means comprising:

a filter ring being located entirely outside said basket and extending between said lower wall of said tub and said lower wall of said basket and being substantially circumferentially continuous about said axis to define annularly continuous first and second tub regions outside said basket wall,

said filter ring including a plurality of teeth for filtering suspended foreign particles from liquid passing from said second to said first tub region,

said circulating liquid flowing generally along a path in said first tub region along said lower wall of said basket, into the interior of said basket, from the basket into said second tub region, and past said filter ring back to said first tub region.

4,075,877

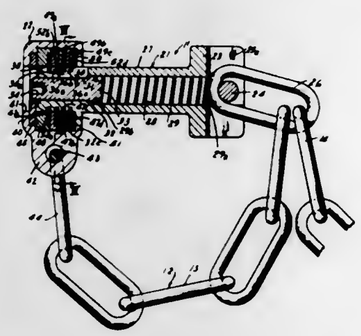
LOCK ASSEMBLY

James Van Gompel, Fremont, Ind., assignor to Brammall, Inc., Angola, Ind.

Filed Jan. 7, 1977, Ser. No. 757,655

Int. Cl.² E05B *15/16, 35/04, 67/06; E00B 67/36*

U.S. Cl. 70—34 **13 Claims**



1. A lock assembly comprising, a locking post having a first securing portion at one end, a longitudinal bore, at least one rib transverse to the longitudinal axis of and near the other end of the post, and at least one longitudinal slot in the locking post intersecting said at least one rib, a locking cap receivable over said other end of the post, a second securing portion on the locking cap, a key aperture in the cap, a locking means positioned in the locking cap and spring biased to engage said at least one rib of the locking post when said cap is received over said other end of the locking post, and in which said locking means comprises a locking ring having a central aperture through which said locking post may be received, said locking ring being biased by spring means into an eccentric position with respect to a central longitudinal axis of said locking post, a portion of said locking ring intersecting the locking post longitudinal slot.

4,075,878

CABLE LOCK

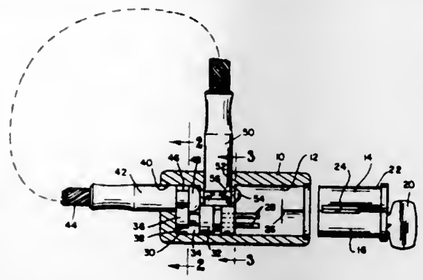
Walter E. Best, Best Lock Corporation, P.O. Box 103, Indianapolis, Ind. 46206

Filed Jun. 10, 1976, Ser. No. 694,685

Int. Cl.² E05B *67/06*

U.S. Cl. 70—49 **18 Claims**

1. A cable lock, comprising a lock body, a core chamber formed at one end of said body for receiving a lock core having a key-actuated key plug and a tumbler pin housing projecting radially of said key plug, said chamber having a first portion adapted to contain the key plug of the core and a side portion to contain the pin tumbler housing, a bore extending inward beyond said chamber and a rotary bolt mounted therein in coaxial relation with the key-plug of the core and connected for operation by such key plug, an axial first cable-receiving bore extending inward from the opposite end of the body in parallel overlapping relation with said bolt-receiving bore and in general axial alignment with said chamber side portion, for receiving a cable end member, a second cable-receiving bore formed in said body transversely of and generally coplanar



with and axially between said side portion and said first cable-receiving bore, a cable having a first end member thereon secured in said second cable-receiving bore and a second end member on said cable formed for releasable engagement in said axial first cable-receiving bore, said releasable end member and bolt being shaped for interlocking engagement, the bolt having a normal locked position in which it locks such end member in the body and having a key-actuated release position in which it releases such end member for withdrawal from the body.

4,075,879

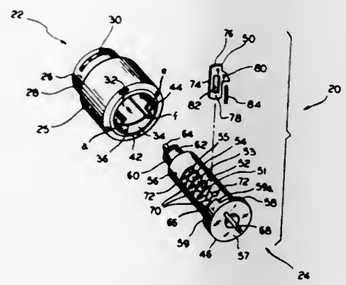
MULTIPLE FUNCTION PLATE TUMBLER-TYPE CYLINDER LOCK MECHANISM

Walter S. Christopher, Park Ridge, Ill., assignor to Chicago Lock Co., Chicago, Ill.

Filed Jun. 22, 1977, Ser. No. 808,971

Int. Cl.² E05B *9/04, 29/02, 35/08*

U.S. Cl. 70—337 **12 Claims**



1. A cylinder lock mechanism which comprises:

a barrel having a plurality of longitudinal internal splines therearound adapted for receiving tumbler ends,

means providing at least three internal circumferentially extending tumbler movement paths on said barrel having proximal ends disposed in a first one of said splines and terminating at distal ends in respectively different ones of said splines,

a key plug assembly rotatably mounted in said barrel and including a key plug and a plurality of spring-pressed plate tumblers mounted in said plug in a longitudinal series,

said tumblers being mounted for reciprocal transverse movement upon insertion and withdrawal of a bitted key with opposite tumbler ends projecting alternately from opposite sides of said plug,

first ones of said tumbler ends being spring-pressed to project outwardly for reception in a second one of said splines to secure the plug assembly initially in the absence of a key, said second spline being diametrically opposed to said first spline,

opposite second ones of said tumbler ends being adapted to be projected outwardly and received in said first spline when a key is inserted for the purpose of freeing said plug assembly for rotation,

different ones of said second tumbler ends registering with respective movement path proximal ends whereby when such tumbler ends are projected outwardly they may travel in the movement paths between the proximal and distal ends thereof, and

means adjacent to at least one end of each movement path adapted for engagement with the tumbler end traveling in the path to prevent travel thereof beyond such path end,

whereby a plurality of different keys may be employed for rotating said plug assembly with each key rotating the assembly to a different limited extent, said keys each engaging a different one of said tumblers having a second end registering with a movement path to cause such end to project into the movement path and thereby limit rotation of the plug assembly.

4,075,880

MACHINE FOR CONTINUOUSLY COLD WORKING STEEL BAR

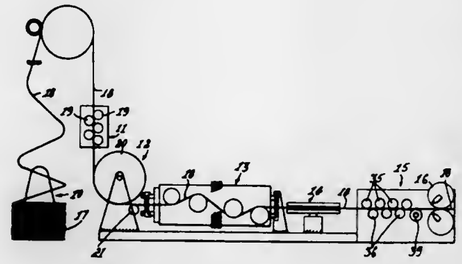
William Raeburn Copeland, Johannesburg, South Africa, assignor to Reinforcing & Allied Industries (Proprietary) Limited, Johannesburg, South Africa

Filed Nov. 12, 1976, Ser. No. 741,410

Claims priority, application Australia, Nov. 14, 1975, 3970/75

Int. Cl.² B21F *7/00*

U.S. Cl. 72—64 **9 Claims**



1. A method of cold working an elongated steel length by imparting a torsional force to such length including the steps of:

feeding the elongated length into a first gripping formation, such gripping formation restraining the steel length from rotating about an axis along its line of feed,

feeding the elongated length into a second gripping formation,

causing the second gripping formation to rotate about an axis substantially axially aligned to the line of feed thereto of the elongated steel length,

continuously feeding the length of steel through the gripping formations thereby causing the second gripping formation to impart continuously the requisite degree of torsion to the steel length, and

feeding the steel length from the second gripping formation to a third gripping formation downstream of the second formation, such third formation being non-rotatable about the axis of the line of feed and restraining the steel from rotating about an axis along the line of feed thereto of the steel length, such that relative the second and third gripping formations a rotation occurs counter the rotation between the first and second gripping formations such that between the second and third gripping formations a continuous counter torsional force is imparted into the steel length.

4,075,881

METHOD OF AND DEVICE FOR MAKING RODS, TUBES AND PROFILED ARTICLES

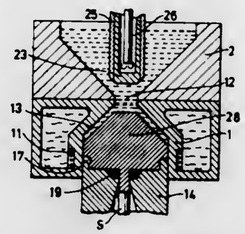
Alfred Kreidler, Zurich, Switzerland, assignor to Metall-Invent S.A., Zug, Switzerland

Filed Dec. 4, 1975, Ser. No. 637,817

Claims priority, application Germany, Dec. 5, 1974, 2457423

Int. Cl.² B21C *33/02*

U.S. Cl. 72—270 **21 Claims**



1. The method of extruding a continuous extrusion from molten material, comprising confining a mass of said material between two relatively movable members, the first member having a receiving compartment in which said mass is confined with the second member within said compartment, cooling the material in said compartment to a plastic state, one of said members having an inlet, the other member having an extrusion opening opposite said inlet and supporting said material and being relatively movable toward and away from said inlet, closing said inlet and moving said members relatively to move said second member inwardly into said compartment, exerting pressure on said mass and extruding a portion of said mass adjacent said other member through said extrusion opening, opening said inlet and moving said second member outwardly with said plastic mass and admitting a supply of said molten material into said compartment to form a layer of molten material on said plastic mass adjacent said inlet, closing said inlet to confine said material in said compartment and cool said layer, and repeating said cycle of moving said second member inwardly and outwardly relatively to said compartment while extruding a portion of the plastic mass in said compartment of each cycle.

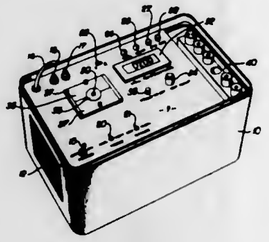
7. An apparatus for producing strands in the form of rods, tubes and profiled articles, which includes: a first housing section comprising a casting funnel adapted to be filled with a melt from which the strands to be produced are made, a second housing section comprising a receiving compartment for receiving melt from said casting funnel, conduit means establishing communication between said casting funnel and said receiving compartment, stopper to means operable selectively to move for interrupting communication between said casting funnel and said receiving compartment, pressing die means forming a plunger slidably extending into said compartment and operable to support a bar of the material of said melt in a thermal plastic condition and with each inward stroke of said die means relative to said compartment to extrude from said bar a section of a strand, a tool arranged on said die for shaping the cross section of said strand section, a thin wall bounding at least in part the inner space of said compartment and adapted to be cooled from the outside while being made of heat conducting material, and means for transmitting pressure force and adapted only during the pressing stroke to engage said wall for supporting the same.

4,075,882

TEMPERATURE CALIBRATION SYSTEM

Bradley C. Waldron, Canoga Park, Calif., assignor to King Nutronics Corporation, Woodland Hills, Calif.

Filed Feb. 4, 1977, Ser. No. 765,732
Int. Cl.² G01K 15/00
U.S. Cl. 73—1 F 22 Claims



1. In a system for calibration of a temperature probe and including a first heatsink with an opening for receiving the temperature probe, a temperature sensing resistor, a plurality of thermo-electric modules, each module serving as a heat source and a heatsink depending on the polarity of the applied voltage, a second heatsink, and means for mounting said modules between said first and second heatsinks,

the improvement comprising a control circuit for selectively connecting said modules to an electric power source with one polarity and with the opposite polarity, said control circuit including in combination:

a first bridge arm with said temperature sensing resistor connected therein, and providing a first output;

a second bridge arm with a temperature set resistor connected therein, and providing a second output;

a comparator circuit having said first and second outputs as inputs and providing a power output; and

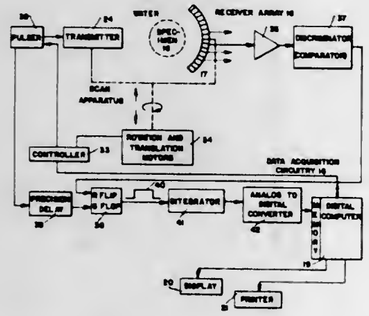
power switching means having said power output as an input for connecting said modules to the power source.

4,075,883

ULTRASONIC FAN BEAM SCANNER FOR COMPUTERIZED TIME-OF-FLIGHT TOMOGRAPHY

Gary H. Glover, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 20, 1976, Ser. No. 716,109
Int. Cl.² G01N 29/00
U.S. Cl. 73—620 11 Claims



1. An ultrasonic scanner for computerized time-of-flight tomography comprising

a scan apparatus having a rotational axis and including a generally sector-shaped tank having openings in opposing end walls, a transmitter transducer with an attached divergent lens mounted in one opening for producing a planar ultrasound fan beam, and an arcuate receiver transducer array mounted in the other opening and comprising multiple receiver transducers for individually detecting acoustic pulses propagating along divergent paths through a liquid bath and a tissue specimen immersed therein,

means for rotating said scan apparatus, and means including a pulser circuit for generating start electrical pulses for periodically exciting said transmitter transducer and initiating generation of multiple acoustic pules approximately at each of a large number of equally spaced anagular positions of said scan apparatus,

data acquisition circuit means operative approximately at each angular position for deriving digital projection output data indicative of acoustic pulse propagation delay times upon detection at individual receiver transducers, the ensemble of projection output data for the respective angular positions of the scan apparatus forming transmission time-of-flight projections to be used in combination to reconstruct velocity distributions at known coordinates in a specimen layer

said data acquisition circuit means including a plurality of parallel processing channels, substantially smaller in number than the number of receiver transducers, that are switched in sequence among sets of said receiver transducers between generation of successive acoustic pulses at the respective angular positions, each channel comprising pulse height discriminator means for generating a delay time stop signal upon detection of acoustic pulses at a coupled receiver transducer, and further comprising a digital timing circuit including a digital clock that is effectively enabled by the respective start electrical pulse and stopped by the corresponding delay time stop signal to derive said projection output data, a register coupled to each timing circuit for temporarily receiving said projection output data, and

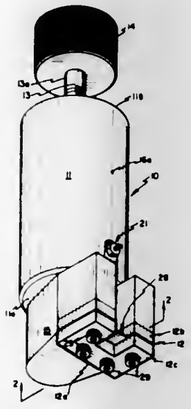
a memory unit for storing said projection output data.

4,075,884

FRACTURE SPECIMEN LOADING MACHINE

Lynn Marshall Barker, Salt Lake City, Utah, assignor to Terra Tek, Inc., Salt Lake City, Utah

Filed Feb. 14, 1977, Ser. No. 768,193
Int. Cl.² G01N 3/36
U.S. Cl. 73—91 21 Claims



1. A fracture specimen loading machine comprising,

a source of fluid under pressure;

fluid transfer means connected to said source of fluid under pressure for receiving fluid therefrom;

envelope-shaped pressure bag means connected to said fluid transfer means to receive fluid therefrom, to expand as the fluid volume therein increases;

flow control means for controlling the volume of fluid within said pressure bag; and

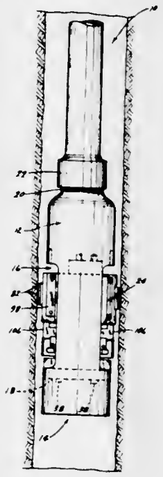
sensor means connected to said fracture specimen loading machine for sensing fluid pressure within said pressure bag.

4,075,885

ROCK BOREHOLE SHEAR TESTER

Richard L. Handy, Des Moines; Leon E. Girard, Ames; Bruce R. Roorda, Marshalltown, all of Iowa, and John M. Pitt, Woodridge, Va., assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Feb. 23, 1977, Ser. No. 771,360
Int. Cl.² E21B 49/00
U.S. Cl. 73—88 E 16 Claims



1. A method of in situ determination of rock properties by forming a bore hole in the rock under test, introducing into said bore a device for determining the shear strength of rock at different measured applied normal stresses, including a hinged shear head having a plurlity of hinged points, and at least one of two oppositely mounted shear plates adaptable for lateral movement with respect to the axis of said bore, the invention comprising,

moving said movable shear plate laterally until said shear plates engage and grip opposite surfaces of said bore,

maintaining said hinged shear head in a substantially rigid configuration while said movable shear plate is being moved,

exerting a shearing force on said body means in a direction parallel to the axis of said bore to exert a shearing force to the opposite surfaces of said bore through said shear plates, and simultaneously releasing said shear head from its rigid configuration to permit limited deformation thereof while said shearing force is being applied, and measuring the shearing resistance of the rock engaged by said shear plates.

4,075,886

FRACTURE TOUGHNESS TEST METHOD

Lynn M. Barker, Salt Lake City, Utah, assignor to Reed Tool Company, Houston, Tex.

Continuation of Ser. No. 718,994, Aug. 30, 1976, abandoned. This application Apr. 20, 1977, Ser. No. 789,318
Int. Cl.² G01N 3/20
U.S. Cl. 73—88 R 12 Claims

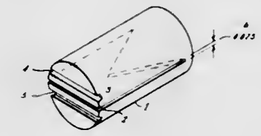
1. A method of measuring the fracture toughness of hard brittle materials comprising

forming a short rod-shaped test specimen,

cutting slots in said specimen in a single plane intersecting to form a single slot having an internal V shape,

applying an opening force at the open end of said single slot to form an initial short crack at the apex of said V,

applying slowly increasing forces to the slotted end of said specimen perpendicular to said slot in opposite directions tending to open said slot and propagate said crack, and



measuring the peak force applied in propagating said crack prior to breaking said specimen,

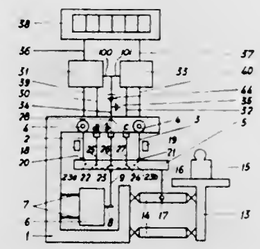
said peak force being linearly related to the fracture toughness of the specimen.

4,075,887

MASS AND FORCE METER

Mario Gallo, Zurich, Switzerland, assignor to Wirth, Gallo and Company, Switzerland

Filed Dec. 22, 1975, Ser. No. 643,326
Claims priority, application Switzerland, Jan. 23, 1975, 00967/75
Int. Cl.² G01L 1/10
U.S. Cl. 73—141 R 3 Claims



3. A mass and force meter comprising a frame, a digital evaluation and display device, two pre-tensioned electrically conductive strings, each having one end thereof fixed electrically insulated to said frame, a force distributor, the other end of said strings being connected electrically to said force distributor, an exciter comprising electrical circuits for each string controlling an alternative current, three electric conductors in said circuits being electrically connected to said force distributor, one of said electric conductors closing said circuits of both said exciters, each of the other two of said three electrical conductors closing a respective circuit of each of said electrical circuits, a magnetic field extending over a part of the length of said strings, said alternative current exciting said strings to transversal vibrations, first and second transmission elements for transmitting to said strings a pre-tensioning force and a force proportional to the mass or force to be measured respectively, an electrically insulating element at each end of said transmission elements, said insulating elements being connected to said force distributor, which is thereby electrically insulated from said frame, the other ends of said transmission elements being operatively connected to receive their respective forces, means for applying to the evaluation and display device resultant frequency variations caused by the variations of tension of said strings due to the application of the force proportional to the mass or force to be measured.

4,075,888

MEASUREMENT OF UNDULATORY WEAR ALONG RAILROAD TRACKS

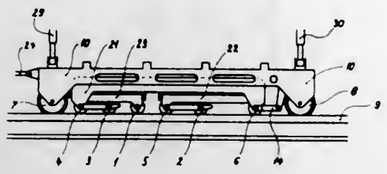
Fritz Buhler, Ecublens, Switzerland, assignor to Les Fils d'Auguste Scheuchzer S.A., Switzerland

Filed Apr. 20, 1976, Ser. No. 678,666

Claims priority, application Switzerland, Apr. 23, 1975, 5186/75

Int. Cl.² B61K *9/08*

U.S. Cl. 73—146 **13 Claims**



1. In a method of measuring undulatory wear of a rail of a railroad track comprising moving along the track a unit including a rail sensor sensitive to deformations in relation to a given measuring base within which said sensor is disposed, the improvement comprising simultaneously using several measuring bases of different lengths, and a plurality of sensors each disposed within a respective one of said bases, the lengths of said measuring bases being each chosen to provide measurements corresponding to undulations of given wavelength values, and the length of each successively shorter measuring base being related to the length(s) of the longer one(s) to include measurements of undulations of wavelength values not provided by said longer one(s).

4,075,889

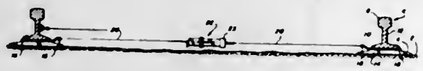
RECORDER FOR MEASURING MOVEMENT OF RAILROAD TRACK RAILS UNDER LOAD

Paul T. Jones, 505 Dover Ave., LaGrange Park, Ill. 60525

Filed Oct. 26, 1976, Ser. No. 735,404

Int. Cl.² G01L *5/20*

U.S. Cl. 73—146 **10 Claims**



1. Apparatus for recording relative movement under load between opposing rails of a railroad track comprising,

body means disposed between said opposing rails, and

means for securing said body means to each of said rails in a manner to permit normal passage of a vehicle over the rails,

said body means including displacement indicia means for showing maximum extent of relative movement of said opposing rails between no load condition and load condition created by the passing of a vehicle over said rails.

4,075,890

DEVICE FOR DETECTING LEVEL OF MOLTEN METAL SURFACE WITHIN A CONTINUOUS CASTING MOLD

Takeshi Iwasaki, Tokyo; Yasuo Fujikawa, and Kunimasa Sasaki, both of Hiroshima, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

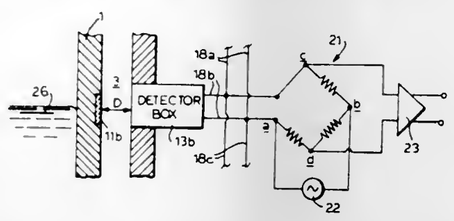
Filed Dec. 2, 1976, Ser. No. 747,250

Claims priority, application Japan, Mar. 31, 1976, 51-34278

Int. Cl.² G01F *23/22*; H01F *27/16*

U.S. Cl. 73—295 **4 Claims**

1. In a device for detecting the level of the molten metal surface within a continuous casting mold having a detector element consisting of a body of a thermosensitive magnetic material, the magnetic properties of which vary in response to a temperature variation mounted at an appropriate position on a side wall of the continuous casting mold, and an electromagnetic coil for detecting the magnetic flux in said detector element and contained within a detector box mounted in a water jacket surrounding said mold at a position opposed to said detector element, so that a molten metal surface level within the mold can be detected by detecting a change in the magnetic properties of said detector element by means of said electromagnetic coil, the improvement comprising means for detachably mounting said detector box in the water jacket, water supply inlet and outlet means in said detector box for guiding cooling water through said detector box for cooling the elec-



tromagnetic coil within the detector box, a protective casing slidably mounted in a side wall of said detector box toward the mold for movement toward and away from the mold, said electromagnetic coil being contained entirely within said protective casing for being protected against electrical contact with the cooling water, said casing having an extension thereon projecting from the end of said electromagnetic coil toward the mold, and spring means engaging said protective casing for spring-biasing said protective casing towards said mold for keeping the free end of said extension against said mold, whereby a predetermined distance is maintained between the outer side wall of the mold and said protective casing.

4,075,891

SELF-LEVELING STATIC WHEEL BALANCER

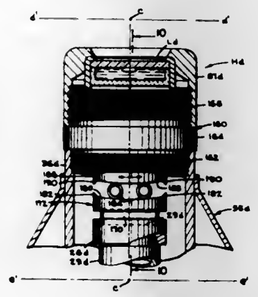
Thomas E. Roberts, Jr., Saratoga, Calif., assignor to FMC Corporation, San Jose, Calif.

Division of Ser. No. 633,779, Nov. 20, 1975, Pat. No. 4,041,781.

This application May 6, 1977, Ser. No. 794,581

Int. Cl.² G01M *1/04*

U.S. Cl. 73—483 **2 Claims**



1. In a wheel balancer of the type comprising a post having a generally vertical axis, means for supporting said post on the floor, a wheel balance head having means for mounting and centering a wheel to be balanced in a plane that is normally horizontal, a level on said head, and universal pivot means for mounting said balance head on said post for freely accommodating tilting of said balance head plane relative to said post about a pivot point in response to wheel unbalance, the pivot point of said balance head plane being coincident with the axis of said post when the post axis is vertical; the improvement wherein said pivot means comprises an anvil on the upper end of said post, a concave cylindrical bearing surface formed on the upper face of said anvil, a first set of equal diameter cylindrical rollers on said concave anvil surface; an intermediate swivel block having a lower face formed with a convex cylindrical surface supported by said rollers, the axes of said cylindrical surfaces being coincident to form a common axis that is perpendicular to and intersects the axis of said post, the axes of said rollers being parallel to that of said cylindrical surfaces; said swivel block having an upper face formed with a concave cylindrical surface, a second set of equal diameter rollers on said concave swivel block surface, and a mounting block on said balancing head, said mounting block having a lower surface formed with a convex cylindrical surface supported by said second set of rollers; the axes of said latter named cylindrical surfaces being coincident to form a common axis that is perpendicular to and intersects the common axis of said first named cylindrical spherical surfaces at the axis of said post.

4,075,892

INDICATING ARRANGEMENT FOR A DISTANCE WARNING INSTALLATION

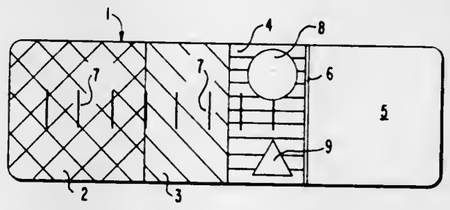
Manfred H. Burckhardt, Waiblingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Mar. 19, 1976, Ser. No. 668,422

Claims priority, application Germany, Mar. 20, 1975, 2512144

Int. Cl.² B60K *35/00*; G01P *15/00*

U.S. Cl. 73—495 **14 Claims**



1. An indicating arrangement with an indicating means for a distance-warning system in motor vehicles that includes a measuring and evaluating means for determining the distance of the vehicle to an obstacle disposed in front thereof and for determining the approach velocity to this obstacle, characterized in that the indicating means includes a scale means having deceleration values marked thereon, means for obtaining a signal from the values determined by the measuring and evaluating means representing the braking deceleration necessary for avoiding a collision and means for reproducing said braking deceleration as desired value indication on the scale means with the deceleration values marked thereon.

4,075,893

RADIALLY MOVING TRIGGER MECHANISM AND TRANSMISSION OVERSPEED INHIBITOR USING SAME

Franklin O. Koch, Jr., Edelstein, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 25, 1976, Ser. No. 661,087

Int. Cl.² F16H *5/42, 25/08, 53/00*; G01P *3/18*

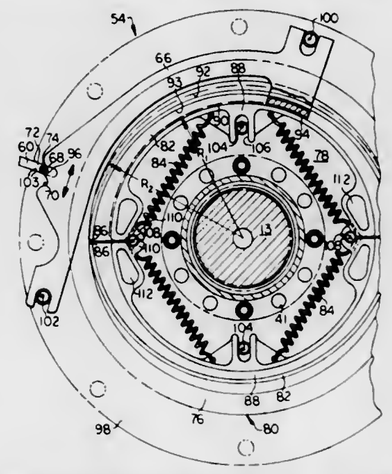
U.S. Cl. 74—3 **7 Claims**

1. A trigger mechanism providing stepwise linear motion responsive to a shaft rotating above a predetermined rate, comprising:

a rotating shaft having a collar thereabout attached to rotate therewith;

a plurality of arcuate cams mounted within said collar to rotate therewith, each normally biased with the ends of the arcs thereof adjacent said collar and the mid points of the arcs thereof spaced away from said collar towards said shaft, said mid points of said arcs being forced centrifugally to adjacent said collar when said shaft rotates above a predetermined rate, each of aid cams having channel means therein, each of said cams fitting against a respective adjacent cam end to end to form a generally circular arrangement thereof and of said channel means, said circular arrangement of said channel means defining a first circular path in said cams at a normal shaft rotation rate up to said predetermined rate a first radial distance from said shaft and a second circular path in said cams at a second radial distance from said shaft above said predetermined shaft rotation rate;

non-rotating cam-follower means having a tang extending therefrom into said first circular path at said normal shaft rotation rate and into said second circular path above said



predetermined shaft rotation rate, said cam-follower means being constrained to shift laterally with shifting of said tang from a respective one to a respective other of said first and second circular paths and providing a pair of detent positions separated by a distance generally equal to said lateral shift a first of which is further from said shaft and a second of which is closer to said shaft;

a rod having a first end extending outwardly from said cam-followeer means away from said shaft and a second end contacting a respective one of said first and second detent positions; and

means biasing said second end of said rod toward said respective one of said first and second detent positions and thereby indexing said tang in said first circular path at said normal shaft rotation rate and in said second circular path at said predetermined shaft rotation rate.

4,075,894

WINCH DRUM HYDRAULIC DISCONNECT

Henry T. Therkildsen, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

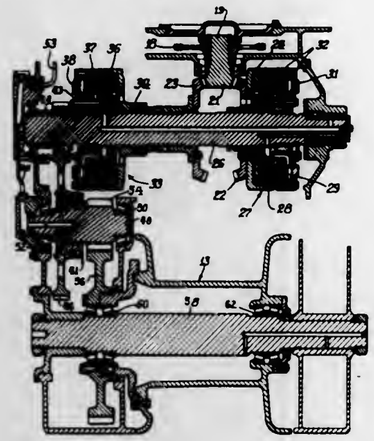
Filed Dec. 23, 1976, Ser. No. 753,679

Int. Cl.² F16H *37/00*

U.S. Cl. 74—15.69 **9 Claims**

1. In a drum rotating apparatus which comprises an input gear, means for selectively drivingly rotating said input gear about its axis in a first and a second direction, a transfer gear meshing with said input gear and driven thereby, a shaft rotatably driven by said transfer gear and having gear engaging means thereon, an output gear meshing with said gear engaging means and driven thereby and a drum secured to said output gear to rotate therewith, an improvement comprising:

a normally engaged linearly movable ring coupling intermediate said transfer gear and said shaft; and



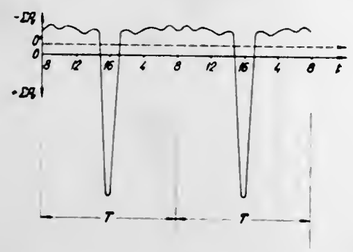
means for hydraulically disengaging said normally engaged ring coupling to allow said drum to rotate unencumbered by said input gear and said means for selectively drivingly rotating said input gear.

4,075,895

METHOD OF OBTAINING PERIODICAL IMPACTS IN ONE DIRECTION

Krystian H. Eyman, Warsaw, Poland, assignor to Politechnika Warszawska, Warsaw, Poland

Filed Oct. 30, 1975, Ser. No. 627,038
Claims priority, application Poland, Oct. 30, 1974, 175226
Int. Cl.² F16H *33/00*
U.S. Cl. 74—61 **2 Claims**



1. A method of producing periodic shocks in one direction comprising aligning at least three eccentric weights in the direction of desired shock, rotating the weights to induce centrifugal forces, and establishing different speeds of rotation of the weights in a sequence of cardinal numbers which as a result of summation of centrifugal forces, a desired shock is produced in one direction for every phase of complete revolution of the most slowly rotating eccentric weight.

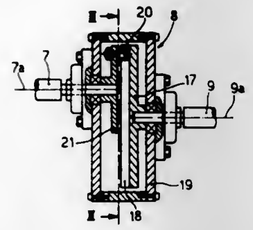
4,075,896

MECHANISM FOR THE VARIABLE-SPEED DRIVE OF THE AUTOMATIC SHEET FEEDER DRUM

Giorgio Pessina, and Aldo Euclide Perobelli, both of Via Arborina 2, Paderno Dugnano, Italy

Filed Feb. 24, 1976, Ser. No. 661,014
Int. Cl.² F16H *21/14*
U.S. Cl. 74—69 **3 Claims**

1. In an automatic sheet feeder, the combination of:
A. a feed drum,
B. grippers carried by the drum and shiftable between a sheet releasing idle position and a sheet gripping operative position,
C. means mounting the drum for rotation about its center,
D. means rotatably driving said drum at a speed that varies continuously between a maximum value and a minimum value, said drum driving means including:
a. a guide component rotatable about a fixed axis,
b. means to rotate said guide component,
c. means providing a diametral groove in said component,
d. a roller slidable in said groove,



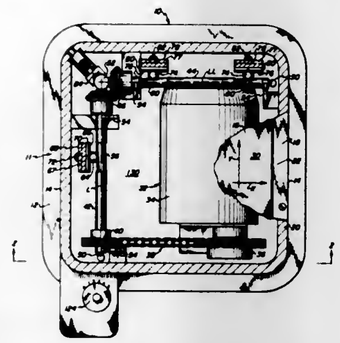
e. a revolving disc on which said roller is mounted close to the circumference of the disc, said roller being mounted for rotation about a fixed axis parallel to and displaced from the axis of rotation of the guide component, and
f. the axis of rotation of the disc being displaced with respect to the axis of rotation of the component to drive the drum at the aforesaid variable speed, and
E. means to render the grippers operative to grip a sheet when the drum is rotating at its minimum value and without stopping the drum.

4,075,897

APPARATUS FOR OBTAINING RELATIVE ORBITAL MOVEMENT IN ELECTRICAL DISCHARGE MACHINING

Fred Schmidt, Cranford, N.J., assignor to Triangle Tool Company, Union, N.J.

Continuation-in-part of Ser. No. 547,082, Feb. 4, 1975, abandoned. This application Dec. 8, 1975, Ser. No. 638,930
Claims priority, application Italy, Mar. 3, 1975, 20849/45
Int. Cl.² F16H *33/10*
U.S. Cl. 74—86 **29 Claims**



1. Apparatus for obtaining orbital movement of a driven member, said apparatus comprising:
a frame;
a first cam mounted for rotation on the frame, said first cam having a given cam surface and throw, the throw of said first cam extending in a first direction;
a second cam mounted for rotation of the frame, said second cam having a given cam surface and throw, the throw of said second cam extending in a second direction transverse to the first direction;

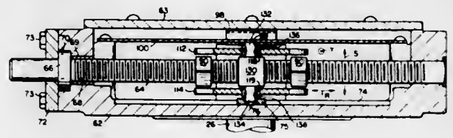
drive means for simultaneously rotating both cams in synchronism;
first coupling means coupling the driven member with the first cam for reciprocating movement along said first direction in response to rotation of the first cam, said first coupling means permitting simultaneous reciprocating movement of the driven member relative to the first cam along said second direction independent of said rotation of the first cam; and
second coupling means coupling the driven member with the second cam for reciprocating movement along the second direction in response to rotation of the second cam, said second coupling means permitting simultaneous reciprocating movement of the driven member relative to the second cam along the first direction independent of said rotation of the second cam;
the given cam surface and throw of each cam being such that movement of the driven member simultaneously along said first and second directions in response to the synchronized rotation of the cams results in orbital movement thereof.

4,075,898

SCOTCH YOKE

William L. Carlson, Jr., St. Cloud, Minn., assignor to General Signal Corporation, Rochester, N.Y.

Continuation of Ser. No. 530,641, Dec. 9, 1974, which is a division of Ser. No. 385,379, Aug. 3, 1973, abandoned. This application Jun. 14, 1976, Ser. No. 695,890
Int. Cl.² F16H *21/40*
U.S. Cl. 74—89.15 **4 Claims**



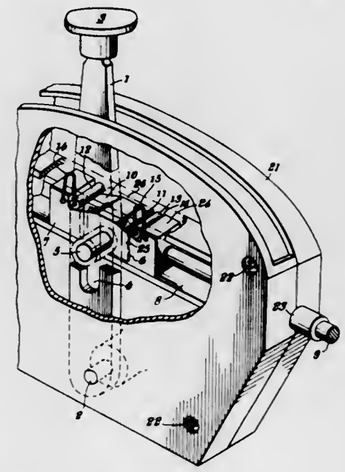
1. A scotch yoke and an actuator therefor comprising:
(a) a scotch yoke housing having a hole therethrough, a threaded rod extending along an axis through said hole in a first direction, means for preventing said rod from moving in said first direction, a yoke arm in said housing pivotable about an axis and extending in a second direction that intersects said first direction, slot means in said yoke arm, a member on said rod and threadingly engaged therewith, said member having projection means extending through said slot means in said yoke arm, a means cooperating with said projection means for absorbing thrust in a sideward direction on said yoke arm and in a sideward direction on said rod, said means for absorbing thrust being positioned in a plane which includes said axis of said rod and is perpendicular to said sideward direction of said rod to thereby minimize bowing and twisting in said yoke arm and said rod, and a threaded hole extending through said member, said rod being threaded into said threaded hole, said means for absorbing sideward thrust to minimize bowing and twisting comprises a guide strap fixed to said housing and a saddle slidably mounted on said guide strap, said guide strap extending in said first direction, said projection means fitting into a hole in said saddle to link said saddle to said yoke arm, whereby rotation of said rod slides said member in said first direction and pivots said yoke arm about said axis, and
(b) actuator means for rotating said threaded rod to thereby rotate said yoke arm.

4,075,899

OPERATING MECHANISMS

Jack Leonard Bartholomew, 5 Newick Drive, Newick, Sussex, and Derek John Bristow, Jackies Lane, Freshwater, Newick, Sussex, both of England

Filed May 20, 1976, Ser. No. 688,393
Claims priority, application United Kingdom, May 30, 1975, 23553/75
Int. Cl.² F16H *21/44*
U.S. Cl. 74—102 **14 Claims**



1. An operating mechanism comprising:
a housing;
a guide member in said housing;
an output member slidable in said guide member;
a surface on said guide member adjacent said output member at all slidable positions thereof;
said output member including at least one surface inclined so that it converges toward said surface of the guide member whereby a maximum and minimum separation distance exists therebetween;
at least one rolling means located between the inclined surface of the output member and said surface of the guide member;
the diameter of said rolling means being intermediate the maximum and minimum separation distances between said inclined surface and said surface of the guide member;
means for urging said rolling means along said inclined surface toward said minimum separation distance;
input means;
said input means being operative when actuated to displace said rolling means toward said maximum separation distance;
means operative to apply force to said output member upon actuation of said input means whereby displacement of said output member is urged; and
said means for urging being further operative to resume urging said rolling means into jamming abutment upon termination of actuation.

4,075,900

TWO-SPEED VIDEO RECORDER

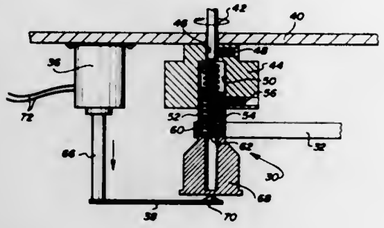
Henry John Hattendorf, 262 Santa Paula, Grand Prairie, Tex. 75050

Filed Apr. 12, 1976, Ser. No. 676,111
Int. Cl.² F16H *9/06*; B65H *17/22*
U.S. Cl. 74—217 S **4 Claims**

1. Speed changing apparatus for connection to a video recorder comprising:
a base portion operable to be rotated,
an aperture formed in said base portion,

a pulley having an extension slidably received within said aperture but keyed for rotation with said base portion, said pulley having a large diameter portion and a small diameter portion,

a spring positioned within said aperture for normally biasing said pulley to an extended position,



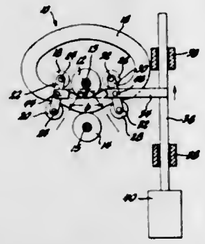
a solenoid for being mounted adjacent said base portion, and means connecting said solenoid with said pulley for selectively extending and retracting said pulley relative to said base portion.

4,075,901

VARIABLE SPEED FRICTION TRANSMISSION

William J. Freyermuth, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 3, 1977, Ser. No. 765,352
Int. Cl.² F16H *7/00, 15/00, 7/10*
U.S. Cl. 74—226 **4 Claims**



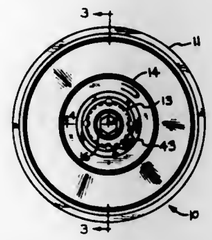
1. A transmission comprising a cylindrical drive pulley, a cylindrical driven pulley, an endless belt of a suitable material and a predetermined uniform thickness, said belt being frictionally confined between said drive and driven pulleys and loosely encompassing one of said pulleys, an inner pair of cylindrical positioning pulleys mounted toward the inside of said endless belt on opposite sides of said one of said pulleys, an outer pair of cylindrical positioning pulleys mounted toward the outside of said endless belt on opposite sides of the other of said drive and driven pulleys, each of said inner and outer pairs of positioning pulleys frictionally confining a portion of said endless belt, and means for moving said positioning pulleys inwardly or outwardly so as to cause said endless belt to bend partially around one of said drive and driven pulleys such that the inner and outer surfaces of said belt become respectively alternately variably shortened or lengthened to thereby cause said inner and outer surfaces to travel different distances and, hence, different speeds for infinitely varying the resultant speed ratio between said drive and driven pulleys between predetermined limits, depending upon the relative dimensions of said drive and driven pulleys radii and said belt thickness.

4,075,902

VARIABLE SPEED PULLEY

Loris J. Charchian, Troy; Larry E. Marvin, St. Clair Shores, both of Mich., and George R. Boxhorn, West Allis, Wis., assignors to Dana Corporation, Toledo, Ohio

Filed Sep. 27, 1976, Ser. No. 727,058
Int. Cl.² F16H *55/52*
U.S. Cl. 74—230.17 C **12 Claims**



1. A variable speed pulley for use with a rotatable shaft comprising, in combination, a tubular hub, means for attaching said hub to rotate about an axis with such shaft, said hub having at least two substantially V-shaped keyways spaced symmetrically about an outer surface and extending parallel to such axis, first and second sheave halves each having a tubular sleeve and an integral annular flange defining a conical surface, said conical surface on each sheave half defining one side of a V-belt receiving groove, said sheave half sleeves each having a central opening for slidably receiving said hub, means attaching said first sheave half sleeve to said hub whereby said first sheave half rotates with said hub, means attaching said second sheave half sleeve to said hub including a separate substantially V-shaped keyway in said second sheave half sleeve opening associated with each of said hub keyways, each of said associated hub and sleeve keyways cooperating to define a key receiving opening of generally square cross section, an elongated key formed from a non-metallic compliant material positioned in each key receiving opening, means for retaining said keys within said second sheave half sleeve whereby said second sheave half and said keys are free to slide axially on said hub, and springs mean biasing said second sheave half towards said first sheave half.

4,075,903

ADJUSTABLE STEERING COLUMN

Thomas G. Cornell, Danville, Ky., assignor to Eaton Corporation, Cleveland, Ohio

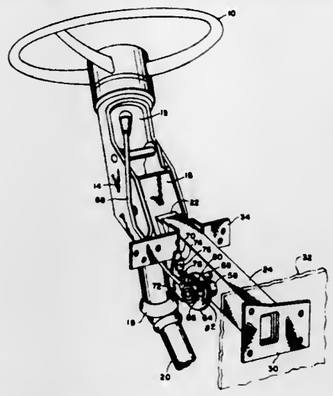
Filed Sep. 14, 1976, Ser. No. 723,257
Int. Cl.² B62D *1/18;* G05G *5/16, 5/18*
U.S. Cl. 74—493 **15 Claims**

1. An adjustable steering column for a vehicle comprising:

an outer tubular member adapted to be secured to the body of said vehicle;

an inner tubular member received in said outer tubular member and axially movable therein in a telescoping relationship; and

means operable upon actuation by the vehicle operator for clamping said inner member to said outer member, said clamping means comprising a first retaining means received in the interior of said inner member, a second retaining means mounted on the exterior of said outer member, and fastening means received through said inner and outer members to operatively connect said first and second retaining means, wherein movement of said movable means from said first position to said second position causes a clamping force to be applied to said inner and outer members, said clamping force being released by



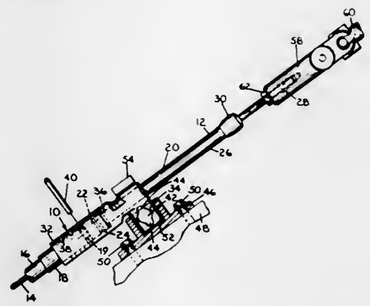
movement of said movable means from said second position to said first position.

4,075,904

ADAPTER FOR PUSH-PULL CONTROL CABLES

Steve Irwin, Seattle, Wash., and Dick Moser, Stow, Ohio, assignors to Incom International Inc., Pittsburgh, Pa.

Filed Mar. 13, 1975, Ser. No. 558,053
Int. Cl.² F16C *1/10*
U.S. Cl. 74—501 P **26 Claims**



1. An adapter for attachment to a push-pull control cable, said control cable having a conduit slidably supporting a motion transmitting core, an end fitting attached to said conduit and coaxial therewith, said end fitting having an annular groove therein, said adapter comprising a substantially "L" shaped member, the longer leg of said member having a longitudinally extending bore therethrough for fitting over and accommodating said end fitting at least one hole through said leg perpendicular to said bore and in alignment with said annular groove, fastening means adapted to be inserted within said hole to engage said end fitting at its annular groove, to positionally fix in an axial direction said adapter on said end fitting.

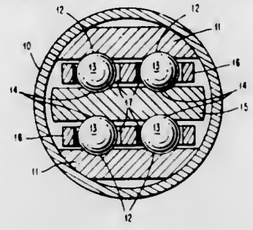
4,075,905

STABILIZED FLEXIBLE REMOTE CONTROL WITH SPACED BALL BEARINGS

Peter R. W. Schaaphok, Mount Kisco, N.Y., assignor to Controlex Corporation of America, Croton Falls, N.Y.

Filed Nov. 29, 1976, Ser. No. 745,592
Int. Cl.² F16C *1/10;* B21H *1/14*
U.S. Cl. 74—501 R **7 Claims**

1. In a tubular flexible remote control for transmitting push and pull forces wherein at least one flexible push-pull blade is in contact with a series of spaced balls on each of its opposite sides, the improvement of said control wherein each said blade has two parallel grooves in at least one side of each said blade



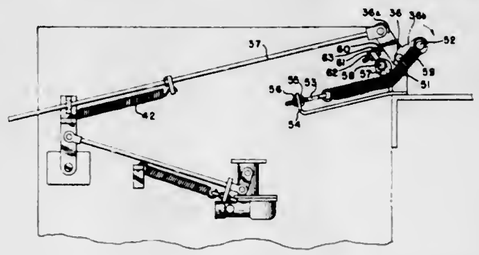
and two parallel series of spaced balls are disposed in said two parallel grooves of each said blade.

4,075,906

VARIABLE SPEED GOVERNOR

James E. Schimpf, Joliet, and Lucien B. Shuler, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 6, 1976, Ser. No. 712,429
Int. Cl.² G05G *1/14, 9/08*
U.S. Cl. 74—513 **5 Claims**



1. A control system including in combination an engine variable speed governor for sensing changes in engine speed from a preselected setting and controlling the speed of the engine to correspond to said setting;

operator control input means connected to said governor and movable over a control range for varying the control setting of said governor; and

balance means connected to said operator control input means for acting in opposition to reactive forces of said governor against said operator control input means for establishing a substantially constant force for said operator control input means over a major portion of said control range comprising spring means acting in opposition to said reactive forces and cam means engaging said spring means and altering the normal variations in tension of said spring over its normal range of displacement.

4,075,907

VARIABLE TRANSMISSION RATIO BRAKE ACTUATING DEVICE

Miloslav Petrzelka, Troisdorf, Altenrath, Germany, assignor to Uni-Cardan AG, Lohmar, Germany

Filed Nov. 18, 1976, Ser. No. 742,747
Claims priority, application Germany, Nov. 27, 1975, 2553228
Int. Cl.² G05G *1/04*
U.S. Cl. 74—523 **3 Claims**

1. A variable ratio brake actuating device comprising a frame, a brake lever pivotally mounted on said frame, first and second guide means on said frame and brake lever respectively extending toward the pivot mount and intersecting each other throughout pivoting of the brake lever, and a connector link to transmit force to a brake always positioned at the point of

intersection of said first and second guide means, pivoting of said brake lever guiding said link at a distance relative to the



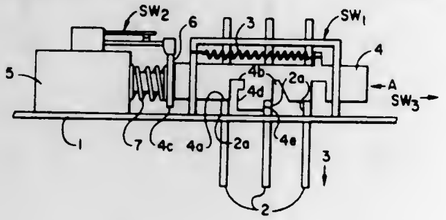
pivot mount which decreases from the release position toward the braking position.

4,075,908

CONTROL LEVER LOCKING MECHANISM

Shoji Suzuki, Iwaki, Japan, assignor to ALPS, Motorola, Inc., Japan

Filed Jan. 2, 1975, Ser. No. 538,095
Claims priority, application Japan, Feb. 16, 1974, 49-18949
Int. Cl.[2] G05G *5/06*
U.S. Cl. 74—527 **2 Claims**



1. A switch control lever locking mechanism including in combination:

a switch frame member;

a switch control lever, having a projecting portion thereon, slideably mounted in said frame member for movement between first and second positions;

a cam plate slideably mounted in said frame member for movement between first and second positions along a path at right angles to the path of movement of said switch control lever and having a first surface thereon for engaging the projecting portion of said control lever with said cam plate in said first position to prevent movement of said control lever from the first to the second position thereof, said cam member further having a slot therein aligned with the projection on said control lever with said cam plate in said second position to permit movement of said switch control lever between the first and second positions thereof; and

means for selectively moving said cam plate between the first and second positions thereof,

said means for moving said cam plate including a solenoid having an armature operatively coupled with said cam plate for controlling movement thereof between said first and second positions and including means for supplying a first amount of electrical power to said solenoid for moving said cam plate means from one of said first and second positions to the other and means for supplying a reduced amount of power to said solenoid to positively maintain said cam plate means in said other position.

4,075,909

AUTOMATIC SHAFT BALANCER

James E. Deakin, 52511 Belle Vernon, Rochester, Mich. 48063

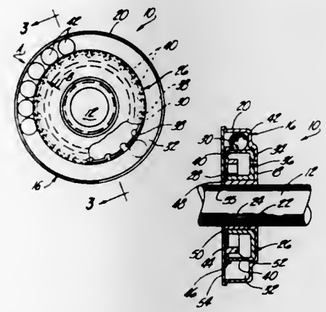
Filed Jan. 29, 1976, Ser. No. 653,494
Int. Cl.[2] F16F *15/32*
U.S. Cl. 74—573 R **6 Claims**

1. A device for automatically correcting an unbalanced condition in a rotating body and maintaining said body in a balanced condition comprising:

a housing having a rim, means for securing said housing to said body so that said rim is concentric with the axis of rotation of said body,

a one piece annulus constructed of a flexible material and having a base and an outer slotted rim,

means for rigidly securing the base of said annulus to said housing so that the slotted rim of the annulus is concentric with and spaced radially inwardly from said housing rim thereby forming an annular raceway between said slotted rim and said housing rim,



a floating inertia ring and means for securing said inertia ring across the open axial end of said slotted rim whereby said ring is adapted to flex the open axial end of said slotted rim between a radially retracted and radially extended position while the other axial end of said rim is radially stationarily secured to said housing by said base, and

at least one ball disposed in said raceway wherein said ball is free to move circumferentially in said raceway with said ring in a retracted position and wherein said ball is locked by said slotted rim against circumferential movement in said raceway with said ring in an extended position.

4,075,910

OVERLOAD SAFETY DEVICE FOR GAS TURBINE ENGINES

Warren W. Davis, Dunlap, and Leroy R. Thompson, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 20, 1976, Ser. No. 716,044
Int. Cl.[2] F16H *57/10*; F16D *7/02*; B60T *13/04*
U.S. Cl. 74—785 **16 Claims**

1. A drive mechanism mounted in a stationary housing comprising

an input shaft rotatably mounted in said housing,

an output shaft rotatably mounted in said housing,

drive means, including normally engaged drive establishing means, interconnecting said input shaft and said output shaft for normally permitting said input shaft to continuously rotate said output shaft under varying torque loads, and

an overload safety device including clamping bar means pivotally mounted in said mechanism adjacent to said drive establishing means for normally permitting engagement of said drive establishing means and for releasing said drive establishing means when said torque loads exceed a predetermined amount.

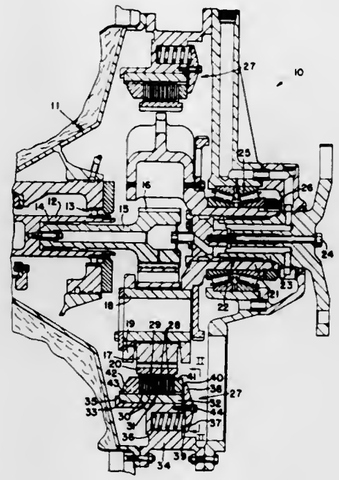
14. A drive mechanism comprising

an input shaft,

an output shaft,

drive means, including normally engaged drive establishing means comprising first and second sets of interleaved friction discs, interconnecting said input shaft and said output shaft for normally permitting said input shaft to drive said output shaft under varying torque loads, and

an overload safety device including clamping bar means pivotally mounted in said mechanism adjacent to said drive establishing means for normally permitting engagement of the first and second sets of friction discs of said



drive establishing means by applying pressure thereto and for releasing said first set of friction discs from said second set of friction discs when said torque loads exceed a predtermined amount.

4,075,911

DRIVE MECHANISM FOR RECIPROCATING AND MULTIPLE STEP INDEX DEVICES

John Henry Brems, 32867 White Oaks Trail, Birmingham, Mich. 48010

Continuation-in-part of Ser. No. 444,024, Feb. 20, 1974, abandoned, and Ser. No. 474,947, May 31, 1974, abandoned. This application May 15, 1975, Ser. No. 577,942
Int. Cl.[2] B23B *29/24*
U.S. Cl. 74—816 **16 Claims**

1. A reversible and cyclically repetitive indexing system incorporating a substantially linear, first harmonic and higher harmonic components to achieve a variety of kinematic objectives comprising:

(a) a frame,

(b) a main output member supported by said frame for movement along a predetermined path,

(c) a first rotating pair supported by said frame comprising:

(1) a first rotating member mounted for rotation in said frame,

(2) a first eccentric member mounted eccentrically, in non-rotational relation to, and on said first rotating member,

(d) a second rotating pair mounted in fixed spatial relationship with said first rotating pair comprising:

(1) a second rotating member,

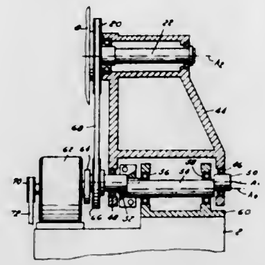
(2) a second eccentric member mounted eccentrically in non-rotational relation to, and on said second rotating member,

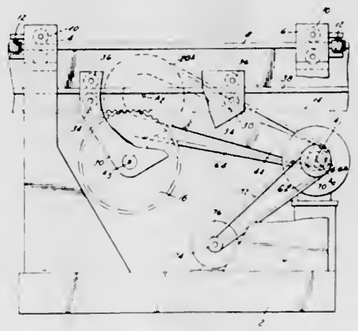
(e) means connecting for rotation said first rotating pair and said second rotating pair for substantially integral angular velocity ratio,

(f) means connecting said main output member with said first eccentric member and with said second eccentric member comprising:

(1) a first output member in tangential driving engagement with the periphery of one of said eccentric members,

(2) a second output member rotatably mounted to the other of said eccentric members, and





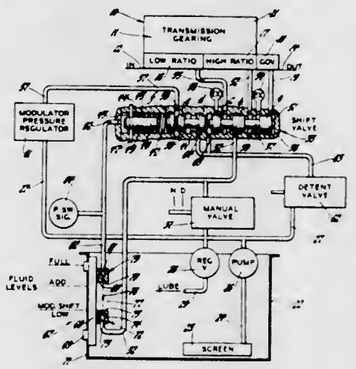
(g) power means connected to one of said rotating pairs to impact a rotary motion to that said rotating pair.

4,075,912

TRANSMISSION WITH SUMP OIL LEVEL RESPONSIVE CONTROLS

Robert H. Schaefer, Westfield, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 20, 1976, Ser. No. 752,460
Int. Cl.[2] B60K *41/04*; F16K *21/18*
U.S. Cl. 74—867 **9 Claims**



1. In a transmission: a housing having a sump with a normal fluid level range and an abnormal fluid level beyond said normal fluid level range; a multiratio gear unit having drive means for establishing low and high ratio drives mounted in said housing; a mainline; a fluid pressure source having a suction inlet in said sump and applying substantially proper regulated pressure when the fluid level in said sump is in said normal fluid level range and at said abnormal fluid level to said main-

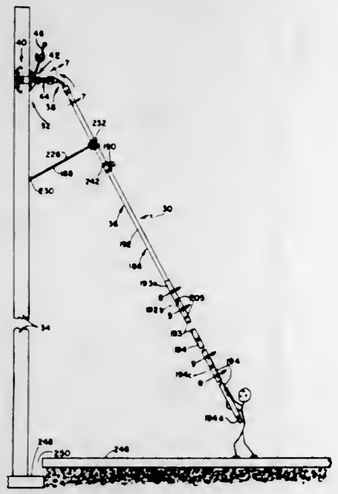
line for proper positive transmission operation;. shift control means for selectively controlling said drive means to selectively establish said low and high ratio drives; level sensor means mounted in said housing providing an abnormal fluid level signal in response to the fluid level in said sump being at said abnormal fluid level beyond said normal fluid level range; and shift inhibiting means connected to said level sensor means and said shift control means operative in response to said abnormal fluid level signal to change said shift control means operation to provide abnormal operation in one operating phase and provide normal proper positive transmission operation in another operating phase.

4,075,913

REMOTELY OPERABLE MECHANISM FOR DISCONNECTING A PICKUP UNIT FROM A TILT-UP CONCRETE WALL SLAB

Dennis W. Tye, Hayward, Calif., assignor to Superior Concrete Accessories, Inc., San Diego, Calif.

Filed Dec. 15, 1976, Ser. No. 750,913
Int. Cl.² B25B *13/48*
U.S. Cl. 81—177 UJ **14 Claims**



1. The combination of lifting apparatus for a tilt-up concrete wall slab, said apparatus including an insert for embedment in the slab and a pickup unit to be removably connected to the slab by fastening means releasably engaging the insert, and a remotely operable mechanism for disconnecting an elevated pickup unit from the slab when the latter is in a raised position following a lifting operation, said mechanism comprising:

an elongated element serving as an operating handle and having uppermost and lowermost ends when in use,

means on said element adjacent to its uppermost end for engaging said fastening means and operable to release the fastening means from said insert in order thereby to disconnect said pickup unit for removal from the slab,

said engaging means being movable into its engagement with said fastening means and operable when the latter is disposed at a location above and remote from an operator of the mechanism by manipulation of said element grasped adjacent to its lowermost end, and

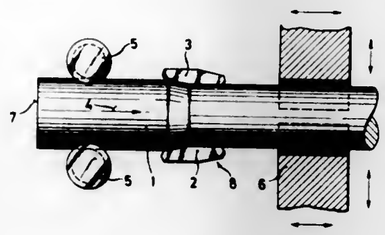
fulcrum means associated with said element and adapted to effect pivotal movement of the element whereby movement of the lowermost end of the element causes the element to function as a lever for pulling said fastening means away from the slab.

4,075,914

METHOD FOR ROTARY PEELING ELONGATED WORKPIECES

Wilhelm Schweer, Leichlingen, Germany, assignor to Th. Kieserling & Albrecht, Solingen, Germany

Filed Oct. 8, 1976, Ser. No. 730,836
Claims priority, application Germany, Oct. 15, 1975, 2546171
Int. Cl.² B23B *1/00, 5/00*
U.S. Cl. 82—1 C **5 Claims**



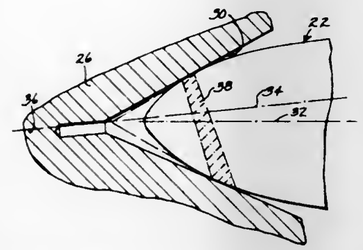
1. In a method of processing elongated workpieces of generally circular cross-sectional shape including the steps of; progressively performing on the workpieces from leading to trailing ends thereof a finishing operation with finishing tools while preventing rotation of the workpieces under torsional stress imparted thereto from the finishing operation by holding the workpieces in an unfinished area adjacent the finishing tools, releasing the hold on the unfinished area of the workpieces as the trailing ends thereof approach the finishing tools, and clamping the workpieces in a finished area adjacent the finishing tools at least prior to said step of releasing the hold on the unfinished area, the improvement comprising; smoothly reducing the torsional stress imparted to the workpieces by the finishing tools before said step of releasing the hold on the unfinished area of the workpieces and continuing to perform the finishing operation on the workpieces to the trailing ends thereof at the reduced torsional stress.

4,075,915

CENTERING APPARATUS

Lionel Williams, 14733 Winchester, Harvey, Ill. 60426

Filed Apr. 21, 1975, Ser. No. 570,190
Int. Cl.² B23B *23/02*
U.S. Cl. 82—33 R **2 Claims**



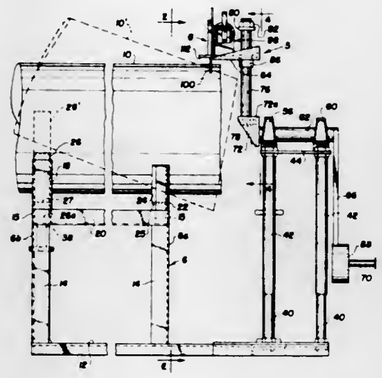
1. A centering mechanism for a rotary machine tool such as a lathe or the like, having a pair of opposed confronting stocks, a centering tool mounted in each of said stocks, at least one of said centering tools being symmetrically convex and substantially parabolically shaped to effect engagement with a recess in a work piece, said workpiece having a recess in each end thereof, in a substantially frusto-conical zone in such a way that the axis of the work piece is coincident with the axis of the stock even if the axis of the work piece recess bears an angular relation to the axis of the work piece.

4,075,916

PIPE CUT OFF SAW

Roy Jack Fisher, Dallas, Tex., assignor to Nipak, Inc., Dallas, Tex.

Filed May 21, 1976, Ser. No. 688,758
Int. Cl.² B23D *45/12*
U.S. Cl. 82—78 **8 Claims**



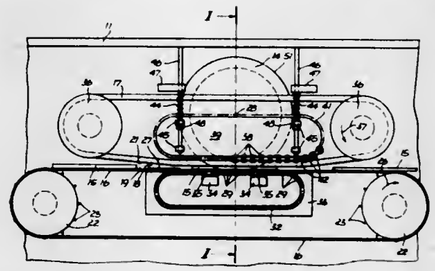
1. In a pipe cutting device: a base; spaced pipe supports mounted on the base; means to adjust the height of one of the supports to tilt a pipe carried in the supports; a saw; means for supporting the saw in a position to engage and cut a pipe disposed on the supports; means to move the saw in an arcuate plane about a pipe disposed on the support; and means to adjust the height of the saw support comprising means slidably mounting the support relative to the base; a threaded shaft having an upper end secured to the support; a sleeve attached to the base with the lower end of the shaft extending into the sleeve; and a collar threadedly engaged with the shaft resting on the upper end of the sleeve whereby when the collar is rotated the shaft is caused to move into and out of the sleeve to adjust the height of the support.

4,075,917

DEVICE FOR CUTTING A PILE OF SHEETS WITH A DISK-KNIFE

Hermann Kistner, Tamm, and Gunthart Lehmann, Heubach, Lautern, both of Germany, assignors to Maschinenbau Oppenweiler GmbH, Oppenweiler, Germany

Filed Mar. 31, 1976, Ser. No. 672,389
Claims priority, application Germany, Apr. 4, 1975, 2514836
Int. Cl.² B26D *7/06*
U.S. Cl. 83—422 **18 Claims**



1. In a device for conveying and cutting a pile of sheets, the combination of:

a frame;

at least one disk knife supported on said frame for rotation about its axis, said disk knife having two sides, one of said sides having a circumferential planar portion, said planar portion being surrounded by a circular cutting edge, at least said planar portion of said one side and said cutting edge defining a common plane extending at right angles to said axis of rotation;

a conveyor for feeding the pile of sheets to said disk knife in a conveying direction, said conveyor including first and second elongated, flexible, endless conveyor elements having clamping parts, deflecting means for supporting said conveyor elements on said frame for revolving movement along endless paths so that the clamping parts of said conveyor elements extend along each other and the circumferential surfaces of said clamping parts confront each other and define a clamping gap for the pile of sheets, said first conveyor element being located farther away from said axis of said disk knife than said second conveyor element and being formed as a first endless belt having a portion forming a counter knife and a first and a second surface said first surface confronting said clamping gap, said disk knife and said first endless belt being mutually so arranged that a part of said planar portion and cutting edge overlaps and contacts said counter knife of said first endless belt, so that said disk knife and said counter knife of said first endless belt constitute a cutting device for cutting the pile of sheets with a scissor-like cut in a cutting range of said conveyor;

a first set of rolling bodies supporting said second surface of said first belt at least in said cutting range; and

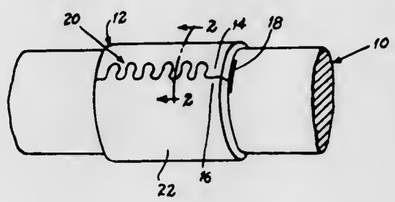
a first support structure supported on said frame and having a support surface for supporting said first set of rolling bodies.

4,075,918

ROTARY ANVIL COVER

Louis E. Sauer, St. Louis, Mo., assignor to L. E. Sauer Machine Company, St. Louis, Mo.

Continuation of Ser. No. 515,520, Oct. 17, 1974, abandoned, which is a continuation-in-part of Ser. No. 372,423, Jun. 21, 1973, abandoned. This application Apr. 1, 1976, Ser. No. 672,648
Int. Cl.² B26D *7/20*
U.S. Cl. 83—659 **25 Claims**



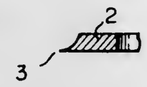
1. In a cover for a rotary anvil, a main body of resilient material having ends with complimentary lug and recess interlocking means whereby the body may be joined to form a cover for the anvil and means adjacent the interlocking means for elevating the surface of the cover at the interlocking means, to counteract the tendency of the cover thereat to yield to compressive forces applied to the anvil to a greater degree than the yielding of the rest of the cover.

4,075,919

CUTTING BLADE OF A DEVICE FOR CUTTING A YARN IN A TEXTILE MACHINE

Ikuo Komura, Toyota; Hideo Tamai, Kariya, and Takayuki Morita, Obu, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Japan

Filed Dec. 27, 1974, Ser. No. 536,751
Claims priority, application Japan, Dec. 27, 1973, 49-370
Int. Cl.² B26D *1/14*
U.S. Cl. 83—676 **6 Claims**



1. In a device for cutting a tail-end yarn portion, a cutting blade comprising:

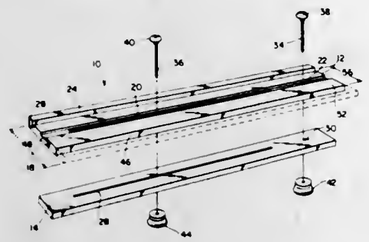
a main body formed from thin plate and having at least one sharp cutting edge formed on at least one peripheral portion of said main body, said sharp cutting edge being provided with at least one etched surface formed on one side thereof.

4,075,920

POWER SAW CUTTING GUIDE

Edwin S. Neal, 101 E. Boulevard, Charlotte, N.C. 28203

Continuation-in-part of Ser. No. 435,527, Feb. 8, 1974, Pat. No. 4,014,236. This application Aug. 16, 1976, Ser. No. 714,897
Int. Cl.² B27B *9/04, 27/06*
U.S. Cl. 83—745 **10 Claims**



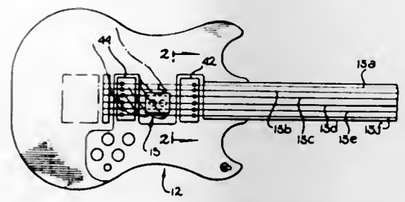
1. A sawing guide for guiding a power saw having a flat base plate during the sawing of an object comprising a guide plate assembly including an elongated guide plate for engaging the saw base plate to control the line of cut, the guide plate including a flat surface for engaging the flat base plate for said saw, an upstanding shoulder extending above said flat surface including an inner face for engaging an edge of said flat base plate to define the line of cut, said upstanding shoulder extending substantially across the major dimension of said elongated guide plate, and a cut indicating edge extending across the major dimension of said guide plate in spaced, parallel relation to the inner face of said upstanding shoulder, the guide plate at least in the area bounded by and adjacent to said cut indicating edge being formed of a non-metallic material of a type to be cut by said power saw, angle controlling means adapted to engage said object and to extend between said object and said guide plate, and mounting means to secure said guide plate to said object and to maintain said guide plate in contact with said object, said mounting means being adapted to allow pivotal movement of said guide plate relative to said object to maintain a first portion of said guide plate in contact with said object while permitting said angle controlling means to vary the distance between a second portion of said guide plate and said object.

4,075,921

STRING INSTRUMENT VIBRATION INITIATOR AND SUSTAINER

Gregory S. Heet, 611 Ducommun St., Los Angeles, Calif. 90012

Continuation of Ser. No. 595,597, July 14, 1975, abandoned. This application Dec. 2, 1976, Ser. No. 746,690
Int. Cl.² G10H *3/00*
U.S. Cl. 84—1.16 **14 Claims**



1. An apparatus for initiating or sustaining the vibration of at least one string of a musical instrument having a plurality of generally parallel, spaced apart, coplanar strings comprising:

a housing adaptable for being hand-held, said housing defining a channel;

at least one pair of coils disposed within said channel of said housing;

guide means comprising a pair of parallel guides defined by said housing and disposed on opposite edges of said channel such that when said pair of guides engage alternate strings said channel straddles at least one intermediate string; and,

amplifier means having an input coupled to one of said coils and an output coupled to the other of said coils;

whereby said intermediate string may be set in motion by said amplifier means and coils and said motion is sustained by said amplifier means and coils.

4,075,922

DECORATIVE PERCUSSION RHYTHM INSTRUMENT AND NOISEMAKER

Thomas R. Smith, 27 Brushy Hill Road, Newtown, Conn. 06470

Filed Dec. 15, 1975, Ser. No. 640,957
Int. Cl.² G10D *13/08*
U.S. Cl. 84—402 **7 Claims**



1. A sound-producing clapper assembly capable of producing a soft pattering sound and an alternative, louder, rattling drum-roll noise comprising:

A. at least one elongated drum blade formed of relatively stiff, flat material;

B. at least one flexible elongated cover blade formed of flat material thinner than that of the drum blade and having a reduced thickness bendable transverse region at an intermediate point along its length;

C. and at least one flexible elongated clapper blade formed of flat material thinner than that of the cover blade; and sandwiched between the cover blade and the drum blade;

D. with all of the elongated blades being firmly joined together at one handle end by at least one through-fastener, permitting the clapper assembly to be held in one hand by a user near the fastener and moved in a flapping motion, producing repeated successive impacts of the blades on each other,

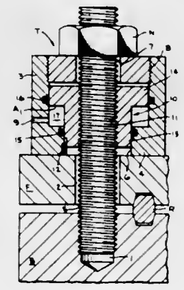
whereby gentle flapping motion patters the clapper blade softly against the drum blade, while vigorous flapping motion clatters the clapper blade briskly against both the drum blade and the cover blade in a continuous drum-roll rattle.

4,075,923

FASTENER TENSIONING APPARATUS

Raymond E. Latham, 231 Tamerlaine, Houston, Tex. 77024

Filed Jun. 17, 1976, Ser. No. 696,877
Int. Cl.² F16B *35/00*
U.S. Cl. 85—1 T **8 Claims**



1. Apparatus for placing tension on a standard bolt or stud fastener device having a threaded shaft and a standard cooperating nut member for holding the shaft in tension while fastening two or more objects together, said apparatus comprising:

housing means for surrounding said fastener shaft in a fixed relationship thereto and against which said cooperating fastener nut member may bear, said housing means having end openings therein through one of which said shaft may extend for engagement by said fastener nut member externally of said housing means;

piston means disposed within and sealingly engaging said housing means and axially movable therein between a first position and an axially spaced second position, said piston means being centrally bored and threaded from one end to the other for removable and axially adjustable attachment to said threaded shaft, leaving the end of said shaft exposed externally of said housing means for said engagement by said nut member;

annular chamber means defined by said housing and piston means; and

port means communicating with said chamber means through which pressure may be applied to said piston means for movement thereof between said first and second positions to place said fastener shaft in tension.

4,075,924

ANCHOR ASSEMBLY FOR FASTENER

Thomas W. McSherry, Bay Shore, and Allan Thaw, Massapequa, both of N.Y., assignors to Mechanical Plastics Corporation, Farmingdale, N.Y.

Filed May 14, 1976, Ser. No. 686,323
Int. Cl.² F16B *21/00, 13/06*
U.S. Cl. 85—3 R **30 Claims**

1. An anchor assembly for retaining an elongated fastener member within an opening defined by a wall portion having at least one concealed side which comprises:

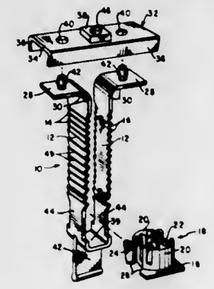
a. at least two elongated leg members of flexible material positioned in generally parallel relation;

b. means connecting a pair of adjacent end portions of said leg members;

c. a generally elongated anchor member positioned transversely of the leg members at the opposite end portions thereof and defining an opening generally medial of the leg members capable of receiving an elongated fastener member positioned between the leg members for attachment to the anchor member;

d. means to connect an end portion of each leg member to said anchor member, at least said end portion thereby connected being generally transversely oriented relative to said leg members and at least portions of said leg members adjacent said connected portions being resilient and angularly oriented relative to the major portion of the associated leg member to bias said anchor member toward its transverse position relative to said leg members against forces which tend to rotate said anchor member toward a generally parallel orientation with said leg members, and control of the orientation and position of said anchor member behind a concealed wall portion is facilitated by said leg members; and

e. a collar member of a resilient material configured to be at least partially received within the wall portion opening



and having at least one flange member extending outwardly therefrom in a direction generally transverse of its axis, and defining at least two openings for reception of said leg members and having means correspondingly positioned, configured, and dimensioned to engageably mate with said leg members to restrict movement of said collar member relative to said leg members when said leg members are positioned within said openings to facilitate selective positioning of said collar member along said leg members and to selectively permit gripping of wall portions of several thickness between said anchor member and said collar member while said flange member engages at least a surface portion of said wall portion adjacent the wall portion opening to prevent said collar member from entering the wall portion opening, said collar member defining at least one opening substantially aligned with said anchor member opening for reception of an elongated fastener member positioned between said leg members.

4,075,925

SPRING ACTION EXPANSION BOLT

Lester Lerich, Broomfield, Colo., assignor to Wej-It Expansion Products, Inc., Broomfield, Colo.

Division of Ser. No. 422,537, Jan. 2, 1974, Pat. No. 3,967,525. This application Jun. 30, 1976, Ser. No. 701,414
Int. Cl.² F16B *13/08*
U.S. Cl. 85—64 **1 Claim**

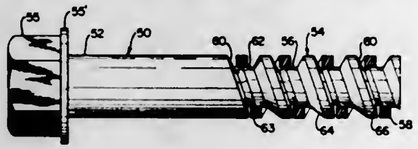
1. A masonry expansion bolt adapted to be anchored within a bolt hole comprising:

an elongated shank portion of generally circular cross-section having a diameter equal to or slightly less than that of the bolt hole,

a wedging section extending at least along a portion of said shank including a plurality of peripheral ridges in longitudinally spaced relation to each other, the space between adjacent of said ridges being in the form of an annular channel of generally trapezoidal cross-section with an inner surface parallel to and concentric with the longitudi-

nal axis of said bolt, a forward side inclined radially outward at an obtuse angle to said inner surface, and a rearward side also inclined radially outward at an obtuse angle to said inner surface, said channel also having an annular groove of generally V-shaped cross-section recessed into its inner surface at its rearward side, the rearward side of said V-shaped groove being an extension of the rearward side of said channel inclined radially inwardly in the same plane as said rearward side of said channel, and the forward side of said V-shaped groove diverging away from the rearward side at a right angle thereto, and

resilient wedging means in the form of an annular wire ring of substantially square cross-section normally disposed in said channel forwardly of said groove with one of its flat sides positioned adjacent and parallel to the inner surface of said channel, the crosssectional dimension of said wire between opposite of its flat sides being greater than the depth of said channel, said wire ring also being slidable longitudinally rearwardly in said channel in response to urging in that direction of force applied to its outer periph-



ery and rotatable about its annular longitudinal axis in response to limiting resistance to said rearward sliding movement on its inner rearward edge by said inclined rearward side of said channel such that said inner rearward edge is rotatable into and retained by said V-shaped groove in a position with its outer forward edge rotated to protrude radially outward beyond the peripheral surface of said bolt into engagement with the walls of said hole with said one flat side of said wire ring bearing against said forward side of said V-shaped groove to restrain said bolt from longitudinal retraction from said hole, the diagonal dimension of said substantially square cross-section being greater than the combined depths of said channel said v-shaped groove by an amount which is more than the difference between said dimension between the opposite flat sides and the depth of the channel, said wedging section being in the form of a threaded section in which said channel extends spirally therealong, and said wedging means is defined by a number of turns of a coiled spring wire extending along said channel.

4,075,926

GUN BARREL

Kjell Viktor Eriksson, and Ivan Åslund, both of Karlskoga, Sweden, assignors to AB Bofors, Bofors, Sweden

Filed May 12, 1976, Ser. No. 685,574
Claims priority, application Sweden, May 30, 1975, 7506177
Int. Cl.² F41F *17/08*
U.S. Cl. 89—16 **4 Claims**

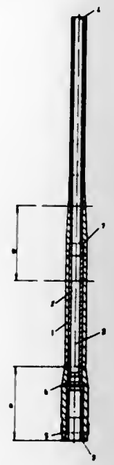
1. An improved gun barrel comprising:

an outer tube dimensioned to withstand internal gas pressure of the magnitude encountered during firing of a gun embodying said barrel for a small number of rounds without rupture;

an inner liner located within said outer tube and so dimensioned to withstand said gas pressure for a large number of rounds that a crack may extend completely through said inner liner to its boundary with said outer tube before the rejection limit for said barrel is reached; and

means cooperating with said outer tube and said inner liner for providing an indication of the presence of a crack extending through said inner liner to said boundary,

said indicating means comprising at least one conductor between said outer tube and said inner liner in position to be broken or deformed by movement of said inner liner or said outer tube or both of them under the influence of powder gas pressure coming through a crack in said inner



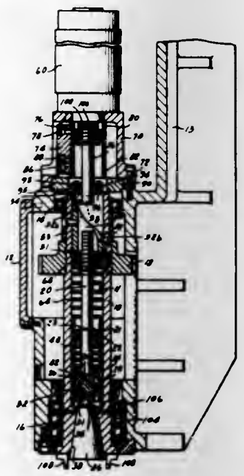
liner, whereby changes in the electrical characteristics of said conductor provide an indication of the presence of a crack through said inner liner.

4,075,927

TOOL ORIENTING AND RELEASE MECHANISM FOR MACHINE TOOL

James L. Frazier, Los Alamitos, Calif., assignor to Houdaille Industries, Inc., Fort Lauderdale, Fla.

Filed Nov. 6, 1975, Ser. No. 629,217
Int. Cl.² B23Q *17/18*; B23C *1/00*
U.S. Cl. 90—11 D **23 Claims**



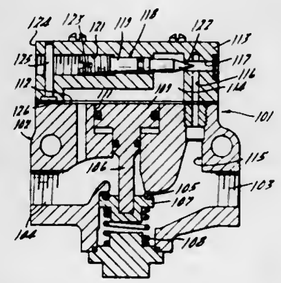
1. In a machine tool having a tool-supporting spindle, the combination comprising a draw bar supported by said spindle and adapted for longitudinal movement relative thereto between a tool retaining position and a tool release position, a plurality of tool retention fingers connected with the lower end of said draw bar adapted to assume a tool gripping position when said draw bar is in its tool retaining position and a tool release position when said draw bar is in its tool release position, a cam secured to said spindle, a cam driver member mounted on an actuating shaft adapted for longitudinal movement relative to said spindle, means for movng said actuating shaft so that said cam driver member is moved into engagement with said cam and then said actuating shaft is moved into engagement with said draw bar, whereby said cam and said spindle are rotated to a predetermined angular orientation, said draw bar being moved by said actuating shaft as said cam driver member moves beyond the point at which it engages said cam, whereby said draw bar is moved to its tool release position.

4,075,928

SAFETY VALVE FOR FLUID SYSTEMS

Paul A. Bitonti, Troy, Mich., assignor to Ross Operating Valve Company, Detroit, Mich.

Filed May 31, 1974, Ser. No. 474,901
Int. Cl.² F15B *13/04*
U.S. Cl. 91—29 **5 Claims**



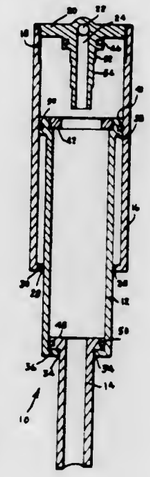
1. In combination with a reciprocable motor, a compressed air supply line for said reciprocable motor, said line having a supply valve for selectively pressurizing and exhausting said line and a control valve for said motor fed by said line through said supply valve, a safety valve interposed between said supply and control valves, said safety valve having a housing, supply and outlet ports in said housing, a radial valve seat in said housing, a valve stem carrying a poppet valve member engageable with said seat, said supply port being connected to said seat so as to urge said poppet valve member against the seat, a spring urging said member against the seat, a piston carried by said stem movable in a piston chamber in said housing leading to one face of said housing, a portion of said piston chamber being formed by a cover mounted on said housing face, means separating the other side of said piston from said supply and outlet ports, a first passage in said housing leading from said supply port to the portion of said piston chamber formed by said cover, an unrestricted second passage in said housing leading from said portion of the piston chamber to said outlet port, and means for adjustably restricting said first passage, said means comprising a member manually movable with respect to said passage and accessible by an operator from the outside of said housing in the vicinity of said housing face and cover, said adjustable restriction member further comprising a needle valve rotatably mounted in said cover passing through said piston chambers portion and disposed within a portion of said first passage, whereby rotation of said needle valve will adjust restriction, the relative dimensions of said piston and spring being such that said piston will shift said valve member against the urging of said spring to its open position when a predetermined proportion of said full line pressure has been reached.

4,075,929

THREE STAGE THRUSTING DEVICE

Paul F. Peterson, Rancho Palos Verdes, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 28, 1976, Ser. No. 653,055
Int. Cl.² F01B *15/00*; F15B *11/18, 15/22*
U.S. Cl. 91—168 **4 Claims**



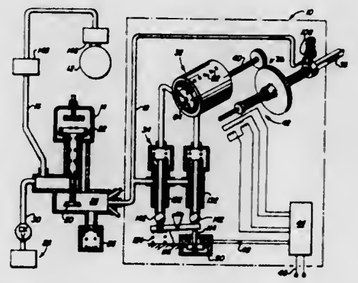
1. A three stage thrusting device comprising: a housing; first and second driving means telescopally mounted within the housing and adapted to extend from one end thereof, said first driving means positioned within said second driving means; means for sealing one end of the housing; probe means attached to the sealing means and extending into the first first driving means wherein said probe means is tapered and adapted to mate in a sealed relationship with a collar portion of said first driving means; port means in the end seal means and extending through the probe means for allowing fluid forces to act upon the said first and second means.

4,075,930

PNEUMATIC ACTUATOR SYSTEM AND METHOD

Dennis A. Millett, Tempe, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Apr. 28, 1976, Ser. No. 681,004
Int. Cl.² F16B *13/16, 13/044*; B64C *13/36*
U.S. Cl. 91—361 **12 Claims**



1. In combination:

a generally elongated housing having a pair of separate, internal, elongated chambers therewithin;

a linearly shiftable mechanical output member mounted for reciprocation within one of said chambers;

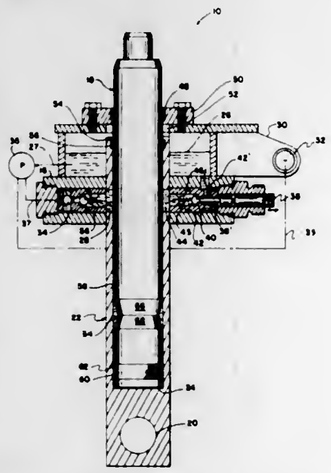
a rotary, bi-directional, pneumatic vane motor operably disposed in the other said chambers;
a power output shaft operably coupled to said motor and mounted for rotation within said housing, said output shaft extending substantially parallel to said linear member;
gearing means operably extending transversely across said housing between said output shaft and said output member for effecting linear shifting of said member in response to rotation of said output shaft, said output shaft being rotatable in opposite directions to effect corresponding opposite shifting of said output member;
elongated sensing means disposed in said one chamber for sensing the linear position of said output member;
a source of pressurized gas;
conduit means for communicating said source with said motor to effect rotation thereof; and
directional flow control means operably disposed in said conduit means and operably associated with said sensing means for controlling motor operation in relation to said sensed position of the output member.

4,075,931

LIFT-JACK FLUID MOTOR FOR HYDRAULIC LIFT TRUCKS

Melvin R. Caldwell, R.F.D. No. 1, Millersville, Pa. 17551

Continuation-in-part of Ser. No. 620,865, Oct. 9, 1975, abandoned. This application Feb. 24, 1977, Ser. No. 771,771
Int. Cl.² F15B *15/22, 13/042*
U.S. Cl. 91—402 **3 Claims**



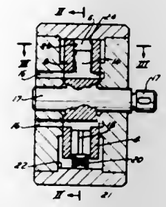
1. In an expanding chamber fluid motor for load lifting in hydraulic lift trucks and the like, including: a cylinder having upper and lower ends, the upper end of the cylinder open, means closing the lower end of the cylinder, means for attaching the cylinder for load pickup, a piston in and supported by the cylinder in openly spaced relation with the interior of the cylinder, the piston extending upwardly from the cylinder in position for said load lifting, a gasket proximate the upper end of the cylinder sealing the space between the cylinder and the piston, means for forcing fluid into said space between the cylinder and the piston and thereby causing piston travel extending the piston further from the cylinder; and means for limiting piston travel by releasing said forced fluid between said gasket and piston at a predetermined location in the travel of the piston including the piston having structure defining an annular recess around the periphery of the piston with a portion of the annular recess tapering inward downwardly, the improvement comprising, the annular recess proportioned for and located along the piston in position for releasing said forced fluid in a 360° arc above said gasket and over the periphery of the upper end of the cylinder, the length of the annular recess in an axial direction relative to the piston and cylinder being greater than that of said gasket, and a portion of the piston remaining below the gasket and supported by the cylinder at said position for releasing the forced fluid.

4,075,932

ROTOR, PISTONS, PISTON SHOES AND ASSOCIATED MEANS IN FLUID HANDLING DEVICES

Karl Eickmann, 2420 Isshiki,, Hayama, Kanagawa, Japan

Continuation of Ser. No. 321,854, Jan. 8, 1973, Pat. No. 3,967,540. This application Mar. 11, 1976, Ser. No. 666,003
Claims priority, application Austria, Jan. 7, 1972, 2138/72
Int. Cl.² F01B *13/06*
U.S. Cl. 91—488 **7 Claims**



1. In a fluid-handling machine of the type having a housing formed with a cavity having an inner circumference, a rotor body rotatably mounted in said cavity and having an outer periphery and a plurality of radial cylinder bores extending inwardly thereof, and a plurality of pistons each slidably accommodated in one of said cylinder bores, a plurality of recesses formed in said outer periphery of said rotor body, each intersecting the outer end of one of said cylinder bores and extending from the associated cylinder bore in one circumferential direction of said rotor body; a plurality of piston shoes each located adjacent the outer end of one of said cylinder bores and pivotably connected to the piston accommodated therein, said piston shoes each having an outwardly directed face in sliding engagement with said inner circumference and an extension projecting transversely of and beyond the associated cylinder bore in said one circumferential direction of said rotor body, said cylinder bores, recesses and piston shoes being configurated so that in the fully retracted position of the respective piston shoe the same is located substantially entirely within the associated recess and outer end of the associated cylinder bore without projecting beyond the outer periphery of said rotor body, the improvement comprising that said recesses extend in said rotor body only in direction forwardly of the axis of a respective piston, whereas the backward clyinder wall portion extends uninterrupted radially toward the outer radial end of said rotor body for guiding the respective portions of the respective pistons at the outer portion of the piston stroke.

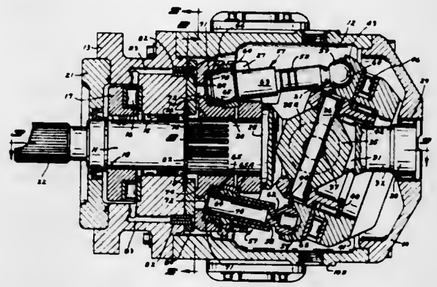
4,075,933

HYDRAULIC PUMP OR MOTOR

William T. Stephens, New Brighton, Minn., assignor to Gresen Manufacturing Company, Minneapolis, Minn.

Filed Jun. 4, 1976, Ser. No. 693,017
Int. Cl.² F01B *13/04*
U.S. Cl. 91—506 **15 Claims**

1. A hydraulic pump or motor, comprising:
(a) a housing defining a fluid inlet and a fluid outlet;
(b) a shaft rotatably carried by the housing;
(c) reciprocating piston-cylinder pumping means;
(d) actuating means associated with the rotatable shaft for reciprocating the pumping means as the shaft rotates;
(e) valving means for alternately connecting the pumping means with the inlet and outlet as it reciprocates;
(f) and carrying means defining a socket for pivotally carrying a part of the pumping means relative to the valving means;
(g) the pumping means comprising
(i) a cylinder member defining a cylindrical bore of constant diameter and open at both ends, the exterior surface of the cylinder member defining a partial spherical surface disposed in and carried by said socket;
(ii) and a piston member reciprocally disposed in the cylinder, the piston member being operatively connected to the actuating means.

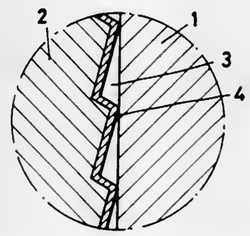


4,075,934

PISTON FOR INTERNAL COMBUSTION ENGINES

Erich Wacker, Heilbronn; Heinz Hofmann, Obereisesheim; Karl Kopp, Untereisesheim; Hermann Bauer, Neckarsulm; Volker von Ey, Neckarsulm, and Franz Weiss, Neckarsulm, all of Germany, assignors to Karl Schmidt GmbH, Neckarsulm, Germany

Filed Dec. 29, 1975, Ser. No. 645,129
Int. Cl.² F16J *1/02, 1/08*
U.S. Cl. 92—159 **5 Claims**



1. In combination: a piston having a piston skirt and an aluminum cylinder having a nonreinforced working surface for use in an internal combustion engine, said piston skirt having a profile in the form of vertically running saw teeth to define oil-dragging grooves on the periphery of said piston skirt, the saw tooth profile including a first side and a second side joined to one another to define a protruding tooth, said piston skirt having thereon an electrodeposited hard iron layer defining a saw tooth profile, said iron layer having a thickness of 1–30 μm and containing 0.5–6% by weight of a metal-oxy compound incorporated therein.

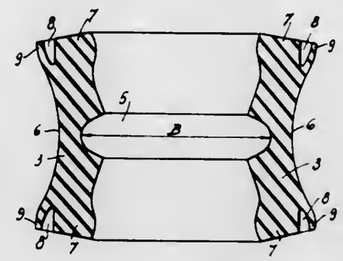
4,075,935

PISTON FOR PRESSURE FLUID OPERATED CYLINDERS

Pier Luigi Panigati, Via Friuli, 64, Milan, Italy (20135)

Continuation-in-part of Ser. No. 345,032, Mar. 26, 1973, abandoned. This application May 19, 1975, Ser. No. 578,565
Claims priority, application Italy, Mar. 30, 1972, 22626/72
Int. Cl.² F16J *1/02, 1/12*
U.S. Cl. 92—243 **2 Claims**

1. A piston for pressure fluid cylinders which comprises, a piston rod, a disc member fixed thereon and a sleeve-like body of elastic material open at both ends thereof and mounted on said disc member to overhang from both sides thereof and defining the piston head, said sleeve-like body having a central zone with an inner and outer peripheral surface, a circumferential notch on the inner periphery of said central zone for receiving the peripheral portion of said disc member, said inner peripheral surface of said central zone and said circumferential notch having, in disassembled condition thereof, a diameter effectively smaller than the diameter of said disc member, said sleeve-like body having at each end portion thereof a circumferential bead-like formation and a frontal end surface extending transverse to said piston rod, a circumferential longitudinally extending slot in said frontal surface, a flexible peripheral lip in said bead formation, the thickness and length of said flexible peripheral lip being defined by said slot, the difference between the size of the diameter of said circumferential notch in disassembled condition and the size of the diameter of said disc causing upon the mounting of said sleeve-like body on said disc member a pretensioning and a deformation of said sleeve member such that said flexible lip has in mounted condition of said piston head an external peripheral end portion having a circumferential outer diameter smaller than the circumferential outer diameter of the corresponding bead formation and wherein said outer peripheral surface is outwardly concave and defines together with said bead formations a saddle-like configuration of the outer peripheral surface of said piston head, thereby allowing an offset positioning of said sleeve-like body with respect to said cylinder without detachment thereof from the cylinder inner wall at the side opposite to the side towards which the offsetting occurs.

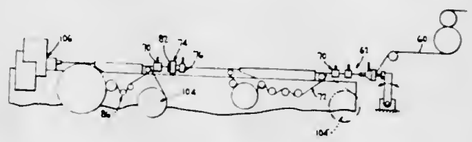


4,075,936

METHOD AND APPARATUS FOR MAKING TOBACCO SMOKE FILTER

Richard M. Berger, Richmond, Va., assignor to American Filtrona Corporation, Richmond, Va.

Division of Ser. No. 627,858, Oct. 31, 1975, Pat. No. 4,022,221. This application Dec. 6, 1976, Ser. No. 747,603
Int. Cl.² A24C *5/50*
U.S. Cl. 93—1 C **15 Claims**



1. A method of making smoke filter means comprising the steps of:
a. providing a bondable filtering material including a multiplicity of fibrous members;
b. continuously passing said filtering material into and through an elongated bonding zone and, intermediate the passage of said filtering material through said bonding zone, contacting same with a bond activating agent to bond said fibrous members of said filtering material to

each other at spaced contact points thereby forming an elongated, smoke-permeable, rod defining a tortuous path for passage of smoke therethrough;

c. during the passage of said filtering material through said bonding zone, positioning a mandrel generally axially of said bonding zone to define an annular space through which said filtering material must pass;

d. reciprocating said mandrel in timed relationship to the passage of said filtering material through said bonding zone between a first position, at least as far forward in the path of travel of said filtering material as the point at which said filtering material is contacted by said bond activating agent, to thereby produce a smoke-permeable annular wall of bonded fibrous members as said filtering material passes said point, and a second position, sufficiently rearwardly of said point in the path of travel of said material to permit a portion of said filtering material to extend tranversely completely across said bonding zone before reaching said point, to thereby produce a smoke-permeable plug section of bonded fibrous members as said filtering material passes said point, said annular wall and said plug sections being integral with each other, whereby said rod is provided with intermittent inner cavity means totally enclosed and surrounded by said annular wall and by plug sections forwardly and rearwardly thereof;

e. covering said rod with a smoke-permeable plug wrap;

f. forming outer cavity means on the exterior surface of said rod, said outer cavity means being axially spaced from each other at least a position on either side of a transverse axis intermediate each inner cavity means, the area of said outer cavity means forming a minor portion of the total exterior surface of said rod;

g. overwrapping said rod with an overwrapping material so as to juxtapose portions of the inner surface of said overwrapping material with peripheral portions of the exterior surface of said rod to form sealed areas precluding passage of smoke thereacross; and

h. transversely severing said overwrapped rod at selected locations to form filter elements.

4,075,937

METHOD AND APPARATUS FOR FEEDING ROD-LIKE ARTICLES

Rolf Penzias, London, England, assignor to Molins Limited, England

Filed Mar. 18, 1976, Ser. No. 668,303

Claims priority, application United Kingdom, Mar. 25, 1975, 12351/75

Int. Cl.² A24C 5/50

U.S. Cl. 93—77 FT 14 Claims



1. A method of feeding rod-like articles in succession, comprising the steps of conveying groups of endwise-moving rod-like articles along part of a first path at substantially constant speed by means of a feed member which follows said path at said constant speed, delivering said groups onto a second path which diverges from the first path, and continuing to convey said groups with said feed member along an initial part of said second path so that the groups are conveyed by the feed member traveling along said first path at a progressively reducing component of said constant speed in the direction of said second path as the first and second paths diverge.

4,075,938

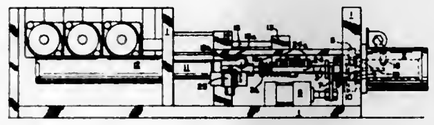
METHOD AND APPARATUS FOR MAKING END CLOSURES FOR SHIRRED CASING STICKS

Thomas W. Martinek, Covington, Ind., assignor to Teepak, Inc., Chicago, Ill.

Filed May 27, 1976, Ser. No. 690,745

Int. Cl.² A22C 13/00

U.S. Cl. 9.3—84 TW 22 Claims



21. A method of forming an end closure in a hollow shirred casing stick comprising, in sequence, the steps of:

1. deshirring casing material from one end of the casing stick;
2. winding the deshirred material into a wall portion generally transverse to the bore of said casing stick; and
3. advancing said wall portion into the bore of said casing stick while winding a generally cylindrically twisted portion following said wall portion, said cylindrically twisted portion being composed of casing material deshirred from said one end of said casing stick and wound on a rotating, axially translating mandrel.

4,075,939

LIQUID FEEDING DEVICE FOR COOKING CONTAINERS

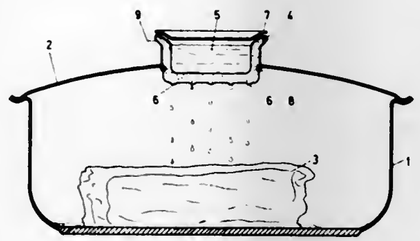
Walter Horn, Idar-Oberstein, and Rudolf Fissler, Kirschweiler, both of Germany, assignors to Fissler Gesellschaft mit beschrankter Haftung, Idar-Oberstein, Germany

Filed Mar. 28, 1974, Ser. No. 455,878

Claims priority, application Germany, Mar. 31, 1973, 7312332[U]

Int. Cl.² A47J 27/52

U.S. Cl. 99—345 5 Claims



1. A liquid feeding device for a cooking container having an upper wall, said feeding device comprising a liquid reservoir, means supporting said reservoir on the upper wall of the cooking container with at least a portion of said reservoir being disposed within the cooking container so that liquid placed within said reservoir can be transferred to interior of the cooking container for replacing liquids evaporated during cooking, said reservoir portion includes porous, liquid permeable means for permitting the liquid within said reservoir to be gradually fed to the interior of the cooking container, said porous means being a ceramic material, said reservoir having side and bottom walls completely formed of porous, liquid permeable ceramic material, and a liquid impervious coating disposed on the side walls of said reservoir, whereby water is only permitted to be fed through said bottom wall.

4,075,940

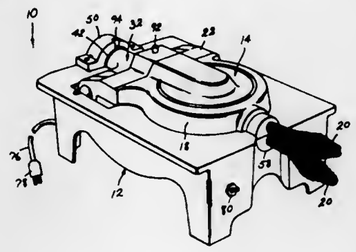
BAKER FOR WAFFLES, PANCAKES AND SIMILAR FOOD ITEMS

Fred S. Carbon, 105 Days Ave., Buchanan, Mich. 49107

Filed Feb. 1, 1977, Ser. No. 764,766

Int. Cl.² A47J 37/00

U.S. Cl. 99—377 11 Claims



9. A baker for waffles, pancakes and similar food items, said baker including first and second shell members each having a hinge part and a concave food receiving part, said shell members having their respective hinge parts in a cooperating relationship and being pivotal about a first axis between a closed position in which said food receiving parts confront one another to form an enclosed baking cavity and an open position in which the shell members are separated at the food receiving parts thereof, a base, said base including means for supporting said shell members for rotation as a unit about a second axis when in their closed position, at least one of said shell members including handle means for rotating said shell members in their closed position about said second axis, the improvement wherein each shell member hinge part includes a pintle and a spaced eye, the hinge part pintel of each shell member fitting rotatively into the hinge part eye of the other shell member to accommodate movement of the shell members between their open and closed positions, and bracket means engaging said hinge parts for supporting said shell members and accommodating pivotal movement of the shell members between said open and closed positions, said bracket means including a shaft part, said base carrying said shaft part at its said shell member supporting means, said shaft part being rotatable with the shell members as the shell members are rotated about said second axis of rotation.

4,075,941

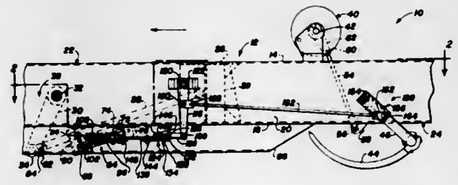
LINKAGE FOR CONTROLLING A NEEDLE SAFETY LATCH ON A BALER

Robert G. Young, Bird-in-Hand, and Richard A. Pucher, Leola, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Aug. 30, 1976, Ser. No. 718,644

Int. Cl.² B65B 13/08

U.S. Cl. 100—19 R 4 Claims



1. In a baler having a bale case, a plunger reciprocable in said bale case on working and return strokes, one or more needles for carrying banding material across said bale case, first pivot means on said bale case, a needle-carrying member being coupled through said first pivot means for movement from a home position towards said bale case and then away from said bale case back to said home position so as to correspondingly project said needles from a location outside said bale case to across said bale case and then withdraw said needles from said bale case back to said outside location, means reciprocating said plunger in timed relation with the movement of said needle-carrying member such that said needles are first projected and then withdrawn from across said bale case between predetermined successive working strokes of said plunger, a safety latch mechanism supported on said baler, means biasing said latch mechanism for movement from a retracted position to an extended position for stopping the reciprocation of said plunger if the timing between said plunger and said needle-carrying member is disrupted and said plunger moves on a working stroke when said needles are projected across said bale case, second pivot means on said bale case, a lever arm coupled to said second pivot means for a pivotable movement about the same and being pivotally interconnected to said latch mechanism, an improved linkage for controlling said latch mechanism, comprising:

an elongated rigid member extending along said bale case and being pivotally interconnected at one end to said lever arm; and

a link pivotally coupled adjacent one of its ends to said first pivot means for said needle-carrying member, said link being pivotally coupled adjacent an opposite one of its ends to an opposite end of said elongated member, said link including a portion disposed in the path of movement of said needle-carrying member such that said needle-carrying member holds said link at a first position when said needle-carrying member is at its home position which via said elongated member and said lever arm holds said latch mechanism at said retracted position, said needle-carrying member releasing said link from said first position upon movement of said needle-carrying member away from its home position toward said bale case to allow said link to pivot to a second position as said biasing means moves said latch mechanism to its extended position upon said release of said link.

4,075,942

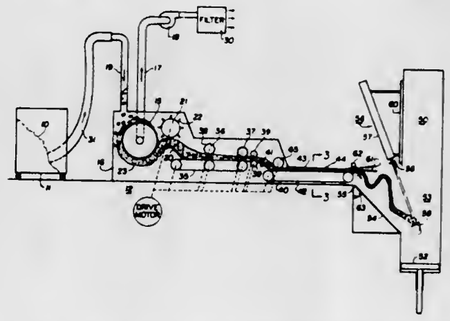
METHOD AND APPARATUS FOR FEEDING A BALE PRESS

Joe Johnson, Jr., Powder Springs, Ga., assignor to Coats & Clark, Inc., Stamford, Conn.

Filed Dec. 13, 1976, Ser. No. 749,815

Int. Cl.² B30B 7/04

U.S. Cl. 100—42 17 Claims



15. A process for baling fibrous materials while minimizing the discharge of dust into the atmosphere, comprising sucking said fibrous materials into a condenser while filtering the air output of the condenser, to produce a fluffy blanket of said fibrous materials, mechanically continually precompressing said fluffy blanket by passing it sequentially through packing roll means of decreasing density, directing said precompressed blanket continually to a bale press, having a loading door periodically ramming said blanket into said bale press in response to the presence of said blanket at the loading door of

said bale press, and then closing the door of said bale press and forming a bale of said material therein.

4,075,943

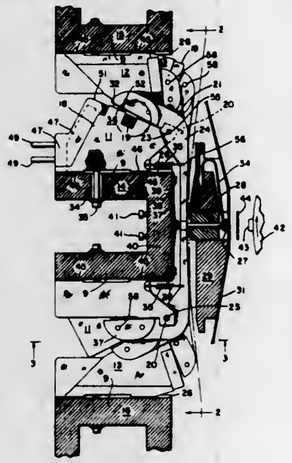
HIGH SPEED ACTUATOR FOR IMPACT LINE PRINTERS

Ross W. Johnston, Norristown, Pa., assignor to Sperry Rand Corporation, New York, N.Y.

Continuation of Ser. No. 449,866, March 11, 1974, abandoned. This application Oct. 21, 1975, Ser. No. 624,501

Int. Cl.[2] B41J *9/02*

U.S. Cl. 101—93.48 **3 Claims**



1. A high speed impact printing mechanism having high energy actuators for driving print hammers which are positioned opposite moving type from a ready position to a free flight position comprising:

a channel mounting means having vertical and horizontal mounting webs,

each said actuator having an actuator frame made of high flux density magnetic material mounted on a horizontal web of said channel mounting means,

each said actuator frame comprising a pivot mounting arm extension and a pole piece extension integral with said actuator frame and a flux path portion therebetween,

a magnetic coil winding wound on said pole piece extension of said actuator frame,

a low mass actuating lever comprising a moment arm and a force arm pivotally mounted on said pivot mounting arm extension of said actuator frame,

said moment arm being juxtaposed said pole piece extension and separated therefrom by an angular gap when said actuator and print hammer are in said ready position,

said force arm being angularly disposed from said horizontal web of said channel mounting means by approximately 90° and positioned opposite said vertical web of said channel mounting means in engagement with one of said print hammers,

said actuating lever being made of high flux density high strength magnetic material,

a plate of high flux density magnetic material attached to the end of said moment arm juxtaposed said pole piece extension and said flux path portion providing therewith a high flux density path through said actuating lever moment arm, said plate, said pole piece extension, said actuator frame and said flux path portion.

first adjustment screw means extending through an aperture larger than said first adjustment screw means in said horizontal web of said channel mounting means and engaged in said actuator frame for locking said frame on said channel mounting means in a predetermined horizontal position when said moment arm is closed flat against the face of said pole piece extension and said flux path portion with no angular gap to define said free flight position and with a predetermined angular gap to initially set said ready position of said actuator and said print hammer, and

second adjustment screw means in said vertical web cooperating with said force arm for making a final critical adjustment of the time of impact of said print hammer with said moving type by adjusting the size of said angular gap and finally setting said ready position of said actuating lever and said print hammer.

4,075,944

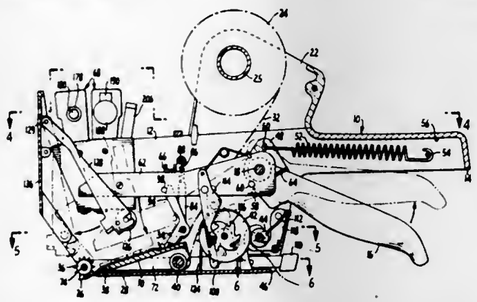
SELF-INDEXING LABEL MARKING GUN

Dwain D. Conley, Reno, Nev., assignor to Primark Corporation, Palo Alto, Calif.

Filed Apr. 30, 1976, Ser. No. 682,024

Int. Cl.[2] B41J *1/20*; B41F *1/08*

U.S. Cl. 101—94 **3 Claims**



1. An improved adhesive label printer of the type which operates in combination with pre-cut adhesive labels carried on a separable backing tape with regularly spaced apart perforations, the printer having trigger operated tape transport means for transporting the backing tape and labels through the printer and for sequentially separating the labels from the backing tape, the tape transport means having non-trigger operated portions which exert a retarding frictional force against the movement of the backing tape through the printer, and a printing head with a plurality of selectable characters for imprinting the labels, wherein the improvement comprises

a drive drum, the drive drum being rotatably mounted in the printer to contact the backing tape, and having a plurality of circumferentially spaced apart, radial projections for mating with the spaced apart perforations in the backing tape, the drive drum being selectively rotatable by the trigger operated means,

spring loaded pressure roller means mechanically interengaged to rotate with the drive drum and to resiliently press the backing tape against the drive drum, the roller means and drive drum together initially exerting a frictional pulling force on the label backing tape which is less than the retarding frictional force exerted by the tape transport means on the backing tape and labels which must be overcome to pull the backing tape and labels through the printer, whereby self-indexing is accomplished when the initial rotation of the drive drum and pressure roller means causes the backing tape to slip over the drive drum projections until the projections of the drive drum mate with the spaced apart perforations in the backing tape upon initial operation of the trigger operated tape transport means.

4,075,945

PRINT MEDIUM AND ASSEMBLY

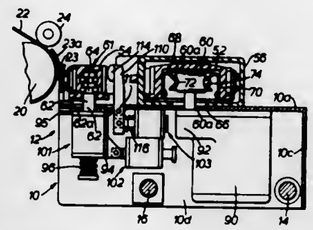
Siegfried Heinz Bienholz, 43 Blamey St., East Bentleigh, Victoria, Australia

Filed Nov. 10, 1975, Ser. No. 630,647

Claims priority, application Australia, Nov. 12, 1974, 9585/74

Int. Cl.[2] B41J *1/20*

U.S. Cl. 101—111 **11 Claims**



1. A printing apparatus employing a printing assembly comprising:

a pair of spaced upright shafts, a structure supporting said shafts, one shaft being fixed relative to the structure while the other is laterally displaceable relative to said one shaft in a direction substantially perpendicular to the axes of the shafts;

a wheel supported on said other shaft and being freely rotatable on said other shaft;

means for effecting lateral displacement of said other shaft in a direction away from said one shaft to a predetermined position relative to said one shaft;

a second wheel mounted on said one shaft for rotation therewith; and

a continuous flexible band looped under tension around said wheels and carrying a multiplicity of indicia discretely arranged on the band whereby a discrete representation of the respective indicia can be transposed to a further medium, said band being resiliently extensible to increase the separation of the indicia;

an upright striker arm for engaging said wheel when the latter is in said predetermined position to thereby displace said wheel a further small distance away from said one shaft;

means for biasing the striker arm away from said wheel; and

means for momentarily effecting said wheel displacing movement of the striker arm.

4,075,946

ARMOR PIERCING PROJECTILE

Jean Deffayet, and Etienne Lamarque, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 27, 1977, Ser. No. 763,205

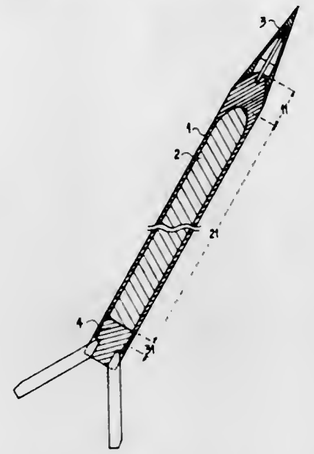
Claims priority, application France, Jan. 30, 1976, 76 02590

Int. Cl.[2] F42B *11/14*

U.S. Cl. 102—52 **8 Claims**

1. An armor-piercing projectile comprising an outer steel envelope having three portions: a conically tapering forward portion which defines a solid impact head having a leading edge contour suitable for piercing armor on impact as well as providing means for attaching an overlying nose cone thereto, a substantially cylindrical medial portion contiguous with said forward portion having a hollow area running its entire extent, said hollow area being filled with a ballast having a density greater than the density of said steel envelope,

and a cylindrical trailing portion contiguous with said medial portion, but remote from said forward portion provided with means to retain said ballast in said medial portion, and further provided with means for attaching stabilizing fins thereto.



4,075,947

AIR TIGHT CONNECTION BETWEEN PNEUMATICALLY CONVEYED CONTAINERS

Evgeny Maximovich Soschenko, Polotskaya ulitsa, 16/14, korpus 4, kv. 46; Ivan Timofeevich Zonenko, Saperny proezd, 8, korpus 3, kv. 72; Adolf Moritsovich Alexandrov, Federativny prospekt, 6, korpus 3, kv. 8; Vladimir Efimovich Aglitsky, Zatsepsky val, 6/13, kv. 61; Jury Abramovich Tsimbler, Sojuzny prospekt, 10, kv. 261; Ilya Solomonovich Kantor, Malo-Moskovskaya ulitsa, 31, kv. 45; Jury Arnoldovich Topolyansky, Matveevskaya ulitsa, 10, korpus 4, kv. 233; Anatoly Petrovich Chizhikov, ulitsa Petrovka, 26, kv. 3, and Igor Igorievich Volyansky, ulitsa Stratonavtov, 12, korpus 1, kv. 12, all of Moscow, U.S.S.R.

Filed Mar. 19, 1976, Ser. No. 668,446

Claims priority, application U.S.S.R., Mar. 20, 1975, 2112002

Int. Cl.[2] B61B *13/10*

U.S. Cl. 104—23 FS **2 Claims**



1. A train of containers for pneumatic transportation of goods through a tube having guideways secured to the internal surface thereof in opposition to one another, throughout the length of the tube, comprising:

a plurality of containers, means for connecting said containers to one another comprising a plurality of ball and socket joints wherein said ball is connected to a container and said socket is connected to an adjacent container wherein said ball and socket are engaged for connecting adjacent containers together, a front flap mounted on the end face of the foremost one of said plurality of containers, in the direction of the travel of said train, said front flap spanning the lower half of a gap defined between said train and said tube; a tail flap mounted on the end face of the tailmost one of said plurality of containers, in the direction of the travel of said train, said tail flap spanning the upper half of the gap defined between the train and said tube; longitudinal flaps mounted on the lateral side of each container of said plurality of containers, said longitudinal flaps acting

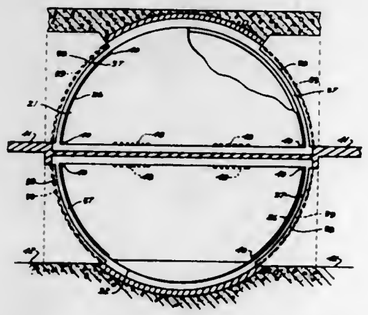
as the plain bearings of said train of containers in the process of its travel, said longitudinal flaps bearing upon said guideways; bridging piece means mounted on the opposing end faces of adjacent pairs of said plurality of containers for closing off the gaps between said adjacent pairs of said plurality of containers; said bridging piece means comprising engaging means for engaging each other and for engaging said longitudinal flaps of its associated container of said plurality of containers, said engaging means comprising bridge pieces having their end faces forming conjugating spherical surfaces wherein the geometrical center of said spherical surfaces is the center of the adjacent ball and socket engagement.

4,075,948

RAPID TRANSIT SYSTEM

Michael A. Minovitch, 2832 St. George St., Apt. 6, Los Angeles, Calif. 90027

Filed Jan. 31, 1974, Ser. No. 438,230
Int. Cl.² B61B *13/10*
U.S. Cl. 104—138 R **25 Claims**



1. A rapid transit system comprising:
a plurality of stations;
tunnels extending underground between adjacent stations of said system, each of said tunnels between said stations comprising two sloping reaches separated by one horizontal reach;
means for evacuating and maintaining vacuum in said tunnels;
a ferromagnetic suspension rail of high resistivity extending lengthwise along the tunnel;
a vehicle in the tunnel;
a plurality of electromagnets on the vehicle for suspending the vehicle from the ferromagnetic rail by magnetic attraction so that no part of the vehicle is in physical contact with any part of the tunnel when it is coasting between stations;
said vehicle being propelled essentially by gravity when moving from one station to another station at equal elevations where acceleration propulsion is obtained by moving down one sloping reach of the vacuum tunnel, thereby converting gravitational potential energy into kinetic energy, and where deceleration is obtained by moving up another sloping reach of the tunnel, thereby converting kinetic energy back into gravitational potential energy to be used later for making the next trip;
magnetic means for roll stabilizing the vehicle about its longitudinal axis;
means for starting and stopping said vehicle in the immediate vicinity of each station; and
at least one air lock at each station for connection between the interior of the vehicle and the station to allow passage between such a station and the interior of the vehicle when stopped at the station without removing the vacuum environment from the tunnel surrounding the vehicle at the station.

4,075,949

CART PUSHING APPARATUS

Noel Davis, Wayzata; John T. Haub, Maple Grove, and Stanley C. Rustad, Golden Valley, all of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Feb. 19, 1976, Ser. No. 659,310
Int. Cl.² F27B *9/22*
U.S. Cl. 104—162 **8 Claims**



1. Apparatus for moving a plurality of aligned carts along a predetermined path comprising a frame construction which includes a pair of parallel elongated frame members, each cart including a frame structure adapted to straddle said frame construction, a pair of parallel elongated pusher bars, means for orienting said bars with respect to said frame members so that they are superposed and aligned therewith, said means including two pairs of substantially vertically oriented legs, means for pivotally connecting one end of each pair of legs to a frame member, means for pivotally connecting the other end of each leg to a pusher bar so that each pusher bar is connected to a frame member by a pair of said legs, means for oscillating said pusher bars with respect to said frame members along a path parallel to said bars and frame members, means mounted on said pusher bars for engaging a portion of at least one cart and causing it to move as the pusher bars move in a first direction, said engaging means comprising a plurality of lugs, means for mounting said lugs on the pusher bars so that they are axially aligned along the longitudinal axis of said bars in spaced-apart relationship, means for biasing said lugs in an upward direction so that a portion of each lug projects above the top surface of the pusher bar, said lugs being movable against such biasing action by exerting a downward force against said lugs, means on each cart frame adapted to be engaged by said lugs, said means including a pair of elongated parallel channel members, means for attaching said channel members to the cart frame so that they are aligned directly over said pusher bars and parallel therewith, a plurality of pusher plates, means for mounting said plates within the channel members in spaced-apart relationship so that they extend laterally with respect to the longitudinal axis of the channel members, said lugs adapted to engage said pusher plates as the pusher bars are caused to move in said first direction, said frame members and said pusher bars being shorter in length than the alignment of carts so that the means mounted on the pusher bars engage less than all the aligned carts, said cart when moved causing the other aligned carts ahead of it to move as well, said engaging means permitting said cart to remain substantially stationary as the pusher bars move in a second direction, and means for guiding said carts along said predetermined path.

4,075,950

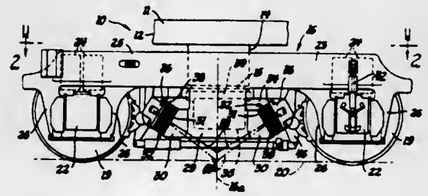
RAILWAY LOCOMOTIVE TRUCK WITH RESILIENT SUSPENSION

Henry A. Marta, LaGrange Park; Kenneth D. Mels, Orland Park; Vijay K. Garg, Darien, and Albert J. Miller, LaGrange Park, all of Ill., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 29, 1976, Ser. No. 681,712
Int. Cl.² B61C *9/50*; B61F *3/04, 5/08, 5/30*
U.S. Cl. 105—197 A **3 Claims**

1. A railway vehicle power truck having longitudinal and lateral central axes and comprising

a pair of wheeled axles spaced apart longitudinally equidistant from said lateral axis,
a rigid frame including (1) a pair of side frames extending longitudinally along opposite sides of the truck interconnecting and resiliently supported on said axles, (2) means laterally interconnecting said side frames, and (3) a bolster support depending from each of said side frames and centered between said axles, said bolster supports each having a pair of longitudinally spaced support points on their respective sides of said truck and equally spaced from said longitudinal and lateral central axes,
a bolster extending laterally across said truck along said lateral central axis at about the height of said axles with a center bearing carried on the top of said bolster at a height substantially below the top of said side frames, said bolster having longitudinal arms extending laterally adjacent to said bolster supports with load points opposing the bolster support points of said frame,



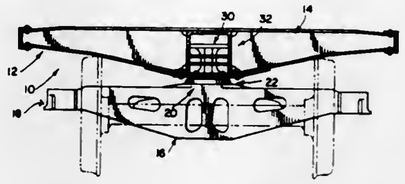
resilient suspension members disposed near axle height between said frame-carried bolster support points and said bolster carried load points and supporting said bolster on said frame, said suspension members on each side of said truck having primary load carrying axes angled downwardly and longitudinally inwardly to meet at points near rail height and in a vertical plane through the lateral central axis of the truck, said suspension members having high load carrying capacity and spring rates along their primary load axes and substantially lower capacities and spring rates in planes perpendicular thereto,
said suspension members comprising the sole means to carry under normal operating conditions all combinations of vertical, longitudinal and lateral loads between said truck frame and bolster with a minimum of weight transfer between axles during the application of traction and braking forces, the low center bearing location limiting longitudinal bolster tipping forces.

4,075,951

SELF LUBRICATING CENTER BEARING LINER

Osvaldo F. Chierici, Elmhurst, and Richard F. Murphy, Aurora, both of Ill., assignors to Holland Company, Lombard, Ill.

Continuation-in-part of Ser. No. 649,275, Jan. 15, 1976, abandoned. This application Dec. 29, 1976, Ser. No. 755,197
Int. Cl.² B61F *5/16, 5/50*; F16C *17/04*; F11C *33/66*
U.S. Cl. 105—199 C **8 Claims**



1. In a center plate arrangement for railroad cars having a car body riding on car trucks, with the center plate arrangement being centered on the car longitudinal center line and including at each truck a body bolster having a center plate, including a neck at its junction to the body bolster, and a truck bolster having a bowl swivelly receiving and supporting the body bolster center plate for swivelling movement about the truck pivot axis, and a liner received in the bowl and between the bowl and the body bolster center plate, said bowl defining an upstanding side wall thereabout defining at its upper edge the top surfacing of the bowl, and said body center plate defining a depending wall external side wall thereabout proportioned to fit within the bowl side wall and provide shiftable lost motion about the truck pivot axis in the plane of the bowl, the improvement wherein:
the liner is formed from a dry self lubricating polymer material that is distension free,
with the liner being of bowl configuration and defining a floor on which the body bolster center plate rests, and an upstanding side wall in circumambient relation about the bowl floor and received about the body bolster center plate and between the side wall of same and the truck bolster bowl side wall and in physical engagement with both the center plate and bowl side walls about the truck pivot axis,
and with the liner being proportioned in the portion of same that is interposed between the body bolster center plate side wall and the truck bolster bowl side wall to space the body bolster center plate side wall from the bowl side wall with a movement restraining connection therebetween in the plane of the bowl thereabout whereby longitudinal impacts acting on the car body are transmitted through the center plate side wall arrangement over a substantial portion of said side wall on either side of the car longitudinal center line,
with the liner side wall being free of tension acting longitudinally of said axis, and defining at its upper end rim surfacing that is spaced from and free of engagement with the bolster bowl top surfacing,
said liner and bowl defining a first normally operative slip surfacing whereby the bowl swivels relative to the liner and the body bolster center plate, on swivelling of the car truck relative to the car body,
said liner and the body bolster center plate defining a second contingency slip surfacing, whereby when said first slip surfacing is rendered temporarily restrained by said liner being clamped between said center plate and bowl side walls, the bowl and liner will swivel relative to the body bolster center plate at said second slip surfacing, on swivelling of the car truck, under such conditions, relative to the car body,
said liner being characterized by having the polymer material surface portions of same that engage the bowl and body bolster center plate to form said slip surfacing effecting during use of the assembly resurfacing of the portions of said center plate and bowl engaged thereby for reforming said center plate and bowl portions to have a wear free mirror finish.

4,075,952

SCISSOR-TYPE SLIDE GATE OPENER

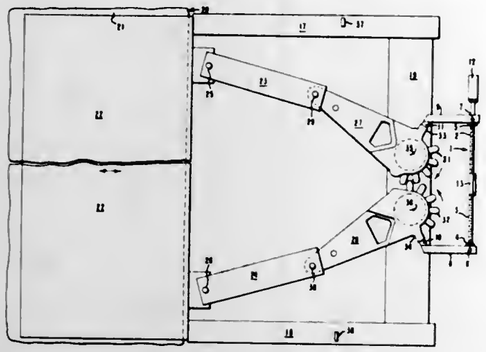
Ralph Clarence Burge, Christiana, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 1, 1976, Ser. No. 701,613
Int. Cl.² B61D *7/26*
U.S. Cl. 105—282 R **1 Claim**

1. A discharge outlet assembly for a hopper car in which a slideable gate is moved between an open and closed position by a pair of crank arms which move links to operate the slide gate, said crank arms being connected to meshing gear sectors containing a socket which gears cause conjoint rotation of the crank arms for moving said slide gate between an open and closed position, the improvement comprising a motion transducer adapted to drive each of the paired gears of the meshing gear sector said motion transducer comprising
a rotatable, cylindrical shaft wherein said shaft has a right-hand threaded section on one outboard length and a left-hand threaded section on the opposite outboard length,
a pair of threaded members engaged on opposite sides of the threaded shaft so that rotation of the shaft moves said

threaded members in opposite directions on said threaded shaft,

a link pivotally mounted on each threaded member, and



a block adapted to fit into the socket of said gear sectors, said block being at the end of said link distal to said threaded member.

4,075,953

LOW POLLUTION INCINERATION OF SOLID WASTE

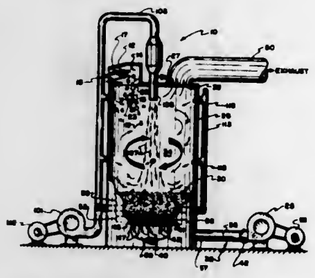
Norman K. Sowards, Coeur d'Alene, Id., assignor to Energy Products of Idaho, Coeur d'Alene, Id.

Continuation-in-part of Ser. No. 591,556, Jun. 30, 1975, Pat. No. 4,060,041. This application Jun. 20, 1977, Ser. No. 807,866

The portion of the term of this patent subsequent to Nov. 29, 1994, has been disclaimed.

Int. Cl.² F23G *5/00*; F23D *19/00*

U.S. Cl. 110—8 F **4 Claims**



1. An incineration system comprising:

a generally cylindrical incineration chamber;

a fluidized bed located within the chamber with a vapor space defined in the chamber above the fluidized bed;

means causing combustible waste to be introduced into the incineration chamber and dispersed within the fluidized bed;

effluent opening means above the vapor space communicating exhaust from the interior of the chamber;

influent air means communicating air into the interior of the chamber and being disposed centrally above the fluidized bed directing said air centrally downward against the fluidized bed and causing air to elevate within the chamber as an annulus adjacent the wall of the chamber;

auxiliary influent air means communicating air into the interior of the chamber adjacent the wall of the chamber within the vapor space with at least the major component of air displaced therefrom being tangential to the wall when introduced into the chamber;

whereby a gradually elevating annular vortex of air is created whereby fine particles are centrifuged from the vapor space to the fluidized bed and vapor space residence time for any residual particles is increased accommodating complete combustion.

4,075,954

DEVICE FOR MAKING BRAID OPENINGS IN CUTS OF GARMENTS

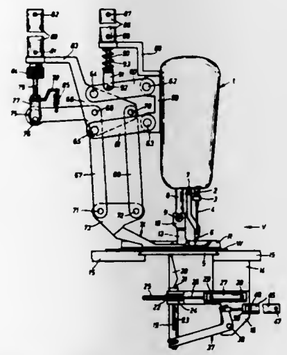
Peter Hintzen, Krickenbach, and Erich Willenbacher, Karlsruhe, both of Germany, assignors to Pfaff Industriemaschinen GmbH, Germany

Filed Dec. 7, 1976, Ser. No. 748,227

Claims priority, application Germany, Dec. 11, 1975, 2555753

Int. Cl.² D05B *3/10*

U.S. Cl. 112—68 **7 Claims**



1. In a two-needle sewing machine including a machine casing having a sewing head mounting the needles, a work support plate, a ripping knife supported in the sewing head and working between the needles to form an elongated slot of a braid opening in a cut garment piece, and means for making diverging corner cuts at the opposite ends of the elongated slot, an improved device for forming the braid opening comprising, in combination, a supporting bar guided in the machine casing for longitudinal displacement perpendicular to the work support plate and rotatable into different angular positions; a single angular cross-section cutting knife mounted on said supporting bar and serving as a tool for making said diverging corner cuts; and means operable to effect longitudinal and rotational displacement of said supporting bar and said cutting knife.

4,075,955

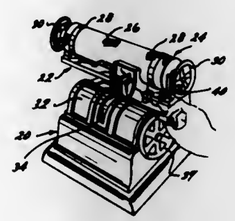
MACHINE FOR NEEDLEPOINT OR THE LIKE

Sidney Bass, Los Angeles, and Raymond Marie St. Pierre, Hawthorne, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 10, 1977, Ser. No. 757,870

Int. Cl.² D05C *15/04*

U.S. Cl. 112—79 R **18 Claims**



1. In a machine for performing needlepoint or the like, the combination comprising:

a housing;

a generally open framework mounted on said housing for movement in a first direction, said framework being adapted to support a fabric thereon;

a first member pivotally mounted to said housing and having a needle arm means on said needle are for receiving cord-like material, said needle arm being configured to insert said cord-like material through said fabric;

a second member pivotally mounted to said housing and having an arm portion configured to selectively slidably engage a surface of said needle portion, the end of said arm portion being configured for inserting through said fabric to releasably engage said cord-like material;

phased cam means operatively coupled to said first and second members for permitting insertion of said needle arm through said fabric, retention of the cord-like material by said arm portion during withdrawal of said needle arm and incrementing of said framework by said arm portion; and

means for moving said cam means.

4,075,956

AUTOMATIC APPARATUS FOR OBTAINING RING-SHAPED ARTICLES FROM AN ELONGATED PLAIT OR STRIP OF TEXTILE MATERIAL

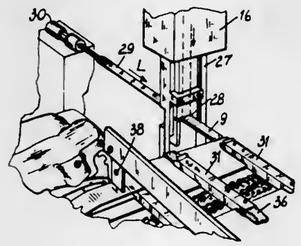
Orlando Manetti, Valdobbiadene, Italy, assignor to Sigismondo Piva S.p.A., Milan, Italy

Filed Jul. 14, 1976, Ser. No. 705,118

Claims priority, application Italy, Jul. 18, 1975, 25539/75

Int. Cl.² D05B *33/02*

U.S. Cl. 112—121.27 **8 Claims**



1. An automatic apparatus for obtaining ring-shaped articles from an elongated plait or strip of textile material, which comprises: a continuously feeding station for the plait or strip; a cutting station for cutting said plait or strip into sections of prefixed length; a folding station for the sections from said cutting station; a sewing station including means for receiving said folded sections and also including means for sewing together the cut ends of said folded sections to form ring-shaped articles; a transport station for carrying the folded sections to said sewing station wherein the ring-shaped articles are formed; a discharging device for receiving and discharging the finished ring-shaped articles from said transport station.

4,075,957

WORKPIECE GUIDE FOR SEWING MACHINES

Nerino Marforio, Milan, Italy, assignor to Rockwell-Rimoldi S.p.A., Milan, Italy

Filed Jul. 15, 1976, Ser. No. 705,601

Claims priority, application Italy, Jul. 21, 1975, 25585/75

Int. Cl.² D05B *35/10*

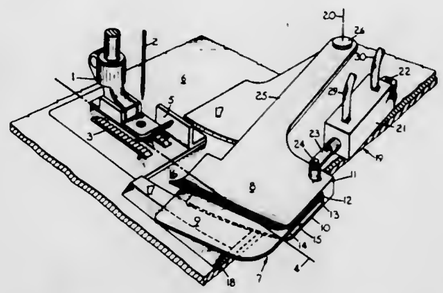
U.S. Cl. 112—153 **5 Claims**

1. A workpiece guide for a sewing machine having a work surface comprising:

(a) superposed upper, lower and base plates formed integrally with said guide which are spaced apart and disposed substantially parallel to the work surface and at right angles to the sewing axis;

(b) at least one integrally formed vertical wall disposed between said upper, lower and base plates and between the lower plate and the work surface, said vertical walls being disposed to the right of the sewing axis and being substantially convergent with said axis;

(c) a stationary bed plate including means defining a recess with arcuately shaped limits for receiving said base plate; and



(d) means for rotating the entire guide with respect to said bed plate about a vertical axis passing through a point situated on the right of the sewing axis and to a location displaced from the sewing elements.

4,075,958

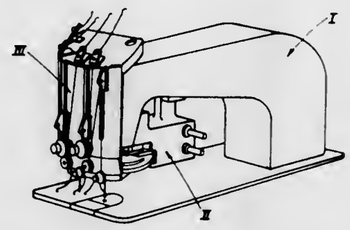
SEWING MACHINE AUTOMATIC THREAD CHANGER

Alfred D. Sacchetti, 1903 Sharon Road, Meadowbrook, Pa. 19046

Continuation-in-part of Ser. No. 639,569, Dec. 10, 1975, Pat. No. 4,036,157. This application Jul. 29, 1976, Ser. No. 709,697

Int. Cl.² D05B *1/08*

U.S. Cl. 112—163 **9 Claims**



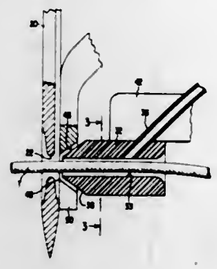
1. An automatic thread changer for use in connection with a sewing machine having a needle bar assembly, said automatic thread changer comprising a plurality of threaded needles and means to move said threaded needles one by one sequentially into operative but detachable connection with said needle bar assembly to form a temporary solid needle bar assembly, said automatic thread changer further including a plurality of needle holders to which said threaded needles are secured, one threaded needle being secured to one particular needle holder, said needle holders being detachably secured, one by one to a slidable connector, said needle holders having a through opening and said connector having a through opening whereby when there is a solid needle bar assembly, one of said needle holder through openings is aligned with said connector opening and a releasable shot pin extending through said openings to form said solid needle bar assembly.

4,075,959

PNEUMATIC THREAD AND FIBER FEEDING DEVICES

Josef Zocher, Aachen, Haaren, Germany, assignor to The Singer Company, New York, N.Y.

Filed Apr. 6, 1977, Ser. No. 785,266
Int. Cl.² D05B 87/00
U.S. Cl. 112—225 4 Claims



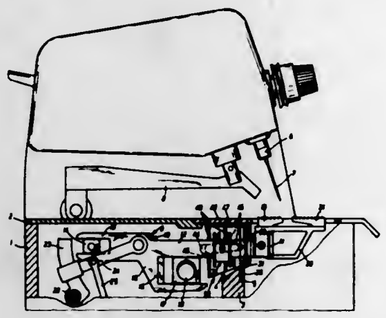
1. A device for feeding thread through the eye of a thread carrying needle comprising, a thread guide member formed with a delivery extremity shaped substantially complemental to the eye portion of a thread carrying needle, said thread carrying member being formed lengthwise with a thread accommodating passageway, a constricted slot formed the entire length of said thread accommodating passageway and extending radially from said passageway to the exterior of said thread carrying member, a compressed air delivery conduit opening onto said thread accommodating passageway and extending obliquely toward the delivery extremity thereof, and an operator influenced valve means in said compressed air delivery conduit for controlling the compressed air which propels a thread lengthwise through said thread accommodating passageway when the delivery extremity is positioned complemental to the needle eye for threading the needle.

4,075,960

LUBRICATING OIL SEALING DEVICE FOR A SEWING MACHINE

Kurt Klundt, Hirschhorn, Germany, assignor to Pfaff Industriemaschinen GmbH, Germany

Filed Jun. 24, 1977, Ser. No. 809,777
Claims priority, application Germany, Jul. 2, 1976, 2629713
Int. Cl.² D05B 71/00
U.S. Cl. 112—256 6 Claims



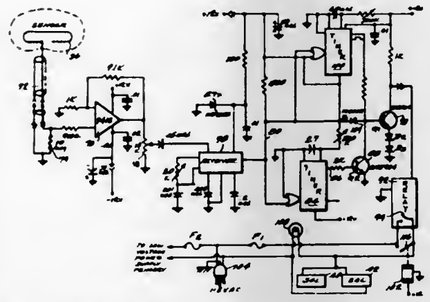
1. A sewing machine, comprising a housing having a wall with an opening therethrough, first and second material feed supports adapted to move backwardly and forwardly and upwardly and downwardly through the opening in said wall, said supports being movable relatively to each other and defining an oil duct therebetween having an oil inlet and an opposite oil outlet, first seal means engaged over the feed supports, means for mounting said first seal means adjacent the opening on the exterior of the wall so as to permit movement of said support means and to prevent the outward passage of the oil through the opening, and second seal means including first and second sealing members engageable over respective opposite exterior sides of said first and second feed supports on the interior of said housing adjacent the opening in said wall, and a frame in said opening having portions cooperable with said first and second sealing members to deflect oil from said members into the inlet.

4,075,961

INJURY PROTECTION DEVICE FOR MACHINERY

William Donald Harris, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed May 7, 1976, Ser. No. 684,319
Int. Cl.² D05B 69/36
U.S. Cl. 112—277 16 Claims



1. A system for producing a control signal to stop operation in response to intrusion of a human body part into a given machine area comprising:

means for detecting presence of a human part in said area and producing a first signal in response to intrusion of said part and a second signal in response to removal of said part,

means for producing a disable signal in response to said first signal which prevents operation of said machine until said second signal is produced,

means for producing an enable signal in response to said second signal for a predetermined time following production of said second signal to permit operation of said machine during said predetermined time and preventing operation thereafter, and

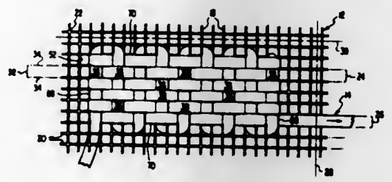
means connected to said disable signal producing means for causing said machine to stop in response to said disable signal and connected to said enable signal producing means for causing said machine to stop in response to the absence of said enable signal.

4,075,962

NEEDLEWORK TECHNIQUE USING RIBBON

Patricia D. Mabry, 2700 Mountain Brook Parkway, Birmingham, Ala. 35223

Filed Mar. 2, 1977, Ser. No. 773,498
Int. Cl.² D05C 17/00
U.S. Cl. 112—439 18 Claims



1. A method of making a needleworked ribbon piece on a needlework canvas having a front, a back and a multiplicity of equally spaced interconnected strands lying along perpendicular *x* and *y* axes and defining a multiplicity of mesh openings, comprising

first steps for laying up a multiplicity of first flat untwisted ribbon sections on the front of said canvas extending in the direction of the *x* axis;

second steps for laying up a multiplicity of second flat untwisted ribbon sections on the front of the canvas extending in the direction of the *y* axis for completely covering the canvas front between margins of the piece;

the steps including

juxtaposing, inside the margins, four sides of each first section to a side of a different second section,

juxtaposing, inside the margins, four sides of each second ribbon section to a side of a different first section; and

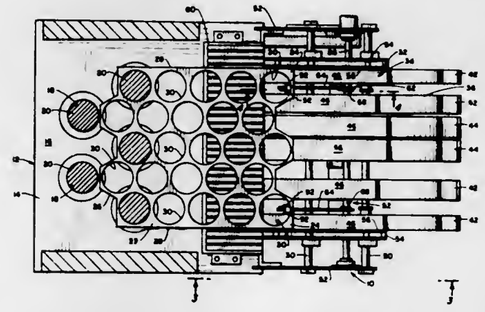
securing the ribbon ends to the piece.

4,075,963

SKELETON DISCHARGE MECHANISM FOR USE WITH CUPMAKER BLANK AND DRAW PRESSES AND THE LIKE

Terril M. Crago, Long Beach, Calif., assignor to Standun, Inc., Compton, Calif.

Filed Dec. 15, 1975, Ser. No. 640,938
Int. Cl.² B21D 43/00; B21C 1/14
U.S. Cl. 113—113 R 4 Claims



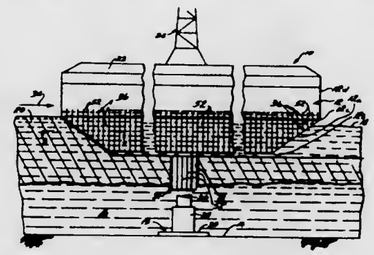
1. In a skeleton discharge mechanism for use with cupmaker blank and draw presses and the like of the type wherein the leading edge portions of completed scrap skeleton sheets, having precisely located hole means formed therethrough, are consecutively positioned ready for discharge on an exact timed basis by the press extending longitudinally into an entrance portion of the skeleton discharge mechanism; such that said hole means is positioned precisely at a pick-up station of said skeleton discharge mechanism entrance portion; the combination of: scrap sheet support means comprising a support surface projecting longitudinally away from said press between said entrance portion and an exit portion spaced away from said press for supporting said scrap skeleton sheet movable longitudinally therealong; sheet transportation means for longitudinally moving said scrap skeleton sheet along said support surface of said scrap sheet support means between said entrance and exit portions comprising a sheet engagement member, mounting means for mounting said engagement member movable on an exact timed basis in a closed longitudinal path to said entrance portion pick-up station of said support surface into sheet engagement only exactly through said hole means of said sheet leading edge portion and then longitudinally along said support surface to said exit portion pulling said sheet solely by said hole means engagement and then to spaced from said support surface disengaging said sheet and ultimately back to said entrance portion pick-up station of said support surface, said mounting means including means for selectively adjusting said engagement member closed longitudinal path of movement to selectively vary the exact longitudinal location along said support surface entrance portion to which said engagement member is moved into said sheet leading edge portion hole means engagement thereby varying the exact longitudinal location along said support surface entrance portion of said pick-up station constituting said exact predetermined location and adapting said engagement member and mounting means to hole means engaging and pulling scrap skeleton sheet of different longitudinal lengths.

4,075,964

ICE MELTING SYSTEM

Charles Norman Sjogren, San Gabriel, Calif., assignor to Global Marine, Inc., Los Angeles, Calif.

Filed Aug. 29, 1975, Ser. No. 609,030
Int. Cl.² B63B 35/08
U.S. Cl. 114—40 29 Claims



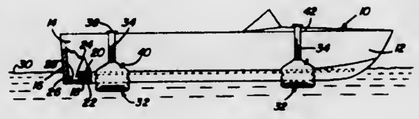
1. Heat transfer apparatus for melting a solid layer moving toward an object having an exterior heat conducting surface in the path of movement of the layer, the apparatus comprising a series of spaced apart, elongated grooves formed in the exterior surface and located proximately adjacent the portion of the solid layer a be melted, at least a portion of the grooves extending upwardly along said surface to a location above the top surface of the solid layer; and means for directing heat outwardly from the grooved surface to a portion of the layer located proximately adjacent the grooved surface, the grooves providing areas of heat concentration plus means for draining melted material away from between the solid layer and the grooved surface.

4,075,965

SYSTEM FOR RENDERING A MOORED HULL SELF-BAILING

Frank J. Lasch, 60 Manning Blvd., Albany, N.Y. 12207

Filed Jun. 18, 1976, Ser. No. 697,744
Int. Cl.² B63C 1/02
U.S. Cl. 114—49 1 Claim



1. A system for preventing the accumulation of rain and spray water in a boat hull, at least one drain hole at the bottom of the hull which is normally plugged and rides beneath the water line, and a buoyant arrangement which may be transversely secured beneath the hull of the boat to buoy the latter to an elevation with the drain hole above the water line and the hull in a slight bow up attitude whereby the hole may be unplugged and any water tending to collect within the boat may be drained therefrom through the drain hole, said buoyant arrangement comprising a pair of elongated, flexible and independently inflatable flotation members removably secured transversely beneath the bow and stern of the boat so as to underride the hull, said inflatable members each having a longitudinal extent greater than the width of the hull, an elon-

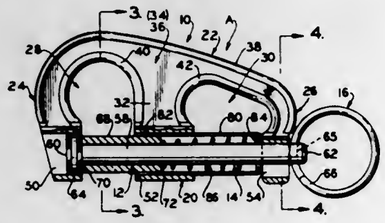
gated, adjustable length tension member attached to and connected between the opposite ends of each inflatable member and passed over the upper side of said hull, each tension member comprising a pair of elastic straps secured at one pair of ends to the opposite ends of the corresponding inflatable member and including coacting releaseably securable and adjustable fastening means at their other pair of corresponding ends.

4,075,966

SPRING BIASED SNAP HOOK AND METHOD

A. Arthur Bates, Lakewood, Ohio, and Norman J. Cook, E. Greenwich, R.I., assignors to Zaleboats, Incorporated, East Greenwich, R.I.

Filed Aug. 20, 1976, Ser. No. 716,105
Int. Cl.² B63H *9/04*
U.S. Cl. 114—114 **22 Claims**



16. A snap hook comprising:

a generally planar hook body having spaced apart inner and outer edges and spaced apart end edges, said body including first and second recess areas adapted to hold a jib stay and a jib, respectively, extending inwardly from said inner edge toward said outer edge with a body web area extending from said inner edge between said recess areas, said inner edge including coaxial locking member receiving openings spaced therealong with the common longitudinal axis of said openings being generally parallel to the plane of said body; an elongated locking member slidably received in said receiving openings for selectively closing said first and second recess areas, said locking member slidably received in said receiving openings for selectively closing said first and second ecess areas, said locking member being selectively longitudinally movable between a first normal position blocking both of said recess areas and a second position whereby at least one of said recess areas is opened, said locking member having inner and outer ends with the distance between said ends being such that when said locking member is in said first position the inner end thereof is slidably embraced by a receiving opening disposed adjacent one body edge with the outer end thereof protruding through a receiving opening disposed adjacent the other body end edge, as said locking member is moved between said first and said second positions; biasing means for continuously urging said locking member toward said first position, and means for moving said locking member from said first toward said second position.

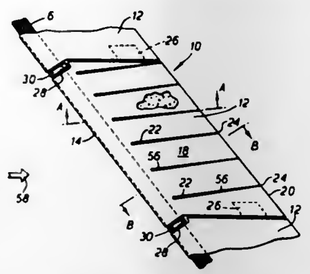
4,075,967

HYDRODYNAMIC CABLE FAIRING

Trevor Ian Silvey, Sherborne, England, assignor to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Dec. 15, 1976, Ser. No. 750,816
Claims priority, application United Kingdom, Dec. 19, 1975, 52020/75
Int. Cl.² B63B *21/00*
U.S. Cl. 114—243 **8 Claims**

1. A hydrodynamic cable fairing section comprising a nose portion, a body portion having two side surfaces, and vane means comprising a plurality of vanes connected to each side surface of said body portion, said plurality of vanes being substantially parallel to each other, wherein said nose portion has a continuous curved surface and a longitudinal through bore means for receiving a cable, said body portion extending from said nose portion and tapering from said nose portion



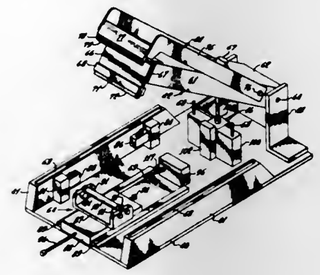
towards a trailing edge which forms part of the body portion, and each of said vanes comprises flat surfaces which taper toward said trailing edge of said body portion.

4,075,968

APPARATUS FOR MANUFACTURING CYLINDRICAL RESISTORS BY THICK-FILM SILK-SCREENING

Richard E. Caddock, 640 Sandalwood Court, Riverside, Calif. 92507

Continuation of Ser. No. 530,751, Dec. 9, 1974, abandoned, which is a division of Ser. No. 424,810, Dec. 14, 1973, Pat. No. 3,880,609, which is a continuation-in-part of Ser. No. 315,018, Dec. 14, 1972, abandoned. This application Jul. 8, 1976, Ser. No. 703,460
Int. Cl.² B05C *1/16*; B41M *1/12*
U.S. Cl. 118—7 **18 Claims**



1. Apparatus for effecting silk-screening of large portions of the cylindrical exterior surfaces of cylindrical substrates, including very small-diameter cylindrical substrates, which comprises:

a. a silk-screen assembly,

b. means to rotatably support a cylindrical substrate beneath the screen of said screen assembly, said means including first and second roller means respectively engaged with only the end regions of the exterior cylindrical surface of said substrate, the intermediate regions of said substrate being unsupported,

c. a squeegee mounted above said screen in registry with said substrate,

d. means to actuate said squeegee back and forth between an upper "release" position at which said squeegee is not pressing on said screen, and a lower "pressure" position at which said squeegee presses downwardly on said screen with sufficient pressure to force said screen against said substrate,

whereby movement of said screen assembly in a direction lateral to said substrate, when said squeegee is in said lower position, effects rotation of said substrate on said roller means at a speed corresponding to the speed of movement of said screen assembly,

said actuating means comprising a first lever pivotally connected at one end to a support, the other end of said first lever being connected to said squeegee,

e. flood-bar means comprising a second lever pivotally connected at one end to said first lever,

the other end of said second lever being connected to a flood bar adapted to effect spreading of ink over said screen,

f. fulcrum means pivotally related to said second lever at a region located between said flood bar and said one end of said second lever,

said one end of said second lever being located between said fulcrum means and the pivotal connection between said first lever and said support, and

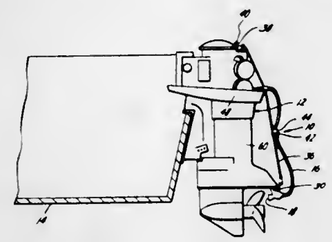
g. means to operate said squeegee actuating means to shift said squeefee from said lower "pressure" position to said upper "release" position when said lateral screening movement of said screen assembly has been completed.

4,075,969

AUXILIARY WATER SYSTEM FOR OUTBOARD MOTOR

Edward R. Griffin, 415 Hereford Drive, Brookshire, Tex. 77423

Filed Feb. 16, 1977, Ser. No. 769,262
Int. Cl.² B63H *5/13*
U.S. Cl. 115—17 **8 Claims**



7. An auxiliary cooling water system for an outboard motor having a water jacket and a pair of ports communicating therewith, comprising

a conduit,

an element defining a scoop and a recess,

means for connecting said conduit to said element whereby said scoop provides the inlet to said conduit,

means connecting said conduit to one of said water jacket ports,

said recess adapted to receive a portion of the motor therein to position said scoop underwater facing in the direction of movement of the motor through the water, and

means for retaining said element in position with the portion of said motor received within said recess.

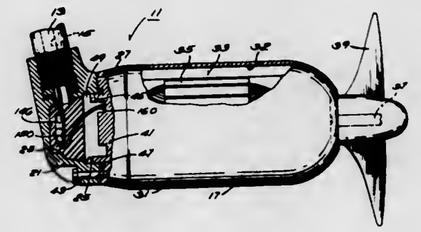
4,075,970

SPEED SELECTION FOR A DIRECT CURRENT PERMANENT MAGNET MOTOR

Charles H. Blake, Park City, and Donald H. Wood, Gurnee, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Division of Ser. No. 504,353, Sept. 9, 1974, abandoned. This application Mar. 26, 1976, Ser. No. 671,019
Int. Cl.² B63H *21/26*
U.S. Cl. 115—18 E **10 Claims**

1. An outboard motor comprising a shaft extending vertically under normal operating conditions and adapted to be connected to a boat hull, said shaft including a hollow interior, a lower housing fixedly connected to said shaft and including a hollow interior communicating with said hollow interior of said shaft, a permanent magnet, direct current electric motor including an armature winding having opposed terminals, said motor being mounted in said housing hollow interior and further including an output shaft including a first end extending exteriorly of said lower housing and a second end terminating within said hollow interior of said lower housing, a propeller mounted on said first end of said output shaft, a control circuit for said motor including a first resistor connected to one of said armature winding terminals and adapted for connection to a direct current source, a second resistor connected to said one armature winding terminal, a shunt lead connected to said one armature winding terminal, and a switch adapted for con-



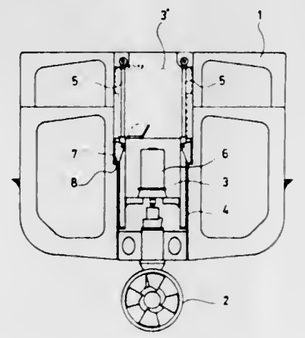
nection to the direct current source in parallel with said first resistor and selectively operable between a first position for connecting the direct current source to said shunt lead, a second position for connecting said direct current source to said second resistor, and a third position disconnected from both of said shunt lead and said second resistor, whereby to permit current flow from the current source to said armature solely through said first resistor, at least one of said resistors being located in said housing hollow interior in axially spaced relation from said output shaft, and a thermally conductive means fixedly bonding said resistor to said housing.

4,075,971

MOTOR HOUSING FOR A RETRACTABLE PROPULSION UNIT FOR BOATS

Jean-Pierre Reginensi, Grenoble, and Peter Slack, Echirolles, both of France, assignors to Alsthom-Atlantique S.A., Paris Cedex, France

Filed Apr. 11, 1977, Ser. No. 786,742
Claims priority, application France, Apr. 22, 1976, 76 11857
Int. Cl.² B63H *5/12*
U.S. Cl. 115—41 R **3 Claims**



1. In combination, a motor housing for a water vessel, said vessel having a well for up and down movement of said motor housing therein to permit an associated propulsion unit to be moved between an upper, retracted position with the housing and the propulsion unit inside the well and a lower, operating position with the propulsion unit projecting out of the bottom of the well, the upper part of the motor housing including first

clamping means for clamping the housing in the lower, operating position, said first clamping means comprising inclined articulated bolts operatively positioned to engage the walls of the well to provide a force with both a horizontal component and a vertical component, said well including a wall with a shoulder formed therein, the vertical component serving to clamp and seal the housing against said shoulder provided in the wall of the well and the horizontal component serving to hold the upper part of the housing in position in the well against lateral displacement therein, said lower part of the housing including second clamping means for clamping the housing in both the upper and the lower positions, said second clamping means comprising articulated bolts operatively positioned to engage the walls of the well horizontally to hold the lower part of the housing in position in the well against lateral displacement therein.

4,075,972

APPARATUS FOR THERMAL DIFFUSION OF SEMICONDUCTOR DEVICES

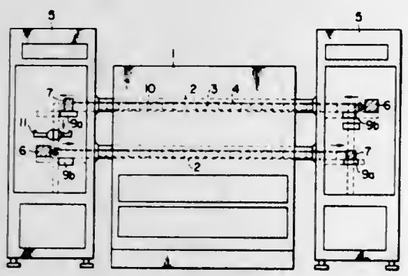
Masao Yamawaki, Handa; Katsuo Aoki, Aichi; Osamu Ina, Okazaki; Takao Suzuki, Kariya; Yoshio Oka, Toyota, and Kunihiko Hara, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 16, 1976, Ser. No. 714,806

Claims priority, application Japan, Aug. 20, 1975, 50-100863; Oct. 1, 1975, 50-119135; Oct. 30, 1975, 50-131025

Int. Cl.² C23C *13/12*

U.S. Cl. 118—6 **12 Claims**



1. A thermal diffusion apparatus for use in fabricating semiconductor devices comprising:

a furnace tube which is so controlled as to have a predetermined temperature distribution or gradient,

gas supply means laid in said furnace tube axially thereof for introducinga diffusion gas into said furnace tube through a plurality of gas outlets to provide a predetermined diffusion atmosphere,

a plurality of boats each of which is made of a refractory material and is adapted to carry a number of wafers to be processed in said furnace tube, and

pushing means for pushing said plurality of boats in contact with the adjacent boats from an inlet end to an outlet end of said furnace tube, said gas supply means functioning as a guide rail so that said boats are guided by said gas supply means from said inlet end to said outlet end when they proceed in said furnace tube.

4,075,973

APPARATUS FOR APPLYING FLOCK TO A SUBSTRATE

Joseph E. Geary, Rochester; Joseph Pelensky, Perry, and John Peter Hart, Leicester, all of N.Y., assignors to Champion Products Inc., Rochester, N.Y.

Filed Aug. 16, 1976, Ser. No. 714,475

Int. Cl.² B05B *5/00*

U.S. Cl. 118—7 **5 Claims**

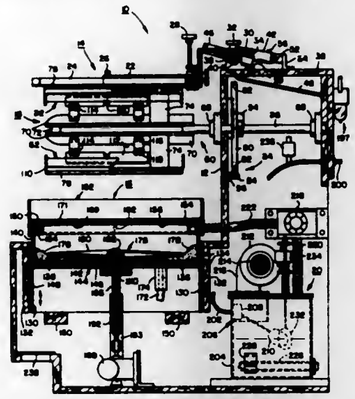
1. Apparatus for flocking a substrate comprising:

(a) a cabinet,

(b) a substrate holding turret apparatus,

(c) a screen holding apparatus located above the turret apparatus,

(d) a flock tray located between the turret apparatus and means for raising and lowering the flock tray,



(e) a high voltage electrode in the flock tray,

(f) means for energizing said electrode only after said flock tray has been raised to its up position adjacent said substrate holding turret apparatus.

4,075,974

APPARATUS FOR DEPOSITING UNIFORM FILMS

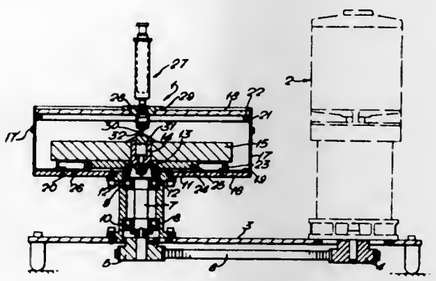
Graham Stuart Plows, Cambridge, and Paul Castle, Willingham, both of England, assignors to Decca Limited, London, England

Division of Ser. No. 586,632, June 13, 1975, abandoned. This application May 21, 1976, Ser. No. 688,562

Claims priority, application United Kingdom, Jun. 17, 1974, 26794/74

Int. Cl.² B05C *5/00, 11/08*

U.S. Cl. 118—52 **15 Claims**



1. Apparatus for forming a uniform film on a planar surface of a planar support the apparatus comprising a drivable turntable;

means for removably locating the planar support on the turntable;

a distributor, mounted for rotation with the turntable for distributing fluent material radially outwardly onto the planar surface of the planar support, the distributor having at least one portion extending axially from the turntable and defining a radially outwardly inclined conical surface for guiding the fluent material towards the planar surface;

a housing for enclosing the turntable and the support;

dispensing means defining an outlet for delivering a charge of fluent material to the distributor; and means for locating the dispensing means in the housing so that the outlet of the dispensing means is located over the distributor.

4,075,975

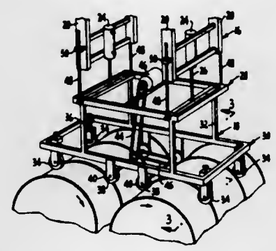
ROTATOR AND COATER SYSTEM FOR DRUM SHELLS

Donald E. Oswald, Foster City, Calif., assignor to Kaiser Steel Corporation, Oakland, Calif.

Filed Oct. 6, 1976, Ser. No. 730,028

Int. Cl.² B05B *13/06*

U.S. Cl. 118—318 **4 Claims**



1. Drum handling apparatus comprising roller support means for supporting a horizontally disposed drum for rotation, and drum rotator and hold-down means operable to rapidly rotate a drum on said support means while suppressing horizontal and vertical movement of said drum, said rotator and hold-down means comprising an overhead frame, means supporting said frame for guided, reciprocatable, vertical movement, power rollers and idler rollers carried by said frame, depending therefrom, and adapted to engage and rotate said drum when said frame is moved downwardly, power means to move said frame downwardly and press said power and idler rollers against said drum and to thereafter move said frame upwardly, and a motor mounted on said frame, movable therewith, and driveably connected to said power rollers.

4,075,976

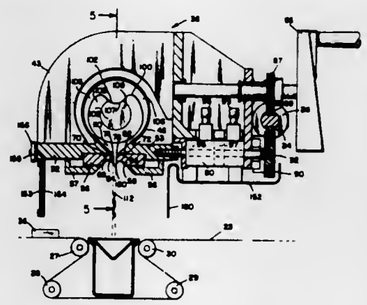
APPARATUS FOR CURTAIN COATING OBJECTS

A. Wiley Clayton, 1428 Maxwell Lane, Upland, Calif. 91786, assignor to A. Wiley Clayton, Upland, Calif.

Continuation-in-part of Ser. No. 448,017, Mar. 4, 1974, abandoned. This application Sep. 30, 1976, Ser. No. 728,336

Int. Cl.² B05C *5/00*

U.S. Cl. 118—324 **35 Claims**



1. A curtain coater for depositing material onto an object comprising:

a support;

a longitudinally split, resilient, tubular member;

a pair of knife members carried by said tubular member defining an orifice along the split, one of said knife members being attached to said support and the other knife member being movable to adjust the width of said orifice;

end closure means carried by said support and in engagement with each end of said tubular member in sealing relationship to form a chamber therein to contain coating material and to accommodate changes in the shape of said tubular member when the width of said orifice is adjusted, said end closure means each having a material passageway therethrough to said chamber, and comprising a cylinder attached to said support and having an orifice through its end, a movable piston having a tapered portion on one face in said cylinder, said piston and tapered portion having orifices coincident with said orifice in said cylinder to define said passageway, and means carried by said cylinder and piston for urging said piston to effect sealing between the piston face and an end of said tubular member around said tapered portion;

means for maintaining said chamber substantially full of the coating material to discharge through said orifice at a velocity to form a stable curtain of the material; and

means for conveying said object through said curtain at a velocity to deposit a layer of the material of predetermined thickness.

4,075,977

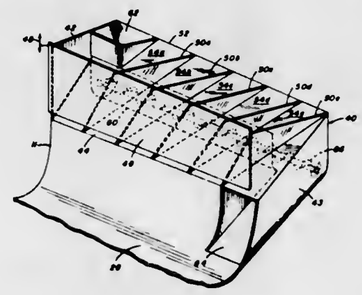
MIXING HOPPER FOR MAGNETIC BRUSH DEVELOPING APPARATUS

James Ora Williams, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 12, 1977, Ser. No. 758,539

Int. Cl.² G03G *15/09*

U.S. Cl. 118—658 **8 Claims**



1. In a developer station of an electrographic copier or the like having a developer roller adapted to provide developer material to a photoconductor member and a transport roller for conveying such material to the developer roller, the improvement comprising:

an elongate hopper, means in the hopper defining a series of discrete storage compartments, said compartments of the hopper each receiving through a top portion thereof developer material returned from the developer roller, said compartments all tapering downwardly in the same direction relative to a horizontal plane so that developer material therein is urged by gravity toward a lower portion of each of the compartments, means in the hopper for deflecting developer material laterally in said one direction as it moves through each of the compartments, and a single auger outside the compartments for moving developer material in the opposite direction.

4,075,978

APPARATUS FOR HEATING A CONTAMINATED FEEDWATER FOR STEAM FLOODING

Jan L. Friedrich, Pompton Plains, and Ronald L. Davies, Newton, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

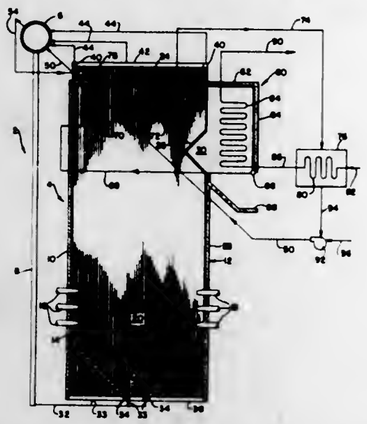
Filed Sep. 22, 1976, Ser. No. 725,616

Int. Cl.² F22B *1/08*; F22D *1/28*

U.S. Cl. 122—33 **8 Claims**

1. An apparatus for heating a fluid comprising a vapor generator including a furnace section for combusting a fuel and means to pass water in a heat exchange relation to said furnace

section to convert said water to steam; first heat exchange means disposed externally of said vapor generator in fluid flow communication with said furnace section for receiving said steam; said first heat exchange means including coil means through which said fluid is passed, said steam passing over said



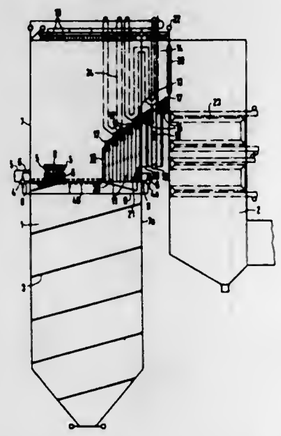
coil means to preheat said fluid; second heat exchange means disposed adjacent said furnace section for receiving the combustion gases from said furnace section; and means for passing said preheated fluid through said second heat exchange means to apply additional heat to said fluid.

4,075,979

ASSEMBLY OF A COMBUSTION CHAMBER NOSE IN A CONTINUOUS-FLOW BOILER HAVING A TWO-SECTION CONSTRUCTION WITH GAS-TIGHTLY WELDED WALLS

Rupprecht Michel, Erlangen, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Dec. 13, 1976, Ser. No. 750,163
Claims priority, application Germany, Dec. 19, 1975, 2557427
Int. Cl.² F22B *27/04, 29/06*
U.S. Cl. 122—235 A **3 Claims**



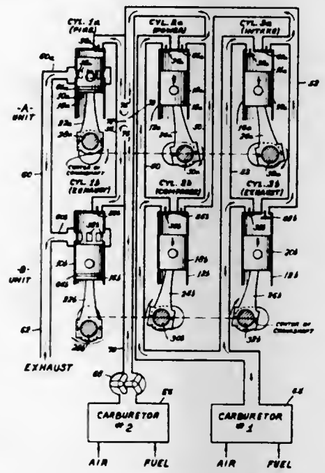
1. In a continuous-flow boiler having a two-section contruction with gas-tightly welded walls and having a structure forming a combustion-chamber nose disposed beneath a horizontal section connecting both sections of the two-section boiler and including combustion chamber walls formed of a helical winding made up of wound parallel tubes which terminate in transition headers located externally to the combustion chamber walls at a point of transition of the tubes into vertical-tube walls extending upwardly from the helical winding, the combustion-chamber nose having a forward edge and an upper nose incline extending for a given distance along the top of the helical winding toward a front wall of the combustion chamber walls, two of the transition headers being disposed respectively adjacent lateral walls of the combustion chamber and extending from the front wall and terminating at the forward edge of the combustion-chamber nose, the tubes of the helical winding, in the region of the nose, being bent upwardly unwelded, auxiliary headers being disposed in step-wise offset relationship to one another below the nose incline, and the upwardly bent tubes of the helical winding being connected to said auxiliary headers, the lateral walls of the combustion chamber above the nose incline being formed of tubes extending upwardly from said auxiliary headers.

4,075,980

MULTIPLE-CYCLE, PISTON-TYPE INTERNAL COMBUSTION ENGINE

Robert M. Anger, 3323 Konkle St., Kalamazoo, Mich. 49001

Filed Mar. 19, 1976, Ser. No. 668,476
Int. Cl.² F02B *75/20*
U.S. Cl. 123—1 R **15 Claims**



1. A multiple-cycle, piston-type internal combustion engine having a basic unit comprising two four-cycle cylinders operating 180° apart and one unit two-cycle cylinder firing 90° after the four-cycle cylinders, said cylinders having intake and exhaust port means, manifold means for channeling four-cycle exhaust gases directly to the unit two-cycle cylinder intake port means, and means for opening and closing the unit two-cycle intake and exhaust port means so correlated with the discharge of four-cycle exhaust from the four-cycle cylinders that expanded four-cycle exhaust can flow into said unit two-cycle cylinder without substantial back pressure.

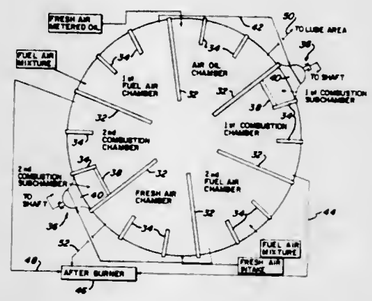
4,075,981

ROTARY INTERNAL COMBUSTION ENGINE

David L. Durst, Fort Collins, Colo., assignor to Duane Burton, Boulder, Colo.

Filed Apr. 15, 1976, Ser. No. 677,337
Int. Cl.² F02B *53/08*
U.S. Cl. 123—8.31 **14 Claims**

1. A rotary internal combustion engine comprising:
a. a housing including two confronting but spaced apart side casings having respective rotor support points in alignment with one another, said casings defining therebetween a plurality of chambers circumferentially spaced about said rotor support points, said chambers including
i. a fuel-air chamber,
ii. an air-oil chamber,
iii. an air chamber, and
iv. a fuel combustion chamber including therein an area for a fuel combustion sub-chamber;
b. a shaft located between said casings and extending from one of said support points to the other support point, said shaft being mounted for rotation about its longitudinal axis;
c. a rotor located between said side casings and fixed at its center to said shaft for rotation therewith, said rotor including a plurality of radially outwardly extending, circumferentially spaced lobes moveable through said chambers during rotation of said rotor;
d. a plurality of main vane mechanisms respectively positioned between said chambers and cooperating with said rotor and side casings for substantially fluid sealing said chambers from one another between said rotor and side casings, each of said mechanisms including
i. a pair of elongated side vanes located on opposite sides of said rotor and in slidable engagement therewith, said side vanes being mounted for movement towards said rotor, and
ii. a cross vane extending between and connected with said side vanes across the outer periphery of said rotor and moveable toward said outer periphery, and
iii. means for biasing said cross vane in slidable engagement with said outer periphery;
e. means for moving said vane mechanisms in a radially



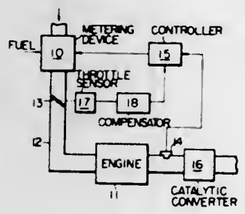
directed reciprocal fashion in synchronism with the rotation of said rotor so as to maintain said cross vanes in slidable engagement with the outer periphery of said rotor substantially continuously throughout the rotation of said rotor, said moving means including
i. a pair of substantially identical cam grooves located in opposite sides of said rotor in alignment with one another, said grooves being located inwardly of the outer periphery of said rotor and taking substantially the shape of said outer periphery, and
ii. a pair of side vane support grooves for each of said vane mechanisms, the side grooves of each pair being respectively located in said casings and facing said rotor, said side grooves extending radially outwardly from points adjacent said cam grooves to points adjacent the outer periphery of said rotor;
f. the side vanes of each vane mechanism being respectively located in a pair of said side grooves for radial movement therein, said side vanes including cam means located in said cam grooves so that during rotation of said rotor the interaction between said cam grooves and cam means causes said vane mechanisms to reciprocate radially in synchronism with said rotor to maintain said cross vane in engagement with the outer periphery of said rotor;
g. two pairs of sealing rings respectively located on opposite sides of said rotor between said rotor and said side casings and in sealing engagement with said rotor and casings, each pair of rings being comprised of an inner sealing ring located concentrically around said shaft radially inwardly of said cam grooves and an outer sealing ring located concentrically around said inner ring radially outwardly of said cam grooves, each pair of rings defining a circumferential oil receiving area therebetween;
h. means for delivering a predetermined mixture of fuel and air to said fuel-air chamber, said rotor, during rotation thereof, compressing said fuel and air mixture as one of the rotor lobes passes through the fuel-air chamber;
i. means for delivering said compressed mixture of fuel and air from said fuel-air chamber to said area in said combustion chamber, said last-mentioned means including
i. a passage extending from said fuel-air chamber to a point adjacent said combustion chamber, and
ii. a valve mechanism cooperating with said passage for metering a predetermined amount of said compressed mixture of fuel and air to said combustion chamber at predetermined points in time during rotation of said rotor, said valve mechanism including
a. a valve moveable between an opened position for allowing said compressed mixture to pass into said combustion chamber and a closed position for preventing said compressed mixture from passing to said combustion chamber, and
b. coupling means connected with said valve and cooperating with said rotating shaft so as to open and close said valve at predetermined times during the rotation of said shaft and said rotor;
j. means including said rotor for further compressing said compressed mixture of fuel and air in said area in said combustion chamber;
k. means for igniting said further compressed mixture within said combustion chamber to combust said mixture at a predetermined time during the rotation of said rotor so as to cause further rotation of said rotor, said combustion chamber cooperating with said compressed fuel-air chamber such that as said rotor rotates, the residue from the combustion of said fuel and air mixture passes into the overall combustion chamber;
l. passage means connected between said combustion chamber and a point outside the engine for directing said residue to said outside point;
m. means for delivering a predetermined mixture of air and oil to said air-oil chamber, said rotor, during rotation thereof, compressing said air and oil mixture as one of the rotor lobes passes through said air-oil chamber;
n. passage means connected between said air-oil chamber and said oil receiving areas defined by said sealing rings for directing said compressed mixture of air and oil from said air-oil chamber to said oil receiving areas, said mixture of air and oil entering said areas and passing up said side groove and into said cam grooves to provide lubrication between said cam means and said rotor and between said side vanes and said casings, said air and oil mixture in said side grooves also biasing said side vanes against said rotor;
o. said air chamber including air therein, said rotor, during rotation thereof, compressing said air as one of the rotor lobes passes through said air chamber; and
p. passage means connected between said air chamber and said outside point for delivering said compressed air from said air chamber to said outside point to mix with said residue.

4,075,982

CLOSED-LOOP MIXTURE CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE WITH MEANS FOR IMPROVING TRANSITIONAL RESPONSE WITH IMPROVED CHARACTERISTIC TO VARYING ENGINE PARAMETERS

Masaharu Asano, No. 964, Shimonagaya-cho, Yokohama, and Kokichi Ochiai, No. 2-8-2, Nishitomi, Fujisawa, both of Japan

Filed Apr. 20, 1976, Ser. No. 678,598
Claims priority, application Japan, Apr. 23, 1975, 50-48605
Int. Cl.[2] F02B *33/00, 3/00, 7/00*
U.S. Cl. 123—32 EH **6 Claims**



1. An air-fuel mixture control system for an internal combustion engine wherein an exhaust composition of the engine is detected for controlling the air-fuel ratio of the mixture through a feedback loop at a predetermined value, comprising:

means for detecting an operating parameter of the engine indicative of a rich mixture or a lean mixture transitory demand condition;

means for generating an error compensating signal including means for differentiating the output from said detecting means, a first delay network effective to extend the duration of an input signal applied thereto to shape the input signal into a signal waveform having exponential slopes, a second delay network effective to extend the duration of an input signal applied thereto to shape the input signal into a signal waveform having exponential slopes, first polarity sensitive means connected to the output of the differentiating means for passing signals of a first polarity to said first delay network, and a second polarity sensitive means connected to the output of the differentiating means for passing signals of a second polarity to said second delay network to produce alternatively at the output of said first and second networks an output signal to represent said error compensating signal; and

means for combining the error compensating signal with a control signal representing the detected exhaust composition.

4,075,983

ELECTRONIC CIRCUITRY FOR MAINTAINING CONSTANT ENGINE SPEED FUEL INJECTION

Harold R. Robinson, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 25, 1976, Ser. No. 717,724
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—32 EA **5 Claims**

1. A fuel injection control circuit for an internal combustion engine having ignition distributive means and comprising:

means connected to the output of the distributive means for generating a pulse signal having a frequency directly proportional to engine speed;

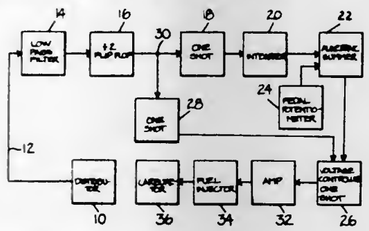
a first one shot multivibrator circuit responsive to the output of the generating means for regulating the pulse signal to ensure pulses of constant width;

means connected to the output of the first multivibrator circuit for integrating the output therefrom;

means responsive to an engine operator for producing a signal directly proportional to the position of an accelerator pedal;

means for algebraically summing the outputs of the integrating means and the operator responsive means for generating a control signal;

a voltage controlled one shot multivibrator circuit having a first triggering input furnished by a second one shot multivibrator circuit connected to the generating means output and a second input carrying the control signal for producing pulses having pulse width inversely proportional to the amplitude of the control signal; and



injection means connected to the output of the voltage controlled multivibrator circuit for fluidically delivering pulses of fuel corresponding to the output pulses from the voltage controlled multivibrator circuit;

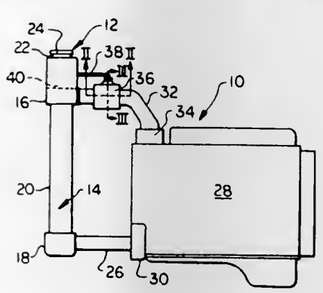
whereby the operating speed of the engine is maintained relatively constant.

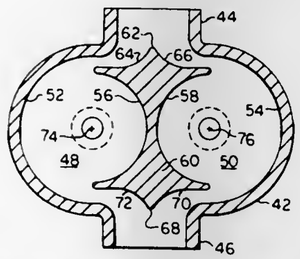
4,075,984

GAS-LIQUID SEPARATORS

Edwin M. Kirchgessner, Peoria, and Dennis G. Krohn, Pekin, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 13, 1976, Ser. No. 657,984
Int. Cl.[2] F01P *3/22*
U.S. Cl. 123—41.54 **6 Claims**





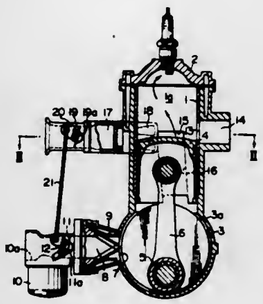
1. In an engine cooling system a liquid coolant fluid source, pump means for directing fluid from said coolant fluid source to an engine, heat exchanger means, conduit means for directing fluid from said engine to said heat exchanger means, said heat exchanger means serving to cool the fluid from said engine, conduit means further directing the fluid from said heat exchanger means to said coolant fluid source, centrifugal gas-liquid separator means in said conduit means for separating gas from the liquid of said coolant fluid by centrifugal action, and gas-liquid separator means comprising a body having an inlet and outlet, a pair of chambers within said body each in communication with said inlet and said outlet, said inlet and said outlet being aligned so as to define a straight line flow path therebetween, said chambers symmetrically placed on opposite sides of and equidistant from said straight line flow path and from said inlet and said outlet, each said chamber having semi-circular curved walls extending equal distances from said straight line flow path and defining a center of curvature on a radius from said curved walls and also defining a curved flow path for said coolant fluid entering the chamber from said inlet and exiting through said outlet whereby entrained gas in said coolant fluid is directed away from said curved walls and toward said center of curvature, said body including a divider portion therein on said straight line flow path and intermediate said chambers, and wherein said semi-circular curved walls are located on said body and on said divider portion, said divider portion further including symmetrical, generally wedge-shaped inlet and outlet portions adjacent said inlet and outlet, respectively, said wedge-shaped portions being located on said straight line flow path, whereby flow of fluid may be reversed from outlet to inlet without impairing the gas-liquid separator efficiency, and further including vent means for venting said entrained gas from said center of curvature.

4,075,985

TWO CYCLE INTERNAL COMBUSTION ENGINES

Tomio Iwai, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jun. 18, 1976, Ser. No. 697,681
Claims priority, application Japan, Jun. 20, 1975, 50-86128[U]; Jun. 20, 1975, 50-86129[U]
Int. Cl.[2] F02B *33/04*
U.S. Cl. 123—73 A **7 Claims**



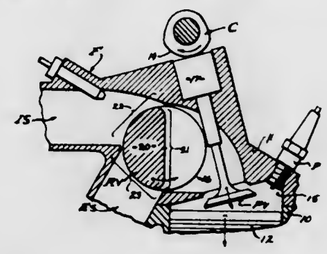
1. Two cycle internal combustion engine comprising cylinder means, piston means disposed for sliding movement in said cylinder means and defining combustion chamber means of variable volume in one end of said cylinder means, crankcase means provided at the other end of the cylinder means and defining therein crank-chamber means having a volume which varies in response to the sliding movement of the piston means, exhaust port means formed in said cylinder means and connected with exhaust passage means, scavenging port means formed in said cylinder means, scavenging passage means having one end connected with said scavenging port means and the other end with said crank-chamber means, air passage means communicating through check valve means with the scavenging passage means for providing supply of air thereto, intake passage means communicating with the crank-chamber means and having throttle valve means provided therein, control valve means provided in said air passage means, means for actuating the control valve means so that it is opened in accordance with engine load condition, and said control valve means is connected through mechanical connecting means with the throttle valve means so that the former is opened as the latter is opened.

4,075,986

ROTARY-POPPET VALVE INTERNAL COMBUSTION ENGINE

Mark Keck, 60 Argonne, Belmont Shores, Calif. 90803

Filed Jul. 12, 1976, Ser. No. 704,169
Int. Cl.[2] F01L *1/28*
U.S. Cl. 123—79 R **17 Claims**



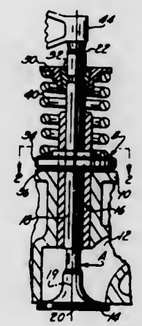
1. A four stroke internal combustion reciprocating piston and cylinder engine including; induction and exhaust stacks, blower means supplying air to said induction stack, a first valve means opening into the cylinder and controlling intake, compression, power and exhaust strokes thereof, and a second valve means opening sequentially (1) to divert induction air into the cylinder through said first valve means during the intake stroke, (2) to divert induction air into the exhaust stack during the compression and power strokes, and (3) to divert exhaust gases from cylinder and through said first valve means into the exhaust stack during the exhaust stroke, there being means for timing the said first and second valve means and for timed induction of fuel during the power stroke.

4,075,987

VALVE ROTATOR

Max J. Tauschek, South Euclid, and William A. Michaels, Seven Hills, both of Ohio, assignors to TRW Inc., Cleveland, Ohio

Filed Apr. 23, 1975, Ser. No. 570,749
Int. Cl.[2] F01L *1/32*
U.S. Cl. 123—90.3 **6 Claims**



1. A valve rotator comprising first and second parts movable relative to one another rotatably and axially, variable force applying means for applying a first and second force in a predetermined direction to move said parts toward one another, said second force having a magnitude substantially greater than the first force, shiftable elements positioned between said parts and engaged therewith and movable to relatively rotate said parts in response to axial movement of said parts toward each other, spring means acting on said shiftable elements and biasing the elements against movement due to axial movement of the parts toward each other, said spring means comprising means for applying a separating force through said shiftable elements to said parts which separating force is of a magnitude intermedi-

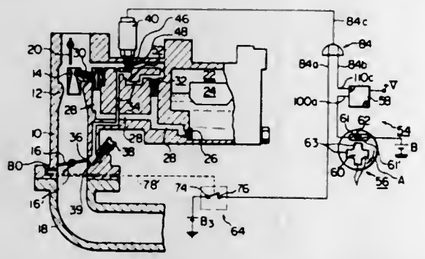
ate said first and second forces to move said parts axially away from one another, and rotation inhibiting means engagingly coacting between said parts and being completely separate from said spring means and said shiftable elements for inhibiting relative rotation between said parts in a direction opposite to said predetermined direction, said rotation inhibiting means being substantially ineffective to inhibit rotation between the parts in said predetermined direction.

4,075,988

APPARATUS FOR CONTROLLING SUPPLY OF FUEL TO INTERNAL COMBUSTION ENGINE

Takashi Kato, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Nov. 9, 1976, Ser. No. 740,221
Claims priority, application Japan, Jul. 22, 1976, 51-86499
Int. Cl.² F02O *11/10*; F02J *9/00, 33/02*
U.S. Cl. 123—97 B **3 Claims**



1. An apparatus for controlling the supply of fuel to an internal combustion engine provided with a carburetor which includes fuel passageway means adapted for communicating a fuel source with an intake system at a position located downstream of a throttle valve, said apparatus comprising:

valve means capable of opening and substantially closing said fuel passageway means;

means for sensing the engine during a running condition wherein the deceleration rate of the engine rotational speed is lower than a predetermined rate, while said throttle valve is substantially being closed, and;

means connected to said sensing means for operating said valve means so as to cause said fuel passageway means to be substantially closed while the engine is in said running condition in order to substantially stop the supply of fuel from said carburetor to said intake system.

4,075,989

METHOD FOR OPERATING 2-CYCLE INTERNAL COMBUSTION ENGINE

Masao Nagasawa, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

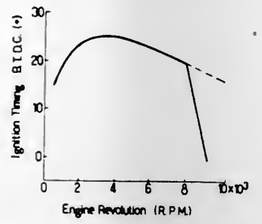
Continuation-in-part of Ser. No. 637,185, Dec. 3, 1975. This application Jun. 16, 1976, Ser. No. 696,848
Claims priority, application Japan, Dec. 9, 1974, 50-141928; Jan. 27, 1975, 50-12183; Mar. 5, 1975, 50-27492; Aug. 2, 1975, 50-107750; Jun. 28, 1975, 50-80418
Int. Cl.² F02P *5/04*
U.S. Cl. 123—117 R **4 Claims**

1. A method for operating a 2-cycle internal combustion engine having a combustion chamber comprising the steps of;

introducing an air-fuel mixture into said combustion chamber;

compressing the air-fuel mixture during the compression stroke of said engine;

igniting the compressed air-fuel mixture before said compression stroke ends, to thereby produce a power therein, the ignition timing for each igniting step being gradually advanced as the engine speed increases up to a set engine speed at which the engine can produce a maximum output power, the ignition timing being sharply and continuously



retarded as the engine speed increases above said set engine speed; and

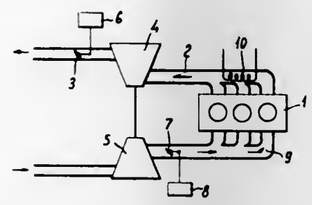
discharging the burnt gases.

4,075,990

DIESEL ENGINES

Jean Marie Ribeton, Mulhouse, France, assignor to Societe Alsa Clienne de Constructions Mecaniques de Mulhouse, France

Filed Jan. 28, 1975, Ser. No. 544,805
Claims priority, application France, Feb. 1, 1974, 74 03387
Int. Cl.² F02D *23/00*
U.S. Cl. 123—119 C **5 Claims**



1. A method of improving operating conditions, especially at starting and during low-load running, of a super-charged four-stroke Diesel engine in which the intake air pressure is normally higher than the pressure at the exhaust during the normal operating load of the Diesel engine and in which the intake air pressure is normally lower than the pressure at the exhaust during low loads of the Diesel engine, comprising keeping the exhaust valves open during more than the first half, but less than the second half of the intake stroke, and selectively increasing the difference in said intake and exhaust pressure existing on low loads to control the quantity of exhaust gases drawn from exhaust to the intake during the intake stroke.

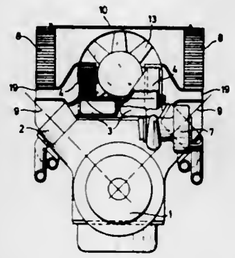
4,075,991

SUPERCHARGED WATER COOLED INTERNAL COMBUSTION ENGINE

Hermann Mettig, Rodenkirchen, and Bernhard Medenus, Bensberg-Lustheide, both of Germany, assignors to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Germany

Division of Ser. No. 501,214, Aug. 28, 1974, Pat. No. 3,976,041. This application May 26, 1976, Ser. No. 690,247
Claims priority, application Germany, Aug. 28, 1973, 2343300
Int. Cl.² F02B *29/04*
U.S. Cl. 123—119 CD **3 Claims**

2. A water cooled internal combustion engine having a central axis which includes: a cooling blower arranged at one end face of said engine, at least one water cooler extending alongside said engine and operatively connected to said cooling blower, a supercharger air cooler arranged underneath said water cooler and in parallel alignment with the central axis of said engine, and means for directing the cooling air delivered by said cooling blower so that said cooling air flows through said supercharger air cooler in a direction perpendicular to the central axis of said engine, said supercharger air cooler itself being provided with a gap forming an exit for the air to be discharged in one common direction from said supercharger air cooler and extending parallel to the path of the air to be discharged from said water cooler, cylinder rows in V-arrangement with one water cooler each over each of said cylinder rows, said water coolers and said supercharger air



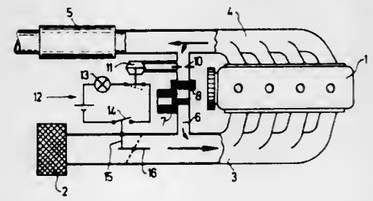
coolers being arranged to be passed through by air horizontally, said supercharger air coolers being arranged within that region of said water coolers which faces said engine and being located between said water coolers, said water coolers and said engine defining a gap therebetween, and each supercharger air cooler having an air discharge passage leading into said gap between said water coolers and said engine.

4,075,992

METHOD AND APPARATUS FOR REDUCING THE TOXIC COMPONENTS IN EXHAUST GAS

Ernst Linder, Muhlacker; Gunter Wossner, Esslingen; Helmut Maurer, Schwieberdingen, and Franz Rieger, Wasseralfingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 20, 1975, Ser. No. 560,555
Claims priority, application Germany, Mar. 27, 1974, 2414761
Int. Cl.² F02M *25/06*
U.S. Cl. 123—119 A **4 Claims**



1. An apparatus for exhaust gas detoxication, in an internal combustion engine which includes an induction tube, a throttle valve disposed therein, and an exhaust manifold, comprising:

(A) an exhaust gas recycle line, connected to establish flow communication between the exhaust manifold and the induction tube of the engine;

(B) valve means, disposed within said recycle line for controlling the gas flow therethrough;

(C) first orifice means, disposed within said recycle line between said valve means and the exhaust manifold;

(D) first pressure-sensitive switch means, communicating pneumatically with at least said recycle line to sense pressure conditions occurring in the vicinity of said first orifice means and near the connection of the exhaust gas recycling line to the exhaust manifold upstream of said first orifice means and occurring downstream of said first orifice means;

(E) warning signal means in circuit with said first switch means and influenced thereby, for producing a warning signal capable of being sensed and related to the gas flow in said recycle line; and

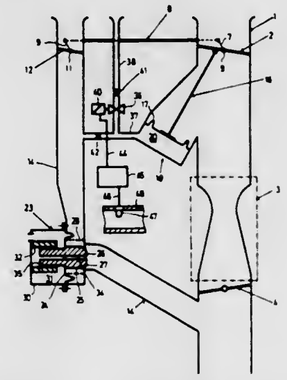
(F) second switch means, connected in electrical series with said warning signal means, actuated by the throttle valve of the engine.

4,075,993

FUEL MIXTURE CONTROL APPARATUS

Johannes-Gerhard Bertling, Vaihingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 24, 1976, Ser. No. 717,379
Claims priority, application Germany, Sep. 3, 1975, 2539099
Int. Cl.² F02M *23/00, 23/04, 11/02*
U.S. Cl. 123—119 EC **24 Claims**



2. In an apparatus for controlling the fuel mixture of an internal combustion engine, said engine including a fuel mixture generator and an air intake tube in which is disposed a throttle valve, the improvement comprising, in combination:

an air bypass conduit, terminating in said air intake tube downstream of said throttle valve for supplying supplementary air to said intake tube;

first flow control means, disposed within said bypass conduit, for adjusting the free flow cross section

an air flow rate meter, disposed in said air intake tube upstream of said mixture generator and including a movable air flow control element, actuated by the difference between a reference pressure and the pressure downstream of said air flow rate meter and coupled to said first flow control means for simultaneous actuation of said meter and said first flow control means;

a pressure control valve disposed in said air bypass line downstream of said first flow control means;

a connecting line for establishing communication between a region of said air bypass conduit defined by lying upstream of said pressure control valve and by lying downstream of said first flow control means and said air flow rate meter to provide a reference pressure therefor;

a source of constant pressure, connected to said air flow rate meter; and

adjustable valve means associated with said source of constant pressure for changing said reference pressure.

4,075,994

INTERNAL COMBUSTION ENGINE OPERATION UTILIZING EXHAUST GAS RECIRCULATION

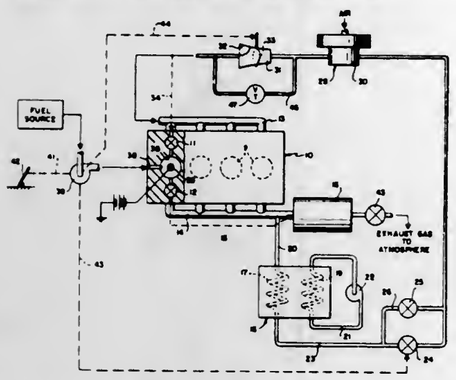
Edward A. Mayer, Newburgh, and Donald W. Plungis, Fishkill, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 533,588, Dec. 17, 1974, Pat. No. 4,011,845, which is a continuation of Ser. No. 295,064, June 2, 1972, abandoned. This application Sep. 27, 1976, Ser. No. 726,718
Int. Cl.² F02M *25/06*
U.S. Cl. 123—119 A **7 Claims**

1. Method for operating an internal combustion engine having a combustion chamber including intake and exhaust valves,

in which a hydrocarbon fuel is admixed with a combustion supporting gas to form a combustible mixture, the ignition and burning of which combustible mixture produces a hot exhaust gas stream containing a portion of NO_x, which method reduces the NO_x content within the exhaust gas emitted from said engine and comprises the steps of;

(a) forming a preliminary combustion supporting gaseous mixture, comprising a major portion of air, together with a minor portion of said hot exhaust gas stream,



(b) introducing said preliminary air-exhaust gas mixture into said combustion chamber whereby to intermix with said hydrocarbon fuel in said combustion chamber, and to render at least a segment of said air-exhaust gas preliminary mixture combustible,

(c) igniting said combustible mixture within said chamber, and

(d) segregating a portion of the hot exhaust gas thereby created, to form said preliminary combustion supporting mixture.

4,075,995

FUEL INJECTION SYSTEM

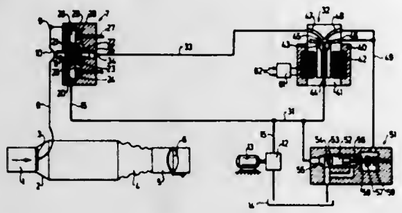
Manfred Krämer, Schwieberdingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 20, 1976, Ser. No. 650,735

Claims priority, application Germany, Jan. 21, 1975, 2502153

Int. Cl.² F02M *69/00*

U.S. Cl. 123—139 AW **5 Claims**



1. A fuel injection system for an internal combustion engine, said engine including a fuel tank, an air induction tube containing an air flow rate meter and a throttle valve and transducer means for generating signal related to engine conditions, said fuel injection system including a source of pressurized control fluid and fuel metering means incorporating a control slide which is displaced in one sense by said air flow rate meter and which is urged in the opposite, return, sense by control fluid, the improvement comprising:

an electromagnetic fluid pressure modulator, having a housing and an outlet connected to said control slide for exerting variable pressure on said control fluid, said pressure modulator having internal fluid compartments in said housing and including electromagnetically actuated means for adjusting the spatial direction of the flow of fluid selectively within said compartments and toward said outlet to thereby determine the static pressure at said outlet and at said control slide, said modulator being connected to said transducer means to receive said signals related to engine conditions.

4,075,996

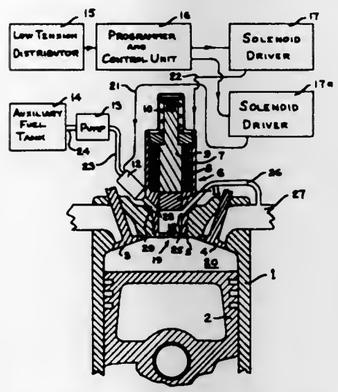
EXTERNAL COMPRESSION IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Charles A. Hisserich, 447 Cabrillo St., Costa Mesa, Calif. 92627

Filed Jan. 5, 1976, Ser. No. 646,569

Int. Cl.² F02P *21/00*

U.S. Cl. 123—143 A **11 Claims**



1. An internal combustion engine comprising a main combustion chamber, means to supply a main charge of a lean fuel-air mixture thereto, and

an ignition system comprising

an igniter, a source of auxiliary igniter fuel and air, feed means to feed an igniter charge thereof to said igniter, and control means connected to said feed means and igniter;

said igniter comprising

a small cylinder-like igniter chamber, a piston-like ram slidable therein to reduce its volume by a large factor,

a permanently-open orifice extending from a bottom orifice end of said igniter chamber directly into said main combustion chamber and having a diameter greater than about one-third its length,

and electromagnetic ram driving means disposed to drive said ram rapidly down to said bottom orifice end in less than about three milliseconds to compress said igniter charge adiabatically to ignition temperature to form a jet of flame spurting out through said orifice to ignite said main charge.

4,075,997

SPARK IGNITION SYSTEMS FOR INTERNAL COMBUSTION ENGINES

William Frank Hill, Stafford, England, assignor to Lucas Electrical Co., Limited, Birmingham, England

Continuation of Ser. No. 515,067, Oct. 15, 1974, abandoned. This application Jun. 1, 1976, Ser. No. 691,439

Claims priority, application United Kingdom, Oct. 19, 1973, 48845/73

Int. Cl.² F02P *1/02*

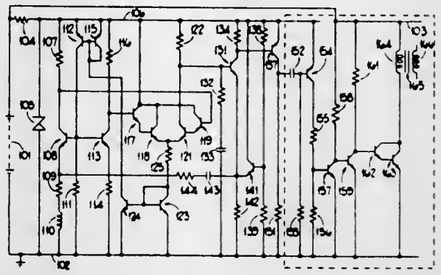
U.S. Cl. 123—148 E **4 Claims**

1. A spark ignition system for an internal combustion engine comprising:

a variable reluctance pick-up for producing output pulses which change in polarity when sparks are to be produced;

a spark circuit operated by said output pulses; and

control means for coupling said variable reluctance pick-up to said spark circuit, said means including an operational amplifier, an input resistor, connecting said pick-up directly to said amplifier input, and an AC negative feedback path comprising a resistor and a capacitor in series between the output and input of the operational amplifier, such that each pulse from said pick-up drives the amplifier



relatively slowly into saturation when the pick-up pulse is of one polarity and drives the amplifier relatively quickly out of saturation when the pulse changes polarity, said spark circuit operating to produce a spark when said amplifier is driven out of saturation.

4,075,998

ELECTRICAL ON-OFF-STARTING OPERATION CONTROL SYSTEM FOR ENGINES REQUIRING PRE-HEAT TIME, SUCH AS AUTOMOTIVE DIESEL ENGINES

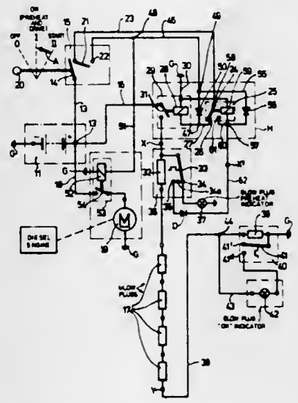
Heinz Krauss, Stuttgart; Gunther Kauhl, Asperg, and Leo Steinke, Waiblingen-Hegnach, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 4, 1977, Ser. No. 765,832

Claims priority, application Germany, Mar. 19, 1976, 2611594

Int. Cl.² F02N *17/00*

U.S. Cl. 123—179 H **10 Claims**



1. Electrical ON-OFF-START operation control system for engines requiring a pre-heat time before starting, such as automotive-type Diesel engines having

a source of electrical power (11, 12);

a starter motor (M-19); and a starter switch means (18, 52, 53, 54) therefor selectively connecting the motor (19) to the source;

a manually operable control switch (15, 20) having the positions, in sequence; OFF (O); ON (I); START (II); and corresponding ON (21) and START (22) terminals and a movable switch member (14) connected to said source;

a glow plug energization circuit (X-17-38-G) including at least one glow plug (17) and a heating element (32) — temperature sensitive switch (36) in heat transfer relation to the heating element (32);

wherein, in accordance with the invention,

the START position of the control switch (15) is unstable and includes means (A) biassing the switch to return to the ON position upon release of manual operation after having moved the switch through the ON position to the START position,

said switch being connected to form in the single ON position simultaneously a pre-heat connection for the glow plug or glow plugs;

and wherein the system further comprises

a first relay (29) having its relay terminals and switch element (31) selectively connecting the glow plugs (17) directly to the source (11);

a second relay (25) having transfer terminals (24-26; 24-61), one set (24-61) of which is connected in a self-holding circuit;

the coil (28) of the first relay (29) being connected (30-28-27-23) through the other set of transfer contacts (26-24) of the second relay (25);

a start control circuit (46-48-51) connecting said START terminal (22) of the switch (15) to the starter switch means (18, 52, 53, 54);

an energizing junction (57) connected to the coil (59) of the second relay (25) which, when energized, provides energization to the coil;

a diode (56) connecting (46-55) said START terminal (22) of the control switch (15) to the energizing junction (57);

and a further diode (50) connecting (46-49-47) said START terminal (22) of the control switch (15) to the coil (28) of the first relay (29).

whereby said further diode (50) and the connection thereof to the START terminal will be in parallel with the connection of the coil (28) of the first relay (29) through the other set (24-26) of the transfer contacts of the second relay (25),

said diodes (56, 50) being poled in conductive direction with respect to said source;

said energizing junction (57) being further connected (60) to said one set of transfer contacts (24, 61) of said second relay (25) to form said self-holding circuit, and being additionally connected (X', 62) to said temperature sensitive switch (33, 36) to be energized thereby when the temperature to which said switch is exposed is above a predetermined level to provide energization current to the junction (57) and hence to the second relay (25) when the temperature as sensed by said temperature sensitive switch (36) is indicated to be adequate to permit starting and operation of the engine.

4,075,999

HARD FACING ALLOY FOR ENGINE VALVES AND THE LIKE

Louis J. Danis, Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

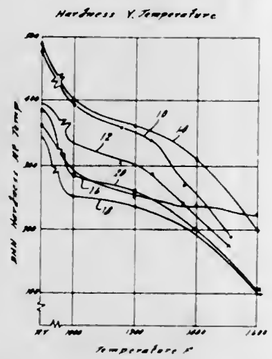
Filed Jun. 9, 1975, Ser. No. 585,272

Int. Cl.² F02B *19/00*; F01L *3/04*; B32B *15/04*

U.S. Cl. 123—191 A **7 Claims**

1. An article of manufacture comprising an internal combustion engine component having a portion which is simultaneously subjected to abrasive wear and combustion oxide induced corrosion at elevated temperatures and having said portion coated with a nickel based alloy consisting essentially of: about 1.0 to 3.5 percent by weight carbon, about 25 to 40

percent by weight cromium, about 3 to 12 percent by weight molybdenum, and about 40 to 70 percent by weight nickel.



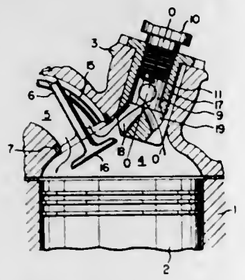
4. The structural element of claim 1 where said engine component is a precombustion chamber for an internal combustion engine.

4,076,000

INTERNAL COMBUSTION ENGINE HAVING AN AUXILIARY COMBUSTION CHAMBER WITHOUT AN INTAKE VALVE

Kenji Goto, and Takao Tate, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 15, 1976, Ser. No. 677,288
Int. Cl. F02b *23/00*
U.S. Cl. 123—191 S **15 Claims**



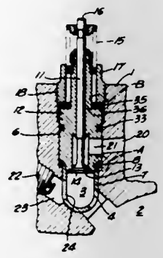
1. An internal combustion engine having an auxiliary combustion chamber without an intake valve comprising:
a cylinder;
a cylinder head;
a piston in said cylinder;
means defining an intake port in said cylinder head;
said piston, said cylinder, and said cylinder head defining a main combustion chamber;
said intake port opening into said main combustion chamber;
an intake valve, having a disc portion, operatively associated with said intake port;
means, having an interior wall, defining an auxiliary combustion chamber, having no intake valve, positioned adjacent said intake port;
an ignition plug having an electrode within said auxiliary combustion chamber; and
means defining a plurality of passage means fluidly intercommunicating said main combustion chamber and said auxiliary combustion chamber, a first one of said passage means opening toward a stream of sucked gas deflected by the disc portion of said intake valve in said main combustion chamber, with the direction of flow therein intersecting at an acute angle with the interior wall of the means defining the auxiliary combustion chamber lying symmetrical with respect to a central longitudinal axis thereof, a second one of said passage means opening at a position remote from the intake valve, the central axis of the second passage means being not in a plane containing the central axis of the first passage means whereby the interior of the auxiliary combustion chamber is loop-scavenged.

4,076,001

PRECHAMBER MOUNTING FOR INTERNAL COMBUSTION ENGINE

Tadashi Kuno, Kamifukuoka; Akihiko Abe, Kurume, and Akito Shoji, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 16, 1976, Ser. No. 696,827
Claims priority, application Japan, Jun. 30, 1975, 50-92063
Int. Cl.² F02B *23/00*; F16J *15/00*
U.S. Cl. 123—191 S **4 Claims**



1. In an internal combustion engine having a stationary member, a portion of said member forming one wall of a main combustion chamber, said member having a bore provided with a first annular shoulder, a liner insertable into said bore, said liner having an outward extending radial end flange overlying said shoulder, said liner defining an auxiliary combustion chamber therein and having an opening in one wall thereof, said opening forming a flame passage connecting said chambers, a valve guide insertable into said bore and having a second shoulder overlying said end flange, a poppet valve slidably guided on said valve guide and adapted to close against a seat formed at one end thereof, a first seal ring positioned between said first shoulder and said end flange, and a second seal ring positioned between said end flange and said second shoulder, the improvement comprising, in combination: said end flange having a radially extending stepped surface on the upper surface thereof, said second shoulder having a radially extending stepped surface, said second seal ring having radially extending stepped surfaces shaped to interfit and cooperate with said stepped surfaces of said end flange and said second shoulder, a Belleville spring encircling a portion of said valve guide, and a nut in threaded engagement with said member acting on said Belleville spring to place both of said seal rings under compression.

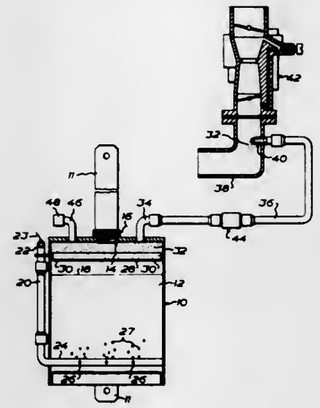
4,076,002

APPARATUS FOR THE SUPPLY OF LIQUIDS IN FINELY-DIVIDED FORM TO AN INTERNAL COMBUSTION ENGINE

Allan Mellqvist, Balzarsgatan 8, 211 36 Malmo, and Thorild Nils Kristian Ewald Anderberg, Papegojvagen 3, 230 11 Falsterbo, both of Sweden

Filed Apr. 16, 1976, Ser. No. 677,847
Claims priority, application Sweden, Apr. 18, 1975, 7504498
Int. Cl.² F02B *47/02*
U.S. Cl. 123—198 A **1 Claim**

1. In an apparatus for supplying liquid in finely divided form to an internal combustion engine, said apparatus being of the type including a closed container having therein liquid, apertured distribution means in a lower region of said container for introducing air into said liquid in said container, whereby said air passes upwardly through said liquid and is moistened thereby, said air entraining therein said liquid in finely divided form, and conduit means having a first end connected to said container at the upper end thereof and a second end discharging into the intake manifold of an internal combustion engine for conveying entrained liquid to said engine, the improvement comprising:
baffle means, fixedly positioned within said container at a position adjacent a maximum upper level of said liquid, for dividing said air and lengthening the flow path thereof



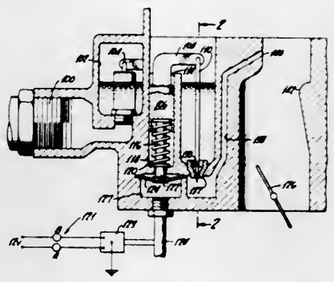
through said liquid, said baffle means comprising a plate extending across the entire cross-sectional area of said container, said plate having elongated slits therein at positions adjacent the outer periphery thereof, the remaining area of said plate being impervious to the passage therethrough of said air, whereby the positions of said elongated slits cause said flow path of said air through said liquid to be lengthened, thus maximizing the effective entrainment of said liquid by said air, and whereby the dimensions of said slits cause said air to be divided.

4,076,003

SPLIT ENGINE VACUUM CONTROL FUEL METERING SYSTEM

Arthur Garabedian, Fullerton, Calif., assignor to Dudley B. Frank, Santa Ana, Calif.

Filed Nov. 5, 1975, Ser. No. 629,178
Int. Cl.² F02D *17/00*
U.S. Cl. 123—198 F **7 Claims**



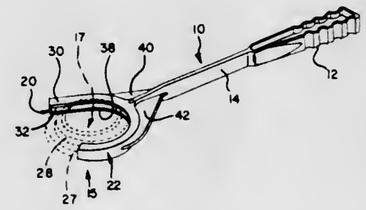
1. A split engine carburetor for independently controlling the flow of fuel to respective halves of the number of an engine's cylinders, said carburetor comprising:
a first fuel path located in said carburetor;
a second fuel path located in said carburetor, said first fuel path in fluid communication with one-half of said cylinders, said second fuel path in fluid communication with the other half of said cylinders;
valving means for controlling the flow of fuel through said second fuel path to said other half of said cylinders, said valving means in fluid communication with an intake manifold of said one-half of said cylinders;
means connected to said valving means for biasing said valving means toward an open position; and
means connected to said valving means and responsive to a specified vacuum in said intake manifold for moving said valving means toward a closed position, said engine operating on only said one-half of said cylinders when said vacuum in said manifold is above said specified level by closing said valving means and preventing said fuel flow to said other half of said cylinders.

4,076,004

HAND LAUNCHER FOR CLAY PIGEONS

Urban A. Huelskamp, Dayton, Ohio, assignor to MTM Molded Products Co., Dayton, Ohio

Filed Jan. 13, 1977, Ser. No. 759,235
Int. Cl.² F41B *5/00*
U.S. Cl. 124—5 **3 Claims**



1. A unitary hand launcher for clay pigeons formed of a single piece of resilient material, comprising:
a. a handle portion,
b. a flexible neck portion extending from said handle portion,
c. a head portion extending from said neck portion on the end of said launcher opposite said handle portion, said head portion including:
i. a trailing arm extending outwardly and laterally away from said neck portion, the end of said trailing arm opposite said neck portion being substantially straight,
ii. a substantially curved leading arm extending outwardly and laterally from said neck portion opposite said trailing arm, said arms being shaped to define a substantially circular opening therebetween having a diameter substantially the same as the outermost diameter of a pigeon, for receiving a pigeon within said opening,
iii. upper and lower opposed flanges which are substantially symmetrical with respect to one another and extend inwardly from the upper and lower edges of said leading and trailing arms to reinforce said arms, and are spaced to define a channel for receiving the outermost rim of the pigeon therein, said arms defining the base of said channel, said flanges defining the sides thereof, and said arms and flanges being shaped to surround more than 50% of the perimeter of the pigeon when fully seated within said channel,
iv. said flanges also being sized to define an opening between the arms having a diameter less than the outermost diameter of the pigeon and greater than the diameter of any rims on the pigeon located inwardly from the outermost edge of the pigeon, to receive a pigeon individually in said channel and to cause a pigeon to contact said head portion of the launcher along only the base and sides of the channel and to be substantially free of contact with the inner edges of the flanges,
d. leading and trailing reinforcement webs extending respectively between and attached substantially rigidly to said leading and trailing arms and said neck portion to rigidify and substantially immobilize at least the portions of said

arms adjacent said neck portion, the remainder of said arms and flanges being sufficiently resiliently flexible to be pried apart at their outer ends for insertion and ejection of a clay pigeon into and from said openings, and

e. said channel accepting a pigeon therein equally well in upright or inverted positions to provide for inverting the hand launcher for launching a clay pigeon equally well with either the right or left hand.

4,076,005

ARCHERY BOW

James H. Hill, 995 W. 100 South, Provo, Utah 84601

Filed Aug. 2, 1976, Ser. No. 710,432
Int. Cl.² F41B *5/00*
U.S. Cl. 124—24 R **15 Claims**



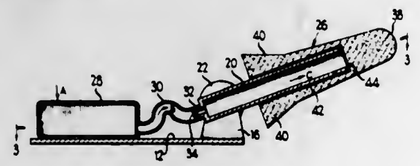
1. A foldable archery bow comprising a pair of limbs and hinge means connecting the bow limbs together in end-to-end relationship for pivotal movement about an axis adjacent the back of the bow and transverse to the direction of the draw of the bow, wherein the interconnected, corresponding end portions of the bow limbs are enlarged with respect to the remainder of said limbs so as to form a handle portion of the bow; the handle end portion of each bow limb has a passageway therethrough extending from the bellyside to the backside thereof; at least one of the bow limbs has a pulley positioned at the tip end of the limb, said pulley having its axis transverse to the plane of the bow; and a bowstring is provided, extending from the tip end of the other bow limb to and around the pulley at the tip end of the first bow limb, through the passageway in the handle end portion of said first bow limb to the backside of the bow, then through the passageway in the handle end portion of said other bow limb, and to its origin at the end of said other bow limb, whereby the bow limbs can be rotated from their aligned, operable position to a folded position in which said limbs are adjacent each other with the backs thereof facing each other.

4,076,006

TOY ROCKET WITH PNEUMATIC LAUNCHER

Jeffrey D. Breslow, Highland Park, and Eugene Jaworski, Park Ridge, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Continuation-in-part of Ser. No. 623,756, Oct. 20, 1975, abandoned. This application Jul. 29, 1976, Ser. No. 709,651
Int. Cl.² F41B *11/00*
U.S. Cl. 124—64 **4 Claims**



1. A toy rocket, comprising:

launching means including a base portion for positioning on a suitable supporting surface, a hollow cylindrical, elongated launching tube for holding a projectile before launching, said launching tube being pivotally mounted to the base portion by a trunion shaft formed integrally with said launching tube including at least one enlarged end providing a thumbwheel handle to facilitate manual pivoting of the launching tube relative to the base portion, means removably mounting said trunion shaft comprising an arcuate surface for engaging said shaft and providing a snap-fit therewith for frictionally maintaining the shaft therein at any predetermined angle and a generally rectangular, molded, flexible air impact bulb having a conduit in communication with said launching tube, said bulb being positioned on top of said base and adapted to withstand sudden impact by a user whereby the resultant compressed air is transmitted from the bulb through the launching tube; and

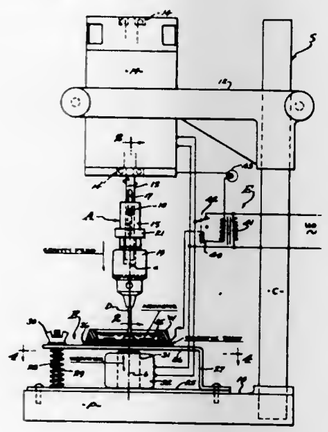
a projectile having a receiving means therein positionable over said launching tube to receive the impact of said compressed air, the exterior of said projectile being generally cylindrical having integrally formed outwardly protruding longitudinal fins at one end thereof, and being fabricated of low density, soft, porous material, said receiving means comprising a cylindrical liner of rigid impervious, relatively higher density material secured to the interior of said projectile for adding mass to the projectile for flight and to prevent leakage of said compressed air therethrough, said liner having an internal diameter approximately equal to the outer diameter of said launching tube for mounting thereon.

4,076,007

GEMSTONE DRILL

Eugene E. Redlin, 10764 Freer St., Temple City, Calif. 91780

Filed Mar. 29, 1976, Ser. No. 671,056
Int. Cl.² B28D *5/00*
U.S. Cl. 125—30 R **5 Claims**



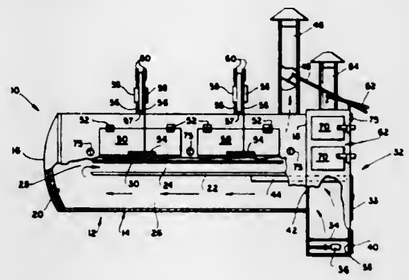
1. In combination, a platform with a stand projecting vertically therefrom, an abrasive drill assembly carried by the stand and depressible by gravity on a vertically disposed rotational cutting axis into engagement with a work piece cutting zone, and a vibrating support means carried by the platform and supporting the work piece for vertical excursions in alignment with said cutting axis and periodically engaging the said depressible abrasive drill assembly, said vibrating support means comprising a caliper-shaped body fixed to said platform by a lower arm thereof and with an upper arm thereof carrying the work piece underlying said cutting zone, there being spring means lifting the said upper arm and adjustment means restricting lifting thereof, whereby the vibratory lift means alternately lifts and supports the work piece and the drill assembly engaged thereon by means of excursions aligned with the rotational axis.

4,076,008

BARBECUE APPARATUS AND METHOD

Guy W. Deaton, 6393 Walker Road, Riverdale, Ga. 30296

Filed Sep. 27, 1976, Ser. No. 726,767
Int. Cl.² A47J *37/07*
U.S. Cl. 126—25 R **6 Claims**



1. A barbeque oven comprising:

a horizontally disposed elongate housing having two enclosed ends;

a heat conductive baffle positioned within said housing to divide said housing into an upper portion and a lower portion which communicate by a passageway adjacent one of said enclosed ends;

a firebox in communication with said lower portion adjacent the other of said enclosed ends;

a flue means in communication with said upper portion adjacent said other of said enclosed ends; and

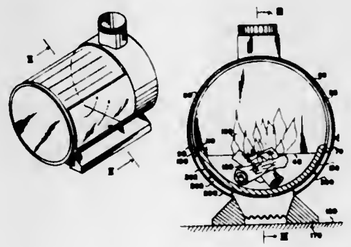
an insulating means positioned in said lower portion adjacent said other of said enclosed ends and in a position to reduce the direct transfer of heat from said firebox through said baffle into said upper portion by an amount sufficient for said upper portion to be of a substantially uniform temperature along its length in response to the flow of combustion gases from said firebox through said lower portion, said passageway and said upper portion into said flue means.

4,076,009

FIREPLACE

Harold W. Hannebaum, Bellevue, Id., assignor to The Raymond Lee Organization, Inc., a part interest

Continuation-in-part of Ser. No. 580,808, May 27, 1975, Pat. No. 3,986,488. This application Jun. 21, 1976, Ser. No. 698,257
Int. Cl.² F24B *1/02*
U.S. Cl. 126—120 **5 Claims**



1. A fireplace, comprising:

a hollow, generally cylindrical casing with horizontal axis and with closed ends and having two parallel elongated horizontal air intake slits parallel to the axis, said slits extending rearwardly along the curved surface of the casing to an end point intermediate the ends of the casing;

a base having a top section in the form of a horizontally elongated hollow bottom half cylinder provided with means for receiving and supporting the bottom portion of said casing, thereby forming a space between said section and said bottom portion which communicates with said slits, said base having a hollow vertical air intake duct connected between a bottom air intake opening in the base and said space to feed air from the outside of the base into the interior of the casing, said base supporting the casing upon a horizontal surface; and

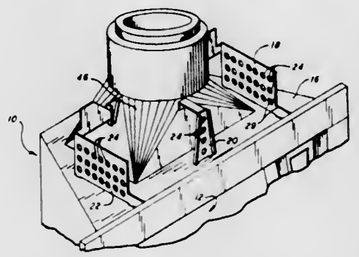
a vertical partition placed at the endpoint and dividing the casing into a fire chamber and an exhaust chamber, the partition restricting all communication between the chambers to an opening between the casing and the bottom of the partition.

4,076,010

FACTORY-BUILT FIREPLACE SPACER CONSTRUCTION

George M. Andrews, Syracuse, N.Y., assignor to Vega Industries, Inc., Syracuse, N.Y.

Continuation of Ser. No. 597,394, Jul. 18, 1975, abandoned. This application Nov. 8, 1976, Ser. No. 739,442
Int. Cl.² F24B *1/18*
U.S. Cl. 126—120 **10 Claims**



1. A factory built fireplace unit for enclosure by combustible framing members and having integral means for insuring minimum clearance distance between an exterior surface of said unit and said framing members, said unit comprising, in combination:

(a) a fireplace unit having an outer shell of sheet metal defining the exterior surface thereof; and

(b) a rigid, plate-like spacer member having a straight edge portion and associated with said outer shell for movement with respect thereto about an axis substantially in the plane of said shell between a folded position, wherein no portion of said spacer member extends an appreciable distance beyond said external surface, and an erected position, wherein said edge portion is arranged at a distance from said external surface at least equal to said minimum clearance distance.

4,076,011

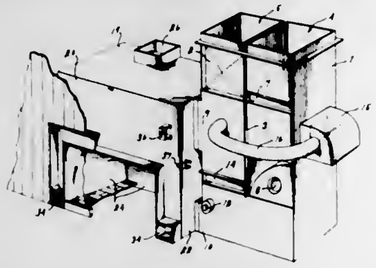
WARM AIR HEATING AND FIRE-PLACE SYSTEM

Roger Proulx, 383 Laurier Street, Otterburn Park, Rouville, Canada

Filed Jun. 21, 1976, Ser. No. 697,955
Int. Cl.² F24B *7/02*
U.S. Cl. 126—121 **4 Claims**

1. A warm air heating and fire-place system comprising, in combination, an open hearth jacketed fire-place opened at the front and including an outer casing and an inner wood-burning chamber separated from the outer casing by an air heating space, a bonnet upstanding from, and in communication with, the top of said chamber at its lower end, extending through said heating space and adapted to communicate with a smoke stack at its upper end, said outer casing having a side wall provided with a lower air inlet and an upper air outlet, and an auxiliary air heating assembly comprising an air plenum housing disposed adjacent said side wall of said outer casing and having a lateral outlet communicating with said lower air inlet

of said outer casing, first and second upright air conduits disposed side by side on top of said air plenum housing and having lower ends in direct communication with said air plenum housing, said second upright air conduit being disposed adjacent said side wall of said housing and said first upright conduit being disposed in the opposite side of said second upright air conduit with respect to said outer casing, said outer casing, air plenum housing and first and second upright air conduits being in general alignment, said first and second upright air conduits having top ends adapted to be connected to the return air conduit network and the warm air conduit network, respectively of a house to be heated, said second upright air conduit having a lateral opening spaced upwardly from the lateral opening of said air plenum housing and in direct communication with said upper air outlet of said outer casing, a motor-operated air blower located within said first upright air conduit to circulate air downwardly within said first upright air conduit from its top ends towards said air plenum housing and from said air plenum housing either through said air heating space within said outer casing and then to issue through the



open top end of said second upright air conduit or directly from said air plenum housing through said second upright air conduit to its open top end, an electric heating element mounted within the assembly of said first and second upright air conduits and said air plenum housing, downstream from said air blower, and valve means mounted within said assembly and operable to take a first limit position in which said valve means block air circulation through said air heating space within said outer casing, while they allow direct air circulation frm said air plenum housing upwardly through said second upright air conduit and a second limit position in which said valve means block air circulation from said air plenum housing through said second upright air conduit, while they allow air circulation from said air plenum housing through said air heating space of said outer casing and back into said second upright air conduit through said upper air outlet of said outer casing, so arranged that, when said electric heating element is operating, air heated thereby can flow directly from said first to said second upright air conduit without circulating through said outer space where the heated air would lose heat in heat exchange with said inner chamber.

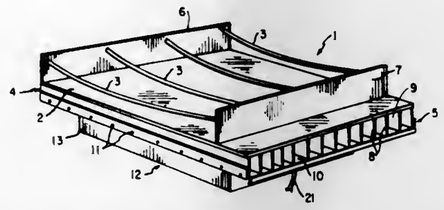
4,076,012
FIREPLACE GRATE
John G. Meeker, Deansbridge Road, Somers, N.Y. 10589
Filed Oct. 30, 1975, Ser. No. 627,184
Int. Cl.² F23H *13/00*
U.S. Cl. 126—164 **21 Claims**

1. A fireplace grate for holding logs in a fireplace located in a room of a building and having a back adapted to be disposed along the back of the fireplace and a front adapted to face the front of the fireplace, said grate comprising:

a. support means for supporting burning logs and accompanying ashes and hot embers and for transferring heat to air passageway means disposed therebelow, said support means having a lateral extent about the same as the length of logs to be supported and comprising a support plate for supporting said ashes and hot embers;

b. a plurality of spaced heat transfer fins depending from said support plate into said air passageway means, said fins extending from the back of said grate to the front of said grate to define separate air subpassageways;

c. air passageway means bounded at the top by said support plate, bounded on the bottom by a second plate generally co-extensive with said support plate, and having air inlet means connected thereto at the back of said grate and having air outlet means near the front of said grate extend-

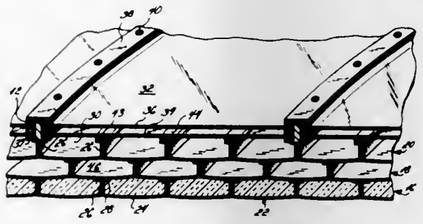


ing across substantially the entire lateral extent of said support means;

d. fan means for forcing air into said air inlet means, through said air passageway means and out said air outlet means into said room; and

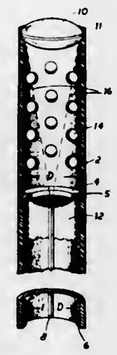
e. base means disposed beneath said air passageway means for supporting said grate in said fireplace with said air passageway means spaced above the floor of said fireplace.

4,076,013
SOLAR HEATING SYSTEM
Joseph A. Bette, Southbury, Conn., assignor to Universal Construction Industries, Inc., Southbury, Conn.
Filed Mar. 11, 1976, Ser. No. 666,010
Int. Cl.² F24J *3/02;* **E04C** *1/00;* **F24H** *7/00*
U.S. Cl. 126—270 **9 Claims**



1. A solar heating system for use in a building comprising a self supporting stressed skin roof structure including three layers of longitudinally extended channel shaped beam members wherein each beam member is generally U-shaped in cross-section having a bight portion, outstanding leg portions, and an open channel between said leg portions directed outwardly of the interior of the building; said beam members in each layer being positioned side by side with each other and with their bight portions lying in substantially the same plane; the beam members in the two outermost layers being positioned on the free edges of the leg portions of the beam members in the underlying layer with their bight portions secured to said leg portions therebelow thereby to close the channels of the beam members in the intermediate and lowermost layers; means secured to the free ends of the leg portions of the beam members in the outermost layer for closing the open channels therein in an air tight relation; said means including at least one sheet of a generally transparent material; said channels in said outermost layer having a heat absorbing surface whereby said outermost layer of channels forms a solar heat collector collecting heat from the sun through said transparent material; insulating means in the channels of said lowermost layer for insulating the channels of the intermediate layer against heat loss to the interior of the building; a heat storage bed associated with said building; and means for selectively circulating air through the closed channels of said intermediate layer, through the heat storage bed and back to the channels of the intermediate layer, whereby air flowing in the channels of said intermediate layer below said outermost layer of channels absorbs heat collected from the sun in said outermost layer to in turn heat the heat storage bed to store heat therein; and separate means for selectively circulating air from the interior of said building to said heat storage bed and back to the building to draw heat from the storage bed and supply it to the interior of the building.

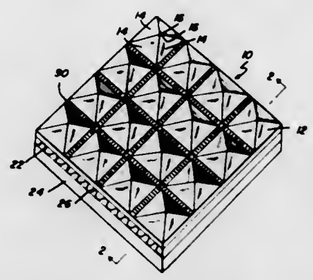
4,076,014
SOLAR CIGARETTE LIGHTER
Attilio-William Wiquel, c/o Monaco Government Tourist Office, 115 E. 64th St., New York, N.Y. 10021
Filed Aug. 12, 1976, Ser. No. 713,797
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **4 Claims**



1. A cigarette lighter comprising a hollow tube, apertured means intermediate the ends of the tube to prevent a cigarette introduced into the tube at one end thereof from passing through the tube beyond said means, a lens of positive power arranged on the tube on the side of said means remote from said one end and spaced substantially by its own focal length from said means, and a plurality of axially extending ribs projecting inwardly from the inside wall of the tube in the portion thereof between said means and said one end of the tube, to center and guide a cigarette.

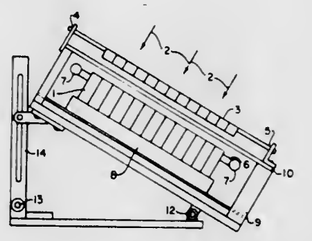
4,076,015
SOLAR ENERGY COLLECTOR
John P. Mattson, 123 Lake Shore Drive, Duxbury, Mass. 02332
Continuation-in-part of Ser. No. 621,759, Oct. 14, 1975, abandoned. This application Jan. 14, 1976, Ser. No. 649,033
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **5 Claims**

1. An apparatus for collecting radiant solar energy upon an energy receiving means for conversion to heat energy comprising a solar energy collecting module, said module having a base and a plurality of radiant energy transparent means angularly disposed to said base for transmitting radiant energy to said energy receiving means for conversion to heat energy, and a plurality of reflective means angularly disposed to said base and adjacent said transparent means to reflect incident radiant energy to an adjacent transparent surface for transmission to said energy receiving means, said transparent and reflective surfaces forming a plurality of discrete structures having a



common base and at least one reflective surface, and means for transfer of said heat energy to a heat exchange fluid.

4,076,016
APPARATUS FOR THE UTILIZATION OF SOLAR HEAT
Maurice E. Phillips, 182 Dellenberger Ave., Akron, Ohio 44312
Filed Oct. 14, 1975, Ser. No. 622,149
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **7 Claims**



1. Apparatus for the utilization of solar heat comprising,

a carrying frame,

a plurality of hexagonal shaped solar collector cells carried by the frame having an open end directed toward incoming sunlight and a closed end, the cells on the closed end being of a high heat transfer metallic material,

a pair of spaced, substantially parallel header pipes on opposite sides and inside of the frame,

a plurality of substantially parallel heat transfer collector pipes connected at opposite ends to the header pipes and passing through the upper, center portion of each cell to obtain maximum focused heat, and

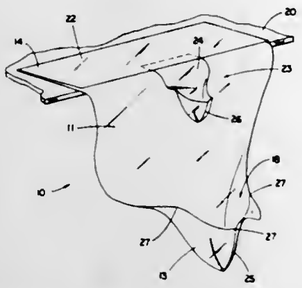
means to pass fluid through the header pipes and the heat transfer collector pipes to collect the heat passed by conduction, radiation, and convection to the fluid through the heat transfer pipe.

4,076,017
POSTPARTUM FLUID LOSS RECEPTACLE
John N. Haswell, 607 Dubois St., Vincennes, Ind. 47591
Filed Feb. 11, 1976, Ser. No. 657,161
Int. Cl.² A61B *10/00, 19/06*
U.S. Cl. 128—2 F **3 Claims**

1. A postpartum fluid loss receptacle which comprises:

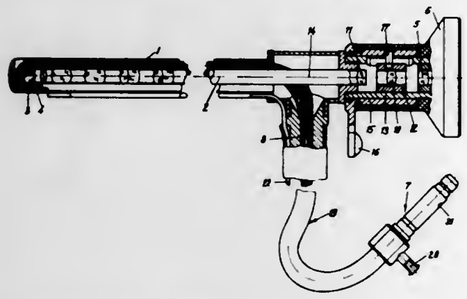
a first sheet of flexible material that is essentially nonabsorbent to body fluids, said first sheet having a first end portion forming a first pocket and a second end portion, the first end portion of said first sheet being folded and defining a first edge and a second edge, the edges having a common point, the first edge being sealingly attached to

the second edge continuously along a line extending from the common point; and



a second pocket smaller than the first pocket, said second pocket being connected to and position relative said first sheet of flexible material between the first and second end portions.

4,076,018
ENDOSCOPES
Helmut Heckele, Knittlingen, Germany, assignor to Richard Wolf GmbH, Knittlingen, Germany
Filed Dec. 1, 1975, Ser. No. 636,802
Claims priority, application Germany, Dec. 6, 1974, 7440701[U]
Int. Cl.² A61B *1/06*
U.S. Cl. 128—6 **3 Claims**

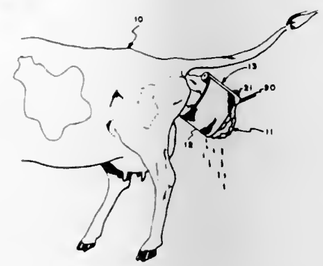


1. An endoscope comprising
a. a barrel
b. a light guide passing through said barrel
c. an optical system for viewing an illuminated area to be examined, said optical system having a focus,
d. a magnifying lens incorporated in said optical system and
e. means for selectively varying the magnification of the object to be viewed, thereby to enable the object to be viewed at one enlargement and view angle on the one hand and a different enlargement and view angle on the other hand, said means comprising a setting mechanism coupled to said magnifying lens for effecting axial displacement of said magnifying lens between two positions in which said magnifying lens lies in front of and behind said focus respectively.

4,076,019
ORTHOPEDIC CAST CONSTRUCTION
Bernard S. Sain, 811 Threadneedle Lane No. 285, Houston, Tex. 77079
Filed Aug. 16, 1976, Ser. No. 714,701
Int. Cl.² A61F *5/04*
U.S. Cl. 128—83 **9 Claims**

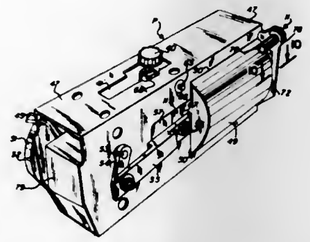
5. A method of forming a cast on a patient comprising the step of placing moistened plaster bandages on a patient to form a cast, which cures on the patient after the passage of time, and including the step of positioning on the interior of said cast a fibrous material having impregnated therein a water adsorbing agent of silica-gel or alumina prior to curing of the cast.

4,076,020
VETERINARY APPLIANCE
James S. Lovick, Rte. 2, Box 76-B, Henderson, Tex. 75652
Filed Dec. 6, 1976, Ser. No. 748,067
Int. Cl.² A61F *5/24*
U.S. Cl. 128—98 **7 Claims**



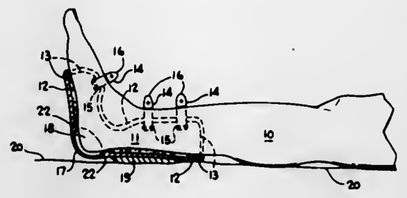
1. An apparatus for the size reduction of an edematous prolapsed bovine cervix which comprises:
(a) a flexible band member having a first end and a second end and adapted to fit around said edematous prolapsed bovine cervix;
(b) a housing member;
(c) a roller means rotatably supported by said housing;
(d) means for operably connecting at least one end of said band member to said roller means;
(e) when only one end of said band member is operably connected to said roller, a means for affixing the other end of said band member to said housing; and
(f) means for rotating said roller means to thereby decrease the effective length of said band member.

4,076,021
POSITIVE PRESSURE RESPIRATORY APPARATUS
Harris A. Thompson, 175 Bellevue Drive, Boulder, Colo. 80302
Filed Jul. 28, 1976, Ser. No. 709,450
Int. Cl.² A61M *16/00*
U.S. Cl. 128—145.6 **5 Claims**



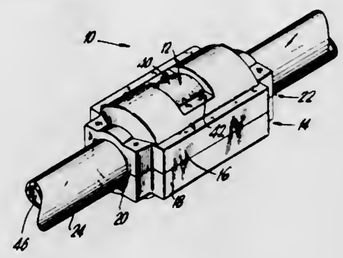
1. A positive pressure respiratory apparatus to cyclically pump proper volumes of air for inspiration by a patient, as through a breathing tube extended to the patient, and comprising in combination therewith:
a. a frame, in the general form of an elongated rectangular tube, with portions of said walls having a top wall, a bottom wall and side walls cut away to provide operative clearances and to carry the components of said apparatus as a compact unit and facilitate the implacement and removal of the components to and from a container said rectangular tube having a slot in each side wall adjacent one end of said frame and directly opposing each other;
b. a breathing tube; a cylinder having an outside diameter greater than the height of said slots and the width of said top and bottom walls and less than the height of said side walls, said cylinder being mounted within said slots and supported in said frame by said side walls, said cylinder having a closed end adjacent to one end of the frame and an open end within the frame, said breathing tube connected to and extending from the closed end and with the cylinder volume exceeding, but not greatly exceeding, the aforesaid proper volume of air for inspiration by a patient;
c. a piston within the cylinder;
d. a motor means mounted within the frame near the other end of the frame to rotate at a rate corresponding with the patient's natural or selected inspiration and exhalation breathing cycles, a crank having a first end mounted to said motor means for rotation thereof and a second end;
e. a rocker near the open end of the cylinder and having a first end pivotally mounted to the frame adjacent a sidewall of the cylinder to extend generally transversely to the cylinder and a second end and to rock towards and away from the cylinder;
f. a connecting arm having a second end pivotally mounted to the second end of said crank and a second end pivotally mounted to the second end of said crank and the rocker to swing the rocker towards and away from the cylinder as the crank rotates;
g. a piston rod pivotally connected to the rocker between said first and second ends thereof and to the piston to convert swinging movements at the rocker to sliding movements at the piston; and
h. a valving means associated with the cylinder and the tube to permit air to flow into the cylinder when the piston is moving towards the open end of the cylinder and prevent a flow of air from the patient's end of the tube towards the cylinder, and to confine air flow to the tube and to the patient when the piston is moving towards the closed end of the cylinder.

4,076,022
THERAPEUTIC FOOT AND LEG PROTECTOR
James Walker, 6 Pine Tree Drive, Stamford, Conn. 06906
Filed Dec. 20, 1976, Ser. No. 752,529
Int. Cl.² A61B *19/00*
U.S. Cl. 128—149 **10 Claims**



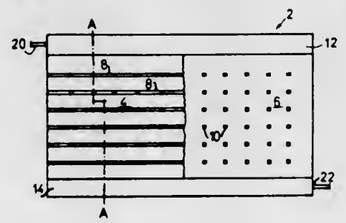
1. A therapeutic foot and leg protector comprising a rigid shell and a soft protective batting disposed within said shell, said shell and said batting partially encasing and generally conforming about a lower portion of a leg and a foot of a patient disposed therein, means defining a cut-away heel portion in said batting, said shell having a perforated heel portion substantially surrounding the heel of said patient adjacent said cut-away heel portion of said batting for the purpose of aerating a sore disposed on the heel of said patient, said shell further comprising a built-up supporting section generally extending from said heel portion along a portion of the shell encasing the lower leg portion of the patient, said supporting section raising a level of said heel portion of said shell generally above a level of a bed in which the leg and shell are resting and extended, said supporting section allowing a facilitated circulation of air about the heel of said patient via the perforated heel portion of the shell, while the leg of the patient is resting and extended upon the bed, whereby a healing of said heel sore may be more aptly effected as a result of the facilitated circulation.

4,076,023
RESEALABLE DEVICE FOR REPEATED ACCESS TO CONDUIT LUMENS
Felix Jesus Martinez, Demarest, N.J., assignor to Erika, Inc., Rockleigh, N.J.
Filed Aug. 1, 1975, Ser. No. 600,980
Int. Cl.² A61M *5/00*
U.S. Cl. 128—214 R **6 Claims**



1. A resealable device for repeated access to the lumen of a continuous walled conduit, comprising:
a puncturable, elastomeric, generally tubular shaped member having a predetermined outer diameter and length, said tubular member being concentrically arranged about said conduit and in contact with said conduit; and
rigid jacket means defining a cavity therein having a smaller diameter and longer length than said elastomeric member predetermined outer diameter and length, respectively, said jacket means being arranged concentrically about said conduit with said cavity about said elastomeric member, whereby said elastomeric member is radially compressed against said conduit, said jacket means defining an opening into said cavity to expose a portion of said elastomeric member for access by needles and cannulae and including fixed transverse stop means at each end of said cavity for limiting the longitudinal expansion of said elastomeric member to concentrate and maintain the elastic recoil energy of said elastomeric member against the conduit enabling said elastomeric member to reseal punctures therein and also provide a compression seal between said elastomeric member and the conduit, thereby preventing leakage from the conduit lumen after access thereto.

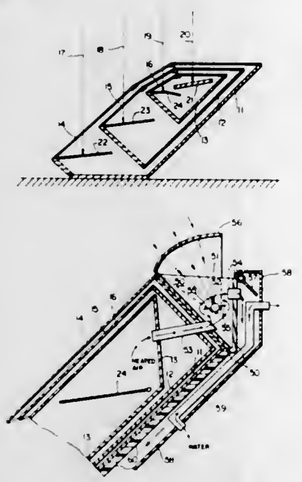
4,076,024
SOLAR RADIATION COLLECTOR
Joseph Banet, 112 Uziel Str., Jerusalem, Israel
Filed Mar. 16, 1976, Ser. No. 667,430
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **8 Claims**



1. A solar radiation collector comprising a first and a second plate member in close spatial disposition and seamed along

their edges to define a closed liquid containing substantially planar chamber therebetween, said chamber having an inlet and an outlet port and wherein said first plate member is provided with substantially parallel extending shallow channels projecting toward the interior of said chamber, said second plate member is provided with a plurality of shallow recesses projecting toward the interior of said chamber and wherein web portions of said channels and recesses engage each other whereby there are formed longitudinal passages along the inner surface of said first plate and longitudinal and transverse passages along the inner surface of said second plate to enable the liquid to be heated by solar energy, to flow in a longitudinal direction along the inner surface of said first plate and in a longitudinal transverse direction along the inner surface of said second plate.

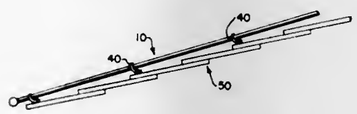
4,076,025
SOLAR STEAM BOILER
Louis W. Parker, 2040 N. Dixie Highway, Fort Lauderdale, Fla. 33305
Filed Nov. 22, 1976, Ser. No. 744,054
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **6 Claims**



1. A solar heater comprising a plurality of elongated containers nested one within the other, each of said containers having a gaseous medium therein, said containers respectively heaving transparent upper surfaces which are superposed and positioned to admit incident solar radiation to the interior of each of said containers, the other surfaces of each container being coated with a heat insulating material superposed by a heat reflective material for reflecting heat toward the interior of said container, at least one heat absorbing and radiating plate located within each of said containers adjacent one end of said container, each of said plates having a face which is exposed to said incident solar radiation and which is coated with a blackened material to cause said plate to absorb heat from said incident solar radiation, the opposite face of each such plate being coated with a blackened material for transmitting heat from said plate to said gaseous medium within said container to cause said gaseous medium to move in a convection current toward the other end of said container, each of said nested containers being constructed to define an interior volume which is completely closed off from the interior volumes of the others of said nested containers whereby the convection current produced within each container is confined to that container, and a steam boiler structure located within the innermost one of said nested containers, said boiler structure being positioned within said innermost container to be heated by solar radiation incident on said boiler structure through said superposed transparent surfaces, the exterior side of said boiler structure which is exposed to said incident solar radiation being coated with a blackened heat absorption material, and the opposite exterior side of said boiler structure being polished to a shine to reduce heat radiation from said boiler.

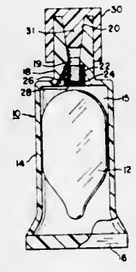
4. A solar heater comprising a plurality of elongated containers nested one within the other, each of said containers having a gaseous medium therein, said containers respectively having transparent upper surfaces which are superposed and positioned to admit solar radiation to the interior of each of said containers, the other surfaces of each container being coated with a heat insulating material superposed by a heat reflective material for reflecting heat toward the interior of said container, at least one heat radiating plate located within each of said containers adjacent one end of said container, each of said plates having a face which is exposed to incident solar radiation and which is coated with a blackened material to cause said plate to be heated by said incident solar radiation, the opposite face of each such plate being coated with a blackened material for transmitting heat to said gaseous medium within said container to cause said gaseous medium to move in a convection current toward the other end of said container, a steam boiler structure located within the innermost one of said containers, said boiler structure being positioned within said innermost container to be heated by solar radiation incident on said boiler structure through said superposed transparent surfaces, the exterior side of said boiler structure which is exposed to incident solar radiation being coated with a blackened heat absorption material, and the opposite exterior side of said boiler structure being polished to a shine to reduce heat radiation from said boiler, a steam outlet pipe connected to said boiler structure, said steam outlet pipe being located within a further container located adjacent one end of said plurality of nested containers, said further container having a further transparent upper surface to admit solar radiation to said further container, the side of said steam outlet pipe which faces said further transparent upper surface being coated with a blackened heat absorption material and the opposite side of said steam outlet pipe being polished to a shine, an optical means for focusing solar radiation on said outlet pipe to further heat steam passing thrrough said outlet pipe, said optical means comprising a cylindrical lens, and means for varying the position of said lens to concentrate solar energy on said pipe.

4,076,026
SOLAR HEATER
Bruce G. Copping, 310 Burning Tree Drive, Naples, Fla. 33940
Filed Oct. 12, 1976, Ser. No. 731,221
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **4 Claims**



1. A solar heater for a liquid and comprising a panel unit including a plurality of tubes lying in and defining a plane, said panel unit comprising an inlet header tube, an outlet header tube, a coupling securing said inlet and outlet header tubes together and in alignment, seal means associated with said coupling to prevent direct flow from said inlet header to said outlet header, a connector header, one set of a plurality of relatively small diameter tubes connecting said inlet header to spaced areas of one end portion of said connector header, a second set of a plurality of relatively small diameter tubes connecting spaced areas of the other end portion of said connector header to said outlet header tube; and support means for said panel unit comprising members slidably engaging said sets of tubes, said members comprising flexible anchor strips extending the width of said panel and apertured to engage all of said tubes of said sets of tubes, a portion of said strip extending down from said tubes to be anchored to a support structure by anchor means, inlet and outlet tubes connected to said inlet and outlet headers to retain such tubes and headers in substantially fixed positions and permit longitudinal movement of said tubes of said sets of tubes and of said connector header in relation to said anchor strips to said inlet and outlet tubes.

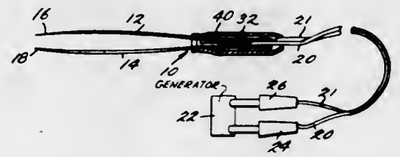
4,076,027
FLUID TRANSFER DEVICE
Elmer A. Koenig, Kirkwood, Mo., assignor to Sherwood Medical Industries Inc., St. Louis, Mo.
Filed May 7, 1976, Ser. No. 684,139
Int. Cl.² A61J *1/08*
U.S. Cl. 128—272 **12 Claims**



1. In combination, a container, and at least a portion of a glass ampule containing a parenteral liquid, said container comprising first and second relatively rigid members connected together to define a chamber shaped to receive said ampule portion, said ampule portion being disposed in said chamber, coupling means on each of said members engageable with each other to connect said members together and permit relative axial movement of said members while connected together and permit separation of said members to permit said ampule portion to be positioned axially between said members within said chamber, said first member having luer tapered coupling means for receiving a complementary luer tapered coupling element, passage means extending from said luer tapered coupling means to said chamber, and filter means in said first member for filtering liquid when it flows from said ampule portion through said passage to said luer tapered coupling means, said members being axially movable toward each other to clamp said ampule portion axially between portions of said members, and means for sealing said chamber against the flow of liquid from said ampule to the exterior of said container.

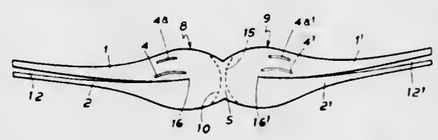
4,076,028
FORCEPS SPACING DEVICE
Raymond W. Simmons, Pinellas Park, Fla., assignor to Concept Inc., Clearwater, Fla.
Filed Oct. 7, 1976, Ser. No. 730,613
Int. Cl.² A61B *17/36*; A61N *3/06*
U.S. Cl. 128—303.13 **12 Claims**

1. An electrosurgical forceps comprising two electrically conductive blades each blade having a forward end and a rear end, an electrosurgical frequency carrying insulated wire means for connecting only said forceps blades to an electrosurgical frequency generator, said wire means being secured to said forceps blades and adapted to be connected to said generator, a spacer means constructed of insulative material secured between the rear ends of said blades, said spacer means comprising a front section and a rear section, both sections conforming to the shape of the forceps blades and a middle section defining two inclined serrated surfaces extending between the



front section and rear section, said inclined serrated surfaces engaging said wire means to secure the wire means against said forceps blades in direct electrical contact with each of the forceps blades.

4,076,029
BRASSIERE
Attilio-William Wiquel, c/o Monaco Government Tourist Office, 115 E. 64th St., New York, N.Y. 10021
Continuation-in-part of Ser. No. 713,798, Aug. 12, 1976. This application Mar. 29, 1977, Ser. No. 782,534
Int. Cl.² A41C *3/00*
U.S. Cl. 128—425 **9 Claims**



1. A brassiere comprising, for each of two breast-receiving cups, an elongate strip of flexible material slit from one end to a location near the other end to form two connected limbs, the limbs being crossed over each other to form a concave breast-receiving cup, and means to hold said limbs in crossed position, the brassiere further comprising means joining said strips together.

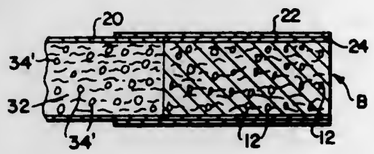
4,076,030
METHOD FOR UTILIZING TOBACCO STEMS IN SMOKING PRODUCTS
Ezra Thomas Smith, Kernersville, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.
Filed Dec. 22, 1975, Ser. No. 643,207
Int. Cl.² A24B *3/18*
U.S. Cl. 131—17 R **9 Claims**

1. The process of treating tobacco stems that have not been previously rolled or crushed which comprises conditioning the stems to a moisture content between 18 and 50 percent, subjecting the conditioned stems to a cutting operation in which the cuts per inch are at least 25, expanding the cut stems and subjecting the expanded cut stems to a second cutting operation to produce particle sizes approximating those found in cut tobacco filler for cigarettes or cut pipe tobacco.

4,076,031
FILTER AND CIGARETTE INCLUDING A FILTER
Harold Grossman, Upper Montclair, N.J., assignor to Montclair Research Corporation, Silver Spring, Md.
Continuation of Ser. No. 562,214, March 26, 1975, abandoned. This application Feb. 28, 1977, Ser. No. 772,668
Int. Cl.² A24B *15/02*
U.S. Cl. 131—261 A **8 Claims**

1. A filter for tobacco smoke comprising a porous substrate

having a deposit thereon of a system of particles of a water-insoluble, hydrophobic, moisture-laden substance activatable



by the tobacco smoke to release the moisture, the major ingredient of the substance being water.

4,076,032

VENTED HAIR BRUSH

Douglas Misercola, Mamaroneck, N.Y., assignor to Empire Brushes, Inc., Port Chester, N.Y.

Filed Aug. 17, 1976, Ser. No. 715,187

The portion of the term of this patent subsequent to Dec. 21, 1990, has been disclaimed.

Int. Cl.² A45D *20/00*

U.S. Cl. 132—9 **22 Claims**



1. A hair brush intended to be used with a distinct and separate air blower which can be selectively moved relative to said hair brush, said hair brush comprising a body having an elongated handle, said handle having a first end and a second end, said ends being spaced apart from each other, an elongated tubular brush block affixed to said first end of said handle, said brush block being substantially in tandem with and coaxial of said handle so that said handle and said brush block may be rotated together about the elongated longitudinal axis of said handle and said brush block, said brush block being formed with an interior bore extending lengthwise of said brush block, said interior bore being coaxial with the longitudinal axis of said handle, said brush block being provided with inwardly directed web means defining a plurality of longitudinally and circumferentially spaced diametric elongated crossing through passages communicating at said bore arranged in transverse sets of passages to direct air initially toward said bore from a separate air blower from where the air can pass through said passages to be directed against a user's hair for the styling of said hair, each of said passages being in communication with said bore to allow air to be blown through said passages by the separate air blower toward one side of the brush block when juxtaposed adjacent said side thereof, a plurality of hair brush elements affixed to said brush block and projecting outwardly therefrom in longitudinally and circumferentially spaced relation and disposed between said sets of passages, said handle having means to close said handle to prevent air from being blown through said passages and said bore entirely through the handle of the brush block or through said handle to said bore and passages of said brush block.

4,076,033

SPRAYING APPARATUS FOR CLEANING FILTER PRESS PLATES

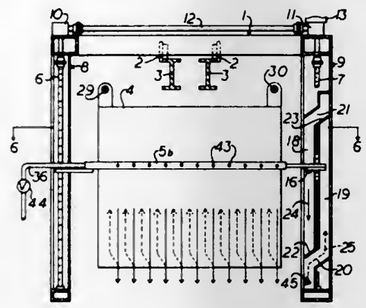
Oswald Busse, and Hugo Klesper, both of Aarbergen, Germany, assignors to Passavant-Werke Michelbacher Hutte, Germany

Filed Jun. 30, 1976, Ser. No. 701,081

Claims priority, application Germany, Jul. 3, 1975, 7521093[U]

Int. Cl.² B08B *3/02*

U.S. Cl. 134—172 **13 Claims**



1. Spraying apparatus for cleaning filter press plates which are slidable along horizontal guides therefor comprising,

a. at least one spray unit having at least one tube with one row of spray nozzles at one side thereof located at spaced apart locations and directed at the vertical surface of an adjacent filter plate,

b. means to reciprocate said spray unit over a distance equalling the distance across the filter plate to be cleaned so that spaced apart areas are sprayed by said one row of nozzles as said spray unit makes one run relative to said filter plate to be cleaned,

c. spray nozzles positioned at the other side of said spray unit during the return run thereof between said spaced apart locations of said one row of nozzles in position to spray the areas between said spaced apart areas on the return run of said spray unit with the spray nozzles at said other side of said spray unit being staggered in a direction longitudinally of said tube relative to the spray nozzles of said one row of spray nozzles a distance of approximately half the spacing between the spray nozzles of said one row of spray nozzles,

d. means to rotate said spray tube approximately 180° about its longitudinal axis adjacent at least one point that reverse movement takes place in the reciprocation of said spray unit, and

e. means supplying fluid under pressure to said one row of spray nozzles as said spray unit makes said one run and to said spray nozzles located between said spaced apart locations as said spray unit makes said return run.

4,076,034

METHOD FOR SEALING A BUTTERFLY VALVE

Horst Adams, Bochum, Germany, assignor to Panamera, A.G., Switzerland

Division of Ser. No. 611,764, Sept. 9, 1975, Pat. No. 4,003,394. This application Sep. 24, 1976, Ser. No. 726,335

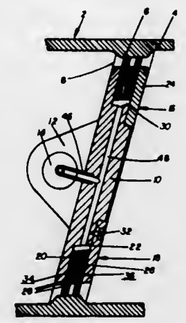
Claims priority, application Germany, Sep. 12, 1974, 2443723; Jul. 23, 1975, 2532879

Int. Cl.² F16K *1/22, 25/00*

U.S. Cl. 137—15 **3 Claims**

1. A method for sealing a high pressure butterfly valve, the valve having a tubular housing including a valve seat, a disc pivotally mounted within the housing for movement between an open position in which the disc is substantially parallel to an axis through the housing and a closed position in which it is

parallel to the valve seat, the disc including a peripheral seal ring disposed in a peripheral seal ring groove of the disc for engaging the valve seat when the disc is closed and a conduit communicating a source of a pressurized fluid with the ring groove, the method comprising the steps of moving the disc from its open position towards its closed position; flowing a pressurized fluid from the source through the conduit into the seal ring groove; flowing the pressurized fluid from the seal



ring groove to a periphery of the seal ring by directing the fluid in a generally radial direction along a portion of the seal ring disposed between axial ends of the seal ring while continuing the step of moving the disc, whereby pressurized fluid contacts the seat before the seat is contacted by the seal ring to thereby remove foreign particles from the seat, and continuing the step of moving the disc until the seal ring fully engages the seat and seals an upstream portion of the valve from a downstream portion thereof.

4,076,035

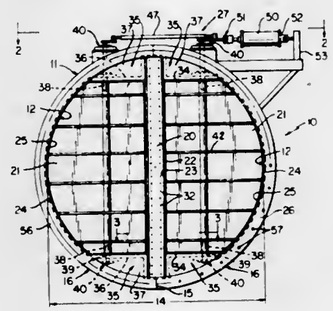
VALVE CONSTRUCTION

Paul P. Frisch, Skokie, Ill., assignor to Dayco Corporation, Dayton, Ohio

Filed Dec. 20, 1976, Ser. No. 752,486

Int. Cl.² F16K *1/22*

U.S. Cl. 137—601 **8 Claims**



1. A butterfly valve construction comprising, a valve body comprised of two roughly semicylindrical portions having open ends, means comprising a box-like assembly connecting said open ends to define said valve body as a pair of back-to-back roughly D-shaped portions, a pair of valve members each rotatably mounted within an associated D-shaped portion, a pair of barrier structures at opposite ends of each D-shaped portion adjoining said bar-like assembly, and means for rotating said valve members to open and close same.

4,076,036

HYDRAULIC FLOW CONTROL VALVE ASSEMBLIES

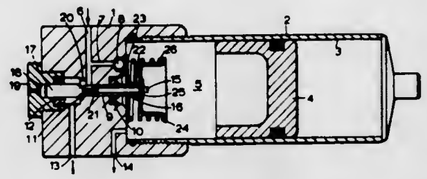
Phillip Augustus Taft, Solihull, England, assignor to Girling Limited, Birmingham, England

Filed Apr. 24, 1974, Ser. No. 463,612

Claims priority, application United Kingdom, Apr. 24, 1973, 19461/73

Int. Cl.² G05D *11/00*

U.S. Cl. 137—118 **9 Claims**



1. A control valve assembly for use in vehicle hydraulic systems, said assembly comprising a housing which includes an inlet passage for connection to a pump, a first outlet passage for connection to an hydraulic accumulator and a braking circuit, a non-return valve between said inlet passage and said first outlet passage, a second outlet passage for connection to a steering circuit, a bleed passage connecting said inlet passage with said second outlet passage, and a second valve responsive to the pressure in said first outlet passage for controlling communication between said inlet passage and said second outlet passage, wherein said housing also includes a cylinder bore, and a seating between said bore and said second outlet passage, one end of said bore communicating with said second outlet passage, a piston of constant diameter in sealing engagement with said bore, and a stem of a diameter smaller than that of said piston connected to and extending from said piston towards said second outlet passage, said second valve comprising a valve member integral with said stem and engagable with said seating, and said inlet passage leads into said bore between said piston and said valve member.

4,076,037

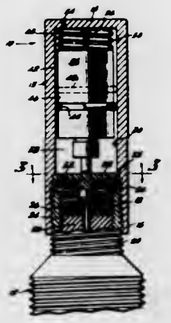
SAFETY VALVE CAP FOR INFLATABLE BODIES

Jose R. Perez, 10828 SW. 3 St., Miami, Fla. 33174

Filed Feb. 27, 1976, Ser. No. 662,211

Int. Cl.² F16K *15/20*

U.S. Cl. 137—230 **4 Claims**



1. A safety valve cap for engagement on the valve stem of an inflatable body to prevent increases of pressure therein above a pre-selected level,

the valve stem of said inflatable body being of the type provided with a check valve for pressurizing the inflatable body and for releasing the air pressure therefrom by means of a pressure release pin, said safety valve cap comprising:

A. a generally tubular wall having a first end and a second end and defining an interior chamber, an outer end closure wall having orifice means therethrough at said second end, and an open inner first end, said first end of said tubular wall having an internally threaded zone for removable threaded fixed engagement with an outwardly extending threaded end portion of the valve stem of the inflatable body;

B. a disc member, spanning said interior chamber, adjacent to and spaced from said first end, said disc member having an orifice therethrough and an outwardly extending depressor stud extending toward said second end, said second stud being normally in depressing engagement with the pressure release pin of the valve stem check valve when said tubular wall is in threaded engagement with said valve stem;

C. a check valve, slidably engaged in said interior chamber between the disc member and the first end closure wall, the outer cylindrical housing of said check valve comprising a piston;

D. O-ring means carried by said piston in sealing slidable engagement with the tubular wall in said interior chamber;

E. compression spring means captivated in said interior chamber between said second end closure wall and said piston;

F. said check valve including a release pin in said piston and said pin having a portion extending from said piston toward but not to said outer end closure wall of said second end and adapted upon axial movement of said check valve to open said check valve; and

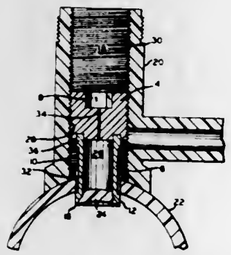
G. said compression spring being calibrated to a predetermined degree of compression to correspond to the air pressure to be maintained in the inflatable body and yieldable upon an increase in pressure to permit escape of pressure through the safety valve cap orifice means in the event of a pressure in the inflatable above the predetermined level.

4,076,038

TAPPING TEE CUTTER HAVING RELIEVED SIDEWALL

Ralph A. Wynne, Dallas, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 5, 1976, Ser. No. 646,469
Int. Cl.² B23B *41/08*
U.S. Cl. 137—318 **11 Claims**



1. A cutter for a tapping tee for cutting plastic pipe comprising:

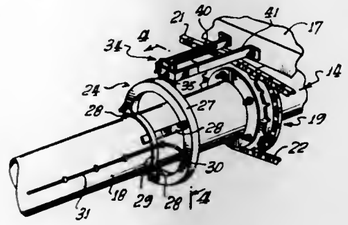
a. a band cutter terminating in a cutting edge, said cutter having a portion of the cutter wall near the cutting edge of an external diameter at least equal to the diameter of the cutting edge and forming a shoulder with an adjacent portion of the cutter wall, said adjacent portion of the cutter wall having a relieved external diameter sufficiently less than the diameter of the cutting edge to minimize the frictional contact between the relief diameter and the cut wall of a pipe being tapped.

4,076,039

SIGNAL TRANSMISSION AND CONTROL SYSTEM

Robert E. Hartsock, 2025 Deep Canyon Road, La Habra, Calif. 90631

Filed Jan. 14, 1976, Ser. No. 649,192
Int. Cl.² A01M *7/00*; B05B *3/00*
U.S. Cl. 137—344 **6 Claims**



4. In combination with a farmland irrigating apparatus having a frame; an engine, mounted on said frame for powering the movement of said apparatus; a set of driving wheels for permitting movement of said apparatus; and a rotatable hub adapted to fasten a central irrigating pipe thereto, said pipe being adapted to rotate about its longitudinal axis; the combination comprising:

a magnetic-field-producing multi-turn wire coil mounted on said rotatable pipe;

said coil being mounted to rotate with said pipe, and to produce a magnetic field that is substantially concentric with the axis of rotation of said pipe;

means for detecting the magnetic field produced by said coil regardless of the angular orientation of said coil, and regardless of whether said coil is rotating or is stationary;

said detector comprising a magnetic-reed-switch;

means for mounting said magnetic-reed-switch on said frame, and positioned in the magnetic area of said coil;

means, comprising a control box, for remotely energizing said coil;

whereby when said control box energizes said coil, the magnetic field from said coil causes said detector to produce a signal;

means for utilizing said signal from said detector.

4,076,040

ALTERNATOR VALVE

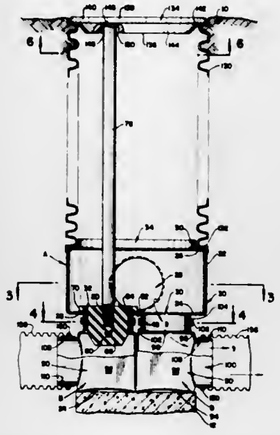
Robert J. Alpers; Fredrick J. Crates; Denis P. Ott, and John D. Schmunk, all of Findlay, Ohio, assignors to Hancor, Inc., Findlay, Ohio

Filed Jun. 1, 1976, Ser. No. 691,890
Int. Cl.² F16K *11/00*
U.S. Cl. 137—371 **16 Claims**

14. In a valve assembly adapted to be located some distance beneath a reference surface wherein said valve includes a housing having a valve plug receiving opening in the top wall thereof; an inlet and at least one outlet and wherein a valve plug member is receivable in said housing through said receiving opening in a fluid blocking position with said at least one outlet, said valve plug member including a sealing area adapted to sealingly engage a seat area disposed in said housing adjacent said at least one outlet and wherein an elongated member having one end operatively communicating with said valve plug to extend outwardly therefrom through said housing receiving opening toward said reference surface when said valve plug is received in said fluid blocking position with said at least one outlet, the improvement comprising:

said elongated member being dimensioned so that the other end thereof is disposed adjacent said reference surface; means for defining a passage extending between said housing receiving opening and reference surface, said passage defining means being dimensioned to receive at least said elongated member therethrough; and, means for selectively closing said passage defining means adjacent said

reference surface and including means for positively cooperating with said elongated member other end to assist in maintaining said valve plug sealing area in sealing engage-



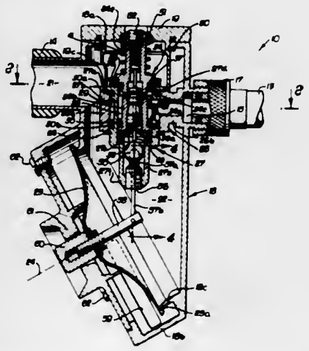
ment with the seat area of said at least one outlet and to prevent dislodgement of said valve plug from the desired fluid blocking position.

4,076,041

PILOT VALVE OPERATED DEMAND REGULATOR FOR A BREATHING APPARATUS

Raymond A. Christianson, 120 8th St., Manhattan Beach, Calif. 90266

Continuation-in-part of Ser. No. 508,580, Sept. 23, 1974, abandoned. This application Jun. 16, 1975, Ser. No. 587,272
Int. Cl.² F16K *31/126*
U.S. Cl. 137—490 **8 Claims**



1. A demand regulator for use with a breathing apparatus comprising:

a regulator body having an interior chamber, a mouthpiece outlet communicating from said interior chamber, a diaphragm responsive to pressure within said interior chamber, an inlet port, an annular support member within said interior chamber, and a tublar member communicating between said inlet port and said support member,

a generally cylindrical valve housing removably supported within said annular support member, said housing having an open end and a substantially closed end,

a poppet movably mounted within said valve housing, said inlet port communicating via said tubular member and an inlet opening in said valve housing to a space between said valve housing and said poppet, the flow of breathable gas from said inlet port to said interior chamber being controlled by a flow valve formed by said poppet and a portion of said housing, said poppet being biased to a position closing said flow valve, and

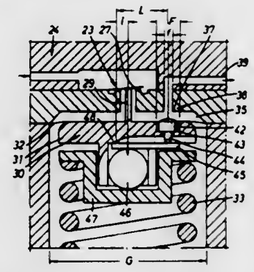
a normally closed pilot valve mounted within said poppet for movement therewith, and controlling the flow of gas from said space via a flow channel through said poppet to a position between an end of said poppet and said substantially closed end of said housing, the force of said gas admitted to said position being exerted directly on said poppet end to cause displacement of said poppet against said bias, thereby opening said flow valve, said pilot valve being linked to said diaphragm and being mounted so that said pilot valve is urged closed as said poppet is displaced in the flow valve opening direction.

4,076,042

CUT-OFF VALVE FOR OIL FIRING INSTALLATIONS

Peder Larsen, Augustenborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Continuation-in-part of Ser. No. 611,196, Sept. 8, 1975, abandoned. This application Dec. 1, 1976, Ser. No. 746,475
Claims priority, application Germany, Dec. 10, 1973, 2361380
Int. Cl.² F16K *31/12*
U.S. Cl. 137—494 **1 Claim**



1. A cutoff valve unit for an oil burner assembly comprising a casing defining a chamber, inlet and outlet passages in said casing having communication with said chamber, said outlet passage having a valve seat, a movable adjustment element in said chamber having a disk shaped portion, spring means biasing said element in the direction of said valve seat, a diaphragm in said chamber between said disk shaped portion and said valve seat, a closure member having a face which engages said valve seat, said closure member being attached to said disk shaped member with said face being displaceable relative to said disk shaped member, said face having a larger diameter than said valve seat, said closure member extending through said disk shaped portion, a second element between said disk shaped portion and said spring means, said second element being movable relative to said adjustment element, a bearing between said elements, a lever having one side thereof engaging said bearing and the other side thereof engaging said adjusting element and said closure member at spaced apart points, said bearing being between said points.

4,076,043

HIGH FATIGUE STRENGTH CHECK VALVE

John Rogan, Greenford, England, assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Jul. 1, 1976, Ser. No. 701,923
Int. Cl.² F16K *15/04*
U.S. Cl. 137—539.5 **9 Claims**

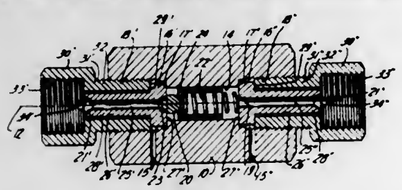
1. A ball-type valve assembly especially suited for service in high pressure fluid systems comprising

a. a main body block having a longitudinal opening extending therethrough the median portion of which is a smooth cylindrical bore having a smaller cross-section than any of the remaining portions of said longitudinal opening and a

portions of said longitudinal opening on either side of said media portion being in the form of a counter bored well of substantially larger cross-section then said median portion thus providing an annular shoulder adjacent either end of said smooth cylindrical bore,

b. a ball stop, associated biasing spring element and movable guide member slidably housed within said median portion to permit limited axial movement of said ball stop between closed and open positions,

c. an upstream and a downstream tail piece each having a fluid passageway extending therethrough along its longitudinal axis and an enlarged head portion fitting closely within the counter bored well on the respective side of said median portion, the face of each head portion being shaped to bear uniformly against a direct-contact sealing area on the annular shoulder adjacent thereto, the fluid



passageway at the head end of the upstream tail piece being shaped to form a valve seal for said ball stop and the fluid passageway at the head end of the downstream tail piece being shaped so that part of the face portion thereof serves as a base support for said biasing spring element, the remainder of each of said tail pieces being formed as an elongated, sleeve-like body of substantially smaller cross-section than its head portion thus providing an annular shoulder on the back side of said head portion, and

d. a back-up attaching device positively engagine with each end of said main body block and having a collet shaped extension thereon which fits around the sleeve-like body of the adjacent tail piece and bears upon the annular shoulder on the back side of said head portion so as to force the face thereof into good sealing contact with said sealing area on the annular shoulder adjacent thereto.

4,076,044

LOCK CHAMBER FOR DISCHARGING DUST

Josef Franz Schindling, Frankfurt-Unterliederbach, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Sep. 24, 1976, Ser. No. 726,487
Claims priority, application Germany, Sep. 30, 1975, 2543523
Int. Cl.² G01F *11/42*; F16K *5/00*
U.S. Cl. 137—614.11 **7 Claims**

1. A lock chamber device for discharging dust by gravity from a pressurized system, comprising:

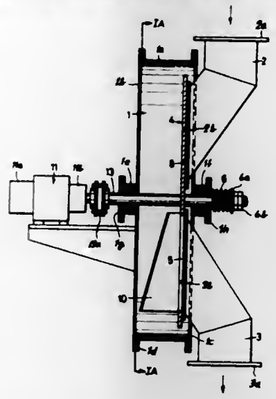
housing means forming a chamber;

an inlet opening communication with said system and having an opening into said chamber;

an outlet opening from said chamber at a location spaced from said inlet;

a rotary valve member disposed in said chamber and provided with a throughgoing passage selectively alignable with said inlet and outlet openings whereby only one of said openings can communicate with the interior of said chamber at any time; and

prestressed resilient means urging said valve member against said openings, said valve member consisting of a flat disk, said openings lying in a common vertical plane perpendic-



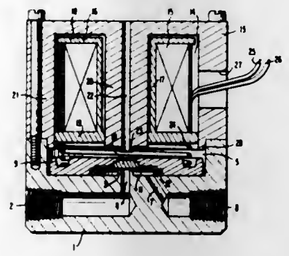
ular to the axis of rotation of said valve member said inlet opening being disposed directly above said outlet opening.

4,076,045

SOLENOID OPERATED VALVE

Hiroyuki Nakajima, Ashiya, Japan, and Takashi Hosokawa, No. 43, Nishimagawa-cho 6-chome, Higashisumiyoshi, Osaka, Japan, assignors to Konan Electric Co., Ltd., Nishinomiya and Takashi Hosokawa, Osaka, both of Japan

Continuation of Ser. No. 566,575, Apr. 8, 1975, abandoned. This application Jul. 30, 1976, Ser. No. 710,048
Claims priority, application Japan, Nov. 27, 1974, 49-144715
Int. Cl.² F16K *31/06*
U.S. Cl. 137—625.65 **2 Claims**



1. A low cost, low power, solenoid operated valve comprising:

a two part valve housing,

said valve housing consisting of end-to-end sealably joined annular valve and electromagnet bodies, said valve body being of U-shape in vertical cross-section and defining a central, circular valve chamber, said electromagnet body being of E-shape in cross-section and defining integral central and outer yokes forming an annular coil chamber,

means for sealably connecting said valve bodies together at their peripheries with said chambers facing each other and with the ends of said central yoke and that of said outer yoke extending to said valve chamber,

a cylindrical solenoid coil bobbin including integral, inner and outer flanges at opposite ends and carrying a coil wrapped about said cylindrical coil bobbin between said flanges, said bobbin being disposed within said coil chamber, the inner flange relative to said coil chamber having a radial width less than that of said coil chamber and at least a part of said outer flange having a radial width in excess of that of the coil chamber and being tightly fitted within said coil chamber to render said coil chamber fluid

tight to prevent the passage of fluid between said valve and coil chambers,

an annular movable valve block positioned within said valve chamber and having a diameter such that its periphery extends to said outer yoke and being located at the center of said valve chamber, said valve body being provided with a first valve seat at the center of said valve chamber,

a first fluid port within said valve body communicating to an aperture formed in the center of said valve seat,

a second fluid port within said valve body communicating to said valve chamber through a passage within said valve body,

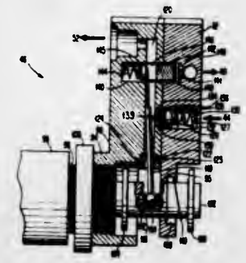
a spring biasing said movable block away from said yokes to close said first valve seat aperture and being attracted, when said coil is energized, towards said central yoke and said outer yoke to provide a low magnetic impedance path through contact of said block at its center with the central yoke and at its periphery with the outer yoke and to readily open the valve seat aperture under low current to said coil against the bias of said spring.

4,076,046

FAST ACTING TWO-WAY VALVE

Gerald Whitfield Hieronymus, Lexington; Michael Lynn Sendelweck, Georgetown; James Everett West, and Joe William Woods, both of Lexington, all of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 1, 1976, Ser. No. 691,648
Int. Cl.² F16K *11/16*
U.S. Cl. 137—627.5 **3 Claims**



1. A valve assembly comprising:

a housing having a small volume cavity formed therein for communicating with two valves and an outlet;

a valve member in each of said two valves to control communication between said two valves and said cavity;

said valve members being normally biased by means in a closed position to prevent communication between said two valves and said cavity;

one of said valve members extending across said cavity and having a slot therein substantially equal to the width of said cavity and the other of said valve members having a portion thereof extending into said cavity;

actuating means extending through said cavity and passing adjacent said portion and extending into said slot for actuating said two valve members;

sealing means within said housing surrounding said actuating means to seal said cavity to the atmosphere;

solenoid means connected to said actuating means for providing pivoting motion to said actuating means;

said solenoid means normally conditioning said actuating means to hold one or the other of said valve members in an open condition;

said solenoid means when in a deactivated state holds said actuating means against a sidewall of said slot in said one valve member to maintain the corresponding one of said valves in an open position and thereby establish a fluidic path through said one valve, said cavity and said outlet, with said other valve being in a closed position;

said solenoid means upon activation pivoting said actuating means away from said sidewall in said slot allowing said one valve member to close completely and thereby break said fluidic path through said one valve, said cavity and said outlet;

after said one valve is closed completely, said actuating means continuing its pivoting motion through said cavity contacts said other valve member to force said other valve member in the other of said valves to an open position to thereby make a fluidic path through said other valve, said cavity and said outlet;

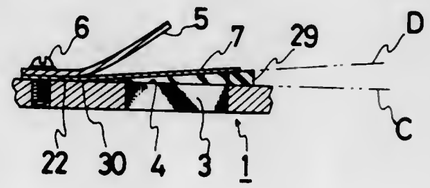
said one valve being completely closed before said other valve is opened preserving pressure in flow lines leading to said other valve.

4,076,047

REED VALVE

Masami Akahori, Shizuoka, Japan, assignor to Nippon Oil Seal Industry Co., Ltd., Japan

Filed Jun. 4, 1976, Ser. No. 692,914
Claims priority, application Japan, Jul. 16, 1975, 50-97821[U]
Int. Cl.² F16K *15/14*
U.S. Cl. 137—856 **14 Claims**



1. In a valve comprising a body having a valve port, a fixing seat on said body, a stopper, a reed valve plate covering said valve port said plate being flat in an unassembled state and in an assembled state interposed between said fixing seat of said body and said stopper, and a rubber elastic valve seat fixed onto the upper surface of said body surrounding said valve port bearing said reed valve plate, the improvement wherein the surface of said fixing seat of said body and the surface of said valve seat are not in the same plane, the surface of said valve seat is gradually diverged from the projection of the plane of the surface of said fixing seat and the thickness of said valve seat is gradually increased according to the increase of the distance from said fixing seat, said reed valve plate is biasingly bent in the neighborhood of the cross-point of said projection and the projection of the plane of the surface of said valve seat in an assembled state, and said reed valve plate extends along and is biased into contact with the surface of said valve seat.

4,076,048

SLEY DRIVE FOR A WEAVING MACHINE

Ulrich Bolleter, Seuzach, and Marcel Brugger, Winterthur, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jun. 3, 1976, Ser. No. 692,278
Claims priority, application Switzerland, Jun. 10, 1975, 7450/75
Int. Cl.² D03D *49/60*
U.S. Cl. 139—190 **15 Claims**

1. A sley drive for a weaving machine comprising

a sley shaft mounted for oscillation about a longitudinal axis,

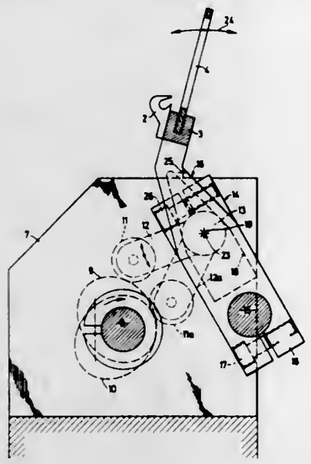
a reed,

a balance weight,

first means coupling said balance weight to said sley shaft for oscillation of said balance weight with said sley shaft about said longitudinal axis and,

second means coupling said reed to said balance weight for

oscillation therewith about said longitudinal axis whereby said shaft, reed, balance weight, first means and second



means have a center of gravity coincident with said longitudinal axis.

4,076,049

MACHINE FOR THE FORMATION OF SELVEDGES IN FABRICS

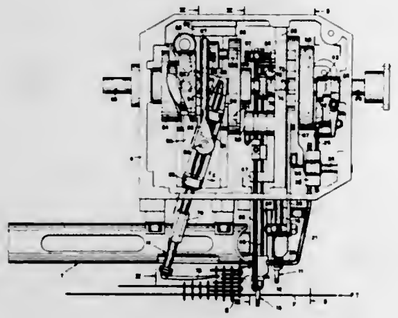
Antonio Manea, Schio (Vicenza), Italy, assignor to F.lli Manea S.n.c. Costruzioni Meccaniche Accessori Tessili, Schio (Vicenza), Italy

Filed Apr. 15, 1976, Ser. No. 677,484

Claims priority, application Italy, Apr. 16, 1975, 22411/75; Oct. 3, 1975, 27937/75

Int. Cl.² D03D *47/48*

U.S. Cl. 139—434 3 Claims



1. A machine for the formation of tucked-selvedges in fabrics formed with warp and weft threads by means of a shuttleless loom, wherein said machine comprises, in combination:

(a) a thread-seizing device movable between an advanced position in which it closes on the extremity of the last weft thread inserted extending outside the warp shed and a retracted position in which it takes said extremity of the weft to engage with a stationary thread-seizing device positioned laterally with respect to the thread-seizing, so that a section of said weft thread extremity is pinched between the thread-seizing devices;

(b) a scissors positioned between the thread-seizing devices and actuable so as to cut said section of weft extending between the thread-seizing devices;

(c) first actuating means cooperating with the thread-seizing device in order to return it, with the weft thread extremity extending from the warp and just cut by the scissors, to the aforesaid advanced position and then again to retracted position passing through a raised position;

(d) a hook needle movable from a position within a seating of the template of the loom above the fabric being formed, through a succeeding warp shed, to a position protruding from the said warp shed below the thread-seizing device to be returned to the retracted position gripping the extremity of the weft extending from the shed and previously cut by the scissors, so that said extremity of the weft is released by the thread-seizing device and is seized by the hook needle which, returning within the seating in the template inserts it folded into the shed which closes to form on the fabric the tucked-selvedge; and

(e) with the aforesaid first actuating means adapted to move in a correct operating sequence the movable thread-seizing device cooperating additional actuating means adapted to open and close the stationary thread-seizing device and the scissors and to move the hook needle in a correct operating sequence.

4,076,050

SHED FORMING DEVICE ON AN UNDULATED SHED LOOM

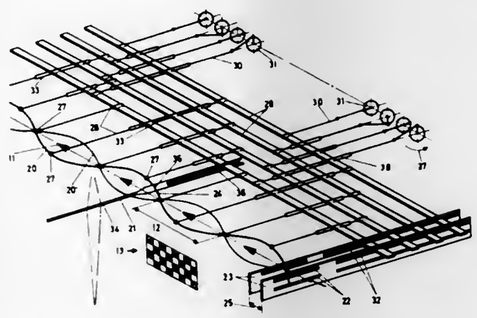
Edgar Strauss, Agincourt, Canada, assignor to Ruti Machinery Works Ltd, Ruti, Switzerland

Filed Nov. 26, 1975, Ser. No. 635,401

Claims priority, application Switzerland, May 17, 1974, 6768/74

Int. Cl.² D03D *47/26*

U.S. Cl. 139—436 13 Claims



1. A shed forming device on an undulated shed loom in which during operation sheds are formed one after the other in a sinusoidal movement and shed forming heddles are arranged along flexible cables and held by them, and the flexible cables during the operation of the loom carry out a sinusoidally advancing movement for the production of which drive points arranged spaced apart from each other are provided on each of said cables, there being provided operational members extending in the width-wise direction of the loom, each operational member being operatively coupled to drive points of one of the corresponding flexible cables by a coupling means, for each cable there being provided individually movable operational members while lie parallel to each other in a single plane and which are of straight, elongate and rod-like shape, each of said operational members being driven by an individual driving means.

4,076,051

APPARATUS FOR CHARGING WEFT THREAD CARRIERS

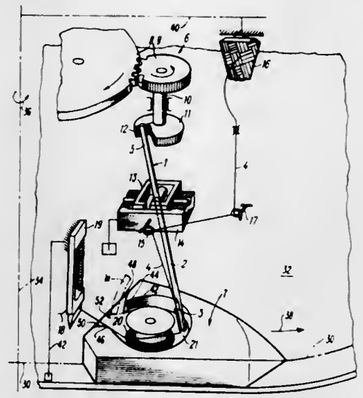
Alexandr Alexandrovich Zabotin, Belyaevo-Borgorodskoe, kvartal 45, korpus 26, kv. 85, Moscow; Evgeny Dmitrievich Loschilin, Domodedovo, ulitsa 8 Marta, 34a, Moskovskaya oblast, Domodedovo; Eduard Arshakovich Onikov, ulitsa Panferova, 5, korpus 2, kv. 106; Alexandr Lvovich Galperin, ulitsa Moldagulovoi, 10, korpus 3, kv. 166, both of Moscow, all of U.S.S.R.; Nicola Santucci, Schio (Vicenza), 32, and Luciano Corain, Vicenza, both of Italy

Filed Sep. 20, 1976, Ser. No. 724,763

Claims priority, application U.S.S.R., Sep. 23, 1975, 2170554

Int. Cl.² D03D *47/26*

U.S. Cl. 139—436 8 Claims



4. In an apparatus for charging, in wave-type shedding looms, weft thead carriers which move in a given plane during the charging thereof, an elongated rod having opposed ends one of which is formed with an opening through which weft thread is adapted to pass, support means supporting said rod for tilting movement in all directions, and drive means operatively connected to said rod for describing at least at said one end thereof a circle situated in a plane parallel to said given plane, while said rod tilts with respect to said support means, whereby thread issuing from said opening at said one end of said rod can be introduced into a carrier for charging the same.

4,076,052

SYSTEM FOR TRANSFERRING A YARN FROM ONE PART OF A TEXTILE MACHINE TO ANOTHER PART

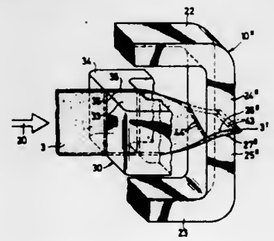
Hans Demuth, Winterthur, Switzerland, and Jose R. A. Ferreira, Alverca do Alentejo, Portugal, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jul. 6, 1976, Ser. No. 703,003

Claims priority, application Switzerland, Jul. 4, 1975, 8736/75

Int. Cl.² D03D *47/24, 47/34*

U.S. Cl. 139—439 8 Claims



1. A system for transferring a yarn from one part of a machine to a second part of the machine comprising

a first clip at a yarn transfer position having a first pair of jaws, each of said jaws having a clamping surface facing a clamping surface on the other of said jaws, and at least one of said jaws being movable relative to the other of said jaws; and

a second clip disposed coaxially of said first clip at said yarn transfer position and having a second pair of jaws, each of said jaws having a clamping surface facing a clamping surface on the other of said jaws, and at least one of said jaws being movable relative to the other of said jaws, said clamping surfaces of said second pair of jaws being disposed in cross-wise relation to said clamping surfaces of said first pair of jaws at an angle differing from 90° by at least 4°.

4,076,053

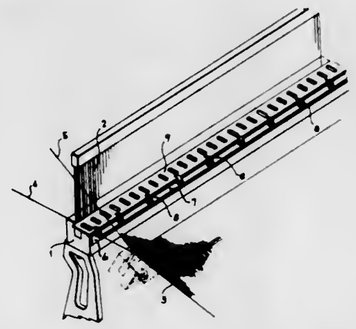
MEANS GUIDING THE STRAPS OF THE WEFT CARRYING GRIPPERS INSIDE THE SHED

Graziano Genini, Stabio, Switzerland, assignor to Albatex A.G., Vaduz, Liechtenstein

Filed Jul. 12, 1976, Ser. No. 704,630

Int. Cl.² D03D *47/18*

U.S. Cl. 139—449 9 Claims



1. In a system for guiding inside the warp yarns shed the straps of weft carrying grippers in shuttleless weaving looms comprising a sley and a reed, of the type in which said grippers are moved backward and forward into the shed between upper and lower laps of the warp yarns by a pair of flexible straps arranged in a substantially horizontal plane parallel to the sley; the improvement in which said straps freely bear on the lower lap of the warp yarns and are guided along at least one side edge by a plurality of guides upstanding from the sley, said guides being separate from each other and individually secured to the sley and extending through the sley, and means bearing against the underside of the sley for releasably securing said guides to the sley.

4,076,054

WEFT PRESENTING DEVICE FOR LOOMS WITH SELECTIVE WEFT FEED

Alberto Merisio, Colzate (Bergamo), Italy, assignor to Somet Societa' Meccanica Tessile S.p.A., Gazzaniga (Bergamo), Italy

Filed Oct. 4, 1976, Ser. No. 729,366

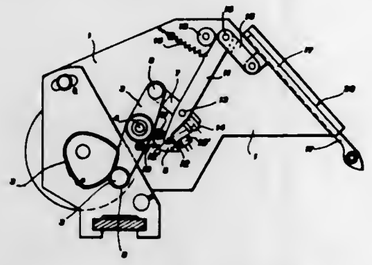
Claims priority, application Italy, Oct. 3, 1975, 27928/75

Int. Cl.² D03D *47/34*

U.S. Cl. 139—453 5 Claims

1. Apparatus for selectively presenting weft threads into position to be picked up and down into successive sheds of a loom, comprising a plurality of weft thread presenting rods, and means for advancing and retracting a selected said rod in the direction of its length, said means comprising, associated with each said rod, a rotary cam, a pawl, a lever connected to a said rod, means interconnecting said cam and said lever for moving a point intermediate the length of said lever through a

predetermined path, means for selectively engaging and disengaging one end of said lever with and from said pawl, whereby when said one end of said lever is engaged with said pawl, said lever swings about its said one end and the other end of said lever imparts to the associated said rod a movement of substantial magnitude but when said pawl is disengaged from said one end of said lever said one end of said lever is free to swing relative to said pawl, and means restricting movement of the other end of said lever whereby when said one end of said lever is free to swing, said other end of said lever imparts at most only very small movement to said associated rod.



4,076,055

WINDING MACHINE

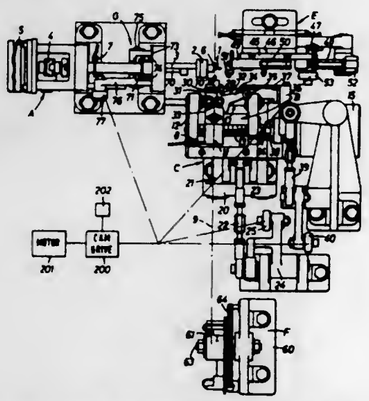
Peter Martin Zolman, and Keith Gilbert Doyle, both of Twickenham, England, assignors to Alfred Bader Limited, Surrey, England

Filed Sep. 28, 1976, Ser. No. 727,431

Claims priority, application United Kingdom, Sep. 29, 1975, 39777/75

Int. Cl.² B21F *3/04*

U.S. Cl. 140—92.2 **4 Claims**



1. A coil winding machine comprising a mandrel on which a coil is to be wound, a wire guide for guiding wire onto said mandrel in a correct position for forming a wire coil on said mandrel, a first stepping motor for providing a rotary motion between said mandrel and said wire guide, a second stepping motor, a rotary to straight line motion converting mechanism connected to said second stepping motor for providing a longitudinal displacement between said mandrel and said wire guide and electronic control means comprising a programmer in which desired parameters for controlling said stepping motors for producing a desired coil are set, a velocity generator connected to said programmer for generating a number representative of a desired rotational speed of said mandrel, a clock pulse generator providing clock pulses to said velocity generator, a first arithmetic unit supplied with said number representative of said desired rotational speed of said mandrel and with a fixed scale factor, means for connecting said arithmetic unit to said first stepping motor, a second arithmetic unit supplied with said number representative of said desired rotational speed of said mandrel, with a variable scale factor representing turns per unit distance of the desired coil to be wound and with a wire guide return factor for controlling return operation of said longitudinal movement between said mandrel and said wire guide and means for connecting said second arithmetic unit to said second stepping motor.

4,076,056

WIRE WRAPPING DEVICE FOR CONNECTING AN INSULATED ELECTRICAL WIRE TO AN ELECTRICAL CONTACT PIN

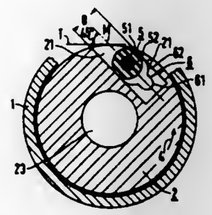
Fritz Dümmel, Nuremberg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed May 6, 1976, Ser. No. 683,689

Claims priority, application Germany, May 26, 1975, 2523247

Int. Cl.² B21F *15/04*

U.S. Cl. 140—119 **4 Claims**



1. In a wire wrapping device for connecting an insulated electrical wire comprising a wire core and electrical insulation surrounding said core to an electrical contact pin including a wrapping sleeve, a rotatable cylindrical wrapping spindle disposed within said wrapping sleeve having an axially-disposed aperture opening at one end thereof for receiving said contact pin and a continuous wire guiding canal disposed in the surface of said spindle, said canal having curved, U-shaped stripping knives disposed therein opening towards the surface of said spindle for receiving and cutting said electrical insulation from said wire, said knives defining a first cutting opening having a width corresponding to the cross-sectional dimension of said insulated electrical wire and a second cutting opening having a width which is at least the same as the diameter of said wire core, the improvement comprising said stripping knives being disposed in said wire guiding canal so that the longitudinal axes of said knives are disposed at an angle ranging between about 30° and about 60° with respect to the tangent at the intersection of said longitudinal axes of said knives and the surface of said wrapping spindle, and said knives being positioned from the end face of said one end of said spindle by a distance which is at least several times greater than the diameter of said insulated electrical wire.

4,076,057

METHODS FOR FILLING FILTER CELLS WITH ADSORBENT MATERIAL

Ivars Sigurds Spulgis; Jack Leland Pettit; Michael Duane Allard, all of Columbus, and Harold Cheney Parish, Upper Arlington, all of Ohio, assignors to Penwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 572,580, Apr. 28, 1975, Pat. No. 4,030,639. This application Apr. 5, 1976, Ser. No. 673,840

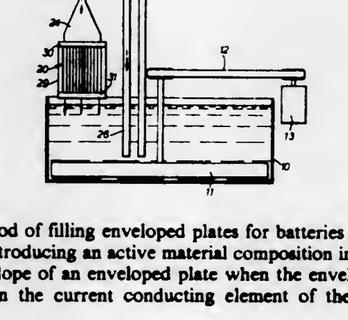
Int. Cl.² B65B *3/00*

U.S. Cl. 141—1 **9 Claims**

1. A method, for filling a longitudinally extending vertically oriented filter cell, with a uniformly packed density of granular adsorbent material whereby subsequent gas flow through said filled cell is uniform across the cell face, comprising the steps of:

a. positioning a longitudinally extending openable bottom portion of a reservoir of granular adsorbent material above a longitudinally extending apex orifice of an empty vertically oriented filter cell;

b. aligning a first open end of a longitudinally elongated collimating conduit with said reservoir openable bottom portion and aligning a second open end of said conduit with said longitudinally extending apex orifice of said filter cell;



c. interposing at least one longitudinally extending planar mesh within said conduit and perpendicular to a collimating wall thereof, intermediate said openable portion of said reservoir and said filter cell apex orifice;

d. opening said reservoir bottom portion thereby dispensing a downward flow of granular adsorbent material therefrom through said collimating conduit and said meshes and into said filter cell apex orifice; and

e. removing said reservoir from above said cell thereby halting downward flow of granular adsorbent material into said cell when said cell is filled.

4,076,058

ELECTRIC STORAGE BATTERIES

Barry Culpin, Bolton, and Gordon Alexander Clegg, Rossendale, both of England, assignors to Chloride Group Limited, London, England

Filed Oct. 14, 1976, Ser. No. 732,538

Claims priority, application United Kingdom, Oct. 15, 1975, 42362/75

Int. Cl.² B65B *3/04*

U.S. Cl. 141—1.1 **5 Claims**

1. A method of filling enveloped plates for batteries which comprises introducing an active material composition into the porous envelope of an enveloped plate when the envelope is assembled on the current conducting element of the plate characterised in that the active material composition is introduced into the envelope as an aqueous slurry, which has a degree of sulphation in excess of 50% and a rotating vane viscometer torque value (as herein defined) of not more than 0.2 lbs ft at 20° C, that said aqueous slurry being introduced into the envelope at a pressure of less than 5 psi until the envelope is filled with the composition, liquids issuing through the walls of the envelope, the pressure then being allowed to rise to a value above 5 psi but not in excess of 70 psi, the pressure there after being released.

4,076,059

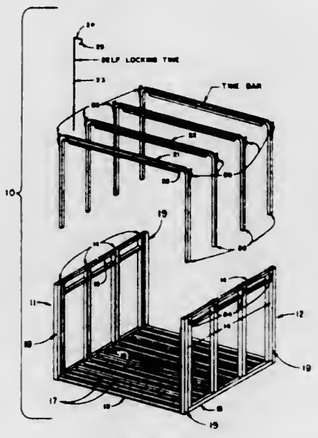
APPARATUS FOR LOADING TOBACCO IN BARNS

Frank W. MacIntosh, Mount Holly, N.C., assignor to Gas-Fired Products, Inc., Charlotte, N.C.

Division of Ser. No. 671,279, Mar. 29, 1976, Pat. No. 4,032,023. This application Mar. 7, 1977, Ser. No. 774,592

Int. Cl.² B65B *1/04*

U.S. Cl. 141—390 **3 Claims**



1. A loading sleeve having a correspondingly shaped tobacco container of a given uniform height removably contained therein, said loading sleeve being of a size in all dimensions such that said container is removably contained therein said loading sleeve including first two opposed wings which extend vertically above said container and are attached to opposed sides of the sleeve and having second two opposed wings extending vertically above the container and attached to other opposed sides of said sleeve, the said second two wings having a smaller vertical dimension at their mid-points than at their junctures with the first two opposed wings and having a concave configuration in elevation, whereby tobacco can be loaded into the container by loading the tobacco up to the level and contour of the wings thereby the loaded tobacco will have a concave top such that when the tobacco is compressed from the level of the wings to the level of the container a uniform density of the compressed tobacco is achieved within the confines of the container.

4,076,060

ENERGY SAVING TREE HARVESTER

Thomas L. Bestard, Woodstock, Canada, assignor to Eaton Yale Ltd., Ontario, Canada

Filed Mar. 23, 1977, Ser. No. 780,575

Int. Cl.² A01G *23/08*; B27L *1/00*

U.S. Cl. 144—3 D **9 Claims**

1. An apparatus for felling and delimbing a tree comprising:

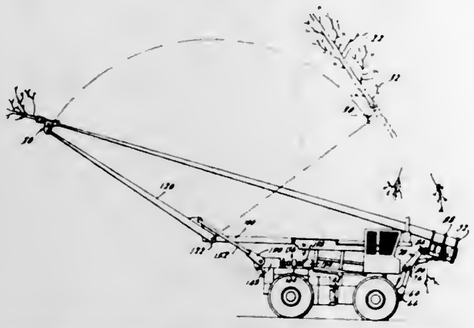
means for severing the trunk of a standing tree;

means for felling a tree from a standing position to a fallen position;

delimbing means cooperating with the felling means and

operable to delimb the tree in a substantially continuous operational step as the tree trunk is moved from the standing position to the fallen position, said delimbing means icluding a delimber head which removes branches from the trunk of the tree as the delimber head is moved along the trunk of the tree, and a delimbing boom for moving the delimber head along the tree trunk; and

drive means for moving said delimbing boom from a first



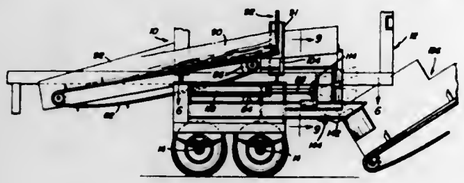
position wherein said delimber head is adjacent the butt end of the tree to a second position wherein said delimbing head is adjacent the top of the tree, and stopping said boom in said second position, said drive means including energy storing means operable to store energy dissipated in bringing said boom to a stop in said second position and to transfer said energy to the boom to accelerate the boom when said boom is moved from said first position toward said second position.

4,076,061

FIREPLACE WOOD CUTTING MACHINE

Carroll D. Greeninger, 7965 SE. 92nd St., Apt. No. 20, Portland, Oreg. 97266

Filed Jul. 19, 1976, Ser. No. 706,290
Int. Cl.² A47J *42/09*; B27L *7/00*
U.S. Cl. 144—3 K **16 Claims**



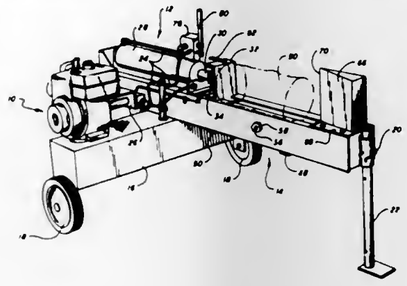
1. In combination, an elongated support frame including inlet and outlet ends, said inlet end including an inclined loading conveyor with its lower end remote from said outlet end, drag cable winch means carried by an upper portion of said support frame and having a drag cable mounted thereon for winching logs lengthwise toward said conveyor from outwardly of said inlet end, shear means mounted on said frame adjacent the upper end of said conveyor for shearing log end portions being discharged from the upper end of said conveyor, elongated trough means supported from said frame and including one end for receiving log end portions from said shear means, force means for engaging and forcing a log end in said one end toward the other end of said trough means against which a cut log end forced along said trough means by said force means may be forced for splitting said cut log end into multiple log sections, said upper portions of said frame including longitudinally extending support track means, a traveling overhead winch assembly mounted on said track means movement therealong, said overhead winch assembly including lift cable means for engagement with and elevating the mid portion of a log supported from said loading conveyor.

4,076,062

POWER DRIVEN LOG SPLITTER

Robert W. Kanik, Alder Creek, N.Y., assignor to R. Kanik Sales, Ltd., Black River, N.Y.

Filed Apr. 29, 1976, Ser. No. 681,475
Int. Cl.² B27L *7/00*
U.S. Cl. 144—193 A **6 Claims**



1. A power-operated log splitter comprising, in combination:
(a) a stationary splitting wedge having a vertically disposed cutting edge;
(b) frame means including a pair of U-shaped channel members fixedly positioned in spaced relation with the free edges of the two members being parallel and facing one another in substantially horizontal planes, whereby a log may be longitudinally supported upon the opposing free edges on the upper side of said two members;
(c) means fixedly securing said wedge to said frame means;
(d) a linearly reciprocating ram element having integrally formed upper and lower portions separated by notches extending into each side of said element along the entire length thereof;
(e) said channel members on the upper side of said two members extending into said notches to attach said ram element to said frame means for sliding movement along said channel members;
(f) the upper sides of each of said channel members including adjacent cut-out areas having a combined length and width at least as great as the length and width of said lower portion of said ram element, whereby said ram element may be disconnected from said rod and removed from attachment with said frame means by removal of said lower portion through said cut-out areas;
(g) drive means including a hydraulic cylinder having an operating rod and power means providing hydraulic power for reciprocating movement of said cylinder; and
(h) means releasably connecting said ram element to the end of said operating rod.

4,076,063

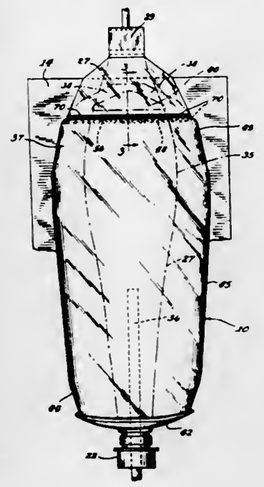
FLEXIBLE, COLLAPSIBLE CONTAINER FOR LIQUIDS WITH IMPROVED TAIL SEAL

Frank Cammarata, III, Wheeling; Joe Alan Miller, Lake Zurich, both of Ill., and Jerry D. Martin, Kenosha, Wis., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Division of Ser. No. 648,603, Jan. 12, 1976. This application Dec. 13, 1976, Ser. No. 750,791
Int. Cl.² B65D *33/02*
U.S. Cl. 150—.5 **3 Claims**

1. In a hollow, tubular container including a head portion with access means to the contents of the container, and a tail portion defining a sealed line in said tail portion joining sides of said container into a sealed end, and a flat plastic piece formed integrally with said sealed line and extending away therefrom,

the improvement comprising, in combination, a pair of spaced rod members formed as an integral part of said sealed line and flat plastic piece, said rod members extending transversely to the longitudinal axis of said container across its entire width, said flat plastic piece also defining a portion thereof between



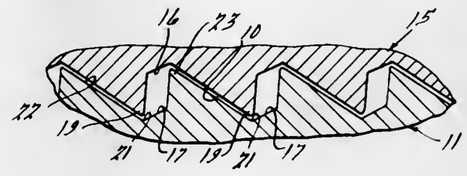
said rod members which is thinner than the remainder of said plastic piece spaced from said rod members, said container having a generally uniform wall thickness of no more than 0.05 inch in the wall of said container adjacent said flat plastic piece, whereby said rod members and intermediate portion therebetween provide an improved and stronger tail seal.

4,076,064

LOCKING THREAD CONSTRUCTION

Horace D. Holmes, 28576 Green Willow, Farmington Hills, Mich. 48018

Continuation of Ser. No. 620,566, Oct. 8, 1975, abandoned. This application Dec. 29, 1976, Ser. No. 755,437
Int. Cl.² F16B *39/30*
U.S. Cl. 151—14 R **9 Claims**



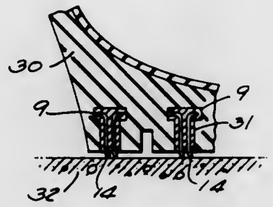
1. A fastener combination comprising a threaded male element and a threaded female element adapted to receive the male element in threaded engagement therewith;
each of the male and female threaded elements having a thread form thereon defined by leading and trailing helical flanks, which intersect to define a crown each flank lying at an angle relative to the common longitudinal thread axis of the fastener combination;
the female element including a truncated coat adjacent the major diameter thereof, said truncated coat defining a helical flat extending between the trailing flank and the adjacent leading flank which faces said trailing flank, and said flat, throughout its axial extent, lying at an angle between about 20° and 30° relative to the thread axis which is substantially less than the angle of the male element flank which tends to converge on said flat under axial tension load; said flat angled radially outward from said trailing to said adjacent leading flank.
whereby axial tension loading of the combination tends to displace the crown of the male thread into contact with the flat to prevent movement between the elements transverse to said axis and lock elements.

4,076,065

TIRE STUD WITH ANTI-SKID SURFACE

Jay G. Somers, 1706 Chestnut St., Oshkosh, Wis. 54901

Continuation of Ser. No. 521,166, Nov. 5, 1974, abandoned. This application Nov. 26, 1975, Ser. No. 635,495
Int. Cl.² B60C *11/16*
U.S. Cl. 152—210 **2 Claims**



1. An individual, discrete anti-skid stud for insertion into a hole in the surface of a resilient automotive tire comprising
a generally cylindrical matrix body,
a matrix base at the inside end of the matrix body, the matrix base having a larger diameter than the matrix body,
at least two wires of a material of greater wear resistance than the material of the matrix body and base,
said wires being embedded in the matrix body in parallel,
portions of said wires extending outwardly from the end of the matrix body opposite the matrix base,
retaining means on each of said wires; said retaining means extending outwardly in spaced radial direction into the matrix base beyond the diameter of the matrix body to securely embed the wires in the matrix body,
each retaining means being an integral part of its associated wire and carried thereform into said matrix base to define a generally L-shaped configuration.

4,076,066

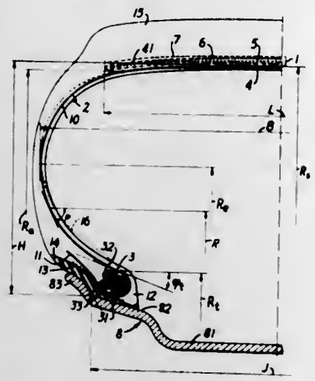
PNEUMATIC TIRE

Henri Verdier, Beauregard-l'Eveque, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Jul. 29, 1975, Ser. No. 600,125
Claims priority, application France, Aug. 5, 1974, 74 27217
Int. Cl.² B60C *9/02, 9/18, 15/00*
U.S. Cl. 152—354 R **5 Claims**

1. A pneumatic tire comprising a tread, a pair of side walls respectively extending inwardly from the edges of the tread, a pair of beads respectively at the inner edges of the side walls, a pair of bead rings respectively reinforcing said beads, a carcass reinforcement formed of radial cords anchored to the bead rings, a tread reinforcement formed with reinforced edges and comprising at least two plies of cords parallel in each ply and crossed from one ply to the other at a slight angle with respect to the circumferential direction of the tire, the aspect ratio H/B of the height H on the rim to the largest axial width B of the carcass reinforcement being at most equal to 0.6, characterized in that, when the tire is mounted on a rim and inflated, the rim being of standard diameter and the rim width being substantially equal to the width of the tread reinforcement, then the carcass reinforcement, seen in meridian section, follows its natural equilibrium profile between the zone of contact of the side walls with the tread reinforcement and the zone of contact of the side walls with the respective bead rings, said profile

meeting the bead rings in tangent relation and the bead rings themselves comprising three members, each of said members



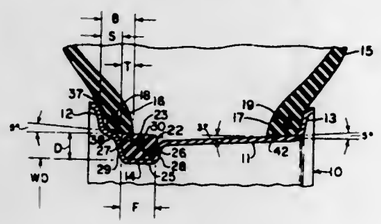
being tangent to two others of said members, the bead rings thus having a reinforced torsional rigidity.

4,076,067

ELASTIC WHEEL WELL FILLER

Michael L. Gill, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 3, 1976, Ser. No. 663,514
Int. Cl.² B60C *15/02*
U.S. Cl. 152—381.6 **9 Claims**



1. In combination, a wheel rim for mounting a tire of the type having a bead portion with a circumferentially extending bead, said rim having a generally cylindrical portion, a side flange on one side of said rim, a circumferentially extending wheel well in said generally cylindrical portion adjacent said side flange, said wheel well having an axial width greater than the width of said bead portion and being spaced from said side flange a distance less than the width of said bead portion providing a bead seating flange adjacent said side flange so that said bead portion will extend over a portion of said well, a wheel well filler for mounting in said wheel well comprising a flexible ring having a radially outer surface, a radially inner surface for seating in the bottom of said well, a side surface connecting said inner and outer surfaces and abutting a side of said well spaced from said bead seating flange, a plurality of rigid retainer members located in said ring at circumferentially spaced-apart positions, each of said retainer members extending from a first position under said bead spaced from said side surface and adjacent said bead seating flange of said rim to a second position closer to said radially inner surface and in close proximity to said side surface of said ring and to said side of said well so that said bead portion will overlap the end of each of said retainer members at said first portion and the retainer members will limit deflection of said ring at said side surface by said side of said well to prevent rotation of said ring out of said wheel well when subjected to centrifugal force.

4,076,068

INSULATING VENETIAN BLIND

John Neville Archer, Nynashamn, and Hans Folke Larsson, Vasterhaninge, both of Sweden, assignors to Rederiaktiebolaget Nordstjernan, Stockholm, Sweden

Filed Jun. 14, 1976, Ser. No. 695,571
Int. Cl.² E06B *9/30*
U.S. Cl. 160—107 **6 Claims**



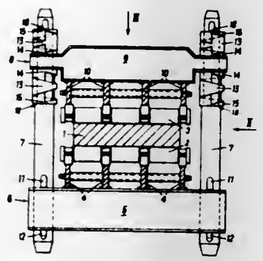
1. An insulating venetian blind consisting essentially of a number of thin blades, which are provided between the panes of glass of a double glass window and stretch from the inside edge of one side frame to the other across the whole window and which are turnable between a horizontal and a vertical position, characterized in that in the vertical position the blades (2, 3) form at least mainly tight walls being spaced apart and forming between them an integral and substantially closed air space, thereby reducing heat losses through a double glass window to at least equal low heat losses as through a window with three panes of glass.

4,076,069

STRAND GUIDE TO BE USED IN A CONTINUOUS CASTING PLANT

Alois Scheinecker, and Werner Scheurecker, both of Linz, Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Austria

Filed Oct. 15, 1976, Ser. No. 732,934
Claims priority, application Austria, Oct. 29, 1975, 8217/75
Int. Cl.² B22D *11/12*
U.S. Cl. 164—448 **10 Claims**



1. In a strand guide to be used in a continuous casting plant and having oppositely arranged frame parts, drawing anchors connecting the frame parts and strand guiding rollers journaled in the frame parts, at least one of the frame parts being a displaceable frame part which is movable along the drawing anchors and fixable thereon, the improvement comprising:

two rotatable bushings having helical supporting faces provided on each drawing anchor and rotatable therearound, the displaceable frame part being located on said drawing anchors between said two rotatable bushings;

two fixed abutments provided on each drawing anchor on opposite sides of the displaceable frame part, the fixed abutments securing the two rotatable bushings on each drawing anchor; and

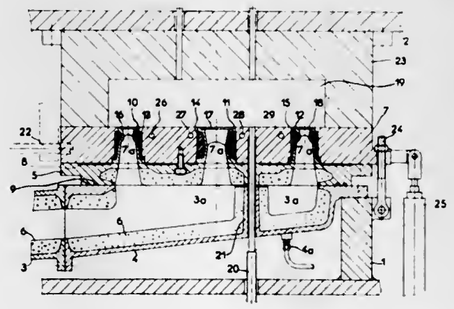
sliding elements provided on opposite sides of the displaceable frame part on each drawing anchor for contacting the helical supporting faces of the rotatable bushings and translating the rotary motion of the rotatable bushings into a displacement of the displaceable frame part on each drawing anchor.

4,076,070

LOW-PRESSURE DIECASTING MACHINE

Jean Lefebvre, and Jean-Claude Pichouron, both of Boulogne-Billancourt, France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt and Automobiles Peugeot, Paris, both of, France

Filed Oct. 1, 1975, Ser. No. 618,485
Claims priority, application France, Oct. 9, 1974, 74.33918
Int. Cl.² B22D *17/00, 27/14*
U.S. Cl. 164—303 **3 Claims**



1. An improved automatic low-pressure diecasting machine of the type having separable upper and lower mould portions wherein molten metal is forced by gaseous pressure into the casting cavity, the improvement comprising:

a plurality of feed inlets arranged substantially vertically through the bottom of said lower mould portion and opening into the casting cavity, and

a separable heat-insulated distribution chamber formed of an upper and lower portion and being thermally insulated from said lower mould portion said distribution chamber having an inlet port and a plurality of outlet ports arranged to communicate with said feed inlets in said lower mould portion, said distribution chamber portions also having bosses extending therethrough to permit the mutual bearing engagement of said chamber portions, said bosses having bores axially aligned and extending therethrough, said bores communicating with an axially aligned bore in said lower mould portion and and ejector rod extending through said bores in said bosses and through said bore in said lower mould portion into said casting cavity for removing the casting from the cavity.

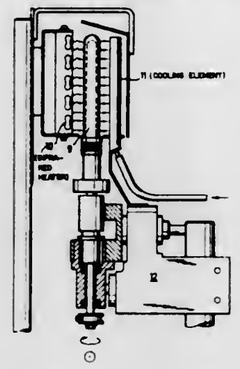
4,076,071

METHOD FOR HEATING PLASTICS MATERIALS

Otto Roseakranz, Hamburg; Heinz Goos, Schenefeld, and Karl-Heinrich Seifert, Hamburg, all of Germany, assignors to Heidenreich & Harbeck Zweigniederlassung der Gildemeister AG, Hamburg, Germany

Filed Oct. 22, 1974, Ser. No. 516,904
Claims priority, application Germany, Oct. 22, 1973, 2352926
Int. Cl.² F25B *13/00;* **B28B** *11/08*
U.S. Cl. 165—2 **4 Claims**

2. A method of heating an essentially tubular parison formed of a heat degradable thermoplastic material from a temperature at which the parison is essentially non-deformable and non-workable to a temperature at which the parison is deformable and workable, comprising the steps of placing a tubular parison at a non-deformable temperature onto a laterally displaceable and rotatable carrier, laterally displacing the carrier and conveying the parison past a bank of infra-red heaters while (a) simultaneously rotating the carrier and the parison about a



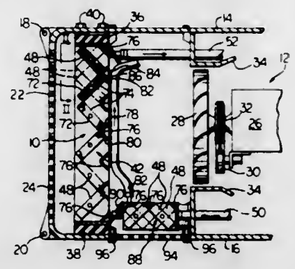
common longitudinal axis and (b) directing a stream of gaseous coolant onto the surface of the rotating parison to prevent overheating of the surface of the parison while facilitating heating the interior of the parison, and displacing the tubular parison from adjacent the radiant heaters at a deformable, workable temperature.

4,076,072

MODULAR HEAT EXCHANGER WITH PIVOTAL CORES

Erwin John Herman Bentz, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 9, 1975, Ser. No. 620,999
Int. Cl.² F28G *13/00*
U.S. Cl. 165—41 **19 Claims**



18. A heat exchanger, comprising:

a plurality of cooling cores each having first and second opposed outer surfaces and first and second opposed edges, said cooling cores being generally positioned in side by side relationship and movable between a first position at which the first edges of adjacent cores are in close proximity and oriented for passing cooling fluid through the cores in a direction from the first surface to the second surface and a second position at which the second edge of adjacent cores are in close proximity and oriented for passing cooling fluid through the cores in a direction from the second surface to the first surface;

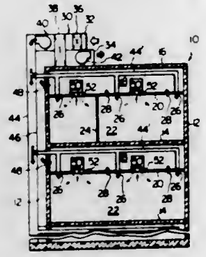
means for pivotally mounting said cores for pivotal movement of the cores less than 180° during movement between the first and second positions.

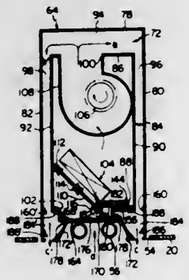
4,076,073

COMBINATION RE-CONDITIONING UNIT AND ILLUMINATING APPLIANCE FOR USE WITH CENTRAL AIR CONDITIONING SYSTEM

Toshio Yamamoto; Jyoji Kamata; Shigeo Murase, and Kouichirou Yamaguchi, all of Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jan. 26, 1976, Ser. No. 652,155
Claims priority, application Japan, Feb. 18, 1975, 50-20521
Int. Cl.[2] F24D 5/10
U.S. Cl. 165—53 31 Claims





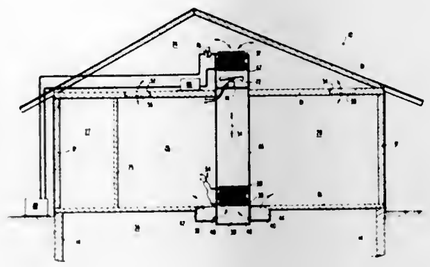
1. In a building having a wall structure and a central air conditioning system and with at least one ceiling chamber having the bottom defined by a ceiling panel, a combination of one of re-conditioning units for use with said central air conditioning system including a main air supply duct communicating with spaces below said ceiling panel through ducts passing through said ceiling chamber and openings formed in said ceiling panel and an air return duct communicating with said ceiling chamber through at least one opening formed in said wall structure and an illuminating appliance for installation in the ceiling chamber through an opening formed in the ceiling panel which forms the ceiling chamber, said re-conditioning unit being installed within the ceiling chamber above said opening in the ceilng panel and comprising casing means formed with a plurality of separate chambers which are arranged in series longitudinally of said casing means and which include a conditioning chamber having blower means for circulating therethrough air from the space below said ceiling panel and back into the space below and a heat-transfer chamber having heat exchange means therein for passing therethrough and conditioning air from said ceiling chamber and back into the ceiling chamber, said casing means further having an air inlet opening located at the bottom of said conditioning chamber and at least one air outlet opening located at the bottom of the casing means, and said illuminating appliance being positioned immediately below said casing means and having its lower end exposed to said space below the ceiling panel through said opening in the ceiling panel and having an air inlet opening upwardly in communication with said air inlet opening in said casing means and at least one air outlet opening upwardly in communication with said air outlet opening in said casing means and which is open at the lower end of the illuminating appliance to the space below the ceiling panel.

4,076,074

HIGH EFFICIENCY NATURAL CONVECTION HEATING AND COOLING SYSTEM FOR HOME DWELLINGS

Leo L. Tompkins, Jackson, Miss., assignor to Xenco, Inc., Jackson, Miss.

Filed May 27, 1976, Ser. No. 690,820
Int. Cl.[2] F24H 9/08; F24D 5/10
U.S. Cl. 165—53 3 Claims



1. A high efficiency convection heating and cooling system for a residential dwelling building structure, said building structure including:

outer walls, an overlying roof and an underlying floor, a ceiling extending across said building between said roof and said underlying floor and forming the top of at least one room and defining with said roof an attic, the outer walls, the overlying roof and the underlying floor being insulated and forming a relatively closed insulated enclosure including said at least one room,

a closed vertical stack extending vertically within the center of said building structure from said floor and through said ceiling and terminating just beneath said roof, said stack comprising a tubular duct of maximum length from the floor through the ceiling and into said attic, said cooling coil being located within said stack at a level above said ceiling adjacent the open upper end of the same,

selectively energizable heating coil means mounted within said tubular duct at the lower end thereof in the vicinity of said floor to maximize lifting effort with respect to the heated air heated at the bottom of the stack and to maximize the dropping effort of the air cooled at the upper end of said tubular duct,

first air duct means extending from said at least one room in the vicinity of said floor to the lower end of said tubular duct,

second air duct means extending from the top of said at least one room to the top of said stack, said second air duct means comprising openings within the ceiling remote from said tubular duct for facilitating air flow by convection through said vertical tubular duct, said room and said first and second air duct means;

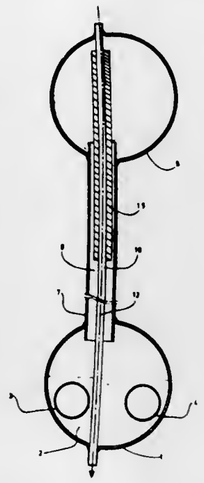
whereby, selective energization of said heating means effects heating of the air within said tubular duct to a greater degree than the air within said room to effect natural convection of air flow through said tubular duct in an upper direction to displace cold air within said tubular duct while selective energization of said cooling means within said tubular duct causes said air within said tubular duct at the top to cool to a greater degree than that within said at least one room to effect downward convection movement of said air within said tubular duct to provide draft free conditioning of the air within said at least one room.

4,076,075

YARN HEATING DEVICE

Jean Venot, Roanne, France, assignor to ASA S.A., Roanne, France

Filed Jun. 25, 1976, Ser. No. 699,713
Claims priority, application France, Jul. 10, 1975, 75.21797
Int. Cl.[2] F28D 15/00; H05B 3/00; F27B 9/08; D02J 13/00
U.S. Cl. 165—105 10 Claims



1. A yarn heating device comprising a lower vessel, a heat transfer liquid in said lower vessel, a heating device effective to vaporise at least a part of said heat transfer liquid, an upper vessel, at least one conduit connecting the upper vessel to the lower vessel, at least one yarn treatment tube passing within said at least one conduit for the passage of the moving yarn to be heated, and a metal heat conductive portion surrounding in thermal contact an upper part of said at least one treatment tube.

4,076,076

MECHANICAL HEAT EXCHANGE JOINT

Henry Harrison, Locust Valley, N.Y., assignor to Halm Instrument Co., Inc., Glen Head, N.Y.

Filed Jul. 12, 1976, Ser. No. 704,374
Int. Cl.[2] F24J 3/02; F28F 1/14, 1/22
U.S. Cl. 165—171 7 Claims



1. A heat-conducting joint suitable for solar heat collectors comprising,

a tubular metal member for carrying heat-transfer fluid,

a sheet metal member in thermal contact with said tubular member, one of said members being pre-curved in a plane perpendicular to the surface of the sheet into a wave shape substantially consisting of a pluality of long radius arches joined by short radius cusps, and

means for first securing the other member while straight to the one member near its ends and while perpendicular to the long radius arches of the wave shape in a manner to prevent sliding of the other member on the one member, and

means for then securing said other member against said one member at said short radius cusps forming a wave shape in said other member,

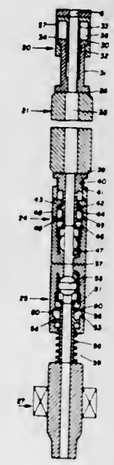
whereby the two members are pressed together elastically along at least one line of contact for efficient heat conduction between them.

4,076,077

WEIGHT AND PRESSURE OPERATED WELL TESTING APPARATUS AND ITS METHOD OF OPERATION

George J. Nix, London, England; Burchus Q. Barrington; David L. Farley, both of Duncan, Okla., and Norman G. Hortman, Laurel, Miss., assignors to Halliburton Company, Duncan, Okla.

Division of Ser. No. 595,648, Jul. 14, 1975. This application Dec. 2, 1976, Ser. No. 746,912
Int. Cl.[2] E21B 43/12
U.S. Cl. 166—315 2 Claims



1. A method of operating a valve in a testing string having a flow channel therethrough and located in a fluid filled well bore, comprising the steps of:

providing a sealed chamber in said testing string;

creating a pressure differential between the pressure in said sealed chamber and fluid pressure in the well bore, wherein the pressure in said sealed chamber is independent of the pressure in the flow passage of said testing string;

applying weight in the testing string onto an operating mandrel means in said testing string, thereby moving said operating mandrel means in a first direction;

increasing the fluid pressure in the well bore by a predetermined amount, thereby increasing said pressure differential; and,

applying said increased pressure differential across a piston on said operating mandrel means, thereby overcoming the weight added to said operating mandrel means, and moving said operating mandrel means in a second opposite direction.

4,076,078

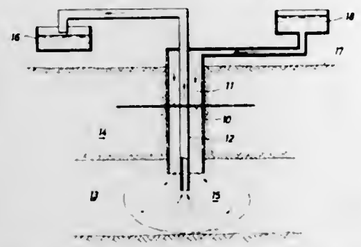
PROCESS FOR FORMING A COALATE SOLUTION IN-SITU

Gary Drinkard, Houston, and William A. McLaughlin, Bellaire, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 23, 1976, Ser. No. 716,906
Int. Cl.[2] E21B 43/24, 43/28
U.S. Cl. 166—271 14 Claims

1. A process for dissolving a subterranean coal formation of

coal of high oxygen content which comprises contacting said coat with a heated basic aqueous solution at a temperature of



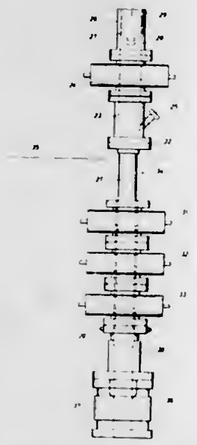
from about 175° to about 250° C. for a time sufficient to dissolve at least a portion of said coal by forming coalate solution.

4,076,079

FULL BORE FRACTURE TREATING ASSEMBLY

Herman H. Herricks, Azle, Tex., and Richard L. Easterwood, Slidell, La., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 16, 1976, Ser. No. 714,869
Int. Cl.² E21B *43/26, 23/00*
U.S. Cl. 166—308 **8 Claims**



1. A method for fracturing down casing in an oil or gas well comprising, providing (a) a tubing hanger which seals with a tubing spool to prevent fracture fluid from affecting blowout preventors located concentrically thereabove and which is modified to support a section casing thereabove to allow full bore access into the well, (b) a fracture spool with an outlet for introducing fracturing fluid into the well, the spool being connected with the tubing hanger via the section casing, (c) closure means located above the fracture spool, and (d) a lubricator located above the closure means with a packer located therewithin; fracture treating the well with the closure means closed; opening the closure means and admitting the packer into the well; and securing the packer at a desired depth above the formation which has been fractured.

4,076,080

FRONT END LOADER ATTACHMENT

Walter J. Anderson, Two Harbors, Minn., assignor to Milton I. Larson, Two Harbors, Minn.

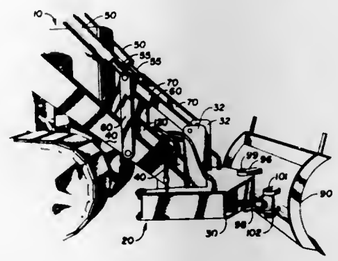
Continuation of Ser. No. 516,746, Oct. 21, 1974, abandoned.
This application Apr. 1, 1976, Ser. No. 672,837
Int. Cl.² E02F *3/76*
U.S. Cl. 172—804 **4 Claims**

4. A bulldozer blade attachment for use with a front-end loader having a push-beam assembly comprising a pair of push arms connected to the frame of said front end loader and having a pair of bucket control links actuated by hydraulic motor means for movement of such links generally parallel to the axis of said push arms, said attachment comprising:

(a) a generally U-shaped horizontal frame member having opposite rearwardly extending legs immovably connected by a transverse base;

(b) a pair of rigid upright transversely spaced pivot arms immovably mounted on said frame, one each of which being disposed adjacent the base of each of said opposite legs thereof and extending upwardly therefrom;

(c) first pivot means constructed and arranged for pivotally connecting said frame member and said pivot arms to the forward end of each of such push arms for pivotal movement about a horizontal transverse axis, said first pivot



means being positioned adjacent the lower end of each of said pivot arms;

(d) second pivot means carried by said pivot arms at a location spaced upwardly from said first pivot means and constructed and arranged to pivotally connect the forward end of each of such bucket control links of such a push beam assembly to a separate one of said pivot arms;

(e) a blade member having a backside pivotally connected to said frame base for pivotal movement about an axis extending normally of said frame base at a point intermediate and forward of the junction of said base and said legs of said frame member; and

(f) said blade member being rotatable with said frame member about said horizontal axis of connection between said pusher arms and said frame member when such bucket control links are actuated by such hydraulic means.

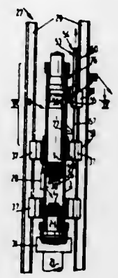
4,076,081

PILE DRIVING DEVICE

Hans Gunther Schnell, Hamburg, Germany, assignor to Van Kooten B.V., Naarden, Netherlands

Filed Dec. 5, 1975, Ser. No. 637,987
Claims priority, application Netherlands, Dec. 10, 1974, 7416079
Int. Cl.² E02D *7/12*
U.S. Cl. 173—137 **8 Claims**

1. In a diesel pile-driving device having at least one cylinder guide stay, and a diesel hammer consisting of a combustion cylinder, guide means for guiding the cylinder along said cylinder guide stay, a hammer piston operating in the combustion cylinder and a striker in the combustion cylinder for engagement by the hammer to transmit the blow of the hammer to a pile, the improvement comprising lifting means for elevating the hammer piston away from the striker in the first stroke of operation of the hammer without combustion in the cylinder, said lifting means comprising at least one catch support slidably mounted in said device with respect to said cylinder, catch means mounted in the support for engaging the piston through the combustion cylinder; and elevating means for lifting the support with respect to the cylinder for raising the piston therein, said elevating means including at least one hydraulic cylinder-piston set operatively connected between the catch support and the combustion cylinder for lifting the catch support with respect to the cylinder; said cylinder-piston



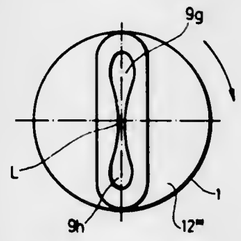
set engaging the cylinder guide means guiding the combution cylinder with respect to at least one guide stay.

4,076,082

THERMAL DRILLING DEVICE

Werner Baum, Flein, and German Munding, Bad Friedrichshall, both of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Germany

Filed Oct. 21, 1976, Ser. No. 734,424
Claims priority, application Germany, Feb. 20, 1976, 2607046
Int. Cl.² E21B *7/14*
U.S. Cl. 175—14 **4 Claims**



1. A thermal drilling device operating in a rotary motion, particularly for drilling geological formations, comprising a drill body having an interior combustion chamber with a bottom having an outlet defining a discharge nozzle, said drill body being rotatable about an axis of rotation, means for generating hot gaseous products of combustion in said combustion chamber, said discharge nozzle having at least one slot shaped discharge opening for the hot gases having a radially extending portion with a circumferential width increasing in a radial outward direction.

4,076,083

METHOD AND APPARATUS FOR CONTROLLING A WELL DURING DRILLING OPERATIONS

Philip S. Sizer, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Nov. 24, 1975, Ser. No. 634,824
Int. Cl.² E21B *23/04, 33/127, 41/00*
U.S. Cl. 175—65 **38 Claims**

1. A downhole blowout preventer system for use in a well comprising:

a well casing;

a drill string in said well casing;

a drill bit on the lower end of said drill string;

tubular mandrel means forming a portion of said drill string;

packer means carried by said mandrel means;

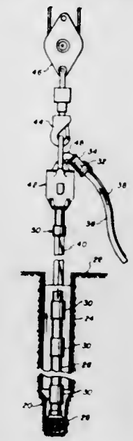
drilling fluid to circulate in the well;

valve assembly means initially providing for normal, parallel drilling fluid circulation;

said valve assembly means selectively changing the circulation of said drilling fluid from normal parallel circulation through the drill string and through the annulus to controlled circulation by-passing said packer means when said packer means is actuated;

means for actuating said packer means to seal the annulus between said drill string and the well; and

means for controlling said valve assembly means.



12. A method of controlling pressure in a well having a drill string with a drill bit therein comprising the steps of:

actuating downhole packer means to seal the annulus between the drill string and the well;

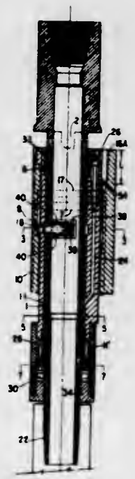
controlling the drilling fluid circulation at said packer means so that drilling fluid by-passes said packer means, continues to circulate around the drill bit and flows upward in the interior of the drill string above said packer means.

4,076,084

ORIENTED DRILLING TOOL

Robert E. Tighe, Chicago, Ill., assignor to Amoco Production Company, Tulsa, Okla.

Filed Jul. 16, 1973, Ser. No. 379,279
Disclosure was also published under second Trial Voluntary Protest Program on Jun. 10, 1976
Int. Cl. E21b *7/06*
U.S. Cl. 175—73 **9 Claims**



1. An apparatus to be used in a borehole drilled by a drill bit at the lower end of a drill string, which comprises:

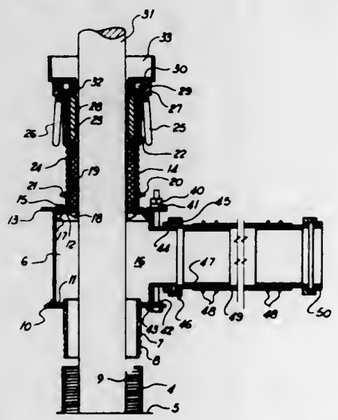
a. a hollow torque tube,
b. an inner cam sleeve having a cam-shaped cross section and rotatably mounted on the torque tube,
c. an outer cam sleeve having a cam-shaped cross section and rotatably mounted about said inner cam sleeve.
d. remotely actuatable means to releasably secure said outer cam sleeve to said inner cam sleeve,
e. remotely actuatable means to releasably secure said outer cam sleeve to said hollow toque tube.

4,076,085

DRILL SAMPLING DIVERSION UNIT

Barry Frederick Clark, 7 Bligh Crescent, Seaforth, Sidney, New South Wales, 2092, Australia

Continuation of Ser. No. 589,981, Jun. 2, 1975, Pat. No. 3,991,838. This application Nov. 15, 1976, Ser. No. 741,989
Claims priority, application Australia, May 31, 1974, 7743/74
The portion of the term of this patent subsequent to Nov. 16, 1993, has been disclaimed.
Int. Cl.² E21B *49/02*
U.S. Cl. 175—210 **9 Claims**



1. A self-centralizing sealed diverter for aiding the surface collection of underground samples produced by a drilling rig of the kind which employs fluid extraction comprising, in combination,
a. a first rigid casing driven into the ground to line a partially drilled hole,
b. a rigid chamber mounted above and firmly but removably attached to said first casing via sealing means and adapted to receive and retain drill samples,
c. a sleeve fastened to the top of said chamber and having therein a stuffing box having an at least partly self-lubricating stuffing gland which lines said box,
d. journalling means removably mounted upon the top of said sleeve for journalling at least one drill rod entering said sleeve from about the journalling means, and also for axially locating initially said stuffing gland which lines said box,
e. a second casing including at least one bearing for aligning the drill rod with respect to a drill head,
f. a protective top-plate attached to said second casing of said bearing, and
g. a pressed-in bush coupled to said bearing to be interposed between the rod and said bearing, said bush permitting little play between said bearing and the rod and being composed of material harder than the material of the rod.

4,076,086

FISHING JAR FOR ACCOMMODATION OF EXCESS TENSILE LOAD

Robert W. Evans, Houston, Tex., assignor to Baker International Corporation, Orange, Calif.

Filed Jan. 6, 1977, Ser. No. 757,358
Int. Cl.² E21B *1/10*
U.S. Cl. 175—297 **82 Claims**



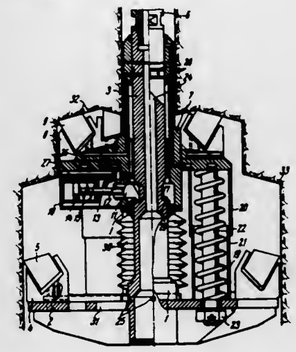
1. In a hydraulic fishing jar adapted to be run into a well on a fishing string and connected to a fishing tool in the well bore:
(a) inner and outer telescopically interengaged bodies;
(b) means defining between said bodies a hydraulic fluid chamber having at least three associatable fluid chamber members;
(c) means in the chamber operable upon tensioning the fishing string for telescopic movement of said bodies to compress and apply a predetermined force to a plurality of said fluid chamber members;
(d) there being by-pass flow passage means in one of said bodies;
(e) valve means in the chamber for normally closing off one end of the by-pass flow passage means from the compressed fluid in the chamber and responsively activatable to open so that compressed hydraulic fluid is released to the by-pass flow passage means;
(f) flow by-pass means to transfer the compressed hydraulic fluid in the chamber and thereby move said fluid in said chamber to engage and move said valve means to open the by-pass flow passage means at one end to the compressed hydraulic fluid upon application of said predetermined force;
(g) pressure relief means activatable at forces substantially in excess of said predetermined force to meter fluid therethrough and to transfer fluid pressure resulting from said excess force and within one of said plurality of hydraulic fluid chamber members to another of said plurality of hydraulic fluid chamber members whereby said valve is engaged and moved to open the by-pass flow passage means at one end of the compressed hydraulic fluid chamber; and
(h) hammer and anvil means on said bodies movable into engagement when said valve member and valve means open the by-pass passage means to the chamber across said flow by-pass means.

4,076,087

HOLE REAMER

Vladimir Yakovlevich Chuply, ulitsa Kosmonavtov, 36, kv. 35; Leonty Feofanovich Vojuta, ulitsa Studencheskaya, 4, kv. 19; Feofan Ilich Kondratenko, ulitsa Kosmonavtov, 36, kv. 5; Jury Zakharovich Poludnenko, ulitsa Karla Marxa, 47, kv. 21; Adam Arsentievich Milach, ulitsa Studencheskaya, 4, kv. 22; Vladimir Nikolaevich Kobozev, ulitsa Yanova, 3, kv. 1, and Alexandr Vasilievich Turchenko, ulitsa Kharitonova, 1b, kv. 32, all of Krivoi Rog, U.S.S.R.

Filed Jun. 14, 1976, Ser. No. 696,045
Int. Cl.² E21C *23/00*
U.S. Cl. 175—334 **8 Claims**



1. A hole reamer adapted to cooperate with a drill stem comprising a main body or support device with roller cutters adapted to be rigidly coupled to the drill stem; an additional body or support device with roller cutters arranged co-axially with said main body and mounted for rotary movement with said main body or support device and for relative axial movement with respect thereto along the axis of said main body; means for axially moving said additional support device relative to said main body; means for locking said additional body against axial movement relative to said main body at a predetermined axial distance therebetween, said main body and additional support device being arranged to successively operate on and destroy substantially distinct and separate portions of the face of the hole to be drilled.

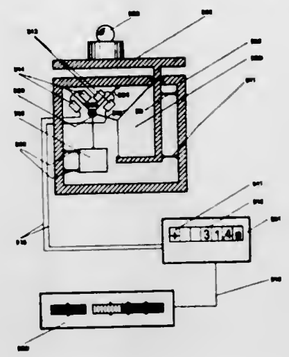
4,076,088

BALANCE WITH A DIGITAL AND AN ANALOGUE DISPLAY

Mario Gallo, and Johannes Wirth, both of Zurich, Switzerland, assignors to Wirth, Gallo and Company, Switzerland

Filed Feb. 23, 1977, Ser. No. 771,315
Claims priority, application Switzerland, Jun. 9, 1976, 007322/76
Int. Cl.² G01G *3/14, 23/36*
U.S. Cl. 177—210 R **6 Claims**

1. A scale having a digital display for digitally displaying the results of weighing operations, said results falling within discrete value ranges, the length of the highest value range being at least ten times bigger than the length of the lowest value range, an analogue display in said scale for simultaneous analogue displaying of said results of weighing operations, said analogue display comprising at least one group of optically activable elements forming a row, said elements corresponding each to one of said discrete value ranges and being connected to each other so that the elements corresponding to value



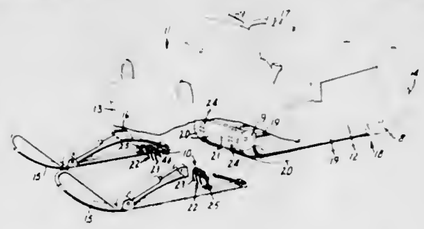
ranges lower than the value range to be displayed by activation of the corresponding element are also activated.

4,076,089

DEVICE FOR LUBRICATING THE SLIDE RAILS ON SNOWMOBILES TRAVELING OVER PACKED SNOW

David Leonard Sanders, 1424 18th Ave. NW, New Brighton, Minn. 55112

Filed Nov. 28, 1975, Ser. No. 635,989
Int. Cl.² B62D *55/24*
U.S. Cl. 180—5 R **15 Claims**



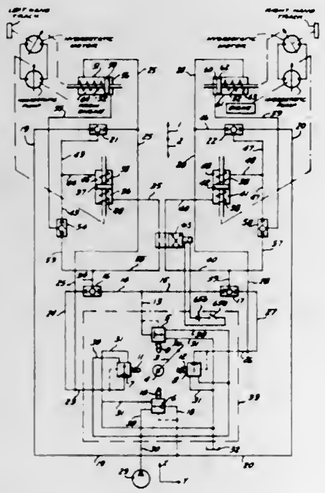
12. In a snowmobile including a frame with front and rear ends, a drive track comprising a plurality of endless belts of similar length having flat outer peripheral surfaces and positioned in side by side spaced relationship, a plurality of spaced cleats transversely crossing the outer peripheries of and joining said belts, and means mounting said track for movement relative to said frame comprising a plurality of parallel slide rails each being a longitudinal bar mounted on said frame, having front and rear ends respectively adjacent the front and rear ends of the frame, and slidably engaging and being supported by the inner surfaces of the cleats along the portion of said track disposed to support the snowmobile in the spacing between two of said adjacent belts, the improvement wherein said snowmobile comprises for each of said slide rails at least one tine having a terminal end portion adapted to engage packed snow, and means mounting the tine with said terminal end portion of the tine forceably engaging packed snow on which the snowmobile is supported and aligned between the front end of said frame and the front end of the slide rail so that when the snowmobile is moving forward the terminal end portion of said tine will fracture the packed snow and spray fragments of the packed snow through the openings between the belts and cleats of the drive track of the snowmobile and between the slide rail and drive track of the snowmobile adjacent the front end of the slide rail to provide lubrication and cooling therebetween.

4,076,090

DRIVE AND STEERING ARRANGEMENT FOR A VEHICLE WITH DIFFERENTIAL-SPEED STEERING

Alfred Krusche, Groessostheim, and Hans Dieter Drahtmüller, Obernau, both of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Mar. 12, 1976, Ser. No. 666,214
Claims priority, application Germany, Mar. 14, 1975, 2511176
Int. Cl.² B62D *11/04*
U.S. Cl. 180—6.48 16 Claims



1. In a differential-speed steering system for an automotive vehicle in which opposite sides of the vehicle are driven by respective hydrostatic transmissions each having a servomechanism shiftable from a neutral position to forward-drive and reverse-drive positions, four control-pressure transmitters are provided for actuation by a common control member, and the control-pressure transmitters are connected to said servomechanisms, said control member having a neutral position in which all four control-pressure transmitters are unaffected, said control-pressure transmitters being disposed symmetrically about said control member, the improvement wherein:

said control-pressure transmitters are disposed opposite one another in pairs including a first pair lying in a plane parallel to the longitudinal direction of the vehicle and a second pair lying in a plane transverse to said first plane;

said servomechanisms each include a servomotor having a piston defining a pair of oppositely effective pressurizable compartments adapted to be charged with fluid to displace the piston in a respective direction;

correspondingly effective compartments of both said servomotors are connected to a respective one of the control-pressure transmitters of said first pair for simultaneous pressurization of said correspondingly effective compartments, and

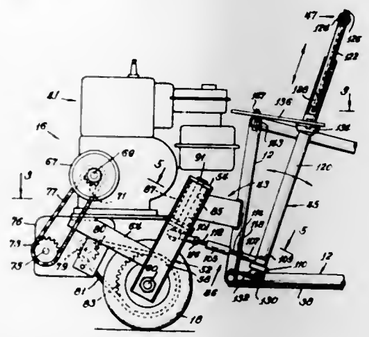
each of the control-pressure transmitters of said second pair is connected to the compartment opposite that energized by a transmitter of said first pair on the corresponding side of said vehicle to reduce the output speed of the hydrostatic transmission on said corresponding side of said vehicle to enable differential speed turning thereof.

4,076,091

SELF-PROPELLED VEHICLE

Larry G. Forster, Shoshoni, Wyo., assignor to Chair-E-Yacht, Inc., Shoshoni, Wyo.

Filed Mar. 30, 1976, Ser. No. 671,779
Int. Cl.² B62D *61/08*
U.S. Cl. 180—26 9 Claims



1. A vehicle, comprising:

a frame;

front and rear wheel assemblies mounted on said frame for supporting rollably said frame above the ground, said front wheel assembly being swingably mounted to the front portion of said frame;

drive means mounted on said front wheel assembly for driving said front wheel assembly to enable the vehicle to be propelled along the ground;

mounting means for attaching rotatably said front wheel assembly to said frame;

a steering column rotatably mounted on said frame;

bearing means for mounting said steering column in a backwardly inclined position;

bracket means connecting said bearing means to said frame for adjusting angularly positionally said steering column;

a linkage connecting said steering column and front wheel assembly for moving said front wheel assembly angularly in response to rotational movements of said steering column for steering purposes; and

wherein said bearing means including a pair of self-aligning bearings, one of said bearings surrounding the lower end portion of said steering column and fixed to said frame, the other one of said bearings being attached to said bracket means.

4,076,092

GRILLE MOUNTING APPARATUS

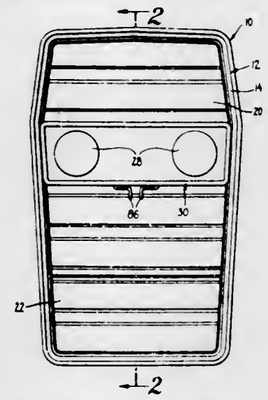
Leo J. Lorenz, Farmington, and Gary C. Stanek, Taylor, both of Mich., assignors to Massey-Ferguson Inc., Detroit, Mich.

Filed Aug. 6, 1976, Ser. No. 712,290
Int. Cl.² B60K *11/04*
U.S. Cl. 180—68 P 8 Claims

1. A grille mounting apparatus in combination with a tractor adapted to be propelled in a forward direction, the tractor being provided with a grille and a grille frame assembly having an inwardly extending flange about an opening, the inwardly extending flange extending in a plane generally normal to the longitudinal axis of the tractor and having opposed portions extending towards each other across the opening: characterized by the grille mounting apparatus including:

support means interconnected with the tractor and operable to support the grille for movement between either a normal working position wherein the grille is disposed in juxtapositioned relationship with respect to the inwardly extending flange or a service position wherein the grille is disposed to one side of the normal working position of the grille, the support means permitting the grille to be initially swung forwardly of the grille frame assembly and then to one side of the grille frame assembly as the grille is moved from its normal working position to its service position; and

fastening means engageable with the opposed portions of the inwardly extending flange and the grille and operable to maintain the grille in its normal operating position, the fastening means being shiftable from a first position wherein it engages said opposed portions of the inwardly extending flange to a second position wherein the fastening means does not engage said opposed portions of the inwardly extending flange, and wherein the fastening means includes biasing means operable to insure that the grille is maintained in its juxtapositioned relationship with respect to the inwardly extending flange when the fastening means is in its first position.

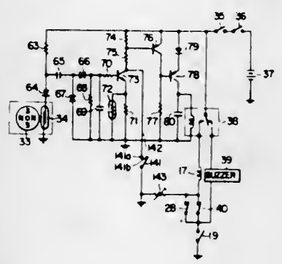


4,076,093

BRAKING CONTROL APPARATUS FOR A VEHICLE

Akira Mizuno, Kariya, Japan, assignor to Goshi Kaisha Mizuno Kogeisha, Japan

Filed Oct. 4, 1976, Ser. No. 729,078
Claims priority, application Japan, Mar. 31, 1976, 51-35700; May 21, 1976, 51-59421; Jul. 1, 1976, 51-78010
Int. Cl.² B60T *7/02*
U.S. Cl. 180—82 R 10 Claims



1. A braking control apparatus for a vehicle comprising:

an electromagnet and a locking plate attractable to said electromagnet, one of said electromagnet and said locking plate being fixedly attached to a vehicle and the other thereof being fixedly attached to a connecting rod responsive to the movement of a brake pedal of said vehicle, said electromagnet and said locking plate being slidable relative to each other in accordance with the amount of depression of said brake pedal when said electromagnet is deenergized, and said electromagnet attracting said locking plate to lock said brake pedal in any given depressed position of said brake pedal when said electromagnet is energized;

first brake pedal switch means inserted in an electric closed circuit including said electromagnet and a power source, said first brake pedal switch means being mounted to said vehicle and operable in response to the movement of said brake pedal so as to be closed when said brake pedal is depressed in excess of a predetermined amount;

amplifier means having switching means inserted in said electric closed circuit including said electromagnet and said power source;

second brake pedal switch means mounted to said vehicle to be operable in response to the movement of said brake pedal and electrically connected to said amplifier means, said second brake pedal switch means closing in response to the depression movement of said brake pedal to deenergize said switching means of said amplifier means, and said second brake pedal switch means opening in response to the backward movement of said brake pedal to disconnect said amplifier means with said second brake pedal switch means; and

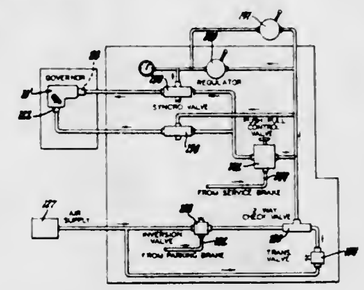
accelerator pedal switch means mounted to said vehicle to be operable in response to the movement of an accelerator pedal of said vehicle and inserted in said electrically closed circuit including said electromagnet and said power source, said accelerator pedal switch means opening in response to the depression of said accelerator pedal.

4,076,094

VEHICLE ENGINE SPEED CONTROL SYSTEM

Warren L. Moody, Milford, and Edward D. Baugh, Union Lake, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 19, 1976, Ser. No. 715,984
Int. Cl.² B60K *31/00*
U.S. Cl. 180—108 8 Claims



1. The combination in a vehicle engine speed control system of means for manually controlling fuel flow to said engine, a governor for shifting said manually controlled means in a fuel decreasing direction when said engine speed reaches a set maximum value, and the improvement comprising means for maintaining said engine speed at a desired value, said maintaining means including:

means for advancing said manually controlled means to a fuel flow position capable of producing engine speeds above said desired value in response to the application of fluid pressure; means for reducing said set maximum value of said governor to a value representing said desired value in response to the application of a variably controlled fluid pressure; and means for simultaneously actuating said advancing means and said reducing means, said actuating means including a source of fluid pressure, shutoff valve means connected to said fluid pressure source for selectively providing fluid pressure signals, first conduit means connecting said valve means to said advancing means whereby a first one of said fluid pressure signals actuates said advancing means, second conduit means connected to said valve means, and an adjustable regulator connected

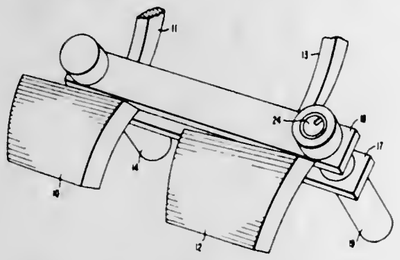
to said second conduit means for variably controlling a second one of said fluid pressure signals, said variably controlled fluid pressure signal actuating said reducing means, whereby said engine speed is automatically maintained at said desired value when said shutoff valve means provides said fluid pressure signals and said governor prevents said engine speed from exceeding said maximum value under manual control when said shutoff valve does not provide said fluid pressure signals.

4,076,095

PEDAL LOCKING DEVICE

Richard Adamski, 293 Yasemite Drive, Pittsburgh, Pa. 15235

Filed Sep. 3, 1976, Ser. No. 720,149
Int. Cl.² G05G *5/00*
U.S. Cl. 180—114 **3 Claims**



1. In a motor vehicle having a floor with operational pedals including a brake pedal with actuating arms proximate to said floor, the improvement comprising a removable locking device for at least one of said operational pedals comprised of:

a. a first rigid support in contact with the floor of the motor vehicle and generally perpendicular thereto;

b. a first rigid bar permanently mounted on one end thereof along said support and perpendicular thereto;

c. a second rigid bar permanently mounted at one end thereof along said first support, parallel to said first rigid bar and in spaced relation thereto, to allow the brake actuating arm to pass between said first and second bar and to prevent passage of the brake pedal between said first and second bar, said rigid bars being in spaced relation from said floor;

d. apertures in each of said rigid bars at the other end thereof;

e. a second rigid support in contact with the floor of said motor vehicle and generally perpendicular thereto, said second rigid support removably mounted to the other end of said first and second rigid bars through said apertures and said second support parallel to said first support; said first and second supports maintaining the position of said first and second bars to prevent downward travel of the brake pedal; and,

f. means for locking said second rigid support in said apertures in the first and second rigid bars.

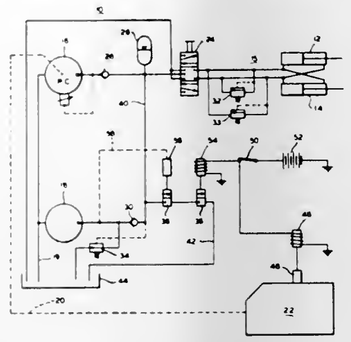
4,076,096

HYDRAULIC STEERING SYSTEM

Richard R. Hushower, Benton Harbor, and George M. Daresh, St. Joseph, both of Mich., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Nov. 24, 1976, Ser. No. 744,555
Int. Cl.² B62D *5/06*
U.S. Cl. 180—133 **5 Claims**

1. A steering system for a vehicle having a hydraulic steering mechanism, comprising a ground driven hydraulic pump which operates only when the vehicle is moving, a second hydraulic pump which operates independently of movement of the vehicle, an accumulator, means connecting each of said pumps to supply said accumulator, the accumulator being connected to supply pressurized hydraulic fluid to the steering mechanism, and two valves connected in series and arranged to discharge said accumulator and depressurize the steering system when both said valves are open, means responsive to



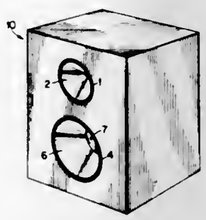
stoppage of said hydraulic ground driven pump for opening a first one of said valves, and means responsive to stoppage of said second pump for opening the second said valve.

4,076,097

AUGMENTED PASSIVE RADIATOR LOUDSPEAKER

Thomas Lowe Clarke, 12110 SW. 108 St., Miami, Fla. 33186

Filed Aug. 4, 1976, Ser. No. 711,570
Int. Cl.² H04R *1/02*
U.S. Cl. 181—147 **3 Claims**



1. A loudspeaker system comprising an enclosed chamber having

an energized driver mounted in a first opening,

two diaphrams suspended in second and third openings,

said diaphrams being interconnected so that an outward motion of one produces an inward motion of the other.

4,076,098

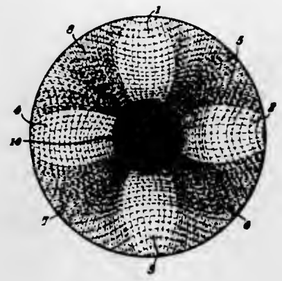
LOUDSPEAKER DIAPHRAGM

Dennis Charles Ward, Brighton, England, assignor to B & W Loudspeakers Limited, England

Filed Mar. 15, 1976, Ser. No. 666,616
Claims priority, application United Kingdom, Mar. 15, 1975, 10888/75
Int. Cl.² D10K *13/00*; H04R *7/00*; D06N *3/18*
U.S. Cl. 181—170 **10 Claims**

1. A loudspeaker diaphragm comprising: (a) a textile material having spaces between adjacent threads, (b) an impregnant stiffening material for stiffening the threads and which does not completely fill the spaces between the threads of the textile material, the impregnant comprising a first synthetic resin, and

(c) a damping material at least partially filling the spaces, the damping material comprising a second synthetic resin, and



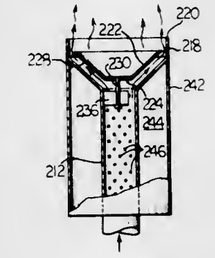
wherein said damping material is different from said impregnant.

4,076,099

DEVICE FOR REDUCING ENGINE EXHAUST NOISE

Frederick D. Proksch, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 5, 1976, Ser. No. 674,030
Int. Cl.² F01N *1/08, 1/00*
U.S. Cl. 181—264 **2 Claims**



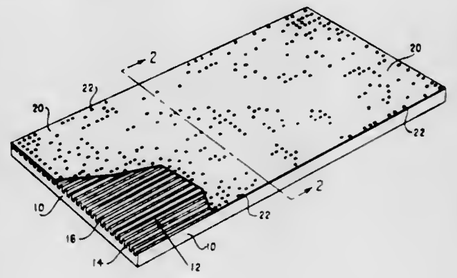
1. A device for reducing exhaust noise comprising: an exhaust pipe having inlet and outlet portions separated by an intermediate transition portion, said inlet and outlet portions being generally tubular and defining inlet and outlet diameters, said outlet diameter being greater than said inlet diameter, and further including baffle means at least partially within said transition portion for reducing exhaust noise, said transition portion being generally frustoconical in shape and wherein said baffle means comprises a correspondingly frustoconically shaped baffle, and mounting means mounting said baffle within said exhaust pipe, and spaced from said generally frustoconical transition portion whereby exhaust fluid passing through said inlet portion and out said outlet portion by way of said transition portion is deflected generally radially outwardly by said baffle, said baffle defining a generally circular forward end wall joined to a frustoconically shaped baffle side wall, said frustoconically shaped baffle side wall being in spaced parallel relation to said frustoconically shaped transition portion, and further including vent means in said frustoconical transition portion and said baffle sidewall fluidly intercommunicating the exterior thereof with the interior of said baffle, said vent means comprising openings in said baffle sidewall and said transition portion, and generally elongated, hollow vents defining walls at least partially supporting said baffle and shaped so as to have a semi-circular lead portion and an elongated tail portion along opposite sides thereof, said lead portion being oriented toward said inlet and said tail portion being oriented toward said outlet so as to facilitate exhaust flow therearound, and wherein said hollow vents are of integral, one-piece construction with said frustoconical transition portion and said frustoconically shaped baffle so as to produce a unitary device.

4,076,100

OIL IMPERVIOUS ACOUSTICAL BOARD

George G. Davis, Cos Cob, Conn., assignor to Frigitemp, New York, N.Y.

Continuation-in-part of Ser. No. 497,952, Aug. 16, 1974, Pat. No. 3,991,848. This application Oct. 7, 1976, Ser. No. 730,323
Int. Cl.² E04B *1/99*
U.S. Cl. 181—290 **2 Claims**



1. An acoustical facing material comprising a melamine board, including a plurality of longitudinal ribs on one side thereof, having grooves between each pair of ribs; an impervious thin film covering the ribbed side of said board; and a fabric covering material covering said impervious film, said fabric material being perforated with perforations intermediate said ribs.

4,076,101

UTILITY COAT WITH SEATING HARNESS

Lew Himmelrich, 32742 Alipaz St., San Juan Capistrano, Calif. 92675

Filed Nov. 9, 1976, Ser. No. 740,096
Int. Cl.² A62B *35/00*
U.S. Cl. 182—3 **7 Claims**



1. A utility coat, comprising, in combination:

a tubular body portion with a lower edge, engageable about the torso and upper portions of a wearer's legs and including a rear panel and front panels having front edges which define a vertically-extending front opening;

an elongate, flexible belt fixed to the outside of said body portion to occur adjacent the midriff of the wearer's body and having free end portions carrying fastening means which extend to adjacent the front opening;

a pair of elongate, flexible crotch straps within the body portion having rear ends fixed to the belt at the rear panel

in laterally spaced-apart relationship, and forward ends with belt-coupling means, and

means for releasably securing the forward ends of the crotch straps within the body portion adjacent the rear panel in a folded relationship, the forward ends of said crotch straps being shiftable from the folded position, forwardly between a wearers legs, through the front opening, and into coupling engagement with the free end portions of the belt.

4,076,102

TRAP DOOR AND FOLDING LADDER ARRANGEMENT

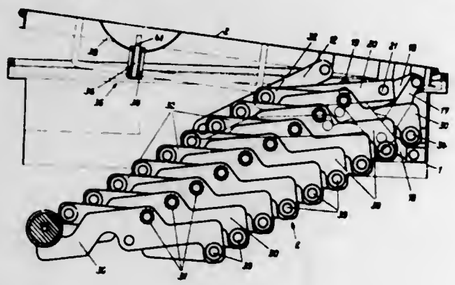
Francis Desarzens, Prilly, and Claude Cruchet, Apples, both of Switzerland, assignors to Arcia SA, Switzerland

Filed Jan. 21, 1977, Ser. No. 760,911

Claims priority, application Switzerland, Feb. 3, 1976, 1328/76

Int. Cl.² E06C 9/14

U.S. Cl. 182—81 3 Claims



1. A trap door and folding ladder arrangement comprising a casing able to receive the ladder folded in a storage position, the ladder comprising two uprights composed of rung-supporting pieces and intermediate pieces pivotally connected to one another to form an extensible folding structure, and a cover connected to the casing and to each upright of the ladder by a system of levers and connecting rods whereby the ladder when unfolding automatically actuates raising of the cover then moving it forward by a slight distance to free a rear edge of the cover from a corresponding side of the casing, and finally complete opening of the cover when the ladder is completely unfolded.

4,076,103

LUBRICATING MEANS FOR GAS-OPERATED CYLINDERS

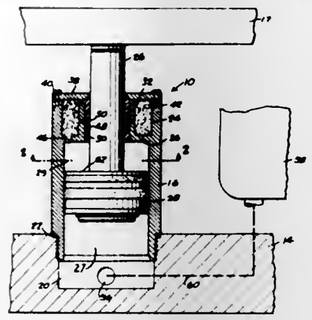
Bernard J. Wallis, 25200 Trowbridge Ave., Dearborn, Mich. 48124

Filed Sep. 13, 1976, Ser. No. 722,863

Int. Cl.² F16N 1/00

U.S. Cl. 184—25 10 Claims

1. In combination, a cylinder, a piston in said cylinder dividing the cylinder into a working chamber and an idle chamber which vary inversely in size in response to reciprocation of the piston within the cylinder, said cylinder having an end wall defining one end of the idle chamber, the other end of the idle chamber being defined by the back face of the piston, means for introducing gas under pressure to the working chamber for displacing the piston to a position adjacent said end wall, means on said cylinder defining a lubricant chamber, lubricant-impregnated wick means in said lubricant chamber, passageway means extending between said lubricant chamber and said idle chamber, said wick means having a portion thereof extending through said passageway means into said idle chamber at a location axially adjacent said end wall, whereby, when the piston is displaced to a position axially adjacent said end wall,



it is contacted by said wick means so as to apply lubricant thereto.

4,076,104

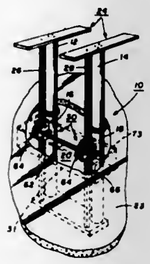
SAFETY LATCH FOR AUTOMOTIVE HOISTS

Burton DeWolfe Bishop, and Lawrence E. Murray, both of Salisbury, Md., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 18, 1977, Ser. No. 769,972

Int. Cl.² B66F 7/28

U.S. Cl. 187—8.5 12 Claims



1. In an automotive hoist including a hoisting mechanism, the combination of an automatically operable safety latch comprising in combination:

a. a vertical member defining a lateral recess in a vertically extending surface thereof;

b. a pawl shaft extending transversely of said member and having a lateral slot defined at a location between its ends inwardly receiving the recess containing surface of said member for straddling the member thereat, said pawl shaft being supported for limited rotation and adapted to cooperate with said member recess to effect an interlocking latching relation of the hoisting mechanism;

c. bias means rotationally biasing said pawl shaft from a cocked relation toward said latching relation;

d. one of said pawl shaft or said member being vertically fixed in place and the other of said pawl shaft or said member being attached to the hoisting mechanism for vertical movement in conjunction with the raising and lowering of said hoist mechanism whereby said pawl shaft will effect said latching relation at a predetermined elevated position of said hoisting mechanism; and

e. release means manually operable in opposition to said bias means to disengage said latching relation and enable lowering of said hoisting mechanism.

4,076,105

LEVER STRAP FOR A DRUM BRAKE

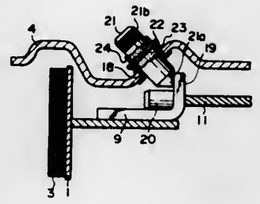
Masami Aono, Yokohama, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed Oct. 18, 1976, Ser. No. 733,307

Claims priority, application Japan, Oct. 20, 1975, 50-142740[U]

Int. Cl.² F16D 65/22

U.S. Cl. 188—106 A 4 Claims



1. In a drum brake of the type having

a rotatable drum to be braked;

a non-rotatable backing plate;

a pair of concavely opposed, arcuate brake shoes shiftably mounted upon said backing plate and carrying friction linings thereon within said drum disposed for brakingly engaging the latter when said shoes are shifted outwardly away from each other;

means for yieldably biasing said shoes toward each other;

first brake force applying means operably coupled with one extremity of each of said shoes for moving said one extremities and thereby said shoes outwardly away from each other;

second brake force applying means including an elongate lever pivotally connected adjacent one end thereof with one of said shoes adjacent said one extremity of the latter and extending therefrom in the general direction of the opposite extremity of said one shoe, strut means extending between and oppositely coupled with intermediate portions of the other of said shoes and said lever to provide a fulcrum for the latter intermediate its ends, and means operably coupled with said lever adjacent the opposite end thereof for applying a force to the latter to swing the same inwardly to rock said lever upon said fulcrum and move said one end of said lever and thereby said one extremity of said one shoe outwardly away from said other shoe; and

a hole in said backing plate facing a part of said lever adjacent said opposite end of the latter;

the improvement of which brake comprises improved and reusable stop means for releasably holding said shoes in a standby, partially retracted position between the fully inwardly retracted position they would otherwise assume under the influence of said biasing means and their outwardly shifted braking position and for automatically causing said shoes to shift to said fully retracted position thereof to facilitate access to said linings for maintenance purposes when said stop means are placed in a releasing condition thereof, said improved stop means including:

a housing mounted on said backing plate in adjacent but spaced relationship to said part of said lever and having a sleeve portion extending outwardly from said backing plate in a direction away from said part of said lever,

said sleeve portion being provided with a cylindrical bore extending therethrough, communicating with said opening in said backing plate, having its inner extremity spaced from said part of said lever, and having its axis in alignment with said part of said lever;

an elongate stop member of greater length than said bore having a generally cylindrical stretch of lesser diameter than said bore slideably and rotatably receivable within the latter for free rotation of said member relative to said sleeve portion and free axial movement of said stretch selectively inwardly into and through and outwardly out of said bore,

said member having a holding position in which the inner extremity thereof is disposed inwardly of said inner extremity of said bore for engaging said part of said lever to hold the latter in said standby, partially retracted position thereof while an outer portion of said member is disposed outwardly of said backing plate and accessible for manipulation to move said member rotationally and axially relative to said housing; and

cooperating, rotationally lockable and releasable, fastening means on said sleeve portion and said member for limiting rotation of said member relative to said housing as said member is moved toward said holding position thereof and for, selectively and in response to predetermined rotation of said member relative to said housing, alternatively locking said member in said housing in said holding position of said member for maintaining said shoes in their said standby, partially retracted position or releasing said member from said housing for permitting either outward retraction of said member axially of said bore away from said lever to cause said shoes to automatically shift into said fully retracted position thereof of reinsertion of said member and repositioning thereof in its said holding position within said housing.

4,076,106

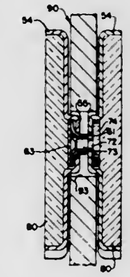
SNAP FASTENERS FOR BRAKE DISK WEAR PLATES

Peter D. Bermingham, Mogadore, and Robert W. Chin, Akron, both of Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

Filed Oct. 19, 1976, Ser. No. 733,732

Int. Cl.² F16D 69/04

U.S. Cl. 188—250 G 1 Claim



1. Releasably connected brake disk wear plates, comprising:

a first brake disk wear plate, said first plate having a top portion and a wear pad therein,

said top portion of said first wear plate having a button formed therein,

a projection fastener having a base plate positioned in said button,

a shaft attached to said base plate and having an enlarged ball shaped end with said shaft and ball shaped end extending through an aperture in said button,

a core plate having an aperture therein, said first wear plate engaging said core plate on one side thereof with said button and projection fastener extending into said core aperture,

a second brake disk wear plate, said second plate having a top portion and a wear pad therein,

said top portion of said second wear plate having a button formed therein,

a resilient female prong fastener, said prong fastener including a base plate positioned in said button of said second wear plate and a number of sections attached to said prong fastener base plate with the end portions of said sections

extending through an aperture in said button of said second wear plate,

said second wear plate engaging the opposite side of said core plate than said first wear plate with said second wear plate button and said prong fastener extending into said core aperture,

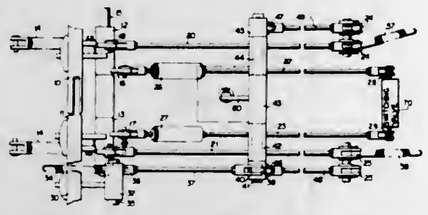
said sections of said prong fastener releasably and matingly engaging said ball shaped end of said projection fastener and said end portions are free to move radially of said ball shaped end to engage and disengage the same so that said first and said second wear plates are releasably engaged to said core plate, said buttons having adjacent opposed surfaces spaced from each other, said end portions of said sections and said ball shaped end having engaging surfaces positioned in the area between the opposed faces of said buttons.

4,076,107

VEHICLE CLUTCH BRAKE STEERING CONTROLS WITH TRANSMISSION NEUTRALIZER

Kazuo Yasoshima, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Feb. 3, 1976, Ser. No. 654,780
Int. Cl.² F16D *67/02*; B60K *29/00*
U.S. Cl. 192—4 A **7 Claims**



1. A steering control apparatus for a vehicle of the type having a pair of steering clutches and a pair of steering brakes comprising a pair of steering control means, first connecting means for connecting said pair of steering control means to said steering clutches and brakes such that said brakes are actuated without disengaging said clutches when said pair of steering control means are operated simultaneously, and one of said steering brakes is actuated after disengaging one of said steering clutches when only one of said pair of steering control means is operated, a speed change control means for a speed change gear clutch, power transmission gear means for transmitting power to driving wheels, and second connecting means for connecting said speed change control means to said steering brakes and said power transmission gear means such that said steering brakes are actuated after disengagement of said power transmission gear means when said speed change control means is operated.

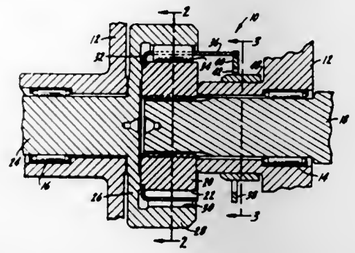
4,076,108

TWO-WAY OVERRUNNING CLUTCH MECHANISM

Mark John Fogelberg, Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Aug. 5, 1976, Ser. No. 712,122
Int. Cl.² F16D *15/00, 41/06*
U.S. Cl. 192—35 **6 Claims**

1. In a two-way engaging device including first and second rotatable members, one of said rotatable members defining an inner race and the other of said rotatable members defining an outer race, wedging means disposed between said inner and outer races for selectively providing a wedgingly engaged drive between said rotatable members in either a clockwise or counterclockwise direction, a stationary member, and biasing means for said wedging means; the improvement wherein said biasing means comprises drive means engaged with said wedging means, said drive means defining a drive element having a plurality of lugs, and a plurality of spring clips each engaged with a respective lug by a lost motion connection, said spring clips frictionally contacting said stationary element with a friction force of predetermined magnitude, said spring clips



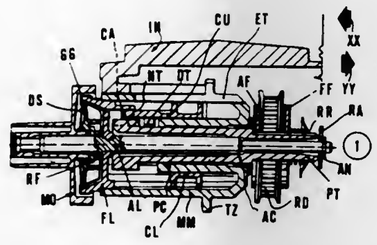
yielding toward frictional contact with said stationary member at a decreased friction force in response to rotation of said rotatable members.

4,076,109

DUAL FRICTION CLUTCH FOR MOTION-PICTURE PROJECTORS

Roberto Bencini, Dr.Ing. Misitano A.G. via Padova, 217, 20127 Milan, Italy

Filed Sep. 5, 1975, Ser. No. 610,789
Claims priority, application Italy, Sep. 25, 1974, 27672/74
Int. Cl.² F16D *47/00, 7/02*
U.S. Cl. 192—48.4 **7 Claims**



1. A dual friction clutch for motion-picture projectors comprising spindle means for carrying a film spool, a stationary frame, a hollow spindle coaxial about the spindle means, a stationary sleeve having an inside tubular section and an outside tubular section, the outside tubular section being fixed to the stationary frame and a toothed drive wheel mounted around said hollow spindle, a weak friction clutch and a strong friction clutch mounted coaxially on said spindle means at opposite ends thereof and a selector device comprising a slider rotatably mounted about the said inside section of the tubular sleeve and movable parallel to the axis of said spindle means between a first position wherein both clutches are unclutched, a second position wherein the spindle means is subject only to the weak friction clutch and a third position wherein the spindle means is subject to the strong friction clutch.

4,076,110

QUICK DISENGAGEMENT VISCOUS DRIVE COUPLING

Thomas H. Tinholt, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 13, 1976, Ser. No. 722,907
Int. Cl.² F16D *35/00*
U.S. Cl. 192—58 B **8 Claims**

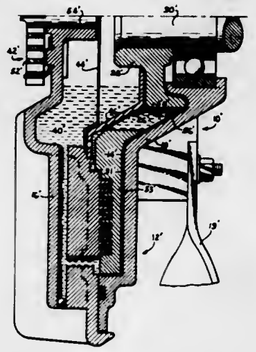
1. A viscous drive coupling comprising:

(a) a housing defining an annular cavity bounded by a pair of generally radially extending axially disposed annular surfaces;

(b) a shaft rotatably supported by said housing and partially located within said cavity;

(c) an annular rotor secured to said shaft within said cavity, said rotor having a pair of generally radially extending axially disposed annular surfaces, one of said annular surfaces on said rotor having a radially inner portion disposed no more than fifty thousands (0.050) of an inch from a portion of one of said annular surfaces of said housing and a radially outer portion disposed no more than forty thousands (0.040) of an inch from another portion of said one annular surface of said housing, and the other annular surface of said rotor having a radially outer portion disposed no more than thirty thousands (0.030) of an inch from a portion of the other annular surface of said housing;

(d) a plate located within said cavity and connected to said housing to divide said cavity into a working chamber containing said rotor and a reservoir, said plate having a



generally radially extending annular surface disposed no more than seventy thousands (0.070) of an inch from a radially inner portion of said other annular surface of said rotor;

(e) fluid disposed in said cavity and positionable between said annular surfaces to transmit energy through said fluid from either said housing or said rotor respectively to said rotor or said housing;

(f) valve means effecting selective fluid flow communication between said reservoir and said working chamber;

(g) means for controlling said valve means;

(h) means defining a discharge opening for fluid flow communication between said working chamber and said reservoir; and

(i) pump means carried by either said housing or said rotor to pump fluid from said working chamber during rotation of said housing and said rotor through said discharge opening to said reservoir.

4,076,111

REGISTRATION MEANS FOR PRINTERS AND THE LIKE

Prentice I. Robinson, Pelham, and Thomas T. Butterfield, Chester, both of N.H., assignors to Centronics Data Computer Corporation, Hudson, N.H.

Filed Jul. 8, 1976, Ser. No. 703,623
Int. Cl.² B41J *3/04*
U.S. Cl. 197—1 R **17 Claims**

1. Apparatus for electronically controlling the printing of a line of N dot patterns and the like on a paper document to assure proper registration of the dot patterns comprising:

a movable carriage;

a print head assembly mounted upon said carriage and including print control means for producing dot patterns;

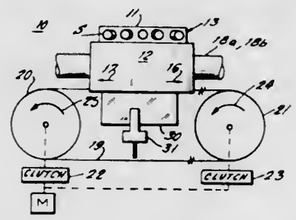
means for moving the carriage across the paper document between the margins of said paper document at a substantially constant speed during printing;

a light source and a light sensing element arranged in spaced fashion near one of said margins;

a flag mounted upon said carriage and movable between said light source and said light sensing element to selectively interrupt light from said source from reaching said light sensitive element when positioned therebetween;

gated oscillator means;

means normally disabling said gated oscillator means and responsive to activation of said carriage moving means



and said light sensitive element when said flag moves out of the region between said light source and said light sensitive element for enabling said oscillator means when said carriage is moving at said constant speed;

said oscillator means comprising R-C timing means for generating print control pulses at a constant frequency, which frequency enables printing of N equi-spaced dot patterns when said carriage is moving at said constant speed;

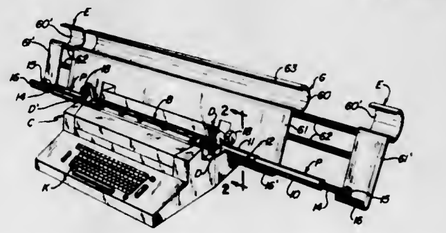
means coupling the output of said oscillator means to said print control means for enabling said print control means at spaced intervals determined by said print control pulses.

4,076,112

FREE PLATEN TYPEWRITER

Cecil S. Effinger, 828 Pearl St., Boulder, Colo. 80302

Filed Apr. 30, 1976, Ser. No. 681,822
Int. Cl.² B41J *13/03, 11/04*
U.S. Cl. 197—127 R **14 Claims**



12. A free platen typewriter having means for supporting said platen at points a predetermined distance apart and means for imprinting characters at selected positions on a sheet extending around said platen, said platen having free ends, being movable to different endwise positions, receiving a sheet extending around the same having a width greater than the length of said platen and including:

a tube having a length greater than said predetermined distance;

a covering of an elastomer extending on said tube for a length greater than said predetermined distance;

tubular end extensions slidable within said tube from the opposite ends thereof and adapted to receive a sheet extending around both of said extensions, when fully extended, and wider than the combined length of said platen and the fully extended extensions;

a weight disposed within said tube and extending longitudinally thereof, said weight being cylindrical and having an

outer diameter less than the inner diameter of said platen tube; and

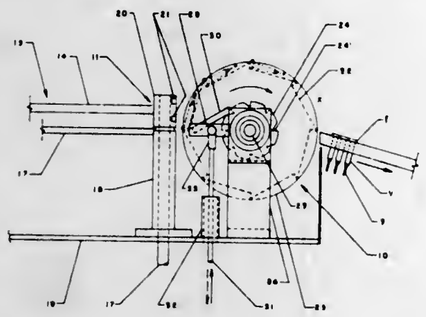
said tubular end extensions surrounding and being slidable along said weight between said weight and the elastomer covered portion of said tube.

4,076,113

APPARATUS FOR SIMULTANEOUSLY REORIENTING AND TRANSPORTING ARTICLES

Walter A. Shields, 181-41 Henley Road, Jamaica, N.Y. 11432

Filed Nov. 24, 1976, Ser. No. 744,482
Int. Cl.² B65G *47/24*
U.S. Cl. 198—403 **1 Claim**



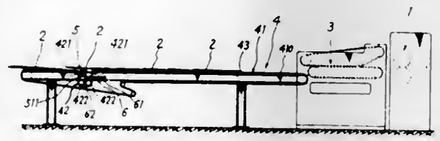
1. The combination of apparatus for simultaneously inverting and transporting from a first location to a second location syringe sub-assemblies including syringe vials having hypodermic needles secured to one end thereof, the vial of each of said syringe sub-assemblies having an external annular flange at the end thereof opposite the needle, said flange being downwardly oriented at said first location, and apparatus for washing said sub-assemblies while said sub-assemblies are retained substantially vertically with said flanges oriented downwardly, said washing apparatus including a turret rotatable in a substantially horizontal plane and having substantially vertical notches in the periphery thereof each for retaining a respective said sub-assembly substantially vertically with said flange thereof oriented downwardly, said inverting and transporting apparatus comprising a wheel in a substantially vertical plane, said first and second locations being adjacent the periphery of the wheel and being substantially diametrically opposed relative to said wheel, a plurality of recesses formed in the periphery of the wheel for receiving said sub-assemblies, each said recess being of such size and shape relative to said sub-assemblies as to retain each said sub-assembly in a substantially fixed orientation relative to said recess in which said sub-assembly is received as said sub-assembly is transported from said first location to said second location and to permit said sub-assembly to discharge by gravity from the recess into the receiving means at said second location, means for consecutively rotationally indexing the wheel thereby to bring consecutive said recesses into substantial registry with said first location, said indexing means comprising a ratchet wheel secured to said recess-containing wheel and a driven ratchet pawl operatively associated with the ratchet wheel, means for striking each said syringe sub-assembly with force sufficient to carry the sub-assembly from the first location into a respective said recess in substantial registry with the first location but insufficient to cause damage to said sub-assembly or to cause said sub-assembly to rebound out of said recess receiving said sub-assembly, the path of movement of each of said notches of said washing apparatus turret bringing said sub-assemblies consecutively into juxtaposition with said striking means at said second location for striking by said striking means and propelling thereby into a respective said recess of said wheel, and means for receiving said articles from said recesses at said second location, said receiving means comprising a pair of parallel rails having a spacing therebetween greater than the largest diameter of the vials except for said flange thereof and less than the diameter of said flange whereby the flanges of the vials rest on the rails thereby to support the sub-assemblies and retain the sub-assemblies in an orientation inverted relative to the orientation of the sub-assemblies at the first location, said rails being inclined downwardly in a direction away from said wheel sufficiently to assist gravity transport of said sub-assemblies away from said wheel.

4,076,114

BOARD GROUPING APPARATUS

Masateru Tokuno, Nishinomiya, Japan, assignor to Rengo Co., Ltd., Osaka, Japan

Filed Sep. 3, 1976, Ser. No. 720,234
Claims priority, application Japan, Apr. 19, 1976, 51-45135
Int. Cl.² B65G *47/29*
U.S. Cl. 198—425 **3 Claims**



1. A board grouping apparatus wherein boards successively discharged from a rotary cutter which cuts a web of material such as a corrugated web, and continuously, transversely feeds said boards of a suitable length onto a conveyor to group the boards in any suitable number of sheets, said apparatus comprising:

a board transporting belt conveyor;

a detour portion wherein the transporting surface of the belt of said conveyor passes through a substantially U-shaped path;

said substantially U-shaped path of said detour portion includes a first upper guide roll, a first lower guide roll, a second lower guide roll being parallel to the first lower guide roll and a second upper guide roll mounted above said second lower guide roll;

a stopper comprising first and second members;

said first member of said stopper being fixed to a rotatable transverse shaft arranged within said detour portion of said transporting belt conveyor; said first member of said stopper being movable to protrude above a transportation plane of said transporting belt conveyor from within said detour portion of said transporting belt conveyor by the rotation of said transverse shaft;

said first member of said stopper assumes a substantially horizontal posture in the fully protruded position;

said second member of said stopper being joined to said first member so as to be inclined relative to said first member of said stopper in a direction opposite to a feed direction of said transporting belt conveyor;

said second member of said stopper substantially protrudes above the transportation plane of said transporting belt conveyor when said first member of said stopper protrudes above the transportation plane;

said second member of said stopper includes a portion which is within said detour portion when said first member of said stopper protrudes above the transportation plane of said transporting belt conveyor; and

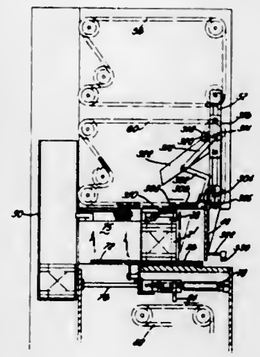
means for rotating said transverse shaft.

4,076,115

APPARATUS FOR HANDLING ROD-LIKE ARTICLES

Robert Thomas Daisley, and David Charles Phillip Chumley, both of London, England, assignors to Molins Limited, England

Filed Apr. 26, 1976, Ser. No. 680,224
Claims priority, application United Kingdom, Apr. 25, 1975, 17161/75
Int. Cl.² B65G *47/00, 45/00*
U.S. Cl. 198—487 **17 Claims**



1. Apparatus for handling rod-like articles, comprising conveyor means for delivering a stream of rod-like articles in a direction transverse to their lengths, said conveyor means including divider means for separating said stream into batches, each batch comprising a stack of said articles, pusher means including a pusher for moving batches off said conveyor means in a direction parallel to the lengths of said articles, drive means for moving said pusher in a feed stroke, locating means arranged to move with the pusher and adapted to exert light pressure on the upper surface of the batch during said feed stroke, means responsive to said drive means for moving said locating means relative to said pusher from a primed position in which it is spaced above said stack downwardly into its operative position in contact with the top of a batch adjacent one longitudinal edge thereof as said pusher moves through a feed stroke, at least a part of said locating means being movable independently of said moving means to accommodate changes in the level of said upper surface, and means for supporting a container in a position to receive a batch from said pusher so that at the end of a feed stroke the locating means extends into the container and continues to exert light pressure on the upper surface of the batch.

11. Apparatus for handling rod-like articles, comprising a pusher for moving a batch comprising a stack of rod-like articles in a direction parallel to the lengths of the articles, means for moving said pusher in a feed stroke, locating means arranged to move with the pusher and adapted to exert light pressure on the upper surface of the batch during said feed stroke, and a brush member attached to the rear surface of said pusher and positioned to sweep particles from a surface over which a batch is moved by said pusher.

4,076,116

KA-BOB DISPLAY

Roger E. Sowders, 7322 Elm Court, Wichita, Kans. 67206

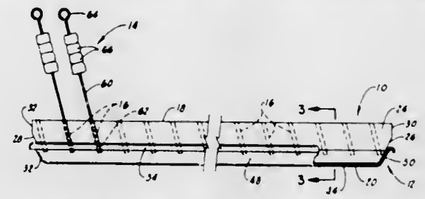
Filed Aug. 4, 1975, Ser. No. 601,527
Int. Cl.² B65D *1/34*
U.S. Cl. 206—45.19 **1 Claim**

1. A meat display holder, the holder comprising:

a tray having an open top portion, a flat bottom portion, side portions, and end portions, the side portions and end portions of said tray angled upwardly and outwardly from the flat bottom portion of said tray;

a holder mounted in said tray, said holder having a flat top portion, a flat bottom portion disposed on top of the bottom portion of said tray, side portions, and end portions, the side portions and end portions of said holder angled upwardly and outwardly and received in a snug fit against the angled side portions and end portions of said tray when the holder is mounted thereon, said holder extending upwardly from the open top portion of said tray;

a plurality of apertures in the top portion of said holder, said apertures arranged in rows in the top portion of said holder and parallel to the length of said holder, said apertures inclined toward one of the end portions of said holder; and



a plurality of upwardly extending recesses disposed along the length of said holder and in the bottom portion thereof, said recesses parallel and adjacent the rows of said apertures along the length of said holder;

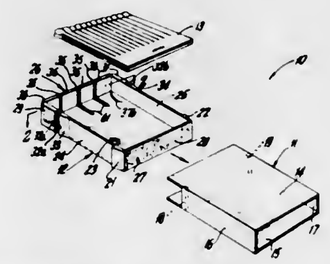
the display holder being constructed and adapted in use for placing in a refrigerated meat display case or the like and having food product ladened ka-bob skewers slidably received in said plurality of apertures.

4,076,117

SAFETY MATCH BOX

Trevor C. Wisdom, 14 University Place, Glen Head, N.Y. 11545, and Leroy J. Wisdom, 148 Fifth Acre Road South, Smithtown, N.Y. 11787

Filed Jul. 21, 1976, Ser. No. 707,438
Int. Cl.² A24F *27/00*; B65D *13/06*
U.S. Cl. 206—106 **7 Claims**

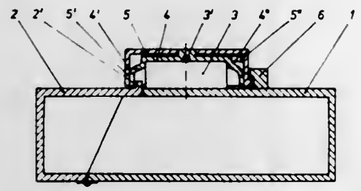


1. A safety match box comprising:

a cover having upper and lower surfaces and side walls joining said surfaces, said side walls being recessed at one end from the edge of the upper and lower surfaces, and having locking means protruding inwardly at said ends, and,

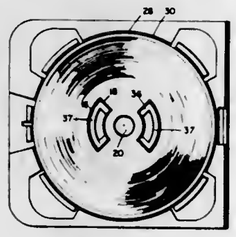
a tray which is slideable within the cover comprising a base and connecting side walls and end walls joined thereto forming a recessed container wherein one of said end walls comprises a striker and the opposite end wall comprises a segmented flexible wall to permit withdrawal from the locking means to permit movement of the tray, and wherein the side walls each include a recessed portion normally engaged by the locking means when the tray is in a closed condition and a protruding portion adjacent the striker end to engage the locking means and prevent the tray from being completely withdrawn from the cover.

4,076,118
DEVICE FOR LIMITING THE CONSUMPTION OF OBJECTS IN A CONTAINER
Jack Karlsson, Elvabovagen 30, 230 12 Hollviksnas, Sweden
Filed Jun. 1, 1977, Ser. No. 802,556
Claims priority, application Sweden, Jun. 14, 1976, 7606719
Int. Cl.² B65D *85/10*
U.S. Cl. 206—268 3 Claims



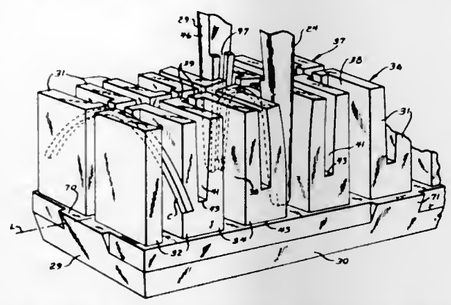
1. A container assembly including a timed lock apparatus, comprising in combination, a container having a openable cover, a presettable manually wound timer mounted on a wall of said container of the type that is wound by rotation of a shaft in one direction and which rotates in the opposite direction to a limit position for a time period which is a function of the degree of shaft rotation in the winding direction having a rotatable member operated by a timing mechanism thereof with a notch in said member movable to a registry position at said limit position after a time preset on said timer, a locking member movable with said cover into said registry position when the cover is closed and retained by said rotatable member to lock the cover closed except when said notch is presented in said registry position, and a protecting cap which control said timings mechanism by rotating said shaft only in said wound direction to set a further time period thereon, whereby the reduction of a preset time by manual access to said shaft is prevented by said protecting cap.

4,076,119
PACKAGING TRAY FOR A VIDEODISC
John William Clarke, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.
Filed Mar. 4, 1976, Ser. No. 663,656
Int. Cl.² B65D *85/30, 85/02*
U.S. Cl. 206—309 7 Claims



1. A packaging tray for an entertainment disc having at least two elongated apertures in its central unrecorded portion comprising: an integral disc platform having a wall extending upwardly therefrom defining a cavity for closely receiving the disc, a raised central pedestal extending from said cavity in supporting contact with an unrecorded central portion of the disc, upright retaining posts extending from said pedestal and positioned to extend through and adjacent the ends of the disc apertures, and recessed areas in said pedestal underlying the disc apertures.

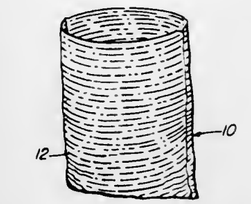
4,076,120
CARTRIDGE FOR HOLDING HEMOSTATIC CLIPS
Ronald L. Carroll, Evanston, and John S. Ziegler, Arlington Heights, both of Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.
Filed Dec. 10, 1976, Ser. No. 749,292
Int. Cl.² B65D *85/54*
U.S. Cl. 206—339 10 Claims

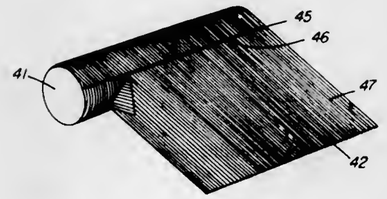


1. A cartridge for holding a plurality of articles in a manner which permits the articles to be individually removed, the cartridge comprising an elongated base, a pair of spaced-apart longitudinally extending outer walls extending upwardly from the base, a plurality of sets of inner walls extending upwardly from the base between transversely to the spaced-apart outer walls, each of the sets of inner walls including a pair of holding walls which are spaced apart in the longitudinal direction of the base and which provide a compartment for receiving one of said articles, the longitudinal spacing between the holding walls being such that the article is frictionally retained between the holding walls, and means for supporting the article within the compartment, each of the holding walls being formed of flexible material and being flexible away from each other when an article is removed from a compartment by inserting an instrument between the holding walls of the compartment and over the article, the instrument bearing upon the walls so as to force the walls apart and release their grip upon the article, thereby allowing the article to be removed without resistance.

4,076,121
REINFORCED THIN WALL PLASTIC BAG, AND METHOD AND APPARATUS TO MAKE MATERIAL FOR SUCH BAGS
William J. Clayton, Fairport; Robert H. Olson, Pittsford, and Donald F. Kutniewski, Macedon, all of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 406,423, Oct. 15, 1973, Pat. No. 3,984,047, which is a continuation-in-part of Ser. No. 383,027, Jul. 26, 1973, abandoned. This application Feb. 17, 1976, Ser. No. 658,561
Int. Cl.² B32B *1/08, 3/30*; B65D *65/28, 85/70*
U.S. Cl. 206—390 3 Claims

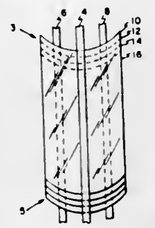
1. A continuous roll of thermoplastic bags, said bags having been fabricated from a film of low density polyethylene material having a wall thickness on the order of about 0.02 to 0.05 mm and spaced, peaked ribs integral with the film being formed in the film and having a rib-to-rib spacing on the order of ½ cm to 2 cm, said ribs merging smoothly from a projecting peak to the thickness of the walls between the ribs, each individual bag being joined in side-by-side relationship by a transversely positioned heat seal line and having a transversely disposed weakened area in the area of said heat seal line whereby removal of a bag from said roll is effected by tearing along said weakened area.





2. A roll of thermoplastic bags in accordance with claim 1, having a weakened area within the confines of said heat seal line.

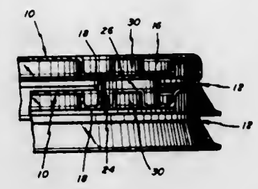
4,076,122
PACKAGE OF BAGS
Stanley Darwin Hall, Taylors, S.C., assignor to W. R. Grace & Co., Duncan, S.C.
Filed Oct. 26, 1976, Ser. No. 735,709
Int. Cl.² B65D *73/00*
U.S. Cl. 206—460 10 Claims



1. In a chain of bags wherein each bag has an open end and a closed end and sides extending between said open end and said closed end and wherein a plurality of bags are connected together in an imbricated arrangement by a first carrier removably secured to the bags on one side of each of the bags adjacent the open end thereof, the improvement comprising:
a second carrier removably secured to each of the bags on the other side of the bags adjacent the closed end thereof.

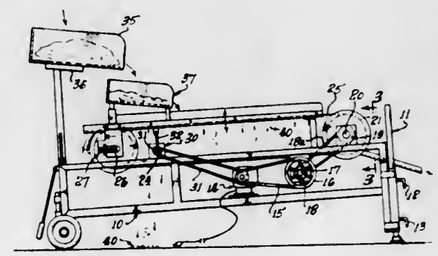
8. In a method of assemblying a chain of imbricated bags wherein each bag has an open end and a closed end and sides extending between said open end and said closed end and a first carrier is removably secured to one side of said chain of imbricated bags adjacent the open end of each of said bags, the improvement comprising:
securing a removable second carrier on the opposite side of said chain of imbricated bags adjacent the closed end thereof.

4,076,123
DISPOSABLE PLASTIC LID
Paul Davis, Swampscott, Mass., assignor to Sweetheart Plastics, Inc., Wilmington, Mass.
Filed Jun. 17, 1976, Ser. No. 696,935
Int. Cl.² B65D *21/00, 85/62*
U.S. Cl. 206—503 4 Claims



1. A thin wall disposable plastic lid for covering containers and designed to stack with other substantially identical lids without compacting comprising
a circular closure wall and a surrounding downwardly extending skirt,
a recess formed about the closure wall by downwardly depending generally encircling walls and a recess bottom,
a pair of upwardly extending and closely spaced annular walls defining a raised rib formed in the recess and concentric with the closure wall,
said raised rib in turn defining in part two concentric downwardly extending ribs in said recess,
and a plurality of upwardly extending bosses formed in the recess and aligned with the space defined by and extending over the annular walls of the raised rib, said bosses being radially wider than said space to span said space and engage the bottoms of the downwardly extending ribs of a like lid stacked on it to prevent the lids from compacting when an axial directed force is applied to like lids.

4,076,124
MECHANICAL EARTHWORM HARVESTER
Dell A. Taysom; Larry D. Taysom; Robert J. De Witt, and Carl S. De Witt, all of Hemet, Calif., assignors to Carroll S. Mohr, Fountain Valley, Calif.
Filed Feb. 16, 1977, Ser. No. 769,176
Int. Cl.² B07C *1/10*
U.S. Cl. 209—75 6 Claims



1. A device for separating earthworms from bedding and worm castings, said device comprising;
and endless belt fabricated from a screen having a mesh size of between 3/16 and ½ inches, said endless belt having an upper separating surface held at an incline of about 1° to 15° with respect to the horizontal;
drive means for moving said belt in the direction of the upward incline at a speed of between 0.3 and 5 feet per second;
vibrating means for vibrating the separating surface so that when a mixture of earthworm bedding material containing earthworms, bedding and worm castings is placed on the

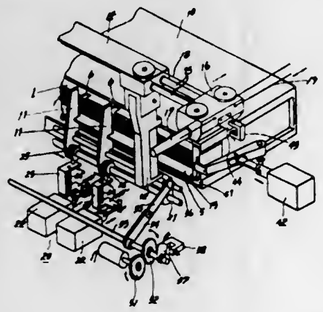
separating surface, the worms are conveyed upwardly along the separating surface and pass over the upper edge thereof, the worm castings pass through the separating surface and a substantial portion of the bedding material moves downwardly along the incline separating surface and passes over the lower edge thereof.

4,076,125

CARD RETRIEVAL SYSTEM

Mikio Ohsaki, Kashihara; Toshiaki Kawamoto, and Osamu Fujimoto, both of Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 21, 1976, Ser. No. 688,697
Claims priority, application Japan, May 22, 1975, 50-61730; Jun. 9, 1975, 50-69835; Jun. 23, 1975, 50-77736
Int. Cl.² B07C *3/18;* G06K *21/00*
U.S. Cl. 209—80.5 8 Claims



1. A card retrieval system comprising:
a multiplicity of cards stored in a stationary stack structure, each of said cards being provided with a face which includes a magnetic strip and a notch structure formed in the magnetic strip;
means for receiving input information for the purpose of selecting a specific card;
magnet means for magnetically attracting the cards;
a predetermined number of selector bars adapted to engage with the notch structures of the cards;
said selector bars being mounted to be rotatable from an inoperative to an operative position and to be laterally displaceable relative to the stationary stack structure;
said selector bars being mounted to be movable along the face of the cards in response to input information; and
said selector bars when in the operative position block the attraction between the magnet means and the non-selected cards to thereby select the selected one of the cards in response to the positioning of the selector bars which is determined by the input information and the attraction of the magnet means.

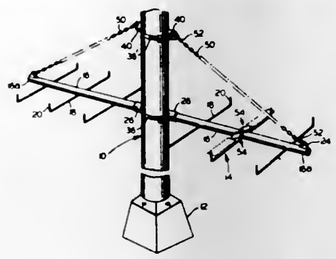
4,076,126

MULTIPURPOSE DISPLAY RACK

Richard C. Gilmour, 207 Weymouth Ave., Scullville, N.J. 08330

Filed Sep. 10, 1976, Ser. No. 722,049
Int. Cl.² B42F *13/12;* A47F *7/024*
U.S. Cl. 211—59.1 13 Claims

1. A display rack for attachment to an upright pole member or the like comprising:
A. an extension arm having a socket end and an outer end and a suspension bracket affixed thereto at a location spaced from said socket end towards said outer end:
B. a holder comprising a hollow member of substantially uniform cross section having a mounting seat at one end and a socket opening at its other end, said mounting seat being comprised by said one end of said holder being cut to shape said one end of said holder for seating upon a surface of an upright pole member or the like; said socket opening receiving said socket end of said extension arm, said holder further having a holder aperture therein located adjacent said one end;
C. first flexible mounting means engaging said holder through said holder aperture and adapted to mount said holder to the upright pole member or the like with said one end seated thereagainst;
D. a support bracket having a mounting seat at one end and a support bracket aperture located adjacent said one end;



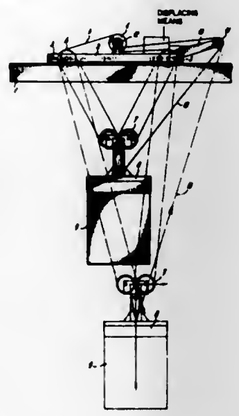
E. second flexible mounting means engaging said support bracket through said support bracket aperture and adapted to mount said support bracket to the upright pole member or the like;
F. a support link connecting said suspension bracket to said support bracket to support said extension arm therefrom; and
G. a plurality of hangers attached to said extension arm and extending transversely therefrom and terminating in respective distal ends remote from said extension arm.

4,076,127

DEVICE FOR THE PURPOSE OF PREVENTING A BODY DEPENDING FROM ROPES FROM SWINGING

Leonard Hupkes, Heemstede, Netherlands, assignor to Conrad-Stork B.V., Haarlem, Netherlands

Filed Dec. 9, 1976, Ser. No. 748,914
Claims priority, application Netherlands, Dec. 11, 1975, 7514471
Int. Cl.² B66C *17/00*
U.S. Cl. 212—10 6 Claims



1. A device for raising and lowering a load while preventing swinging of the load, said device comprising a container bridge, a trolley displaceable on said bridge, a drum on said trolley, sheaves on said drum and on the load to be raised and lowered, hoisting cables extending from said sheaves on said drum to the sheaves on the load for lowering and raising the load by pay-out and wind-up of the cables, and means for

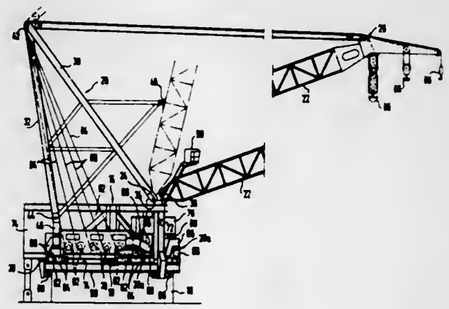
preventing swinging of the load comprising at least one positioning wire connected to said trolley for being paid-out and wound-up, one end of said positioning wire being secured to said load such that said wire extends obliquely upwards therefrom at an angle with respect to said hoisting cables, and a further drum on said trolley, the other end of said positioning wire being attached to the further drum on the trolley to pay-out and wind-up the positioning wire to a smaller extent than the hoisting cables such that the load is raised and lowered along a path inclined with respect to the vertical.

4,076,128

ROTARY CRANE

Hans Tax, Potsdamer Str. 3, Munich 40, Germany (8000)

Filed Sep. 9, 1976, Ser. No. 721,664
Claims priority, application Germany, Sep. 15, 1975, 2541065
Int. Cl.² B66C *23/72, 23/52*
U.S. Cl. 212—48 10 Claims



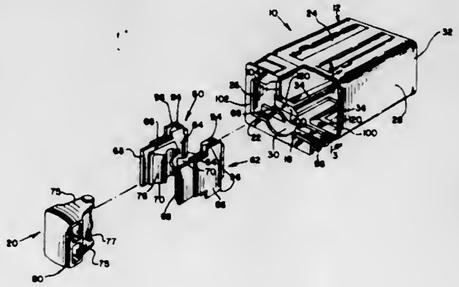
1. A rotary crane comprising, in combination:
(a) a base carrying a track circular about an upright axis;
(b) a turntable;
(c) a plurality of undercarriage assemblies mounted on said turntable for movement along said track,
(1) a first and second undercarriage assembly having respective portions fastened to said turntable for pivotal movement about respective pivot axes radial relative to said upright axis;
(d) a boom including two elongated boom members having respective first, longitudinally terminal, transversely spaced portions fastened to said turntable for pivoting movement about a common horizontal axis,
(1) said boom members converging from said first terminal portions thereof in a radially outward direction relative to said upright axis toward respective second terminal portions fastened to each other;
(e) a column upwardly projecting from said turntable,
(1) two load-bearing members of said column having respective bottom ends secured to said turntable contiguously adjacent said common horizontal ais and said first terminal portions respectively and extending from said common axis obliquely upward and opposite to said radially outward direction,
(2) said portions of said first and second undercarriage assemblies being substantially aligned vertically with respective ones of said first terminal portions and of said bottom ends,
(3) a part of said turntable having the shape of a right triangular prism including one edge member extending substantially along said upright axis, and two other side members connecting said bottom end and said first terminal portions to said first and second undercarriage assemblies;
(f) a tension member having respective end portions fastened to said column and to said second terminal portions for maintaining a desired angular position of said boom relative to said common axis;
(g) a flexible hoisting member extending from said column to said second terminal portions and depending from said second terminal portions for receiving a load;
(h) winch means for varying the effective lengths of said tension member and of said hoisting member; and
(i) a counterweight on said turntable spaced from said upright axis in a direction away from said boom.

4,076,129

FRICTION MECHANISM FOR DRAFT GEAR

Richard J. Housman, Dolton, Ill., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Sep. 22, 1976, Ser. No. 725,513
Int. Cl.² B61G *9/10*
U.S. Cl. 213—33 4 Claims



1. In a draft gear for railroad cars including a housing having front and rear ends and defining a rear chamber at the rear end of the housing and a front chamber at the front end of the housing in open communication with the rear chamber and open at the front end of the housing, said housing having opposed top and bottom walls and a pair of opposed side walls separating said top and bottom walls to define said chambers, cushioning means in the rear chamber, an intermediate follower seated against said cushioning means, with each of the housing side walls carrying in the housing front chamber adjacent said housing front end an inwardly facing friction surface, with said side friction surfaces facing each other, an energy dissipative friction device mounted in the housing front chamber and comprising a pair of fixed plates disposed between the housing side wall friction surfaces, said fixed plates substantially paralleling said housing side walls and each defining a first friction surface facing one of said side wall friction surfaces, a second friction surface facing the other housing side wall, and upper and lower side edges opposing the housing top and bottom walls, respectively, a pair of movable plates extending through the front chamber and engaging the intermediate follower, with one of the movable plates being interposed between one of the fixed plates and the housing side wall friction surface opposing said one fixed plate, and the other movable plate being interposed between the other fixed plate and the housing other side wall friction surface facing said other fixed plate, said movable plates defining side edges opposing the housing top and bottom walls, respectively, a pair of wedge shoes having wedge surfaces facing sidewise of said housing interposed between and engaging the respective second friction surfaces of said fixed plates, and a thrust wedge acting between said shoes to urge said wedge surfaces of said shoes into cooperation with the fixed plates during compression of the gear, with the housing top and bottom walls at said front chamber being formed to define opposed pairs of inner and outer ribs spaced apart longitudinally of the housing and extending transversely of the housing and crosswise of said plates, and with said movable plates on either side of the housing in extending through the housing front chamber being disposed between said rib pairs thereof to present the inner

ends of said movable plates for engagement with the intermediate follower, and front follower means acting consecutively on said thrust wedge and the outer ends of said movable plates to force same inwardly and longitudinally of said housing on compression of the gear,

the improvement for prolonging the useful life of the gear as represented by the spacing of said outer ends of said movable plates from said front follower means in the riding position of said gear, said improvement comprising:

said fixed plates each including on each side edge of the respective fixed plates a lug seated between the ribs of the housing top and bottom wall rib pairs to hold said fixed plates against movement longitudinally of the housing on compression of the gear,

said lugs respectively projecting laterally from said side edges of the respective fixed plates in the direction of, but short of, the housing side wall friction surfaces opposing the respective first friction surfaces of the respective fixed plates and forming at the inner ends of the respective lugs thrust resisting abutments of extended area of engagement with the inner rib of the respective housing rib pairs,

said lugs of each fixed plate, at said abutments thereof, defining portions overlapping the respective side edges of the respective movable plates adjacent same in the direction of the respective housing side walls a distance that at least equals approximately one half the thickness of the respective movable plates for bracing the respective fixed plates against rocking in the direction of the respective housing side walls on compression of the gear,

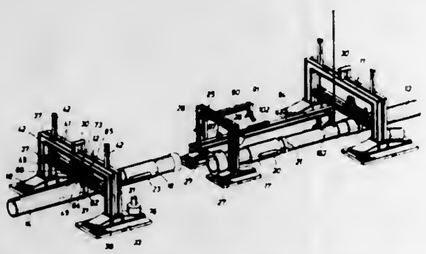
said lug overlapping portions defining corner portions facing the respective housing side wall friction surfaces that the respective lugs project toward, and diagonal bracing portions extending from the respective lug corner portions to the respective fixed plate side edges adjacent the median portions of the respective fixed plates for bracing the respective lug corner portions against the respective fixed plates to resist said rocking of said fixed plates under force concentrations acting in the directions of said housing side walls against said fixed plates adjacent their outer ends on compression of the gear prior to engagement of the outer ends of said movable plates by said front follower means on initial compression of the gear.

4,076,130

APPARATUS FOR MOUNTING A COUPLING MEMBER OVER A PIPE END IN A SUBSEA LOCATION

Glen R. Sumner, Houston, Tex., assignor to HydroTech International, Inc., Houston, Tex.

Filed Feb. 27, 1976, Ser. No. 662,268
Int. Cl.² B23K *37/04*
U.S. Cl. 214—1 PA **4 Claims**



1. In apparatus for mounting a coupling member over the end of a pipe in a subsea location where the pipe end is being supported in cantilevered fashion, the combination comprising:

a frame arranged for lowering to and mounting generally adjacent said pipe end and supported on the seabottom;

an elongated support beam connected to said frame and arranged to extend generally longitudinally over said pipe to support said coupling member therebelow;

a carriage mounted on said support beam for longitudinal travel thereon;

means for moving said carriage longitudinally along said support beam;

means connected to said carriage means for holding said coupling member therebelow;

a guide beam connected to said frame and extending generally transversely thereto;

means connected to said guide beam for initially contacting and holding said support beam in generally parallel alignment therewith;

alignment means connected to one end of said support beam for contacting said pipe and spacing said beam end a predetermined distance therefrom;

means connected between said frame and said beam for raising and lowering said beam while said coupling member is supported thereby;

and means for moving said support beam transversely relative to said frame and said pipe;

whereby said frame and said coupling can be lowered in a body of water until said frame contacts said seabottom, and said coupling member can be brought into coaxial alignment with and passed over the end of said pipe by operation thereof.

4,076,131

INDUSTRIAL ROBOT

Lars Dahlstrom, and Bengt Nilsson, both of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Jun. 3, 1976, Ser. No. 692,553
Claims priority, application Sweden, Jun. 16, 1975, 7506848
Int. Cl.² B25J *9/00*
U.S. Cl. 214—1 BC **17 Claims**

1. Industrial robot comprising a movable arm part, a tool part including a tool, connecting means flexibly mounting the tool part on the arm part for movement with at least one degree of freedom relative to the arm thereby reducing mechanical stresses when the tool comes into contact with a workpiece or other obstacle, displacement transducer means associated with one of the parts to sense the position of the tool relative to the arm, and to generate a signal (x_a) corresponding to said position, automatic control means for moving the arm part, and means for transmitting said signal to said control means for moving the arm part in dependence upon said position.

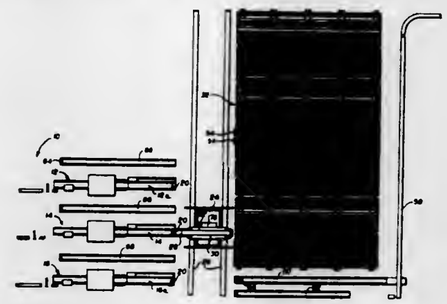
4,076,132

BOBBIN TRANSPORTING AND STORAGE SYSTEM

Walter F. Thompson, and Dennis M. Redo, both of Somerville, N.J., assignors to General Cable Corporation, Greenwich, Conn.

Filed Oct. 28, 1975, Ser. No. 626,371
Int. Cl.² B65G *1/08*
U.S. Cl. 214—16.4 A **22 Claims**

1. A wire transport system for a communication cable manufacturing facility in which wire is wound on bobbins having flanges on both sides thereof and on which the bobbins roll from one location to another, including in combination a number of machines for making insulated wires with different color coding and winding the wire on successive bobbins, a first set of tracks including one for receiving successive bobbins from each machine, each of the tracks being of a length to receive and accumulate a plurality of bobbins from its machine and which are wrapped with wire of the same color coding, a second set of tracks extending generally parallel to the first set of tracks and at substantially the same level as the first set of tracks and horizontally spaced therefrom, tracks of the first set sloping downward toward one end thereof, and tracks of the second set sloping downward toward the opposite end thereof, whereby the bobbins roll by gravity along the tracks in different directions toward or from each of the machines for making the insulated wires, a carriage track extending transversely of the bobbin tracks at the ends of the bobbin tracks remote from the machines, an inventory storage rack having a plurality of bobbin holding compartments at spaced locations in a row on a common level along the length of the carriage track, said



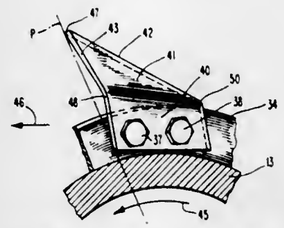
inventory storage rack having a plurality of rows of similar bobbin holding compartments at successively higher levels above the level of the carriage track, an elevator with a track for receiving bobbins selectively from each of the first bobbin tracks, the elevator having supporting surfaces on which the bobbin flanges roll on and off the elevator, from the first and second set of tracks, respectively, means for bringing empty bobbins back to the elevator for delivery to said second track for return to the machines for rewinding, guide surfaces along the tracks for maintaining the bobbin flanges in substantial alignment with the tracks on which the bobbins roll, a shaftway in which the elevator travels up and down, and a carriage on which the elevator shaftway and elevator are supported for movement as a unit with the carriage along the carriage track, the elevator being movable successively into line with the first and second bobbin tracks of any of the machines and then into alignment with any compartment for storing bobbins with wire of the same color coding in the same compartment of the inventory storage rack.

4,076,133

SILO UNLOADER BLADES

Richard L. Weaver, Rte. 4, Myerstown, Pa. 17067

Filed Nov. 26, 1975, Ser. No. 635,395
Int. Cl.² B65G *65/46*
U.S. Cl. 214—17 DA **3 Claims**



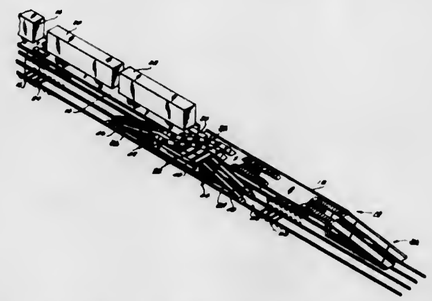
1. In a silo unloader apparatus, wherein an unloader of the auger type is provided for use at the bottom of a silo for bottom discharge of silage therefrom, and wherein the auger is of the radially directed worm type that advances or sweeps across the silo floor about a generally centrally located axis and that rotates in a forward silage-engaging direction about is own axis to bring teeth carried thereby into engagement with silage, the improvement comprising said teeth having blunt leading edges that face in the direction of rotation and are not substantially backwardly raked, so as to be of plow-like construction, wherein said teeth leading edges and adjacent raked edges define acute angular relationships therebetween with the apex of the angular relationship in each instance being located at a forward portion of the associated said tooth.

4,076,134

WHEELED RAMP LOADING AND UNLOADING APPARATUS

Herbert T. Landow, North Tarrytown, N.Y., assignor to Landow Consulting Associates, Inc., North Tarrytown, N.Y.

Filed Mar. 19, 1975, Ser. No. 559,714
Int. Cl.² B65G *67/00*; B65J *1/10*; E01D *15/12*; E04G *3/16*
U.S. Cl. 214—38 B **14 Claims**



1. A ramp device for guiding vehicles to and from laterally adjacent cars of a railroad train, said ramp device comprising a body, ramp means for guiding said vehicles between the ground and the tops of said cars, said ramp means extending up from the ground in a first direction and further forming bridge means having a portion extending laterally over a side of said body and adapted to extend over a side of a railway car in a second direction transverse to said first direction, said laterally extending portion of said bridge means providing continuous means for enabling said vehicles to move onto said cars of said train in a direction longitudinal of said cars.

4,076,135

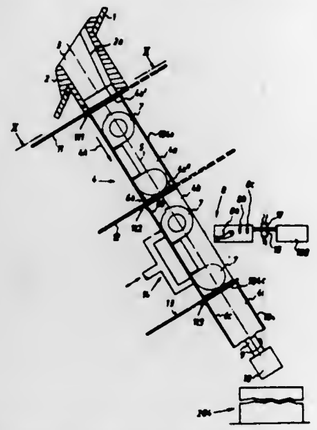
APPARATUS FOR PROCESSING CASSETTES CONTAINING EXPOSED PHOTOGRAPHIC FILMS

Klaus Klose, Holzkirchen, Germany, assignor to AGFA-Gevaert, Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 5, 1976, Ser. No. 729,773
Claims priority, application Germany, Oct. 9, 1975, 2545215
Int. Cl.² B65G *65/04*
U.S. Cl. 214—300 **27 Claims**

1. In an apparatus for processing containers for photographic films, particularly cassettes for exposed photographic roll films, a combination comprising a conveyor defining a predetermined path for transport of successive containers in a predetermined direction; an enclosure adjacent to a first portion of said path and defining an antechamber having an inlet opening for admission of containers into and an outlet opening for evacuation of containers from said antechamber; means for removing films from successive containers in a second portion of said path which is located downstream of said outlet opening, as considered in said direction; a light-intercepting gate movable between at least one operative position in which said gate prevents the penetration of light and the transport of containers from said antechamber into said second portion of said path by way of said outlet opening and a second position

in which said portions of said path are in communication with each other by way of said outlet opening and said conveyor is free to transport a container from said antechamber into the



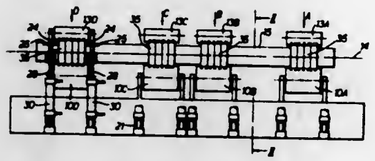
range of said removing means; and light intercepting means for sealing said inlet opening thus preventing penetration of light into the antechamber in said second position of said gate.

4,076,136

PIPE STRAIGHTENING AND SPINNING METHOD AND APPARATUS

Royston Paul Jenkin, St. Austell, England, assignor to English Clays Lovering Pochin & Co. Ltd., St. Austell, England

Filed Nov. 12, 1975, Ser. No. 631,233
Claims priority, application United Kingdom, Nov. 21, 1974, 50585/74; Nov. 21, 1974, 50587/74
Int. Cl.² B21D 3/02
U.S. Cl. 214—340 18 Claims



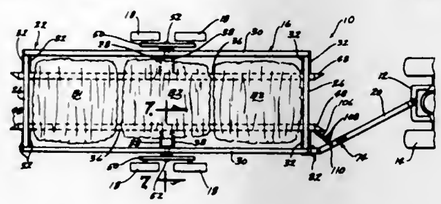
1. A method of temporarily straightening and spinning a non-straight pipe comprising providing a plurality of removable circular collars axially spaced along the pipe, which collars circumferentially closely surround the pipe and have a higher yield strength in the circumferential direction than that of the pipe wall, each collar being formed of three segments of approximately equal arcuate length and two of the segments being hingedly connected to respective opposite ends of the third segment so as to allow the segments to be pivoted relative to each other to open the collar for positioning the collar around the pipe, applying forces to the collars by means of roller elements in directions so as to straighten the pipe and to hold it substantially straight during rotation, and rotating the collars and the pipe.

4,076,137

LARGE ROUND BALE HANDLING APPARATUS

Joseph Benedict Kucera, Traer, Iowa, assignor to Rudolph L. Lowell, Des Moines, Iowa, a part interest

Filed Aug. 5, 1976, Ser. No. 711,967
Int. Cl.² B60P 3/00
U.S. Cl. 214—394 4 Claims



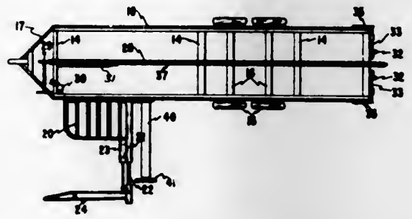
1. A device for handling large round bales comprising:
a. an elongated portable frame including a pair of transversely spaced opposite longitudinally extended side members,
b. a pair of elongated bale supporting ramps corresponding to said side members spaced transversely a distance apart to support opposite bottom portions of a round bale thereon,
c. means rigidly securing each bale supporting ramp to a respective frame side member at a position inwardly thereof,
d. means connecting the side members together to provide a longitudinally extended unobstructed bale passage zone between said supporting ramps, said zone having an open front end and an open rare end,
e. hitch means having one end connected to the portable frame and the other end connectable to a towing vehicle,
f. a pair of transversely spaced ground wheel assemblies, one on each side of the frame located outwardly of an adjacent side member,
g. means movably supporting the frame on the ground wheel assemblies for up and down tilting movement, and
h. power lift means for raising and lowering the frame between a raised bale transport position and a lowered bale loading position,
i. said frame, when in the lowered bale loading position, being movable in a forward direction axially of a ground supported round bale to receive a bale within the front end of said bale passage zone and between said side ramps whereby, on actuation of the power lift means the round bale is lifted on the side ramps to said transport position said round bale on movement of the frame from the transport position to the bale loading position being unloaded from the open rear end of the bale passage zone on movement of the frame in the forward direction.

4,076,138

ROUND BALE LOADER AND CARRIER

Ben K. Honomichl, Sr., Box 68, Jefferson, S. Dak. 57038

Filed Jan. 7, 1976, Ser. No. 647,125
Int. Cl.² B60P 1/36
U.S. Cl. 214—518 4 Claims



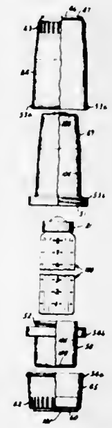
1. Carrier means for carrying substantially cylindrical objects comprising a carrier frame mounted on wheels for transport, platform means pivotally connected to said frame near one end thereof, a carrier arm slidably mounted on said platform means for movement toward and away from said platform means, said carrier arm and said platform means each including means extending substantially parallel to said frame arranged to bracket said cylindrical object, power means connected between said carrier arm and said platform means adapted to slide said carrier arm relative to said platform means, and second power means connected between frame and said platform means to pivot the platform means relative to said frame whereby said cylindrical object may be raised and rolled onto said frame, and discharge means provided on said frame including a pair of arms hinged to said frame and located so that said cylindrical object will be moved onto them, said arms being supported from said frame in laterally spaced relation to each other, one arm being generally higher than the other so that said object will be caused to roll off to the side of said arms.

4,076,139

INSULATED BOTTLE CONTAINER HAVING A BOTTLE SUPPORT AS ONE PART

Scott E. Larson, 313 Riverwoods Lane, Burnsville, Minn. 55337

Continuation-in-part of Ser. No. 596,468, July 16, 1975, abandoned. This application Jun. 16, 1976, Ser. No. 696,696
Int. Cl.² A61J 9/00
U.S. Cl. 215—11 C 8 Claims



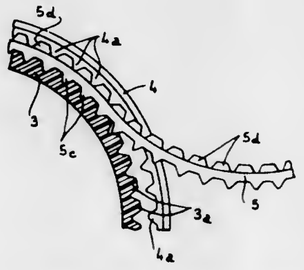
1. A thermal-insulating container particularly adapted to completely contain an elongate vessel such as a baby bottle containing liquid at a predetermined temperature, said container comprising a cup-shaped base member and a cup-shaped cover member having mating portions adapted to be engageable secured together, said members being formed of a thermally insulating material and when secured together defining a generally cylindrical central cavity, said base member having a bottom end capable of supporting said container in an upright position and being open on the opposite end to define a cavity having a depth corresponding to no more than about one-half the length of a said vessel and being dimensioned to provide a frictional fit therewith, and an inner end surface corresponding generally to the shape of the base of a said vessel, said cover member cavity having a depth sufficient to contain that portion of a said vessel not contained in said base member cavity, a diameter slightly larger than the diameter of a said vessel and an inner end surface corresponding generally to the shape of the top surface of a said vessel wherein each of said cover member and said base member is formed of a cup-shaped outer member and a cup-shaped inner member one of said cup-shaped outer member and said cup-shaped inner member having a peripheral ridge at its open end and the other of said cup-shaped outer member and said cup-shaped inner member having a flange member at its open end, a said flange member having a portion projecting toward the closed end of the member with which it is associated and spaced from its outer surface providing an annular socket for receiving and engaging the open end of the other of said outer or inner members with said ridge abutting and in engaged relationship with the projecting portion of said flange member to provide said cover and base members having cavities between their inner walls and their outer walls.

4,076,140

TAMPERPROOF CLOSURE ELEMENT

Raymond Perne, Morance, France, assignor to Astra Plastique, Saint-Georges de Reneins, France

Filed Jan. 13, 1977, Ser. No. 759,292
Int. Cl.² B65D 41/32
U.S. Cl. 215—256 2 Claims



1. An improved tamperproof closure element to be applied to the neck of a container, the closure element having a top cap section joined to a tear strip which has a lower container gripping collar, the tear strip being attached to said cap section along abutting faces at an annular zone of reduced strength, the cap section and collar and tear strip being integrally formed of molded synthetic material, the improvement comprising at the annular zone between the tear strip and the cap section:
a first annular series of spaced projections extending radially from the section toward the tear strip;
a second annular series of spaced projections extending radially from the tear strip toward the section, the projections of said series being shaped to mutually interfit to provide a continuous closure; and
the projections of each annular series of projections being partially axially displaced from the projections of the adjacent interfitting series of projections to reduce to a thin layer the material which joins the tear strip to the adjacent section where said projections are mated.

4,076,141

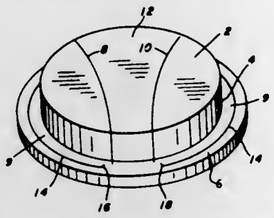
TEAR-OFF CLOSURE WITH ENTRAPPED PULL-RING

Paul R. Lewis, Richmond, Ind., assignor to Aluminum Company of America, Pittsburgh, Pa.

Division of Ser. No. 661,255, Feb. 25, 1976, Pat. No. 4,037,551. This application Mar. 3, 1977, Ser. No. 773,827
Int. Cl.² B65D 41/42
U.S. Cl. 215—254 5 Claims

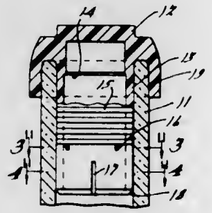
1. A closure for a container comprising:
a top end wall;
a closure skirt around the top end wall;
a radially outwardly projecting annular rim around the bottom of the closure skirt; and
an integral pull ring around the bottom of the skirt comprising a curled bead having a radially inwardly open slot

therein defined by adjacently disposed surfaces of said bead with a terminal edge portion of said annular rim



projecting into and entrapped between said adjacently disposed surfaces of said bead.

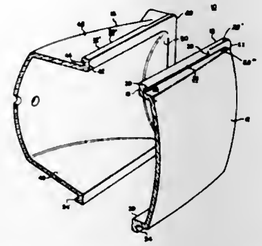
4,076,142
SELF-VENTING BOTTLE CLOSURE
John F. Naz, 6523 Wellesley Terrace, Waterford, Mich. 48095
Filed Jan. 19, 1977, Ser. No. 760,362
Int. Cl.² B65D *51/16*
U.S. Cl. 215—307 **1 Claim**



1. A stopper for the open end at the neck of a bottle having a gas pressure generated therewithin after the stopper has sealed the end thereof, means associated with the stopper to relieve the gas pressure within the bottle before the stopper is removed therefrom, annular ribs provided on the exterior wall of the stopper to form a plurality of sealing engagements with the interior wall of the bottle neck to seal the gas within the bottle, said stopper being hollow and provided with a resilient wall containing through apertures between the top and bottom ends through which the gas can escape when the stopper is partially removed from the bottle neck, the inner surface of the wall being provided with spaced recesses to divide the wall into joined sections which are forced outwardly by the pressure of the contained gas to circumferentially engage the wall and hold the stopper from being expelled from the bottle before the pressure is relieved.

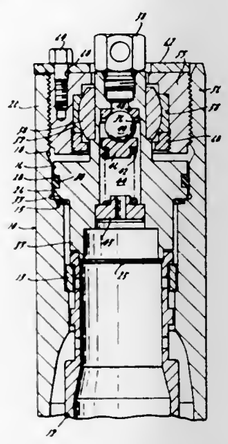
4,076,143
RECTANGULAR SEAL BEAM LAMP UNIT
Frank Jenne, Jr., South Euclid, and Denes Tarnay, Cleveland, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.
Filed Dec. 13, 1976, Ser. No. 750,004
Int. Cl.² H01J *5/20*
U.S. Cl. 220—2.1 R **13 Claims**

1. A rectangular shaped pressed glass lens for a sealed beam lamp unit which includes a sealing rim having front and back sealing surfaces wherein the improvement comprises a longitudinally extending molded projection disposed on the back



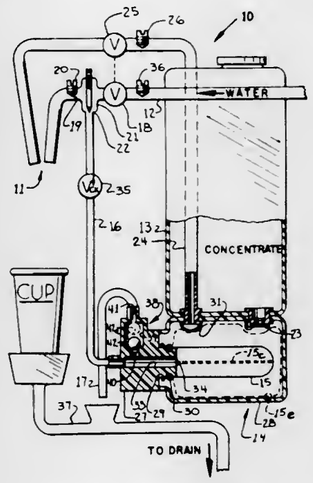
sealing surface of said sealing rim intermediate the inner and outer edges.

4,076,144
TOP CLOSURE FOR CONTROL ROD DRIVE FOR NUCLEAR REACTOR
Jean H. Raas, Lancaster, and Joseph I. Schwartz, Columbus, both of Ohio, assignors to Diamond Power Specialty Corporation, Lancaster, Ohio
Filed Jun. 3, 1976, Ser. No. 692,386
Int. Cl.² B65D *51/16*
U.S. Cl. 220—367 **3 Claims**



1. A closure assembly for a tubular control rod drive housing of circular cross section comprising an annular mounting ring threadably insertable in and removable from the end of the housing and means for sealing the housing and the central opening of the annulus defined by such ring, at a position below the ring, including a closure insert having a sealing head slidably sealably engageable with the interior of the housing, characterized by a neck portion extending outwardly through and rockable in said opening, and a ball and socket joint in the neck portion of the ring and connecting the ring and insert for axial movement as a unit but permitting rocking of the insert and rotation of the ring independently of the insert.

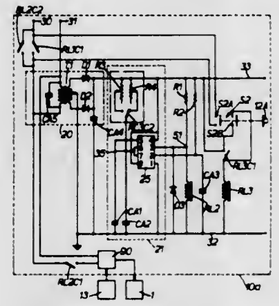
4,076,145
METHOD AND APPARATUS FOR DISPENSING A BEVERAGE
Alfred E. Zygiel, deceased, late of Dallas, Tex. (by Mary E. Zygiel, heir), assignor to The Cornelius Company, Minneapolis, Minn.
Filed Aug. 9, 1976, Ser. No. 712,935
Int. Cl.² B67D *5/56*; G01F *11/08*
U.S. Cl. 222—1 **12 Claims**



8. A method of mixing and dispensing a beverage comprising the steps of:
a. providing a beverage concentrate in a metering chamber;
b. opening a dispensing valve and passing a flow of water through a water line from a pressurized water source to a dispensing head;
c. partially obstructing the flow of water and developing a bypass pressure downstream of the valve when the valve is opened;
d. directing a bypass flow of water under the bypass pressure through a bypass line to an open drain valve;
e. closing the drain valve with the flow of water thereinto;
f. maintaining the drain valve closed with the bypass pressure;
g. directing the bypass flow of water under the bypass pressure into the metering chamber and displacing concentrate therefrom;
h. transferring the displaced concentrate to the dispensing head and combining the concentrate with water to form a palatable beverage;
i. closing the dispensing valve, thereby terminating the flow of water and limiting the amount of beverage dispensed, and dropping the bypass pressure;
j. opening the drain valve in response to the dropping of the bypass pressure; and subsequently
k. draining the bypass water from the metering chamber through the open drain valve.

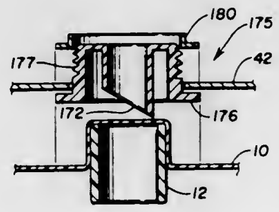
4,076,146
DISHWASHERS AND DETERGENT DISPENSERS
Johannes Willebrordes Lausberg, Mulgrave, and Denys Edward Downton, East Brighton, both of Australia, assignors to Gibson Chemicals International Pty. Limited, Revesby, Australia
Filed Mar. 3, 1976, Ser. No. 663,310
Int. Cl.² D06F *33/02*; F04B *19/00*
U.S. Cl. 222—52 **12 Claims**

1. A liquid dispenser for dispensing a first liquid to a reservoir, said dispenser comprising
a pumping device having an inlet adapted to receive said liquid and an outlet adapted to be placed in communication with said reservoir, and
control means controlling operation of the pumping device and effecting operation of the pumping device to pump a metered amount of said first liquid into said reservoir, said control means comprising
a timer circuit, and
sensing means adapted to sense the commencement of delivery of other liquid to said reservoir,
said sensing means operating, during use of the dispenser and pursuant to said sensing, to activate the timer circuit to thereby actuate said pumping device for a first predetermined time,
said timer circuit including a monostable multivibrator, said sensing means including first switch means actuated, in



use of the dispenser, to activate the multivibrator by application of electric supply thereto,
said timer circuit further including second switch means operated, pursuant to said application of supply to the multivibrator, to effect said actuation of the pumping device by switching electric supply thereto, said multivibrator being switched to a first state upon said application of said supply thereto at which state said actuation of the second switch means is not precluded, but passing to a second state after said predetermined time at which the second switch means is deactuated to end dispensing,
said timer circuit further including latching means for latching said second switch means following application of supply to said multivibrator, until deactuation thereof under control of the multivibrator occurs, irrespective of any intervening deactuation of said first switch means.

4,076,147
LIQUID CONTAINER HAVING A PLASTIC FILM POUCH AND A PIERCING ELEMENT TO OPEN THE PLASTIC FILM POUCH
Justin M. Schmit, 126 Sea Island Lane, Boca Raton, Fla. 33432
Filed May 4, 1976, Ser. No. 683,174
Int. Cl.² B67B *7/26*
U.S. Cl. 222—89 **10 Claims**



10. A container for dispensing fluid comprising, a carton having sides defining a generally rectangular cross section and a height dimension greater than the dimension of a side with a

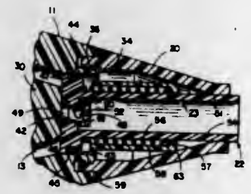
sealed bottom and top end; said carton being made of a paper material and having an aperture through the sealed top end; a flexible pouch of plastic material positioned in the carton, said pouch being formed with seamed edges defining sides and a top; a tubular member positioned through the top of the pouch with a pouch being formed around the tubular member; a locking ring positioned over the tubular member and the top of the pouch and securing the tubular member therein; a sleeve member positioned telescopically over the locking ring with the exposed end of the tubular member being open; said locking ring being positioned through the aperture in the sealed top end of the carton with said sleeve member being positioned over the aperture and cooperating with the locking ring to retain the pouch secured to the carton; a removable cap positioned over the sleeve member to seal the pouch; and including a piercing element telescopically fitted into the tubular member to open the pouch at the end of the tubular member, said piercing element being formed integral with the locking ring.

4,076,148

MULTIPLE FLUID DISPENSER WITH MECHANICAL VALVE

Clifford C. Carse, 500 Woodcrest Court, Boulder City, Nev. 89005

Filed Oct. 13, 1976, Ser. No. 732,020
Int. Cl.² B67D *5/60*
U.S. Cl. 222—144.5 **3 Claims**



1. A dispensing apparatus comprising:
a housing having a flat discharge surface;
a nozzle connected to said housing and having a converging inner surface;
a plurality of conduits formed in said housing, each conduit communicating with a corresponding fluid reservoir, said conduits terminating at said flat discharge surface;
a linearly movable piston valve element mounted to slide within said nozzle, said piston having a head portion including a flat surface for abutting said flat discharge surface to open and close said conduits to the passage of fluid, and a tubular stem portion extending through said nozzle to direct the discharge of said fluid from said apparatus, said head portion having a centrally located recess with radially spaced openings for directing fluid radially against an interior wall of said tubular stem; and
a compression spring disposed around an exterior wall of said tubular stem and out of contact with the flow of fluid, said spring biasing said piston element against said flat discharge surface whereby said piston element is slidable in response to pressure variations in the fluid conduits and the biasing force created by said spring.

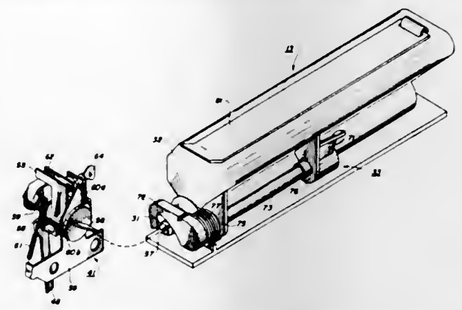
4,076,149

SLAVE DRIVE FOR TONER DISPENSER WITH STRIKER

Allan L. Saxinger, Denton, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 18, 1976, Ser. No. 658,980
Int. Cl.² B65G *3/12, 65/70*
U.S. Cl. 222—202 **14 Claims**

8. A transmission for driving a toner dispenser having a reservoir for storing a supply of toner, a rotatably mounted dispensing roll for feeding metered amounts of toner out of said reservoir, and a biased impact device for importing shock forces to said reservoir to maintain a free flow of toner; said transmission comprising the combination of
a drive shaft having an enlarged flat at one end for connection to said dispensing roll,
a crank having one end coupled to said drive shaft for rotating said dispensing roll in a first direction and an opposite free end extending outwardly away from said drive shaft,
an indexable wheel-like member having at least one drive pin



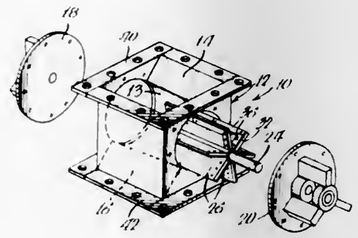
extending therefrom in position to engage the free end of said crank,
means for incrementally indexing said wheel-like member, thereby causing said drive pin to periodically urge said crank in said first direction,
bias means for urging said crank in a second, opposite direction, and
cam follower means coupled to said impact device in position to engage said flat for alternately cocking and releasing said impact device in response to rotation of said dispensing roll.

4,076,150

ROTARY AIRLOCK HAVING ADJUSTABLE BLADES TO MAINTAIN A SEAL

Donald D. Didrickson, 3648 Quince Court, Downers Grove, Ill. 60515

Filed May 14, 1976, Ser. No. 686,389
Int. Cl.² G01F *11/10*
U.S. Cl. 222—368 **6 Claims**



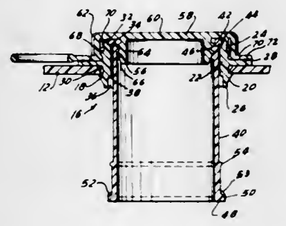
1. A rotary airlock for conveying material having a housing which includes a cylindrical wall and a pair of end walls which together define a generally cylindrically shaped chamber and a plurality of rotating members in said chamber which extend toward said housing and are spaced therefrom to permit rotation while maintaining a seal with said housing, said airlock comprising:
a rotatable shaft extending axially through said chamber;
said plurality of rotating members comprising a plurality of vanes having one edge secured to said shaft, the remaining edges of said vanes terminating adjacent to and spaced from said cylindrical wall and said end walls respectively, each of said vanes being provided with a plurality of apertures adjacent to said remaining edges of said vane; a plurality of blades secured to said remaining edges of each of said vanes and extending toward said housing, with at least one blade on each edge adjacent the respective end walls and at least two blades in end-to-end relation on the edge adjacent said cylindrical wall, the adjacent edges of all of said blades having overlapping portions to define a continuous edge along said cylindrical wall and said end walls, each blade being provided with a plurality of apertures in alignment with said apertures in said vanes; and
fastening means which extend through said pluralities of apertures to secure said blades to said vanes, one of said pluralities of apertures having a first diameter greater than the diameter of the other of said pluralities of apertures to enable each of said blades on each vane to be moved relative to said vanes and said housing in all directions in the plane of said vane to adjust the clearance between said blades and said housing while maintaining said continuous edge to maintain a seal therebetween and minimize leakage from said airlock.

4,076,151

COMBINED SEALING AND POURING SPOUT ASSEMBLY

Herrick B. Littlefield, Darien, Conn., assignor to Polyproducts Corporation, Long Island City, N.Y.

Continuation of Ser. No. 550,914, Feb. 19, 1975, abandoned.
This application Sep. 1, 1976, Ser. No. 719,409
Int. Cl.² B65D *47/10*
U.S. Cl. 222—525 **6 Claims**



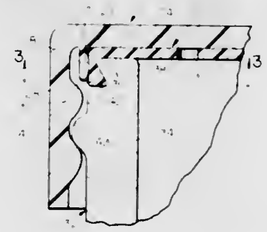
1. A combined sealing and pouring spout assembly for a container comprising:
a carrier plug member adapted to be secured within an access opening in said container,
said carrier plug member including an opening therethrough,
a spout member telescopically received within said carrier plug opening and movable from a first position wherein a first end of said spout member is disposed within a plane substantially coextensive with the exterior surface of said carrier plug and a second position wherein said first end of said spout member is removed from said exterior surface of said carrier plug,
removable and replaceable sealing means engageable with both said spout member to seal said spout member to preclude fluid access from within said container and with said carrier plug when said spout member is in said first position to secure said sealing means to said carrier plug to retain said spout member secured within said carrier plug,
said removable sealing means comprising a screw cap closure member including an end wall member and a depending wall member extending from said end wall member,
said depending wall member provided with a screw thread form engageable with a mating screw thread form formed adjacent said first end of said spout member,
said screw cap closure including a depending member extending from said end wall member and radially spaced from said depending wall member,
said depending member including means cooperable with said carrier plug to sealingly secure said screw cap closure to said carrier plug, and
said carrier plug including an interrupted screw form thereon and wherein said means on said depending member of said screw cap closure includes an extending lug member adapted to fit between the interruption of said screw form and then be threadably engageable with said carrier plug to secure said screw cap closure on said carrier plug.

4,076,152

FITMENT-RETAINING CLOSURE

George V. Mumford, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed May 23, 1977, Ser. No. 799,847
Int. Cl.² B65D *47/00*
U.S. Cl. 222—545 **7 Claims**



4. A fitment-retaining closure and container combination comprising:
a container including a neck portion terminating in an annular rim defining an open mouth, said neck portion having a fitment-retaining groove formed near said annular rim and a plurality of threads formed therebelow;
a fitment member having a fitment top panel spanning the open mouth of said container and a fitment skirt depending from the outer periphery of the fitment top panel, the fitment skirt including an annular retaining bead extending inwardly from the lower end thereof and adapted to engage the fitment-retaining groove in the container neck portion; and
a fitment-retaining closure, including a closure top panel and a closure skirt depending from the outer periphery of said closure top panel, said closure skirt having threads formed on its interior surface which are adapted to matingly engage with said threads on the container neck to enable said closure to be placed in threaded engagement with said container, said closure top panel having a plurality of fitment-retaining, flexible projections extending downwardly therefrom and spaced about the circumference thereof to engage and retain said fitment member for simultaneous application of said closure and said fitment to said container.

4,076,153

PLATE STRUCTURE FOR A LIQUID METAL CONTAINER CLOSURE

Bernhard Tinnes, Zollikerberg, Switzerland, assignor to Metacon AG, Zurich, Switzerland

Filed Oct. 7, 1975, Ser. No. 620,270
Claims priority, application Sweden, Oct. 24, 1974, 7414231
Int. Cl.² B22D *41/08*
U.S. Cl. 222—600 **5 Claims**

1. In a device for opening and closing the outlet bore of a vessel of the type used for containing molten metallic material where the device includes:
a protective casing having a through bore,
a first plate member having an aperture therethrough aligned with said through bore,

valve means including a second plate member having an aperture therethrough, said valve means being mounted for sliding movement relative to said first plate member for controlling flow of said molten material from said bore and first plate aperture through said second plate aperture,

an outlet casing having a through bore aligned with said aperture of said second plate member, said casings each having butt joint portions disposed adjacent said respective plate members and surrounding said bores,

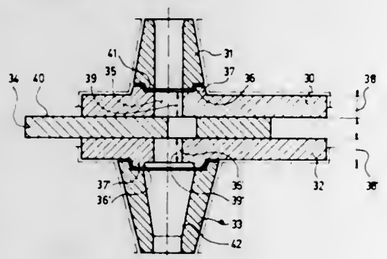
the improvement comprising:

each of said plate members having sealing surfaces and surfaces opposite said sealing surfaces,

said opposite surfaces having means defining a groove and key connection for said casings,

said means on each of said opposite surfaces including a bead projecting from said respective opposite surfaces, each bead having inner and outer flank surfaces with said bead surrounding said respective apertures in said plates,

said inner and outer flank surfaces being inclined toward one another, and



said inner flank surfaces of each bead having a base disposed on a diameter which is substantially greater than the diameter of said respective apertures to form about each said aperture an annulus having a substantial radial dimension, the thickness of each said annulus being less than the combined thickness of the respective plate and its bead,

said butt joint portion of said outlet casing forming with its said through bore a recess having a cross-section and sloping surface complementary to the outer end and outer flank surface of said second plate member bead whereby said butt joint portion of the outlet casing is disposed adjacent said second plate member exteriorly of its bead, and

the through bore of said outlet casing narrowing in the direction of flow and having its upstream end corresponding in cross-section substantially to the cross-section of the rim of the recess formed in said second plate member by the inner flank surface of its said bead.

4,076,154

SEALING MEANS FOR THE JOINT OF A CASTING LADLE CLOSURE

Bernhard Tinnes, Zollikerberg, Switzerland, assignor to Metacon AG, Zurich, Switzerland

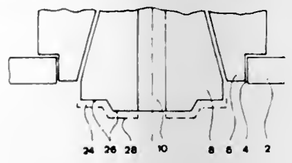
Filed Dec. 18, 1975, Ser. No. 641,872

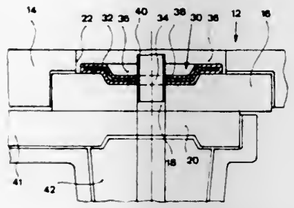
Claims priority, application Switzerland, Jan. 16, 1975, 531/75

Int. Cl.² B22D *41/08*

U.S. Cl. 222—600 5 Claims

5. Sealing means for a joint between the outlet of a casting ladle and a plate member forming a portion of a movable closure for said outlet, said sealing means comprising a rigid core body shaped to surround said outlet and having an aperture therethrough alignable with said outlet, said rigid core body having opposite faces and an outside peripheral edge with said opposite faces and said outside peripheral edge being coated with flowable mortar material, said rigid core body





having anchoring means in the form of holes formed through said core body.

4,076,155

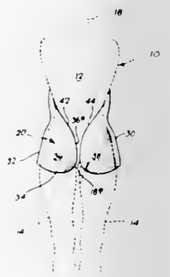
ATTACHMENT FOR HUMAN FIGURE FORM

Evangeline M. Calvin, 735 SW. St. Claire, Portland, Oreg. 97205

Filed Jan. 13, 1977, Ser. No. 758,946

Int. Cl.² A41H *5/00*

U.S. Cl. 223—68 4 Claims



1. An attachment, for a manikin depicting a non-pregnant, female figure, for preparing from the manikin a figure depicting a pregnant woman, the attachment comprising

a front expanse of sheet-like material including an upper region in said expanse shaped to depict the enlarged breasts of a pregnant female which upper region fits over the breasts of the manikin, said upper region including an upper margin which bears on the breasts of the manikin to support the attachment, the front expanse further including a lower region shaped to depict the enlarged abdominal region of a pregnant female,

opposed side expanses of sheet-like material joined to the lower region of said front expanse, said side expanses depicting the hips of a pregnant female, and

a rear expanse formed of sheet-like material, in the form of a pair of buttock panels, one joined to each side expanse, and said panels depicting the buttocks of a pregnant female, said buttock panels presenting unjoined opposed margins located approximately midway between the side expanses of the attachment whereby the attachment is divided along the back thereof,

the opposed side and rear expanses having upper margins

which together with the upper margin of the front expanse define an opening accommodating the projection therethrough of the shoulder region of a manikin with the attachment mounted on said manikin,

the sheet-like material in the attachment having sufficient stiffness whereby the attachment holds its shape while providing support for a garment draped thereover.

4,076,156

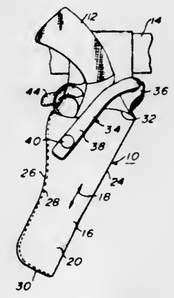
SAFETY HOLSTER

Menasha Emanuel Katz, 6102 Pimlico Road, Baltimore, Md. 21209

Filed Mar. 3, 1976, Ser. No. 663,626

Int. Cl.² F41C *33/02*

U.S. Cl. 224—2 B 12 Claims



1. A safety holster for minimizing unauthorized removal of a gun from said safety holster confines, comprising:

a. tubular insert means extending in a substantially longitudinal direction and adapted in contour for insertion of said gun, said tubular insert means having a frontal wall member and a rear wall member;

b. gun securement means extending in continuous relation from said frontal wall to a location behind said rear wall for releasably capturing said gun at least partially within said tubular insert means;

c. fixed attachment means fixedly fastening in a pivotal relation to said frontal wall member one end of said gun securement means thereby providing relative rotation of said gun securement means relative to said frontal wall member; and,

d. releaseable detachment means for securing said gun securement means to and behind said rear wall member of said tubular insert means, said gun securement means extending in a substantially transverse direction to said longitudinal direction adjacent said rear wall member, said gun securement means extending beyond a contour boundary of said rear wall member in said transverse direction.

4,076,157

VEHICLE-TOP-CARRIER SUPPORT MEANS

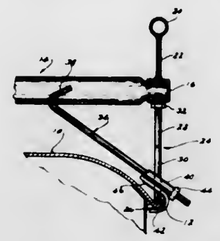
Robert E. Hedstrom, and Edmund W. Brown, both of Racine, Wis., assignors to UPEC Corporation, Racine, Wis.

Filed Jul. 19, 1976, Ser. No. 706,917

Int. Cl.² B60R *9/04*

U.S. Cl. 224—42.1 E 5 Claims

1. A means of securing a carrier rack over the top of a vehicle said vehicle having a gutter adjacent said top, said carrier rack having a longitudinally-extending tubular member, and ribs extending substantially normal to, and integral with said longitudinal member, said means comprising a U-shaped member having a foot portion positioned in said gutter, and legs extending upwardly to engage apertures in said longitudinal member and abutting said longitudinal member, a tension membr spaced between the legs of said U-shaped member and being separable from said U-shaped member and said carrier rack, said tension member embracing the exterior of said gutter and extending divergently to engage one of said ribs at a point inwardly spaced from said longitudnal member, said tension member having a hook which engages an aperture in



said one of said ribs at said inwardly spaced point and means on said tension member to secure said foot in positive engagement with said gutter.

4,076,158

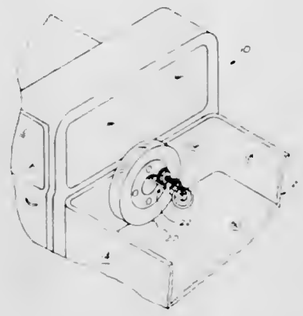
DEVICE FOR SECURING SPARE TIRES

Rolla W. Barr, 16300 Fontaine Drive, Chesterfield, Mo. 63017

Filed Sep. 2, 1976, Ser. No. 719,997

Int. Cl.² B62D *43/08*

U.S. Cl. 224—42.25 12 Claims



1. Apparatus for securing a spare tire comprising:

a baseplate;

first elongated means threaded into and rotatable relative to the baseplate at a first end and extending therefrom terminating at a second end for extending through a lug hole of an associated spare tire; and

second elongated means fixedly secured to the first elongated means including a portion extending substantially parallel with the first elongated means and through a hub hole of the spare tire for anti-rotating engagement with the hub upon rotation of the first elongated means.

4,076,159

BREAKING FLAT GLASS INTO CULLET

Joseph Farragher, Southport, England, assignor to Pilkington Brothers Limited, St. Melens, England

Filed Oct. 18, 1976, Ser. No. 733,720

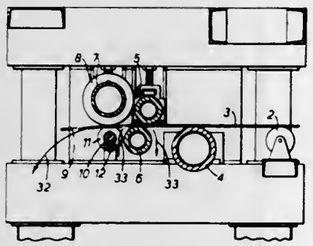
Claims priority, application United Kingdom, Oct. 29, 1975, 44693/75

Int. Cl.² C03B *33/02*

U.S. Cl. 225—3 12 Claims

1. A method of breaking flat glass into cullet, comprising supporting and advancing the flat glass and bending the glass

as it is advanced to apply a breaking stress across the glass about a first axis, and simultaneously applying breaking stresses



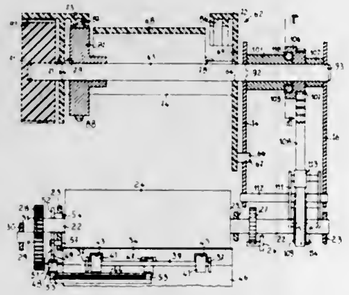
to the bent glass at a series of locations across the bent glass about an axis substantially orthogonal to said first axis.

4,076,160

PAPER AND CONTINUOUS-FORM FEED SYSTEM FOR A DESK-TOP PRINTING ELECTRONIC CALCULATING MACHINE

Bruno Azzalin, and Francesco Bettini, both of Ivrea (Turin), Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Sep. 7, 1976, Ser. No. 720,936
Claims priority, application Italy, Sep. 11, 1975, 69259/75
Int. Cl.² B41J *11/34*
U.S. Cl. 226—82 **7 Claims**



1. A continuous-form feed system for a desk-top printing electronic calculating machine, comprising a platen, a pin element spaced from the platen and rotatable for driving perforated forms, a guide support for supporting the forms and guiding them to follow a path such that they engage around the pin element, a pair of guide elements disposed at the sides of the guide support and between which the continuous forms are, in use, laterally guided, and a locating element fixed to one of the guide elements adjacent a peripheral portion of the pin element for holding the forms in engagement with the pin element, wherein the guide support for the forms comprises a central part of substantially cylindrical form on which the continuous forms rest, in use, and wherein the locating element has the form of a concave circular sector substantially concentric with the central part and confronting the pin element so as to define a limited gap for the passage of the continuous forms.

4,076,161

STOCK FEEDER FOR PUNCH PRESSES AND THE LIKE

Albert W. Scribner, 6 Country Club Road, Darien, Conn. 06820

Filed May 10, 1976, Ser. No. 679,490
Int. Cl.² B65H *17/36, 17/44*
U.S. Cl. 226—146 **12 Claims**

1. A pneumatically operated feeder for intermittently advancing stock into a work station of a punch press or the like: comprising

a main frame;

a feed slide mounted for reciprocal movement on said main frame;

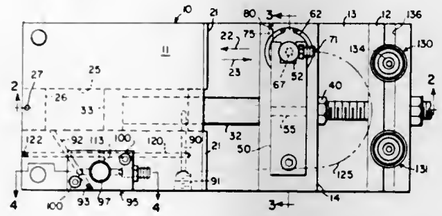
stock gripping means mounted on said feed slide;

fluid motor means for actuating said feed slide and stock gripping means;

valve means for controlling the operation of said fluid motor means; and

at least one stock braking means adapted to continuously apply a frictional drag force to a longitudinal corner edge portion of said stock being moved through said feeder;

said stock braking means including at least one yieldably biased member that is mounted so as to be capable of a small amount of swinging movement about an axis that is substantially parallel to the longitudinal axis of said stock so that said biased member engages essentially only a longitudinal side corner of said stock and applies substantially equal braking forces against movement of the stock in either longitudinal direction through the feeder.



5. A pneumatically operated feeder for intermittently advancing stock into the work station of a punch press or the like: comprising

a main frame;

a feed slide mounted for reciprocal movement on said main frame;

a first double-acting fluid motor means for actuating said feed slide, the rod end of said fluid motor means being adapted to be continuously supplied with pressure fluid;

stock gripping means mounted on said feed slide;

said stock gripping means including a gripper bar that is pivotally secured at one end thereof to said feed slide;

a second fluid motor means carried by said feed slide and adapted to actuate the other end of said gripper bar, a portion of said bar intermediate the said ends thereof being adapted to engage and grip the stock to be advanced by said feeder and to afford the bar gripping action with a mechanical advantage; and

valve means for controlling the operation of said fluid motor means.

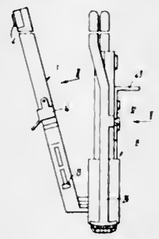
4,076,162

SURGICAL INSTRUMENT FOR SUTURING VESSELS WITH METAL STAPLES

Nikolai Nikolaevich Kapitanov, 8 ulitsa Oktyabrskogo polya, 5, kv.9; Vladimir Vasilievich Ippolitov, ulitsa Lavochkina, 6, korpus 2, kv. 143; Galina Dmitrievna Andreeva, Fedoskinskaya ulitsa, 3, kv. 33; Natalyd Petrovna Petrova, 1 Novokuznetskaya ulitsa, 4, kv. 40, and Vladimir Semenovich Rabotnikov, Profsojuznaya ulitsa, 71, kv.65, all of Moscow, U.S.S.R.

Filed Jul. 9, 1976, Ser. No. 703,921
Claims priority, application U.S.S.R., Jul. 11, 1975, 2166201
Int. Cl.² A61B *17/11, 17/04*
U.S. Cl. 227—019 **2 Claims**

1. An improved surgical apparatus for suturing together vessels of the same or different diameters end-to-end or end-to-side or of suturing a patch on a vessel with metal staples in a single stroke or operation comprising: an anvil having two halves hinged to each other with provision for being joined together and disjoined; a working head at one end of said anvil formed when its halves are joined together, and having a through hole for the passage of the vessel to be sutured; a bell mouth at one end of said working head for stretching the vessel to be sutured thereon, said working head of said bell mouth being of a shape in section, as a polygon elongated in the direction of its two opposite apices lying on the split line of the working head; recesses for clinching the staple ends on the outer surface of said bell mouth; catches for securing the edges of the vessel stretched over said bell mouth, mounted on said anvil; a staple element comprising two L-shaped plates hinged



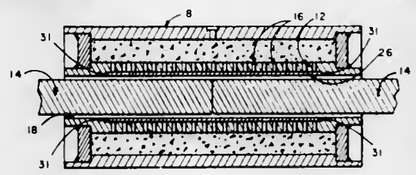
to each other and encompassing said working head of the anvil from the outside; means for fastening said plates on said anvil; magazines with slots for staples are provided at the ends of said plates against said bell mouth of the working head so that the slots with staples are disposed against said recesses on the bell mouth and supply said staples simultaneously to all sides of the elongated polygon head of said said bell mouth; and tappets for said staples, situated in slots in said magazines; and lever-type handles for actuating or moving the tappets to suture a vessel in one operation; whereby resetting of the parts of said apparatus or changing of said magazines is not required.

4,076,163

COUPLER DEVICE

Edvard Grande, 506 Highland Drive, Beckley, W. Va. 25801

Filed Aug. 13, 1976, Ser. No. 714,102
Int. Cl.² B23K *23/00*
U.S. Cl. 228—56 **4 Claims**



1. An improved thermite-type coupler for the splicing of bar-like structures such as reinforcement bars, of the type having an outer sleeve; an inner sleeve located within said outer sleeve; two collar members, each joining one end of said outer sleeve to one end of said inner sleeve; the region defined between said inner sleeve and said outer sleeve containing a thermite-type mixture and the region within said inner sleeve forming an annular space utilized for insertion of the ends of two bar-like sturctures, including means for igniting said thermite-type mixture and means for allowing the reaction products of the thermite-type mixture after it is ignited to enter said annular space under pressure so as to cause upon solidification of the reaction products, splicing of said bar-like structures, wherein the improvement comprises:

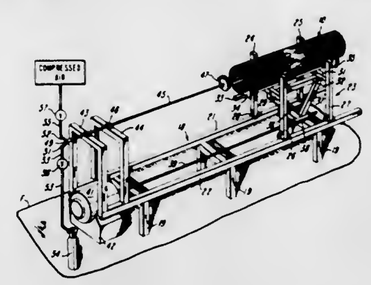
an inner sleeve having a multiplicity of perforations therethrough distributed over a substantial portion of its surface, each of said perforations being of a size sufficiently large to allow said reaction products to flow therethrough and of a size sufficiently small to cause the pressure of said activated thermite reaction products as they enter the annular space to be substantially lower than the pressure of said reaction products in the region between the inner and outer sleeves, each of said perforations being tapered so as to have a decreasing cross-sectional area in the vicinity of said annular space.

4,076,164

PRE-BLISTERING OF BRAZE JOINTS

Ivan Gene Fresbcorn, Kenton, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio

Filed Apr. 21, 1977, Ser. No. 789,495
Int. Cl.² B23K *31/00, 1/04*
U.S. Cl. 228—103 **10 Claims**



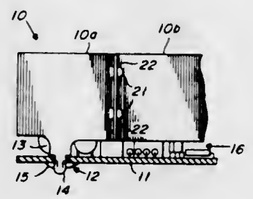
1. In the art of brazing metallic parts using a braze alloy to bond the parts together along a braze joint, the steps of subjecting a brazed joint to a relatively high and rapid temperature rise inducing blistering at locations of imperfect braze, and removing material loosened as a result of blistering.

4,076,165

MOUNTING ARRANGEMENT FOR CHASSIS AND PRINTED CIRCUIT BOARD WITH METHOD OF ASSEMBLY

Leonard Latasiewicz, Hoffman Estates, and Peter Franklin Stultz, Des Plaines, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 3, 1976, Ser. No. 692,615
Int. Cl.² H01L *3/34*
U.S. Cl. 228—136 **4 Claims**



1. A method of attaching an insulated circuit board to a metal chassis and carrying the combination on a conveyor mechanism, comprising the steps of:

forming a plurality of apertures in the circuit board;

providing solder receptive areas adjacent each circuit board aperture;

inserting component leads in certain ones of said board apertures;

forming projections on an edge of the chassis, the projections having a shoulder portion adjacent the chassis edge and a body portion smaller in cross-section than said shoulder portion, said body portion having a twistable end portion;

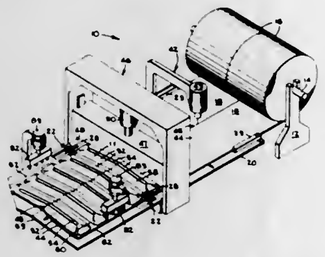
inserting the body portions of the chassis projections into certain other ones of the apertures in the circuit board;

twisting the end portions of the chassis projections for loosely retaining the circuit board;
conveying the chassis and circuit board in suspension for soldering;
soldering the twisted end portions of the chassis projections and the component leads to the adjacent solder receptive areas on the circuit board.

4,076,166
ROOF FOR RAILWAY CAR AND METHOD OF MAKING SAME

Robert J. Austill, Santa Clara, Calif., assignor to FMC Corporation, San Jose, Calif.

Division of Ser. No. 618,851, Oct. 2, 1975, Pat. No. 4,020,603.
This application Jan. 21, 1977, Ser. No. 761,178
Int. Cl.² B23K *31/10*
U.S. Cl. 228—157 **8 Claims**



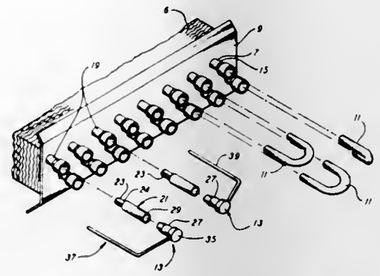
1. A method of manufacturing a one piece roof from two longitudinally elongated webs of sheet metal for installation as a unit on the upper side plates and end plates of the walls of a railway car, said method comprising the steps of: drawing two elongate flat webs of sheet metal in abutting relation along a given path; welding the abutting longitudinal edges between said webs together at a welding station forming a seam as the webs are drawn along said path to form a one-piece sheet approximately the width of a railway car; forming a gable cresting substantially along the seam; transversely deforming a selected longitudinal area of said sheet at a location closely spaced from said welding station for providing a stiffening panel offset from the normal plane of the sheet; repetitively advancing and deforming said sheet to form a plurality of integral longitudinally spaced stiffening panels therein; and transversely severing the thus formed unitary gabled roof along a line in a non-deformed portion so that the roof approximates the length of the railway car.

4,076,167
ULTRASONIC DIP SOLDERING PROCESS

William E. Wright, East Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jun. 30, 1976, Ser. No. 701,299
Int. Cl.² B23K *3/00*
U.S. Cl. 228—173 F **1 Claim**

1. A process for relieving the interior air pressure of a heat exchanger fluid circuit of a heat exchange coil during a soldering operation, the circuit including a plurality of heat exchange tubes having open ends connected by return bends prefitted over the open ends and the circuit terminating in open-ended tubular members having an inner surface, wherein the return bends prefitted on the open ends of the heat exchange tubes of the circuit are immersed in the bath of molten solder, the process comprising the steps of:
inserting the plug member of process snorkels into the open ends of the tubular members; the plug members formed of a material incompatible with the solder in the solder bath for inhibiting the adherence of solder to said plug members including outer configurations dimensioned to enable the plug members to telescope into the open-ended tubular members terminating the circuit in sliding engagement with the inner surfaces of the tubular members, a forward surface exposed to the interior of the circuit when the plug member is telescoped into the open end of the tubular member, a bore extending from said surface into the plug member, and a tubular member extending from the bore, the tubular member being dimensioned to place the bore in communication with the atmosphere when the circuit is immersed in the solder bath;
expanding the ends of the tubular members by forcibly assembling the plug members having a greater outside diameter than the inside diameter of the tubular members such that a portion of each tubular member assumes the

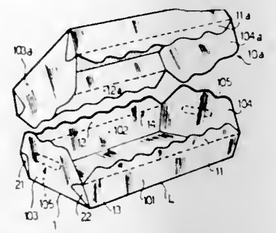


configuration of the respective plug member, said step of expanding occurring simultaneously with the step of inserting the plug member;
immersing the portion of the heat exchange coil having the open ends of the heat exchange tubes with the prefitted return bends, and the open-ended tubular members with the inserted process snorkels, into the solder bath, the process snorkels relieving the internal pressure in the circuit enabling the molten solder to flow into the joints between the heat exchange tubes and return bends;
removing the immersed portion of the heat exchange coil immersed from the solder bath; and
removing the process snorkels from the tubular members.

4,076,168
CARTON FOR FOOD PRODUCTS

Luigi Ferri, Via Belfiore 24, Turin, Italy

Filed Oct. 12, 1976, Ser. No. 731,774
Claims priority, application Switzerland, Oct. 15, 1975, 013480/75; Aug. 6, 1976, 010114/76
Int. Cl.² B65D *43/22, 5/46*
U.S. Cl. 229—43 **6 Claims**

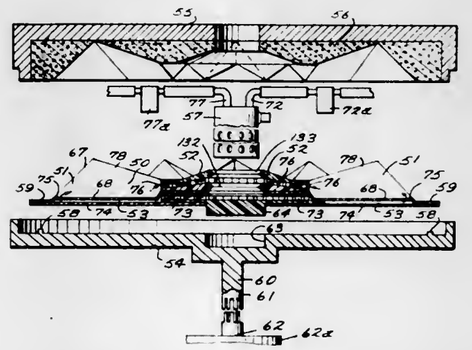


1. A hollow receptacle for the retail packaging of delicate food products, particularly fresh confectionary, comprising
two separate essentially identical half-receptacles which are superimposable above one another to make a package with a chamber for the articles therein, and which may be separately used before or after packaging of the articles in form of trays for display and respectively support of food products, separately, on each half-receptacle;
wherein each half-receptacle comprises a bottom;
a first pair of opposed walls, said walls being provided with connecting tongues;
and a second pair of opposed walls having a height greater than that of first walls;
said connecting tongues on said first pair of walls being formed with engagement areas to fit said half-receptacles together
said second walls being capable to engage one over another by reciprocal telescoping fit when said half-receptacles are arranged one turned over another to form an internally hollow package;
and connecting means to mutually connect the connecting tongues together.

4,076,169
CENTRIFUGE SEPARATION AND WASHING DEVICE AND METHOD

Charles A. Schlutz, 7081 NW. 10th Place, Plantation, Fla. 33313

Division of Ser. No. 513,509, Oct. 9, 1974, Pat. No. 3,982,691.
This application Aug. 16, 1976, Ser. No. 714,651
Int. Cl.² B04B *11/02, 15/06*
U.S. Cl. 233—14 R **20 Claims**

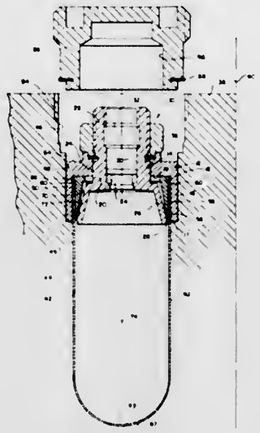


1. A disposable structure for use in a centrifuge for the separation and washing of liquid suspended finely-divided particulate material wherein the centrifuge includes means for containing a quantity of liquid suspended material, a rotation means for rotating the suspended material about a longitudinal axis of the rotation means, and control means for flowing the suspended material and a wash liquid into and out of the centrifuge comprising:
1. a disposable enclosure means for enclosing a quantity of liquid suspended material and adapted and configured to be releasably held by the rotation means in a manner that the enclosure means with liquid suspended material therein may be rotated by the rotation means, said enclosure means having a plurality of angularly shaped material receiving means in fluid communication with each other and evenly spaced about the longitudinal periphery of the enclosure means and forming a part of the enclosure means, said material receiving means having at least one pair of opposite wall portions which converge towards the longitudinal periphery of the enclosure means and thereby form a locus of maximum centrifugal force in the rotating enclosure at the apexes formed by the juncture of the converging wall portions;
2. a plurality of disposable independent conduit means in fluid communication with each other, each with one end thereof in fluid communication with the said locus of maximum centrifugal force and the other end thereof in fluid communication with the control means.

4,076,170
TUBE CAP ASSEMBLY FOR PREPARATIVE CENTRIFUGE ROTORS

Steven John Chulay, Los Altos, and Victor John Grilli, Mountain View, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Apr. 18, 1977, Ser. No. 788,484
Int. Cl.² B04B *15/00*
U.S. Cl. 233—26 **10 Claims**



1. A centrifuge test tube cap assembly for a thin test tube, said assembly comprising:
a crown member with a depending outer flange forming a generally cylindrical cavity, said crown member having a central aperture;
a stem member movably mounted within said aperture of said crown member, said stem member having a biasing end positioned within said cylindrical cavity; and
a bushing member positioned within said cavity between said biasing end of said stem member and said depending outer flange of said crown member, said bushing member having a frustoconical interior surface, the top edge portion of said test tube being positioned within said cavity between said depending flange and said bushing member, said biasing end of said stem member having a diameter generally greater than the largest diameter of said frustoconical interior surface of said bushing member, movement of said stem member in a first direction causing said biasing end to force said bushing member to tightly secure said test tube against the interior surface of said depending flange and movement of said stem member in a second direction opposite said first direction causing said biasing end to release said bushing member allowing said top edge portion of said test tube to be released from said tube cap assembly.

4,076,171
DAMPER CONTROL APPARATUS

Paul F. Swenson, 25525 Edgecliff Drive, Euclid, Ohio 44132

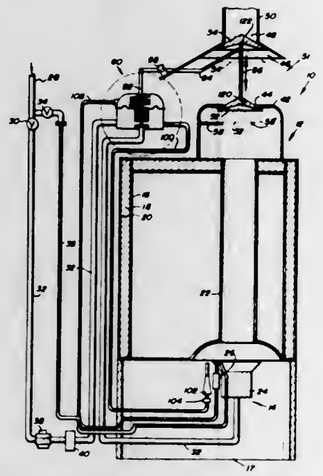
Filed Jul. 12, 1976, Ser. No. 704,548
Int. Cl.² F23N *3/02*
U.S. Cl. 236—1 G **14 Claims**

1. In a heating apparatus of the type including a fluid fuel burner, a flue duct for discharging the products of combustion produced by said burner, a supply line for supplying fluid fuel to said burner and a valve means operable between open and closed positions for controlling the flow of fuel through said supply line to said burner, the improvement comprising:
at least one damper means movable between open and closed positions for controlling flow through said flue duct;
expansible chamber fluid motor means connected to said flow control damper means for moving said damper

means to an open position when pressurized and to a closed position when unpressurized; and,

connection means for pressurizing said expansible chamber motor means whenever said valve means is in an open position, and said expansible chamber motor means including control means for preventing the flow of fuel to said burner until said damper means are in an open position.

10. In a heating apparatus of the type including a fluid fuel burner, a flue duct for discharging the products of combustion produced by said burner and a valve means operable between



open and closed positions for controlling the flow of fuel through said supply line to said burner, the improvement comprising:

at least one damper means movable between open and closed positions for controlling flow through said flue duct;

fluid motor means connected to said damper means for moving said damper means to an open position and to a closed position; and,

connection means for pressurizing said fluid motor means whenever said valve means is in an open position, and control means for preventing the flow of fuel to said burner until said damper means are in an open position.

4,076,172

TEMPERATURE RESPONSIVE VALVE ASSEMBLY

Masami Inada, Toyoake, and Kazuhiko Kitamura, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Dec. 17, 1976, Ser. No. 751,720

Claims priority, application Japan, Jan. 12, 1976, 51-003069

Int. Cl.² G05D *23/10*

U.S. Cl. 236—48 R **3 Claims**

1. A temperature responsive valve assembly comprising:

a body havng an inlet port and first and second outlet ports,

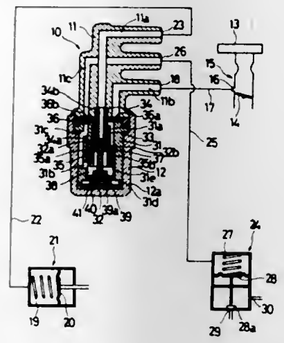
a thermostatic bimetal disk disposed within said body and responsive to a variation in temperature to change the curvature thereof from a first position to a second position,

a valve spool following the movement of said bimetal disk and having first and second valve portions,

an adjusting member secured to said valve spool at a proper position and arranged to be engageable with said bimetal disk,

a first seat member disposed within a first passage between said inlet port and said first outlet port, said first seat member engageable with said first valve portion of said valve spool to thereby control said first passage, and

a second seat member disposed within a second passage between said inlet port and said second outlet port, said second seat member engageable with said second valve portion of said valve spool to thereby control said second



passage, and said second seat member being adjustably threaded with said body.

4,076,173

ATOMIZER

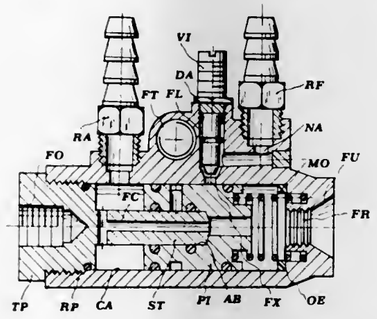
Danizzo Taccon, and Gloriano Taccon, both c/o Dr. Ing. Misitano - Novelty, Via Padova, 217, 20127 Milan, Italy

Filed Mar. 26, 1976, Ser. No. 670,871

Claims priority, application Italy, Apr. 3, 1975, 21954/75

Int. Cl.² B05B *7/12*

U.S. Cl. 239—411 **3 Claims**



1. An atomizer comprising a chamber, a first inlet for admitting air under pressure to said chamber, a piston mounted in said chamber for displacement by said air under pressure from a rest position to an operative position, spring means operable to urge said piston to the rest position, an outlet to said chamber, an air passage through said piston maintaining said outlet in constant communication with said air inlet, a second inlet for admitting fluid to be atomized to said chamber at a location at which it is closed by said piston in the rest position, valve means for controlling the flow of fluid to be atomized to said second inlet and a fluid passage in said piston operable in the operative position of said piston to place said second inlet in communication with said air passage to entrain fluid to be atomized in air flowing through said air passage when said control valve is open, a fixed stem extending within said chamber and into said piston whereby the piston is displaced on said stem between said rest position and said operative position, and a passageway through said stem maintaining said air passage through said piston in communication with said first inlet, said stem engaging said piston in the rest position to limit displacement of said piston under the influence of said spring means, the said fluid passage including a radial passage formed in said piston and opening to the exterior of said piston at a first location in communication with said second inlet in the operative position of said piston and closed by the wall of said chamber in the rest position of said piston, said radial passage opening to the air passage through said piston at a second location at which it is closed by said stem in the rest position of said piston.

4,076,174

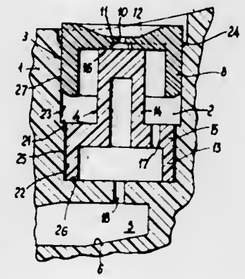
SPRAY NOZZLE FOR DISPENSING CONTAINERS

Günter Melchior Volgel, and Wendelin Velten, both of Nurnberg, Germany, assignors to Aerosol Inventions & Developments S.A. Aid SA, Switzerland

Filed Mar. 26, 1976, Ser. No. 670,860

Int. Cl.² B05B *1/34*

U.S. Cl. 239—492 **10 Claims**



1. A spray-tip assembly comprising a tip body, said body including a recess communicating with a passage for receiving presurized fluid;

a swirl break-up insert mounted axially within said recess; and

an intermediate member mounted axially within said recess between said passage and said swirl break-up insert.

said intermediate member comprising a cylindrical skirt abutting against a base portion of said recess and extending around the passage for receiving the pressurized fluid,

said intermediate member including an axially-extending nose defining thereabout and with said recess an annular expansion chamber,

said swirl break-up insert including a depending skirt at least partially limiting said expansion chamber,

said nose having an upper end surface abuttingly-engaging an inner confronting surface of said swirl break-up insert and including portions cooperating therewith and defining a collecting-chamber communicating with channels tangential with respect to an outlet orifice in said swival break-up insert,

said intermediate member including an intermediate shoulder between said cylindrical skirt and said

nose, and at least one metering-orifice in said shoulder communicating with said expansion chamber.

4,076,175

ADJUSTABLE INDUSTRIAL PAINT SPRAYER

Walter J. Bert, 213 N. Emerald Drive, McHenry, Ill. 60050

Filed Aug. 24, 1976, Ser. No. 717,228

Int. Cl.² B05B *13/02*

U.S. Cl. 239—532 **3 Claims**

1. Industrial spraying apparatus for applying paint to an overhead pipe or the like, comprising:

a. support means including a pair of spaced apart contoured support members adapted to extend in surrounding relation to the pipe to be sprayed and having a passageway contained therein,

b. nozzle means including a nozzle mounted on each of said support members in communicating relation with said passageway and directed in the direction of the pipe so as to obtain an application of the paint onto the pipe,

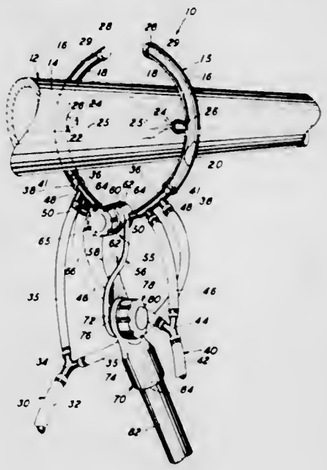
c. paint supply means connected to each of said support members and communicating with each said passageway,

d. air supply means connected to each of said support members adjacent said paint supply means and communicating with each said passageway,

e. mounting means for pivotally connecting said support members at substantially one end thereof to provide angular positionment so as to obtain an adjustment between said nozzles such that pipes of various sizes may extend therebetween for painting,

f. extension means connected to said mounting means at substantially one end thereof and including an extension member adapted to receive interchangeable handles of various lengths so as to permit the user of the spraying apparatus to retain and move said support members relative to the pipe to be sprayed,

g. locking means pivotally adjustable relative to said mounting means so as to permit angular adjustment of the interchangeable handles relative to said support means,



h. said mounting means includes

i. a bracket,

ii. a flanged member extending from one end of each of said support members in overlapping relationship to said bracket, and

iii. coupling means for releasably retaining said bracket and said flanged members in fixed relationship to each other,

i. said support means includes

iv. an extension member extending from one end of each said support member,

v. a neck portion extending from each said flanged member and adapted to be received by said extension member,

vi. means connecting said paint supply means to each said extension member, and

vii. means connecting said air supply means to each said extension member.

4,076,176

GAS DISTRIBUTION MANIFOLD ARRANGEMENT AND METHODS FOR USE WITH PLURALITY OF HYDROPNEUMATIC HYDRAULIC ACCUMULATORS

James D. Torrence, Appleton, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 27, 1976, Ser. No. 754,623

Int. Cl.² B02C *2/00*

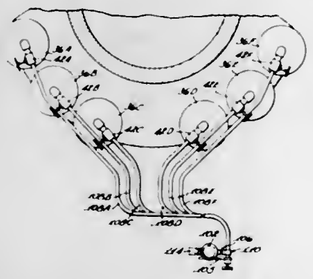
U.S. Cl. 241—30 **10 Claims**

9. The method of precharging with pneumatic fluid to an equal pneumatic pressure a plurality of associated hydropneu-

matic hydraulic accumulators of the type in which each of said accumulators is provided with a first inlet means for admitting hydraulic fluid to the respective accumulator and with a second inlet means for admitting pneumatic fluid to the respective accumulator, and in which said second inlet means of each of said accumulators is fluidly connected by a corresponding separate conduit means to a gas manifold common to all of said accumulators, and in which a separate corresponding selector valve is interposed in series with each said separate conduit means whereby to control pneumatic fluid communication through the respective conduit means between said gas manifold and the second inlet means of the corresponding accumulator, which method comprises the steps of:

(1) Opening said second inlet means of each of said accumulators;

(2) Opening each of said selector valves whereby to fluidly



communicate the respective said second inlet means of all of said accumulators with the interior of said gas manifold;

(3) Charging the interior of said gas manifold with a suitable pneumatic fluid for said accumulators whereby said pneumatic fluid enters said gas manifold and thence passes to all of said accumulators in parallel fluid flow paths to simultaneously pneumatically charge all of said accumulators;

(4) Read the pneumatic pressure in said gas manifold, which pneumatic pressure is common to all of said accumulators, by a suitable pressure-measuring device, and when the measured pneumatic pressure reaches a predetermined desired value, discontinue charging said manifold with said pneumatic fluid;

(5) Close all of said selector valves, thereby pneumatic fluidly isolating all of said pneumatically charged accumulators from each other and from said gas manifold.

4,076,177

PULVERIZING METHOD AND APPARATUS

Yoshio Hirayama, Zushi; Kanichi Ito, Yokohama; Ryoichi Takeuchi, Kamakura; Masao Nomoto, Tokyo, and Tomoyuki Shiina, Yokohama, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Jun. 18, 1976, Ser. No. 697,734

Claims priority, application Japan, Jun. 24, 1975, 50-77981; Feb. 17, 1976, 51-16099

Int. Cl.² B02C *23/04*

U.S. Cl. 241—32 **7 Claims**

1. A drum-type pulverizer for pulverizing a mixture of materials, said pulverizer comprising:

a rotatable cylindrical screen having a plurality of ridge projections on the inside surface thereof and having inlet opening and outlet openings;

a rotatable shaft centrally and coaxially extending through said cylindrical screen;

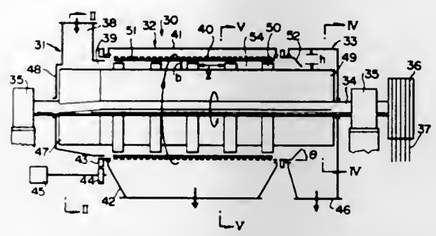
a plurality of anti-entangling plates, each radially mounted on said shaft;

feed means at said inlet opening for advancing the material to be pulverized from said inlet opening toward said outlet opening;

a frusto-conical shaped weir attached at the outlet opening of said cylindrical screen restricting the area of said opening;

a plurality of beaters, each beater being radially mounted on the edge of one of said anti-entangling plates;

at least one pin member pivotally connecting at least one of said beaters to said anti-entangling plate associated therewith; and



breakable support means further connecting said pivotally connected beater and said anti-entangling plate, said breakable support means being weaker than said pin member, for supporting said beater in a radially projecting direction on said anti-entangling plate and for breaking under pressure and allowing said beater to pivot about said pin member toward said anti-entangling plate.

4,076,178

DEVICE FOR CONTROLLING FLOW FROM THE DISCHARGE END OF A TUBULAR BALL MILL OR THE LIKE

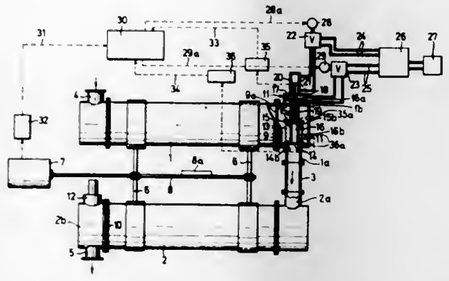
Friedhelm Haude, Cologne, Germany, assignor to KHD Industrienlagen AG

Filed Jun. 2, 1976, Ser. No. 692,220

Claims priority, application Germany, Jun. 6, 1975, 2525242

Int. Cl.² B02C *17/18*

U.S. Cl. 241—33 **14 Claims**



1. A device for controlling flow from the discharge end of associated apparatus such as a tubular ball mill or the like, wherein treated fluent material is received in an accumulation chamber having a lower discharge outlet, the device comprising:

a vertically contractible and expandable hollow body having a metering valve disk on its upper end and a discharge outlet controlling valve disk on its lower end, said valve disks having material metering ports communicating through said hollow body;

means for adjusting the level of the upper valve disk to control the accumulation level of material while the lower of the disks closes the discharge outlet except for the metered flow through said metering ports;

and means for independently raising said lower valve disk to open the discharge outlet for bypassing of the treated material into the discharge outlet.

4,076,179

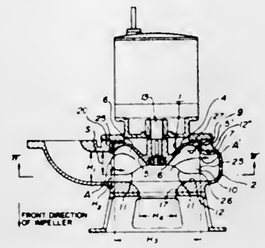
CENTRIFUGAL SEWAGE PUMP

Syozo Tsukube, Ikoma, Japan, assignor to Kabushiki Kaisha Sogo Pump Seisakusho, Osaka, Japan

Filed Apr. 22, 1976, Ser. No. 679,464

Int. Cl.² B02C *23/36*

U.S. Cl. 241—46.11 **8 Claims**



1. A centrifugal sewage pump which comprises a semi-open impeller (1) with a disk-like shroud (4) fixed on a pump shaft (13) and plural impeller vanes (10) formed on the shroud (4) in one body,

a front face (5) of the impeller shroud (4) facing water passages between impeller vanes (10),

front face (5) provides hollows (8) depressing smoothly backward between an annular inner edge (6) and annular outer edge (7) thereof;

a shroud outer periphery (9) covered with a shroud ring (20) of a pump casing (2);

radial flow impeller vanes (10) each having a vane outer periphery (25) extending forward from an outer periphery (7) of the shroud front face (5), said vane having a smooth front edge (11) running from a front end (26) of said vane outer periphery to the front face inner edge (6), there being a clearance (H_2) between a front edge (11) of the radial flow impeller vanes (10) and a casing inner face (12) located in front of the impeller (1) and surrounding a suction port (17) for passing solid matter, and a height (S) of the vane outer periphery (25) being 30–70% of a water passage clearance (H_1), an axial distance between casing inner faces (12) (12″) at an impeller outlet in a casing 2, said piump being further characterized in that among portions of the shroud front face (5) divided by the radial flow impeller vanes (10), at least two portions (5′) and (5′) located at symmetrical positions have no or little backward depression.

4,076,180

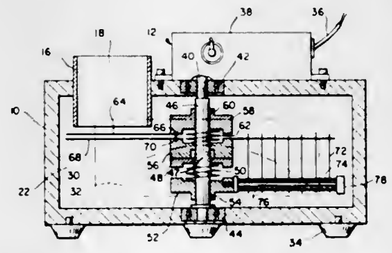
FOOD SHREDDING AND DICING MACHINE

William Y. Liu, 286 Clinton Ave., Brooklyn, N.Y. 11205

Filed Mar. 9, 1976, Ser. No. 665,169

Int. Cl.² B02C *18/10, 18/18*

U.S. Cl. 241—154 **8 Claims**



1. A food dicing and shredding machine, comprising:

a housing,

a motor attached to the housing,

a shaft extending vertically from the motor,

a control disk vertically adjustably attached to the shaft,

a parallel cutting blade attached to the shaft above the control disk,

the shaft rotatably supported by the housing,

means of introducing a piece of food through an upper surface of the housing down on to the control disk, and

an exit opening formed in a side of the housing, whereby the piece of food may be sliced by the parallel cutting blade while resting on the control disk when the shaft is rotating and a piece sliced from the piece of food may be discharged through the exit opening.

4,076,181

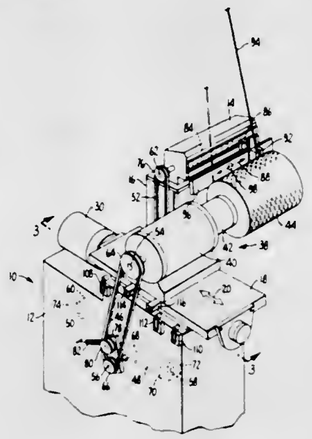
PRECISION WINDER FOR DRAWING AND PACKAGING SYNTHETIC FIBERS

Charles H. Coggin, Jr., Glendora, Calif., assignor to Kaiser Glass Fiber Corporation, Oakland, Calif.

Filed Oct. 22, 1976, Ser. No. 735,000

Int. Cl.² B63H *54/02*

U.S. Cl. 242—18 G **9 Claims**

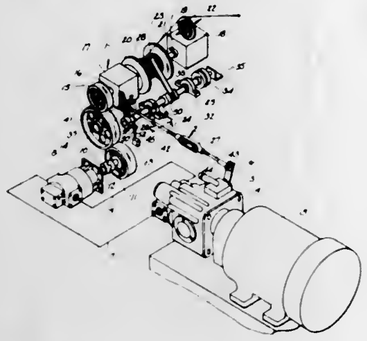


1. A winder for directly drawing glass fiber from an orifice plate to form a precision wound package, said winder comprising: a traverse mounted in a fixed position, said traverse having a follower disposed for back and forth movement thereacross in a generally rectilinear path; a spindle disposed in parallel relationship to the rectilinear path of the follower; means mounting the spindle for rectilinear movement toward and away from the traverse while maintaining the relative parallel relationship of the spindle with the rectilinear path of the follower; a package engaging member mounted on the follower for engagement with the peripheral surface of a package of windings on the spindle and movement relative to the traverse in response to changes in the diameter of such a package; a metallic element mounted for movement with the package engaging member; an oscillator carried by the traverse to sense the position of the metallic element; and, motion imparting means coupled to the spindle to move the spindle on the mounting means therefor and away from the traverse, said motion imparting means being operatively associated with the oscillator to maintain a substantially constant distance between the peripheral surface of windings on the spindle and the traverse.

4,076,182
VARIABLE SPEED WIRE SPOOLER

Harold W. Stites, Raytown, Mo., assignor to Armco Steel Corporation, Middletown, Ohio

Filed Jan. 10, 1977, Ser. No. 757,786
Int. Cl.² B65H *59/00*
U.S. Cl. 242—45 10 Claims

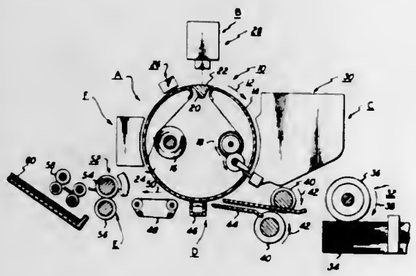


1. In winding apparatus of the type having driving means for operating a pump, winding means responsive to said driving means for winding material in a coil on a spool, a displacement control valve for varying the speed of said winding means, a swinging arm adapted to contact the outer surface of said coil and to be movable therewith as the diameter of said coil increases, and a rotating shaft non-rotatably affixed to said arm, the improvement, in combination therewith, comprising:
(a) lever means non-coaxially attached to said shaft;
(b) slide means adjustably connected to said lever means;
(c) speed control means operatively connected between said slide means and said displacement control valve;
(d) means for adjusting the length of said speed control means;
(e) a frictional dampening clutch attached to said shaft; and
(f) adjustable sensing means activated by the rotation of said shaft,
whereby a constant linear winding speed of said material may be maintained.

4,076,183
PHOTOCONDUCTOR INCREMENTING APPARATUS

William Kingsley, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 18, 1977, Ser. No. 769,984
Int. Cl.² B65H *17/02, 75/02*
U.S. Cl. 242—67.3 R 9 Claims

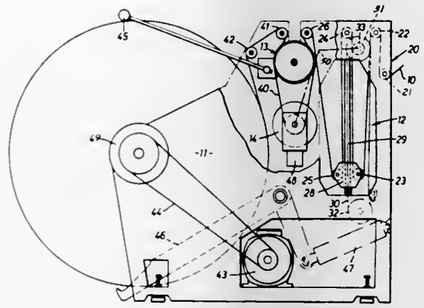


1. An apparatus for incrementing a photoconductive belt to advance unused portions thereof to an operative location as used portions thereof advance to an inoperative location, including:
a movable support member having an interior chamber with the exterior surface thereof defining a path for entraining the photoconductive belt thereabout, said support member having an aperture between the exterior surface thereof and the interior chamber;
means, disposed in the chamber of said support member, for storing the unused portions of the photoconductive belt;
means, disposed in the chamber of said support member, for receiving the used portions of the photoconductive belt;
means for advancing automatically portions of the photoconductive belt from said storing means to said receiving means with the photoconductive belt passing through the aperture in said support member and having one surface thereof in contact with the exterior surface of said support member; and
means for actuating periodically said advancing means in response to said support member moving a pre-selected interval.

4,076,184
APPARATUS FOR REELING WEB- OR STRAND-LIKE MATERIAL

John Henry Morgan, Dursley, England, assignor to John Morgan Printing Machinery Ltd., England

Filed Apr. 15, 1976, Ser. No. 677,137
Claims priority, application United Kingdom, Apr. 17, 1975, 15915/75
Int. Cl.² B65H *23/16*
U.S. Cl. 242—75.3 10 Claims



1. An apparatus for reeling web or strand-like material comprising sensing means for sensing the tension in the material to be reeled, a non-driven control cylinder separate from said sensing means and with a non-slip surface around which the material is to pass, brake means acting on said sensing means to provide actuation of said brake means in dependence thereon.

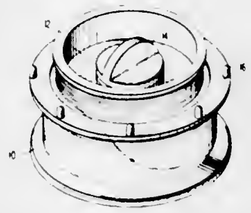
4,076,185
DUPLEX SPOOL FOR AN OPEN FACE SPINNING REEL

Thor Dorph, San Francisco, Calif., assignor to Bjorn Lie and Gina Lie, both of Oslo, Norway, part interest to each

Filed Apr. 16, 1976, Ser. No. 677,714
Int. Cl.² B65H *75/14;* A01K *89/00*
U.S. Cl. 242—118.41 2 Claims

1. A spool structure for a conventional open face spinning reel comprising:
a first main line storage spool and a second line storage spool on the axial outer face of the first in concentric abutting relation thereto, said spools each having a hub portion and a common rim there between, said common rim having a smooth uninterrupted circular peripheral surface, the other rim of said second spool being of less diameter than said common rim and the line capacity of said second spool being only a few turns; and

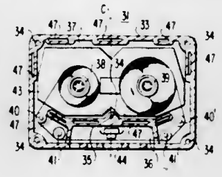
means defining a plurality of equally circumferentially spaced knobs extending axially of said common rim adjacent the periphery thereof, the axial dimension of said knobs being less than the axial dimension of said spool.



4,076,186
MAGNETIC TAPE CASSETTES

Kengo Oishi, and Osamu Suzuki, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 21, 1976, Ser. No. 734,692
Claims priority, application Japan, Oct. 23, 1975, 50-144708[U]
Int. Cl.² G11B *23/10*
U.S. Cl. 242—199 5 Claims

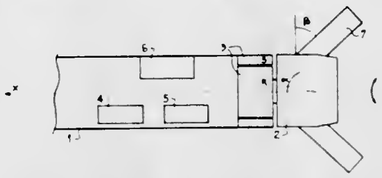


1. In a magnetic tape cassette including upper and lower rectangular case members having peripheral inner walls secured together at their corners to define a hollow interior region therebetween, partition means within said interior region defining therein a recording and reproducing area and a tape storage area, a pair of parallel, rotatable reels mounted in said storage area and spaced from each other, a first pair of parallel, flanged rotary guide rollers mounted in said storage area on opposite sides of said recording and reproducing area, and a magnetic recording tape wound on and extending between said reels and guided in a path of travel through said recording and reproducing area by said guide rollers, the improvements characterized by:
a. a second pair of parallel, flanged rotary guide rollers individually mounted in said storage area between said first pair of guide rollers and said reels, positioned closer to said first pair of guide rollers than to said reels, and serving to further define said path of travel of said tape,
b. a plurality of elongated insert tabs mounted on and protruding along said peripheral walls, and projecting inwardly from one of said case members, and
c. a plurality of elongated slots mounted on and projecting inwardly from the other of said case members, positioned to matingly receive said insert tabs when said case members are assembled and secured together, and having the bottom walls of said slots at a higher level than the height of the inner walls of said case members whereby said engaged tabs and slots increase the rigidity of said cassette and maintain the parallelism of said reels and guide rollers.

4,076,187
ATTITUDE-CONTROLLING SYSTEM AND A MISSILE EQUIPPED WITH SUCH A SYSTEM

Pierre Metz, Paris, France, assignor to Thomson-Brandt, Paris, France

Filed Jul. 20, 1976, Ser. No. 707,029
Claims priority, application France, Jul. 29, 1975, 75 23642
Int. Cl.² F42B *13/30*
U.S. Cl. 244—3.23 8 Claims

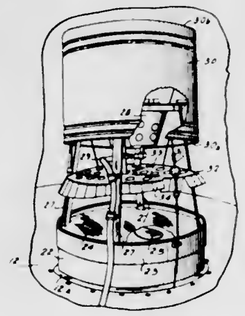


1. A system for controlling the attitude of a cylindrical body moving in a fluid, capable of controlling the attitude of this body in roll, which comprises:
a finned rotary empennage concentric with the body;
a bi-directional torque transmitter providing a connection between the body and the empennage and acting on the empennage relative to the body;
an attitude detector means for producing a signal proportional to the divergence between the detected and desired attitudes of the body;
an amplifier means for amplifying said signal, said torque transmitter being connected to be driven by the amplified signal produced by said amplifier means; and
a source of electrical energy for powering said amplifier and said bi-directional torque transmitter.

4,076,188
BLOWER AND BURNER TO PRODUCE SUPERPRESSURE IN A THERMAL AIRSHIP

Douglas B. Obermoller, Sioux Falls, S. Dak., assignor to Raven Industries, Inc., Sioux Falls, S. Dak.

Filed May 19, 1976, Ser. No. 687,913
Int. Cl.² B64B *1/58*
U.S. Cl. 244—98 11 Claims



1. A thermal hot air airship comprising in combination:
a flexible elongate heated air lifting envelope aerodynamically shaped for horizontal flight providing a hull for the airship;
tail members on the aft end of the airship for controlling the horizontal flight;
a gondola carried below the hull for supporting a payload;
power propelling means on the airship for propelling the airship horizontally;
means defining a pressurizing inflation opening leading into the hull;

hot air pressure generating means comprising an integral blower and controlled burner means interiorly of the pressurizing inflation opening and on the interior of the envelope for pressurizing and inflating the soft envelope with heated air to supply substantially the entire lift during flight, said blower being positioned at the hull inflation opening for moving a flow of air through the hull opening for inflating the envelope with a superpressure, said controlled burner means being positioned downstream of the blower in the interior of the envelope and in the path of air flow for heating the air passing into the envelope interior.

4,076,189

KITES

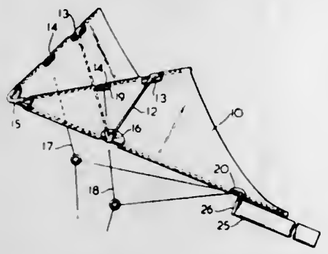
Peter Trevor Powell, Cheltenham, England, assignor to Peter Powell International Limited, Gloucester, England

Filed Jul. 16, 1976, Ser. No. 705,891

Claims priority, application United Kingdom, Jul. 16, 1975, 29844/75; Mar. 6, 1976, 9076/76

Int. Cl.[2] B64C *31/06*

U.S. Cl. 244—153 R **4 Claims**



1. The combination of a kite and a streamer for attachment to the kite in the form of an elongated, inflatable, flexible tube, the tube from which the streamer is formed being of constant cross section throughout its length, the tube having an open mouth at one end thereof and the other end of the tube being closed, reinforcement means in the form of a tape that is provided at said one end of the tube, the reinforcement means serving to strengthen said one end of the tube and to insure that it will adopt a generally circular configuration and thereby afford an open mouth, the kite comprising sheeting spread by a longitudinal spar and a flexible lateral spar, there being an opening in said reinforcement tape for attachment of the streamer to the kite by passage of the longitudinal spar of the kite through said opening.

4,076,190

APPARATUS FOR EXTRACTING ENERGY FROM WINDS AT SIGNIFICANT HEIGHT ABOVE THE SURFACE

Lambros Lois, 6104 Dunleer Court, Bethesda, Md. 20034

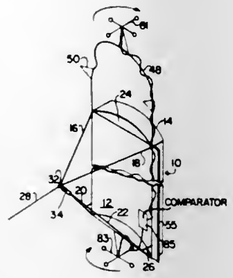
Filed Mar. 30, 1976, Ser. No. 671,944

The portion of the term of this patent subsequent to Dec. 9, 1992, has been disclaimed.

Int. Cl.[2] B64C *31/06*; F03D *9/02*

U.S. Cl. 244—153 R **7 Claims**

1. In apparatus for harnessing energy from atmospheric winds, comprising at least one floating sail, each sail being connected to a flexible line, the other end of each flexible line being wound upon a respective pulley for utilizing energy extracted from the wind by playing out each said flexible line and each said sail under the influence of the wind, the improvement comprising wind velocity gradient sensing means for sensing the wind adjacent the upper and lower edges of said sail, comparator means to compare the signal from said sensing means and to provide an indication of the direction in which



each sail should move to reach an altitude of highest wind velocity.

4,076,191

SPACECRAFT COMPONENT ROTATION MEANS

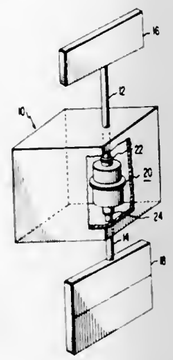
Derek Sidney Binge, Hamilton Square, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 5, 1976, Ser. No. 672,700

Claims priority, application United Kingdom, Apr. 29, 1975, 17784/75

Int. Cl.[2] B64G *1/10*; H02K *5/00*

U.S. Cl. 244—173 **10 Claims**



1. A solar array drive apparatus for rotating at least one array of solar panels in a spacecraft adapted for orbital operation, comprising:

a housing secured to a portion of said spacecraft;

a rotatable shaft within said housing;

a duplex pair of coacting rolling-contact bearing means secured to said shaft and to said housing to rotatably support said shaft relative to said housing, said duplex bearing means being adapted to be preloaded;

means to preload said duplex bearing means to a predetermined force to provide thereby radial and axial constraint and moment stiffness of said shaft relative to said housing;

a single rolling-contact bearing means secured to said shaft for rotatably supporting said shaft, said single bearing means adapted to be preloaded;

axially resilient support means having substantially no radial resilience secured to said single bearing means and to said housing;

means for elastically flexing said axially resilient support means to preload said single bearing means to provide a radial constraint of said shaft relative to said housing and thereby a rotatable support of said shaft in addition to said rotatable support by said duplex bearing means for increased moment stiffness of said shaft;

motor means for rotating said shaft; and

means for connecting said shaft to said array of solar panels.

9. A bearing and drive mechanism to rotate components in a spacecraft, comprising:

a housing secured to a portion of said spacecraft;

a rotatable shaft within said housing;

a duplex pair of coacting rolling-contact bearing means secured to said shaft and to said housing to rotatable support said shaft relative to said housing, said duplex bearing means being adapted to be preloaded;

means to preload said duplex bearing means to a predetermined force to provide thereby radial and axial constraint and moment stiffness of said shaft relative to said housing;

a single rolling-contact bearing means secured to said shaft for rotatably supporting said shaft, said single bearing means being adapted to be preloaded;

axially resilient support means having substantially no radial resilience secured to said single bearing means and to said housing; and

means for elastically flexing said axially resilient support means to preload said single bearing means to provide a radial constraint of said shaft relative to said housing and thereby a rotatable support of said shaft in addition to said rotatable support by said duplex bearing means for increased moment stiffness of said shaft.

4,076,192

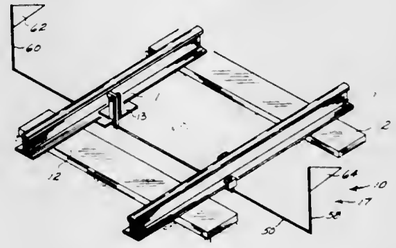
APPARATUS FOR DETECTING A HIGH FLANGE

Myron W. Hoge, 1345 N. Broad St., Fremont, Nebr. 68025

Filed Dec. 30, 1976, Ser. No. 755,528

Int. Cl.[2] B61L *13/04*

U.S. Cl. 246—247 **2 Claims**



1. An apparatus for detecting a high flange on the wheel of a railroad car as the wheel moves over a railroad track, the apparatus comprising:

a base means including a base member secured to the track and an upright member secured to said base member;

an L-shaped unit pivotally secured to said upright member proximate the track in a position to be displaced from a first position to a second position by a high flange, said L-shaped unit in said first position having a generally horizontal arm positioned to be generally in the path of said high flange and a generally vertical leg depending from said arm;

biasing means interconnected between said base means and said L-shaped unit for biasing said L-shaped unit to said first position; and

signal means including an elongated rod operatively connected to said L-shaped unit and affixed intermediate its ends to said upright member with one end of said rod extending laterally of one side of the track and the other end of said rod extending laterally of the other side of the track, and a pair of flags each secured to an end of said rod, wherein movement of said L-shaped unit from said first to said second position causes said rod to move with said flags giving a visual signal of the movement.

4,076,193

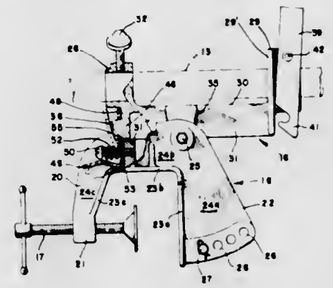
TRANSOM MOUNT FOR FISHING MOTOR

Lester C. Weaver, Fayetteville, Ark., assignor to Shakespeare of Arkansas, Inc., Fayetteville, Ark.

Filed Dec. 17, 1976, Ser. No. 751,468

Int. Cl.[2] B63H *21/26*

U.S. Cl. 248—4 **3 Claims**



1. A transom mount for mounting the motor tube of a fishing motor on the transom of a boat, comprising a clamp adapted for gripping the transom, a yoke swiveled on said clamp, means on said yoke for holding said motor tube, said yoke adapted for swinging said motor tube between vertical operating position and horizontal stowed position, spring-biased catch means on said yoke to engage said clamp when the yoke is in operating position, and spring-biased clip means on the clamp to engage the yoke in the stowed position, said clip means being L-shaped having two legs extending angularly from an apex rockingly abutting said clamp, one leg for lockingly engaging said yoke and the other leg adapted to be manually pressed to rock the clip means and release the yoke.

4,076,194

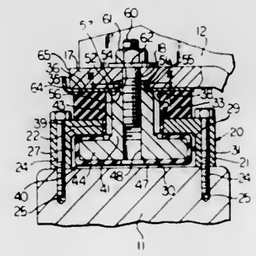
SNUBBED PAD RESILIENT MOUNT

Dennis D. Feucht, Morton, and Terry W. Ryan, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 7, 1976, Ser. No. 730,543

Int. Cl.[2] B62D *27/04*

U.S. Cl. 248—9 **4 Claims**



1. An apparatus for resiliently mounting an engine on a frame comprising:

a housing adapted to be secured to the frame, said housing defining an internal chamber and an opening to said chamber having a diameter less than said chamber;

means for securing said housing to the frame;

a resilient pad disposed between said housing and the engine and having a protrusion extending into said opening in said housing, said pad and said protrusion having a common axially extending bore extending therethrough into said housing, the engine being seated on said pad;

a snubber spool adapted to be secured to the engine, said snubber spool having a stem portion extending through said bore and being radially spaced out of contact with the walls of said bore, said spool having an enlarged flange

portion extending radially from said stem portion and being positioned within said chamber with a diameter of said flange portion being greater than the diameter of said bore and being less than the diameter of said chamber;

a resilient element separate from said resilient pad and being disposed about said flange in spaced relation to the walls of said chamber and to the frame; and

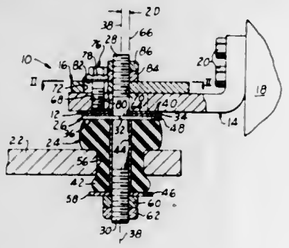
means for securing said snubber spool to the engine.

4,076,195

ADJUSTABLE MOUNTING ASSEMBLY

Douglas Lester Uhler, Painesville, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed May 20, 1977, Ser. No. 798,955
Int. Cl.² F16M *5/00*; F16F *15/00*
U.S. Cl. 248—9 **10 Claims**



1. An adjustable mounting assembly comprising:

a supporting member having a load bearing surface and an anchoring element;

a variably positioned member having an opening and a plurality of threaded passages, said opening having an axis and being of a size sufficient for freely fitting over said anchoring element, said threaded passages being spaced a substantially equidistance from said axis, and said variably positioned member being supported by said load bearing surface;

a mounting plate having an aperture and a plurality of bores, said bores defining a common geometric center, said aperture being eccentrically offset from said geometric center and of a construction sufficient for fitting closely over said anchoring element, said mounting plate being rotatable about said anchoring element for aligning said bores with said threaded passages; and

a plurality of retaining elements being of a construction sufficient for insertion through said bores, screw threading into said threaded passages, aligning said variably positioned member on said supporting member, and clamping said mounting plate to said variably positioned member.

4,076,196

MULTI-USE MOTOR MOUNT

Fred Levine, 1330 - 99th St., Bay Harbor Islands, Fla. 33154

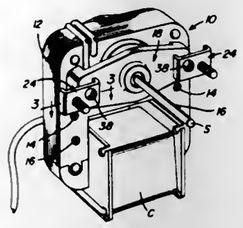
Filed Jun. 3, 1976, Ser. No. 692,271
Int. Cl.² F16F *15/08*; H02K *5/24*
U.S. Cl. 248—14 **7 Claims**

1. Apparatus for relocating mounting studs for replacement fan motors and the like, comprising in combination:

a. a bracket provided with an opening means;

b. a mounting stud including a first head and a screw threaded first shank, being arranged in the opening means and extending from the bracket for attaching the bracket to a supporting panel; and

c. bolt means including a bolt comprising a second head and a screw threaded second shank, with the second shank being also selectively arranged in the opening means and extending from the bracket for being disposed in a mounting hole of a motor being mounted, the bracket being a substantially U-shaped channel provided with a planar back portion having a first surface and a second surface parallel to the first surface, the opening means being a pair of apertures provided in the back portion, one each for the stud and bolt, and a pair of legs extending co-directionally



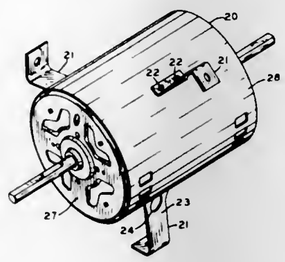
in spaced relation from the back portion and facing the first surface, the first head, that of the stud, abutting the first surface of the back portion and being disposed between the legs of the bracket, with the second head, that of the bolt, abutting the second surface.

4,076,197

TORSIONAL VIBRATION ISOLATING MOTOR MOUNTING ARRANGEMENT AND METHOD OF MAKING THE SAME

Richard W. Dochterman, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Jun. 18, 1976, Ser. No. 697,547
Int. Cl.² F16F *15/04*; F16M *11/04*
U.S. Cl. 248—15 **11 Claims**



1. A torsional mode vibration isolating mounting arrangement for an alternating current induction motor designed for excitation by an alternating voltage of a predetermined source frequency, and wherein said motor has a polar moment of inertia Ip, measured in pound-inches-seconds^2, said mounting arrangement including a plurality of arms, formed from flat sheet material, extending radially from the motor and each having at least one tuning aperture formed therein with each aperture lying generally along a different generally radially extending plane; said tuning apertures being sized and located so that the cumulative effective spring constant, in pound-inches per radian will be less than the quantity $2.84 \times Ip \times 10^5$.

4,076,198

MOBILE HOME TELEPHONE STAKE

Deloris Garrett, 4331 N. McKinley, Oklahoma City, Okla. 73118

Filed May 24, 1976, Ser. No. 689,488
Int. Cl.² H02G *9/02*
U.S. Cl. 248—49 **3 Claims**

1. A mobile home telephone stake used with an underground telephone cable, the end of the cable received in a junction box mounted on the stake, an additional telephone cable is attached to the junction box and received in the mobile home for providing telephone service thereto, the telephone stake comprising:

an elongated metal post having a first side portion and a second side portion, said side portions intersecting, forming a "V" shaped cross section, said side portions having outwardly extending edges, said post having an upper end portion, a center portion, and a lower end portion, said lower end portion having a pointed end for inserting said post in the ground surface;

a flat mounting plate, the back of said plate attached to the outwardly extending edges of said first and second side portions of said post, said plate disposed below the top of the upper end portion of said post, the sides of said plates extending outwardly from the first and second side portions of said post, said mounting plate including a plurality of sets of apertures in a spaced relationship thereon, each of said sets of apertures threadably receiving mounting fasteners of a particular make of junction box;



a flat washer attached to the top of the upper end portion of said post and extending outwardly therefrom, said washer used for striking the upper end portion of the telephone stake and driving the stake into the ground surface; and

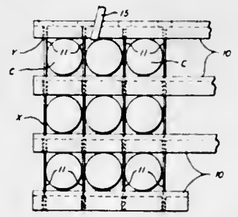
flexible ties secured around the exterior of said first and second side portions of said post for holding the underground telephone cable against the interior sides of said first and second side portions of said post.

4,076,199

CABLE SUPPORT METHOD AND APPARATUS

George T. Paulsen, 13 B Mitchell St., Norwich, N.Y. 13815

Filed Jul. 6, 1976, Ser. No. 702,580
Int. Cl.² F16L *3/22*
U.S. Cl. 248—68 R **17 Claims**



1. Clamping apparatus for clamping together a plurality of elongated articles extending generally parallel to each other, said articles being arranged in rows and columns, said apparatus comprising, in combination: a plurality of separate substantially rigid bar members extending parallel to and spaced apart from each other, with each of said rows of said articles being situated between adjacent pairs of said bar members; and a plurality of separate flexible straps inserted through and extending between said bar members, at least one of said bar members including a plurality of ratcheting locking means engaging respective cooperating locking means on said straps to maintain tension in said straps and maintain each row of said articles clampingly engaged by and between a respective pair of said bar members, said apparatus being unsupported except by said articles.

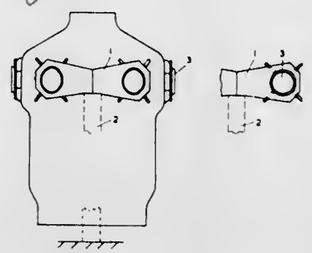
14. The method of binding a plurality of electrical cables in rows and columns which comprises the steps of: inserting an unsupported rigid bar on each side of each row of said cables with said bars extending substantially parallel to each other in a first direction; passing a plurality of separate straps through openings spaced along said bars in a second direction generally perpendicular to said first direction, said openings in at least the last of said bars through which said straps are passed having ratcheting locking means preventing removal of said straps therefrom; and tightening said straps to compress said cables between said bars.

4,076,200

SUPPORTED VESSEL AND MEANS FOR SUPPORT THEREOF

Harold Edward Haigh, Stockton on Tees, and Dietrich Adolf Hofmann, Newcastle on Tyne, both of England, assignors to Tioxide Group Limited, Billingham, England

Filed Sep. 28, 1976, Ser. No. 727,589
Claims priority, application United Kingdom, Nov. 6, 1975, 46093/75
Int. Cl.² B65D *25/24*
U.S. Cl. 248—146 **8 Claims**



1. A supported vessel comprising:

a. a vessel, the sides of which are provided with a number of outwardly directed projections, and

b. a support comprising a plurality of support points carried on a support structure, the lower end of which is secured in the ground, said support points supporting webs which project outwardly on opposite sides of said support points, said webs being of thickness and shape such that they are complant in a horizontal direction, the center part of each web being fixed to a support point and the outer ends of each web being adapted to be fixed to a projection on said vessel such that the weight of said vessel is projected through said webs to the support structure and the horizontal compliance of said webs accommodates horizontal movement of the vessel wall.

4,076,201

ADJUSTABLE CHAIR-SPINDLE ASSEMBLY

Walter E. Hudnall, 2157 W. 236th Place, Torrance, Calif. 90501

Filed Feb. 10, 1977, Ser. No. 767,375
Int. Cl.² F16M *11/00*
U.S. Cl. 248—162 **7 Claims**

1. An adjustable chair spindle apparatus to selectively position the height of a chair seat mounted to the chair-support structure, said apparatus comprising:

a central index spindle fixedly secured to said chair-support structure, wherein said central index spindle includes a plurality of annular grooves equally spaced apart along the longitudinal length thereof;

positioning selective means arranged to be slidably mounted on said index spindle in a releasable locking arrangement, said positioning selective means comprising a central,

tubular support strut arranged to be attached to said chair seat at one end thereof;

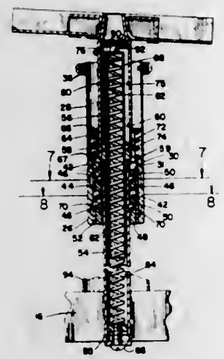
a lever-actuating means operably connected to said positioning selective means, to allow said selective means to be released from a locked condition with said index spindle;

pneumatic means within said positioning selective means to control the rate of vertical movement between said chair seat and said support structure; and wherein said releasable locking means comprises:

a thrust collar secured to said support strut having a plurality of apertures disposed therein;

at least one set of index balls arranged within said thrust collar so as to pass through said apertures to engage said index housing;

at least one index ring slidably positioned between said thrust collar and said spindle, said index ring having oppo-



sitely disposed, inclined walls wherein one inclined wall thereof engages said index balls;

at least one restraining ring positioned between said thrust collar and said spindle, said restraining ring being secured to said thrust collar and having an inclined wall adjacent said inclined wall of said index ring, thereby defining a raceway therebetween; and

at least one set of bearing balls disposed in said raceway for engagement within said annular grooves of said spindle to provide a vertical locking arrangement between said central, tubular support strut and said spindle to prevent vertical movement therebetween, and wherein said index housing includes at least one annular recess therein adjacent said thrust collar to receive said index balls therein when said index housing is raised to release said locking means.

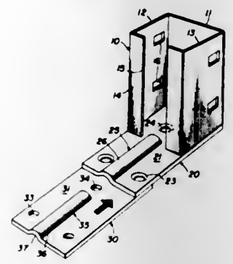
4,076,202

SHIM FOR RACK COLUMN

Kennedy McConnell, Homewood, Ill., assignor to Interlake, Inc., Oak Brook, Ill.

Filed Mar. 25, 1977, Ser. No. 781,173
Int. Cl.² F16M *11/24*
U.S. Cl. 248—188.2 **13 Claims**

1. A nestable shim to control the elevation of an associated column resting on a foot member which has a flat bottom surface with an elongated concave groove therein, said shim comprising a flat plate having an elongated ridge portion with a convex top surface and a concave bottom surface, said convex top surface being shaped and dimensioned to nest within the groove in the foot member when received therebeneath for cooperation therewith to prevent lateral displacement of said plate from the foot member, said top and bottom surfaces of said ridge portion being complementary to each other to permit stacking of a plurality of said plates with each said top surface being nested within the bottom surface of the immediately overlying one of said plates, whereby a plurality of said shims may be stacked beneath the foot member to elevate the



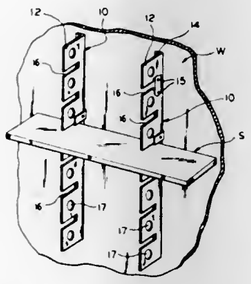
column while preventing lateral displacement of said shims with respect to each other and the foot member.

4,076,203

WALL SHELF ARRANGEMENT

Thomas M. McDonnell, 11 N. 4th Ave., Maywood, Ill. 60153

Filed Jun. 15, 1977, Ser. No. 806,745
Int. Cl.² A47B *57/16*
U.S. Cl. 248—247 **9 Claims**



1. In a wall shelf arrangement, the combination of:

(a) a pair of vertical support members attachable to a vertical surface such as a wall structure;

(b) said support members each having a plurality of forwardly facing, vertically spaced slots for removably receiving a plurality of horizontally disposed shelves;

(c) a plurality of shelf retaining members for detachably securing said shelves to said support members, each of said retaining members comprising:

(i) a first element adapted to be engaged behind a portion of a vertical support member;

(ii) a second element formed integrally with and extending forwardly from said first element and adapted to overlie an upper surface of a shelf;

(iii) a third element formed integrally with and projecting downwardly from a forward portion of said second element and adapted to extend below the upper surface of said shelf for engagement with said shelf to prevent the accidental forward movement of said shelf out of the related slot of the related support member.

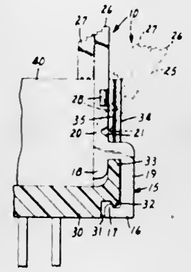
4,076,204

RETAINING CLIP

James C. Kalka, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 16, 1976, Ser. No. 742,176
Int. Cl.² H01R *13/54*
U.S. Cl. 248—500 **4 Claims**

1. A retaining clip for retaining two mating pieces together comprising an attaching end of generally C-shaped cross-section having a first arm with a hook formed at its free end, a second arm terminating in a smooth arcuate curve and a central segment connecting said first and second arms together; a rectangular retaining end having a latching member affixed along one edge thereof at its free end, said latching member being adapted for holding one of said mating pieces by resting



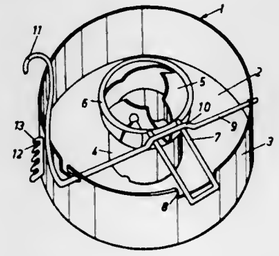
on a surface thereof, said retaining end also having a latching tab along each longitudinal edge thereof; an integral central hing along the intersection of said attaching end and said retaining end, said hinge permitting oscillating movement of said retaining end of said clip from a first position to a second position.

4,076,205

SUPPORT, INTENDED TO BE USED PRIMARILY AS A CHRISTMAS TREE STAND

Bengt Önnert Almér, Saltholmsgatan 55, and Karl Gunnar Gidlöf, Forsvarsgatan 1, both of Vastra Frolunda, Sweden (42176)

Filed Dec. 2, 1976, Ser. No. 747,011
Claims priority, application Sweden, Dec. 9, 1975, 7513841
Int. Cl.² A47G *33/12*
U.S. Cl. 248—524 **6 Claims**



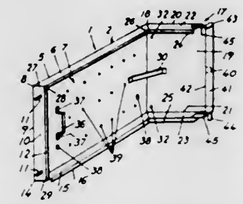
1. A support for a Christmas tree or the like comprising a base member adapted to rest on a level supporting surface, an open top cup-like element secured to the base member and rising therefrom, a unitary hollow clamping shell which is rounded at least on its portion which is lowermost during use and being formed of resilient material, the rounded portion of the clamping shell resting on the open top of the cup-like element and being swiveled on such open top for universal adjustment, the clamping shell having a top-to-bottom through opening adapted to receive a Christmas tree trunk or the like, the clamping shell being circumferentially slotted to form plural circumferentially spaced clamping jaws whose top edges in the use position of the clamping shell are adapted to be forced into clamping engagement with a Christmas tree trunk or the like, and a lockable adjustable operating means for the clamping shell on said base member including a camming element having camming engagement with said jaws, movement of the camming element in a downward direction forcing the lower rounded portion of the clamping shell downwardly in the cup-like element to thereby force said clamping jaws into clamping engagement with a Christmas tree trunk or the like being supported.

4,076,206

PANEL FORMS HAVING PANEL REINFORCING MEANS

Jorge Marsellan, Sarmiento 440, Buenos Aires, Argentina

Filed Apr. 13, 1976, Ser. No. 676,613
Claims priority, application Argentina, Apr. 17, 1975, 258414
Int. Cl.² E04G *11/08, 17/08*
U.S. Cl. 249—44 **12 Claims**



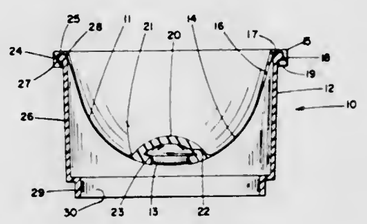
1. A form for walls and the like, formed by two parallel, facing molding surfaces delimiting the outer surfaces of the wall to be molded, wherein each of said two surfaces is formed by a plurality of panels arranged to define mutually facing columns and rows, the edges of each panel having support means for cooperation with the edges of adjacent panels and having rigid means extending substantially transverse to the molding surface thereof; the free end of said rigid means comprising spaced connection means each for cooperation with the adjacent connection means of rigid means of a vertically adjacent panel, said connection means being comprised by a stem, and a stem receiving opening, both the stem and the stem receiving opening being substantially spaced apart from the molding surface of the panel; the stem being adapted to be received in the stem receiving opening of a vertically adjacent panel to permit one panel to be pivoted with regard to the panel vertically adjacent and below thereto; mutual locking means on the vertical edges of adjacent panels, at least the end panels of each column of panels formed with opposed openings, means extending through said opposed openings mutually to connect facing panels, said panels and said last mentioned means having cooperating locking means, whereby the panels forming the facing molding surfaces constitute a self-supporting assembly.

4,076,207

FOOD MOLD

Forrest L. Austin, Brooklyn Center, Minn., assignor to The Cornelius Company, Minneapolis, Minn.

Filed May 19, 1975, Ser. No. 578,526
Int. Cl.² A23P *1/00*
U.S. Cl. 249—66 R **5 Claims**

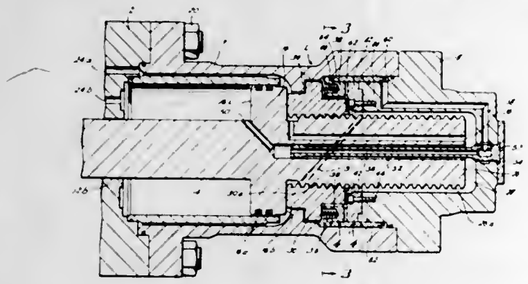


1. A mold liner for molding food to a predetermined shape comprising:

(a) a cup having a flexible bottom and side formed of elastomeric film, an open end, and a sanitary inner concave

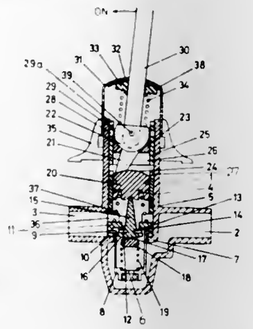
surface forming a predetermined normal cup shape for receiving food product therein;
(b) a rim attached to and circumferentially about the open end of the cup;
(c) securement means on the rim for securing the cup to a rigid holder;
(d) a resiliently and flexibly deformable weight retaining cage formed by an undercut cavity in the bottom and open to the bottom side of the liner, said cage receiving and retaining a weight in the bottom of the liner and being flexibly and resiliently deformable for insertion thereinto and removal therefrom of the weight;
the bottom of the cup and the cage both being resiliently movable toward the rim by resilient flexing of the cup side for discharge of a food product molded to the predetermined normal cup shape.

4,076,208
BLOWOUT PREVENTER RAM LOCK
Richard A. Olson, Houston, Tex., assignor to Hydril Company
Filed Oct. 4, 1976, Ser. No. 729,269
Int. Cl.² E21B *33/06*
U.S. Cl. 251—1 A **40 Claims**



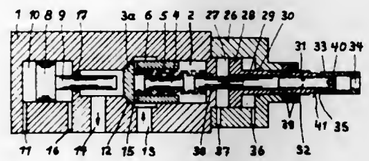
1. In a blowout preventer having at least one blowout preventer ram movable therein to adjustable closed positions for sealing contact with a well pipe or the like in a bore of the blowout preventer, a ram lock for locking the ram at the adjustable closed positions, comprising:
(a) ram carrier means comprising a ram piston having a piston rod with a threaded surface formed thereon for moving the ram to the adjustable closed positions in the blowout preventer;
(b) lock means for locking said ram carrier means at adjustable closed positions, comprising:
(1) a lock nut having a threaded surface formed thereon and engaged by said threaded surface on said ram piston rod for rotational movement with respect thereto during movement of the ram;
(2) a movable clutch plate mounted with said lock nut for rotational movement therewith, said movable clutch plate having ratchet teeth formed thereon;
(3) a fixed clutch plate having ratchet teeth formed thereon; and
(4) means mounting said fixed clutch plate with the blowout preventer against relative movement with respect thereto; and
(c) means for moving said ratchet teeth of said fixed clutch plate and said movable clutch plate into engagement to lock said ram carrier means against outward movement as the ram is moving inwardly.

4,076,209
IMPROVED TAP
Thomas A. Kilgariff, Gleanunga, Australia, assignor to Kilgariff Holdings Pty. Ltd., Australia
Filed Mar. 25, 1976, Ser. No. 670,565
Int. Cl.² F16K *31/524*
U.S. Cl. 251—251 **9 Claims**



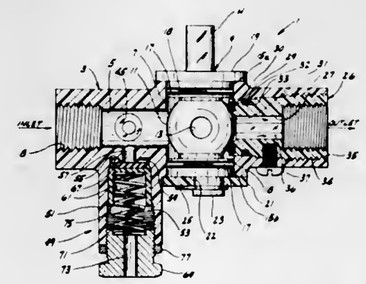
1. A fluid control valve comprising a cylindrical hollow body having an inlet, and an outlet, a cylinder screwed directly into the hollow body and having a bottom defining an aperture surrounded by a valve seat, a valve member closing the aperture by engagement on the seat, said valve member having a stem extending through the aperture, a piston slidable in said cylinder and engaging the stem, spring means acting between the cylinder bottom and the piston, further spring means acting to close the valve member, and cam means for actuating the piston to open the valve, whereby the closure of the valve is by said spring means assisted by fluid pressure and manual effort is applied only to open the valve, said inlet and outlet in the cylindrical body being disposed laterally, said cylindrical body including an upstanding portion extending upwardly beyond said inlet and outlet, said cylinder extending within said upstanding portion to the level of said inlet and outlet, said piston being confined within said cylinder, said cam means penetrating into said cylinder into engagement with said piston and a sleeve mounted on said hollow body above said cylinder for axial adjustable movement relative thereto, said cam being supported by said sleeve.

4,076,210
HYDRAULIC VALVE
Harry Spielvogel, Dusseldorf, Germany, assignor to Schloemann-Siemag Aktiengesellschaft, Germany
Filed Feb. 27, 1975, Ser. No. 553,735
Claims priority, application Germany, Mar. 2, 1974, 2410077
Int. Cl.² F16K *51/00*
U.S. Cl. 251—285 **2 Claims**



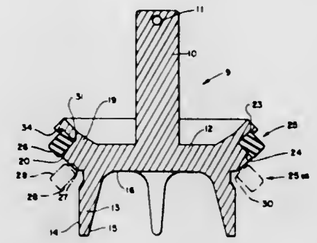
1. A hydraulic valve comprising: housing means;
a valve member axially movable within said housing means;
a cylinder formed in said housing means;
a first hydraulically actuated stepped piston slidable in said cylinder, said piston having a shank with a threaded bore, said shank further including an outer threaded portion which extends out of said cylinder;
lock nuts, engageable with said outer threaded portion of said shank, for adjusting the travel of said first piston in said cylinder;
a threaded piston rod, threadably received into said threaded bore of said first piston shank, forming a stop abutment for limiting axial movement of said valve member, said threaded rod axially adjustable in said first piston; and
means for positively biasing said valve member against said stop abutment when said valve member is open, said means for positively biasing said valve member comprising a hydraulic biasing piston for biasing the valve member towards the stop abutment, and spring means for biasing the valve member away from said stop abutment.

4,076,211
BALL VALVE
Joseph L. Krechel, Chesterfield, and Michael J. Purvis, Maplewood, both of Mo., assignors to Control Devices, Incorporated, St. Louis, Mo.
Filed Oct. 14, 1975, Ser. No. 621,956
Int. Cl.² F16K *5/06*
U.S. Cl. 251—286 **6 Claims**



1. A valve comprising a valve body having a main flow passage therethrough and a bore of generally circular cross-section in said valve body extending generally perpendicularly through said passage, one end of said passage constituting an inlet and the other end of said passage constituting an outlet, a unitary ball valve member received in said bore, said ball valve member being rotatable about the longitudinal axis of said bore between a closed position in which it blocks flow through said flow passage and an open position in which it permits flow through said flow passage, said ball valve member comprising a generally spherical ball portion having an aperture therethrough constituting a portion of said flow passage when said ball valve member is in its open position, and a pair of circular sealing heads, one on each side of said ball portion, each of said sealing heads carrying a seal which slidably, sealingly engages the walls of said bore so as to seal said ball valve member relative to said valve body and to permit rotational and axial movement of said ball valve member within said bore, said sealing heads being of substantially the same diameter so that pressure forces acting on said ball valve member which tend to move the latter axially within said bore are balanced, means external to said valve body at each end of said ball valve member for retaining said ball valve member in said bore and for permitting limited axial movement of said ball valve member in said bore by engagement with said valve body, and seal means insertable in said flow passage from one end thereof, said seal means comprising a body having a longitudinal bore therethrough constituting a portion of said flow passage, and an end seal carried on the inner end of said seal body engageable with said ball portion, said retaining means permitting limited axial movement of said ball valve member in said bore to a position in which said end seal is sealingly seated on said spherical ball portion for preventing leakage around said ball portion to said outlet when said ball valve member is in its closed position.

4,076,212
STRETCH SEAL VALVE
Arthur L. Leman, 10340 Wallisville Road, Houston, Tex. 77029
Filed Mar. 10, 1977, Ser. No. 776,120
Int. Cl.² F16K *1/38, 15/02*
U.S. Cl. 251—332 **8 Claims**



1. An improved valve for high speed pumps operating as fast as 200 revolutions per minute and more than three valve openings and closings per second, and subject to fluid pressure of as much as about 5,500 pounds per square inch, comprising
an annular metal valve seat ring having an upwardly inwardly facing conically tapered flat seat face;
a rigid, integral, annular, metal valve body mounted for reciprocation relative to and coaxially with said seat ring,
said valve body having a downwardly outwardly facing, conically tapered flat seating face,
said valve body seating face having the identical taper of and overlying the inner portion of said seat ring seat face;
said valve body recessed outwardly of its said seating face to present thereat an annular seal groove,
said seal groove having a rigid flat back wall of the same taper as said seat and seating faces, an at least partial outer side wall, and a flat inner side wall inclined substantially at right angles to said back wall;
an annular, rubberous, rectangular-section seal ring in said seal groove,
said seal ring dished to have front and back faces paralleling said seat and seating face taper, and parallel inside and outside faces inclined as said inner side wall of said groove,
said seal ring having when relaxed an inside diameter critically less than the inside diameter of said groove, and whereby said ring is calculatedly pre-stressed in circumferential tension when seated in said groove,
the depth of said seal ring exceeding the depth of said seal groove, and the front face of said seal ring overhanging said seating face of said valve body, such that compressing of said seal ring upon full closing of said valve cushions said valve closing and minimizes the wear on said tapered seat and seating faces,
said seal ring pre-stressing in tension being sufficient both
to stiffen said ring against flow under and "pinch-off" by said fluid pressure and
to so accelerate the rate of elastic recovery of said seal ring beyond its relaxed rate as to achieve full shape recovery from seating compression within the about ½ seconds, or even less, time intervals between successive closings of said valve,
said seat face of said valve seat ring extending upwardly beyond said valve body seal groove outer side wall whereby upon said valve closings said valve body seal ring fully engages said seat ring seat face and is uniformly compressed across its full width between said seat face and said rigid back wall of said valve body groove,
the confining of said seal ring by said valve body groove back and inner side walls allowing only upward-outward expansion of said seal ring upon said valve closing,
said groove outer side wall spaced apart from said groove inner side wall a distance sufficiently greater than the width of said ring to accommodate the upward-outward

seal ring flow towards said outer side wall resulting from compression of the seal, upon said full valve closing to engage said seat and seating faces, that is uniformly over the entire cross-section of the seal,

said outward seal flow being of the entire same seal amount as the overhang amount that is displaced upon the said full valve closing,

said valve body having sufficient material about said annular seal groove to retain full rigidity and not deflect under the pressure thereagainst of said compressing of said seal,

whereby the impact of said valve closing is absorbed and cushioned by said seal,

and whereby said seal shape recovery goes entirely to restoring said overhanging,

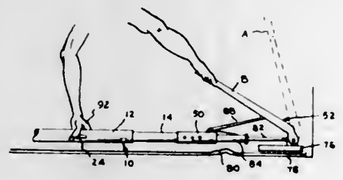
said undeflected seal cushioning and restoring substantially reducing wear of said tapered valve body and seat faces, and correspondingly slowing "pinch-off" of said seal.

4,076,213

LOCKING TUBE ASSEMBLY

Buford L. Payson, Sun City, Ariz., assignor to Robert A. Strauss, Long Beach, Calif., a part interest

Filed Mar. 4, 1977, Ser. No. 774,254
Int. Cl.[2] A47G *27/04*
U.S. Cl. 254—60 **7 Claims**



1. An extendible locking tube assembly for attachment to a carpet stretcher comprising:

an outer tube bearing first and second longitudinal slots on opposite sides, intermediate its length;

a locking collar member received within said outer tube having a central aperture on an axis obliquely inclined to the face of said collar member;

a locking member slidably received within said central aperture;

a radial lug projecting from said collar member and extending through said first slot;

abutment means carried on said outer tube forward of said first slot and bearing against the forward face of said radial lug to provide a fulcrum for said collar member;

lever means carried by said collar and projecting through said second slot;

retainer means fixedly carried within said outer tube;

resilient means captured between the rear face of said collar member and said retainer means;

an inner tube slidably received within said outer tube and removably attached to the rear end of said locking member; and

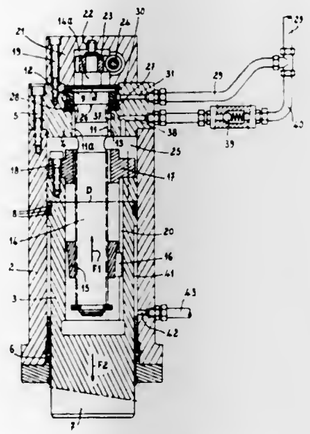
attachment means distally carried by said assembly for attachment in a carpet stretcher assembly with said first and second longitudinal slots in a horizontal plane whereby said abutment means and radial lug can be grasped to release said locking means and retract said assembly with a single-handed motion.

4,076,214

DOUBLE-ACTING JACK HAVING A POSITION STOP

Pierre Colly, 38, chemin du Grand Bois, Tassin la Demi Lune, Rhone, France

Filed Dec. 20, 1976, Ser. No. 752,549
Claims priority, application France, Dec. 24, 1975, 75 40385
Int. Cl.[2] F15B *9/09*
U.S. Cl. 254—93 R **3 Claims**



1. In a double-acting jack fitted with an adjustable positive mechanical stop, against which its piston comes to rest and having a working chamber, the positive mechanical stop being constituted by a nonrotatable nut, the nut being axially displaceable by an axially nondisplaceable lead screw with which it meshes, and the screw being capable of being set in rotation for the purpose of adjusting the position of the nut, the improvement wherein said positive mechanical stop which limits the stroke of said piston includes means for controlling the supply of pressurized fluid from a supply line to said working chamber of the jack by opening the supply line to said working chamber when the fluid is pressurized and said piston and said rod are not at a given end-of-stroke position and by closing the supply line to said chamber as soon as said piston and said rod reach the end-of-stroke position.

4,076,215

ELECTROHYDRAULIC DRAWING APPARATUS, PARTICULARLY A HOIST

Heinrich Landert; Wolfgang Radau, both of Bulach, and Ernst Kuhn, Embrach, all of Switzerland, assignors to Landert - Motoren A.G., Bulach, Switzerland

Filed Dec. 7, 1976, Ser. No. 748,387
Claims priority, application Switzerland, Dec. 15, 1975, 16225/75
Int. Cl.[2] B66F *3/24*
U.S. Cl. 254—93 R **10 Claims**

1. An electrohydraulic drawing apparatus, particularly a hoist for pulling or lifting and lowering loads comprising: a cylinder piston unit; a hydraulic fluid tank; a pump coupled to an electric motor and connected to said cylinder piston unit; control means for electrical and hydraulic control of the drawing apparatus; a load lifting member; control handle means connected to said control means, said control handle means having displacement directions coinciding substantially with motion of said load lifting member; said piston unit has a speed continuously variable in two directions as a function of the

displacement of said control handle means; and said hydraulic fluid tank, said electric motor, a pump, said control means and



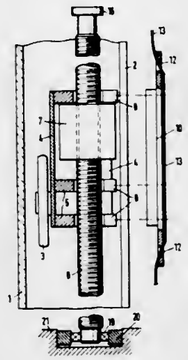
said load lifting member comprising one compact unit rigidly connected to one end of said cylinder piston unit.

4,076,216

HOIST MECHANISM

Hans Nussbaum, Korker Str. 6, 7641 Bodersweier, Germany

Filed Dec. 14, 1976, Ser. No. 750,418
Claims priority, application Germany, Dec. 16, 1975, 2556691
Int. Cl.[2] B66F *3/08*
U.S. Cl. 254—98 **22 Claims**



1. A hoist mechanism for lifting a load comprising:

an elongate hollow post having a longitudinally extending opening through the side thereof;

a threaded spindle rotatably mounted within said post and being generally aligned longitudinally with the opening of said post;

a traveling nut carried by said spindle for linear movement therealong in response to rotation of said spindle, the opening in said post having a width at least as great as the diameter of said traveling nut;

a movable carriage within said post engaged by said traveling nut to move therewith along a predetermined path defined by said spindle, said carriage having an opening generally aligned with the opening of said post and with said spindle, the opening of said carriage having a width of at least as great as the diameter of said traveling nut, whereby said spindle and said traveling nut may be removed laterally through said openings from an operative position within said post; and

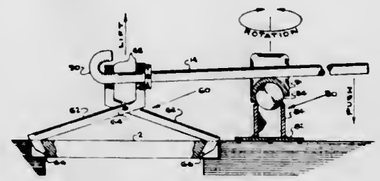
power means carried by said post for rotating said spindle.

4,076,217

APPARATUS FOR LIFTING A MANHOLE COVER

George S. Haller, 359 Colt Drive, and Theodore C. Uphoff, 1298 Richard Road, both of North Huntingdon, Pa. 15642

Division of Ser. No. 561,863, March 25, 1975, Pat. No. 3,957,247. This application May 14, 1976, Ser. No. 686,417
Int. Cl.[2] B66F *11/00*
U.S. Cl. 254—131 **9 Claims**



1. An apparatus for raising and lowering a manhole cover, said apparatus comprising:

a) a scissor type lifting means for engaging the edges of said manhole cover;

b) a lever which cooperates with said scissor type lifting means for raising and lowering said manhole cover in a vertical direction; and

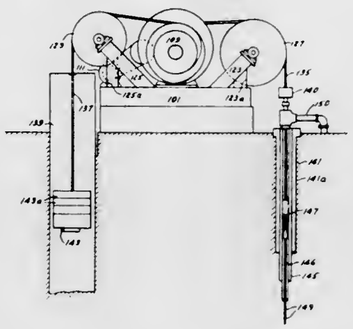
c) a combination fulcrum and pivoting means engageable with said lever to raise said manhole cover and to pivot said manhole cover, in a plane parallel to the surface of the ground, when said manhole cover is in a raised position.

4,076,218

LONGSTROKE PUMPING APPARATUS FOR OIL WELLS

Robert H. Gault, Midland, Tex., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Sep. 24, 1976, Ser. No. 726,389
Int. Cl.[2] B66C *23/72*
U.S. Cl. 254—178 **19 Claims**



1. Improved longstroke pumping apparatus for oil well pumping comprised of:

(i) a reversible prime mover means,

(ii) rotatable grooved capstan means arranged to be periodically driven by said prime mover means during a pumping cycle,

(iii) a flexible linear force transmitting means for operatively connecting said rotatable grooved capstan means to a pumping string and to a counterweight which at least partially counterbalances the weight of the pumping string,

(iv) said rotatable grooved capstan means having a first or well cable section from which the flexible force transmitting means connecting to the pumping string extends and a second or counterweight section from which the flexible

force transmitting means connecting to the counterweight extends,

the improvement wherein:

(a) the grooved capstan has a surface contour comprising

(1) a substantially constant diameter portion constituting a substantial portion of the first or well cable section;

(2) an initial substantially constant diameter grooved portion constituting a substantial portion of the second or counterweight section,

(3) a secondary grooved portion adjacent one end of the initial constant diameter portion of the counterweight section and having grooves interconnecting with grooves of the initial portion, in which secondary portion the diameter of the capstan decreases from the diameter of the initial constant diameter portion,

(4) a tertiary grooved portion adjacent the opposite end of the initial constant diameter portion and having grooves interconnecting with the grooves of the initial portion, in which tertiary portion the diameter of the capstan increases from the diameter of the initial portion,

(b) means to activate the prime mover means as the flexible force transmitting means connecting the capstan to the counterbalance passes from the secondary to the initial portion and from the tertiary to the initial portion of the second section of the capstan, and

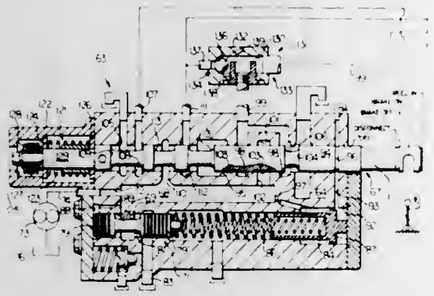
(c) means to deactivate the prime mover means as the flexible force transmitting means connecting the capstan to the counterbalance passes from the initial portion to the secondary portion and from the initial portion to the tertiary portion of the secondary section of the capstan.

4,076,219

FLUID PRESSURE-CONTROLLED WINCH MECHANISM

Bertwin E. Behrends, East Peoria; Richard F. Hoehn, Pekin, and James M. Poirot, Morton, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 13, 1976, Ser. No. 722,991
Int. Cl.² B66D 1/00
U.S. Cl. 254—187.4 **5 Claims**



1. A winch mechanism comprising:

a rotatable drum for receiving and releasing a cable,

drive means for supporting said drum and for selectively transmitting rotary drive thereto, said drive means having a normally disengaged input clutch which is engageable in response to fluid pressure and further having a normally engaged brake for stopping rotation of said drive mean and said drum and which releases in response to fluid pressure,

a source of pressurized fluid,

a first flow line for transmitting pressurized fluid to said input clutch and a second flow line for transmitting pressurized fluid to said brake,

a control valve connected between said source of pressurized fluid and said first and second flow lines and having first outlet means communicated with said first flow line and second spaced-apart outlet means separately communicated with said second flow line, and having a valve position selector element movable to a Brake-On position at which both of said outlet means are isolated from said source of pressurized fluid and communicated with fluid drain means, said selector element also being movable to a Reel-In position at which pressurized fluid from said source is transmitted to both of said first and second outlet means, and

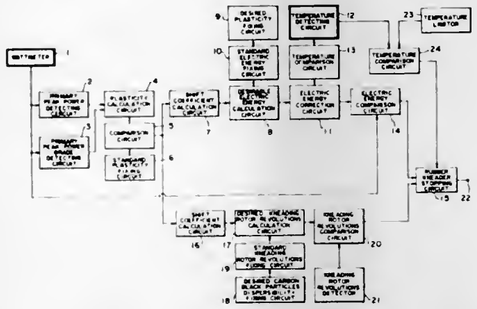
a unidirectional flow valve connected between said first and second flow lines and having means for enabling fluid flow therebetween from said first flow line to said second flow line but which blocks fluid flow from said second flow line to said first flow line, said unidirectional flow valve providing for a drain of fluid from said first flow line, as well as, said second flow line if the pressure in said first flow line exceeds that in said second flow line following movement of said position selector element away from said reel-in position.

4,076,220

METHOD OF MIXING AND KNEADING CONTROL OF A RUBBER KNEADER

Katsutoshi Nakashima; Toshio Kita; Ryuzo Osawa, all of Kodaira, and Takashi Hatanaka, Higashimurayama, all of Japan, assignors to Bridgestone Tire Company Limited, Kyobashi, Japan

Filed Feb. 10, 1976, Ser. No. 656,971
Int. Cl.² B29H 3/00
U.S. Cl. 366—69 **2 Claims**



1. A method of mixing and kneading control of a rubber kneader, comprising the steps of:

placing rubber raw material and additives into a receptacle for working by said rubber kneader through electric motor means;

detecting the plasticity of said rubber raw material as a peak electric power;

comparing said detected peak electric power by a comparison circuit with a predetermined standard peak electric power; seeking deviation between said two peak electric powers for calculation of a shift coefficient; and

controlling total electric energy in relation to said shift coefficient to be spent by said electric motor means of said rubber kneader and total revolutions of said shift coefficient of a mixing and kneading rotor of said rubber kneader corresponding to the detected plasticity of said rubber raw material.

4,076,221

USE OF AN ACID-RESISTING CEMENT FOR THE PROTECTION AGAINST CORROSION OF STEEL SURFACES EXPOSED TO HOT GASES

Rolf Gröger, Oberhausen, Germany, assignor to August Thyssen-Hutte AG, Duisburg-Hamborn, Germany

Filed Nov. 4, 1976, Ser. No. 738,987
Claims priority, application Germany, Nov. 5, 1975, 2549506
Int. Cl.² C21B 9/06
U.S. Cl. 266—44 **9 Claims**

1. In a process for preheating a reduction gas or air employed in producing or refining of iron or steel wherein said reduction gas or air is passed through a preheater and from said preheater through a pipe to a producing or refining furnace for producing or refining said iron or steel the improvement wherein said preheater and said pipe comprise steel shells lined with an acid resisting cement for protecting the steel from corrosion, said acid resisting cement having on its inner surface averted from said steel shell a refractory lining, said cement comprising:

a) quartz sand and refractory material in the form of hollow spheres, said spheres being 10 - 40 vol.% of the total volume of the quartz sand and spheres,

b) silicate binder for the cement

c) hardener.

4,076,222

RUNOUT COOLING METHOD AND APPARATUS FOR METAL ROLLING MILLS

Edward J. Schaming, P.O. Box 1070, Butler, Pa. 16001

Filed Jul. 19, 1976, Ser. No. 706,516
Int. Cl.² C21D 1/62
U.S. Cl. 266—111 **3 Claims**

1. An apparatus for cooling a moving metal strip in a rolling mill or the like comprising a cooling water manifold adapted to be mounted at an elevation above said strip for delivering falling water onto the strip, said manifold extending transversely of the strip, said manifold comprising a first approximately L-cross section longitudinal body portion and a mating generally U-cross section longitudinal body portion, said L-cross section body portion having a top wall, a top wall extension on said U-cross section body portion in superposed relationship to said top wall of the L-cross section body portion and fixedly secured thereto, said U-cross section body portion having an interior wall substantially perpendicular to said top walls and having an upper edge spaced substantially below said top walls, said interior wall being disposed near the lateral center of said manifold and being in spaced parallel relationship to the side walls of the L-cross section body portion and U-cross section body portion, there being a main diffuser chamber in said manifold defined by the side and bottom walls of said U-cross section body portion, a diffuser assembly removably mounted in said diffuser chamber and including a pair of vertically spaced parallel apertured diffuser plates, the uppermost diffuser plate disposed substantially flush with said upper edge of said interior wall, a fixed vertical gap plate secured to the interior face of the side wall of said L-cross section body portion and extending below the lower edge of such side wall and below the bottom wall of the U-cross section body portion, said fixed gap plate being substantially coextensive longitudinally with said L-cross section and U-cross section body portions, an adjustable L-cross section gap plate having a vertical wall in spaced parallel opposing relation to the fixed gap plate and defining therewith a variable width vertical water curtain discharge slot extending for substantially the entire length of said manifold and for the full width of said metal strip, the vertical wall of said adjustable gap plate disposed between the fixed gap plate and said interior wall, the adjustable L-cross section gap plate having a bottom wall underlying the bottom wall of the U-cross section body portion and being transversely slotted at longitudinally spaced intervals, the bottom wall of the U-cross section body portion being apertured at longitudinally spaced intervals in registry with the slots of said adjustable gap plate, clamping bolts engaging through said apertures and slots for securing the adjustable gap plate is selected laterally adjusted positions relative to the fixed gap plate, said manifold having cooling water inlet means.

4,076,223

ENCLOSURE FOR STEEL CONVERTING APPARATUS

Eberhard G. Schempp, Pittsburgh, Pa., assignor to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed Dec. 31, 1975, Ser. No. 645,536
Int. Cl.² C21B 7/22
U.S. Cl. 266—158 **9 Claims**

1. A converter vessel having a metal receiving opening formed adjacent an upper end and means for delivering an oxidizing gas to said vessel,

a primary enclosure having an upper wall portion disposed above said vessel and side wall portions extending downwardly along the sides of said vessel, a vent opening formed in the upper wall portion of said primary enclosure and generally above the metal receiving opening of said vessel,

a smoke hood having an inlet adjacent said vent opening and extending upwardly from said inlet,

a movable skirt disposed in surrounding relation to said hood inlet and movable into and out of close proximity with said metal receiving opening,

an auxiliary enclosure surrounding said vent opening and including a first portion having a first generally outwardly directed wall means having an inner edge disposed in closely surrounding relation to said hood and a second wall means extending generally vertically and spaced from said hood,

said auxiliary enclosure also including a second portion having a third wall means extending generally outwardly from said first portion and a fourth wall means extending generally vertically and spaced from said second wall means, the lower end of said fourth wall means engaging said primary enclosure in surrounding relation to said vent opening,

means extending through said auxiliary enclosure for mov-

ing said skirt vertically within said enclosure and relative to said metal receiving opening,

the second wall portion extending in general parallelism with that portion of said hood adjacent said inlet and being spaced therefrom to define an annular gap therebetween, said skirt being movable into and out of said gap upon vertical movement relative to said metal receiving opening,

said first auxiliary enclosure portion being attached to said hood, said second auxiliary enclosure portion being detached from said first portion and being disposed in closely surrounding relation thereto, engaging means associated with said skirt for engaging said second auxiliary enclosure portion when said skirt is elevated for elevating said second portion away from said primary enclosure,

translating means supporting said hood for movement laterally of said enclosure, supporting means on said translating means for releasably engaging said skirt when the latter is elevated for supporting said skirt and the second portion of said auxiliary enclosure,

said elevating means being releasably connected to said skirt and fixedly mounted relative to said translating means whereby said elevating means may be disconnected from said skirt and supported by said supporting means for lateral movement along with said translating means.

4,076,224

TUNDISHES

Jean Louis Duchateau, Jouy-en-Josas, France, assignor to Foseco Trading A.G., Chur, Switzerland

Filed Apr. 5, 1977, Ser. No. 784,793

Claims priority, application United Kingdom, Apr. 7, 1976, 14195/76

Int. Cl.² C21C 7/00

U.S. Cl. 266—275 **6 Claims**

1. In a tundish comprising an outer metal casing, a permanent refractory lining adjacent the casing, and an inner expendable lining made up of a set of slabs of heat insulating material, the impact area of the tundish being protected by a material selected from the class consisting of highly erosion resistant materials and sacrificial materials, the improvement which comprises providing a body of refractory highly heat-conductive material set in a recess in the permanent lining in the base of the tundish, and located below the material protecting the impact area to conduct heat away therefrom.

4,076,225

ADJUSTABLE ENERGY ABSORBING DEVICE PROVIDING LINEAR DECELERATION

Benjamin T. Houghton, Batavia, N.Y., assignor to Enidine Incorporated, Buffalo, N.Y.

Filed Nov. 15, 1976, Ser. No. 741,730

Int. Cl.² F16F 9/48

U.S. Cl. 267—34 **19 Claims**

1. An adjustable kinetic energy absorbing device comprising:

a) a housing;

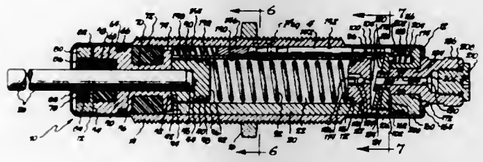
b) means in said housing including a hollow elongated element defining a chamber for containing hydraulic fluid;

c) piston means having a portion movable along within said hollow element and a portion for receiving external forces;

d) a plurality of orifice openings in said hollow element spaced therealong in the direction of movement of said piston means;

e) means defining an elongated path outwardly of said chamber and in fluid communication with said orifice openings, said path being relatively narrow in width and extending along said hollow element;

f) means defining a region in said housing in fluid communication with said path for receiving fluid flowing through said orifice openings and along said path; and



g) flow control means including an elongated element adjustably supported in said housing and movable lengthwise along said path in operative relationship with said orifice openings to adjust the effective size of said openings, said flow control element having surface formations spaced axially therealong and adapted to register with said orifice openings, each of said formations varying in size axially along said element, whereby movement of said flow control element along said path varies the degree of registry between corresponding formations and orifice openings to adjust the effective size of said openings.

4,076,226

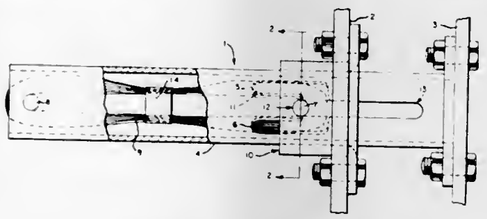
ENERGY ABSORBING MECHANISM

Colin Anolick, and Howard James Kutsch, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 2, 1976, Ser. No. 719,952

Int. Cl.² F16F 1/36, 3/08

U.S. Cl. 267—139 **8 Claims**



1. An energy absorbing mechanism comprising, in combination, a support member, an elongated member carried by said support member and having one end disposed to receive an impact wherein the opposite end is free for displacement under said impact, said elongated member being provided with two longitudinally spaced transverse pins and a pair of longitudinal slots within which the pin adjacent said outboard end of the elongated member is free to slide, said pin adjacent said outboard end of the elongated member being fixed to said support whereas said other transverse pin is fixed to the inboard end of said elongated member, an oriented elastomer operably connecting said pins so as to constitute an energy absorber upon displacement of said elongated member responsive to impact causing relative separation of said pins.

4,076,227

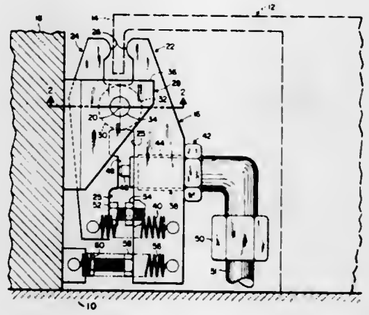
SELF-ALIGNING WORK HOLDING CLAMP

William W. Rameson, Santa Monica, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed May 10, 1976, Ser. No. 684,992

Int. Cl.² B25B 1/18

U.S. Cl. 269—25 **4 Claims**



1. A self-aligning work holding clamp for clamping to a work support a work part resting on the support and having a gripping element for clamping engagement by the clamp, comprising:

a mounting base to be fixed to said work support;

a pair of clamp members having opposed gripping jaws for straddling said gripping element of said work part;

means pivotally mounting said clamp members on a common pivot axis on said mounting base for initial rotation of either jaw into contact with said gripping element and following rotation of the other jaw into contact with said gripping element;

first means for yieldably biassing one clamp member to a normal position relative to said mounting base;

second means for yieldably biassing the other clamp member to a normal position relative to said one clamp member; and

actuating means carried by and acting between said clamp members for relatively rotating said clamp members to open and close said jaws.

4,076,228

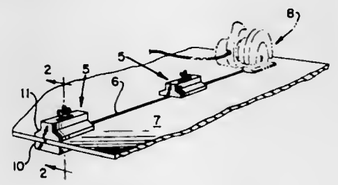
KERF CLAMP

Harold S. Sheldon, Spokane, Wash., assignor to Adjustable Clamp Company, Chicago, Ill.

Filed May 27, 1976, Ser. No. 690,649

Int. Cl.² B25B 5/14

U.S. Cl. 269—49 **1 Claim**



1. A kerf clamp comprising, in combination, a clamp base part having an upper horizontal planar work piece engaging surface, a vertical kerf blade permanently rigidly mounted on said clamp base part so as to project perpendicularly upwardly therefrom and through a kerf in a work piece, a screw mounted vertically on the upper distal end of said blade, a clamp tightening nut threaded onto said screw, and a clamp pressure part having a lower horizontal planar work piece engaging surface and having a vertical slot opening therein for recieving said kerf blade extending upwardly from said lower horizontal planar work piece engaging surface and an additional opening for receiving said screw extending downwardly from the top surface of said clamp pressure part, said kerf blade and said vertical slot providing means to align said clamp base and pressure parts with each other and with a kerf, and the mounted end of said screw being slotted and straddling the distal end of said blade and pivotably pinned thereto.

4,076,229

WORKBENCHES

Donald Price Hickman, Waltham Abbey, England, assignor to Inventec International Limited, Point Robert, Guernsey (Channel Is.)

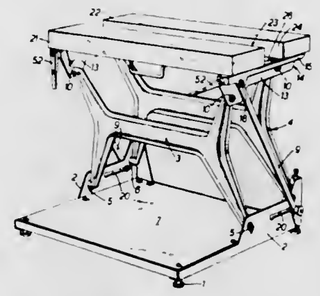
Continuation of Ser. No. 495,265, Aug. 7, 1974, abandoned, which is a division of Ser. No. 177,123, Sept. 1, 1971, Pat. No. 3,841,619, which is a division of Ser. No. 803,600, March 3, 1969, Pat. No. 3,615,087. This application Dec. 22, 1975, Ser. No. 642,743

Claims priority, application United Kingdom, Mar. 4, 1968, 10484/68

The portion of the term of this patent subsequent to Oct. 26, 1988, has been disclaimed.

Int. Cl.² B25B 1/10

U.S. Cl. 269—139 **68 Claims**



1. A workbench comprising:

a first vise member and a second vise member, both members having opposed vertical clamping faces and lying in side by side relationship to provide a clamping space which is open topped and open ended, each of said vise members having a flat upper surface, both of said surfaces lying in substantially the same plane;

clamping means for relatively moving the members translationally towards and away from one another and angularly in a horizontal plane;

said clamping means including two independently operable devices;

means for operatively coupling said devices and said first member and producing angular movement of said first member relative to said second member when one device is operated without operating the other device;

said coupling means for at least one of said devices including means movable along a horizontal arc with respect to said second member so as to move in a direction having a lateral component to accommodate said angular movement;

said first member being capable of being moved angularly in both directions from a position in which it lies parallel to said second member; and

guide and support means underlying said vise members for supporting said vise members and for maintaining the clamping face of the first member substantially vertical during both its translational and its angular movement, and when a workpiece is clamped between the clamping faces at any position therebetween, and for restricting said lateral component of movement of said coupling means

substantially to that which occurs when said one device only is operated to move said first member through its full range of angular movement;

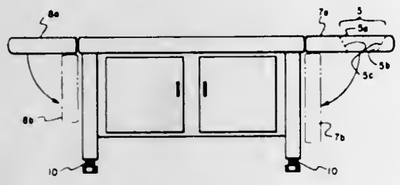
wherein said coupling means and said guide means enable positive control by said devices of the position of the clamping faces such that a workpiece can be gripped between lineally extending portions of the clamping faces which are outboard and above the line of reaction of the devices.

4,076,230

PORTABLE, READILY STORABLE PATIENT TREATMENT TABLE

Allan R. Pike, Portland, Oreg., assignor to Jerome S. Marger, Portland, Oreg., a part interest

Filed Jun. 12, 1975, Ser. No. 586,348
Int. Cl.² A47G 9/00
U.S. Cl. 269—328 **9 Claims**





1. A portable, readily storable patient treatment system which comprises:

(a) a base;

(b) a longitudinally-extending patient platform mounted on said base in a substantially horizontal plane above the surface on which it resides;

(c) a footrest section upon which the patient's feet rest included at one end of said longitudinally-extending patient platform;

(d) a headrest section included at the other end of said longitudinally-extending patient platform, having an aperture containing therein, which accepts and retains a patient head in proper position within said aperture in a steadfast manner thereby maintaining the position of the patient's body in proper alignment without the use of auxiliary retaining means, the preponderance of the patient's head resting within said headrest section; and

(e) a portable elevated head support, including insert means for mating engagement in said aperture, provided for maintaining the patient's head in an elevated position during said treatment process.

4,076,231

APPARATUS FOR TRIMMING SIGNATURES

Willi Albert Peter Kutzner, and Georg Schneider, both of Wurzburg, Germany, assignors to Koenig & Bauer Aktiengesellschaft, Wurzburg, Germany

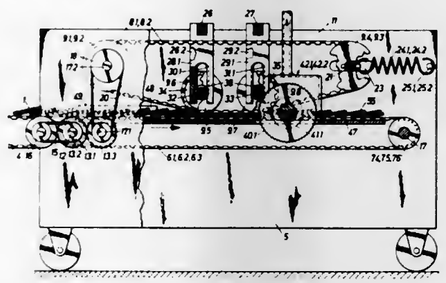
Filed Nov. 30, 1976, Ser. No. 746,049
Claims priority, application Germany, May 12, 1975, 2554662
Int. Cl.² B41F 13/56
U.S. Cl. 270—21 **9 Claims**

1. An apparatus for trimming at least a first edge from each one of a plurality of folded signatures while in an overlapped array, said folded signatures being produced in a web-fed rotary printing press, said apparatus comprising:

a generally planar-support table, said table including at least one bottom conveyor belt and at least one top conveyor belt, said bottom and top belts receiving said folded signatures therebetween in said overlapped array from the press and carrying said signatures along said table;

means for causing downward pressure on said at least one top conveyor belt to press said overlapped array of signatures against said bottom conveyor belt; and

at least a first rotating trimming tool carried on said table, said trimming tool contacting said first edge portion of each said signature to trim each said signature as said signatures are moved past said trimming tool in said overlapped array.



9. A method of trimming at least one edge portion of each one of an overlapped array of folded signatures produced in a web-fed rotary printing press, said method comprising:

receiving said overlapped array of folded signatures from said printing press on conveying means;

holding said overlapped array of folded signatures on said conveying means from above and below;

conveying said overlapped array of folded signatures past at least one rotating trimming wheel; and

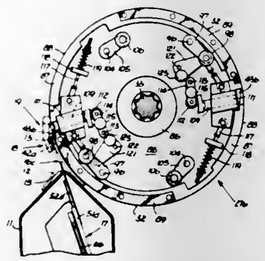
trimming said at least one edge portion of each of said folded signatures while said signatures are in said overlapped array, whereby each said signature is trimmed while in said overlapped array.

4,076,232

APPARATUS FOR LIFTING AND CONVEYING A SIGNATURE FED ON A WEDGE-SHAPED SADDLE

Hermann Kistner, Tamm, and Gunthart Lehmann, Heubach, Lautern, both of Germany, assignors to Maschinenbau Oppenweiler GmbH, Oppenweiler, Germany

Filed Mar. 31, 1976, Ser. No. 672,434
Claims priority, application Germany, Apr. 4, 1975, 2514838
Int. Cl.² B65H 39/02
U.S. Cl. 270—54 **21 Claims**



1. In an apparatus for lifting and advancing a signature consisting of sheets which are folded together about a common fold line defining a signature back having an outer and an inner

side and delimiting a back margin of the signature, the combination of:

a frame,

a wedge-shaped saddle having a vertex for supporting the inner side of the signature,

lifting means for lifting the signature from said saddle,

said lifting means being mounted for reciprocating up-and-down movement,

at least one conveyor having an inlet and an outlet for conveying the signature in a direction from said inlet along a path to said outlet,

a transfer station in a fixed position relative to said frame, in which transfer station the signature lifted by said lifting means is transferred to said inlet of said conveyor,

said conveyor comprising first and second conveyor elements having first and second endless conveyor surfaces respectively, and being supported on said frame for revolution of said first and second conveyor surfaces in opposite directions of revolution so that parts of said first and second conveyor surfaces move in said conveying direction and define a clamping gap between said parts of said surfaces for clamping the signature, said gap forming a mouth arranged at a distance downstream of said inlet for receiving the signature and extending along said conveyor path for conveying the signature to said outlet,

said conveyor further comprising at least one pressing means for pressing the signature lifted by said lifting means to said first conveyor surface at said transfer station and for moving it thereby into said mouth of said clamping gap, said pressing means being mounted for reciprocating movement from a release position for receiving the signature from said lifting means to a clamping position for pressing the signature to said first conveyor surface for a clamping period and for moving together with said first conveyor surface at least for said clamping period,

first drive means for driving at least one of said conveyor elements,

second drive means for said reciprocating up-and-down movement of said lifting means,

third drive means for said reciprocating movement of said pressing means from said release position to said clamping position and back,

said first, second and third drive means being operatively connected to each other so that said lifting means reaches said transfer station at a moment and at a speed, when said pressing means is in said release position and starts its movement to said clamping position, and said speed of said lifting means substantially equalling the speed of said first conveyor surface.

4,076,233

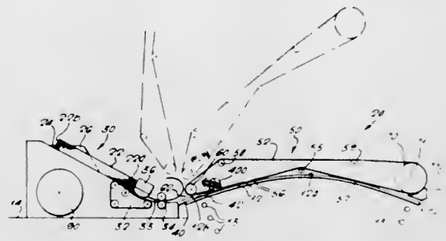
DOCUMENT HANDLING APPARATUS

Clifford Knight, Mitcheldean, and Peter M. Thorp, Lydbrook, both of England, assignors to Xerox Corporation, Stamford, Conn.

Filed May 17, 1976, Ser. No. 687,062
Claims priority, application United Kingdom, Oct. 24, 1975, 43930/75
Int. Cl.² B65H 9/04, 5/02
U.S. Cl. 271—233 **3 Claims**

1. A document handling apparatus for a copying machine, comprising a document transport means including a single, narrow width, endless document-moving belt extending between first and second roller means and movable over a relatively wide surface of a document processing station, said roller means being located on opposite sides of said surface to centrally locate said belt over said surface, whereby in operation said belt engages a generally central portion of a document to move said document over said surface, and

support means for supporting said belt at an intermediate point between said first and second roller means, said intermediate point being generally halfway between said first and second rollers so that said belt contacts said surface in



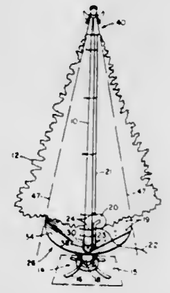
two separated areas on opposite sides of said intermediate point.

4,076,234

ARTIFICIAL SNOW CIRCULATING APPARATUS

Jack Burnbaum, Newton, Mass., assignor to Bradford Novelty Co., Inc., Boston, Mass.

Filed Jun. 28, 1976, Ser. No. 700,612
Int. Cl.² A63J 5/02
U.S. Cl. 272—15 **12 Claims**



1. In apparatus for use with a tree for continuously cascading artificial snow particles through the branches thereof, said apparatus including a particle collecting receptacle having an interior surface which, when said receptacle is installed at the base of the tree, is inclined to guide particles into a bottom sump portion of said receptacle, a blower having an inlet conduit for taking up particles contained in said sump portion and an outlet conduit for delivering said particles to a point adjacent the top of the tree, and deflecting means which, when installed atop the tree, directs particles received from said outlet conduit downwardly through the branches of the tree and into said receptacle, the improvement wherein

said receptacle comprises a conical member,

said conical member forms said interior surface with sufficient smoothness and sufficient downward incline from the periphery thereof to the cone axis so that gravitational force alone moves the particles along said interior surface to said sump portion,

the center of said conical member has an aperture for receiving the trunk of the tree, whereby said receptacle can be installed about the lower portion of the trunk of a tree mounted on a stand located below said receptacle, and

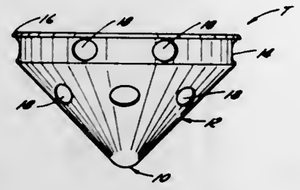
said conical member includes means for sealingly engaging said interior surface with the tree trunk passing through said aperture for containing particles within the sump portion, said sealing means comprising an upwardly directed extension of said interior surface of being adjustable for installing said conical member in sealing engagement with variously sized tree trunks.

4,076,235

ENTERTAINMENT AND EXERCISE DEVICE

Carl Risberg, Jr., 160 Hampshire, Beaconsfield, Quebec, Canada

Filed Jul. 30, 1975, Ser. No. 600,452
Int. Cl.[2] A63G *1/12*
U.S. Cl. 272—33 A **3 Claims**



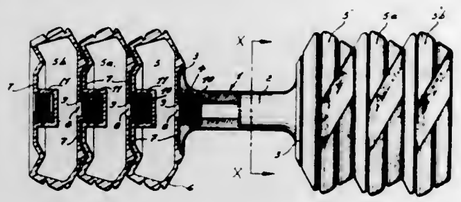
1. A toy device for children adapted for a rotational and rocking movement on a supporting surface, said toy device consisting of a one-piece integral member of a plastics material having a lower portion and an upper portion, said lower portion forming a base seating area adapted to receive a child in a seating position, said lower portion being of a frusto-conical configuration having inwardly and downwardly tapering side walls meeting at a rounded apex, said rounded apex forming a pivot point about which said device rotates, said side walls tapering inwardly at a constant agle such that the exterior surface of said side walls of waid lower frusto-conical portion contacts a planar supporting surface along substantially their entire length whereby said device may be rolled and rotated about said pivot point on the exterior surface of said side walls, said side walls having an interior surface with a plurality of concentric ribs formed thereon, said upper portion having a generally cylindrical configuration, the upper portion extending upwardly from said lower portion a distance sufficient to protect the hand of a child from contact with the supporting surface when said device is rolled and rotated with said walls of said lower frusto-conical portion in contact therewith, an upper portion of said lower frusto-conical portion and said cylindrical upper portion having a plurality of apertures formed therein to provide means for entry of air when said device is overturned.

4,076,236

BAR-BELL TYPE EXERCISING DEVICE

Stefan Ionel, 14, rue Michel Servet, 1206 - Geneva, Switzerland

Filed Jan. 21, 1976, Ser. No. 650,984
Claims priority, application Switzerland, Jan. 21, 1975, 693/75
Int. Cl.[2] A63B *11/00*
U.S. Cl. 272—123 **6 Claims**



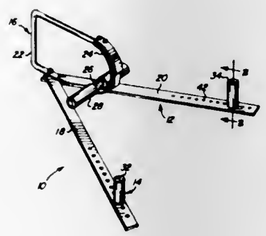
1. A hantel comprising a handle and at least two hollow bodies removably connected to each end of the handle, and a male coupling member interengaged in a female coupling member between the handle and each said hollow body connected to the handle, said coupling members being on said handle and said hollow bodies, each said hollow body connected to the handle having a coupling member thereon corresponding to the coupling member carried by the handle but on the side of the hollow body opposite the handle, thereby to permit the connection together of two said hollow bodies at the same end of the handle, each said hollow body having a filling opening closed by a plug, the plug closing one said coupling member of the hollow body.

4,076,237

SPRING TYPE BACK TRACTION EXERCISER

Melvin A. Dussia, 7511 N. 47th Ave., Glendale, Ariz. 85301

Filed Mar. 21, 1977, Ser. No. 779,502
Int. Cl.[2] A63B *21/04*
U.S. Cl. 272—136 **11 Claims**



1. A back traction exercising apparatus comprising in combination:

(a) a frame positionable on a flat surface and having first and second end sections;

(b) body retention means coupled to the first end section of said frame for maintaining the upper torso of the individual's body in a fixed horizontal position with respect to a flat surface as the individual exercises; and

(c) spring means coupled to the second end section of said frame and mounted on only one upwardly extending frame member, and said spring means being of only one single leaf spring extending downwardly so that the terminal end thereof contacts the body of the individual utilizing said apparatus in the area where his legs join his lower torso for opposing upward movement of his pelvic region as his knees are moved upward toward his chest thus causing a substantially constant horizontal traction force to the lower spine as the individual performs exercises on said apparatus;

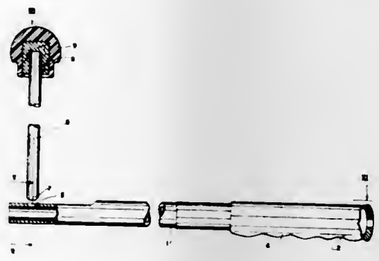
whereby the traction force is applied to the lower vertebrae of the individual's spine by the opposing forces exerted on his torso by said body retention means and said spring means.

4,076,238

AMUSEMENT DEVICE

Robert M. Dively, Port Matilda, Pa., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed May 27, 1977, Ser. No. 801,227
Int. Cl.[2] A63F *9/00*
U.S. Cl. 273—1 R **1 Claim**



1. An amusement device, comprising

a handle member having a hollow elongated shaft having spaced opposite first and second ends, a handle component coaxially affixed to the shaft around the first end thereof, said shaft having a tapered bore formed therein in the area of the second end thereof and extending substantially radially; and

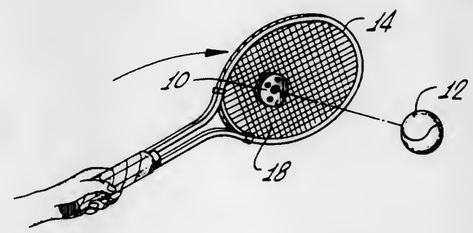
a balance member having an elongated rod having spaced opposite first and second ends, the first end of the rod being tapered to seat in the bore formed in the handle member, and said balance member having a balance device affixed to the second end of the rod, said rod fitting in said shaft, when not in use, with the balance device protruding therefrom and whereby a user attempts to balance the balance member in upright position on the handle member by placing the first end of said rod in the bore of said handle member, holding said handle member substantially horizontal and positioning said balance member substantially upright.

4,076,239

TENNIS TEACHING AID

Charles O. Hall, San Bernardino, Calif., assignor to Sherman R. Plummer, Burbank and Randall Porter, Homewood, both of, Calif., part interest to each

Filed Jul. 29, 1976, Ser. No. 709,798
Int. Cl.[2] A63B *69/38*
U.S. Cl. 273—29 A **7 Claims**



1. A device for providing an audible indication when a tennis ball is struck with a desired area of a tennis racket, said device comprising:

two thin flat plates, each having a smaller planar area than that of the head of a conventional tennis recquet and being of stiff but resilient material disposable one on each side of the strings of the head of a tennis racket at the desired area;

at least one area of padding material having a smaller planar area than each of said plates and affixed to the side of each of said plates between each of said plates and the strings; of the head of the tennis recquet and

a plurality of compressing fasteners attached to said plates and disposable through graps between the strings, for attaching said plates together onto the strings;

whereby said padding material causes said device when disposed on a racket and struck by a tennis ball to emit a first distinctive sound when struck at its center and a second distinctive sound when struck at an off-center location, but has little or no significant effect on the ball rebound characteristics of the racket.

4,076,240

HOCKEY STICK

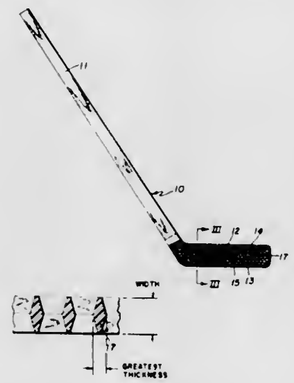
Daniel G. Haddad, 25 Columbus St., Worcester, Mass. 01603

Filed Jan. 26, 1976, Ser. No. 652,425
The portion of the term of this patent subsequent to Jan. 27, 1993, has been disclaimed.
Int. Cl.[2] A63B *59/14*
U.S. Cl. 273—67 A **8 Claims**

1. A hockey stick, comprising:

a. an elongated handle having an end, and

b. a blade having a contact surface, the blade being rigidly mounted on the end of the handle and consisting of a rigid, one-piece, homogenous frame having a head portion consisting of an entirely open-celled network of a plurality of interconnected plates traversing the entire area thereof and forming a honeycomb-like matrix; each of said plates having walls which are perpendicular to the plane of said head portion and constituting the width dimension thereof; each of said plates having planar upper and lower surfaces parallel to the central plane of said head portion, said planar surfaces being exposed at least at said head portion and constituting two contact surfaces of said head portion, the planar surfaces of each of said plates constituting the length dimension thereof; said width dimension being approximately equal to said length dimension; each plate further having a non-uniform thickness with one location of greatest thickness wherein said greatest thickness is less than each of said width and length dimensions and being oriented parallel to said contact surfaces of said head portion.

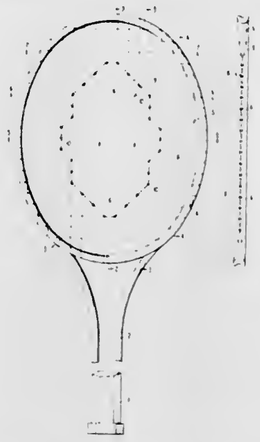


4,076,241

SPORTS RACKET

Ernest L. Newsome, 6 Densmore Ave., Auburn, N.Y. 13021

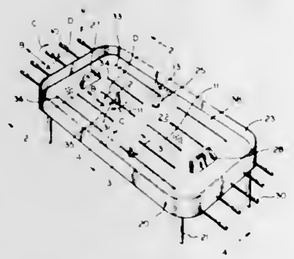
Filed Jul. 12, 1976, Ser. No. 704,386
Int. Cl.[2] A63B *51/06*
U.S. Cl. 273—73 D **5 Claims**



1. A sports racket comprising a head having a frame, a plurality of transversely and longitudinally extending string elements mounted within and connected to said frame to form a ball-engaging surface on each face of the racket, said string elements being interconnected in such a manner to form a substantially flat surface in the sweet spot area on each face of the racket disposed radially inwardly a substantial distance

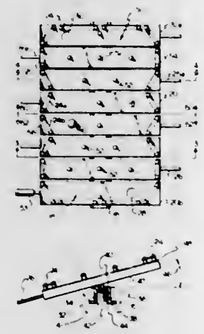
from the periphery of the frame, and a sloped surface on each face of the racket extending radially outwardly from the perimeter of the sweet spot area to said frame, thereby forming substantially concave ball-engaging surfaces on each face of the racket head, whereby various undesirable actions and reactions occasioned by a ball striking the face of the racket anywhere but on the sweet spot are compensated.

4,076,242
GAME DEVICE WITH A PLAYING SURFACE OF PRESSURIZED AIR
Mark Joseph, 2400 N. Lakeview, Chicago, Ill. 60614
Filed Jan. 12, 1976, Ser. No. 648,092
Int. Cl.² A63F 9/14
U.S. Cl. 273—85 B **12 Claims**



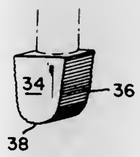
1. A game device having a horizontal playing surface, a playing piece for sliding over said surface, playing piece controller means for imparting energy and for directing the playing piece to cause it to slide, means comprising a source of air pressure for forming a boundary layer of pressurized air above at least part of said playing surface, said playing piece sliding over said boundary layer, said air pressure means comprising a completely enclosed air chamber having a perforated upper side adjacent said playing surface for discharging said boundary layer of air over said playing surface, said air chamber having walls formed therein to provide access means for enabling said playing piece controller means to be operated from points below said chamber for directing said playing piece without loss of air pressure within said chamber.

4,076,243
TABLE GAME
David R. Davis, 214 Birch, Tooele, Utah 84074
Filed Jul. 26, 1976, Ser. No. 708,916
Int. Cl.² A63F 7/06
U.S. Cl. 273—85 E **21 Claims**



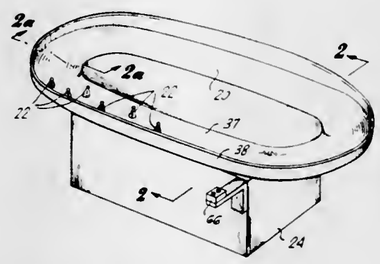
16. A table game comprised of a movable scoring object and a game table, said game table comprising:
support means to support said game table;
an elongated fulcrum member mounted to said support means, said fulcrum member having a substantially flat top surface extending along its length which has substantially parallel outside edges;
a table top comprised of a plurality of side-by-side lever members transversely mounted to said fulcrum member each pivotable thereabout in a plane substantially normal thereto in clockwise and counterclockwise directions through a preselected arc;
mounting means to pivotably mount each said lever member to said fulcrum member, said mounting means including resilient means to cause said lever members to return to the plane of said table top after movement therefrom and a pin member centrally secured to each of said lever members which extends through a corresponding aperture formed in said flat top surface, said resilient means being comprised of a spring positioned about said pin member between said flat surface and the distal end of said pin member to compress upon pivoting said lever member about the outside edges of said flat surface of said fulcrum member and to force the lever member back to the plane of said table top after movement therefrom;
a plurality of first bumper means each secured to a lever member along the outside edges of said table top to form a game playing area on said table top and to contain said movable scoring object on said table top;
a handle secured to each of said lever members to extend away from an outside edge of said table top for use by game players;
first and second goal means positioned with respect to said table top proximate opposite outside edges thereof and sized to receive said movable scoring object;
a plurality of second bumper means each secured to selected lever members in accordance with a preselected pattern with respect to said table top and within said game playing area to interact with said movable scoring object.

4,076,244
PLAYING PIECE FOR TABLE SOCCER
Eugene Lee Peppard, 3537-46th Northeast, Seattle, Wash. 98105
Filed Sep. 20, 1976, Ser. No. 724,474
Int. Cl.² A63F 7/10
U.S. Cl. 273—85 D **4 Claims**



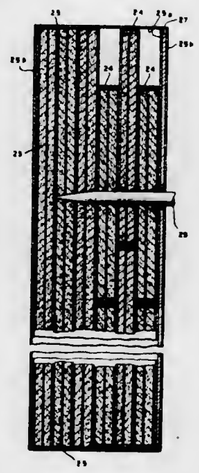
1. A playing piece for use in a table game such as table soccer wherein a ball is propelled and controlled by the playing piece comprising:
an elongated body element, an upper portion designed to be secured to a horizontal rod for movement about a horizontal axis with said rod, a lower ball contacting foot portion including front and back portions which are substantially planar and converge toward the bottom whereat they are tangential with and joined by a smooth continuous uniform curve, whereby the player is assured of good control and a maximized strike surface and strike zone while retaining a definite and significant pin zone.

4,076,245
RACING GAME AND GAME PIECE
Benjamin F. Monroe, 1065 E. Flamingo Road, Apartment 506, Las Vegas, Nev. 89109
Filed Aug. 5, 1976, Ser. No. 712,014
Int. Cl.² A63F 9/14
U.S. Cl. 273—86 C **8 Claims**



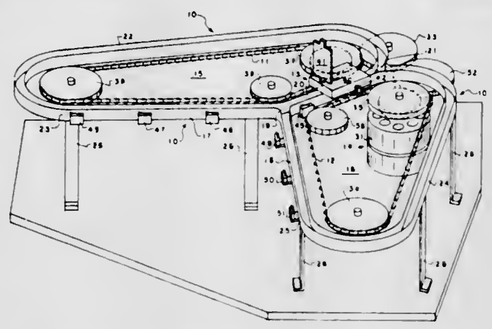
1. A racing game comprising:
a platform having an endless track formed thereon;
a supporting frame;
mounting means for mounting said platform on said frame to permit said platform to be tilted in any direction with respect to said frame;
tilting means operative to support said platform at two support points, and including a pair of weight-supporting arms and means for raising and lowering said arms cyclicly, to tilt said platform in such a manner that the lowest point of said track progresses around the track; and
a plurality of game pieces movable by gravitational forces along said track;
whereby said game pieces are moved by gravitational forces around said track in a random manner with respect to said track and with respect to each other.

4,076,246
TARGET PARTICULARLY FOR ARCHERY
Leonard S. Meyer, 6449 Bridgewood Road, Columbia, S.C. 29206
Continuation-in-part of Ser. No. 533,942, Dec. 18, 1974, abandoned. This application Nov. 14, 1975, Ser. No. 631,893
Int. Cl.² F41J 3/00
U.S. Cl. 273—102 B **26 Claims**



1. An archery target comprising an assembly of a multiplicity of superimposed parallel membranes of sheet resin material, and a multiplicity of parallel layers of resilient and porous material interposed between and each serving to interspace at least a plurality of the membranes, the membranes and layers being secured together in assembled relation with a multiplicity of the membranes and a multiplicity of the interposed layers of porous material overlying each other in parallel relation in all areas of the assembly and the assembly having a front or target face and a back face, the membranes being penetrable by an arrow cast at the target face and being resilient and tear resistant, and the layers of resilient and porous material being penetrable by an arrow cast at the target and providing freedom for formation of sleeve shaped portions of the membranes engaging the arrow around the penetration apertures to provide for imposition of frictional drag in a plurality of zones along the shaft of an arrow penetrating the target and also for partial recovery after withdrawal of the arrow, the front or target face of said assembly being exposed for penetration by arrows cast at the target and the back face of the assembly being substantially unobstructed thereby providing for partial penetration of arrows through and beyond even the rearmost membrane of the assembly.

4,076,247
MOVING TARGET ASSEMBLY AND CONTROL
Raymond W. H. Kim, Skokie, and Erwin E. Figge, Des Plaines, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.
Filed May 7, 1976, Ser. No. 684,044
Int. Cl.² F41J 9/00
U.S. Cl. 273—105.6 **17 Claims**



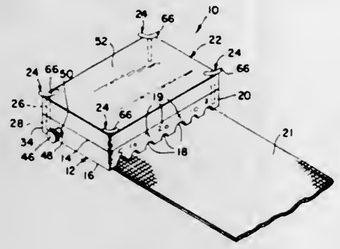
1. A moving target assembly for use in a target practice range comprising:
a target travel quite having first and second straight sections, said first and second straight sections being joined and being substantially at right angles to one another and each including a free end, and a third section connected to the common junction of said first and second sections, said common junction constituting a home position;
target means including a carriage base adapted for traveling within said travel guide, a target member on said carriage base, and target member drive means within said carriage base for selectively raising and lowering said target member;
first and second chain engaging means mounted on said target means and being selectively operable;
chain drive means running substantially parallel to said first, second, and third sections, and being arranged for cooperative engagement with said first and second chain engaging means for driving said target means from said home position along said first straight section when said first chain engaging means is selectively operated, and for driving said target means from said home position along said second straight section when said second chain engaging means is selectively operated; and
a plurality of trip switches spaced along said first and second straight sections, each said switch being capable of actuation by said target means and selectively operable, each said trip switch also being coupled to said target drive means for causing said target member to be lowered re-

sponsive to the actuation of a selectively operated one of said trip switches by said target means.

4,076,248
MARBLE GAME WITH RETRACTABLE PLAYING SURFACE

Guy Goulet, and John Goulet, both of 400 Kings Point Drive, N. Miami Beach, Fla. 33160

Filed May 7, 1976, Ser. No. 684,284
Int. Cl.[2] A63F *3/00, 7/00*
U.S. Cl. 273—123 R **3 Claims**



1. A game apparatus for use with marbles or the like comprising a lower housing having a lowermost surface utilized to support said lower housing on a horizontal supporting surface, said lower housing having a plurality of discrete collecting chambers therein, said lower housing having a plurality of apertures disposed in a first lateral wall thereof, each of said apertures adapted to permit the passage of spherical shaped elements into a corresponding one of said collecting chambers, said lower housing having a discrete elongated roller and sheet housing chamber therein, said discrete elongated roller and sheet chamber being adjacent a second lateral wall spaced from said first lateral wall, said lowermost surface having an elongated opening therein extending into said discrete elongated roller and sheet housing chamber an elongated roller element disposed within said elongated roller and sheet housing chamber, a substantially rectangular flexible sheet element affixed on a free edge thereof to said roller element, said sheet element adapted to pass downwardly through said elongated opening and thence extending outwardly horizontally toward said apertures and thereinfront said sheet element thereby serving as a playing surface, rotatable securing means for rotatably securing said roller element within said elongated roller and sheet housing chamber, rotating means for rotating said elongated roller element and for wrapping said sheet therearound into a storage position within said roller and sheet housing, a portion of said rotating means accessable outside said lower housing, further comprising an additional upper hollow housing having a base portion and a plurality of longitudinal perpendicular side walls affixed to the edges of said base portion forming a chamber having an open side, said chamber divided into a plurality of sub-chambers, the free edges of said side walls adjacent said open side dimensioned to contact the uppermost surface of said lower housing when placed thereagainst, first affixing means for securing said upper housing to said lower housing thereby securing the contents of said sub-chambers therein.

4,076,249
DEVELOPMENT BOARD GAME APPARATUS

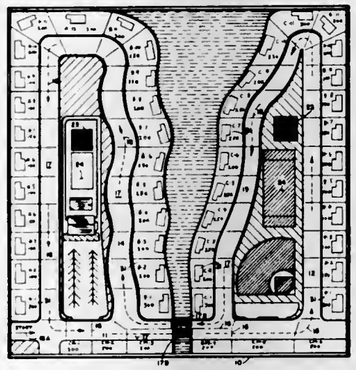
James W. Sneathen, Jr., Berlin, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Apr. 15, 1976, Ser. No. 677,306
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—256 **1 Claim**

1. A game apparatus for use in a game that is played on a marked board to simulate the development of a real estate subdivision, and the various stages of construction of individual buildings on lots in a said real estate subdivision, comprising

a game board, said game board marked in the form of a route laid along connecting streets, with the route marked with dividing lines to form individual blocks, with each said block bounded on one side by a marked lot indentified by an index insignia and by a purchase price, with at least two blocks, each marked with contrasting indicia that distinguish them from each other and from the remainder of the said blocks, said route marked along its length with arrows indicating the direction of travel of individual markers on the blocks of said route, together with

a plurality of individual first markers for use in locating the position of individual players in individual blocks of said route,



a plurality of individual second markers for use by the players in placing on individual lots, said second markers distinguishable in appearance from said first markers,

play money for purchasing individual contracting services required in the construction of a building on a said lot,

play cards marked to represent individual constracting services required in the construction of a building on a said lot,

a set of reward cards and a set of penalty cards to be used by players whose markers have landed on any block marked with one of said contrasting indicia, and

random number generating means for use by the players in moving their markers on the said route of blocks.

4,076,250
BOARD GAME APPARATUS

Emilio Azcarate, Oviedo 18-16, Torrimar, Guaynabo, P.R. 00657

Filed Nov. 22, 1976, Ser. No. 743,849
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—251 **4 Claims**

1. A convict retrieval game board for a plurality of players each provided with a unique playing piece and comprising a flat stationary board having defined on a surface thereof a plurality of successively outlined areas defining a plurality of paths for the playing pieces which are individually moved a number of areas along the path in accordance with a throw of the dice,

a second plurality of discrete outlined areas representing houses, each having only one simulated entranceway from one of said paths for entry by the unique playing pieces,

a starting point for the playing pieces at one end of the path and a finish point at the opposite end of the path,

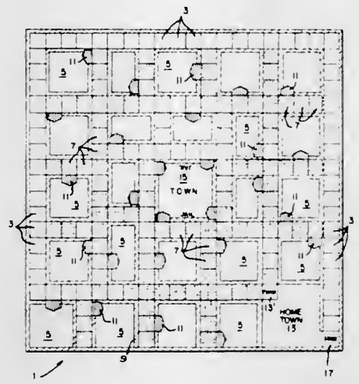
an additional outlined discrete area adjacent the finish point being designated as home town,

a disc located in each house area, said disc being blank on at least the one side that is visible,

a first plurality of said discs each having a symbol on the opposite side depicting an outlaw,

a second plurality of said discs each having a symbol on the opposite side depicting a gun,

one of the discs bearing a unique symbol on its opposite side different from the other symbols depicting the main object which is being sought by the players,

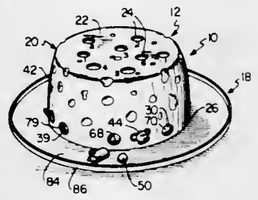


a further discrete outlined area on said board designated as a jail and having a plurality of simulated entranceways, one from each path of a plurality of paths for entry therein of a player's piece if accompanied by a disc having an outlaw symbol retrieved by a player whose piece had previously entered a house area containing said disc.

4,076,251
AMUSEMENT DEVICE INCORPORATING SIMULATED CHEESE AND MICE

James R. Hornsby, Jr., 6239 Edgewater Drive, Orlando, Fla. 32810

Filed Jan. 26, 1977, Ser. No. 762,640
Int. Cl.[2] A63F *7/10*
U.S. Cl. 273—138 R **10 Claims**



1. An amusement device incorporating simulated cheese and mice comprising:

a base plate;

a simulated cheese in the form of a substantially cylindrical body having a closed top portion with a plurality of randomly spaced inlet orifices therein and an open bottom portion, said bottom portion resting on said base plate,

said cylindrical body having a plurality of exit orifices on the cylindrical wall thereof spaced above said bottom portion;

at least one simulated mouse of a size and shape to fit releasably into an exit orifice and to be discharged therefrom upon impact by a spherical body, the number of said mice being less than the number of said exit orifices;

an inverted conical member, having a central hole therein, disposed in said cylindrical body for the reception of a spherical body deposited in any of said inlet orifices and for directing said body through said central hole; and

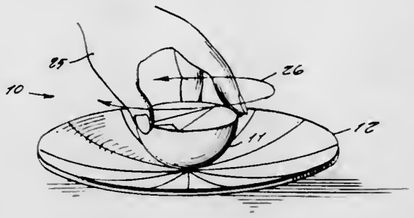
means for randomly distributing a spherical body from said central hole toward a randomly selected exit orifice,

whereby the spherical body passes through the randomly selected exit orifice unimpeded if there is no mouse present therein and forces the mouse out the randomly selected exit orifice if a mouse is present therein.

4,076,252
FLIP TOP AND PLATFORM

Harold J. Bernier, 906 W. Travis, and Norman F. Daniels, 910 W. Travis, both of Harlingen, Tex. 78550

Filed Sep. 13, 1976, Ser. No. 722,794
Int. Cl.[2] A63F *5/04;* **A63H** *1/00*
U.S. Cl. 273—141 R **2 Claims**

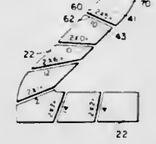


1. In a flip top and platform, the combination of a top of hemispherical shape and a circular platform that is downwardly dished for spinning said top thereupon; said top including a hemispherical surface and a flat circular end, said top being molded of transparent, solid plastic and containing an arrow molded therewithin; said platform being divided into twelve sectors, each defined with a different scoring numeral.

4,076,253
EDUCATIONAL PUZZLE

Diane W. Eriksen, 1796 Macapin St., West Milford, N.J. 08848

Filed Jul. 12, 1976, Ser. No. 704,726
Int. Cl.[2] A63F *9/10*
U.S. Cl. 273—157 R **2 Claims**



1. An educational puzzle comprising a plurality of substantially flat components each having at least one counterpart edge that is intended to be placed in juxtaposition with the counterpart edge of another said component, a printed portion on each component located along and associated with each said counterpart edge on each said component, said printed portions including a plurality of pairs of said printed portions which cooperate to indicate counterpart edges located on separate components which are complementary and are intended to be placed in juxtaposition, said complementary edges being of complementary shape so that they may be placed into substantially coextensive engagement, each of said pairs of said printed portions being different than the other said pairs of said printed portions, at least one of said components having at least two printed portions spaced from each other located along discrete edges of said component to indicate at least two distinct counterpart edges thereon, so that when all said complementary counterpart edges on said components of said puzzle are placed in the proper juxtaposition indicated by said pairs of printed portions a predetermined figure is formed, said predetermined figure having a relationship to each of said pairs of

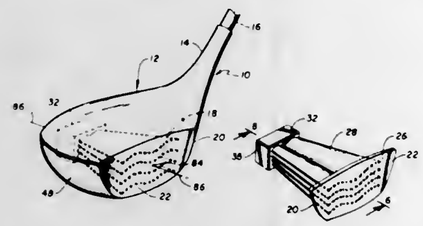
said printed portions, one of said printed portions of each said pair of printed portions including a mathematical problem, and the other printed portion of each said pair including a correct answer to said mathematical problem, each of said mathematical problems being a different mathematical problem and an appropriate answer, said mathematical problems including multiplication, and each said problem including a common multiplier, and said predetermined figure being substantially the shape of said common multiplier.

4,076,254

GOLF CLUB WITH LOW DENSITY AND HIGH INERTIA HEAD

Gordon W. Nygren, 321 Spring Valley Dr., Bloomington, Minn. 55420

Filed Apr. 7, 1976, Ser. No. 674,456
Int. Cl.² A63B *53/04*
U.S. Cl. 273—173 **20 Claims**



1. In a golf club, a head comprising a face plate, weight means spaced rearwardly from said face plate, a plurality of spaced plates, each of said plates extending from said face plate to said weight means, and material encasing said plurality of plates and said weight means to form an aerodynamically curved outer surface.

4,076,255

GOLF BALLS

Travis Moore, and Hugh David Niblock, both of Dumfries, Scotland, assignors to Uniroyal Limited, Scotland

Filed Dec. 17, 1975, Ser. No. 641,477
Claims priority, application United Kingdom, Dec. 30, 1974, 56037/74
Int. Cl.² A63B *37/06*
U.S. Cl. 273—226 **19 Claims**

1. A golf ball comprising a center, an elastic thread wound around the center to form a core, and a cover molded onto the core, the center being formed from a composition comprising:

(1) a cis-polybutadiene elastomer having a cis-content of not less than 80%;

(2) not more than 25 parts by weight per hundred parts of elastomer of a monomer capable of grafting, cross-linking or chain extending the elastomer said monomer is selected from the metal salt of an unsaturated carboxylic acid and a polyol ester or anhydride of a polybasic unsaturated carboxylic acid; and

(3) not less than 135 parts by weight per hundred parts of elastomer of an inert filler; said composition being cured and having a Shore C hardness of not less than 60° and being characterized by not requiring freezing of the center in order to wind the elastic thread around the center.

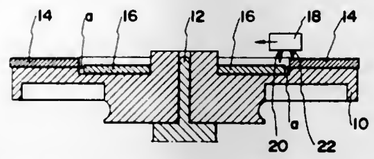
4,076,256

STYLUS SHIFT MECHANISM FOR A PHONOGRAPH HAVING TWO CONCENTRIC RECORDS

Katsumi Watanabe, Kawasaki, Japan, assignor to Ozen Co., Ltd., Tokyo, Japan

Filed Jul. 16, 1976, Ser. No. 705,957
Claims priority, application Japan, Apr. 1, 1976, 51-36275
Int. Cl.² G11B *3/34, 3/80*
U.S. Cl. 274—1 R **6 Claims**

1. In a phonograph of the type having an annular outer record and an inner record arranged concentrically for simultaneous rotation, the improvement comprising a pickup arm pivotally supported at one end, a reproducing stylus carried by said pickup arm at the other end thereof, and a shift stylus also carried by said pickup arm at said other end thereof, said



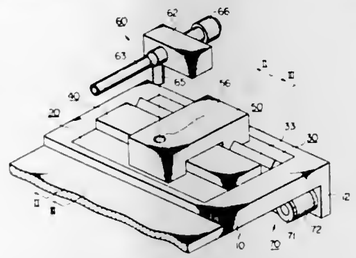
reproducing stylus being adapted to play the outer record then the inner record, said shift stylus being adapted to ride in a groove in the outer record while said reproducing stylus shifts from the outer to the inner record during playback.

4,076,257

APPARATUS FOR SUPPORTING PHONOGRAPHIC TONE ARMS

Motoi Iyeta, Hamakita, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Oct. 22, 1976, Ser. No. 734,961
Claims priority, application Japan, Oct. 23, 1975, 50-144791
Int. Cl.² G11B *3/10*
U.S. Cl. 274—23 A **15 Claims**



1. Improved apparatus for supporting phonograph tone arms in which said phonograph has a servo-motor; carriage driven by said servo-motor; said carriage supporting a tone arm and its related parts for movement along a linear path which is substantially normal to an imaginary radial line extending between the center of the phonograph turntable and said path comprising:

a base member having an elongated opening;

a pair of mutually parallel guide rails arranged on said base member while being spaced from each other along said base member opening and extending in the direction of movement of said carriage substantially over the entire moving ambit of the latter;

an elongated cover arranged between said guide rails extending substantially over the entire moving ambit of the carriage, projecting above the top surfaces of said guide rails and defining an elongated horizontal slit extending along the back thereof;

said carriage having a horizontal passageway by way of which said carriage spacedly and movably rides over said cover;

front and back wheel assemblies each having wheels; mounting means for said assemblies in said carriage; said wheel assemblies being movable on and along said guide rails while supporting said carriage above said guide rails;

one of said guide rails cooperating with its associated wheels to restrain movement of said carriage in a direction transverse to said linear path;

a bottom block forming an integral part of said carriage and extending downwardly through the elongated opening formed in said base member and the horizontal slit of said cover, and

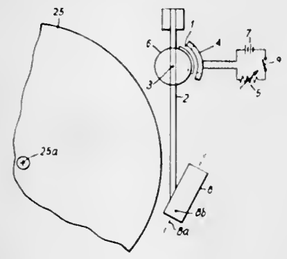
a driving mechanism for said carriage disposed relative to said bottom block of said carriage operatively coupled to said servo-motor.

4,076,258

DISC-RECORD PLAYERS

John Pelham Wren, Swindon, England, assignor to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Oct. 27, 1976, Ser. No. 736,222
Claims priority, application United Kingdom, Oct. 28, 1975, 44399/75
Int. Cl.² G11B *3/10*
U.S. Cl. 274—23 R **9 Claims**



1. A skating-force compensation device for a gramophone pickup arm mounted on an arm support arranged for joint pivotal movement about a vertical axis relative to a base member, which comprises: a permanent magnet means mounted for joint movement with the arm support about said axis and constructed and magnetized to provide two pole faces of opposite polarities, both arranged substantially in a common surface of revolution about said vertical axis with each said pole face extending over an angle about said axis at least equal to the angle of operative movement of the pickup arm about said axis, said magnet means being magnetized at right angles to each pole face; a winding of conductor wire, mounted to be stationary relative to said base member and having two portions arranged in close proximity to said pole faces, said two portions arranged for respective electrodynamic co-operation with the flux from each of said pole faces; and yoke means of magnetizable material which are mounted for joint movement with said magnet means and arranged to form a yoke surface facing each said pole face at such a distance therefrom as to provide a gap sufficient to accommodate said winding portions, and which form a low-reluctance path for the magnetic flux of each said pole face beyond said gap, the lengths of conductor wire in each said portion extending substantially parallel to said surface of revolution and at right angles to the velocity vector of that element of said surface which directly faces the respective portion, said winding portions being electrically connected in series in such manner that when the winding is energised, the electric current flow in each of said winding portions produces, with the magnet flux passing said portion from the magnet means, torque about said axis in the same direction so as to counteract the skating-force of said tone arm.

4,076,259

STATIC SEALING MECHANISM FOR LIQUID NATURAL GAS COMPRESSORS AND HYDROGEN COOLED GENERATORS

Albert A. Raimondi, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 29, 1976, Ser. No. 736,804
Int. Cl.² F16J *15/34*
U.S. Cl. 277—3 **14 Claims**

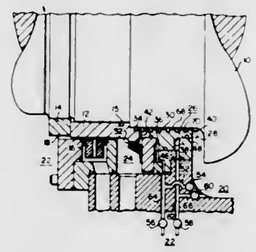
1. An apparatus containing a sealed fluid comprising:

a nonrotatable, fluid-tight casing which envelops said sealed fluid;

a rotatable shaft extending through said casing;

dynamic sealing means for preventing sealed fluid leakage from the casing's shaft opening during shaft rotation, said dynamic sealing means being selectively actuatable and having sealing capability independent of said shaft rotation;

a piston disposed around a predetermined length of said shaft with an annular space therebetween, said piston having a plurality of faces extending substantially radial in relation to the shaft's axis of rotation, a first of said faces being arranged to be in contact with said sealed fluid during shaft rotation, a second and third of said faces being situated on axially opposite ends of said piston;



a seating member situated axially adjacent to said first piston face extending radially from the shaft's axis of rotation with said seating member attached to and surrounding a selected length of said shaft;

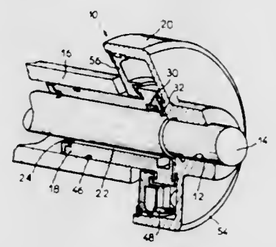
controlling means for selectively providing fluid communication to said second face from a low fluid pressure source P_L and a high fluid pressure source P_H creating an unbalanced axial force on said piston causing said piston to be axially displaced between a first position where said first face is in contact with said seating member during nonrotation of said shaft and a second position where said first face is in contact with said sealed fluid during shaft rotation.

4,076,260

SEALING DEVICE FOR ROTARY MACHINES CONTAINING HYDRAULIC FLUID

Auguste Legoy, and Claude Legoy, both of 12 bis rue Rene Coty, Montivilliers, France 76290

Filed Feb. 3, 1977, Ser. No. 765,285
Claims priority, application France, Feb. 4, 1976, 76 03127
Int. Cl.² F16K *41/00*; F16J *15/42*
U.S. Cl. 277—25 **8 Claims**



1. Sealing device for a rotary machine containing hydraulic fluid of the type comprising a casing, a shaft leaving said casing at at least one point of the latter and an annular gasket/valve (**24**) provided with a flexible lip, whereof one side is turned towards the suction side of the pump and which presses normally with sealed contact around the shaft when the pump is inoperative, characterised in that it comprises an annular sealing chamber (**30**) defined between the shaft **14** and a casing

part, said sealing chamber being connected, on the one hand, to the side of the gasket lip opposite the first said side and, on the other hand, to an annular cavity (52) defined inside a hollow rotary body (20) fixed in a sealed manner around the end of the shaft to be sealed and fitting with clearance around the casing, valve means (44) being provided for connecting the delivery side (40) of the pump to said sealing chamber (30) when the pump rotates at normal speed in order that said sealing chamber is permanently filled with liquid at a pressure equal to that of the delivery pressure, such that the gasket/valve (24) is separated from the shaft and that a leakage flow is delivered to said cavity (52) of the rotary body (20) where it forms a liquid ring (70) pressed under the effect of the centrifugal force against the outer periphery of said cavity, recovery means (48) being provided for keeping the depth of said liquid ring constant and for restoring the excess liquid to said sealing chamber as well as for maintaining said sealing chamber at a pressure greater than that of the suction pressure of the pump.

4,076,261

APEX SEAL DEVICE FOR USE IN ROTARY PISTON ENGINE

Yasumi Ooba, Toyota, Japan, Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

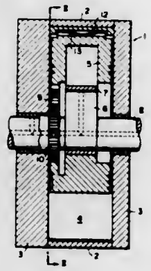
Filed Oct. 16, 1974, Ser. No. 515,216

Claims priority, application Japan, Mar. 28, 1974, 49-35734[U]

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.² F16J *15/48*

U.S. Cl. 277—81 P **2 Claims**



1. In a rotary piston engine of the type comprising a rotor, an apex seal groove provided in a crest portion of said rotor, a rotor housing, and an apex seal device, the improvement comprising:

an apex seal movably located within said apex seal groove in the radial and rotational directions, said seal having a bottom surface inclined to a horizontal plane making a right angle to the radius direction in relation to said apex seal, said apex seal further having an interstice between the leading side wall of said apex seal and the inside wall of said apex seal groove opposite to the leading side wall of said apex seal; and

an apex seal spring confined between the bottom surface of said apex seal groove and said bottom surface of said apex seal.

an apex seal spring confined between the bottom surface of said apex seal groove and said bottom surface of said apex seal, said spring contacting said inclined bottom surface of said apex seal, at only a point nearer the trailing side wall of said apex seal than the leading side wall of said apex seal whereby the trailing side wall of said apex seal is not only urged against the inside wall of said apex seal groove opposite to the trailing side wall of said apex seal but also inclined against the direction of rotation of the rotor thereby preventing blow-through of combustion gas from a combustion chamber to a suction chamber.

4,076,262

SLIDING SEAL

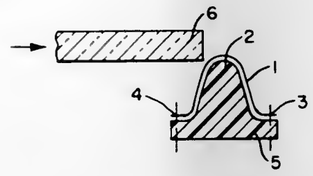
Gert Deventer, Munich, Germany, assignor to Deventer KG, Germany

Filed Nov. 24, 1975, Ser. No. 634,784

Claims priority, application Germany, Sep. 20, 1975, 2541992

Int. Cl.² B65D *53/00;* **F02F** *11/00;* **F16J** *15/00;* **F16K** *41/00*

U.S. Cl. 277—227 **33 Claims**



1. A sliding seal comprising:

base member means,

a layer of material having a relatively low coefficient of friction,

support member means carried by said base member means and disposed for supporting said layer at least within a sliding zone of the seal, said layer being fixedly adhered to said base member means in a shear resistant manner only at positions spaced from said sliding zone, whereby said support member means and said layer are movable with respect to one another in said sliding zone,

and connection means for connecting said layer to said base member means in a shear resistant manner at respective opposite sides of said support member means at positions spaced from said sliding zone, said layer covering said support member means at least in the area of said sliding zone when connected by said connection means.

4,076,263

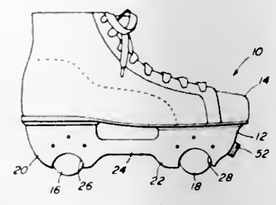
BALL SKATE

Robert K. Rand, 929 Falls Church Road, Matthews, N.C. 28105

Continuation-in-part of Ser. No. 565,144, Apr. 4, 1975, abandoned. This application Nov. 20, 1975, Ser. No. 633,639

Int. Cl.² A63C *17/24*

U.S. Cl. 280—11.1 BR **10 Claims**



1. A skate, comprising:

(a) a frame,

(b) means for attaching said frame to the foot of a person,

(c) said frame defining at least a pair of downwardly open sockets,

(d) a ball mounted for rotation in each of said sockets,

(e) at least a pair of shafts mounted in spaced relation to said frame proximate to each socket and extending in a horizontal transverse direction with respect to the length of said frame,

(f) a plurality of rings mounted for free independent rotation to at least one of said shafts and at least one ring mounted for rotation to another of said shafts, the periphery of each of said rings rotatably supporting said ball at the outer surface thereof.

4,076,264

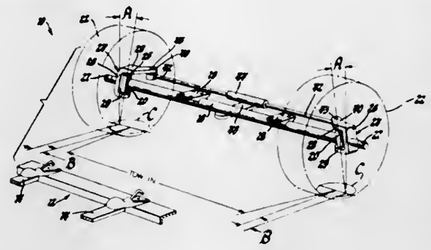
SELF STEERING TRAILER ARRANGEMENT

James P. Chatterley, Washington, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 15, 1976, Ser. No. 732,926

Int. Cl.² B60D *1/06;* **B62D** *13/06*

U.S. Cl. 280—81 A **9 Claims**



1. For use with a motor vehicle, a self steering trailer comprising frame means, hitch means operatively connected to the forward end of said frame means for securing said trailer to said motor vehicle so as to be pivotable relative thereto in the vertical direction only, an axle, a trailer body mounted on said axle and secured to said frame means, a pair of oppositely disposed wheel carriers pivotally connected to the respective ends of said axle, a road wheel rotatably mounted on each of said wheel carriers such that the pivot axis of said wheel carrier intersects the road surface a predetermined distance outboard of the centerline of said road wheel, and adjustable link means pivotally connected between said wheel carriers, said adjustable link means including aligned tie bars pivotally connected at the outer ends thereof to said respective wheel carriers, and damper means operatively interconnecting the inner ends of said tie bars for responding to road load conditions upon the reversing of direction of travel to accommodate pivoting of said wheels about said pivot axis such that said wheels automatically toe-in in the new direction of movement of said motor vehicle.

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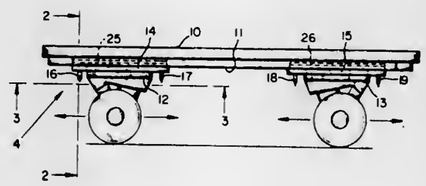
SKATEBOARD WITH LONGITUDINALLY ADJUSTABLE WHEELS

John William Eash, II, 232 Melrose St., Oxnard, Calif. 93030

Filed Jun. 24, 1976, Ser. No. 699,371

Int. Cl.² B62B *11/00;* **A63C** *1/26*

U.S. Cl. 280—87.04 A **5 Claims**



1. A skateboard with longitudinally adjustable wheels including, in combination:

a. a footboard having elongated track means running along its underside;

b. front and rear wheel trucks;

c. front and rear guiding and locking means for said front and rear wheel trucks, respectively, for securing said front and rear wheel trucks to adjacent portions of said track means in selected longitudinal positions, each of said guiding and locking means including:

1. slide plate means on said associated truck means having a top surface engaging the under surface of the adjacent portion of said track means, said adjacent portion of said track means being in the form of a central channel having inwardly opposed flanges to define a T groove running longitudinally along the underside of said footboard, said slide plate means including longitudinally spaced openings;

2. slide bar means of rectangular cross section received in said channel defining the cross portion of said T groove and including longitudinally spaced threaded bores exposed between the opposing flanges defining the stem portion of said T groove; and,

3. threaded bolt means having heads of larger diameter than said openings and shank portions individually receivable through said longitudinally spaced openings in said slide plate means and in said stem portion of said T groove to be threaded in said longitudinally spaced threaded bores, whereby said trucks may be longitudinally positioned along said track means at a desired spacing from each other and the front and rear ends of said footboard, said slide bar means serving as guides for such longitudinal positioning, and whereby said trucks may be secured in their set positions by tightening of said threaded bolt means to draw said slide bar means against the underside of said inwardly opposed flanges and thereby sandwich and grip said flanges between said slide bar means and the top surfaces of said slide plate means.

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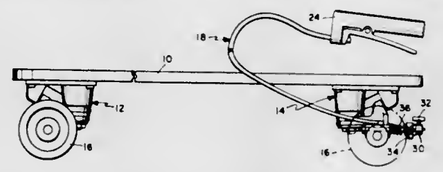
BRAKE ASSEMBLY FOR SKATEBOARD

Howard I. Krausz, 513 12th St., Galveston, Tex. 77550

Filed Jun. 14, 1976, Ser. No. 695,740

Int. Cl.² A63C *17/14*

U.S. Cl. 280—87.04 A **3 Claims**



1. A skateboard assembly having a combination tether and hand brake comrpising:

(a) a deck portion having a cleared upper surface to provide a platform for the unfettered feet of the user, said deck portion also having an undercarriage sturcture;

(b) a plurality of truck means and support wheels journalled on said truck means in said undercarriage structure beneath said deck permitting steering said skateboard assembly completely by the use of the feet;

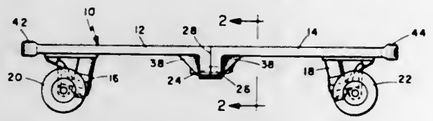
(c) a frictional member and means mounting same on said skateboard assembly beneath said deck and being movable such that said frictional member can move from a first position clear of said wheels to a second position frictionally engaging at least one of said wheels to brake same;

(d) a flexible Bowden wire cable having an outer sheath and an inner core, and doubling as a brake line and a tether, one end of said cable being mounted to said skateboard assembly such that said sheath is substantially immobile relative thereto and said core is connected to said frictional member such that axial motion of said core moves said frictional member between said first and second positions;

(e) a hand grip means mounted on the other end of said cable, said hand grip means being operable to displace said core axially relative to said sheath when said hand grip means is squeezed to brake said skateboard assembly, said cable representing the only connection between the rider and said skateboard save standing contact on said platform, whereby the operator of said skateboard may ride

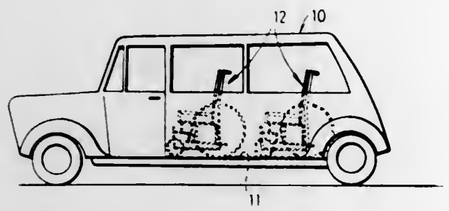
same with his feet and body completely unhindered, and upon engaging said hand grip in the hand have said skateboard assembly securely retained on the end of said cable and prevented from escaping and have complete braking control over said skateboard assembly as well.

4,076,267
ARTICULATED SKATEBOARD
Willis Leonard Lipscomb, 2208 Willow St., San Diego, Calif. 92106
Filed Sep. 20, 1976, Ser. No. 724,660
Int. Cl.² A63C *17/00*
U.S. Cl. 280—87.04 A **4 Claims**



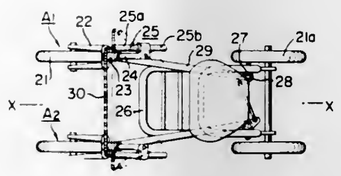
1. An articulated skateboard, comprising:
an elongated, substantially planar board having a rider supporting upper surface, the board being transversely divided into a front section and a rear section;
said front and rear sections having downwardly extending confronting end walls having a common contact face, the end walls extending the full width of the board and having edges curving smoothly downwardly from both sides of the board;
a pivot pin extending through said end walls on a longitudinal axis and pivotally interconnecting said front and rear sections;
and surface travelling supporting means mounted under opposite end portions of the board.

4,076,268
SECURING MEANS
Frederick Leslie Hart, Cressage, England, assignor to GKN Sankey Limited, Bilston, England
Filed Sep. 15, 1976, Ser. No. 723,497
Claims priority, application United Kingdom, Sep. 16, 1975, 37954/75
Int. Cl.² B60P *7/00*
U.S. Cl. 280—179 R **14 Claims**



1. In the combination of an invalid's wheelchair and a vehicle for conveying said wheelchair, means for releasably securing the chair in a predetermined position on the floor of the vehicle, said securing means comprising: hook means having spaced, substantially horizontal upper and lower limbs and cross bar means; one of said means fastened to the floor of the vehicle and the other means fastened to the wheelchair adjacent one end thereof; the cross bar means fitting closely between said limbs when the wheelchair is in said position to prevent substantial vertical relative movement between the wheelchair and the floor; first complementary locating elements on the hook means and the cross bar means to prevent substantial lateral movement of the cross bar means relative to the hook means when engaged therewith; complementary latching elements on the floor and on the wheelchair to prevent, when latched with the wheelchair in said position, disengagement of the hook means and the cross bar means; second complementary locating elements, one of said elements located on the floor of the vehicle and the other element located on the wheelchair adjacent the other end thereof to prevent substantial relative vertical movement between the floor of the vehicle and the wheelchair when the latter is in said position; and guide portions on the wheelchair and on the floor of the vehicle to guide into inter-engagement the elements of the latching means on the one hand and the hook and cross bar means on the other hand as the wheelchair is wheeled into said position on the floor.

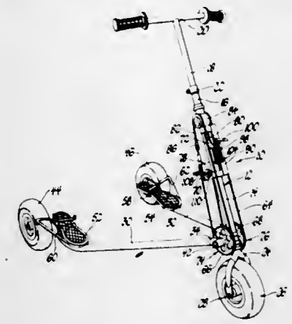
4,076,269
SWING-DRIVE-VEHICLE
Yoshikata Muguruma, Takatsuki, Japan, assignor to Shinpo Kogyo Kabishiki Kaisha, Kyoto, Japan
Continuation of Ser. No. 598,251, July 23, 1975, abandoned. This application Aug. 10, 1976, Ser. No. 713,197
Claims priority, application Japan, Aug. 7, 1974, 49-90630; Feb. 5, 1975, 50-15111; Feb. 5, 1975, 50-15112
Int. Cl.² B62M *1/16*
U.S. Cl. 280—218 **5 Claims**



1. A swing drive vehicle comprising a frame member, at least one ground contacting member mounted on said frame member, two assemblies disposed symmetrically and laterally of said frame member, each assembly comprising a steering column means, a handle member secured to the top of the steering column means, a rod member secured to said steering column means and pivotally mounted at the other end to said frame member with respect thereto, a fork member mounted at the lower end of said steering column means, and a ground contacting element mounted on said fork member, whereby said assemblies may be moved synchronously in diverging and converging directions by said handle members with respect to said frame member so as to impart a motion to the vehicle.

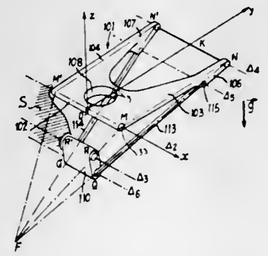
4,076,270
FOLDABLE CAMBERING VEHICLE
Frank J. Winchell, Orchard Lake, Mich., assignor to General Motors Corporation, Detroit, Mich.
Continuation-in-part of Ser. No. 649,967, Jan. 19, 1976. This application Aug. 11, 1976, Ser. No. 713,411
Int. Cl.² B62M *1/04*
U.S. Cl. 280—220 **6 Claims**

6. A cambering vehicle comprising an upright frame provided with a pair of trailing arms having forward ends thereof pivotally connected to opposite sides of the frame for rotation about substantially transverse axes, a mechanical cambering device interconnecting the trailing arms for movement in equal and opposite directions through substantially equal angles about their axes when the vehicle is leaned into a turn, a selectively operable locking device effective to lock the trailing arms at will to maintain fixed relative positions of the trailing arms about their axes, and means operatively associated with said locking device and constructed to permit the frame and the trailing arms selectively, to be folded at will towards each other about the said axes and to be locked in a collapsed position in which the frame and the trailing arms are positioned adjacent each other and extend in generally the same diection



so as to provide a compact rigid package that can be stowed in a minimum of space.

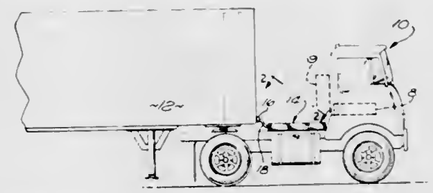
4,076,271
VEHICLE WHEEL SUSPENSION DEVICE
Pierre M. Doncque, Amiens, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly, France
Filed Mar. 30, 1976, Ser. No. 671,947
Claims priority, application France, Apr. 3, 1975, 75 10462
Int. Cl.² B60G *15/00*
U.S. Cl. 280—284 **9 Claims**



1. A motorcycle rear wheel suspension device which is resistant to distortion comprising two arms constituting a fork having an articulated base, which fork oscillates relative to the body of the motorcycle about an oscillation axis at the base of the fork, the free ends of the arms of the fork being adapted for carrying a wheel axle or wheel pivot support; and an intermediate solid lower than said fork and serving as base for connecting rods which converge substantially into proximity with this solid; at least two rods being connected at separated locations to said intermediate solid and each connected to one of the arms of the fork near the free end of the respective arm, each connecting rod extending substantially towards the wheel axle or wheel pivot support, said solid also being connected to the base of the fork.

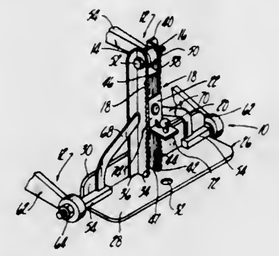
4,076,272
RETRACTABLE CONDUIT SYSTEM
Michael O. Penton, Antioch, Calif., assignor to Penton Hose Protection Systems, Inc., San Diego, Calif.
Continuation of Ser. No. 589,166, Jun. 23, 1975, abandoned. This application Nov. 16, 1976, Ser. No. 742,318
Int. Cl.² B60D *1/08*
U.S. Cl. 280—421 **5 Claims**

1. In combination, apparatus for protecting the unextended portion of a retractable flexible hose and for maintaining the extended portion of the hose under tension, comprising:
a tractor vehicle and a trailer vehicle pivotally coupled in tandem;
a rigid elongated housing mounted on one of said vehicles;
an aperture formed in one end of said housing;
a flexible hose having the ends thereof connected to said vehicles and having an extensible portion contained within said housing, said extensible portion in a retracted position comprising a loop arranged longitudinally of said housing and being fixed to a portion of said housing adjacent said one end with said extensible portion in an extended position thereof extending outside of said housing through said aperture, said extensible portion being of



sufficient length to permit extension of the hose from the housing at least the maximum distance as required for pivotal relative movement of said tractor and trailer vehicles as in turning and maneuvering during use; and,
a linear acting coil spring having an anti-frictional sliding connector directly engaging said flexible hose at one end of the coil spring, the other end of the coil spring being fixed to an end of said housing remote from said aperture, said spring being capable of resiliently retracting said extensible portion of said flexible hose into said housing in proportion to variations in said extension of the hose during use and to maintain tension on the portion of the hose extended outside of the housing.

4,076,273
TRAILER HITCH
Ernest Campion, 4125 Newton Road, Walled Lake, Mich. 48085
Filed Sep. 7, 1976, Ser. No. 720,688
Int. Cl.² B60P *3/06*
U.S. Cl. 280—490 R **13 Claims**



1. A hitch comprising:
a. a drawbar,
b. a pair of vertically extending spaced apart, parallel channel forming members, the members being mounted on the drawbar, each member having one edge thereof provided with a plurality of regularly spaced, aligned serrations along the vertical extent thereof, each one serration on one edge of one member being in registry with one serration on one edge of the other member,
c. a ball for attaching a towing implement thereto,
d. a tongue having the ball mounted thereonto, the tongue having a portion thereof provided with regularly spaced, aligned serrations which are complementary to and which nest in the serrations formed on the channel forming members,

e. means for securing the tongue in a fixed position to the channel forming members, and

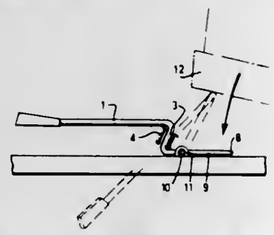
wherein the ball is incrementally vertically adjustable by nesting the tongue serrations in selected channel forming serrations and the tongue securing means urges the serrations of the tongue into nesting relationship with the serrations of the channel forming members.

4,076,274

SKI BRAKES

Georges Pierre Joseph Salomon, Annecy, France, assignor to Societe Anonyme des Etablissements Francois Salomon & Fils, Annecy, France

Filed Apr. 26, 1976, Ser. No. 680,514
Int. Cl.[2] A63C *7/10, 11/02*
U.S. Cl. 280—605 **11 Claims**



1. In a brake mounted on a ski having a longitudinal axis, opposite longitudinal edges, and upper and lower surfaces, the brake comprising a spade lying along and above a longitudinal edge of the ski, a pivot portion connected to said spade and a pedal portion extending from the pivot portion; the pedal being adapted for engagement by a ski boot to move the spade about its pivot portion from an active position, projecting below the ski, to an inactive, retracted position above the ski, the improvement wherein said pivot portion is bent at an angle with respect to said spade, and bearing means is provided for mounting said pivot portion to rotate about an axis inclined downwardly toward the inside at an acute angle with respect to a horizontal plane through the ski, at an acute angle with respect to a transverse vertical plane through the ski and at an acute angle with respect to a longitudinal vertical plane through the ski.

4,076,275

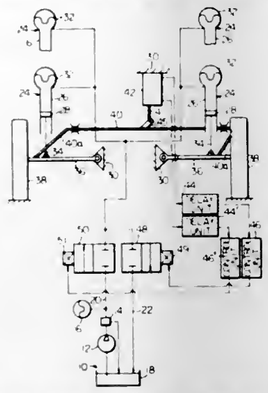
VEHICLE HYDROPNEUMATIC SUSPENSION SYSTEM WITH VEHICLE BODY HEIGHT CONTROL MEANS

Mituo Hiruma, 2-693, Hanakoganei, Kodaira, Tokyo, Japan

Filed May 20, 1974, Ser. No. 471,706
Claims priority, application Japan, May 21, 1973, 48-55521
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976
Int. Cl.[2] B60G *11/28*
U.S. Cl. 280—124 F **9 Claims**

1. In a fluid operated suspension system of a vehicle including a source of fluid under pressure with a fluid reservoir, adjustors disposed between the vehicle wheel axles and the body of said vehicle, valves operative to communicate the adjustors with the source and the reservoir to raise and lower the vehicle body respectively relative to a road surface and a stabilizer bar connected to at least two of the adjustors, the improvement comprising:

sensing means disposed between the vehicle body and the stabilizer bar in such a manner that a first portion of the sensing means is mounted on the vehicle body and a second portion thereof mounted on the stabilizer bar, sensing an angular orientation of the stabilizer bar relative to a longitudinal axis of the vehicle body and operative to produce an electrical signal when said angular orientation is outside a predetermined range indicating that a vehicle height above the road surface is outside a predetermined range, the first portion being adjustably mounted and substantially perpendicularly adjustable through a lever system operable by a vehicle occupant from within the vehicle in a direction along said longitudinal axis for allowing selection of the predetermined range of the vehicle height above the road surface; and



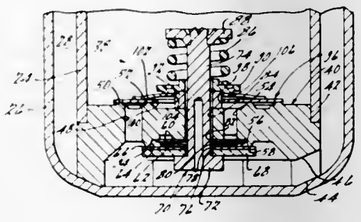
control means responsive to said electrical signal operative to actuate the valves to communicate the adjustors with one of the source and the reservoir to restore the height of the vehicle body above the road surface to within said predetermined range.

4,076,276

BASE VALVE FOR INDEPENDENT WHEEL SUSPENSION STRUT

Jan M. A. Wijnhoven, Sint-Truiden; Alexandru Oancea, Zepperen; Henri C. J. Vanhove, Gelmen, and Roland H. C. Beets, Sint-Truiden, all of Belgium, assignors to Monroe Auto Equipment Company, Monroe, Mich.

Filed Jul. 9, 1976, Ser. No. 704,016
Int. Cl.[2] B60G *11/56*
U.S. Cl. 280—714 **18 Claims**



1. A base valve assembly for a shock absorber having a pressure cylinder, a piston movable within said cylinder, a reservoir tube extending around said pressure cylinder and defining a fluid reservoir therewith,

said valve assembly being located adjacent the lower end of said pressure cylinder and controlling fluid flow between said reservoir and the interior of said cylinder,

said assembly including a valve body having a central axially extending opening and first and second pluralities of radially spaced, axially extending flow ports,

first and second axially extending concentric valve seats on the upper side of said valve body,

said valve seats being located radially opposite sides of the upper ends of said first set of flow ports,

an axially extending third valve seat on the lower side of said valve body,

said third valve seat being located radially outwardly from the lower ends of said second set of flow ports and partially defining a valve chamber adjacent the lower side of said valve body,

a valve pin extending axially through said opening and projecting above the upper side of said valve body,

a floating valve disc disposed adjacent the upper end of said valve body and being engageable with said first and second valve seats for blocking fluid flow through said first set of flow ports,

said valve disc being movable upwardly away from said first and second valve seats without undergoing bending to provide flow through said first set of flow ports,

first spring means for resiliently biasing said floating valve disc toward said first and second valve seats,

a second valve disc disposed adjacent the lower end of said valve body and normally engaged therewith to block fluid flow through said second set of flow ports,

a third valve disc disposed adjacent the lower end of said valve body and being engageable with said third valve seat to block fluid flow from said valve chamber into said reservoir,

said third valve disc being mounted on said valve pin and being movable concomitantly therewith axially of said valve body to open and close a flow path between said reservoir and said chamber, and

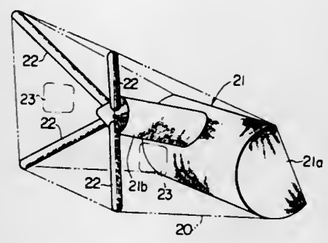
a helical coil spring extending coaxially around the upper end of said valve pin and resiliently urging said pin and said third valve disc carried thereon toward said position wherein said third valve disc closes said flow path.

4,076,277

GAS COLUMN TYPE AIR BAG SYSTEM

Satosi Kuwakado, Nishio; Takao Kasagi, Tokai, and Toshihiro Takei, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio and Arakawa Autobody Co., Ltd., Toyota, both of, Japan

Filed Dec. 3, 1975, Ser. No. 637,184
Claims priority, application Japan, Dec. 9, 1974, 49-141925
Int. Cl.[2] B60R *21/08*
U.S. Cl. 280—738 **3 Claims**



1. A gas column air bag system for restraining an occupant in a vehicle having a compartment, upon collision of the vehicle compartment, comprising:

a gas source for supplying a high pressure gas in case of said collision;

inflatable bag means adapted for being mounted in said compartment said bag means having a bag wall;

means defining a first gas column provided inside said inflatable bag means for expansion by the high pressure gas from said gas source and adapted to be mounted in said compartment said first gas column being expansible to a relatively large volume and effective to restrain when expanded, the knees of the occupant;

means defining a second gas column of relatively large diameter extending from a substantially axially central portion of said first gas column and having an outer end, said second gas column being expansible within said inflatable bag means toward the occupant concurrently with said first gas column; and

four third gas columns extending from the outer end of said second gas column in four diverging directions and having diameters smaller than the diameter of said second gas column, each said third gas column having an outer end jointed in each corner portion of the bag wall and being expansible concurrently with said first and second gas columns; and

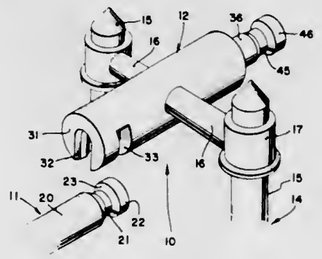
means for drawing air in said compartment of the vehicle into the interior of said bag means when said bag is expanded by said columns, thereby enabling said bag means to restrain the torso of the occupant.

4,076,278

LATERALLY ENGAGEABLE FLOWLINE CONNECTOR DEVICE

Georges M. Chateau, Pau, France, and Praful Desai, Huntington Beach, Calif., assignors to Societe Nationale Elf Aquitaine (Production), Courbevoie, France

Filed Jan. 27, 1977, Ser. No. 763,110
Int. Cl.[2] F16L *35/00, 55/00*
U.S. Cl. 285—18 **10 Claims**



1. In a flowline connector device for a flowline wherein a connector means is laterally engaged and a seal is provided between axially related connector means, the combination of:

a first connector means adapted to be secured to the end of the flowline, said connector means having a sealing surface;

a second connector means adapted to be secured to a subsea installation, said second connector means having a sealing surface;

means on said connector means for interengagement of said connector means by movement of one connector means in a lateral direction to bring said sealing surfaces into juxtaposition and said connector means into axial alignment;

and fluid actuated piston and cylinder means on one of said connector means for moving one of said sealing surfaces into pressure sealed engagement with the other sealing surface.

4,076,279

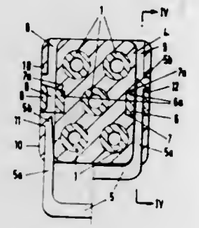
PLUG-IN COUPLING

Heinz Klotz, Dortmund-Syburg, and Dietmar Podszuck, Wuppertal, both of Germany, assignors to Hermann Hemscheidt Maschinenfabrik, Germany

Filed Sep. 23, 1976, Ser. No. 725,942
Claims priority, application Germany, Sep. 23, 1975, 2542284
Int. Cl.[2] F16L *35/00*
U.S. Cl. 285—26 **4 Claims**

1. A multiple-passage plug-in coupling for releasably connecting hose or pipe ends, the coupling comprising: a first coupling part, longitudinally-extending parallel nipples on that part, a second coupling part, longitudinally extending parallel sleeves in the second coupling part to receive the said nipples when the said two coupling parts are plugged together by a simple, axial, non-rotary movement, two guide projections disposed non-centrally on one of said coupling parts, two corresponding guide recesses to receive the said two projections disposed non-centrally and at opposite locations in the other one of said coupling parts, channels in the said projections, further channels in the said other coupling part, said channels in the guide projections being in alignment with said channels in the said other coupling part when said first and

second coupling parts are plugged in together, a U-shaped locking member slidably disposed in said channels of said other coupling part and being slidable into and beyond said channels in the said two projections whereby to lock said first and second coupling parts together, shoulders forming interruptions in said channels of said other coupling part adjacent said two guide recesses, and outwardly-directed latch surfaces at



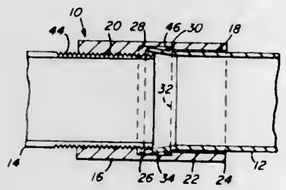
the free ends of the U-shaped locking member adapted to engage said shoulders and thereby prevent said locking member from becoming entirely detached from said other coupling part while allowing said U-shaped locking member to be movable to a position where the latter is clear of said channels in the said projections to allow said first and second coupling parts to be unplugged from each other.

4,076,280

CONDUIT COUPLING

James M. Young, Pittsburgh, Pa., assignor to Robroy Industries, Verona, Pa.

Filed Jun. 21, 1976, Ser. No. 698,222
Int. Cl.² F16L *35/00*
U.S. Cl. 285—39 **11 Claims**



1. A coupling for joining together the end portions of a pair of conduits comprising,

a cylindrical body portion,

said cylindrical body portion having a passageway extending therethrough, said passageway having an internally threaded end portion an intermediate annular recessed portion and a cylindrical end portion,

said intermediate annular recessed portion separating said threaded end portion from said cylindrical end portion,

said intermediate annular recessed portion forming a first shoulder adjacent said threaded end portion and a second shoulder adjacent said cylindrical end portion,

said second shoulder having a circumferential cutting edge portion projecting into said annular recessed portion,

said passageway cylindrical end portion arranged to receive an end portion of a first conduit having an outer diameter less than the internal diameter of said passageway cylindrical end portion, said first conduit end portion arranged to be expanded into said passageway intermediate annular recessed portion and axially spaced from said first shoulder to permit said cylindrical body portion to move axially on the first conduit for rotation of said cylindrical body portion relative to the first conduit, and

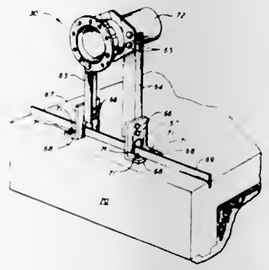
said passageway threaded end portion arranged to threadedly receive an externally threaded end portion of a second conduit in a manner that said externally threaded end portion extends into and underlaps the expanded end portion of said first conduit upon rotation of said cylindrical body portion to maintain said first conduit expanded end portion of said first conduit in abutting relation with said passageway intermediate annular recessed portion second shoulder to securely join together said pair of conduits in locking engagement with said coupling.

4,076,281

BELL FITTING AND SUPPORT ASSEMBLY FOR PIPE

Samuel H. Davis, 111 Forest Drive, Jericho, N.Y. 11753

Filed Apr. 13, 1976, Ser. No. 676,656
Int. Cl.² F16L *3/00*
U.S. Cl. 285—64 **8 Claims**



1. A bell fitting for iron pipe of a preselected standard nominal diameter and particularly adapted for use as a concrete wall penetration fitting, the bell fitting comprising:

an annular member having

a first end having a threaded inside surface adapted to fit an externally threaded pipe of said preselected standard nominal diameter, and said first end including an integrally formed external, circumferential continuous blind flange adapted to serve as a water stop when the fitting is incorporated into a concrete wall;

a second end formed with a bell shape having an inside diameter larger than the inside diameter of said first end and an integral external circumferential bolting flange; and

mounting means comprising at least two circumferentially spaced tabs integrally formed on and extending outwardly from the surface of the fitting adjacent said first end, said mounting means being adapted to permit support of the bell fitting at said first end independently of said bolting flange on said second end.

4,076,282

MOLDED PLASTIC ARTICLE

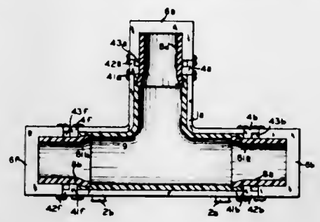
John N. Scott, Jr., Dallas, Tex., and Guy E. Carrow, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 599,738, Jul. 28, 1975, Pat. No. 3,989,787.
This application Jun. 25, 1976, Ser. No. 699,829
Int. Cl.² F16L *47/02*
U.S. Cl. 285—156 **3 Claims**

1. A thermoplastic article comprising

(a) a molded hollow body section of crosslinked thermoplastic resin material, and

(b) at least two pieces of pipe of a non-crosslinked thermoplastic resin material communicating with the interior of said body section, wherein said body section has been rotationally molded from crosslinkable thermoplastic



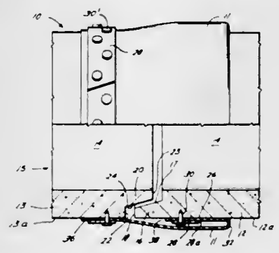
material in contact with and around said one end of said pieces of pipe of non-crosslinked thermoplastic material.

4,076,283

EXPANSION JOINT AND SEAL FOR SEWER PIPE

George W. Harrison, 2119 Sieber Drive, Houston, Tex. 77017

Filed Aug. 27, 1976, Ser. No. 718,419
Int. Cl.² F16L *49/00*
U.S. Cl. 285—230 **3 Claims**



1. An apparatus for preventing fluid leaks in joined pipe member and for enabling expansion of the joined pipe member while preventing such leaks, including:

a. a first pipe member having a male end portion;

b. a second pipe member having a female end portion for receiving said female end portion to form said joined pipe member;

c. a flexible sealing member including

i. a longitudinally expandable cover member having two ends,

ii. a circumferentially sealing mounted band member securing one end of the cover member around said pipe member adjacent the female end portion of said second pipe member such that the cover member extends longitudinally away from the male end portion of said first pipe member,

iii. a plurality of anchor members extending circumferentially around and through the female band member and one end of the cover member into said pipe member adjacent the female end portion,

iv. a circumferentially sealing mounted band member securing the other end of the cover member around said pipe member adjacent the male end portion of said first pipe member after looping the cover member over the female end band member and anchor member to form a looped portion of the cover member,

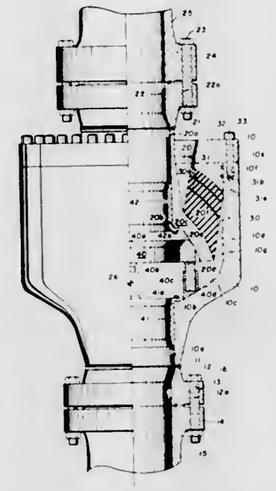
v. a plurality of anchor members extending circumferentially around and through the male end band member and the other end of the cover member into said pipe member adjacent the male end portion thereby permitting relative movement of the female and male ends until prevented from so doing by the one end of the cover member secured with the female end portion while preventing fluid leakage from between the female and male end portions in the joined pipe members.

4,076,284

OCEAN FLOOR RISER CONNECTION

John T. Herbert; Frank J. Kovitch, both of Arlington, and Paul E. Sullivan, Euless, all of Tex., assignors to Murdock Machine & Engineering Co., Irving, Tex.

Filed May 5, 1976, Ser. No. 683,635
Int. Cl.² F16L *27/04*
U.S. Cl. 285—263 **11 Claims**



1. In a flexible riser connector for joining a surface casing to a riser wherein a housing means is connected to said surface casing and into which an annular means connected to said riser depend, the combination therewith which comprises:

(a) guide ring means mounted on at least three legs at a plurality of spaced points about an inner surface of said housing means and externally contoured to mate with an inner surface of said annular means for supporting said riser while accommodating scouring said housing means outside said ring means by flow of fluid between said legs;

(b) elastomeric means adhered to an outer surface of said annular means for providing a resilient seal;

(c) a collar adhered to the top surface of said elastomeric means and in sealed relation with the inner walls of said housing means; and

(d) retainer means secured to the upper end of said housing means for capturing said collar in said housing means.

4,076,285

LAMINAR FLOW CONNECTOR FOR CONDUITS

Felix Jesus Martinez, Demarest, N.J., assignor to Erika, Inc., Rockleigh, N.J.

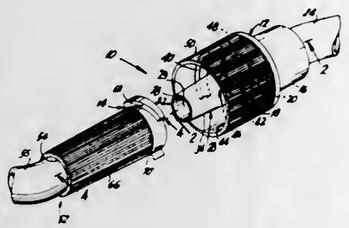
Filed Aug. 1, 1975, Ser. No. 600,962
Int. Cl.² F16L *25/00*
U.S. Cl. 285—332 **4 Claims**

1. A laminar flow connector for coupling first and second conduits to provide a hermetic seal therebetween, comprising:

a male member in the shape of a stepped cylinder having a reduced diameter portion and enlarged diameter portion separated by an annular wall, said reduced diameter portion being dimensioned to receive a first conduit therein with the end of the first conduit abutting against said annular wall, a truncated conical member centrally arranged within said enlarged diameter portion and coupled to said annular wall at its base, said member having an inner and an outer surface, said inner surface being in open communication with said reduced diameter portion and said outer surface having a continuous taper toward its apex, said first conduit and member inner surface being so constructed and arranged to provide laminar flow of a fluid therethrough, and a pair of projections on the inside

surface of said enlarged diameter portion, said projections extending radially inwardly therefrom and being spaced from said annular wall to form a pair of receiving slots; and

a female member in the shape of a cylinder having an end portion with a recess with an annular stop, said recess being dimensioned to receive a second conduit therein with the end of the second conduit abutting against the annular stop and a mating tapered channel in open communication with said recess and having its largest diameter portion at the other end remote from said end portion,



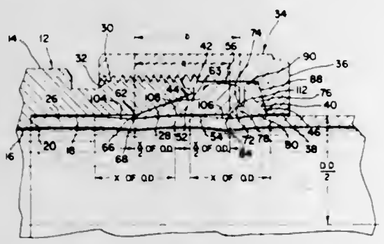
and a pair of mating tabs coupled to the other end of said female member remote from said end portion, said mating tabs being received within said slots upon full insertion of said male member into said female member and relative rotation of said members, said projections and said tabs coacting to provide a wedge-fit therebetween and a continuous hermetic seal between said truncated conical member and mating tapered channel and the apex end of said conical member is presented in smooth continuous flow relationship with the end of said second conduit, whereby a laminar flow path is created between the conduits through said truncated conical member.

4,076,286

TUBE FITTING

Leonard P. Spontelli, Seven Hills,, Ohio, assignor to Crawford Fitting Co., Solon, Ohio

Continuation of Ser. No. 134,154, Apr. 15, 1971, abandoned. This application Feb. 8, 1973, Ser. No. 330,679
Int. Cl.² F16L *19/08*
U.S. Cl. 285—341 **12 Claims**



1. A tube joint comprising in combination:

a large diameter tube having an outside diameter O.D. and an inside diameter I.D., said outside diameter O.D. having a dimension greater than 1 inch;

a coupling body having a bore, a counterbore which receives said tube, and a rearwardly opening camming mouth which surrounds said tube with said tube inserted in said coupling body;

a front ferrule received upon said tube and having a nose portion, the rearward end of said front ferrule having a camming mouth;

a back ferrule received upon said tube adjacent said front ferrule and rearwardly thereof, said back ferrule having a nose portion and a back face;

a coupling nut threadedly engaged with said coupling body and provided with a thrust surface disposed in axially spaced opposition to said camming mouth of said coupling body and engaging said back face of said back ferrule, said coupling nut and camming mouth of said coupling body together defining an annular chamber which surrounds said tube with said tube inserted in said coupling body and within which said front and back ferrules are received;

said front and back ferrules being deformed inwardly into gripping engagement with said tube through engagement of said nose portion of said front ferrule with said camming mouth of said coupling body and said nose portion of said back ferrule with said camming mouth of said front ferrule, each of said ferrules forming a wave in said tube;

the relationship of said front ferrule to said tube being such that the axial length of said front ferrule is at least approximately ⅜ of O.D. of said tube and the ratio of the front ferrule length to the O.D./I.D. ratio of said tube is at least approximately 0.375 inches; whereby

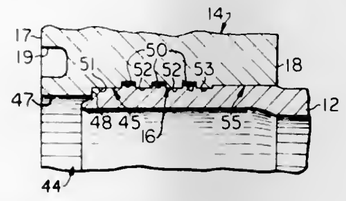
the waves induced in said tube by said front ferrule is not encountered by said nose portion of said back ferrule.

4,076,287

PREPARED JOINT FOR A TUBE FITTING

Roland F. Bill, Washington; Edward G. Prohaska, Aurora, and Bernard A. Wabel, Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 573,648, May 1, 1975, abandoned. This application Nov. 8, 1976, Ser. No. 739,880
Int. Cl.² F16L *13/04*
U.S. Cl. 285—382.4 **18 Claims**



1. A tube assembly, comprising:

a flange having an axis, first, second, third, fourth and fifth portions as consecutively measured along the axis from a first end of the flange, an annular opening extending therethrough and defining inner walls, a plurality of annular grooves, at least one annular land, and an annular rear land, said opening of said first portion being of a first preselected diameter, said opening of said second portion being of a second preselected diameter, said opening of said third portion being defined by annular grooves of a third preselected diameter spaced one from the other by said annular land which has a fourth preselected diameter, said annular rear land having a fifth preselected diameter, said opening of said fifth portion being of a sixth preselected diameter, said second, fourth and fifth preselected diameters being of a substantially uniform, common value, said sixth preselected diameter being of a substantially uniform value greater than said second, fourth, and fifth preselected diameters, and said third preselected diameters being of a substantially uniform, common value greater than said sixth preselected diameter;

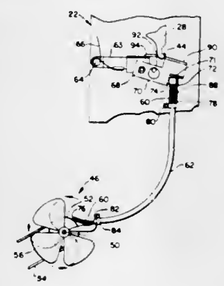
a metal tube having first, second, third, fourth, fifth and sixth portions as consecutively measured from the first portion of the flange along the axis, said first, second, third, fourth and fifth tube portions extending into the flange opening, said first portion of the tube having an edge portion adjacent the first portion of the flange, said second and fifth portions of the tube being in forcible contact with inner walls of the respective second and fifth portions of the flange, portions of said third portion of the tube adjacent the annular land being in forcible contact with said annular land, portions of said third portion of the tube adjacent the annular grooves extending into said annular grooves, said fourth portion of the tube being in forcible contact with the annular rear land, and said sixth portion of the tube extending outwardly from the flange.

4,076,288

ZERO SPEED SENSING SAFETY LATCH APPARATUS

Christopher Morrison Schwab, Cupertino, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Apr. 19, 1976, Ser. No. 678,019
Int. Cl.² E05C *3/14*
U.S. Cl. 292—113 **9 Claims**



1. A safety latching apparatus for use with a cover enclosing a machine having a movable member, said apparatus comprising:

a latch member mounted on one of said cover and said machine and movable between a locked position and an unlocked position; and

an elongated control element having one end interacting with said latch member and the other end located adjacent said movable member, said control element having a single generally uniform elongated configuration between said one end and said other end, said control element movable between a first and a second engaging position with said movable member, said other end of said control element engaging said movable member, said other end being generally rigid when a force is exerted in substantially a longitudinal direction with said other end, said other end being deflective when a force is exerted in a generally transverse direction to the longitudinal direction of said other end, said movable member when stationary blocking longitudinal movement of said other end of said control element to said second position to allow said latch member to move to said unlocked position, said movable member when moving exerting a transverse force on said other end of said control element and deflecting said other end of said control element as said control element moves to said second position to prevent said latch member from moving to said unlocked position.

4,076,289

LOCK FOR A SLIDABLE DOOR

James Samuel Follows, and Gerhard Stanley Bergen, both of Surrey, Canada, assignors to Vanguard Plastics Ltd., Canada

Filed Sep. 22, 1976, Ser. No. 725,517
Int. Cl.² E05C *3/08*
U.S. Cl. 292—226 **10 Claims**

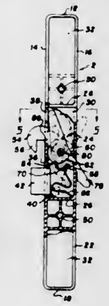
1. A lock for a slidable door comprising:

a elongated body having first and second side walls, a first end wall and a second end wall, the side walls and end walls defining a door-contacting base and a top, a catch compartment formed integrally in the elongated body by: (a) cross walls spaced from the end walls and joining the first and second side walls and (b) an upper wall adjacent the top of the elongate body, and a door handle for opening or closing the door;

a back plate to close the catch compartment;

a catch opening in a first side wall of the catch compartment;

a pivotable hub borne by aligned bearing means in the back plate and the catch compartment;



a catch mounted on the hub and reciprocable with the hub between a lock position in which the catch projects through said catch opening and an unlock position in which the catch is within said catch compartment;

means to permit selection of the lock or unlock position of the catch, and

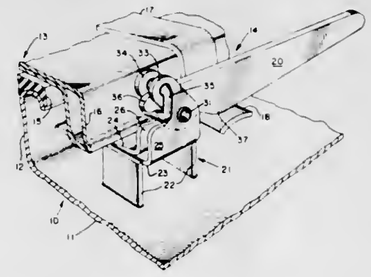
means to maintain the catch in the selected position.

4,076,290

HATCH COVER LOCKING MEANS

Theodore J. Sweger, Lake Worth, Fla., assignor to Illinois Railway Equipment Co., Chicago, Ill.

Filed Mar. 19, 1976, Ser. No. 668,465
Int. Cl.² E05C *3/04*
U.S. Cl. 292—256.5 **2 Claims**



1. In lock means for locking down in its closed position over an upstanding hatchway in the roof of a hopper car a hatch cover that is hinged at one side of said hatchway, said lock means having, a lock strap mounted on said hatch cover and a press-down arm projecting laterally over said roof on the side of the hatchway opposite said hinged side of said hatch cover when the latter is in its closed position, an upstanding bifurcated support for an operating lever mounted on said roof adjacent one side of said press-down arm when said latch cover is closed, and an operating lever pivotally mounted between the sides of said bifurcated support in such manner that in the locked position the underside of said lever presses down on said press-down arm and the handle portion of said lever extends in spaced relationship over said roof, the improvement comprising, the upper end of said bifurcated support projecting above the pivot axis of said lever, a clevis pivotally mounted on said upper end of said bifurcated support, and the end of said lever opposite said handle end having

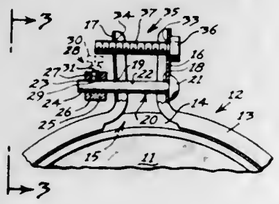
a hook formation thereon projecting through said clevis and engaging the bight thereof when said clevis is turned down and said lever is in the locked position, said lever being released from its locked position by pressing down on said handle thereof thereby simultaneously raising said hook formation sufficiently to allow said clevis to be turned up and thereby released from hooking engagement under said hook.

4,076,291

TAMPER-RESISTANT ELECTRIC METER SEALING RING

William M. Pope, 748 Newberry Road, Nashville, Tenn. 37205, and William M. Pope, Jr., 923 Parrish Road, Knoxville, Tenn. 37919

Filed Dec. 1, 1976, Ser. No. 746,315
Int. Cl.² B65D *45/32, 55/02*
U.S. Cl. 292—256.67 **3 Claims**



1. A tamper-resistant sealing ring assembly for an electric meter, comprising:
(a) a sealing ring member of a very hard material having a rim adapted to couple the cover of an electric meter to the socket for the meter,
(b) said sealing ring member having an opening in its rim defined by a pair of opposed, spaced, elongated ears projecting substantially radially outward from said rim,
(c) each ear having a uniform rivet hole extending therethrough adjacent said opening, said rivet holes being axially aligned,
(d) an elongated rivet of very hard material having a head, a shank longer than the normal spacing between said rivet holes, and a free
(e) said shank extending through said holes so that said head is held against one ear while said free end projects substantially beyond the hole in said opposite ear,
(f) a sleeve having a radial set screw hole and fitting over said free end and upon the portion of said shank projecting beyond said opposite hole,
(g) a shear-head set screw received in said set screw hole sufficiently to bear against said shank, the head of said set screw having been sheared off so that the radial outer portion of said set screw is substantially flush with said sleeve to hold said rivet in the holes of said ears, and
(h) said sleeve being fixed upon said shank close enough to the adjacent ear, and said rivet in said rivet holes being close enough to said opening, that said sealing ring member cannot be deformed sufficiently to be removed from said electric meter.

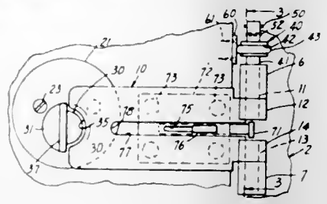
4,076,292

KEY ACTUATED AUXILIARY DOOR LOCK

Brooks Walker, 1280 Columbus Ave., San Francisco, Calif. 94133

Continuation-in-part of Ser. No. 563,570, Mar. 31, 1975, Pat. No. 3,971,238, Ser. No. 523,199, Nov. 13, 1974, Pat. No. 3,971,582, and Ser. No. 530,686, Dec. 9, 1974, Pat. No. 3,980,330. This application Oct. 16, 1975, Ser. No. 622,963
Int. Cl.² E05C *17/04*
U.S. Cl. 292—262 **2 Claims**

1. In a door structure that includes a frame, and a door having a hinge edge and an opposite latch edge, a safety lock for holding said door against opening comprising:
an elongated door holding member swingably supported on said frame adjacent said latch edge of the door and adapted to be swung from an inoperative position adjacent said frame to an operative position alongside the inner face of said door,



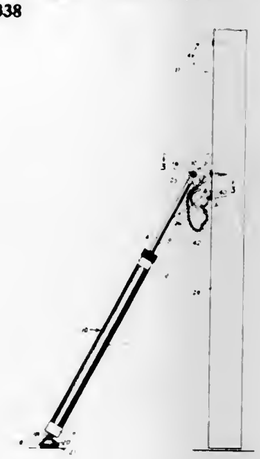
a catch mounted on said door and adapted to be moved from an unlocked position to a locked position for holding said door holding member relative to said door to prevent opening movement of said door,
a wheel rotatably mounted relative to said frame and connected to said member, and
driving means on said door engageable with said wheel for rotating the latter during the closing movement of said door for swinging said member to operative position.

4,076,293

DOOR SECURITY STRUT

Joel Valles, 3601 W. 119th St., Alsip, Ill. 60658

Continuation of Ser. No. 479,649, Jun. 17, 1974, abandoned. This application Oct. 30, 1975, Ser. No. 627,219
Int. Cl.² E05C *17/50*
U.S. Cl. 292—338 **1 Claim**



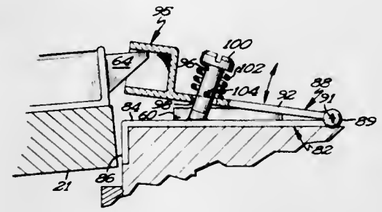
1. A door security strut comprising an elongated member having first and second opposite sides that are substantially straight and parallel, said member including a plate rigid with the member and extending radially from said first side, a bracket having a mounting portion adapted to be attached to a door for mounting the bracket in a fixed position on the door, said bracket having a pair of parallel side portions projecting outwardly from said mounting portion, means for attaching the member to the side portions in a first fixed non-yielding angular position relative to the bracket with the member extending downwardly and outwardly of the bracket, said attaching means including a first pivotal connection between an end of the member and said side portions, and a second connection between said plate and bracket, said second connection being spaced downwardly from said pivotal connection and comprising openings through said plate and said side portions and a locking pin insertable with a close fit through said openings to fix the plate in relation to the bracket, the member having means thereon adapted to engage a floor when the member is in said fixed angular position, said side portions being spaced apart to receive the member therebetween and to also receive the plate therebetween when the member is in said non-yielding position, said side portions being connected by a transverse portion, said plate extending toward the mounting portion in said non-yielding position of said member, said transverse portion being at the upper end of the side portions and spaced from said first pivotal connection in a direction toward said mounting portion to thereby permit the member to be swung about said first pivotal connection from said first non-yielding position to an upward substantially vertical storage position in which the plate extends in a direction away from said bracket and said second side of the member is outwardly spaced from the transverse portion whereby the plate and the member are out of contact with the transverse portion in said upward storage position of said member.

4,076,294

IMPACT ABSORBING LOCK APPARATUS

Bradley C. Holmberg, 2628 30th Ave. South, Minneapolis, Minn. 55406

Filed Aug. 7, 1975, Ser. No. 602,827
Int. Cl.² E05C *21/00*
U.S. Cl. 292—340 **15 Claims**



1. An impact absorbing lock apparatus usable with the latch bolt of a swingable door and mountable on a door jamb to protect against an impulse force applied to the door to force open the door, comprising:
a mounting bracket attachable to the door jamb adjacent the latch bolt;
a keeper capable of retaining the latch bolt;
means mounting said keeper for movement relative to said mounting bracket, permitting said keeper to move along a path between a rest position closely adjacent said mounting bracket and a displaced position;
impact absorbing means resisting movement of said keeper from said rest position to said displaced position and urging said keeper from said displaced position to said rest position to thereby absorb impulse forces applied to the door and the keeper; and
said means mounting said keeper for movement including a first guide rod extending outwardly from and fixed relative to said mounting bracket, said keeper being slidably mounted on said guide rod.

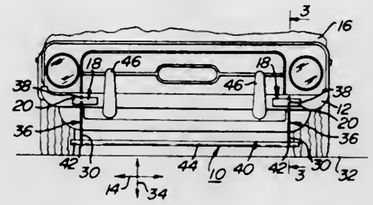
4,076,295

PEDESTRIAN CONTACT GUARD

David Gutman, 503 Reed St., Philadelphia, Pa. 19147

Filed Apr. 8, 1976, Ser. No. 674,931
Int. Cl.² B60R *21/14*
U.S. Cl. 293—71 R **1 Claim**

1. A pedestrian contact guard adapted to be mounted to a transversely directed bumper comprising:
(a) bumper securing means rigidly secured to said bumper, said bumper securing means defining a pair of transversely displaced block members mounted to said bumper,
(b) vertical support means extending in a vertically downward direction, said vertical support means including a pair of transversely displaced vertically directed column members each releaseably secured to a respective one of said block members, each of said column members being securely fastened on a first end thereof to said bumper securing means; and,



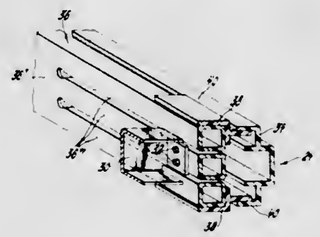
(c) pedestrian contact means being secured to each of said column members of said vertical support means on a second end thereof, said pedestrian contact means adapted in contour to extend forward of said bumper for initial contact of said pedestrian, said second end of said vertical support means passing through said pedestrian contact means and is secured thereto, said column members being deformably displaced when contacted with a force load in the approximate range of 50–100 pounds thereby minimizing injury to said pedestrian when impacted by said pedestrian contact means.

4,076,296

ENERGY ABSORBING BUMPER

Edwin D. Ditto, Bloomfield Hills, and A. Hadi Kobaisi Abu Akeel, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 19, 1976, Ser. No. 706,850
Int. Cl.² B60R *19/08*
U.S. Cl. 293—71 R **2 Claims**



1. A lightweight bumper structure for a motor vehicle having multiple elongated elements which are elastically deflected to absorb energy resulting from low magnitude impact before their transmission to the vehicle frame, comprising: first and second elongated beam members extending laterally in a generally horizontal direction across the end of the vehicle; both opposite ends of said second beam being separated into adjacent first and second axially extending end portions joined at an inward location toward the midportion of said second beam member to permit individual flexing of said portions out of the beam plane; mounting means between the vehicle frame and said first end portions; coupling means between said first beam member and said second end portion of the second beam member to normally space said beam members and yieldably mount said first beam member with respect to said second beam member by the allowed flexure between said first and second end

portions; said beams being of strong, lightweight material, such as fiberglass, which elastically deflects when subjected to relatively low magnitude impacts, thus absorbing energy in a retrievable manner so that after the impact, beam members return to their original configuration; said first beam member being arranged forward of said second beam member so as to simultaneously react by deflection to impact forces and then transmit a reaction force on said second beam member for further absorption of the impact forces.

4,076,297

DEVICE FOR HANDLING CAKE LAYERS

Paula M. McFarland, 534 N. Grand W., Springfield, Ill. 62702

Filed Aug. 20, 1976, Ser. No. 716,226
Int. Cl.² A47J *43/28*
U.S. Cl. 294—7 **9 Claims**



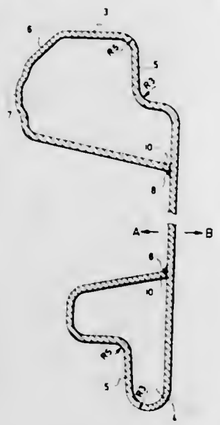
1. A device for handling cake layers or the like, comprising: a first handle, at least six parallel and coplanar tines rigidly and freely so held by said first handle, and a second removable handle bridging the free ends of said tines, said second handle having spaced sockets alignable with, and for quickly and easily receiving and releasing, said free ends.

4,076,298

VEHICLE SIDE WALL AND METHOD OF MAKING SAME

Lubomir Hanzelka; Josef Vidlar, and Ladislav Neuman, all of Koprivnice, Czechoslovakia, assignors to Tatra, narodni podnik, Koprivnice, Czechoslovakia

Division of Ser. No. 527,013, Nov. 25, 1974, abandoned. This application Jun. 2, 1976, Ser. No. 691,976
Claims priority, application Czechoslovakia, Nov. 23, 1973, 8095/73
Int. Cl.² B62D *27/00*
U.S. Cl. 296—28 R **3 Claims**



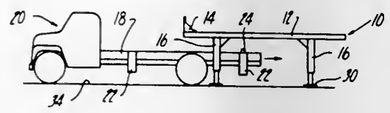
1. In a one-piece vehicle sidewall comprising a central elongated plate portion bent around at its respective opposite ends into unitary, substantially closed upper and lower strengthening borders having respectively, upwardly and downwardly facing broad surfaces, the upper border being provided in a first localized region of the broad surface thereof with a concave portion having a first predetermined radius and an adjacent convex portion having a second predetermined radius, the lower border being further provided in a second localized region of the broad surface thereof with a convex portion having said first radius and an adjacent concave portion having said second radius, the first and second localized regions being respectively located in complementary fashion on the respective upper and lower borders to permit longitudinal stacking of a plurality of the side walls with the broad surfaces of the upper and lower strengthening borders of the respective side walls in mating engagement with each other.

4,076,299

DETACHABLE TRUCK BODY

Thomas B. Dalton, Muskegon, Mich., assignor to Westran Corporation, Muskegon, Mich.

Filed Jun. 18, 1976, Ser. No. 697,485
Int. Cl.² B60P *1/64*
U.S. Cl. 296—35 A **22 Claims**



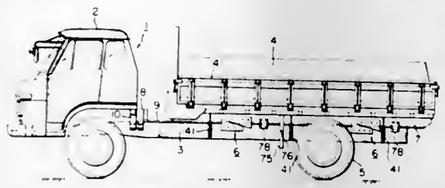
1. A detachable truck body adapted to be mounted onto the bed of a truck comprising:
a substantially horizontal base,
at least one support leg;
an interdigital articulated hinge for pivotally securing said support leg to said base, said support leg being movable between a first and second pivotal position, wherein in said first pivotal position each of said support legs extends downwardly and laterally outwardly from said base to engage a ground supporting surface to maintain said base in an elevated position, wherein in said second position each of said support legs are in a substantially horizontal position adjacent and underneath said base,
first means for locking each of said support legs in said first pivotal position, and
second means for locking each of said support legs in said second pivotal position.

4,076,300

MOTOR TRUCK

Akira Yamanaka, Yokohama, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 503,398, Sep. 5, 1974, abandoned. This application Jul. 28, 1976, Ser. No. 709,311
Int. Cl.² B62D *27/06*
U.S. Cl. 296—35 R **8 Claims**



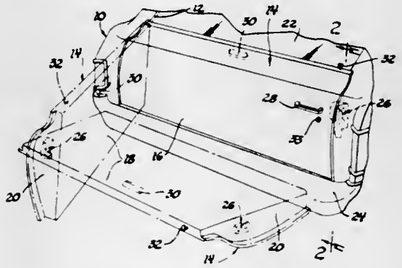
1. A motor truck comprising a frame device, a body device movable relative to the frame device, bolt members extending vertically at opposite sides of said frame and body devices to hold said device together, a die member being fitted on a stepped diameter portion at one respective end of each of the bolt members and having a periphery that is arcuate in section and in operative contact with one of said devices, and an energy transforming means including a first plate member fixed to one of said devices and having a first parabolic sliding surface and a second plate member fixed to the other of said devices and having a second parabolic sliding surface, which slidably contacts with at least a portion of said first sliding surface of said first member, said first sliding parabolic surface including a forwardly projecting, substantially horizontal, gradually descending leading portion in limited engagement with said second parabolic sliding surface; said body device being moved upwardly by said energy transforming means when a longitudinal impacting force of or greater than a predetermined value is applied, whereby said stepped diameter portion of the bolt member is pulled through the die to cause its deformation to absorb kinetic energy of the body device.

4,076,301

VEHICLE TAILGATE

Bela Gergoe, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 2, 1977, Ser. No. 764,867
Int. Cl.² B60J *5/00*
U.S. Cl. 296—50 **4 Claims**



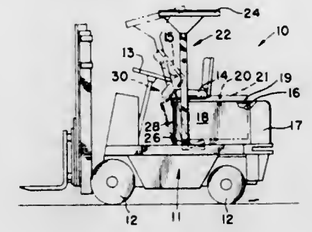
1. In a vehicle with a tailgate-type door, alternately pivotal about a substantially vertical axis in a door mode of operation and about a substantially horizontal axis in a drop gate mode of operation, having door supports including a multi-axis hinge at one corner of the door, and first and second alternately releasable hinge-latches, one of each located at door corners adjacent to the multi-axis hinge, a main latch assembly for securing the door at a corner location diametrically opposite the multi-axis hinge and being releasable during both modes of operation while simultaneously releasing either of the two hinge-latches, comprising:
a pivotally mounted latching member movable between a door unlatched position in which the door is open, and a door latched position in which a portion of the vehicle is engaged to maintain the door in a closed condition,
latch release means including an arm pivotal between a first position engaging said latching member to hold it in its latched position and a second position out of engagement with said latching member, permitting it to rotate to its unlatched position,
a pivotally mounted hinge-latch release lever operably connected to one of said hinge-latches and movable between latched and unlatched positions for releasing the one hinge-latch, thereby permitting the tailgate door to open in the door mode of operation,
connecting means between said hinge-latch release lever and said latch release means to produce unlatching movement of the latch release arm as the hinge-latch release layer rotates from its latched to its unlatched operative position,
a lever supported for pivotal movement on said hinge-latch release lever about an axis offset from the rotational axis of said hinge-latch release lever and adapted to be actuated by a handle mounted on said door, thereby permitting independent rotation of said handle-actuated lever with respect to said hinge-latch release lever without corresponding rotation of said hinge-latch release lever and said connected latch release means,
selectively operable lock means including a member pivotally moved to an unlocked position into engagement with said handle-actuated lever and in alignment with the axis of said hinge-latch release lever to produce simultaneous rotational movement of said handle-actuated lever and said hinge-latch release lever, thereby moving said latch release means to its unlatched position.

4,076,302

OPERATOR'S SEAT ASSEMBLY

Frank Robert Sable, Wickliffe, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Jul. 19, 1976, Ser. No. 706,347
Int. Cl.² B60N *1/02*
U.S. Cl. 296—65 R **9 Claims**



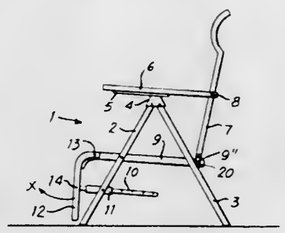
6. In an operator's seat assembly for use in industrial vehicles having a frame,
a seat, and
upstanding support means connected to said frame and to said seat for supporting said seat on said frame, the improvement comprising:
pivot means between said seat and said support means for pivotally securing said seat to said support means so as to allow rotation of said seat about said pivot means, and
biasing means engaging said seat and said support means for urging said seat toward the front of said frame an amount sufficient to clear an opening normally partially covered by said seat when said seat is occupied by an operator.

4,076,303

EASY CHAIRS

Shalom Korenblit, Shderot Hayeled, Ramat Gan, Israel

Filed Jul. 14, 1976, Ser. No. 705,130
Claims priority, application Israel, Jul. 30, 1975, 47839
Int. Cl.² A47C *1/034*
U.S. Cl. 297—30 **1 Claim**



1. In an easy chair having two pairs of legs, the two legs in a pair being hingedly connected at their upper ends to form an inverted V - like structure, a seat being positioned between the two pairs of legs, a back support being connected to the seat to be angularly adjustable in relation to the seat, a support for the legs of a person occupying the chair being provided, such

support being swingable relative to the seat, the improvement wherein said leg support comprises a main U-shaped frame part which is swingably connected to the seat frame of the chair, the ends of said U-shaped frame part being bent through approximately 90° at the connection to the seat frame, and a pair of extensible struts which are hingedly connected to the front legs of the chair and to the said frame part of the leg support, each of said extensible struts comprising a sleeve pivotally connected to the front leg of the chair, a strut telescopically slidable within said sleeve, said strut being pivotably connected to said U-shaped frame part, a series of spaced locking slots formed in said strut, a crosswise extending slot in said sleeve, and a locking bar pivotally connected to said sleeve, said locking bar entering said crosswise extending slot in said sleeve and engaging one of said locking slots in said strut, whereby said strut is locked relative to said sleeve, whereby in position of use of the leg support, the main-horizontal-portion of said frame part is locked in position at a higher level than the seat.

4,076,304

ERECTING SEAT STRUCTURE TO ASSIST INVALIDS FROM SEATED TO STANDING, UPRIGHT POSITION, PARTICULARLY ERECTING WHEELCHAIRS

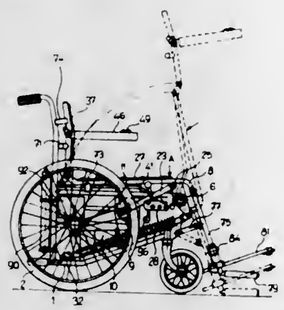
Conrad Deucher, Uster, Switzerland, assignor to Valutec AG, Uster, Switzerland

Filed Jan. 24, 1977, Ser. No. 762,204

Claims priority, application Switzerland, Jan. 30, 1976, 1184/76

Int. Cl.² A61G *5/00*

U.S. Cl. 297—45 **17 Claims**



1. Erecting wheel chair to assist users, particularly invalids, from seated to upright, standing position comprising

a frame (**1**) including laterally spaced frame members (**1*a*, 1*b***);

a seat (**27**) having a seating surface;

pivot means (**6, 7**) defining a seat pivot axis connecting the frame and the seat and permitting pivoting of the seat from an essentially horizontal end position to an essentially vertical end position;

a seat erecting mechanism to move the seat between horizontal and vertical, erected position having

motor means (**9, 10**) having an essentially uniform output speed,

a drive shaft (**12**) extending between the spaced frame members and driven from the motor means (**9, 10**), and

two crank drives (**11, 23; 13, 24**), respectively coupled to the drive shaft (**12**) at adjacent ends thereof and connected to the seat (**27**) to pivot the seat about its seat pivot means, and positioned to provide, with essentially uniform speed of the drive shaft (**12**), an erecting or lowering movement of the seat which is non-linear and has a time-displacement function which is essentially sinusoidal to start movement of the seat from one end position slowly then accelerate movement of the seat and, as the seat reaches its other end position to again move the seat slowly and thereby provide gradual smooth transition of the seat from stopped state at the end positions with an intermediate movement a speed which is high with respect to the speed of the seat when adjacent the limiting, end position;

a back rest (**37**);

means (**41, 41'**) coupling the seat to the backrest to move conjointly with said temporally non-linear movement of the seat including

parallelogram link means (**8, 41, 42**) and a backrest pivot (**41'**) maintaining the backrest (**37**) in essentially vertical position at all intermediate locations between the end limiting positions of the seat, the backrest pivot means (**41'**), being located above the level of the seat by a distance corresponding approximately to the height of the hip joint above the seating surface of the body of the user, so that, upon change of the seat from seating position to erected position, substantial relative movement between the body of the user and the seat as well as the backrest are avoided, and

a footrest (**75, 76**) linked to the seat (**27**), the link between the footrest and the seat including a footrest pivot (**86**) located below the level of the seat and arranged to prevent substantial relative movement between the body of the user and the footrest during said temporally non-linear movement of the seat upon change of the position of the seat between seated and standing, upright position, said footrest including

a link element (**77, 78**) linking the footrest pivot (**86**) to the frame, said link element being connected to the frame (**1**) behind the front edge of the seat and below the seating surface and being pivoted to the frame (**1**), and

floor support means (**79, 80**) movably linked to the seat to move upwardly when the seat is in a horizontal, seating position and to move downwardly when the seat is its end limit erected position to provide a solid ground support when the chair is erected.

4,076,305

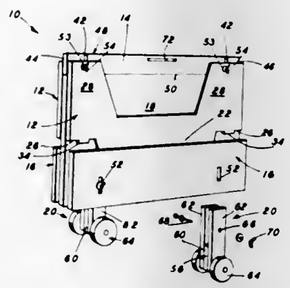
KNOCK-DOWN MOBILE PICNIC TABLE AND BENCH ASSEMBLY

Dwayne Sullivan, Markedtree, Ark., assignor to Lawrence Peska Associates Inc., New York, N.Y.

Filed Mar. 29, 1977, Ser. No. 782,514

Int. Cl.² A47B *3/06*

U.S. Cl. 297—157 **7 Claims**



1. A knock-down mobile picnic table and bench assembly comprising in combination:

a pair of leg members each of which includes a pair of medial oppositely extending horizontal bench-support shoulders, each of said shoulders having at least one upwardly projecting tab element, an upper table top-support edge surmounting each of said leg members, at least one upwardly projecting tab element integral with each of said table top-support edges, a vertical notch in each of said leg members extending inwardly from the table top-support edge thereof, and a pair of spaced apertures in each said leg member adjacent the edge, parallel to and remote from said table top-support edge;

an elongated ridge member having a notch formed therein extending inwardly from a longitudinally extending face adjacent each of the opposed ends thereof, said notches being of sufficient width to permit interlocking of the ridge member with said leg members such that the opposed longitudinally extending face is substantially flush with the table top-support edges of said leg members;

a pair of elongated bench members each of which includes apertures formed therein of such dimensions and at such locations as to be cooperable with the corresponding tabs on the shoulders of said leg members such that said bench members may be mounted in releasable interlocking relation with said shoulders;

a table top dimensioned so as to be superimposed upon said leg members and having apertures formed therein of such dimensions and at such locations as to be cooperable with corresponding tab elements on the table top-support edges of said leg members, whereby the table top may be mounted in releasable interlocking relation on said leg members;

the apertures in said bench members being alignable with corresponding apertures in said table top and the apertures in said leg members being alignable with the notches in said ridge member such that said bench members, leg members, table top and ridge member may be positioned in face-to-face stacked relation to receive fastening means through the aligned apertures and notches and thereby join such components releasably in a unitary stacked assembly; and

a pair of wheel assemblies adapted to rollably support the stacked assembly and be releasably secured to said stacked assembly.

4,076,306

VEHICLE SEAT REST

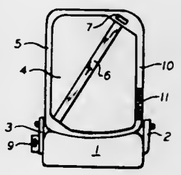
Roland Satzinger, Hammelburger Str. 21a, D-8731 Euerdorf, Germany

Filed Sep. 9, 1976, Ser. No. 721,722

Claims priority, application Germany, Oct. 15, 1975, 2546157

Int. Cl.² B60R *21/10*

U.S. Cl. 297—216 **4 Claims**



1. In a vehicle seat rest having a shoulder belt, one end of which is fastened to said rest, said belt running obliquely across said rest to a belt lock on the opposed side thereof, the improvement wherein said seat rest has a rectangular frame including two vertical sides, means disposed on one vertical side for effecting deformation thereof in response to a substantially perpendicular force applied to the opposite vertical side and means comprising a rigid cross-stay running from the region of the point to which said belt is attached obliquely in the same direction as said belt to the region of said belt lock for both preventing a reduction in the distance between the fastening points of the shoulder belt and maintaining a constant angle of application of the belt to the held body during application of the force and deformation of the one vertical side.

4,076,307

SAFETY CHAIR FOR A CHILD FOR USE IN MOTOR VEHICLES

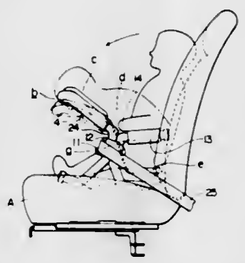
Kunio Nanba, and Taro Ogawa, both of Kurashiki, Japan, assignors to Namba Press Kogyo Kabushiki Kaisha, Kurashiki, Japan

Filed Sep. 7, 1976, Ser. No. 720,591

Claims priority, application Japan, Jan. 23, 1976, 51-7067[U]

Int. Cl.² A47D *1/10*

U.S. Cl. 297—250 **5 Claims**



1. A safety chair for a child for use in motor vehicles arranged to be secured onto the passenger seat of the vehicle by means of a safety lap belt and comprising:

a chair body consisting of a portion of soft material for absorbing a shock exerted to the upper torso of the child, said portion of soft material having some hardness and having a narrower width in the middle thereof, a portion of cushion material for absorbing a shock exerted to the child's head, said portion of cushion material being provided at the front of said portion of soft material, and a seat plate having a proper hardness and provided at the rear of said portion of soft material;

a frame for supporting the chair body having a front frame member and a rear frame member, firmly secured at the intermediate portions thereof with each other, said front frame member comprising an upper front portion inclining in the forward and the upward directions from said intermediate portion, a lower front portion and leg portions extending slantingly in the forward and the downward directions from said intermediate portion, each connected in this order, said rear frame member comprising armrests inclining slightly in the upward direction and extending in the rearward direction from said intermediate portion and leg portions extending in the rearward direction from said intermediate portion, each connected in this order, said upper front portion having a weakened portion against mechanical strength so that the portion is bent in the downward direction when shocks are exerted thereto; and

spaces into which both legs of the child are inserted respectively, formed between said narrow portion of soft material and both sides of the frame;

said head-shock absorbing portion of the chair body being attached to the upper front portion of the frame, said seat plate being attached to the lower portion of the rear frame member of the frame.

4,076,308

CHAIR

Siegfried Slabon, Salzhemmendorf, and Klaus Franck, Elze, both of Germany, assignors to Wilkhahn, Wilkening & Hahne, Eimbeckhausen, Germany

Filed May 19, 1977, Ser. No. 798,493

Claims priority, application Germany, May 22, 1976, 2623024

Int. Cl.² A47C *1/022*

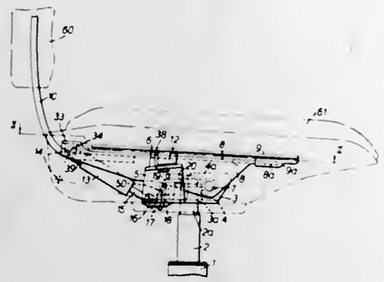
U.S. Cl. 297—313 **9 Claims**

1. In a chair,

leg means,

a support plate carried by the leg means,

an elongate member having a front edge portion, an intermediate portion, and a rear edge portion,
pivot means pivotally supporting the intermediate portion of the elongate member to the support plate,
a back rest secured to the rear edge portion of the elongate member,
a piston and cylinder assembly coupling the rear edge portion of the elongate member to the support plate and being



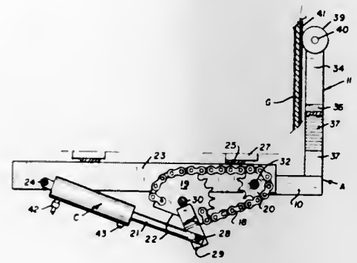
operable to allow the inclination of the back rest to be varied,
a seat portion bearing plate,
coupling means pivotally securing the bearing plate along the front edge of the elongate member, and
resilient pad means slidably mounted on the support plate to carry an intermediate portion of the bearing plate, the resilient pad means being slidable to vary the inclination of the bearing plate with respect to the support plate.

4,076,309
SEAT RECLINER INCLUDING ADJUSTMENT MECHANISM AND LATCH
Russell F. Chekirda, and Randall T. Murphy, both of Morristown, Tenn., assignors to Lear Siegler, Inc., Morristown, Tenn.
Filed Jan. 13, 1977, Ser. No. 758,964
Int. Cl.² B60N *1/02*
U.S. Cl. 297—363 **8 Claims**



1. A seat recliner for adjustably controlling the angular orientation of a seat back relative to an associated seat cushion about a tilting axis, the recliner comprising: a seat cushion arm for securing the recliner to the seat cushion; a seat back arm for securing the recliner to the seat back and being pivotally connected to the seat cushion arm about the tilting axis; an adjustment mechanism including a positioning member pivotally movable relative to the arms about the tilting axis; the adjustment mechanism also including a locking dog mounted on one of the arms for movement between locking and nonlocking positions relative to the positioning member; said locking dog and positioning member having teeth that are interengaged in the locking position of the dog to adjustably locate the positioning member relative to the one arm about the tilting axis; and a latch for selectively securing the other arm to the positioning member, the latch including a latch member mounted on the other arm and having a latching position where the latch member extends between the positioning member and the other arm to locate the seat back arm in a tilted position corresponding to the adjusted position of the positioning member, and the latch member having a nonlatching position that releases the other arm from the positioning member and thereby allows tilting forward movement of the seat back arm to an easy-enter position, said other arm including two plates fixed to each other in a spaced relationship with the latch member of the latch mounted therebetween.

4,076,310
LIFT FOR TRUCK GATE
Howard G. Schwalm, 26697 Weld Co. Road #15, Loveland, Colo. 80537
Filed Jan. 24, 1977, Ser. No. 762,199
Int. Cl.² B60P *1/26*
U.S. Cl. 298—23 MD **13 Claims**

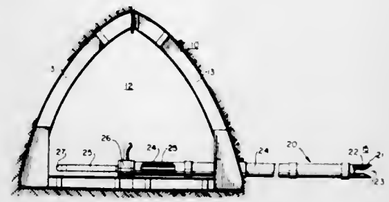


1. A mechanism for lifting the hinged gate of a truck or trailer body and the like, comprising:
an actuator means carried underneath the body of the truck alongside the gate;
a lift arm pivotally mounted upon said actuator means below the hinge area of said gate, to be pivoted upwardly by the actuator means to move said gate from a lower open position to an upper closed position;
said actuator means including:
a smaller sprocket means connected to the pivotal mounting of said lift arm;
a larger sprocket means connected with the smaller sprocket means having a greater pitch diameter than said smaller sprocket means; and
thrust means for pivoting said larger sprocket means through a predetermined arc, thereby moving said smaller sprocket through a greater arc which is sufficient to move said lift arm from underneath the body of the truck into engagement with said gate and thence moving said gate upwardly to an upper closed position.

4,076,311
HYDRAULIC MINING FROM TUNNEL BY RECIPROCATED PIPES
Robert W. Johns, 349 Ashley Crescent SE., Calgary, Alberta, Canada
Filed Jan. 28, 1976, Ser. No. 653,037
Claims priority, application Canada, Jan. 29, 1975, 218912
Int. Cl.² E21C *45/00*
U.S. Cl. 299—2 **11 Claims**

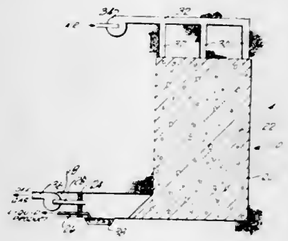
1. A method for the underground mining of subsidable mineral deposits comprising:
(a) providing at least one longitudinally extending tunnel within said subsidable deposit and adjacent the base thereof;
(b) inserting a plurality of hydraulic excavators a predetermined distance laterally into said deposits from at least one side of said tunnel, each of said excavators being positioned such that during operation, there is fluidic interaction between heads of adjacent excavators;

(c) commencing mining of said deposit at a location remote from said tunnel by fluidizing a zone of said deposit adjacent each said excavator head, and withdrawing mined material from said zone by suction;
(d) independently advancing and retracting each of said excavator heads, by programmed reciprocational movement thereof, thus expanding the fluidized zone over a predetermined distance, while permitting subsidence of minable material into said mining zone;



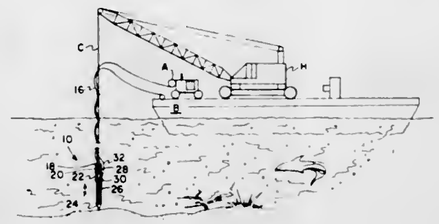
(e) continually extracting samples of mined materials from the material produced by each said excavator for determining the presence of any overburden therein;
(f) relocating each said excavator head by the retraction of each said excavator a predetermined distance towards said tunnel following evidence of overburden in said samples and continuing mining at the new location in the manner as originally done; and
(g) terminating excavation by each said excavator when said mining zone lies adjacent said tunnel.

4,076,312
METHOD AND APPARATUS FOR RETORTING OIL SHALE AT SUBATMOSPHERIC PRESSURE
Chang Yul Cha, Bakersfield, Calif.; Richard D. Ridley, and Robert S. Burton, III, both of Grand Junction, Colo., assignors to Occidental Oil Shale, Inc., Grand Junction, Colo.
Continuation-in-part of Ser. No. 492,823, Jul. 29, 1974, abandoned. This application Jul. 30, 1976, Ser. No. 710,108
Int. Cl.² E21B *43/18, 43/24, 43/26*; E21C *41/10*
U.S. Cl. 299—2 **16 Claims**



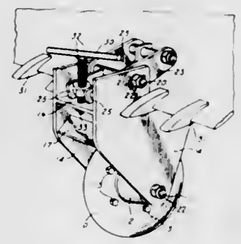
4. In a process for retorting oil shale in situ wherein a subterranean cavity is formed in a formation containing oil shale, the formation contains underground workings, the cavity contains a fragmented permeable mass of formation particles containing oil shale and the particles containing oil shale in the cavity are burned and produce product gases wherein the improvement comprises pumping gases from the bottom of the cavity at a rate sufficient to reduce the pressure within all parts of the cavity to a pressure below the ambient pressure within underground workings adjacent the cavity for preventing leakage of product gases from the cavity into such underground workings.

4,076,313
UNDERWATER RECOVERY APPARATUS
Frank P. Sperandeo, III, 3020 Autumn Branch Lane, Ellicott City, Md. 21043
Filed Aug. 20, 1976, Ser. No. 716,077
Int. Cl.² E02F *5/00*
U.S. Cl. 299—8 **8 Claims**



1. In a device for submersion in a sea bottom or the like and retrieval therefrom to secure items from the sea bottom, including: an elongate shank having an upper and a lower end, means for attachment proximate the upper end, a plurality of arms in radial array about the shank, each arm having a first end and a second end, means pivoting the first end of each arm proximate the lower end of the shank, whereby the arms can pivot from radial position to position folded along the shaft; means flexibly connecting the second end of each arm to the shank, a net supported by the arms, means for forcing the device into the sea bottom and means for spreading all said arms and net and screening material from the sea bottom on said retrieval, the improvement comprising: the means for forcing including means for vibrating said device the lower end of the shank having a conical header pointing downwardly, and means around the conical header for ejecting compressed gas downwardly for coacting with the conical header in penetrating the sea bottom.

4,076,314
PAVEMENT CUTTING WHEEL MOUNTING FOR EARTH MOVING EQUIPMENT
Nicholas Anthony Dodich, Evergreen, Colo., assignor to Over-Lowe Company, Inc., Englewood, Colo.
Filed Oct. 6, 1976, Ser. No. 729,957
Int. Cl.² E01C *23/09*
U.S. Cl. 299—40 **10 Claims**



1. A pavement cutting assembly for attachment to the earth engaging tool of a power driven earth working machine or the like, comprising:
a. a cutter wheel,
b. a supporting structure including means for mounting said wheel for free rotation about a horizontal axis,
c. means for detachably securing said structure to the earth engaging tool or the like of a power driven earth working machine,
d. said securing means including clamping means having

portions relatively movable with respect to one another and into engagement with opposite faces of the earth engaging tool for gripping the tool therebetween, and

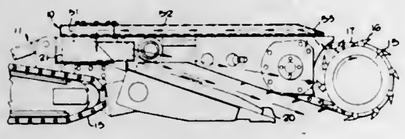
means movable relatively to said structure and positioned for engagement with the tool and tending to move upon forward movement of the tool during the cutting of pavement and to increase the effective gripping force of said clamping means.

4,076,315

DUST ABATEMENT DEVICE AND METHOD OF DUST ABATEMENT

Theodore F. Gundlach, Belleville, Ill., and Arthur L. Hawthorne, St. Clairsville, Ohio, assignors to Rexnord, Inc., Milwaukee, Wis.

Filed Aug. 5, 1971, Ser. No. 169,296
Int. Cl.² E21C *35/02*
U.S. Cl. 299—64 **3 Claims**



1. A machine and a dust abatement device, comprising:

a. a machine including a cutter head for acting on material so as to create an area of dust concentration, and

b. a dust abatement device on the machine located rearwardly of the cutter head, the device including:

1. a propulsion means including a fan and a power means for rotating the fan,

2. intake means for picking up and delivering air containing dry dust particulate from substantially the area of dust concentration to the fan,

3. a discharge outlet means,

4. means cooperating with the fan to provide a flow passage between the intake means and outlet means,

5. spray means directing liquid on the fan,

6. the fan including surfaces wetted by the liquid and located in the flow passage against which the dry dust particulate delivered to the fan impinges and is wetted to provide a slurry, and

7. the fan discharging both the cleaner air and the slurry together from the fan and flow passage and through the outlet means in a spray.

4,076,316

CONTINUOUS MINING MACHINE WITH LATERALLY MOVABLE CUTTER DRUM MEMBER

Maurice K. LeBegue, Ashland, Ky., assignor to National Mine Service Company, Pittsburgh, Pa.

Continuation of Ser. No. 552,857, Feb. 25, 1975, abandoned. This application Apr. 8, 1976, Ser. No. 675,141
Int. Cl.² E21C *25/06*
U.S. Cl. 299—64 **8 Claims**

1. A continuous mining machine comprising,

an elongated body portion mounted on means for propelling said body portion,

a boom member pivotally secured to said body portion and extending forwardly therefrom,

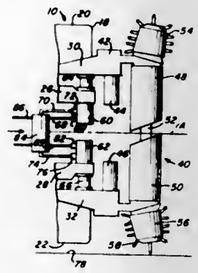
said boom member including support means positioned laterally of said boom member and extending forwardly therefrom, said support means connected to said boom member for slidable movement laterally toward and away from said boom member,

a unitary drum member rotatably supported by said support means at the forward end portion thereof transversely to said body portion for lateral movement thereto, said unitary drum member having end portions and an intermediate portion therebetween, said unitary drum member having cutting elements extending therefrom to cut a continuous kerf from the mine face,

a gathering device extending forwardly from said body portion for gathering and feeding material dislodged by said unitary drum member rearwardly from said body portion, said gathering device having side edge portions,

means to elongate said unitary drum member to an extended position, said unitary drum member in an extended position having a length greater than the width of said gathering device,

extensible means to move a portion of said support means



laterally toward said boom member and simultaneously move a second portion of said support means laterally away from said boom member, and

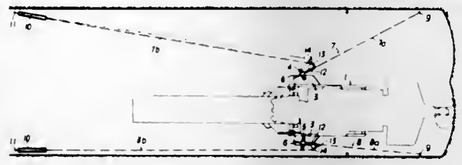
said extensible means operable upon actuation to laterally move said boom member support means and thereby laterally move said unitary drum member relative to said gathering device on said body portion to a position where a selected one of said gathering device side edges extends beyond the respective one of said unitary drum member end portions so that said gathering device side edge gathers the material dislodged by said unitary drum member end portion.

4,076,317

DEVICE FOR GUYING A MOVABLE CUTTING MACHINE

Alfred Zitz, and Herwig Wrulich, both of Zeltweg, Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Vienna, Austria

Filed Sep. 1, 1976, Ser. No. 719,655
Claims priority, application Austria, Sep. 2, 1975, 6771/75
Int. Cl.² E21C *29/08, 29/10*
U.S. Cl. 299—75 **8 Claims**



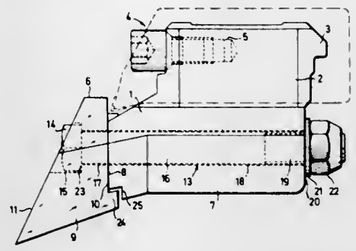
1. In combination with a cutting machine of the kind having a frame mounted on a caterpillar drive and a cutting device projecting forwardly from the frame for cutting into a mine face: a system for guying the machine in a cutting position and for moving the machine on an ascending gallery, said system comprising a driven capstan winch carried at each side of the machine and a flexible tension member having a portion of its length intermediate its ends wrapped around each capstan winch, said tension members having forward ends anchored in rock ahead of the machine and having rearward ends anchored in rock earth behind the machine.

4,076,318

CUTTER BIT ASSEMBLIES FOR COAL PLOUGHS

Alois Hauschopp, Werne, and Oswald Breuer, Dortmund-Husen, both of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Germany

Filed Aug. 30, 1976, Ser. No. 718,502
Claims priority, application Germany, Aug. 30, 1975, 2538682; Aug. 30, 1975, 2538648
Int. Cl.² E21C *35/18*
U.S. Cl. 299—91 **10 Claims**



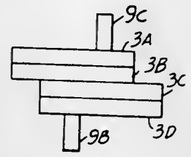
1. In a coal plough having a pocket for receiving the holder of a cutter bit assembly, the improvement comprising a cutter bit assembly having a cutter part and a holder part, the holder part having a base which is insertable into the pocket of the coal plough, and a headpiece, an elongate threaded member extending from the cutter part through the headpiece of the holder part in a direction substantially parallel to the intended cutting direction, a nut engaging on the threaded member to detachably secure the cutter part to the holder part, engaging faces on the headpiece and the cutter part which extend substantially perpendicularly to the intended cutting direction, and at least one interengaging projection and recess between the headpiece and the cutter part to secure the cutter part against rotation about the axis of the threaded member.

4,076,319

NESTED WHEEL ASSEMBLY

Brooks Walker, 807 Francisco St., San Francisco, Calif. 94109

Division of Ser. No. 582,087, May 30, 1975, abandoned, which is a continuation-in-part of Ser. No. 507,715, Sep. 20, 1974, abandoned. This application Jul. 2, 1976, Ser. No. 702,063
Int. Cl.² B60B *37/10*
U.S. Cl. 301—1 **3 Claims**



1. In an assembly of a pair of wheel structures, each including a solid wheel normally imperforate between hub and rim and an axle on which the wheel is rotatably supported and secured against removal therefrom, means for nesting said wheel structures to reduce the space occupied thereby comprising:

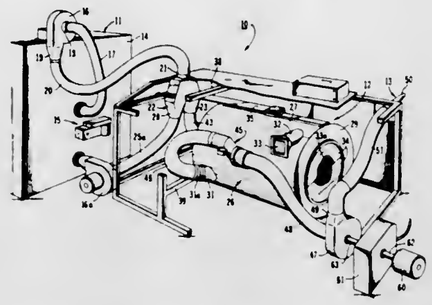
each of said wheels being formed with an aperture complementarily formed relative to an axle and positioned between its hub and rim to receive the axle of the other wheel structure therethrough with said wheels positioned in closely adjoining relationship.

4,076,320

DOWN FILLING MACHINE

David Reiss, 1315 Davenport Road, Toronto, Ontario M6H 2H4, Canada

Filed Dec. 29, 1975, Ser. No. 645,267
Claims priority, application Canada, Apr. 11, 1975, 234434
Int. Cl.² B65G *53/28*
U.S. Cl. 302—3 **8 Claims**



1. Apparatus for weighing material such as down feathers, and the like, comprising a storage bin for storing said material, a frame member, a cylindrical drum having its longitudinal axis disposed horizontally and supported from said frame member by means of first and second spaced apart parallel cantilever springs affixedly secured to said frame member and to points at the top and bottom of said drum, respectively, whereby said drum is allowed to move in the vertical direction;

said apparatus further comprising means for measuring vertical displacement of said drum and for generating output signals indicative of said displacement, transport means for transporting said material from said bin to said drum by means of a flow of air;

said drum having first and second vertical walls, a first opening in said first wall having a cross sectional area substantially smaller than the cross sectional area of said drum communicating with said transport means; and a second opening in said second wall in substantial axial alignment with said first opening, a discharge outlet opening in the cylindrical wall of said drum located in proximity of the lower edge and on one side of said drum and an air inlet opening in said cylindrical wall and on said one side of said drum located in proximity of the upper edge of said drum.

4,076,321

ELECTRONIC CONTROL SYSTEM FOR OPERATING A PNEUMATIC TRASH LINEN CONVEYING NETWORK

Nicholas Haight, Pompton Lakes, and Trygve T. Madsen, Pompton Plains, both of N.J., assignors to Eastern Cyclone Industries, Inc., Fairfield, N.J.

Filed Dec. 6, 1976, Ser. No. 747,887
Int. Cl.² B65G *51/02*
U.S. Cl. 302—27 **6 Claims**

1. A pneumatic network for conveying packages said network including:

a system of generally cylindrical ducts connected to each other for conveying the packages therethrough;

a deposit station at an entrance end of each duct for receiving and preliminarily storing the packages to be conveyed, said deposit station having an inner door for admitting the packages to the duct system;

a first collection center connected to a delivery end of the duct system for receiving a first group of packages after they have been conveyed through the duct system;

a second collection center connected to the delivery end of the duct system for receiving a second group of packages after said second group of packages has been conveyed through the duct system;

an evacuation pump connected to the duct system for drawing air through the duct system to move said first and second groups of packages toward their respective collection center;

control means for connecting all of said deposit stations, and for operating all of the deposit station doors, and for selectively directing packages of the first and second groups to their respective collection centers, said control means comprising:

sequential memory circuit means for recording therein the order in which the packages are directed to a deposit station;

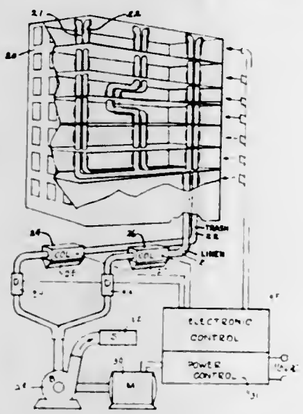
station driver circuit means for operating all of the deposit station doors;

damper driver circuit means for selectively directing packages of the first and second groups to their respective collection center;

timer circuit means for providing a predetermined time interval for the packages to move from the deposit station to their respective collection center; and

control circuit means for selectively operating said memory, driver, and timer circuit means;

said memory circuit means including a plurality of latch circuits which are activated to a latched condition by a manual push button at one of the deposit stations, said latch circuits being connected to the timing circuit



means for return to an unlatched condition when a predetermined time interval is ended, said memory circuit means further including first encoding means for converting decimal information into binary information to be sent to the control circuit means and first decoding means for converting binary information into decimal information for resetting said memory circuit means after the packages have been conveyed to their respective collection center;

said control circuit means including a programmable member, the outputs of said programmable member being programmed to operate said system in accordance with a particular application, said control circuit means further including a first binary counting means for creating a binary address for each deposit station, the outputs of said first counting means forming a fixed input to said programmable member, the outputs of said first counting means being connected to said memory circuit means for sensing which deposit station is activated, said control circuit means further including a second binary counting means the outputs of said second binary counting means forming a variable input to said programmable member whereby for every change in the output of said second counting means, the input and output of said programmable member also changes, the outputs of said second binary counting means being applied to a second encoding means for creating an output for sequentially activating a plurality of latching circuits for sequentially receiving the output signals of said programmable member, the outputs of said programmable member being connected to said timer circuit means and said damper driver circuit means for controlling the conveyance of the packages through the network, said control circuit means further including a decimal counting means connected to said first binary counting means, the outputs of said decimal means being applied to a digital readout means;

said timing circuit means including at least two timing combinations producing two predetermined time intervals;

one of said intervals controlling the travel of packages through a first distance;

the other of said intervals controlling the travel of packages through a second distance, longer than the first;

said damper driver circuit means being connected to said timer circuit means and said control circuit means by means of an NAND gate, said damper driver circuit means having an output only when both a signal from said timer circuit means and a signal from said control circuit means is applied to said NAND gate;

said station driver circuit means including a second decoding means for receiving binary signals from the output of the first binary counting means of said control circuit means, as well as a signal from said timer circuit means, said second decoding means converting said binary signals to a decimal signal for operating the station door of a predetermined deposit station;

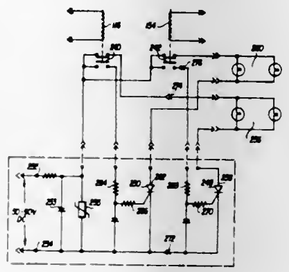
the respective circuit means of said control means being substantially universal from application to application, the programmable member of the control circuit means being unique to each particular application whereby the network operates in accordance with a particular application.

4,076,322

ELECTRO-PNEUMATIC BRAKE SYSTEM WITH VALVE ACTUATING CHECKING CIRCUIT

William W. Banker, and Anthony W. Lumbis, both of Watertown, N.Y., assignors to General Signal Corporation, Rochester, N.Y.

Filed Aug. 20, 1976, Ser. No. 716,056
Int. Cl.² B60T *17/22*; G01L *5/28*
U.S. Cl. 303—1 **7 Claims**



1. An electro-pneumatic brake system for a rail vehicle, comprising:

a brake pipe for conveying pressure signals for brake application and release through said vehicle;

electrically operable release valve means having a first movable valve element and interconnecting said brake pipe with a source of pressure for repressurizing said brake pipe during brake release;

electrically operable application valve means having a second movable valve element and interconnecting said brake pipe with atmosphere for depressurizing said brake pipe during brake application;

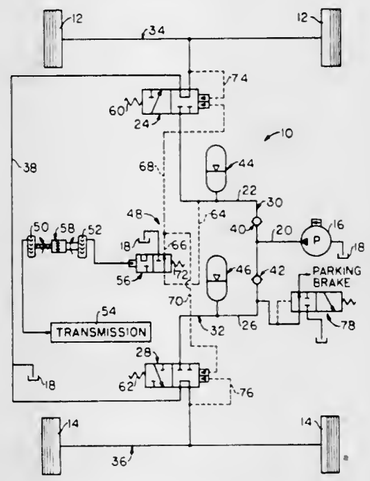
means actuated by said first movable valve element and responsive to opening of said release valve means for providing a continuous indication following opening of said release valve means until said application valve means is opened.

4,076,323

FLUID BRAKE SYSTEM FOR A VEHICLE

Neil W. Kroth, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 9, 1977, Ser. No. 795,037
Int. Cl.² B60T *13/14*
U.S. Cl. 303—6 R **6 Claims**



1. A fluid circuit for the braking system of a vehicle comprising:

fluid pump means;

first and second separate brake valves;

first conduit means communicating the first brake valve with the fluid pump means;

second conduit means communicating a first brake of the vehicle with the first brake valve;

the first brake valve being movable to a position providing communication from the pump means through the first conduit means, the first brake valve, the second conduit means, to the first brake of the vehicle, whereby fluid pressure is applied from the pump means to the first brake, the first brake valve being movable to a position wherein fluid pressure is released therethrough from the first brake;

third conduit means communicating the second brake valve with the fluid pump means;

fourth conduit means communicating a second brake of the vehicle with the second brake valve;

the second brake valve being movable to a position providing communication from the pump means through the third conduit means, the second brake valve, the fourth conduit means, to the second brake, whereby fluid pressure from the pump means is applied to the second brake, the second brake valve being movable to a position wherein fluid pressure is released therethrough from the second brake;

an additional valve;

fifth conduit means communicating the additional valve with the fluid pump means;

sixth conduit means communicating the additional valve with the first brake valve;

seventh conduit means communicating the additional valve with the second brake valve;

the additional valve being movable to a position providing communication from the pump means through the fifth conduit means, the additional valve, the sixth conduit means to the first brake valve to determine a position of the first brake valve whereby fluid pressure is released from the first brake, said movement of the additional valve providing communication from the pump means through the fifth conduit means, the additional valve, the seventh conduit means to the second brake valve to determine a position of the second brake valve, whereby fluid pressure is released from the second brake;

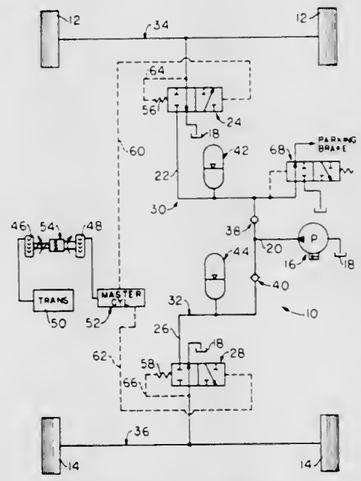
the additional valve being movable to a position wherein fluid pressure is released from the first and second brake valves through the sixth and seventh conduit means respectively, to provide movement of the first and second brake valves to their respective positions providing application of fluid pressure from the pump means to the first and second brakes.

4,076,324

BRAKE SYSTEM

Neil W. Kroth, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 9, 1977, Ser. No. 795,035
Int. Cl.² B60T *13/14*
U.S. Cl. 303—6 R **9 Claims**



1. A fluid circuit for the braking system of a vehicle comprising:

fluid pump means;

first and second separate brake valves;

first conduit means communicating the first brake valve with the fluid pump means;

second conduit means communicating a first brake of the vehicle with the first brake valve;

the first brake valve being movable to a position providing communication from the pump means through the first conduit means, the first brake valve, the second conduit means, to the first brake of the vehicle, whereby fluid pressure is applied from the pump means, to the first brake, the first brake valve being movable to a position wherein fluid pressure is released therethrough from the first brake;

third conduit means communicating the second brake valve with the fluid pump means;

fourth conduit means communicating a second brake of the vehicle with the second brake valve;

the second brake valve being movable to a position providing communication from the pump means through the third conduit means, the second brake valve, the fourth conduit means, to the second brake, whereby fluid pres-

sure from the pump means is applied to the second brake, the second brake valve being movable to a position wherein fluid pressure is released therethrough from the second brake;

a master cylinder; and

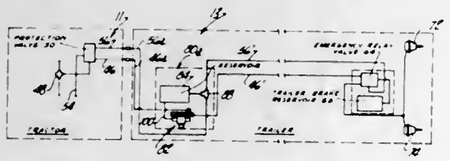
means operatively associated with the master cylinder and first and second brake valves comprising additional conduit means interconnecting the master cylinder and first and second brake valves, by providing selective movement of the first and second brake valves to their respective positions providing communication between the pump means and first and second brakes respectively, and for providing selective movement of the first and second brake valves to their respective positions providing release of fluid pressure from the first and second brakes by operation of the master cylinder.

4,076,325

PNEUMATIC BRAKING SYSTEM FOR TRACTOR-TRAILER COMBINATIONS

Robert John Bray, Huntington Woods, Mich., assignor to Proven Environmental Products, Inc., Auburn Heights, Mich.

Filed Mar. 17, 1976, Ser. No. 667,730
Int. Cl.² B60T *13/00*
U.S. Cl. 303—7 **33 Claims**



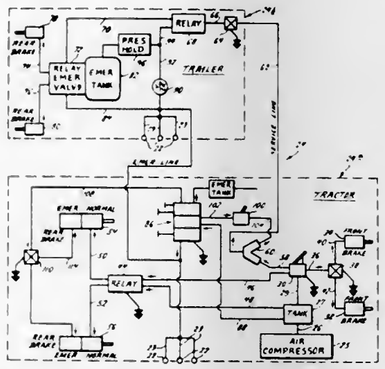
19. In a brake system for a tractor-trailer combination with the system including a tractor brake system and a trailer brake system, the tractor brake system including a supply of air under pressure including a tractor reservoir, pneumatically actuated brake actuators actuable by air pressure from the supply of air for actuating the tractor brakes, a modulating valve connected between the supply of air and the tractor brake actuators for modulating the magnitude of air pressure to the tractor brake actuators, a service fluid line connecting the output of the modulating valve to the tractor brake actuators, the trailer brake system including a trailer reservoir, a trailer relay valve connected to the trailer reservoir and connected to pneumatically actuated brake actuators, a trailer service line connected to the trailer relay valve for transmitting a pressure signal to the trailer relay valve whereby that valve will transmit fluid pressure from the trailer reservoir to the trailer brake actuators with the transmitted pressure varying in accordance with the magnitude of the pressure in the tractor service line, said trailer brake system comprising; fast acting amplifying relay valve means for providing an output pressure greater than an input pressure by a preselected ratio, an auxiliary reservoir separate from the tractor reservoir and trailer reservoir, first conduit means connected to said relay valve means for providing said input pressure thereto as a function of the magnitude of the fluid pressure at the tractor brake actuators, second conduit means for connecting said auxiliary reservoir to provide said output pressure, third conduit means for connecting said output pressure to the trailer service line whereby said output pressure will provide the pressure signal to the trailer relay valve the trailer brake system including a trailr emergency line connected to the supply of air and further comprising fourth conduit means for connecting the trailer emergency line to an input of said auxiliary reservoir for charging said auxiliary reservoir and dump valve means for venting the air pressure from the trailer emergency line and said auxiliary reservoir when the pressure therein drops to a preselected minimum.

4,076,326

AUTOMATIC SAFETY BRAKE SYSTEM

Joe B. D'Angelo, 8719 Stanwood, Dallas, Tex. 75228

Filed Dec. 22, 1976, Ser. No. 753,369
Int. Cl.² B60T *17/04*
U.S. Cl. 303—18 **12 Claims**



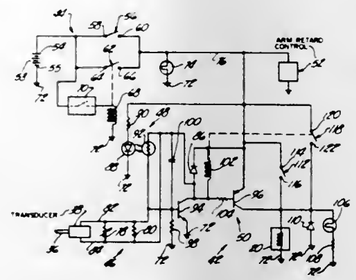
1. An automatic safety brake system for a vehicle having a tank for transporting liquid and delivering liquid to or from the vehicle tank, said vehicle having an air brake system, said automatic safety brake system comprising a connector having an opening therethrough in communication with said vehicle tank for delivering of liquid through said opening to or from said tank, means having a port therein, said connector associated with said vehicle air brake system for applying vehicle brakes in response to a change in pressure within said port, a cap removably secured to said connector, and sealing means operable by said cap for sealing said port when said cap is in a preselected position relative to said connector, the pressure in said port being at a different level with the sealing means in sealing engagement with said port than out of such sealing engagement.

4,076,327

REMOTE CONTROL CIRCUIT FOR ELECTRIC TRAILER BRAKES

Harold C. Hubbard, Lansing, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.

Division of Ser. No. 615,234, Sep. 22, 1975, Pat. No. 4,033,630.
This application Apr. 14, 1977, Ser. No. 787,548
Int. Cl.² B60T *13/74*
U.S. Cl. 303—20 **5 Claims**



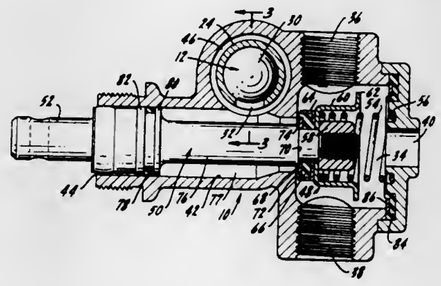
1. In an electronic brake control circuit for trailers equipped with electric brakes of the type in which brake torque is a function of electric current through an electromagnetic brake coil, said control circuit including means to provide an output to said coil as a function of displacement of an operator-responsive control arm, the combination comprising means to provide an electrical signal which varies as a function of said controller output, and electromagnetic means magnetically coupled to said control arm to retard displacement thereof as a function of said electrical signal.

4,076,328

TRACTOR-TRAILER PARKING DASH CONTROL VALVE WITH TWO-WAY CHECK VALVE

Charles Horowitz, Niles, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.

Continuation of Ser. No. 575,469, May 7, 1975, abandoned. This application Aug. 18, 1976, Ser. No. 715,441
Int. Cl.² B60T *13/38*
U.S. Cl. 303—50 **4 Claims**



1. In a tractor-trailer parking control valve, a housing, a first chamber in said housing, a pair of air pressure inlet ports in said housing opening into said first chamber, valve seat means about each of said inlet ports, a valve member within said chamber and positioned to close either inlet port by seating against one of said valve seat means,

a second chamber in said housing, at least one spring brake chamber port and an exhaust port opening into said second chamber, a spring-biased valve member in said second chamber for opening and closing communication between said spring brake chamber port and exhaust port, an annular elastomeric valve seat surrounding said exhaust port, a seating surface on said spring-biased valve member positioned to close upon said elastomeric valve seat, and a coil spring in said second chamber normally urging said seating surface away from said valve seat,

pasage means between said first and second chamber including a bore within said housing in communication with said second chamber and opening to the exterior of said housing, said passage means including a passage between said bore and first chamber, a valve stem connected to said spring-biased valve member and movable in said passage means bore, a seal carried by said spring-biased valve member and positioned to close communication between said second chamber and said passage means bore, a seal member carried by said valve stem and bearing against said bore, said passage being in communication with said bore intermediate said seal and seal member, said spring-biased valve member controlling communication between said passage means and said brake chamber port.

4,076,329

BRAKE MODULATION VALVE FOR PEDAL-APPLIED BRAKES

David G. Johnson, Peoria, and James P. Mueller, East Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

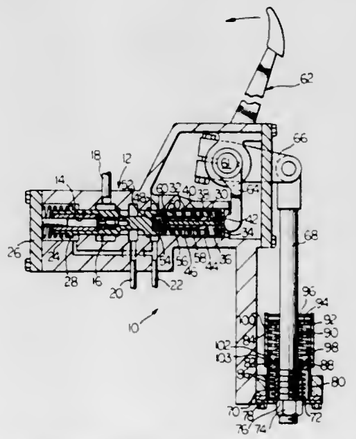
Filed Jan. 12, 1977, Ser. No. 758,540
Int. Cl.² B60T *15/04*
U.S. Cl. 303—56 **11 Claims**

1. In a brake control mechanism including a spool movable in the bore of a body to a first porition wherein the brake of a vehicle is released, and to a second position wherein the brake of a vehicle is applied;

first resilient means operatively associated with the spool and body for urging the spool toward the second position; lever means pivotably mounted relative to the body;

second resilient means operatively associated with the spool and lever means for urging the spool against the resilience of the first resilient means, the second resilient means urging the lever in a first pivotal direction;

third resilient means operatively associated with the body and lever means for biasing the lever means in a second pivotal direction, the lever means being pivotable in the first pivotal direction against the bias of the third resilient means allowing the second resilient means to extend, in turn allowing the first resilient means to extend to move the spool from its first toward its second position;



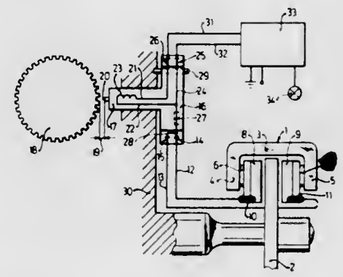
the second resilient means comprising first and second resilient springs operatively associated with the spool and lever means, such that upon initial pivoting of the lever means in the first direction against the resilience of the third resilient means, both the first and second springs urge the spool against the resilience of the first resilient means, and upon a further certain degree of pivoting of the lever means in the first direction, the first spring of the first and second springs no longer urges the spool against the resilience of the first resilient means.

4,076,330

DETECTING APPARATUS FOR A LOCK PREVENTION SYSTEM FOR DETECTING WEAR OF VEHICLE BRAKES

Heinz Leiber, Leimen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

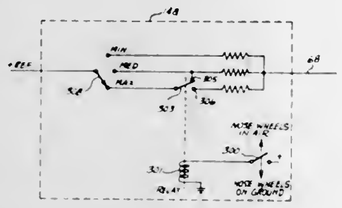
Filed Feb. 11, 1977, Ser. No. 767,860
Claims priority, application Germany, Feb. 14, 1976, 2606012
Int. Cl.² B60T *17/22*
U.S. Cl. 303—92 **7 Claims**



1. In combination, a detecting apparatus and a wheel locking prevention system for vehicle brakes, comprising:

a detector including a pulse generator, a pulse wheel disposed opposite to the pulse generator and pulse circuit;
an electronic switch connected to the pulse circuit;
a monitoring device which insures a correct operation of the wheel locking prevention system; and
a brake lining wear-indicating device connected to the pulse generator.

4,076,331
AIRCRAFT AUTOMATIC BRAKING SYSTEM
Garrett Howard DeVlieg, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.
Continuation-in-part of Ser. No. 632,113, Nov. 14, 1975, abandoned, which is a continuation-in-part of Ser. No. 477,244, Jun. 7, 1974, Pat. No. 3,920,282, which is a division of Ser. No. 394,890, Sep. 6, 1973, Pat. No. 3,917,356. This application Sep. 22, 1976, Ser. No. 725,610
Int. Cl.² B60T *8/02*
U.S. Cl. 303—93 **3 Claims**



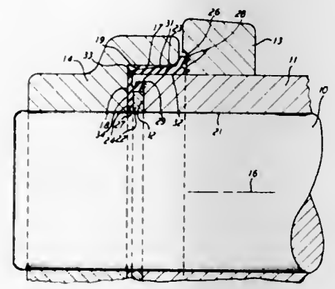
1. In combination in an aircraft having an automatic braking system and nose wheels:
pilot selectable switching means for commanding a level of deceleration upon landing of the aircraft;
second means for detecting aircraft nose wheel contact with a runway surface; and,
third means responsive to said second means for commanding a level of deceleration less than the level selected by said pilot selectable switching means when the aircraft nose wheels are not in contact with the runway surface and providing said pilot commanded level of deceleration when the aircraft nose wheels are in contact with the runway surface.

4,076,332
WHEEL LOCK CONTROL CIRCUIT
David W. Taylor, Davison, and Philip R. Peterson, Grand Blanc, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Jan. 24, 1977, Ser. No. 761,896
Int. Cl.² B60T *8/08*
U.S. Cl. 303—97 **2 Claims**



1. A wheel lock control system for a vehicle with braked wheels and characterized by its insensitivity to system noise and vehicle and wheel transients comprising:
means effective to provide an acceleration signal which is a function of wheel deceleration and wheel acceleration;
means effective to provide a two-component reference signal, one component being independent of initial cycle and representing a reference wheel deceleration and the other component being determined by an initial cycle circuit effective to generate an artificial initial cycle signal having a predetermined magnitude representing a high level of wheel deceleration;
brake control means responsive to the acceleration and reference signals effective to cyclically relieve and apply wheel brake pressure when the acceleration and reference signals attain predetermined relationships; and
circuit means responsive to the acceleration signal effective to provide an initial cycle control signal that is an integral function of wheel deceleration so as to provide filtering of system noise and wheel transients reflected in the acceleration signal, the initial cycle circuit terminating the initial cycle signal when the initial cycle control signal attains a predetermined level in response to wheel deceleration, the initial cycle circuit being effective to establish a high level of reference deceleration which must be exceeded to release the wheel brake pressure to desensitize the brake control means response to system noise and vehicle wheel transients independent of the brake control means response to the acceleration and reference signal until the initial cycle control signal attains the predetermined level.

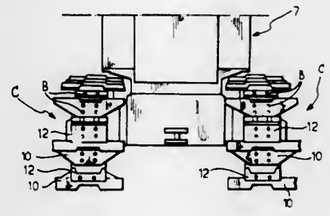
4,076,333
TRACK JOINT WITH COMBINED THRUST MEMBER AND SEAL MEMBERS
John Merlin Baylor, Bettendorf, Iowa, assignor to J. I. Case Company, Racine, Wis.
Filed Oct. 26, 1976, Ser. No. 735,451
Int. Cl.² B62D *55/20*; F16J *15/34*
U.S. Cl. 305—11 **5 Claims**



1. A track joint with combined thrust member and seal members, comprising a track pin, a cylindrical bushing on said pin and having an annular end surface disposed on a plane transverse to the extent of and within the length of said pin, a first track link on said bushing, a second track link on the end of said pin and having an annularly-shaped bearing surface faced toward said annular end surface and being spaced therefrom, a seal assembly including a thrust portion having a rigid thrust ring disposed in the space between said surfaces and with a portion of said assembly extending in contact with both said surfaces for resisting axial thrust forces therebetween, said assembly including an elastic first seal portion bonded to said thrust ring and extending therefrom and contacting said bushing for sealing between said thrust ring and said bushing, and said assembly including an elastic second seal portion bonded to said thrust ring and extending into sealing contact with said pin for sealing thereat, said first elastic seal portion extending from said thrust ring in a cylindrical portion extending co-axially with said pin and between said track links and being under compression between said links and being free of restriction in the length of said cylindrical portion intermediate said links,

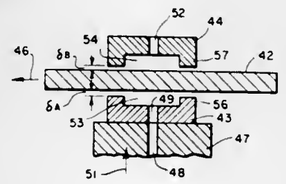
for torsional deflection to accommodate relative pivotal movement between said links.

4,076,334
TRACK FOR TRACK LAYING AGRICULTURAL TRACTORS AND LIKE VEHICLES
Renato Saetti, Turin, Italy, assignor to Fiat Trattori S.p.A., Modena, Italy
Filed Aug. 31, 1976, Ser. No. 719,483
Claims priority, application Italy, Sep. 26, 1975, 69397/75
Int. Cl.² B62D *55/28*
U.S. Cl. 305—54 **2 Claims**



1. A track for a track-laying vehicle such as an agricultural tractor, comprising:
a plurality of links,
means for pivoting the links together to form a closed loop chain,
a plurality of soles fixed to respective links, and
ground engaging cleats on said plurality of soles, the cleats of adjacent soles being offset from one another in a direction transverse the length of the track, wherein alternate soles are of a first type having two of said ground engaging cleats aligned with one another across the width of said tracks and separated by a space,
soles of a second type being located between said soles of said first type, said soles of said second type having a single cleat aligned along the length of the track with said space between said two ground engaging cleats of each of the adjacent soles of said first type, the width of said single cleat of said soles of said second type in a direction transverse the length of said track being substantially the same as that of said spaces between said two cleats of said soles of said first type and the width of said soles of said second type being less than that of said soles of said first type, and substantially the same as that of their single cleat.

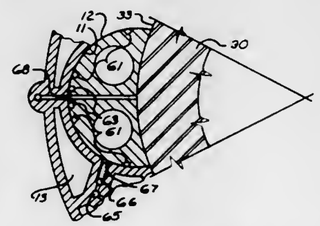
4,076,335
HYDROSTATIC BEARING METHODS AND STRUCTURES
Nazeer Ahmed, Princeton; James Kevin O'Donnell, Raritan Township, Hunterdon County, both of N.J., and Glenn Lewis Schmehl, Lilburn, Ga., assignors to Western Electric Co., Inc., New York, N.Y.
Filed Jun. 17, 1977, Ser. No. 807,626
Int. Cl.² F16C *17/00, 33/72*
U.S. Cl. 308—3.5 **18 Claims**



1. A method of bearing a supported surface relative to a supporting surface, with a space between said surfaces, one of said surfaces including an opening for feeding a hydraulic fluid into said space, which method comprises the steps of:
a. providing a generally annular projection, substantially surrounding said opening, on a first of said surfaces, the projection extending into said space and toward the second of said surfaces, so as to define a cavity between the two surfaces substantially enclosed by the projection and communicating with the opening; and
b. feeding through the opening and into the cavity, at a predetermined pressure, a hydraulic fluid having an intrinsic shear strength sufficient to prevent substantially all leakage of the hydraulic fluid across the outer periphery of the projection without the aid of any additional seals for containing the hydraulic fluid in the vicinity of the projection as said supported surface floats relative to said supporting surface, borne by the hydraulic fluid at said predetermined pressure, with the projection spaced from said second surface.

5. A hydrostatic bearing structure for bearing a supported surface relative to a supporting surface, which hydrostatic bearing comprises:
a supported member providing said supported surface;
a supporting member providing said supporting surface;
one of said members including a passageway extending therein and opening at said provided surface thereof toward said provided surface on the other member;
a first of said members including, along said provided surface thereof, a generally annular projection extending into said space and toward said provided surface on the second of said members, the projection being so located as substantially to surround the opening of said passageway in said one member in order to define a cavity between said surfaces substantially enclosed by the projection and communicating with the opening; and
a source of a hydraulic fluid at a predetermined pressure connected to said passageway in said one member, said hydraulic fluid having an intrinsic shear strength sufficient to prevent substantially all leakage of the hydraulic fluid across the outer periphery of the projection without the aid of any additional seals for containing the hydraulic fluid in the vicinity of the projection as said supported surface floats relative to said supporting surface, borne by the hydraulic fluid at said predetermined pressure, with the projection spaced from said provided surface of said second member.

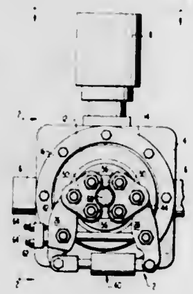
4,076,336
HYDROSTATIC BEARINGS WITH CONTROLLED LUBRICANT PRESSURE
Roy M. Howell, 115 Meadbrook Road, Garden City, N.Y. 11530
Continuation-in-part of Ser. No. 528,342, Nov. 29, 1974, Pat. No. 3,943,895. This application Feb. 2, 1976, Ser. No. 654,468
Int. Cl.² F16C *29/00*
U.S. Cl. 308—3.5 **5 Claims**



1. A hydrostatic bearing comprising, first and second proximate surfaces adapted for relative movement, a liquid lubricant between said surfaces, and raised means on at least one of said surfaces peripherally defining at least two independent enclosed areas within which said lubricant is substantially con-

fined, a pressurized source of lubricant, means for introducing said lubricant into said enclosed area, and check valve means between said pressurized source and said enclosed area, said liquid lubricant being subjected to sufficient pressure to effect a predetermined minimum flow of lubricant from each said enclosed area at all times, said raised means restricting the rate of flow of the lubricant from within said enclosed area, whereby a major portion of the bearing load is borne by a thick film of said lubricant.

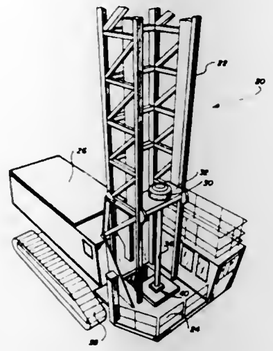
4,076,337
DRILL STEEL HOLDER
Ray Childress, P.O. Box 86, Richlands, Va. 24641
Filed Sep. 22, 1976, Ser. No. 725,649
Int. Cl.² F16C *31/00*
U.S. Cl. 308—3.9 **5 Claims**



1. A device for centering a drill steel for rotation about an axis of rotation of a chuck socket in a drill box, comprising,
a mounting plate adapted to be secured to said drill box,
a spaced pair of posts on the mounting plate,
a pair of levers having corresponding ends disposed on opposite sides of said chuck socket axis, means mounting said levers respectively on said posts for swinging movement in opposite directions towards and away from said socket axis,
a fluid actuated ram connected between said levers for effecting said swinging movement thereof,
a pair of rollers chassis plates pivotally supported on said corresponding ends of said levers for swinging movement about other axes which are parallel to said chuck socket axis and respectively disposed on opposite sides of said chuck socket axis,
and a spaced pair of rollers mounted on said chassis plates, said rollers being so disposed with respect to one another and the pivotal supports of said chassis plates as to bracket the said axis of rotation of the chuck socket.

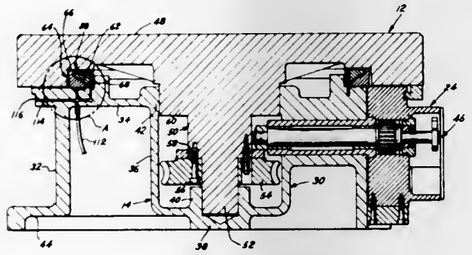
4,076,338
CASTERING ROLLER FOR A DRILL PIPE GUIDE BUSHING
Robert W. Hisey, Richardson, Tex., assignor to Gardner-Denver Company, Dallas, Tex.
Filed Apr. 30, 1976, Ser. No. 682,123
Int. Cl.² F16C *19/00*
U.S. Cl. 308—4 R **4 Claims**

1. In a drill pipe bushing having control means for moving elements toward and away from a drill pipe in the region of the mouth of a well, the combination comprising:
a. a plurality of rollers in a circular array with the axes of said rollers normally parallel to the axis of the drill pipe,
b. support arms on said control means, and
c. means pivotally mounting said rollers on said support arms on axes in a plane perpendicular to the axis of the



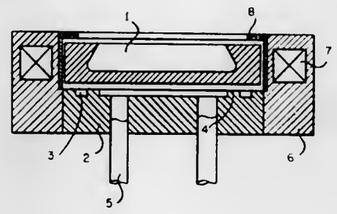
drill pipe for caster motion in response to movement of the pipe.

4,076,339
AIR BEARING ASSEMBLY FOR ROTATIONAL TABLE
Virgil H. Schrolucke, Bradenton, Fla., assignor to National Automatic Tool Company, Inc., Richmond, Ind.
Filed Jan. 19, 1977, Ser. No. 760,748
Int. Cl.² F16C *17/00*
U.S. Cl. 308—9 **7 Claims**



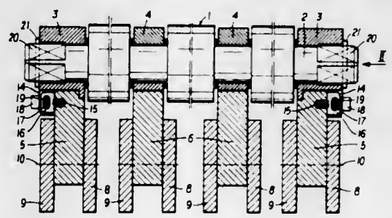
1. An improved bearing assembly for supporting a rotatable table on a fixed base for rotation about a substantially upright axis, said improved bearing assembly comprising, in combination, a fixed annular bearing member having an upper face and a lower face, said upper face having a surface area greater than said lower face, a rotatable annular bearing member in nesting and rotational relationship with said fixed bearing member, said rotatable bearing member having an upper surface and a lower surface, said lower surface having a greater surface area than said upper surface, said bearing members being positioned between said base and said rotatable table, and means for applying gaseous pressure between said lower surface of said rotatable hearing member, and said base, said air pressure lifting said rotatable bearing member upwardly for defining a gaseous bearing between said base and said rotatable bearing member, said upper surface of said rotatable bearing member moving upwardly against said rotatable table for simultaneous rotational movement therewith, and said gaseous pressure applying means further applying gaseous pressure between said fixed annular bearing member and said table for defining a gaseous bearing between said table and said fixed annular bearing member.

4,076,340
DRIVE AND BEARING SUPPORT FOR A DISC-SHAPED ROTOR
Peter Meinke, Grossinzemoos, and Wolfgang Huber, Schweinfurt, both of Germany, assignors to SKF Kugelsagerfabriken GmbH, Schweinfurt and Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Munich, both of, Germany
Filed Jul. 14, 1975, Ser. No. 595,686
Claims priority, application Germany, Jul. 12, 1974, 2433712
Int. Cl.² F16C *39/00*
U.S. Cl. 308—10 **11 Claims**



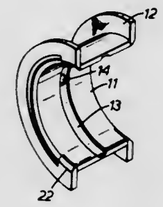
1. In combination, a disc-shaped rotor and a frame surrounding said rotor, said rotor having upper and lower radial surfaces and a peripheral surface, unitary means supported by said frame for magnetic bearing support and drive of said rotor, a plate facing said lower surface of the rotor and means coupled with said plate for producing a gas cushion for axial support of said rotor, said means for producing the gas cushion comprising at least one closable conduit having an end facing said lower surface of said rotor, said unitary means comprising a common annular coil system surrounding said rotor and disposed exactly opposite the rotor for effecting rotary drive of said rotor while suspending said rotor by magnetic effect independently of the gas cushion producing means and with the conduit closed, said conduit being openable during rotation of said rotor for applying a braking effect on said rotor.

4,076,341
FASTENING ARRANGEMENT FOR A LONGITUDINALLY MULTIPLY DIVIDED ROLLER TO BE USED IN CONTINUOUS CASTING PLANTS
Werner Scheurecker, Linz, and Franz Kagerhuber, Traun, both of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria
Filed Jul. 14, 1976, Ser. No. 705,288
Claims priority, application Austria, Jul. 18, 1975, 5572/75
Int. Cl.² F16C *35/04*
U.S. Cl. 308—20 **8 Claims**



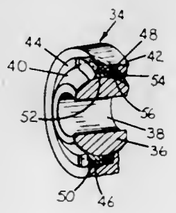
1. A fastening arrangement for a roller divided into multiple sections along its longitudinal extent, said roller to be used in continuous casting plants having a strand guide support, the arrangement comprising:
supporting brackets arranged in the longitudinal direction of the roller at the ends of each section, said brackets being connected to said strand guide support and having pocket-like recesses;
outer and inner roller holding means for exchangeably installing the roller in the strand guide support and being inserted in said pocket-like recesses of said supporting brackets, said outer roller holding means being at the ends of said roller and said inner roller holding means being at the junctions of the multiple sections of the roller;
detachable bolting means for connecting the outer roller holding means with their respective supporting brackets, the inner roller holding means lying loosely and unsecured in the respective pocket-like recesses of said supporting brackets.

4,076,342
BEARINGS
Ernest John Thorpe, Kenton, England, assignor to The Glacier Metal Company Limited, England
Filed Feb. 4, 1976, Ser. No. 654,970
Claims priority, application United Kingdom, Feb. 5, 1975, 4849/75
Int. Cl.² F16C *33/14*
U.S. Cl. 308—36 **11 Claims**



1. A self-supporting half-cylindrical plain bearing comprising a part-cylindrical journal shell and a separate part-annular end flange located radially and axially in relation to the shell by engagement in an annular recess in the back of the shell at one end and located circumferentially by co-operating shoulders on at least one notch in the shell and at least one lug on the flange, the edge of said flange being located in said recess.

4,076,343
SPHERICAL BEARING ASSEMBLY WITH INSERT MEMBER
Albert R. McCloskey, Fairfield, Conn., assignor to Heim Universal Inc., Fairfield, Conn.
Continuation of Ser. No. 512,132, Oct. 4, 1974, abandoned. This application Apr. 19, 1976, Ser. No. 677,870
Int. Cl.² F16C *23/00*
U.S. Cl. 308—72 **10 Claims**



1. A spherical bearing assembly having a metal inner race member and an outer race member, the inner surface of the outer race member being a concave spherical surface, the outer surface of the inner member being a complementary convex spherical surface, the outer member including an annular recess the base of which is threaded, a first yieldable plastic annular ring having an outer surface threaded with threads complementary to the threads on the base of said recess, said ring threadably received in said recess, a second annular ring also received in said recess in a side-by-side relationship to said first annular ring, the second annular ring being made of a

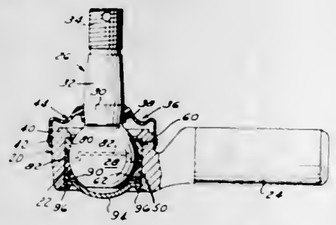
formable and yieldable plastic material, and the first and second annular rings providing a substantial portion which is more than half of the concave spherical surface of said outer race member, said first annular ring operationally capturing said second annular ring and said inner race member within said outer race member.

4,076,344

BEARING ASSEMBLY FOR A BALL AND SOCKET JOINT

Donald R. Gaines, Farmington; Jon M. Smallegan, Ann Arbor, and William H. Trudeau, Brighton, all of Mich., assignors to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed May 7, 1976, Ser. No. 684,392
Int. Cl.² F16C *11/06*
U.S. Cl. 308—72 **9 Claims**



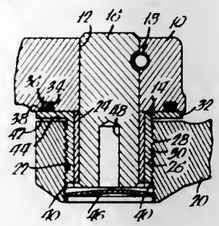
1. In a joint assembly with a socket member having an opening therethrough with a substantially cylindrical recess therein, a stud member with a ball received in said recess and a stud projecting therefrom through said opening to the exterior of said socket member, a seal member of a flexible material engaging both said stud and said socket member and constructed and arranged to provide a seal therebetween, and a pair of bearing rings substantially coaxially received in said recess and constructed and arranged to provide a bearing assembly surrounding and having a spherical surface bearing on a relatively large equatorial area of said ball between the polar regions thereof with interdigitating recesses and tongues overlapping the equator of said ball and having a sufficient thickness to substantially fill the space between said recess and said ball, the improvement comprising said seal member also being constructed and arranged to define in cooperation with said socket member a lubricant reservoir adjacent said ball, said recesses and tongues of said bearing rings being constructed and arranged to define in cooperation with said ball a staggered lubricant passage extending around and opening onto the equatorial region of said ball, at least the one of said bearing rings adjacent said seal member having at least two circumferentially spaced grooves extending generally axially across said ring, opening onto said ball, and connecting said staggered passage with said lubricant reservoir defined at least in part by said seal member such that a lubricant received in said lubricant reservoir can be supplied to the interface of said ball with said spherical surface of said bearing assembly through said generally axially extending grooves and said staggered lubricant passage, one of said bearing rings having an annular recess at an axially outer end and a radially outer surface thereof for receiving a load ring, a load ring of a compressible and resilient material received in said annular recess and extending generally axially beyond the outer end of said ring containing said annular recess, and means carried by said socket member and compressing said load ring into said annular recess so as to yieldably urge said bearing rings toward each other and into firm engagement with said ball whereby the joint assembly has wear take-up compensation.

4,076,345

SEALED JOINT CONSTRUCTION

Kevin George Forster, Peoria, and Harold Lawrence Reinsma, Dunlap, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 1, 1976, Ser. No. 719,624
Int. Cl.² F16C *11/00*
U.S. Cl. 308—120 A **5 Claims**



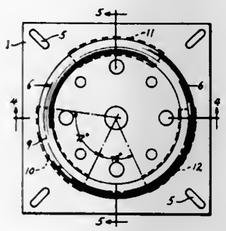
1. A sealed joint comprising:
a first member having a shaft affixed thereto;
a second member having a bore receiving said shaft;
an annular groove in said first member about said shaft and facing said second member;
an annular seal in said groove;
a sleeve within said bore and about said shaft and having a radially outwardly extending peripheral flange at the end nearest said first member, said flange engaging said seal; and
means for axially adjusting the position of said sleeve within said bore to selectively set the pressure of said flange on said seal.

4,076,346

FACE-TO-FACE PLATE-TYPE SWIVEL

Roy F. McMahan, Sr., Louisville, Ky., assignor to Roy F. McMahan, Jr. and William L. McMahan, both of Louisville, Ky.

Filed Oct. 6, 1976, Ser. No. 729,902
Int. Cl.² B60B *33/00*; F16C *17/00*
U.S. Cl. 308—237 R **7 Claims**



1. A plate-type swivel for rotationally supporting an article upon a base, comprising:
A. a pair of relatively rotatable face-to-face metal swivel plates centrally secured together and arranged for respective securement to the article and the base; and
B. plate-bearing means for axially spacing said article and base plates from each other and for axially aligning them relative to each other and centering them for relative rotation about a center axis common to both.
1. said plate-bearing means being radially spaced a substantial distance from said common axis.
2. said radially spaced plate-bearing means including
a. a continuous circular V-shaped race formed in one metal plate to extend concentrically about said common axis and radially spaced a substantial distance therefrom, and
b. frictionless plastic bearing material not only interposed between said metal swivel plates with its opposite sides engaging opposite plates for bearing and spacing purposes but, for said axial aligning and centering purposes, also curved to conform to the circular curvature of said V-shaped race in said one metal plate,
i. one side of said material also being V-shaped to project into and conform to the V-shape of said race and extending sufficiently along the length of the race circle for axially aligning said bearing material and one metal plate relative to each other and for centering them about said common axis.
ii. the opposite side of said material and said other metal plate mutually cooperating to provide complementary means for axially aligning said bearing material and said other plate relative to each other and for centering them about said common axis.

4,076,347

ANTIFRICTION NYLON MEMBER

Lennis E. Meek, Portage, Mich., assignor to Dayco Corporation, Dayton, Ohio

Filed Jul. 21, 1976, Ser. No. 707,451
Int. Cl.² F16C *33/16, 33/20*
U.S. Cl. 308—238 **13 Claims**

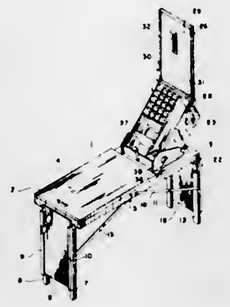
1. An antifriction nylon member comprising, from 4 to 10 parts by weight of a lubricant, from 0.10 to 0.20 parts by weight of a surfactant, and the balance of nylon, said lubricant being substantially uniformly dispersed throughout said nylon by said surfactant.

4,076,348

ARTIST'S KIT

Harvey W. Allison, Oakley, Kans., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Mar. 31, 1977, Ser. No. 783,295
Int. Cl.² A47B *97/08, 27/00*
U.S. Cl. 312—231 **2 Claims**



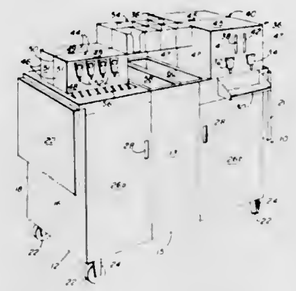
1. An artist's kit, comprising
a bench member having spaced opposite first and second ends, a top and a bottom;
a first pair of legs foldably mounted on the bench member at the bottom of the first end thereof;
first guide means affixed to the first pair of legs for removably supporting a palette between said first pair of legs;
a second pair of legs foldably mounted on the bench member at the bottom of the second end thereof;
second guide means affixed to the second pair of legs for removably supporting a canvas therebetween;
a storage box pivotally affixed at a pair of corners of the box to the bench at the top of the second end of said bench, said storage box being for paints, brushes and supplies, and having a lid movably affixed to the box for selectively covering the box, said lid having an inside surface; and
canvas supporting means on the inside surface of the lid of the storage box for releasably mounting a canvas thereon whereby said lid functions as an easel.

4,076,349

MOBILE BEVERAGE DISPENSING CART

Ronald L. Gettleman, Framingham, and Peter D. Stoner, Newton Centre, both of Mass., assignors to Gettleman-Stoner, Inc., Newton Centre, Mass.

Filed Jun. 17, 1977, Ser. No. 807,427
Int. Cl.² A47B *77/08*
U.S. Cl. 312—236 **8 Claims**



1. A mobile, convertible, self-contained hot and cold beverage storage and dispensing cart comprising:
a rectangular unitary cabinet structure mounted on a plurality of castors;
said cabinet structure having two end panels, two parallel side panels substantially longer than said end panels forming front and rear panels, and a base panel;
a plurality of liquid dispensing units mounted along the top edges of said side and end panels, said dispensing units being mounted at each end of said cabinet structure and accessible for service from both front and rear side panels; the bases of said liquid dispensing units being partially recessed within said cabinet structure;
a plurality of recessed, thermally-insulated open cold storage chambers for storage of ice and cream; said open cold storage chambers being accessible from both front and rear sides of said cart and being centrally situated between said liquid dispensing units;
a condiment and supply rack mounted above said open cold storage chambers, accessible from both sides of said cart;
a storage compartment within said cabinet for storage of components of said liquid beverages;
drain means within said cabinet structure to receive spillage from said liquid beverage dispensing units;
doors mounted on said front side panel to provide access to the interior of said cabinet structure.

4,076,350

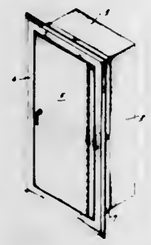
UNIVERSAL RECESSED WALL CABINET

Norman Benjamin Crist, 2135 Clise Place West, Seattle, Wash. 98199

Filed Dec. 29, 1975, Ser. No. 644,431
Int. Cl.² A47B *67/00*
U.S. Cl. 312—242 **1 Claim**

1. A universal recessed wall cabinet for installation in a wall structure recess comprising:
a case defining a storage compartment, said case having a substantially rectangular cross section of substantially constant area from front to back of said case, the outer periphery of said case being formed by flat sidewalls including top, bottom and sides for blocking access between said storage compartment and the wall recess, and said case top, bottom and sides having forward coplanar edges defining a planar front opening;
a rectangular mounting frame separate from said case, including four border members arranged orthoginally, each border member being of angle cross section forming an outer flange portion and an inner flange portion, said inner flange portions of said four border members being parallel

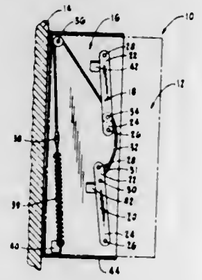
to and snugly encircling said case sidewalls and said outer flange portions of said four border members projecting outward from said border member inner flange portions for engagement with an outer face of the wall structure, said inner flange portion of each border member being substantially narrower than the width of said case sidewalls, and said mounting frame and case being relatively slidable for adjustment of said mounting frame toward and away from said case front opening for engagement of said mounting frame border member outer flange portions with the outer margin of the wall structure recess when



said case is installed in such recess with its sidewalls extending inwardly beyond the inner edges of said mounting frame border member inner flange portions; and

securing pins of a length much greater than the combined thicknesses of said case sidewalls and said mounting frame border member inner flange portions for extending from inside said case, through said case sidewalls, through said mounting frame border member inner flange portions and penetrating into the wall structure forming the recess whereby said case and mounting frame are both secured in the wall structure recess by said securing pins.

4,076,351
UP-DOWN CABINET
Hobart Dale Wyant, 5303 Delaware, Wichita, Kans. 67204
Filed Apr. 19, 1976, Ser. No. 678,131
Int. Cl.² A47B *67/02*
U.S. Cl. 312—247 **1 Claim**



1. An up-down cabinet for lowering a cabinet and retracting the cabinet to its original position, the cabinet comprising:

a cabinet housing having a front, back, and sides, the back of said housing disposed adjacent a wall;

"L" shaped elongated assembly plates, said plates having a first side portion and a second side portion, the first side portion vertically disposed and attached to the wall, the second side portion vertically disposed and parallel the sides of said housing;

stops attached to the second side portion of said plates and extending outwardly toward the sides of said housing;

upper and lower flange portions attached to and perpendicular to the top and bottom of the first and second side portions of said plates;

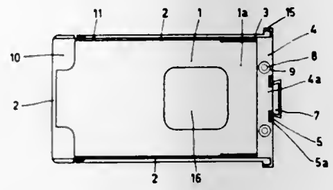
upper swing arms and lower swing arms vertically disposed between the sides of said housing and the second side portion of said plates, the lower end of said arms attached to the second side portion of said plates, the upper end of said arms attached to the sides of said housing, said arms resting against said stops when the cabinet is raised in a retracted position, said lower swing arms resting against the lower flange portion of said plates when the cabinet is lowered;

cables having cable pivots attached at one end to said lower swing arms;

first cable pulleys attached to the top of the second side portion of said plates, and second cable pulleys attached to said upper swing arms, said cables riding on said first and second cable pulleys; and

vertically disposed coil springs, the lower end of said springs attached to a spring mounting plate at the bottom of the second side portion of said plates, the upper end of said springs attached to a spring eye, said spring eye attached to the other end of said cables, said coil springs biasing said cabinet in an upward position and adjacent the wall.

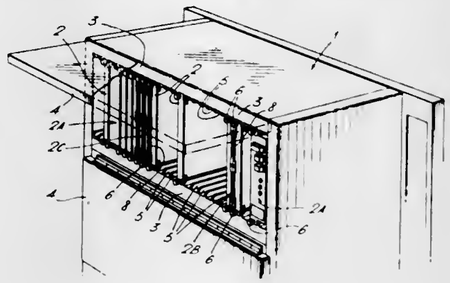
4,076,352
SLIDING DRAWER
Hans Jürgen Weidner, Nuremberg, and Willi Jüttner, Altenfurt, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Jun. 18, 1976, Ser. No. 697,566
Claims priority, application Germany, Jun. 18, 1975, 2527176
Int. Cl.² G09F *19/00*
U.S. Cl. 312—330 R **4 Claims**



1. A sliding drawer, comprising a bottom plate, two side walls and a rear wall connected to the bottom plate, and a front wall connected to the side walls, wherein a portion of the bottom plate which adjoins the front wall is separated from the side walls by slots which extend parallel to the side walls to form a flexible tongue, and the drawer comprises means for locking the tongue in said front wall in a locked condition of the sliding drawer, in an unlocked condition of the drawer the tongue being bent downward from the position of the tongue when locked.

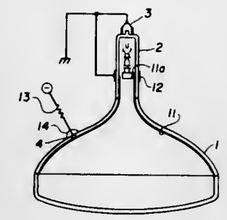
4,076,353
MOUNTING ARRANGEMENTS AND UNITS FOR USE THEREIN
Alan Barlow, Cheltenham, England, assignor to Smiths Industries Limited, London, England
Filed Feb. 25, 1976, Ser. No. 661,221
Int. Cl.² A47B *88/00*; H02B *9/00*
U.S. Cl. 312—350 **4 Claims**

1. A mounting arrangement comprising, a rack including two spaced projections that define a guideway, a unit which is adapted to be slidable into said guideway, means on each said unit for rigidly and non-resiliently locking that unit in its respective guideway by a clamping action that exerts a force against said projections acting generally transverse to the



direction of slidable movement of said unit into its respective guideway.

4,076,354
METHOD FOR CONDITIONING AN EDGE OF AN INTERNAL ELECTRIC CONDUCTIVE FILM OF A CATHODE RAY TUBE
Masamichi Wada, Otsu; Isamu Nakagawa, Oumihachiman, and Hiroshi Mizoguchi, Otsu, all of Japan, assignors to Nippon Electric Glass Company, Limited, Japan
Filed Oct. 14, 1976, Ser. No. 732,450
Claims priority, application Japan, Oct. 17, 1975, 50-125532
Int. Cl.² H01S *9/00*
U.S. Cl. 316—1 **6 Claims**



1. A method for conditioning an edge of an internal electric conductive film of a cathode ray tube comprising a glass neck tube containing an electron gun, a glass funnel connected with one end of the neck tube, an anode terminal mounted in a side wall of the funnel, the internal electric conductive film being applied on an internal side surface of the funnel and extending to have the edge thereof within the neck tube to give an electrical conduction between an anode electrode of the electron gun and the anode terminal, and stem pins being mounted on the other end of the neck tube for connecting the other electrodes of the electron gun with peripheral circuits, which comprises commonly connecting said stem pins to ground and applying to said anode terminal a negative D.C. voltage high enough to cause cathode spot at said edge of said internal electric conductive film until the edge is conditioned and the electric breakdown strength of the glass neck tube is thereby graded up.

4,076,355
CONNECTOR FOR CONNECTING TOGETHER OPPOSITE SIDES OF A PRINTED CIRCUIT BOARD
Billy Erik Olsson, New Cumberland, and John Philip Kunkle, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Continuation of Ser. No. 558,864, Mar. 17, 1975, abandoned.
This application May 18, 1976, Ser. No. 687,567
Int. Cl.² H05K *1/12*; H01R *13/12*
U.S. Cl. 339—17 C **16 Claims**

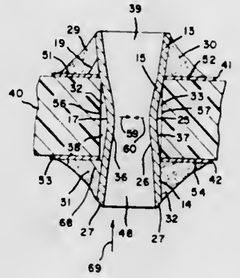
1. In combination, a substrate and a connector for connecting together first and second sides of said substrate having an aperture therethrough and conductive areas adjacent said aperture, with said connector comprising:

a first end section having the general shape of a frustum and extending out of said aperture on said first side of said substrate;

a second end section having the general shape of a frustum and extending out of said aperture on said second side of said substrate;

a sole means for joining together said first and second end sections;

said sole means consisting only of a plurality of beam-like legs extending through said aperture and joining together said first and second end sections;

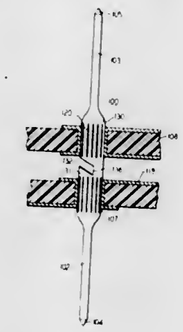


all of said beam like legs being bowed inwardly towards each other and constructed to be sufficiently flexible to enable said first and second end portions to follow the expansion and contraction of said substrate as the said first and second end portions are soldered to said conductive areas on said substrate and subsequently cooled;

means contacting the inner surfaces of said beam like legs for excluding solder from flowing around said beam like legs; and

an unobstructed space surrounding said inwardly bowed leg portions during soldering of the end portions to said conductive areas to permit inward and outward movement of said bowed leg portions.

4,076,356
INTERCONNECTION PIN FOR MULTILAYER PRINTED CIRCUIT BOARDS
Peter James Tamburro, Hanover Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Oct. 18, 1976, Ser. No. 733,333
Int. Cl.² H05K *1/12, 1/14*
U.S. Cl. 339—17 C **17 Claims**



1. A connector for electrically interconnecting multiple conductive layers in a circuit board having at least one aper-

ture therein with electrically conductive material about its periphery including

first and second means for receiving electrically conductive elements,

unitary compliant means, intermediate said first and second means and gradually increasing in cross-sectional thickness from a first end point to a midpoint and thereafter gradually decreasing in cross-sectional thickness from said midpoint to a second end point, for producing a nearly uniform radial pressure on said electrically conductive material on the periphery of said aperture upon the insertion of said connector into said aperture,

means, integral with and abruptly increasing the cross-sectional thickness of an intermediate region along the length of said unitary compliant means at a plurality of discrete radial points, for engaging said conductive material about said aperture periphery at said plurality of discrete radial points,

means, integral with said unitary compliant means, for segmenting said compliant means into a plurality of semiseparate segments, each of said segments engageable with a separate circuit board in an axially assigned stack of such boards, and

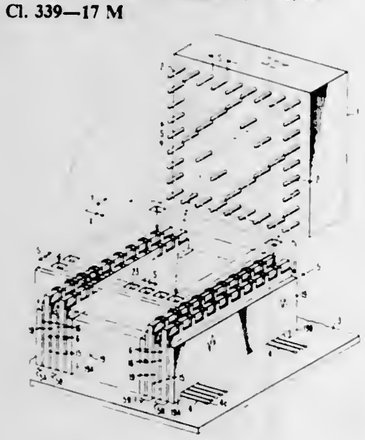
said engaging means on each of said segments are radially offset from one another.

4,076,357

LAMINATED PROGRAMMABLE MICROSTRIP INTERCONNECTOR

Anthony Bartholemew Cistola, Vestal, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 6, 1976, Ser. No. 747,576
Int. Cl.² H05K *1/07, 1/14*
U.S. Cl. 339—17 M **10 Claims**



1. Electrical interconnector apparatus for interconnecting the terminals of at least two electrical devices, said apparatus comprising:

at least one lamination having first and second predetermined printed circuit conductor patterns on the opposing first and second planar sides, respectively, of said lamination,

severable conductor means for connecting said first and second predetermined patterns at predetermined locations across at least one edge of said lamination,

first and second reference voltage plane laminations disposed adjacent said first and second conductor patterns, respectively, said first and second conductor patterns being in signal plane relationships with said first and second reference voltage plane laminations, respectively, in a microstrip manner, and

contact means disposed along at least one laminar edge of said interconnector apparatus adapted to be connectable to said electrical device terminals, said contact means being coupled to predetermined ones of the printed circuit conductors of at least one of said first and second patterns, said one laminar edge being normal to said first and second planar sides, recesses formed in at least one edge of said one lamination, some of said contact means being located within said recesses

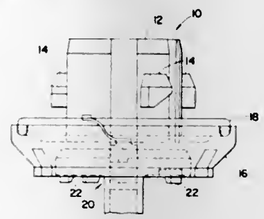
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4,076,358

LAMP SOCKET FOR PRINTED CIRCUIT

Anthony J. Taormina; Artur Wyszynski, both of Detroit, and Roman J. Witek, East Trenton, all of Mich., assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed Mar. 28, 1977, Ser. No. 781,620
Int. Cl.² H05K *1/12*
U.S. Cl. 339—17 D **2 Claims**



1. A lamp socket assembly adapted to be mounted on one side of a printed circuit with a tubular portion thereof extending through a notched aperture in said printed circuit, which comprises:

a tubular socket portion adapted to receive a light bulb having a filament and means for making electrical connections to said filament;

a base member adapted to be latched to said socket portion;

a plurality of longitudinal flanges on the outside of said tubular socket portion to be inserted into said aperture and twisted to lock said socket assembly on said printed circuit board;

a first unitary electric terminal located in said socket assembly, said first electric terminal including a bulb contacting portion extending into said tubular socket portion and a second portion extending outwardly from said socket portion and adapted to make electrical contact to a first conductor on said printed circuit board;

a second unitary electrical terminal located in said socket assembly, said second electrical terminal including a bulb contacting portion extending into said tubular socket portion and a second portion extending outwardly from said socket portion and adapted to make electrical contact to a second conductor on said printed circuit board;

said first and second unitary electrical terminals being mounted upon said tubular socket portion independently of said base portion; and

integral biasing means on said socket portion for urging said socket assembly away from its locked position.

4,076,359

LAMP SOCKET ASSEMBLY AFFORDING VARIABLE BULB FOCAL LENGTH POSITIONING

Robert Charles Brownlee, Fenton, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Mar. 17, 1977, Ser. No. 778,803
Int. Cl.² H01R *33/46;* **F21V** *19/02*
U.S. Cl. 339—32 R **8 Claims**

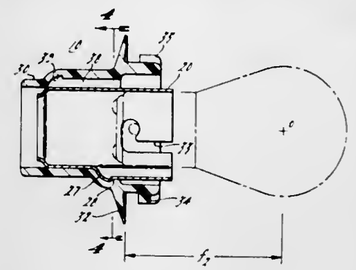
1. A lamp socket assembly providing a selection of several distinct and different bulb socket focal lengths for filament-type lamp bulbs electrically energizable through terminals at the base thereof, said socket assembly comprising

elongated lamp socket means for longitudinally slidably receiving the base of a lamp bulb inserted to a given depth at which it may be energized therein,

a socket housing having a hollow interior for longitudinal slidable reception of said lamp socket means therein,

said socket housing having several arcuately spaced and differentially axially longitudinally located, discontinuous stop shoulder means internally thereof each related to a different one of said bulb socket focal lengths, and

said lamp socket means having an outwardly directed protuberance on an external surface thereof to form a positive unyieldable stop surface located intermediate its ends and



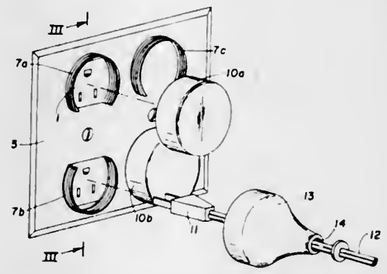
selectively positionable against any one of said several stop shoulder means of said socket housing upon longitudinal slidable insertion of said lamp socket means into said socket housing, whereby the same socket housing and lamp socket means may accomodate and position a lamp bulb so received and inserted in said lamp socket means to any one of several different focal lengths in accordance with which stop shoulder means of said socket housing the stop surface on said lamp socket means is positioned against.

4,076,360

SAFETY DEVICE FOR ELECTRICAL CONNECTOR DEVICE

Dharam Dev Singh, Clearwater, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jun. 21, 1974, Ser. No. 481,676
Int. Cl.² H01R *13/44*
U.S. Cl. 339—36 **4 Claims**



1. A safety device for an electrical connector device of an electrical wall fixture, said safety device comprising

a plate for covering an electrical wall fixture;

a first externally threaded substantially sleeve type device mounted on the plate and surrounding at least part of an electrical connector device of the electrical wall fixture;

a second externally threaded substantially sleeve type device mounted on the plate;

a first internally threaded cap threadedly coupled to the first sleeve type device and covering the electrical connector device when the receptacle is not in use and threadedly coupled to the second sleeve type device when the receptacle is in use; and

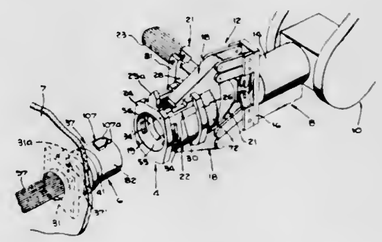
a second internally threaded cap for accommodating an electrical connector plug and threadedly coupled to the first sleeve type device when the receptacle is in use in cooperation with the electrical connector plug.

4,076,361

ELECTRICAL CONNECTOR ASSEMBLY FOR USE WITH REMOTE MANIPULATOR

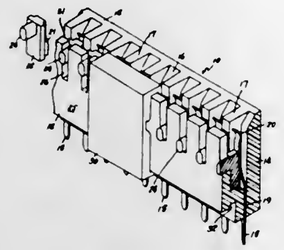
Robert F. Campbell, Irvine, Calif., assignor to Gulton Industries, Inc., Metuchen, N.J.

Filed Dec. 17, 1975, Ser. No. 641,552
Int. Cl.² H01R *13/54*
U.S. Cl. 339—75 M **17 Claims**



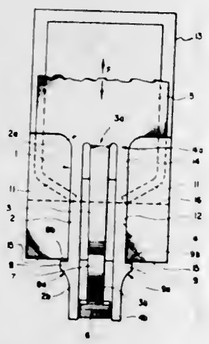
1. Electrical connector apparatus comprising: telescoping inner and outer connector units, said outer connector unit including a housing with a main housing portion having an opening at one end into which said inner connector unit is longitudinally axially movable into said main housing portion of said outer connector unit, one of said connector units having on the end remote from the other connector unit an elbow portion laterally extending therefrom and exposed on at least one side thereof, an outwardly spring-urged means exposed on the outside of the connector unit having said elbow portion and depressible by the jaws of a manipulator brought opposite the apparatus in a direction generally transversely of the longitudinal axis of said outer connector unit opening therein, latch means operated by said depressible means and being normally in a latching position for interlocking with a portion of the other connector unit when the inner connector unit is fully inserted within said outer connector unit to prevent separation of the connector units, and having a release position when said depressible means is depressed a given extent for permitting separation of said connector units, insulated electrical conductors in said inner connector unit, which conductors terminate in longitudinally accessible contact terminals in said inner connector unit, and insulated electrical conductors in said outer connector unit, which conductors terminate in longitudinally accessible contact terminals in said outer connector unit and face toward the contact terminals of said inner connector unit, and make full, proper electrical engagement therewith when said inner connector unit is fully inserted within said opening of said outer connector unit housing and said inner and outer connector units have a given circumferential, angular relationship to one another, and the electrical conductors of the connector unit having said depressible means passing through, and being held in displaced position to one side of the connector unit by said elbow portion thereof to permit a manipulator to be brought into engaging position with said depressible means from the longitudinally, outwardly facing side of the elbow portion of the latter connector unit where the same is depressed to move the latch means to said release position and clamp the connector apparatus therewith for movement thereby to another location.

4,076,362
CONTACT DRIVER
Yoshiaki Ichimura, Akishima, Japan, assignor to Japan Aviation Electronics Industry Ltd., Tokyo, Japan
Filed Feb. 11, 1977, Ser. No. 767,845
Claims priority, application Japan, Feb. 20, 1976, 51-16910; Nov. 1, 1976, 51-131361; May 24, 1976, 51-66389[U]
Int. Cl.² H01R *13/54*; H05K *1/10*
U.S. Cl. 339—75 MP **12 Claims**



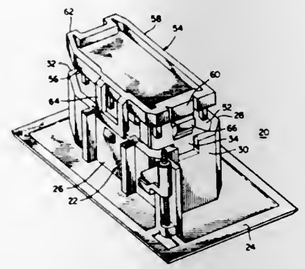
1. A contact driver comprising a contact mount formed as a single molding of a dielectric material having a series of recesses, a set of contacts arranged in said recesses of the molding, each of said contacts having a movable end, conductors arranged in positions in which the conductors remain out of contact with said contacts in said recesses of the molding, a plurality of cam members adapted to be driven separately from each other and mounted to said molding so as to cooperate with said contacts respectively, and a slider longitudinally slidable along said molding whereby to operate said cam members in regular succession so as to move the movable ends of said contacts to relative positions in which the movable ends are in contact with said conductors.

4,076,363
FASTENING AND LOCKING DEVICE
Lucien Leon Péchard, Dole, and Bernard André Logerot, Montbarrey, both of France, assignors to Bunker Ramo Corporation, Oak Brook, Ill.
Filed Oct. 13, 1976, Ser. No. 732,016
Int. Cl.² H01R *13/54*; H05K *1/12*
U.S. Cl. 339—91 R **2 Claims**



1. A fastening and locking device for securing and locking together two elements, including a male part on one of the elements and a receiving opening in the other of said elements, the improvement wherein said male part comprises three flexible parallel blades having fixed ends connected to a common strap element and separated at their other ends, the middle blade terminating with a T-shaped portion which, in the rest position of the device lies in the plane of the two lateral blades and maintains a predetermined spacing between said two lateral blades, said other end of said middle blade being bendable out of the plane of said two lateral blades so as to move said T-shaped portion from between said lateral blades to allow a pinching together of the lateral blades toward each other, said lateral blades each comprising on their outer edges a locking shoulder which engages with the posterior surface of said receiving opening after insertion of said male part into said opening and said lateral blades return to their rest positions, and said male part further comprising a pair of depending taps which lie in a plane parallel to and spaced apart from said plane of said lateral blades and including inwardly folded portions for engaging a stop shoulder in said other element to limit the penetration of said male part into said opening and to assist in locking said elements together.

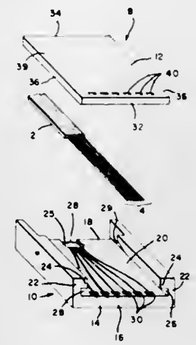
4,076,364
WIRING DEVICE
Ted L. C. Kuo, Fanwood, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.
Filed Jan. 24, 1977, Ser. No. 762,202
Int. Cl.² H01R *13/58*
U.S. Cl. 339—103 R **5 Claims**



1. In an electrical wiring device of the type having, in combination, a housing portion have opposing end walls and opposing sidewalls arranged in a box-like configuration with an open top portion and wherein at least one of said end walls has a notched opening which communicates with said open top portion and has a channeled recess extending within each side edge defining said notched opening, and a generally flat cover portion arranged to fit over and seat upon said open top portion, the improvement comprising: a rigid tab member hingedly coupled to said cover portion by a thin compliant web portion, said tab member being located on said cover portion so as to be aligned with said notched opening in said housing portion when said cover portion is placed over said housing portion adjacent said open top portion in a preselected position, said tab member being pivotally displaceable about said web portion from a first position wherein said tab member is aligned with said notched opening to a second position wherein said tab member is tilted away from said notched opening, said tab member having a central longitudinal axis and being coupled to said cover member along a first axis offset from and parallel to said central longitudinal axis to cause said tab member to be subjected to a pivoting torque upon its contact with an obstruction located within said notched opening, said tab member including a locking shoulder extending outwardly from either side thereof adjacent said web portion and having a length substantially shorter than the length of said tab member, said locking shoulders being dimensioned to engage a respective channeled recess in said notched opening to provide a lock therebetween in the event no obstruction is present in said notched opening and said cover portion is in a substantially fully seated position over said open top portion of said housing portion, said tab member terminating in an extending free end portion opposite said web portion, said free end portion having a rounded edge to facilitate sliding engagement with an obstruction in said notched opening, said free end

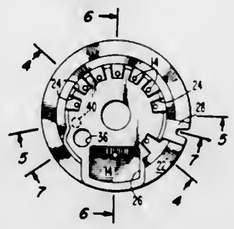
portion being located along said first axis in alignment with said web portion.

4,076,365
ELECTRICAL CONNECTOR HAVING CONDUCTOR SPREADING MEANS
Milton Dean Ross; Andrew Graham Boutcher, and Walter Clifton Shatto, all of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Nov. 22, 1976, Ser. No. 743,897
Int. Cl.² H01R *13/58*
U.S. Cl. 339—107 **28 Claims**



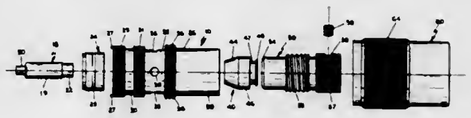
1. A multi-contact electrical connector which is intended to be installed on an end portion of a multi-conductor cable, said connector comprising:
first and second electrical connector housing parts of insulating material,
said first housing part being generally prismatic and having a mating zone and a cable-receiving end, a cable-receiving surface extending across said first part from said cable-receiving end to said mating zone,
a plurality of conductor spreading recesses extending across said cable-receiving surface from said cable-receiving end to said mating zone, said recesses being in side-by-side parallel relationship at said cable-receiving end and extending along pedetermined paths from said cable-receiving end whereby upon locating said cable on said surface at said cable-receiving end with the conductors of said cable in said recesses and progressively pressing said conductors into said recesses, said conductors will be precisely located in said recesses on said surface in said mating zone,
said second housing part being assemblable to said first housing part and having a cable-engaging surface which is against said cable-receiving surface when said second housing part is assembled to said first housing part,
said first and second housing parts having cooperable guide means thereon for guiding said parts into assembled relationship by guiding said second part over said cable-receiving surface of said first part from said cable-receiving end to said mating zone of said first part whereby upon locating said cable on said cable-receiving surface and assembling said second part to said first part, said conductors are pressed into said recesses during assembly of said second part to said first part and will be precisely located in said mating zone, and
electrical contacting means for establishing electrical contact with said conductors in said mating zone.

4,076,366
HIGH VOLTAGE ELECTRON TUBE BASE WITH SEPARATE DIELECTRIC FILL-HOLE
Myron Henry Wardell, Jr., Lititz, and Bruce George Marks, Lancaster, both of Pa., assignors to RCA Corporation, New York, N.Y.
Filed May 18, 1977, Ser. No. 798,127
Int. Cl.² H01R *13/46*
U.S. Cl. 339—144 T **9 Claims**



1. A base member adapted to be disposed over an array of lead conductors and an exhaust tubulation of an electron tube, said base member comprising:
a. a tubular housing having an open end for receiving said exhaust tubulation therein,
b. a flange extending outwardly from said housing at said open end thereof,
c. an array of apertures through said flange for receiving said array of conductors therethrough,
d. a recess in said flange encompassing said open end and at least one of said apertures, and
e. a passageway in said base member separate from the tubulation receiving cavity of said housing and opening into said recess.

4,076,367
SOLDERLESS CONNECTOR
Jules Avins, Staten Island, N.Y., assignor to Avins Industrial Products Corporation, Staten Island, N.Y.
Filed Sep. 9, 1976, Ser. No. 721,872
Int. Cl.² H01R *17/18*
U.S. Cl. 339—177 E **15 Claims**

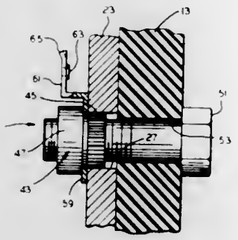


1. A coaxial cable connector comprising: a conductive body, contact means for receiving the center conductor of the coaxial cable, insulating means for mounting said contact means in insulating relationship to said body, said body including seating means for the outer conductor of said coaxial cable, conductive plug means including a central aperture for receiving the cable therethrough and integrally including engaging means for freely rotatably and captively mounting a ferrule to one end thereof, means for providing a nonslip interconnection for the wire braid outer conductor of said coaxial cable to secure said outer conductor to said body including a single piece ferrule having integral means engaging said engaging means of said plug for freely rotatably and captively mounting said ferrule to said one end of said plug said ferrule including a surface for engaging the outer conductor of the cable; said body and plug including means for rotatably securing said plug in said body whereby said outer conductor is compressibly secured between said seating means and said ferrule and held stationary therebetween by said ferrule as said plug is rotatably fitted into said body; and means for coupling said body to the body of a mating connector.

4,076,368
TERMINAL FASTENER AND INSTRUMENT TAP

John W. Erickson, Crystal Lake, Ill., assignor to Boltswitch Inc.

Continuation of Ser. No. 396,384, Sep. 12, 1973, abandoned.
This application Mar. 3, 1975, Ser. No. 554,768
Int. Cl.[2] H01R *13/50*
U.S. Cl. 339—214 R 2 Claims



1. A combination switch terminal fastener means and instrument tap for a high amperage bolted pressure contact switch of the type comprising an insulator base and having switch terminals of hard copper with each switch terminal having a flange abutting said insulator base, and a smooth-walled mounting aperture extending through said flange, said fastener means and instrument tap including:

a cylindrical steel insert, having a knurled portion press-fit into said mounting aperture of said switch terminal flange, and an enlarged head portion incapable of being inserted into said mounting aperture, said enlarged head portion having a radially extending end surface facing the terminal flange, and a threaded hole extending axially of said cylindrical insert;

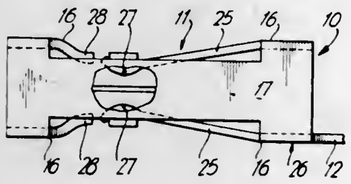
an instrument connection terminal having a flat base portion engaged and held in firm electrical contact with said switch terminal flange by said radially extending end surface of said insert head portion and an offset portion including means for attachment to an electrical instrument; and

a bolt extending through said insulator base and engaging said threaded hole of said cylindrical insert to mount said switch terminal flange on said insulator base and to afford increased contact pressure between said instrument connection terminal and said switch terminal flange.

4,076,369
BOX TERMINAL FOR CARD EDGE RECEPTACLES IN TELECOMMUNICATIONS SYSTEMS AND THE LIKE

Harold Joseph Ostapovitch, Lachine, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jul. 26, 1976, Ser. No. 708,628
Int. Cl.[2] H01R *13/12*
U.S. Cl. 339—258 R 5 Claims



1. A box terminal, for reception of a rectangular terminal pin, including a main body box portion and a tail portion;

the main body portion of elongate form having a rectangular cross-section normal to the longitudinal axis, and including an entry end and an exit end, said tail portion extending from said exit end;

said main body portion having four side members forming first and second pairs of side members, the side members of a pair in opposition;

the first pair of side members being cantilevered from the exit end and resiliently biased inwardly to form cantilever spring contact members, each having a free end extending towards said entry end, and a domed contact area adjacent to the free end of each spring contact member;

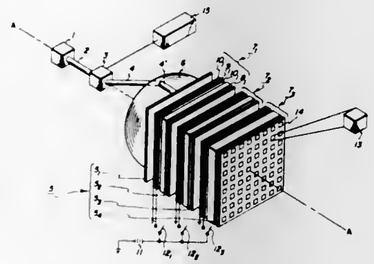
means restricting inward deflection of said spring contact members to provide a preloaded bias on said contact members; and

the second pair of side members deformed inwardly intermediate the ends of the side members to form said pin engaging formations, each formation including an inwardly inclined surface positioned toward said entry end.

4,076,370
OPTICAL MEMORY HAVING SERIALLY STOCKED HOLOGRAM PLATES

Shoji Wako, Ebina, Japan, assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 19, 1976, Ser. No. 650,226
Claims priority, application Japan, Jan. 24, 1975, 50-9808
Int. Cl.[2] G03H *1/30*
U.S. Cl. 350—3.75 6 Claims



1. An optical memory device comprising:

means for generating a scanning light beam,

a first hologram plate adjacent said generating means and transparent except for an array of sub-holograms arranged in spaced relationship on said plate,

means for positioning said scanning light beam to irradiate a selected portion of said first hologram plate;

a second hologram plate adjacent said first hologram plate and transparent except for an array of sub-holograms arranged in spaced relationship on said plate, said first and second hologram plates being arranged in serial alignment in the direction of light propagation of said scanning light beam and in a horizontally registered relation to one another,

a light beam deflector interposed between said first and second hologram plates,

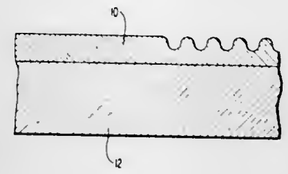
means coupled to said light beam deflector for causing the scanning light beam which is transmitted through a selected transparent portion of said first hologram plate to be deflected by said light beam deflector so the scanning light beam irradiates a selected portion of said second hologram plate, and

detecting means for reading a selected one of said sub-holograms irradiated by said scanning light beam.

4,076,371
HOLOGRAPHIC RECORDING MATERIAL FOR INFRARED RADIATION

Werner Braun, Munich; Gernot Decker, and Horst Röhr, both of Garching, all of Germany, assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Gottingen, Germany

Division of Ser. No. 484,698, Jul. 1, 1974, abandoned. This application Aug. 12, 1976, Ser. No. 713,832
Claims priority, application Germany, Jul. 2, 1973, 2333554
Int. Cl.[2] B05D *3/06*
U.S. Cl. 350—3.61 3 Claims



1. A method for recording holograms, comprising the steps of:

providing a substrate:

providing on said substrate a single layer, said layer consisting of substantially pure gelatin capable of absorbing infrared radiation and having a thickness which is greater than the change in thickness caused by the contemplated exposure to the infrared radiation;

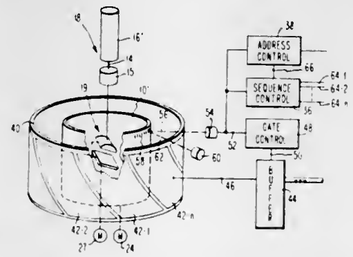
generating a holographic pattern using infrared laser radiation; and

exposing the layer to the holographic patterned infrared laser radiation to cause changes in the optical thickness thereof.

4,076,372
TWO-DIMENSIONAL LIGHT DEFLECTOR APPARATUS

Robert Vladimir Pole, Los Gatos, Calif., and Hans Peter Wollenmann, Rueti, Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 643,891, Dec. 23, 1975, abandoned.
This application Apr. 28, 1977, Ser. No. 791,821
Int. Cl.[2] G02B *27/17*
U.S. Cl. 350—6.9 14 Claims



1. A holographic light deflector apparatus comprising:

a cylindrical member having a plurality of holograms recorded on a surface thereof, each of said holograms when reconstructed producing a line image on a cylindrical image surface, with each line being at an angle with respect to the plane containing the base of said cylindrical member;

optical means for producing and directing a beam of light toward said cylindrical member, said beam of light being shaped to illuminate a small area of said holograms and being shaped to produce more convergence in the direction of said line image so as to reconstruct a point image;

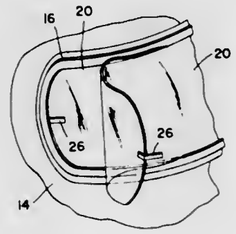
means for rotating said cylindrical member about its axis at a constant high speed so that the resulting reconstructed point image is deflected in a direction perpendicular to said line image; and

means for rotating said optical means about the axis of said cylindrical member so that said reconstructed image point is capable of scanning the entire cylindrical image surface.

4,076,373
METHOD OF AND MEANS FOR SHIELDING THE LENS OF A FACE MASK

Anthony L. Moretti, San Rafael, Calif., assignor to E. D. Bullard Company, Sausalito, Calif.

Filed Mar. 10, 1976, Ser. No. 665,691
Int. Cl.[2] G02B *7/00*; G02C *3/02*
U.S. Cl. 350—61 11 Claims



1. Means for shielding the exterior surface of the protective lens of a face mask comprising:

a. a plurality of thin flexible sheets of material each of which is capable of transmitting at least some light with each said sheet having given length and width dimensions large enough to cover the usable optical area of said exterior surface of said protective lens and with each said sheet having an elongated flexible tab projecting from the edge thereof, said plurality of said thin flexible sheets having said length and width dimensions thereof arranged in a mutually aligned stack having its bottom sheet against said exterior surface of said protective lens with said tab of each said sheet bent to extend generally along the top surface thereof and with said tab of each said sheet except the top sheet of said stack received between such sheet and the bottom surface of the sheet adjacent thereto in said stack; and

b. means removably mounting said stack of said plurality of said thin flexible sheets against said exterior surface of said protective lens, said means being active at a limited area only along substantially the entire periphery of the edge of said stack of said plurality of thin flexible sheets.

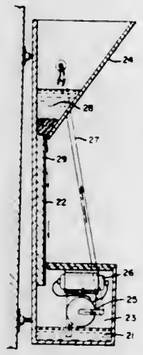
4,076,374
MEANS FOR MAINTAINING VISIBILITY IN THE USE OF MIRRORS SUBJECT TO AQUEOUS DEPOSITS

Robert E. Schwab, 16 Ivy Trail, Greenville, S.C. 29607

Filed Jul. 14, 1976, Ser. No. 705,255
Int. Cl.[2] G02B *5/08*; E06B *7/12*; A47L *1/00*; B08B *3/00*
U.S. Cl. 350—63 4 Claims

1. Means including a surface-coating device and a mirror member having an exposed exterior surface and an upper edge inclined toward said surface, for preventing obscuration of an image due to condensation of vapor and splashing of water on the exposed surface of said mirror member, and including means for applying water to an upper level of said surface while in vertical position and for forming a flowing film of water on said surface, means for withdrawing water from said film at a lower level of said surface, means for returning the

water to said water-applying means at said upper level, a strip of sponge material adjacent said water-applying means at said



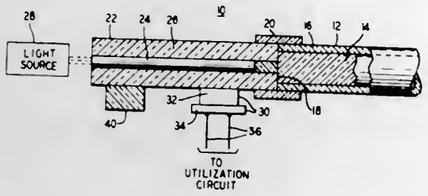
upper level, the said strip having a side edge against the edge of said member.

4,076,375

DIRECTIONAL OPTICAL WAVEGUIDE COUPLER AND POWER TAP ARRANGEMENT

Willis Martin Muska, Little Silver, and Stewart David Personick, Middletown, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 24, 1975, Ser. No. 644,304
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.15 7 Claims



1. A directional optical waveguide coupler and power tap capable of coupling core-guided modes propagating in a first direction out of a transmission optical waveguide and avoiding loss of core-guided modes which may be propagating in a second direction, the transmission optical waveguide including a core surrounded by a layer of cladding material having a refractive index which is less than the refractive index of the core material, the directional coupler and power tap comprising

a second optical waveguide comprising a core having a given refractive index surrounded by a layer of cladding material having a refractive index which is less than the refractive index of said second waveguide core material, the core of said second waveguide having a cross-sectional area which is significantly smaller than the cross-sectional area of the core of the transmission waveguide, and one end of said second waveguide being abutted with an end of the transmission waveguide in a manner to permit a significant amount of the core-guided modes propagating in the first direction in the transmission waveguide to be coupled into the cladding layer of said second waveguide at said abutting point and to permit core-guided modes introduced at the other end of said second waveguide and propagating in a second direction in said second waveguide to be coupled primarily into the core of the transmission waveguide at said abutting point, and

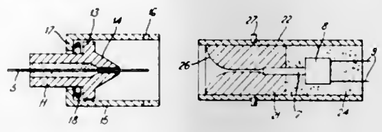
means disposed at a first intermediate position along the peripheral surface of said second optical waveguide capable of coupling out of the cladding layer of said second waveguide the cladding modes coupled therein primarily from the core of said transmission waveguide for subsequent conversion to a representative electrical signal.

4,076,376

OPTICAL TRANSMISSION SYSTEMS

Raymond Jeffrey Slaughter, Chislehurst, England, assignor to BICC Limited, London, England

Continuation of Ser. No. 514,395, Oct. 15, 1974, abandoned.
This application Feb. 2, 1976, Ser. No. 654,524
Claims priority, application United Kingdom, Oct. 16, 1973, 48096/73
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.21 6 Claims



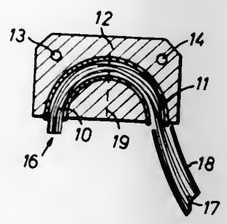
1. For use in an optical transmission system, an optical fibre connector comprising two separately formed bodies, one body of the connector having a bore for housing one of two optical fibres to be detachably connected end-to-end and the other body of the connector having a throughbore which is stepped between its ends the part of said stepped throughbore that will be nearer said first body when the two bodies are detachably connected together being of the same cross-sectional shape and size as the bore of said first body.

4,076,377

FIBER-OPTIC DEVICE WITH CURVED SLEEVE AND FILLER MATRIX

Nando Moraschetti, Bergdietikon, Switzerland, assignor to Volpi AG, Urdorf, Switzerland

Filed Feb. 5, 1976, Ser. No. 655,572
Claims priority, application Switzerland, Feb. 19, 1975, 2091/75
Int. Cl.[2] G02B 5/16
U.S. Cl. 350—96.25 9 Claims



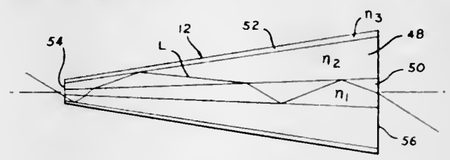
9. In a fiber-optic cable comprising a fiber bundle and at least one socket-type end portion, the improvement of said end portion comprising a curved tubular member rigidly enclosing a portion of said fiber bundle in a closely packed arrangement and embedded in a solid matrix formed of a set lubricant, said curved tubular member having a first end and a second end, said matrix comprising from said first end of said tubular member to a midpoint between the ends thereof an epoxy resin and from said second end of said tubular member to the midpoint between the ends thereof a cured silico-organic compound.

4,076,378

TAPERED FIBER OPTIC ARRAY

Henry B. Cole, East Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Filed Mar. 8, 1976, Ser. No. 664,726
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.24 4 Claims



3. A tapered optical fiber having relatively large and small opposite ends comprising:

a core having first and second concentric similarly tapered and joined together components, the first of said components being centermost and having at said large end of said fiber a light transmitting face of an area size substantially less than that of said large end of said fiber and being of a higher refractive index than said second concentric component; and

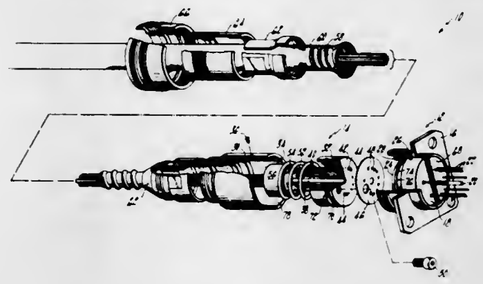
a relatively thin cladding of material of lower refractive index than said second core component surrounding and joined to said multiple component core for rendering said fiber internally reflective to light, the refractive index differential of said first and second core components and their taper ratio being selected according to the numerical aperture output and magnification desired of said fiber.

4,076,379

FIBER OPTIC CONNECTOR

Rene Joseph Chouinard, Andover, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jul. 26, 1976, Ser. No. 708,679
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.22 13 Claims



1. A connector assembly for optically joining a pair of opposing light ways in a fiber optic system, which includes:

a first plug having a polished surface oriented perpendicular to the axis of the connector assembly;

a first light way having an end which is flushly embedded in the polished surface of said first plug;

a second plug having a polished surface which is oriented perpendicularly to the axis of the connector assembly and which faces the polished surface of said first plug;

a second light way having an end which is flushly embedded in the polished surface of said second plug;

a pair of alignment pins which extend perpendicularly from said polished surface of the second plug into engagement with said first plug wherein at engagement the light way of the first plug is aligned with the light way of the second plug; and

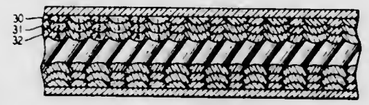
a flat spacer element disposed between said polished surface of the first plug and said polished surface of the second plug the spacer having a plurality of orifices which are located to axially separate the ends of the light ways.

4,076,380

GRADED INDEX OPTICAL FIBER

Frank Vincent DiMarcello, Clinton Township, Hunterdon County, and John Charles Williams, Whippany Township, Morris County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 28, 1976, Ser. No. 736,398
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.31 5 Claims



1. An optical fiber with a transmitting core, the refractive index properties of which are defined in terms of coaxially nested tubular regions which do not necessarily correspond with physically definable layers, comprising:

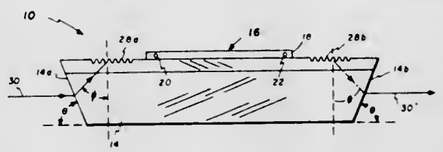
a core with a cross section of nonuniform index of refraction, the tubular regions of which core comprise at least two approximately continuous regions, each of which continuous regions has a different but approximately constant index of refraction and extends from one end of the fiber to the other end describing a helix whose axis is approximately collinear with the fiber axis, each of the tubular regions thereby having periodic longitudinal variations in index of refraction of period between 0.1 and 400 meters, the longitudinal variations in index of refraction of each tubular region being in approximate antiphase relation with the longitudinal variations in index of refraction of the tubular regions adjoining it, and the minimum index of refraction of each tubular region being approximately equal to the maximum index of refraction of the next adjacent tubular region of larger radius.

4,076,381

ON LINE ELECTRO-OPTIC MODULATOR

Jacob Meyer Hammer, Plainsboro, N.J., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 1, 1976, Ser. No. 737,807
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.14 5 Claims



1. An electro-optic modulator device comprising:

a waveguide film having substantially parallel plane surfaces and characterized by electro-optic properties;

first and second gratings formed in one of said plane surfaces of said waveguide and adjacent opposite ends thereof;

electrode means, disposed against said one of said plane surfaces of said waveguide film between said first and second gratings, for subjection of said waveguide film to varying electrical fields;

a prismatic refractive substrate having a plane surface disposed against the other of said plane surfaces of said waveguide, said substrate having opposite plane end faces disposed at pedetermined angles to the longitudinal axis of

said substrate, whereby a beam of light travelling along a predetermined entry axis parallel to said parallel plane surfaces and entering said substrate through one of said end faces is refracted to impinge on said first grating so as to be propagated within said waveguide film toward said second grating by which the light is directed to said second end face for refraction and exit from said substrate along an exit axis that is aligned with said entry axis.

4,076,382

OPTICAL CABLE WITH PLASTIC MULTILAYER SHEATH

Ulrich Oestreich, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 11, 1976, Ser. No. 741,124
Claims priority, application Germany, Nov. 12, 1975, 2551211
Int. Cl.[2] G02B *5/16*
U.S. Cl. 350—96.23 **3 Claims**



1. In an optical cable of the type comprising a cable core containing optical transmission elements and a multilayer sheath surrounding the cable core made of plastic with an outer layer of polyvinylchloride, the improvement comprising:

a. a layer of thermpolastic polyurethane disposed between the outer layer of polyvinylchloride and the cable core;

b. a first serving of filaments of an aromatic polyamide disposed between said cable core and said polyurethane; and

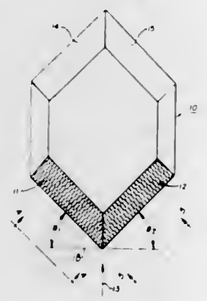
c. a second serving of filaments of an aromatic polyamide arranged between said outer layer of polyvinylchloride and said polyurethane.

4,076,383

MULTI-SIDED RETROREFLECTOR

James H. Heasley, Shaker Heights, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 635,634, Nov. 26, 1975. This application Jan. 26, 1976, Ser. No. 652,236
Int. Cl.[2] G02B *5/124*
U.S. Cl. 350—103 **21 Claims**



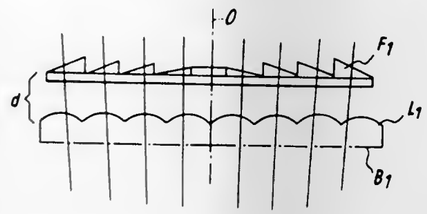
1. A multi-sided retroreflective body having at least two retroreflective substantially planar faces adapted to intercept light that is to be retroreflected, each face having a predetermined angular relationship with the other and each containing a plurality of light-reflecting units, each unit comprising three mutually perpendicular surfaces, each of said at least two retroreflective faces being tilted in the same general direction about a lower portion angularly away from a vertical plane and being angularly related in a horizontal plane with respect to another vertical plane disposed substantially at right angles to the direction of said light to define said angular relationship, all four of said angles being so interrelated as to make said at least two retroreflective faces substantially optically equivalent, such that light passing through said another vertical plane is retroreflected by both of said two retroreflective faces in return paths substantially parallel to that of the intercepted light.

4,076,384

REAR-PROJECTION VIEWING SCREEN

Reinhold Deml, Munich; Ulrich Greis, Weyarn; Wilfried Hofmann, Taufkirchen, and Walter Rauffer, Munich, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Apr. 27, 1976, Ser. No. 680,877
Claims priority, application Germany, May 2, 1975, 2519617
Int. Cl.[2] G03B *21/56*
U.S. Cl. 350—122 **10 Claims**



1. A rear-projection viewing screen operative for receiving light incident upon its back side from the objective of a rear-projection projector and forming a corresponding image visible to a human eye viewing the front side of the viewing screen, the rear-projection viewing screen comprising a lens-aperture matrix; and optical means serving the function of a lens matrix comprised of lens-matrix elements which focus the light from the objective of the rear-projection projector through the apertures of the lens-aperture matrix and furthermore serving the function of a field lens operative for gathering the light emanating from the objective of the projector and deflecting such light in direction toward the optical axis of the objective so as to increase the amount of light from the marginal portions of the viewing screen reaching a viewer's eye located on such optical axis.

4,076,385

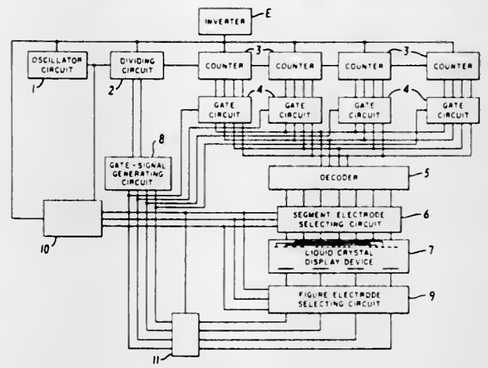
LIQUID CRYSTAL DISPLAY DEVICE

Kenichi Kondo, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Aug. 14, 1975, Ser. No. 604,783
Claims priority, application Japan, Aug. 14, 1974, 49-93069; Sep. 4, 1974, 49-101483
Int. Cl.[2] G02F *1/18*; G08B *5/36*
U.S. Cl. 350—332 **3 Claims**

1. A liquid crystal display device comprising in combination: a liquid crystal display having a plurality of segment electrodes positioned to define a plurality of display figures; a divider for dividing a time-standard signal; a plurality of counters for counting the output of said divider; a gate circuit for transmitting the output signal of said counters in a time-sharing mode; a gate signal generator circuit for generating a gate signal and for applying the same to said gate circuit to control the operating mode of said gate circuit; a decoder for receiving the counter output signal transmitted through said gate circuit and for decoding the same to develop segment signals for enabling

said segment electrodes; a segment electrode selecting circuit and a figure electrode selecting circuit each comprising a transmission gate to which the output signal of said decoder and said gate signal are applied as a control signal, each of the transmission gates comprising said selecting circuits respectively receiving a voltage higher than a threshold voltage of



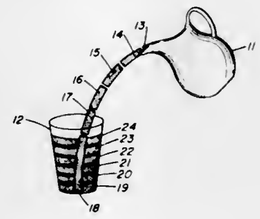
said liquid crystal display and a voltage lower than the threshold voltage, said transmission gates being connected so that the higher voltage is applied to the selected segment electrode alternately and the lower voltage is applied to the non-selected segment electrode whereby the display of each of the figures are driven by said gate-signal in the time sharing mode.

4,076,386

SEGMENTED ELECTROCHROMIC DISPLAY GENERAL

Robert Domenico Giglia, Rye, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 411,575, Oct. 31, 1973, abandoned. This application Mar. 3, 1976, Ser. No. 663,402
Int. Cl.[2] G08B *5/36*
U.S. Cl. 350—357 **6 Claims**



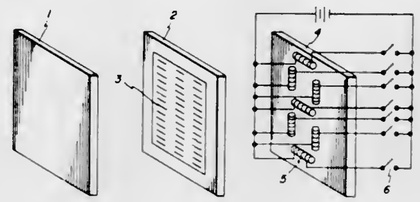
1. A variable information display device which comprises a light transmitting substrate having multiple separate discrete segments of persistent electrochromic material as a light modulating medium, a common counter electrode, and a common layer of an ion conducting material in contact with said electrochromic material and said counter-electrode, said segments being arranged so as to display variable animated pictorial arrangements when selected segments are in a bleached or colored state, electrode means connected to each segment, and an electrical source to power each segment selectively so as to display desired arrangements.

4,076,387

MAGNETIC DISPLAY

Werner E. L. Haas, Webster, and Gary A. Dir, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 2, 1976, Ser. No. 702,270
Int. Cl.[2] G02F *1/36*
U.S. Cl. 350—362 **12 Claims**



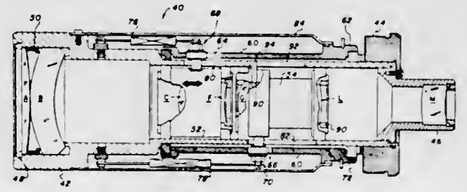
1. A magneto-optic display comprising a layer of composition comprising a ferrofluid and metal flakes said layer of composition sandwiched between two magnetic field permeable substrates, one of said substrates being optically transparent and the other of said substrates having at least one selectively energizable electro-magnet affixed thereto.

4,076,388

ZOOM LENS ASSEMBLY

Harold F. Bennett, Pasadena, and Wai-Min Liu, Arleta, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 516,299, Oct. 21, 1974, abandoned, which is a division of Ser. No. 408,777, Oct. 23, 1973, Pat. No. 3,901,585. This application Apr. 19, 1976, Ser. No. 678,288
Int. Cl.[2] G02B *15/18*
U.S. Cl. 350—187 **4 Claims**



1. In a variable magnification optical system having a housing, first and second movable lens members arranged on a common optical axis within said housing, a cam sleeve coaxial with said housing and operatively associated with said first and second movable members and means for rotating said cam sleeve whereby said first and second movable members are moved on an axial direction within said housing whereby the magnification level of an image projected from a first plane to a second plane is varied, the improvement comprising:

cam slots of a predetermined contour formed on said cam sleeve, said predetermined contour being selected whereby equal increments of rotation of said cam sleeve causes said first and second movable members to be axially positioned within said housing such that the magnification level is changed in equal increments for each corresponding incremental rotation of said cam sleeve, and

first and second fixed lens members arranged on said common optical axis, the arrangement of said lens members from the front to the rear comprising said first fixed lens member, said first movable lens member, said second movable lens member and said second fixed lens member, the first fixed lens member comprising, from the front to the rear, a double convex element and a negative meniscus element convex to the front, the axially movable first lens member comprising, from the front to the rear, a positive

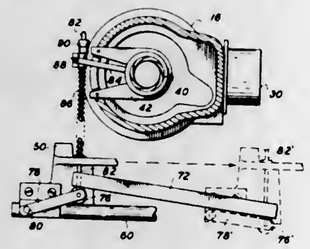
meniscus element convex to the front, a doublet comprising a double convex element, the rear surface of which is affixed to a first double concave element, and a second double concave element, said second movable lens member comprising, from the front to the rear a negative meniscus element convex to the front, a first double convex element; a first doublet comprising a second double convex element the rear surface of which is affixed to a first negative meniscus element concave to the front and a second doublet comprising a positive meniscus element, the rear surface of which is affixed to a second negative meniscus element concave to the front, the second fixed lens member comprising a positive meniscus element.

4,076,389

ZOOM LENS MOUNT AND MECHANISM

Edward C. Bock, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 29, 1976, Ser. No. 681,371
Int. Cl.² G02B *15/00, 9/00, 7/02*
U.S. Cl. 350—187 **8 Claims**



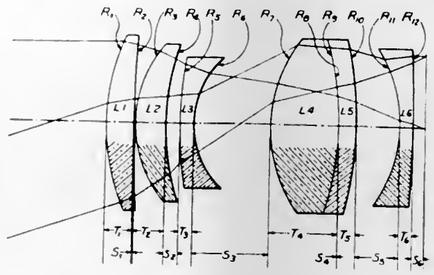
1. A mount and mechanism for a compound zoom lens including:
- a frame supporting a pair of parallel longitudinal rails,
- a stationary cam mounted on said frame and inclined relative to the longitudinal rails thereof,
- a carriage mounted on said rails for movement therealong relative to said frame and said cam,
- first motor means operatively connected to said carriage to effect movement thereof along said rails,
- a lens housing defining a lens aperture on an optical axis and mounted on said carriage for movement therewith, said lens housing supporting a pair of drive shafts extending parallel to said optical axis,
- a first lens holder to support a lens element and operatively connected to one of said drive shafts for axial movement within said housing,
- a second lens holder to support a lens element and operatively connected to the other of said drive shafts for axial movement within said housing,
- said drive shafts being operatively connected to a second motor means for movement in opposite directions relative to each other so that said lens holders move in opposite directions within said housing,
- an iris diaphragm operatively connected to said lens housing and disposed about the aperture thereof to define an adjustable lens aperture stop, said iris diaphragm operatively connected to a diaphragm linkage to open and close said iris diaphragm,
- said diaphragm linkage including a cam follower in operative engagement with said stationary cam so that said diaphragm linkage is responsive to the longitudinal position of said carriage relative to said frame to determine the adjustment of said iris diaphragm.

4,076,390

OBJECTIVE FOR OPTICAL SYSTEM

Andor A. Fleischman, Northbrook, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Dec. 7, 1976, Ser. No. 748,353
Int. Cl.² G02B *9/60, 1/00*
U.S. Cl. 350—216 **1 Claim**



1. An objective sub-system of an optical system having a large effective aperture and having substantially the following specification:

TABLE 1

EFL = 1.0471 inches (26.60mm)
Half Angle of Field = 18.69 degrees

Lens	Radii		Thickness	Spacing	N_D	V
L_1	R_1 =	1.0150	T_1 = .1300		1.734	51.7
	R_2 =	−7.3470		S_1 = .0050		
L_2	R_3 =	0.5507	T_2 = .1420		1.734	51.7
	R_4 =	−1.1810		S_2 = .0680		
L_3	R_5 =	2.4000	T_3 = .0600		1.805	25.4
	R_6 =	−0.4085		S_3 = .3690		
L_4	R_7 =	0.7000	T_4 = .3260		1.734	51.7
	R_8 =	1.0700		S_4 = —0—		
L_5	R_9 =	−1.0700	T_5 = .0800		1.805	25.4
	R_{10} =	1.3100		S_5 = .2050		
L_6	R_{11} =	−0.5800	T_6 = .0600		1.805	25.4
	R_{12} =	3.9260		S_6 = .0491		

wherein the first column lists the lens elements numerically starting at the ray entrance side of the system; the second column lists the respective radii; the third column lists the thickness of the respective elements; the fourth column lists the axial spacings between the respective elements; the fifth column lists the refractive index of the elements; and the sixth column lists the dispersive index of the elements.

4,076,391

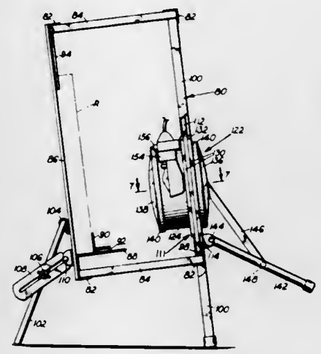
MAGNIFYING READING DEVICE AND VIEWER

Sidney Teiser, Portland, Oreg., and Floyd H. Elliott, 2015 SE. 11th Ave., Portland, Oreg. 97214, assignors to Floyd H. Elliott and Barbara Ann Elliott, both of Portland, Oreg.

Continuation-in-part of Ser. No. 700,464, Jun. 28, 1976, abandoned. This application Nov. 15, 1976, Ser. No. 741,555
Int. Cl.² G02B *27/02, 7/00*
U.S. Cl. 350—241 **2 Claims**

1. A reading device comprising
- a. a body member having forward and rearward ends and top and bottom portions,
- b. a reading material holder on said body member adjacent the rearward end thereof,

- c. a carriage on said body member having a movable support frame adjacent the forward end of said body member,
- d. magnifying means on said support frame,
- e. said carriage being movable transversely on said body member and said support frame being movable up and down on said carriage to view through said magnifying means an area larger than the latter by combined up and down and transverse movements,



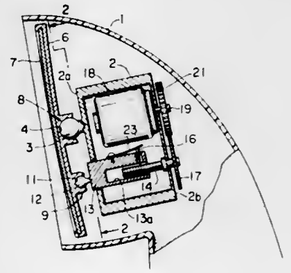
- f. a handle pivotally connected at one of its ends to said carriage,
- g. and a link pivotally connected between said handle and said movable frame whereby said support frame is movable to raised and lowered positions by pivotal adjustment of said handle.

4,076,392

REMOTELY CONTROLLABLE REAR VIEW MIRROR

Toshiyuki Suzuki, Yaizu, and Fumio Yamauchi, Shizuoka, both of Japan, assignors to Murakami Kaimedio Co., Ltd., Japan

Filed Jun. 2, 1976, Ser. No. 692,086
Claims priority, application Japan, Nov. 26, 1975, 50-160697[U]
Int. Cl.² G02B *5/08;* **A47G** *1/24*
U.S. Cl. 350—289 **6 Claims**



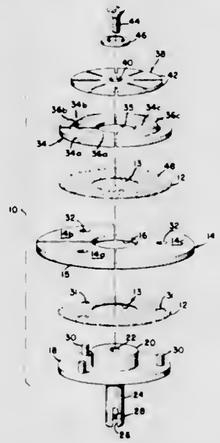
1. A remotely controlled rear view mirror comprising, in combination, a mirror hood; a hollow casing fixed in said mirror hood and having a universal pivotal support on the outer surface thereof on the hood opening side; a rear view mirror within said mirror hood, facing the opening of said mirror hood, and carried by said universal pivotal support; a drive motor having electrically connected thereto a remote control device for operation by a driver, said drive motor fixed within said casing and including an output shaft extending in a direction opposite to said hood opening side; a block disposed within said casing in an axially movable arrangement with its axis of movement parallel to said output shaft; a universal pivot attached to said block and in engagement with said rear view mirror; a pin coupled to said block; a first gear fixedly carried by said pin; a second gear fixed to said output shaft and engaging said first gear; and means for converting rotation of said pin to axial movement of said block; whereby upon activation of said drive motor, said mirror is swung by said universal pivot about said universal pivotal support.

4,076,393

THERMAL STRESS-RELIEVING COUPLING MEMBER AND SUPPORT

Richard L. Bates, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 15, 1975, Ser. No. 640,517
Int. Cl.² G02B *7/00*
U.S. Cl. 350—318 **7 Claims**



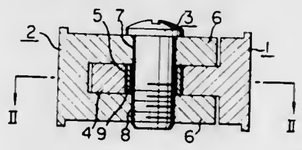
1. A holder for a fragile element subject to large temperature differential environment having a low tolerance to mechanical stress;
- a support means;
- clamping means for securing the fragile member to said support means;
- high heat conducting interface means positioned between the means and the member;
- said interface means being a thin metal sheet having compressive crushable and resilient properties capable of conforming to any irregularities in the surfaces of the adjacent means;
- whereby the fragile member can be maintained under a predetermined pressure with the interface means comforming to and applying a uniform pressure over the surface of the fragile member.

4,076,394

HINGES FOR A SPECTACLE FRAME

Iwao Nakamura, Sabae, Japan, assignor to Taiko Optical Kyogyo Kumiai, Sabae, Japan

Filed May 27, 1976, Ser. No. 690,582
Claims priority, application Japan, Sep. 17, 1975, 50-128263[U]
Int. Cl.² G02C *5/22*
U.S. Cl. 351—153 **3 Claims**



1. A hinge for a spectacle frame comprising a stationary member having at least two interconnecting elements project-

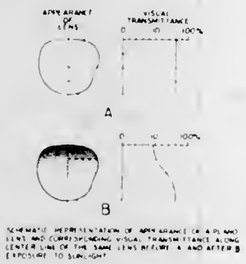
ing therefrom, a swingable member having at least one interconnecting element projecting therefrom and respectively introduced into the respective gaps formed between adjoining sets of said interconnecting elements of said stationary member, a machine screw inserted from the above in aligning holes formed in each of said interconnecting elements of said stationary and swingable members and screwed in the undermost one of said interconnecting elements of said stationary member, and at least one bush rotatably mounted in the hole formed in said at least one interconnecting element of said swingable member, the inner diameters of each of said holes being respectively made somewhat larger than the outer diameter of said machine screw, and the inner diameter of said at least one bush being made somewhat larger than the outer diameter of said machine screw said bush being mounted so as to leave small clearances between the inner periphery of said bush and the outer periphery of said machine screw and between the inner periphery of said hole in the inter-connecting element and the outer periphery of said bush.

4,076,395

PREPARATION OF PHOTOCHROMIC GRADIENT LENSES OF IMPROVED COLOR

Emil W. Deeg, Woodstock, Conn., and David A. Krohn, Southbridge, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Mar. 18, 1976, Ser. No. 668,172
Int. Cl.² G02C 7/10; G02B 5/23
U.S. Cl. 351—165 **4 Claims**



SCHEMATIC REPRESENTATION OF APPEARANCE OF A PLANO LENS AND CORRESPONDING VISUAL TRANSMITTANCE ALONG CENTER LINE OF THE SAME LENS BEFORE A AND AFTER B EXPOSURE TO SUNLIGHT

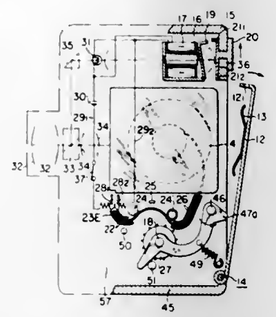
1. In ophthalmic quality lenses and lens blanks exhibiting local reversible, progressive variation in phototropic behavior, said lenses and lens blanks including a portion ultimately to serve as a distance portion and another portion ultimately to serve as a near portion, the distance portion and the near portion to be continuous with the near portion being below the distance portion when a lens made from a said lens blank is glazed in a frame, the reversible, progressive local variation in photochromic behavior being substantially more resistant to light transmission near an upper edge thereof and substantially less resistant to light transmission in the near portion when said lens is glazed in a frame, the transmission in light from the top of the lens to the bottom being substantially uniform laterally of a said lens when glazed, the improvement comprising said lens characterized by including a small, but effective, amount of manganese oxide to thereby provide a lens characterized by a slight blue-yellow color in the unexposed state to a gray color in the exposed state.

4,076,396

CINECAMERA EQUIPMENT CAPABLE OF SYNCHRONOUS SOUND RECORDING

Yoshio Komine; Hiroshi Furukawa, both of Tokyo; Kiyoshi Takahashi, Kunitachi; Tomoshi Takigawa, Machida; Mitsutoshi Ogiso, Kawasaki, and Toshikazu Ichiyanagi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 304,496, Nov. 7, 1972, abandoned. This application Apr. 8, 1974, Ser. No. 459,220
Claims priority, application Japan, Nov. 8, 1971, 46-88891; Nov. 11, 1971, 46-108660; Nov. 13, 1971, 46-90985
Int. Cl.² G03B 23/06
U.S. Cl. 352—29 **10 Claims**



1. A motion picture camera usable with a film magazine containing a roll of sound signal recordable photographic film comprising:

a housing forming a chamber adapted to receive said magazine:

a cover mounted on the housing which is openable and closable with respect to the chamber for closing the chamber;

recording means in the housing for recording the sound signals on said film, said recording means being adapted to engage the film for sound recording at a position in the path of the film on which sound recording is effected;

film transport means in the housing for continuously transporting the film and engaging the film in the sound recording position;

support means in the housing for supporting a portion of said film transport means, said support means being movable to effect engagement of said transport means with the film; and

positioning means in the housing for moving said movable support means to the sound recording position in response to closing of the cover;

said positioning means including switch means mounted in one of said cover and housing and responsive to opening and closing of the cover, and electromagnetic means responsive to said switch means;

said electromagnetic means being operatively coupled to said support means for moving said support means.

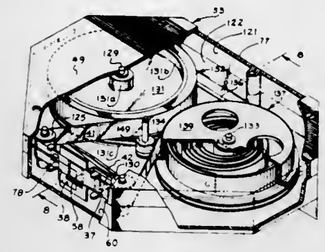
4,076,397

FILM PROJECTION SYSTEM

Charles J. Becker, San Jose, Calif., assignor to American Videonetics Corporation, Sunnyvale, Calif.

Division of Ser. No. 517,919, Oct. 25, 1974, Pat. No. 3,951,536. This application Dec. 22, 1975, Ser. No. 643,557
Int. Cl.² G03B 23/12
U.S. Cl. 353—26 R **6 Claims**

1. A film projection viewing system comprising a projector including a relatively large hollow housing, an optical display viewing screen for receiving images projected onto said screen from a film, a lens system disposed within said housing, a light source disposed within said housing and adapted to be projected along a light path defined through a film and said lens system to project an image onto said viewing screen, means carried by said housing for receiving a film cartridge, a film cartridge within the last named means, a film transport within the cartridge including first and second rolls of film respectively wrapped about first and second hubs, a window formed through said cartridge and aligned in the path of said film, a drive body coupled for rotation with the first hub and disposed coaxially of and substantially coplanar with the second hub, a coil spring having one end connected to the drive body and the



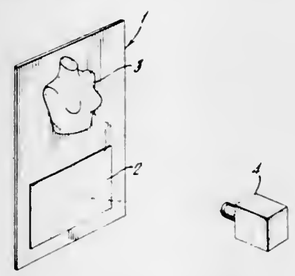
other end connected to the second hub to provide a resilient driving connection between the drive body and the second hub, said spring being pretensioned to tension the film extending between the rolls to cause that portion of said film disposed across said window to lie in a plane free of deformation in the surface of said film portion as said film moves in either of two directions, and motive means carried in said housing independently of said cartridge and disposed to engage and drive said transport through said drive hub in either of two directions at varying rates while said film remains under the tension applied by said spring.

4,076,398

VISUAL COMMUNICATIONS SYSTEM

Charles L. Galbraith, Raritan, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Continuation-in-part of Ser. No. 405,194, Oct. 10, 1973, abandoned. This application Aug. 26, 1975, Ser. No. 607,743
Int. Cl.² G03B 21/26, 21/14
U.S. Cl. 353—69 **3 Claims**



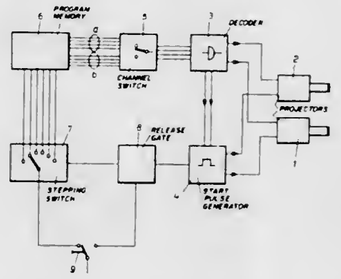
1. A method of preparing, aligning and registering a two-dimensional image which, when projected onto multiple projection-receiving surfaces, at least one of said surfaces being a three-dimensional represenatation of said image, projects as a distortion-free image of said representation, comprising photographing and projecting a grid axis consisting of equal sized squares onto a three-dimensional screen, photographing the projection on the three-dimensional screen from several angles and positions, and projecting onto the three-dimensional screen a two-dimensional photograph prepared from a single representation of each of the photographs of the grid, said representation having incorporated therein the distortions apparent in the grid as projected onto the three-dimensional screen, making two series of photographs of a representation consisting of evenly spaced lines on horizontal and vertical axes by moving said representation horizontally in one series and with each successive photograph moving the representation to the right or left the distance equal to the space between said evenly spaced lines, repeating the same procedure through the vertical axis, projecting each photograph onto the two-dimensional screen, selecting one photograph from the horizontal and vertical series, the lines from said photographs describing a rectangle which is part of the first image in a series used to align and register the images on the screen, placing a transparent overlay containing evenly spaced lines in horizontal and vertical axes over the first piece of art prepared for the three-dimensional surface, simultaneously photographing art for the two-dimensional screen, consisting of three rectangles, and the art prepared for the three-dimensional screen, holding the art for the two-dimensional screen stationary throughout the photographing procedure, making two series of photographs of the two pieces of art, moving the art for the three-dimensional screen through one axis and then through the other, projecting both series of photographs onto two-dimensional and three-dimensional screens, aligning the two-dimensional screen art for each image such that the outer rectangle is not visible, selecting one photograph from each of the horizontal and vertical series of the three-dimensional art, said photographs being the images which most precisely register with the contour of the three-dimensional surface, noting the veritcal and horizontal lines indicating the position from which the art for the three-dimensional screen was photographed, photographing the image to be projected on the two-dimensional screen and the image to be projected on the three-dimensional screen simultaneously to form a bifurcated image, said images comprising representations drawn within the boundaries determined by the rectangle on the two-dimensional screen and the boundaries defined by the photographs selected from the horizontal and vertical series of the three-dimensional art, said bifurcated image being the first image in any series of images made for projection onto said multiple projection-receiving surfaces, repeating said photographic process with each successive piece of art, said art being photographed in the same positions used to prepare the images which were precisely aligned and registered on both the two-dimensional and the three-dimensional screens.

4,076,399

CONTROL MECHANISM FOR A PLURALITY OF SLIDE PROJECTORS

Rudolf Schlei, Kronberg, Taunus, Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 18, 1975, Ser. No. 605,581
Claims priority, application Germany, Aug. 16, 1974, 2439182
Int. Cl.² G03B 21/26
U.S. Cl. 353—86 **9 Claims**



1. A control system for at least two slide projectors each projector having a light source subject to control by an electrical signal, said system comrpising:

freely programmable memory means for storing program instructions for controlling the operation of the projectors, said memory means capable of being programmed

prior to and during operation of said projectors, said memory means being a cross-bar distributor having columns and rows forming cross-over points, said cross-over points being connected by bridging means, a predetermined arrangement of bridged cross-over points forming a control program;

selector means for selecting a predetermined portion of said control program and for providing signals corresponding thereto said selector means including a stepping switch device to automatically change the control program of said cross-bar distributor memory means, said device including an actuating key, a stepping motor and a stepping switch; and

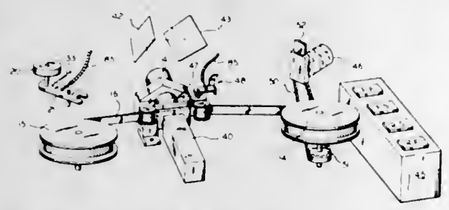
decoding means, responsive to signals provided by said selector means, for decoding said signals and for providing functional control signals for controlling the activation and deactivation of respective projector light sources.

4,076,400

MICROFILM TRANSPORT WITH AUTOMATIC THREADING

Thomas J. Persha, Juneau, and David Jagielski, West Bend, both of Wis., assignors to Bell & Howell Company, Chicago, Ill.

Filed Jul. 21, 1976, Ser. No. 707,172
Int. Cl.² G03B *1/58*; G11B *15/32*; G03B *1/48*
U.S. Cl. 353—95 **14 Claims**



1. An automatic threading device for a microfilm reader comprising a film transport mechanism having at least a supply reel and take up reel, means for driving said take up reel to pull film from said supply reel and move it through said transport mechanism, capstan means driven simultaneously with the driving of said take up reel for selectively engaging or disengaging the perimeter of a film roll on said supply reel, when engaging said perimeter, said capstan peeling off said film and causing it to follow a path through said reader to said take up reel, and one-way clutch means interposed between said take up reel and said capstan for transmitting a driving force to turn said capstan means only when said film moves in a direction which feeds it to said take up reel.

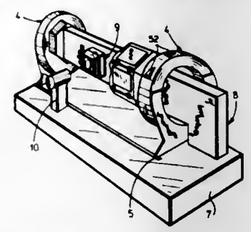
4,076,401

ARRANGEMENT AND METHOD FOR THE STORAGE OF LANTERN SLIDES AND PROJECTOR FOR VIEWING THEREOF

Bohdan Drwiega, "Les Turquoises" Avenue de la Paix, F-06190 Requebrune-Cap-Martin, France

Continuation of Ser. No. 565,251, Apr. 4, 1975, abandoned. This application Oct. 18, 1976, Ser. No. 734,171
Claims priority, application France, Jun. 14, 1974, 74 21542; Germany, Oct. 16, 1974, 2449243
Int. Cl.² G03B *23/10, 21/00*
U.S. Cl. 353—108 **2 Claims**

1. A device for the storage of framed slides, each of said slides having a viewing surface, the device comprising: a plurality of pocket strips composed of strip-shaped, superposed bottom and top parts, each of said strips being formed with a plurality of window openings, at least some of said openings being adjacent to one another; a plurality of superposed moldings associated with said strip-shaped parts, respectively, extending along each of said window openings and somewhat recessed with respect thereto, said moldings serving to hold the framed slides with their viewing surfaces in said window openings, one of said strip-shaped parts being formed with a plurality of recesses, one of said moldings including pins fitting into corresponding ones of said recesses of the other of said parts, said pins and said recesses constituting releasable joining means, each of said pocket strips having longitudinal and lateral edges and at least some hinges for linking at least some of said pocket strips to one another at said longitudinal edges to allow articulated movement between the linked pocket strips



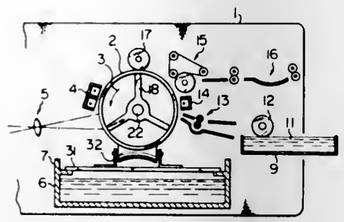
for projecting purposes; strip engaging catches provided on opposite lateral edges of the linked pocket strips said linked pocket strips forming a plurality of leaves, each of said leaves having an edge formed with perforations, each of said perforations having a predetermined diameter, said perforations being spaced from one another at predetermined distances for the perforation diameters and distances to correspond to those of clamps of an album into which the framed slides are insertable, said strip-shaped parts being inherently stiff so as to permit only a limited amount of elastic deformation.

4,076,402

ELECTROPHOTOGRAPHIC APPARATUS WITH DETACHABLE PHOTOCONDUCTIVE DRUM

Tadaaki Kanno, and Sunao Ikeda, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 30, 1976, Ser. No. 653,879
Claims priority, application Japan, Jan. 31, 1975, 50-13566
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 DR **10 Claims**



1. Electrophotographic apparatus comprising:

a housing;

a photoconductive drum having a rotary axis and rotatably mounted in the housing in an operative position, the photoconductive drum being detachable from the housing through movement in its axial direction from the operative position; and

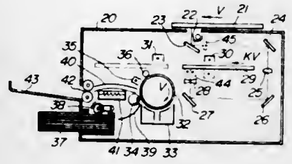
a roller assembly mounted below and axially spaced from the photoconductive drum when the photoconductive drum is in the operation position, the roller assembly comprising at least one roller having a rotary axis perpendicular to the rotary axis of the photoconductive drum, the photoconductive drum engaging with and being guidingly supported by the roller assembly at positions which are equally spaced from a lowest portion of the photoconductive drum when moved axially for detachment from the housing.

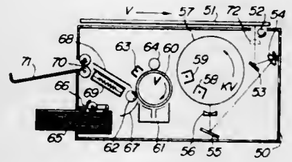
4,076,403

ELECTROGRAPHIC PROCESS

Masaji Nishikawa, Hachioji, and Eiichi Sato, Tama, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 6, 1976, Ser. No. 747,527
Claims priority, application Japan, Dec. 11, 1975, 50-146830
Int. Cl.² G03G *15/00*
U.S. Cl. 355—35 C **3 Claims**





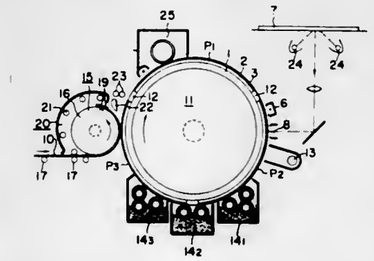
1. An electrographic process comprising using a screen-shaped photosensitive body composed of at least one electric conductive layer and photoconductive layer, uniformly charging said photoconductive layer, illuminating said screen-shaped photosensitive body with a light image corresponding to a picture image of a manuscript to be recorded so as to form an electrostatic latent image on said photoconductive layer, directing a flow of corona ions through said screen-shaped photosensitive body toward a dielectric coated image receiving body and controlling said flow of corona ions by said electrostatic latent image to form, on said dielectric coated image receiving body, an electrostatic charge image corresponding to an image to be recorded, said process comprising a further step of making a radius of curvature of said screen-shaped photosensitive body different from that of said dielectric coated image receiving body, arranging these two bodies in opposed and spaced apart relation and driving said two bodies at surface speeds which are different from each other.

4,076,404

METHOD OF AND APPARATUS FOR ELECTRONIC COLOR PHOTOGRAPHY AND PHOTOSENSITIVE MEMBER USED FOR THE SAME

Katsumi Nagamatsu, and Takashi Saito, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 245,671, Apr. 19, 1972, abandoned, which is a division of Ser. No. 24,734, Apr. 1, 1970, Pat. No. 3,832,170. This application Apr. 22, 1974, Ser. No. 463,159
Int. Cl.² G03G *15/01*
U.S. Cl. 355—4 **10 Claims**



1. An electronic photocopying apparatus comprising:

photosensitive members mounted in juxtaposed relationship on a movable carrier and corresponding in number to resolved colors, each of said photosensitive members being formed of a supporting member, a photoconductive layer and a transparent insulating layer providing a color filter effect;

means for driving said movable carrier;

means for forming an electrostatic latent image on the surface of each of said insulating layers forming the uppermost layer of said photosensitive members juxtaposed on said movable carrier;

developing means for visualizing said electrostatic latent images disposed in juxtaposed relationship with said electrostatic latent image forming means and corresponding in number to the resolved colors, said developing means using different toners complementary to the colors of the color filters provided by said insulating layers; and

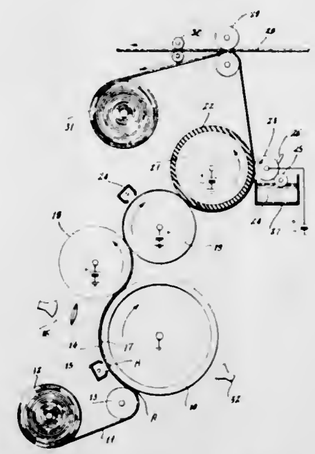
means for transferring said visualized images onto an image transfer member in superposed relationship by causing said image transfer member to effect a cycle of movement with respect to the movement of said photosensitive members for sequentially engaging each said photosensitive member over the total length of each said member.

4,076,405

LIQUID INK IMAGING SYSTEM

Morton Silverberg, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 4, 1976, Ser. No. 692,837
Int. Cl.² G03G *15/10*
U.S. Cl. 355—10 **4 Claims**



1. An electrostatographic imaging apparatus comprising a photoconductor assembly; means for positioning the inner surface of a dielectric web against said photoconductor whereby an air gap is formed between said photoconductor and said web; first charging means for applying a charge to the outer surface of said web, means for exposing a light pattern through the charged web, whereby the air gap is ionized and forms a latent image on the inner surface of the web; means for guiding the latent image bearing web away from the photoconductor, including a first conductive roller biased at a potential sufficient to prevent charge transfer from said assembly to said web as the web is guided away from the photoconductor; means for guiding the latent image bearing web away from the first roller to expose the outer surface of the web, including a second conductive roller biased at a potential sufficient to prevent transfer from said first roller to said web; second charging means for applying a charge to the outer surface of said web when said web is in contact with said second roller, said charge being sufficient to neutralize said first charge;

means for guiding the latent image bearing web away from the second roller, including a third conductive roller having an insulating coating thereon, said third roller being biased at a potential to prevent charge transfer from said second roller to said web; a liquid developing system for developing the latent image on said web; and means for transferring said developed image from said web to an image copy member.

4,076,406

METHOD OF AND APPARATUS FOR TONING ELECTROPHOTOGRAPHIC FILM

Peter Guy Talmage, and Manfred Rudolf Kuehnle, both of Lexington, Mass., assignors to Coulter Information Systems, Inc., Bedford, Mass.

Continuation-in-part of Ser. No. 523,370, Nov. 13, 1974, abandoned. This application Jun. 7, 1976, Ser. No. 693,631

Int. Cl.² G03G *15/10*

U.S. Cl. 355—10 **19 Claims**

1. A method for toning the latent image on a charged electrophotographic member which has been exposed to a radiation pattern which members includes an ohmic layer and a photoconductive coating, the latent image being formed by selective charge distribution in the photoconductive coating in increments dependent upon the amount of radiation received and to selectively attract toner particles of one polarity related to the charge acceptance characteristic of the coating for each increment of charge at the surface in inverse relation to the amount of radiation received by that increment, said method comprising: bringing a conductive plate into juxtaposed parallel relation with the surface of the coating to define a liquid toner retaining volume, applying a low d.c. bias voltage between the plate and ohmic layer of said one polarity and of a value and relationship such as to effect an imaging bias to repel toner particles from said surface at those surface increments which received the most radiation during exposure without substantially changing the overall relative attraction pattern of toner particles at the remaining surface increments, introducing into said volume liquid toner comprising particles of said one polarity and in a dispersant medium, retaining the liquid toner in the volume for a period of time which will substantially fully tone the latent image while at the same time maintaining said low d.c. bias for at least the majority of said period while also maintaining the positional relationship of said plate and coating, and establishing a clearing bias by increasing imaging bias to a condition such that its polarity and the voltage relationship between the plate and the ohmic layer favor attraction of particles to said plate and thereafter removing the liquid remaining in said volume after said period.

4,076,407

DUPLEX COPYING TRANSFER SYSTEM

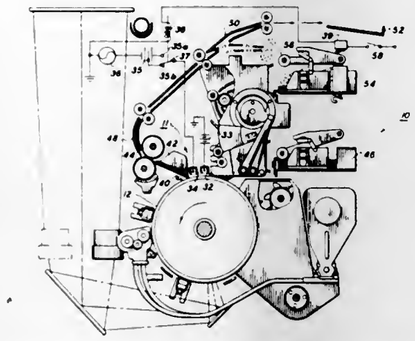
George H. Place, Jr., Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 18, 1976, Ser. No. 668,008

Int. Cl.² G03G *15/00, 15/16*

U.S. Cl. 355—14 **1 Claim**

1. In an electrostatic copying apparatus in which a first image of fusable material formed on an initial image support surface is transferred by electrostatic field producing transfer means applying transfer charges to a first side of a copy sheet, and said first image of fusable material is then thermally fused to said copy sheet by fusing means acting thereon, and in which a second image formed on said initial image support surface is transferred to the second, opposite, side of said same copy sheet by said transfer means subsequent to said fusing of said first image to said first side, wherein said transfer means includes detacking corona generator means for applying an alternating current output with a net direct current output of neutralizing charges to said copy sheet to at least partially neutralize said transfer charges, and wherein said net direct current output of said detacking corona generator means has a nominal output current level for said transfer of said first image to said first side of said copy sheet, the improvement comprising duplex switching means for automatically changing said nominal output current level of said detacking corona generator for said transfer of said second image to said second side of said copy sheet to compensate for changes in the transfer characteristics of said copy sheet due to said first image being



fused to said first side thereof, wherein said duplex switching means automatically decreases said net direct current neutralizing charge output from said detacking corona generator for said transfer of said second image to said second side of said copy sheet relative to said nominal output current level.

4,076,408

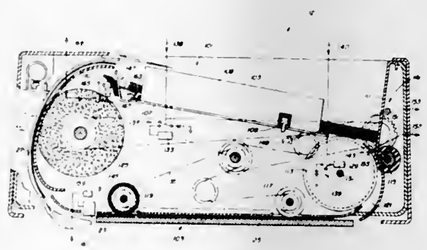
COLLATING DOCUMENT FEEDER WITH MULTIPLE FEED DETECTOR

Michael Gerald Reid, Rochester; Leroy Ellery Burlew, Clyde, and David Charles Hogan, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 30, 1976, Ser. No. 671,758

Int. Cl.² G03G *21/00*

U.S. Cl. 355—14 **8 Claims**



1. In a document feeder for presenting and representing a document, defined by a set of sheets, to a convenience copier; the feeder including sheet handling means for once presenting the set one-sheet-at-a-time to the copier and for once again presenting the set one-sheet-at-a-time to the copier; the improvement comprising:

means for comparing the number of times sheets are presented to the copier when the set is once presented, with the number of times sheets are presented to the copier when the set is once again presented; and

means for establishing an apparent first condition when the number of times once presented equals the number of times once again presented, and a second apparent condition different from the first condition when the number of times once presented differs from the number of times once again presented.

4,076,409

BELT TYPE SENSITIVE MEMBER UNIT

Hiroshi Hamaguchi, Sakai, and Shin Miyata, Toyokawa, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

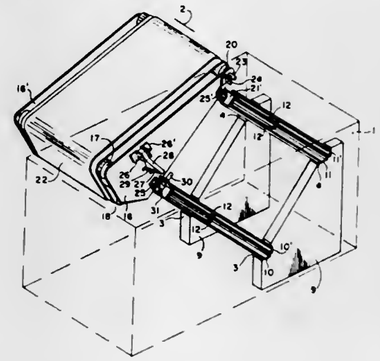
Continuation of Ser. No. 553,841, Feb. 27, 1975, Pat. No. 3,958,879. This application Apr. 30, 1976, Ser. No. 681,989

Claims priority, application Japan, Mar. 7, 1974, 49-27093

The portion of the term of this patent subsequent to May 25, 1993, has been disclaimed.

Int. Cl.² G03G *15/00*

U.S. Cl. 355—16 **11 Claims**



11. An electrophotographic reproducing apparatus having a main body portion; a belt-type photosensitive member unit normally located in an operative position internal to the main body and including a framework and a plurality of rollers rotatably confined within the framework, a belt-type sensitive member being trained about said plurality of rollers and said rollers comprising a drive roller, said unit comprising:

first guide means rigidly secured at two points along the length thereof to the main body of the reproducing apparatus; and

second guide means attached to said sensitive member unit outwardly thereof and adapted to cooperate telescopically with said first guide means to permit displacement of said sensitive member unit to a position external to the main body.

4,076,410

PHOTORECEPTOR DRUM FOR USE IN ELECTROPHOTOGRAPHIC COPYING APPARATUS

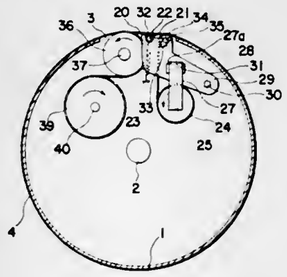
Tateomi Kono, Toyokawa, and Takashi Kuwako, Okazaki, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 30, 1976, Ser. No. 718,937

Claims priority, application Japan, Oct. 3, 1975, 50-135853; Aug. 2, 1976, 51-104840

Int. Cl.² G03G *15/00*

U.S. Cl. 355—16 **12 Claims**



1. In a photoreceptor drum for use in an electrophotographic copying apparatus which includes a rotatory cylindrical drum member having a slot in the outer periphery thereof parallel to the drum axis, a supply roll member and a takeup roll member rotatably disposed in said cylindrical drum member, a sheet-like photoreceptor having one end thereof attached to said supply roll member and the other end thereof attached to said takeup roll member, a supply of said sheetlike photoreceptor being wound around said supply roll member and drawn out therefrom through said slot and along the outer periphery of said cylindrical drum and wound onto said takeup roll member upon rotation thereof for replacement of said photoreceptor, and means covering said slot, the improvement comprising covering means being selectively movable between a first position covering said slot and a second position remote from said slot, means for moving said covering means between said first and second positions for raising said covering means from said first position to said second position at the time of replacement of said sheet-like photoreceptor, lock means having a lock gear connected to one end of said supply roll, a locking claw member engagable with said lock gear for locking said supply roll against rotation, and a cylindrical rotatable cam member having a notch and having said claw member engaged with the outer periphery thereof, and means for associating the releasing of said claw member from said lock gear and from said notch with said moving means for raising said covering means, whereby said cam member is rotated during the replacement of sheet-like photoreceptor from said supply roll, during which rotation said claw member is disengaged from said notch by said associating means, and said claw member is engaged with said notch after a predetermined amount of said sheet-like photoreceptor is drawn off said supply roll.

4,076,411

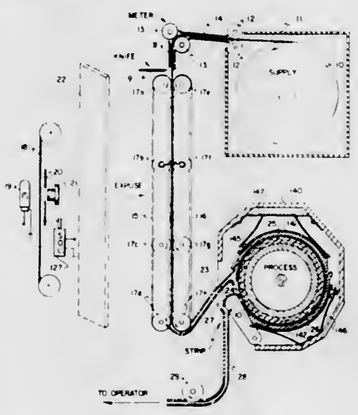
APPARATUS AND METHOD FOR MAKING PRINTS

Bruce E. Crayton, Rochester; James F. Wilson, Webster, and Carl H. Zirngibl, Irondequoit, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 14, 1975, Ser. No. 632,031

Int. Cl.² G03B *29/00*

U.S. Cl. 355—28 **17 Claims**



1. An apparatus for making prints, from sensitized sheets, the apparatus comprising:

an exposure station including means for selectively exposing and means for supporting a sensitized sheet during exposure thereof to form a latent image on the sheet;

a processing station for developing an exposed sheet, the processing station including means defining a rotatably supported drum upon which each portion of an exposed sheet may be supported for rotation with the drum for a substantially fixed time period that is required for the processing of the sheet;

means for rotatably supporting the drum and for rotating the drum about its axis at a rate such that the drum makes one complete revolution in a time period that is less than the said time period required for the processing of the sheet;

means for delivering a sensitized sheet to the exposure station for selective exposure thereof and for simultaneously removing a previously exposed sheet from the exposure station and advancing same onto the drum while the drum is rotating at said rate so that the leading portion of such exposed sheet is taken up first by the rotating drum and succeeding portions of such sheet are thereafter taken-up in turn upon the drum;

sheet removing means adapted to be located adjacent the drum for removing a processed sheet from the rotating drum by removing the leading portion of the sheet first with succeeding portions of such sheet being removed in turn from the drum; and

control means coupled to said sheet removing means for controlling the sheet removing means so that the sheet removing means removes the processed sheet from the drum only after each portion of the sheet has been supported on the drum for more than one complete revolution of the drum.

4,076,412

PROCESS FOR PRODUCING MICROFILM COPIES AND APPARATUS THEREFOR

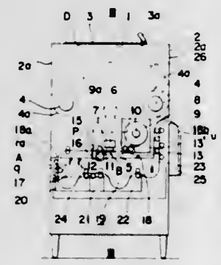
Shunkichi Igarashi, Yokohama; Takeshi Okano, Amagasaki; Sho Takahama, Takarazuka, and Yoshio Hakamata, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jun. 7, 1976, Ser. No. 693,671

Claims priority, application Japan, Jun. 7, 1975, 50-68945; Jun. 20, 1975, 50-76194

Int. Cl.² G03B *29/00*

U.S. Cl. 355—28 **4 Claims**



1. In a microfilm apparatus for a microfilm system which employs silver halide photographic film material in roll form, and forming subsequent to exposure and development a plurality of microfilm multi-frame units each comprising an image-carrier portion of multiple frames of set number exposed for production at reduced magnification microfilm copies of documents at respective frames, and a tab portion of a multi-frame set length for carrying an identification code indicative of the content of a set of documents, said microfilm apparatus comprising:

an exposure station and a development and processing station;

drive roll means positioned near said exposure station and operable to feed film material in roll form to said exposure station to permit individual frames of said film material to be exposed to image-wise light reflected from individual documents to be microfilmed,

means for actuating said drive roll means to unwind said roll of film material and move successive frames of said film material to and past said exposure station;

control means for causing said drive roll means to intermittently move said film material a distance equal to one frame length to permit a set number of film material frames to be successively brought to said exposure station, and for continuously moving said film material a plural number of frames over a set distance subsequent to bringing said set number of frames individually and sequentially to said exposure station;

cutter means, and

means for actuating said cutter means by said control means for cutting said film material to detach successive microfilm multi-frame units from the remainder of said film material prior to development and processing; and

independently actuable advance roll means for advancing successive microfilm units including said tab portion and said multi-frame document exposed portions through said development and processing stations.

4,076,413

APPARATUS AND METHOD FOR PRODUCING COLORED REPRODUCTIONS OF BLACK AND WHITE NEGATIVES

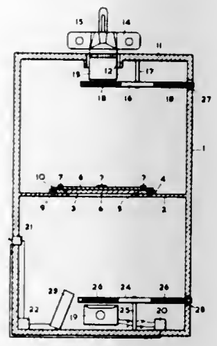
John Ronald Smeaton, Middlesbrough, England, assignor to Tioxide Group Limited, Billingham, England

Filed Mar. 24, 1976, Ser. No. 669,758

Claims priority, application United Kingdom, May 8, 1975, 19347/75

Int. Cl.² G03B *27/32, 27/52*

U.S. Cl. 355—32 **13 Claims**



1. Apparatus for producing colored photographic reproductions of black and white negatives, said apparatus comprising:

a housing providing when closed a substantially light-free enclosure;

said housing having an aperture for receiving a camera lens therethrough;

means for mounting a camera outside said housing with the camera lens extending through said lens receiving aperture into said housing;

a baffle member disposed in the interior of said housing spaced from the lens receiving aperture and extending across the housing;

an aperture in said baffle member and means for mounting a black and white negative across said baffle aperture with the plane of the negative substantially parallel to the plane of the lens of a camera mounted on said camera mounting means;

means for generating a pulse of light of known time and intensity to illuminate the baffle aperture on the side of the baffle member remote from the lens receiving aperture; and

means for positioning at least one colored filter between the light pulse generating means and the camera lens receiving aperture.

13. A method for producing colored photographic reproductions of black and white negatives comprising the steps of: providing apparatus comprising a housing providing a substantially light-free enclosure; a camera mounted on the outside of said housing with the camera lens received through an aperture in the housing wall, a baffle member disposed in the interior of the housing spaced from the camera lens, said baffle member having an aperture therethrough substantially parallel with the plane of the camera lens, means to generate a pulse of light of known time and intensity on the side of the baffle member remote from the camera lens and means for selectively positioning at least one of several colored filters between the light pulse generating means and the camera lens;

mounting a black and white negative across the baffle aperture;

providing a first pulse of light of known duration and intensity from the light pulse generating means to illuminate the negative and simultaneously exposing a color film in said camera through a first desired colored filter;

removing the negative from across the baffle aperture;

providing a second pulse of light of known duration and intensity from the light pulse generating means and simultaneously reexposing the said film in said camera over its entire surface through a second desired colored filter to produce a colored photographic reproduction of the black and white negative.

4,076,414

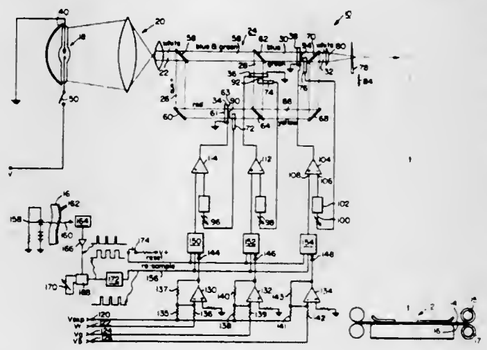
MOTION PICTURE PRINTING APPARATUS

David J. Tulbert, 308 Laburnum Crescent, Rochester, N.Y. 14610

Filed Feb. 18, 1975, Ser. No. 550,261

Int. Cl.² G03B *27/78*

U.S. Cl. 355—38 **108 Claims**



1. An optical printer for making copies of a master film comprising:

a. means for supporting a master film;

b. means for supporting a copy film;

c. a light source;

d. a printing gate;

e. means, including said light source for focusing an optical image from a master film supported by said master film supporting means onto a frame of a copy film supported by said copy film supporting means and located in said printing gate, to effect exposure thereof:

f. electro-optic modulator means disposed in the light beam between said light source and said printing gate for controlling the exposure of a copy film, the light transmitted by said modulator means being a function of the electrical energy applied thereto; and

g. electric circuit means connected to said modulator means for controlling the electrical energy applied to said modulator means, and wherein the light transmitted by said modulator means is a function of the electric field strength applied thereto, and said electric circuit means controls the voltage applied across said modulator means, and

h. said modulator means comprising a PLZT electro-optic ceramic.

4,076,415

MICRORECORD HAVING MIRROR-IMAGES

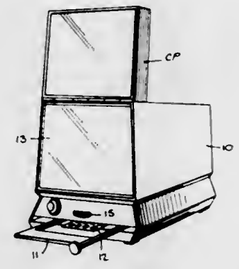
Adnan Waly, Stamford, Conn., assignor to Izon Corporation, Stamford, Conn.

Continuation of Ser. No. 443,028, Feb. 15, 1974, Pat. No. 3,995,956. This application Mar. 22, 1976, Ser. No. 668,979

The portion of the term of this patent subsequent to Dec. 7, 1993, has been disclaimed.

Int. Cl.² 355 *27; G03B 13/28, 27/32, 23/08*

U.S. Cl. 355—45 **4 Claims**



2. A reader-copier machine for a microrecord whose reduced scale images may be selectively projected for viewing by an observer or for copying without the use of an image-reversing mirror, said microrecord comprising a common carrier having formed thereon a main set of images each being a photograph in a reduced scale of only one side of a document or other form of intelligence, and a companion set of images displaced from the main set of images, each companion image being the mirror image of the corresponding photograph in the main set, no other images being formed on the common carrier, whereby a selected main image may be viewed by aligning it with an optical system to project it onto a screen and the corresponding companion image may be copied onto a sensitive film shifting the microrecord relative to said optical system to align said corresponding companion image therewith, said microrecord being a microfiche formed by several horizontal rows of image frames, the frames in each row being constituted by frame pairs in which one is a frame from the main set and the other is its companion frame, said machine comprising:

A a viewing screen;

B an optical system for projecting an image onto said screen;

C a platform supporting said microrecord in operative relation with said optical system;

D indexing means to shift said platform relative to said optical system to cause the platform to assume one operative position in which a selected main image from the main set of images is aligned with said optical system and is projected onto said screen for viewing by said observer and a stepping mechanism associated with said indexing means which, when actuated, causes the platform to assume another operative position in which the companion image of the selected main image is aligned with said optical system and is projected onto said screen for copying;

E a retractable copier having a sensitive film, said copier being retracted from said screen when the selected main image is presented thereon, said copier overlying said screen when the companion image is presented to make a copy thereof; and

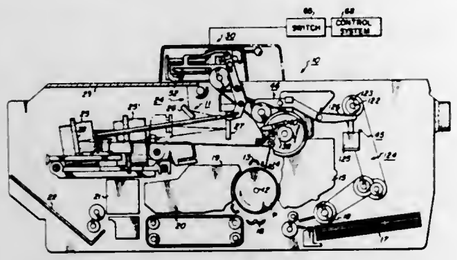
F means to illuminate said selected main image in said one operative position at a level suitable for viewing and to illuminate the companion image in said other operative position at a higher level suitable for copying.

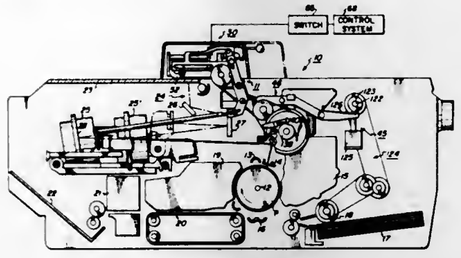
4,076,416

ILLUMINATION SLIT FOR AND A PROCESS OF USE THEREOF IN A REPRODUCING MACHINE

Robert W. Corbin, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 3, 1976, Ser. No. 682,302
Int. Cl.² G03B *27/48, 28/50, 27/70*
U.S. Cl. 355—49 **16 Claims**





1. In an apparatus including means for strip-wise viewing a document and for projecting an image thereof onto a moving imaging surface, said viewing means including: at least one reflector having a reflecting surface and being arranged along an optical image ray path; and means for controlling the projected illumination intensity of said viewing means comprising, an illumination slit arranged along said image ray path, said slit being defined by at least one boundary configured in a desired slit profile which is elongated and defines an opening for the passage of image rays therethrough which is wider at the ends of said slit than in the middle thereof; the improvement wherein:

said reflector and said slit are integral, and wherein said integral reflector and slit comprise:

means for delimiting said reflecting surface so that at least one boundary defined by said reflecting surface is configured in said desired slit profile, said delimiting means comprising a boundary of said reflector which is shaped so that it is configured in said desired slit profile.

16. In a process of making an apparatus for strip-wise viewing a document and for projecting an image thereof onto a moving imaging surface, including the steps of providing at least one reflector having a reflecting surface being arranged along an optical image ray path; and providing a means for controlling the projected illumination intensity of said viewing means comprising, an illumination slit arranged along said image ray path, said slit being defined by at least one boundary configured in a desired slit profile which is elongated and defines an opening for the passage of image rays therethrough which is wider at the ends of said slit than in the middle thereof; the improvement wherein, said process includes:

making said reflector and said slit integral by delimiting said reflecting surface so that at least one boundary defined by said reflecting surface is configured in said desired slit profile, said delimiting step comprising:

masking a desired portion of said reflecting surface with a mask whose outer boundary is configured in said desired slit profile;

coating the unmasked portion of said reflecting surface with a non-reflecting material; and

removing said mask from said reflecting surface.

4,076,417

INTERLOCKING APPARATUS FOR AN OPTICAL SYSTEM AND REPRODUCING MACHINE

Fujio Hayashi, Webster, and Robert W. Corbin, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 3, 1976, Ser. No. 682,694
Int. Cl.² G03B *27/70;* **H01H** *9/20, 33/46*
U.S. Cl. 355—60 **10 Claims**

1. In an apparatus including means for viewing a document and for projecting an image thereof onto a moving imaging surface, said viewing means including: a plurality of optical elements arranged along an optical path; means for changing the projected image modification, said magnification changing means including means for changing the positions of at least two of said optical elements so that the projected image magnification is a function of the positions of said at least two optical elements, the improvement wherein:

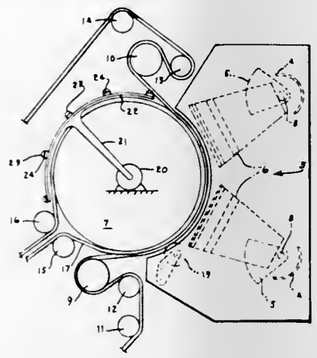
interlock means associated with said magnification changing means are provided for inhibiting the change in position of one of said at least two optical elements until the other of said at least two optical elements has changed its in position upon changing projected image magnifications.

4,076,418

FILM SLEWING DEVICE FOR DRUM TYPE CONTACT PRINTER

Edward F. O'Brien, Northampton, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 5, 1976, Ser. No. 674,021
Int. Cl.² G03B *27/22*
U.S. Cl. 355—104 **4 Claims**



1. In a drum type contact printer in which an inner copy film and an outer master film are transported in contact over the portion of a rotatable drum that substantially coincides with the light exposure region of said contact printer, the improvement comprising a film slewing device, said film slewing device comprising

a film separating means configured and arranged for slideable insertion between said copy and master films and having means for providing free transport of said outer master film thereover, said film separating means comprising a thin arcuate sheet member conformed to the outer periphery of said drum and having a length substantially equal to the length of said light exposure region, said arcuate member residing on said inner copy film and being rotatable about the longitudinal axis of said drum, and

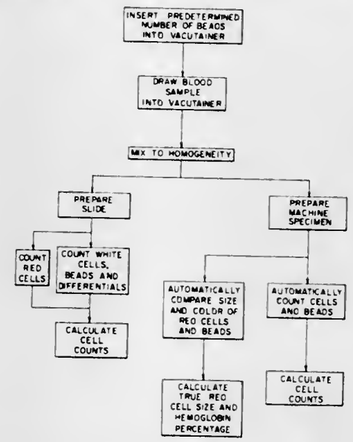
means for selectively inserting said film separating means into and out of position between said copy and master films.

4,076,419

METHOD AND APPARATUS FOR HEMATOLOGY

Richard G. Kleker, 242 25th St., Richmond, Calif. 94804

Filed Jul. 12, 1976, Ser. No. 704,429
Int. Cl.² G01N *33/16;* **G01F** *17/00;* **C09K** *3/00*
U.S. Cl. 356—39 **6 Claims**



1. A method of hematology testing comprising the steps of:

a. mixing to homogeneity a predetermined volume of blood and a predetermined number of particles;

b. smearing a small amount of the mixture onto a plate;

c. counting the white cells of the blood and particles respectively on a predetermined area of the plate; and,

d. multiplying a ratio of the counted number of white cells to the counted number of particles by a ratio of said predetermined number of particles to said predetermined volume of blood to determine a number of white cells per unit volume of the blood.

4,076,420

APPARATUS FOR INVESTIGATING FAST CHEMICAL REACTIONS BY OPTICAL DETECTION

Leo C. M. De Maeyer; Carl-Roland Rabl, both of Gottingen; Thomas M. Jovin, Schloss Berlepsch; Detlev Riesner, Hannover, all of Germany; Rudolf Rigler, Stockholm-Danderyd, Sweden; Lutz Bodo Veil, Gottingen, Germany, and Hans Lehrach, Vienna, Austria, assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Gottingen, Germany

Filed Aug. 19, 1974, Ser. No. 498,816
Claims priority, application Germany, Feb. 22, 1974, 2408646
Int. Cl.² G01N *21/00, 1/10;* **G01J** *3/30*
U.S. Cl. 356—73 **101 Claims**

1. Apparatus for investigating fast chemical reactions by optical detection, said reactions being initiated in a chemical system by an external perturbation, said apparatus comprising means for performing said external perturbation, at least one light path, means for supporting a sample cell in said light path, said sample cell forming a cell chamber for holding a liquid sample of said chemical system, at leat one photodetector, said light path comprising a light source, a monochromator, means for imaging said light source onto the entrance of said monochromator, and means for imaging the exit of said monochromator onto said sample cell chamber, said apparatus comprising also means for directing light from said liquid sample onto said photodetector, the improvement comprising:

(a) a set of at least two different types of sample cells, each of said types having one different means for application of at least one parameter of perturbation, said means comprising:

(a.1) two electrodes facing opposite sides of said chamber for temperature-jump and field-jump perturbation,

(a.2) a pressure autoclave and pressure release means for pressure-jump perturbation,

(a.3) at least one optical window in an auxiliary light path for flash-light perturbation,

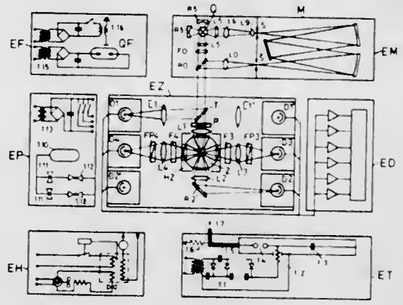
(a.4) a mixing chamber and flow-channels for rapid mixing, and

(a.5) two electrodes, a mixing chamber, and flow-channels for combined rapid mixing and temperature-jump perturbation; each of said sample cells having a specific sample volume at least two optical windows for application of at least one of the following parameters of observation: optical absorption, fluorescence, scattered light, and parameters of polarization, said sample cells having identical exterior dimensions at least in their middle parts and an identical position of their main optical axis with respect to said exterior dimensions;

(b) at least two different ones of the following perturbation supply means:

(b.1) a high-voltage pulse source,

(b.2) a pressure supply,



(b.3) a flash-light source, and

(b.4) a stopped-flow drive system;

(c) a metallic sample cell holder mating said sample cells and holding one selected sample cell operatively inserted into said apparatus, said holder comprising:

(c.1) a hollow structure having a main axis, enclosing said selected sample cell in close mechanical and thermal contact,

(c.2) threaded fixation means for clamping said sample cell therein,

(c.3) thermostatting channels connected to a liquid thermostatting system,

(c.4) window openings for passing said light path in a direction perpendicular to the main axis of said hollow structure, and

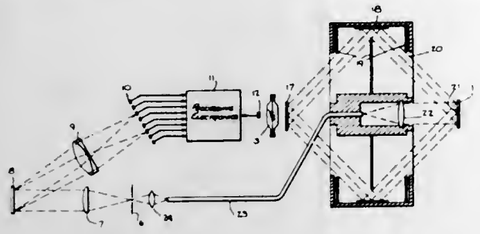
(c.5) means for connecting a high-voltage pulse source at one end of said hollow structure; and

(d) a set of changeable optical elements adapting said light path to the optical dimensions of the chamber of said selected sample cell, said elements comprising at least one lens mounted in an axially adjustable holder and at least one diaphragm modifying the free exit aperture of said monochromator.

4,076,421
SPECTROPHOTOMETER WITH PARALLEL SENSING

Stanley J. Kishner, Pomona, N.Y., assignor to Kollmorgen Technologies Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 669,592, March 23, 1976, Pat. No. 4,022,534. This application Sep. 13, 1976, Ser. No. 722,581
The portion of the term of this patent subsequent to May 10, 1994, has been disclaimed.
Int. Cl.² G01J *3/42*
U.S. Cl. 356—96 **9 Claims**

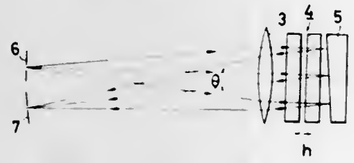


1. A reflection spectrophotometer with parallel sensing for analyzing the light diffusely reflected by a sample comprising:
(a) a source of white light;
(b) means for diffusing the light emitted by said source;
(c) illumination optics for uniformly illuminating said sample with said diffuse light from a complete annular ring at a small angular spread about 45° to said sample;
(d) collection optics for collecting said diffuse light reflected from said sample at a small angular spread about the normal to said sample;
(e) means for focusing the light collected by said collection optics;
(f) a slit responsive to said focused light for restricting the angular spread thereof;
(g) means responsive to the light passed by said slit for separating said light into its component wavelengths and for focusing the dispersed light; and
(h) an array of discrete photodetectors located in the plane of the focused spectrum and responsive thereto for simultaneously sensing the energy present at said component wavelengths.

4,076,422
FABRY-PEROT INTERFERENCE SPECTROMETER

Tsuguo Kohno, Tokorozawa, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Feb. 23, 1976, Ser. No. 660,378
Claims priority, application Japan, Feb. 24, 1975, 50-22646
Int. Cl.² G01B *9/02*
U.S. Cl. 356—106 S **5 Claims**

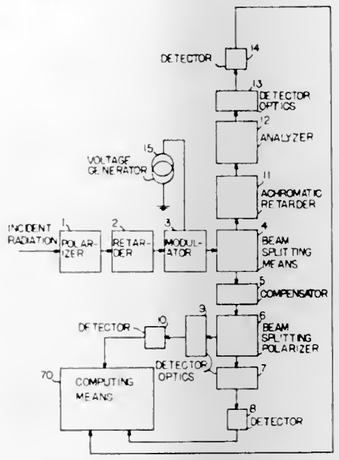


1. A single Fabry-Perot interference spectrometer, comprising an optical system including slits and a lens, a Fabry-Perot interferometer and a reflecting mirror disposed behind said Fabry-Perot interferometer non-perpendicularly to the optical axis of said interferometer, whereby a forward light path parallel to said optical axis and a reverse light path slanted relative to the optical axis are established so that the rays of light travel forward and back along said two light paths through the interferometer.

4,076,423
OPTICAL COHERENCE MEASURING DEVICE

Harry E. Bates, 240 E. Ridgewood St., Orlando, Fla. 32801

Continuation of Ser. No. 518,759, Oct. 29, 1974, Pat. No. 3,927,945. This application Dec. 12, 1975, Ser. No. 640,050
The portion of the term of this patent subsequent to Dec. 23, 1992, has been disclaimed.
Int. Cl.² G01J *4/00*
U.S. Cl. 356—114 **8 Claims**



1. An apparatus for studying the coherence of beams of optical radiation comprising:
a. optical means for polarizing the radiation;
b. means for dividing the resulting polarized beam into two independent orthogonally polarized components;
c. means for generating a phase retardation between the two independent orthogonally polarized components;
d. optical elements for projecting the beam into at least two independent states of polarization such that at least two intensities are provided which supply information needed to calculate the independent elements of the coherency matrix;
e. means for detecting at least two independent intensities and thereafter converting them into electrical analogue signals; and
f. means for calculating the complex degree of coherence from said at least two independent intensities.

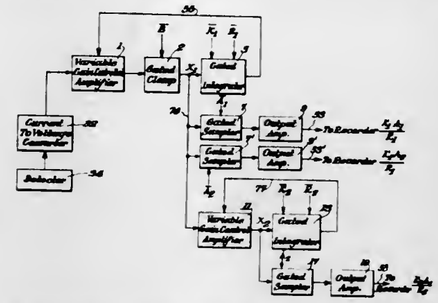
4,076,424
MULTI-CHANNEL IMPLICIT RATIO COMPUTER FOR SEQUENTIAL SIGNALS

Edward Stanley Ida, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 24, 1976, Ser. No. 670,080
Int. Cl.² G01J *3/48*; G01N *21/22*; H03K *5/18*
U.S. Cl. 356—188 **5 Claims**

1. In a multi-channel electrical signal ratioing circuit for a source delivering an electric analog signal pulse sequence constituting measured parameter signals $A_1, A_2 \ldots A_n$ and a plurality of reference signals $R_1, R_2 \ldots R_m$,
signal gating and timing means having signal identification means maintaining time coordination with said signal pulse sequence, and gate actuating means responsive to said signal identification means, actuating, for predetermined time durations, the respective gates corresponding to said parameter signals $A_1, A_2 \ldots A_n$, and said reference signals $R_1, R_2 \ldots R_m$,
a first variable gain amplifier which imparts a gain G to said parameter and reference signals,
a first gated integrator which, during a gated period $\overline{R}$, wherein at least one of said reference signals $R_1, R_2 \ldots$

R_m is delivered, has a first input terminal receiving the sum of said signal pulse sequence of a given polarity from said amplifier and a substantially constant preselected DC reference voltage K of opposite polarity, and a second input terminal connected to common,
a feedback connection between the output side of said gated integrator and said first amplifier to control the gain-determining means thereof,
a signal withdrawal circuit connection delivering said output of said first amplifier to a first sampling circuit incorporating at least one gated sampler reserved to the readout

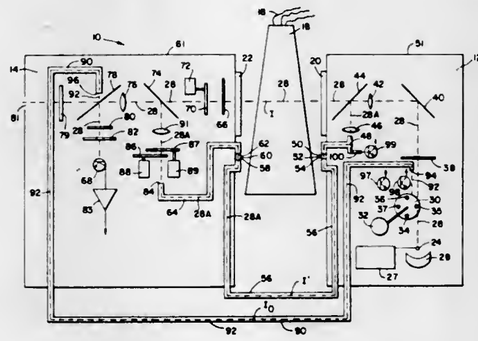


of a preselected one of the ratios KA_1/R, KA_2/R, . . . KA_n/R, where R is the time average of a selected set of reference signals admitted by the gated integrator during said gated period $\overline{R}$, and
additional individual ratioing channels, each incorporating its own variable gain amplifier, gated integrator feedback and sampling circuit, connected to the output of said first amplifier via said signal withdrawal circuit connection determining additional signal ratios with respect to other reference signal sets R selected from said plurality $R_1, R_2 \ldots R_m$.

4,076,425
OPACITY MEASURING APPARATUS

Julian Saltz, 16 Benford Drive, Princeton Junction, N.J. 08550

Filed Feb. 17, 1976, Ser. No. 658,763
Int. Cl.² G01N *21/22*
U.S. Cl. 356—205 **13 Claims**

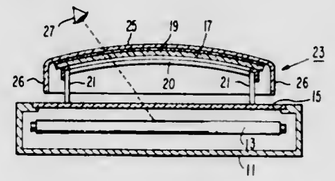


1. An opacity measuring apparatus for measuring the opacity of effluent flowing through a furnace stack comprising:
(a) a collimated light source disposed to direct a narrow beam of light in a first light path within said stack and through said effluent therein;
(b) a photoelectric detector disposed to measure the light transmitted across said stack for providing a first electrical signal related thereto;
(c) means for providing a second light path for the collimated beam external to said stack, said second light path directing said narrow beam of light towards said photoelectric detector for providing a second electrical signal related thereto; said second electrical signal being displaced in time from said first electrical signal;
(d) circuit means coupled to said photoelectric detector for providing a third electrical signal related to the ratio of said first electrical signal to said second electrical signal; and
(e) means for peak detecting said first and second electrical signals, said peak detecting means peak detecting said first and second electrical signals prior to obtaining said third electrical signal.

4,076,426
METHOD FOR INSPECTING CATHODE-RAY-TUBE WINDOW FOR OBJECTIONABLE CORD

Harvey Andrew Gross, Circleville, Ohio; Harry Robert Frey; John David Messner, both of Lancaster, Pa., and Raymond Frederick Walters, Columbus, Ohio, assignors to RCA Corporation, New York, N.Y.

Filed Jun. 29, 1976, Ser. No. 700,892
Int. Cl.² G01N *21/16*
U.S. Cl. 356—239 **9 Claims**

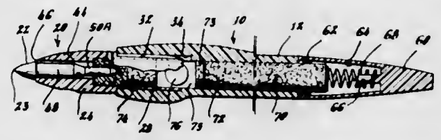


1. A method for inspecting a glass viewing window for a cathode-ray tube, said viewing window having a light-scattering inner surface, said window to be used for transmitting video images displayed on a luminescent viewing screen within said tube, said video images comprising a repetitive array of video image elements, said method comprising
(a) providing a pattern of visually contrasting areas, which pattern approximates said array of image elements,
(b) positioning said pattern adjacent said inner surface of said window,
(c) observing said pattern through said window,
(d) and identifying those local regions of said window where said pattern appears distorted.

4,076,427
WRITING INSTRUMENT HAVING A PREDETERMINED GRASP SHAFT CONFIGURATION

Charles Roger Anderson, 20 East St., Proctor, Vt. 05765

Continuation of Ser. No. 399,389, Sep. 21, 1973, abandoned. This application Mar. 19, 1975, Ser. No. 559,918
Int. Cl.² A46B *5/02*
U.S. Cl. 401—6 **9 Claims**



1. In a hand-held writing instrument having transfer means with a writing tip for transferring a marking medium to a surface in recognizable form and having a shaft for holding said transfer means with said writing tip at one end of said shaft and being of overall dimension and weight to permit grasping by the thumb, index finger and middle finger of a hand, said shaft being operatively connected to the transfer means, the

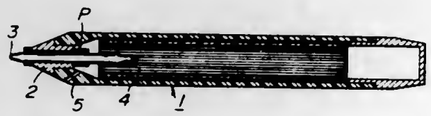
invention comprising said shaft having a longitudinal axis and a circular cross section over the major portion of its length concentric about said axis, said shaft extending generally symmetrically straight along its axis, said marking medium transfer means having a longitudinal axis aligned with and concentric with the axis of the shaft and with said tip being concentrically located with respect to the shaft axis, said shaft having a grasping region extending upwardly along the shaft from a lower boundary, the lower boundary of said grasping region being located between seven-eighths of an inch and one and three-eighths of an inch from the writing tip, said grasping region having therein three axially elongated indentations, each of said indentations commencing at said lower boundary and extending upwardly longitudinally along the shaft from said lower boundary for receiving the thumb, index finger and middle finger, respectively, of a right-handed person, said three indentations being positioned about the periphery of the shaft, the two indentations for receiving the thumb and index finger respectively each being of an elongated tear-drop shape which is enlarged and rounded near said lower boundary and tapering upwardly to merge with the circular cross section of the shaft, said three indentations being generally symmetrically arranged one to another about the shaft axis such that a cross section through the shaft, taken perpendicular to the shaft axis at the location where the perimeters of the indentations for the thumb and the index finger of a right-handed person come in closest proximity one to another on the shaft periphery, appears as a generally equilateral triangle having three sides of approximately equal size and three rounded vertices, said indentation for receiving the index finger of a right-handed person having a concavity for receiving the thumb side of the tip of the index finger as seen in said cross section, and being of slightly shorter axial length in proportion to the other two indentations, thereby to assure that the tips of the user's thumb and index finger are positioned at the optimum distance from the writing surface and to enable the grasping region to be held by a comfortable and relaxed grasp for reducing writing tension while ensuring complete control over the writing instrument.

4,076,428

PEN POINTS FOR WRITING INSTRUMENTS

Nobuyuki Otake, Tokyo; Kozo Ando, Chiba, and Hironobu Hori, Higashikana, all of Japan, assignors to Tokyo Boshi Kabushiki Kaisha, Tokyo, Japan

Filed May 10, 1976, Ser. No. 684,677
Claims priority, application Japan, May 15, 1975, 50-56693
Int. Cl.² B43K 1/06
U.S. Cl. 401—265 **31 Claims**



1. In pen point for writing instruments which is a rod-shaped wick formed by uniting molten synthetic resin monofilaments, wherein radially curved narrow slots extend toward the center of the wick from an outer periphery portion (ring portion) in the cross-section and the radial narrow slots are defined by a plurality of segments projected from the ring portion, an improvement comprises that the rod-shaped wick is provided in the cross-section with curved narrow slots extending not only in the substantially radial direction toward the center from the inside of the ring portion but also in the other directions,

said narrow slots are defined by the components of the pen point consisting of the ring portion forming the outer periphery of the rod-shaped wick, a plurality of trunk portions or trunk portions and stem segments which are projected inwardly from the inner periphery of the ring and partition the inner space of the ring and a plurality of branch portions, which are branched and projected from every trunk and additionally partition the remainder of the above described space,

said components of the trunks, the trunks and stems and branches are adjacently arranged so that the top portions, the end portions and the sides of these components are not connected with one another and that these components constitute 2 - 6 fold axis symmetry wherein the center axis of the ring is the rotary axis,

every component of the ring, the trunks, the stems and the branches has at least one size and shape,

every trunk provided with branches form at least one of standing tree-formed projections in the inside of the ring,

the trunks or the stems of the number corresponding to the fold number of the above described fold axis symmetry are opposed at the center portion to form a center passage,

every side of the narrow slots is formed by connection of circular arcs of a large number of monofilaments, which constitute the elementary components and

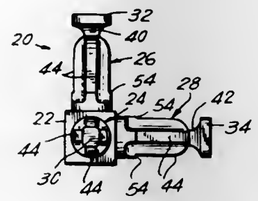
said center passage and the narrow slots extend from one end to the other end of the pen point.

4,076,429

CONVERTIBLE TUBE CONNECTING SYSTEM

Irving L. Berkowitz, Binghamton, N.Y., assignor to Kason Hardware Corporation, Binghamton, N.Y.

Continuation-in-part of Ser. No. 628,584, Nov. 4, 1975, Pat. No. 4,023,913. This application Aug. 26, 1976, Ser. No. 717,873
Int. Cl.² F16B 7/00
U.S. Cl. 403—2 **5 Claims**



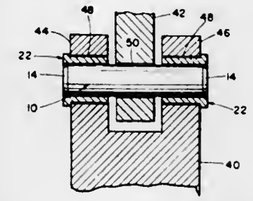
1. A convertible connector specifically designed to enable a desired separation and discarding of a portion thereof to facilitate its use with two or more members formed with connector-receiving cavities of two or more configurations, comprising, in combination: a body portion having at least two leg portions integral therewith, each of said leg portions extending from a body hub portion along a leg axis, the axes of said leg portions extending at an angle with respect to each other, each said leg portion including a first contact portion spaced from said body hub portion and a second contact portion proximate said body hub portion and spaced from said first contact portion, said first and second contact portions serving to be received by and to physically contact inner surfaces of members having connector-receiving cavities, the cross-sectional configurations of said first and second contact portions which are transverse with respect to said leg axes being substantially non-identical, the presence of said first contact portion enabling entry and retention of said leg portion within a first connector-receiving cavity of a first configuration whereby first said first contact portion and thereafter both of said first and second contact portions engage said inner surfaces, the absence of said first contact portion due to said separation further enabling entry and retention of its respective leg portion within a second connector-receiving cavity that will not cooperatively accept said first contact portion and whose inner surfaces are engaged by said second contact portion, and localized frangible means disposed substantially at the juncture of said first and second contact portions for facilitating desired physical separation of said first contact portion from the rest of its respective said leg portion at predetermined points spaced from said body portion, said frangible means comprising a frangible neck portion of said leg portion spaced from said body hub portion.

4,076,430

PIN AND LOCKING COLLAR CONNECTOR FOR LOAD BEARING PARTS

Edward J. Crook, Jr., 6348 S. 70th East Ave., Tulsa, Okla. 74133

Filed Jun. 4, 1976, Ser. No. 692,999
Int. Cl.² F16B 21/00, 2/14
U.S. Cl. 403—154 **9 Claims**



1. In a load bearing connection for a first mechanical part positioned between the ears of a second mechanical yoke part having axial openings through said parts comprising:

a locking collar having a resilient metal bushing of selected metallurgical properties having a flange at one end, of length at least the length of an opening through one of said mechanical parts and positioned within said opening;

a longitudinal slot through said bushing and flange,

a uniform diameter pin extending through said openings and said bushing, said pin of length substantially no greater than the outside width across the assembled parts and collar,

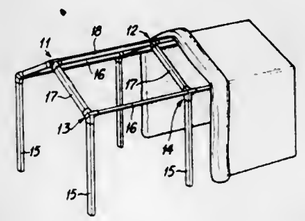
the internal diameter of said collar less than the diameter of said pin such that said collar and pin are firmly clamped for rotation together relative to said parts which openings are larger than the outside diameter of said collar.

4,076,431

CONNECTING ELEMENT

Sten Burvall, 7, Hjartervagen, S-142 00, Trangsund, Sweden

Filed Aug. 9, 1976, Ser. No. 712,998
Int. Cl.² F16B 7/00
U.S. Cl. 403—171 **5 Claims**



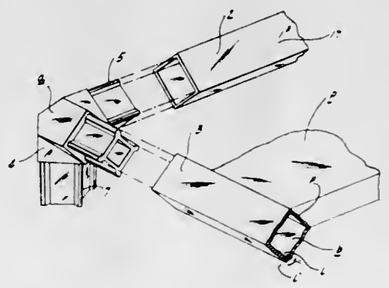
1. In a structural framework of the type comprising a plurality of separate, elongated frame members which are disposed in end to end relation to one another and which are oriented respectively in horizontal, vertical, and oblique directions to define different sections of said framework, the adjacent ends of said frame members being interconnected to one another by connecting elements at a plurality of junction points that are located respectively at the adjacent ends of groups of said frame members, said junction points and their associated connecting elements being disposed in spaced relation to one another throughout said framework, the improvement wherein the connecting elements provided at said junctions throughout said framework all have the same structural shape and configuration, each of said connecting elements consisting of first and second elongated, hollow sleeves which are interconnected to one another adjacent corresponding ends thereof, said first and second sleeves being open at the respective ends thereof remote from their interconnected ends for respectively receiving the ends of two of said frame members, said first and second sleeves being oriented at an angle of substantially 120° to one another and having a pair of outer faces which are coplanar with one another, and a third elongated, hollow sleeve located between the interconnected ends of said first and second sleeves and integral therewith for interconnecting said first and second sleeves to one another, said third sleeve being open at both ends thereof whereby said third sleeve is adapted to receive a further pair of said frame members at opposite ends of said third sleeve respectively, said elongated third sleeve being oriented at substantially 90° to said coplanar outer faces of said first and second sleeves, one of the open ends of said third sleeve being substantially flush with said coplanar outer faces of said first and second sleeves, and said elongated third sleeve extending in one direction only away from said coplanar faces of said first and second sleeves with the other open end of said third sleeve being positioned remote from said coplanar faces whereby said connecting element exhibits an asymmetrical configuration wherein said first and second sleeves are attached to and located adjacent one end of said elongated third sleeve.

4,076,432

CORNER CONSTRUCTION

Harold Glaser, St. Louis County, Mo., assignor to James David Incorporated, Maryland Heights, Mo.

Filed Aug. 30, 1976, Ser. No. 718,776
Int. Cl.² F16B 7/00
U.S. Cl. 403—176 **3 Claims**



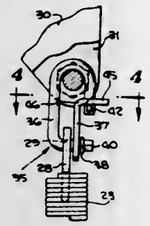
1. A corner connector for developing a corner construction for furniture and the like comprising a body, a plurality of arms integral with said body and projecting therefrom in axially perpendicular relationship to the at least immediately proximate arm, each arm having a normally free end spacedly from said connector body, each arm tapering inwardly toward its free end so that the free end is of less cross-section than the opposite or body-adjacent end, each of said arms being of four-sided character and having projecting ridge-like elements at the intersection of adjacent sides, the axis of projection of said ridge-like elements being at an angle greater than 90° to the planes of the adjacent sides of the related arm, each of said ridge-like elements spacedly from the adjacent sides having an outer arcuate edge, said arms being presented with respect to said body whereby adjacent ridge-like elements are disposed within mutually perpendicular planes, and each arm being of tubular character having a substantially coextensive bore opening outwardly through the free end thereof.

4,076,433

ATTACHMENT FOR GARAGE DOOR SPRING

William Halopoff, 17720 Crusader St., Cerritos, Calif. 90701

Filed Jun. 3, 1976, Ser. No. 692,307
Int. Cl.² F16G 15/04; F16B 45/00
U.S. Cl. 403—213 15 Claims



1. An attachment device for making a secure connection between an attachment element at one end of a counterbalance coil spring and an attachment element on a hanger,

said attachment device comprising a length of rod,

a shoulder configuration at a first end of said rod for reception of one of said attachment elements and a hook configuration at one portion of the rod for engagement with another of said attachment elements,

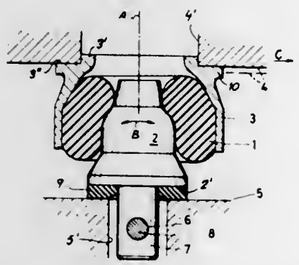
a retention section comprising a substantially flat band having legs angularly disposed relative to each other forming a corner, said legs each having aperture means therethrough engaging over respective ends of the rod, one of said aperture means comprising a slot extending into both of said legs at the corner and providing a counter shoulder configuration for engagement with the hook configuration on said rod, and mutually interlocking means respectively on said retention piece and said ends of the rod whereby to secure the respective attachment element in place and the leg of said retainer engaging the hook position having its free end facing the same direction as the first end of said rod.

4,076,434

ELASTIC JOINT

Peter Sperner, Erfstadt-Lechenich, Germany, assignor to Clouth Gummiwerke Aktiengesellschaft, Cologne, Germany

Filed Oct. 28, 1976, Ser. No. 736,714
Claims priority, application Germany, Oct. 29, 1975, 2548350
Int. Cl.² F16B 1/00
U.S. Cl. 403—224 4 Claims



1. In an assembly of a lower body and an upper body interconnected with limited relative mobility by at least one elastically deformable joint, the improvement wherein said joint comprises:

a first member centered on a substantially vertical axis and secured to one of said bodies;

a second member substantially coaxial with said first member;

a pivotal connection linking said second member with the other of said bodies for limited relative swinging in a predetermined plane including said axis;

a resilient coupling between said members enabling omnidirectional relative tilting thereof against a substantially uniform elastic restoring force; and

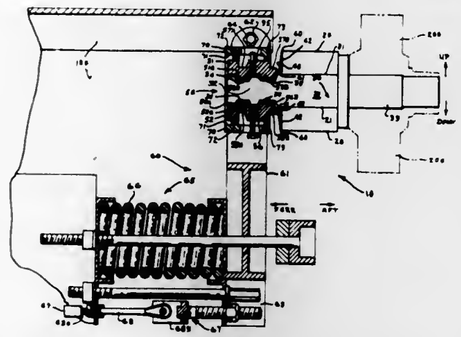
resilient cushioning means interposed between said second member and said other of said bodies for limiting the swing in said plane, said pivotal connection preventing any relative movement of said second member and said other of said bodies in a direction perpendicular to said plane whereby the resistance to relative displacement of said bodies in a direction parallel to said plane is less than in said perpendicular direction.

4,076,435

MECHANICAL DECOUPLER

Howard C. Gueldner, 237 Barcelona, New Braunfels, Tex. 78130

Filed Oct. 29, 1976, Ser. No. 737,117
Int. Cl.² F16B 21/16
U.S. Cl. 403—322 9 Claims



1. A reusable mechanical apparatus for coupling and automatically decoupling a first body and a second body, wherein the automatic decoupling is accomplished while said first and second bodies are under a tension load, and wherein said reusable mechanical apparatus is actuated for decoupling of said first and second bodies by non-explosive means, comprising:

a. a load-carrying component, connected to said second body, with said load-carrying component having an opening therein and therethrough;

b. means, connected to said second body, for passing through the opening in said load-carrying component, wherein said means includes a probe dimensioned and configured to enter into and pass through the opening in said load-carrying component;

c. a release plate having an opening therein and therethrough, with said release plate disposed so that the opening surrounds said probe, and with said release plate abutting said load-carrying component;

d. means for transmitting and carrying a tension load from the probe of said release plate and, thereby, to said load-carrying component;

e. means, pivotally connected to said first body, for releasably engaging and holding the probe, wherein said means includes:

(1) a lever arm-like element having a first end and a second end, with the first end pivotally connected to said first body;

(2) means for biasing the second end of said lever arm-like element;

(3) and, means for releasably securing said biasing means in a biased condition;

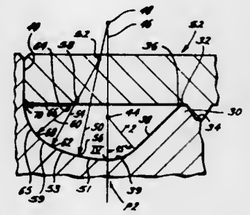
f. and, an interface element interposed between said means for releasably engaging and holding the probe and said means for transmitting and carrying a tension load from the probe to said release plate and to said load-carrying component.

4,076,436

STRESS RELIEVED TOOL ELEMENTS

Damon T. Slator; Archie W. Peil, and Thomas R. Bishop, all of Houston, Tex., assignors to Bowen Tools, Inc.

Continuation of Ser. No. 541,642, Jan. 6, 1975. This application Feb. 5, 1976, Ser. No. 655,442
Int. Cl.² F16B 7/18; E21B 17/042
U.S. Cl. 403—343 6 Claims



1. A drill string mounted tool having a threaded end which is joined to an abrupt shoulder by a new and improved stress relief groove, comprising:

a first partially curved groove portion descending from said threaded end to a point of minimal wall thickness where said groove is the deepest; and

a second groove portion ascending from said point of minimal wall thickness to said abrupt shoulder in a series of curved segments which are joined at common tangents to provide a continuously ascending curved groove portion, each curved segment having a consecutively smaller radius of curvature from said point of minimal wall thickness to said abrupt shoulder whereby stress concentration is substantially reduced between said threaded end portion and said abrupt shoulder.

4,076,437

POSITIVE CAM LOCK FOR EXTENSION POLE

Richard Mazzolla, Bloomfield, N.J., assignor to H & G Industries, Inc., Belleville, N.J.

Filed Mar. 4, 1977, Ser. No. 774,710
Int. Cl.² F16B 2/18
U.S. Cl. 403—350 5 Claims



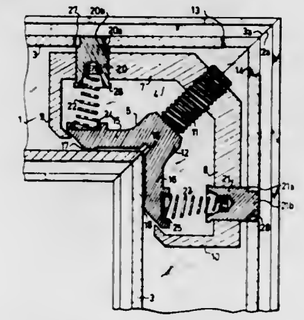
1. A positive cam lock for inner and outer telescoping poles which are longitudinally adjustable along a longitudinal axis comprising a cam support mounted to one end of said inner pole, an idler cam mounted on said cam support for concentric rotation with respect to said inner and outer poles, a locking cam rotatably mounted on said cam support, said locking cam being eccentrically mounted with respect to the central longitudinal axis of said inner and outer poles, and positive engagement means acting between said outer pole and said idler cam and locking cam for simultaneous rotation of said idler and locking cams with said outer pole to cause said eccentrically mounted locking cam to engage the inner surface of the outer pole for locking the position of said inner pole with respect to said outer pole.

4,076,438

TIE MEMBERS FOR ANGLED JOINTS

André Bos, Toulouse, France, assignor to Technal International S.A., Toulouse Cedex, France

Filed Feb. 28, 1977, Ser. No. 772,995
Int. Cl.² F16D 7/04
U.S. Cl. 403—402 9 Claims



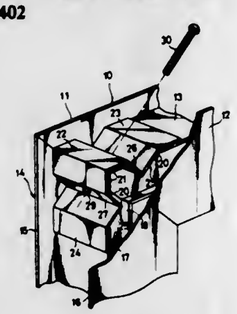
1. A tie member for forming an angled joint between two obliquely cut hollow members, said member comprising two non-deformable oppositely-faced parts each having two arms whose shape and included angle are suitable to enable them to fit into either of the hollow members to be joined, the arms of one part coming into place adjacent those walls of the hollow members which are situated on the inside of the angle and the arms of the other part coming into place adjacent the opposing walls situated on the outside of the angle, and the corners of the two parts being situated near the plane of junction of the two hollow members, said tie member also having means for moving one part relative to the other which are so arranged as to enable the parts to be moved apart by a pressure exerted where their corners are situated, and wherein one of said parts contains two retractable plungers, one of which is carried by one arm and is arranged to slide substantially perpendicularly thereto in an opening formed in said arm, and the other of which is carried by the other said arm and slides in a similar fashion, spring members arranged to cause each said plunger to project from the appropriate arm towards the adjacent wall of one of the hollow members so that said plunger can enter and latch in a bore formed in said wall, and wherein means are arranged between the facing arms of said two parts to form a resilient connection between said two parts and prevent them from becoming detached from one another.

4,076,439

CORNER PIECE FOR MITER JOINT

Masami Sakashita, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Jul. 28, 1976, Ser. No. 709,339
Claims priority, application Japan, Sep. 1, 1975, 50-121020
Int. Cl.² F16B *7/18*
U.S. Cl. 403—402 **2 Claims**



1. A frame joint comprising:

a. a pair of perpendicularly arranged frame members each having an H-shaped cross-section defined by a pair of spaced outer walls and a connector plate extending therebetween for receiving and supporting a panel between said spaced outer walls at one side of said connector plate, the ends of said H-shaped members being angularly mated with each other, each of said connector plates having a rectangular opening therein adjacent its mated end providing an end portion therebetween;

b. a corner angle piece of uniform thickness having legs disposed against the other sides of said connector plates, each said leg having a portion formed as a projection received in one of said rectangular openings, the edges of said legs engaging said outer walls, said angle piece having a continuous corner portion extending about said end portions; and

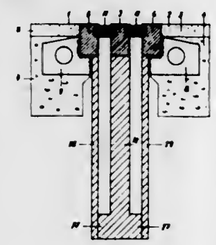
c. means clamping said continuous corner portion to said end portions.

4,076,440

EXPANSION JOINT BRIDGING DEVICE

Silvio Bertschmann, Lindenhobe, 6045 Meggan (Kt. Luzern), Switzerland

Filed Jul. 29, 1976, Ser. No. 709,658
Claims priority, application Switzerland, Jul. 29, 1975, 9852/75
Int. Cl.² E01C *11/02*
U.S. Cl. 404—69 **15 Claims**



1. A device bridging over an expansion joint in a roadway and the like, especially in a bridge roadway, said device comprising:

a. a first edge plate extending in the joint longitudinal direction arranged at roadway level and anchored in one joint edge;

b. a second edge plate extending in the joint longitudinal direction, arranged at roadway level and anchored in the other joint edge;

c. at least one intermediate plate arranged between and spaced from said first and second edge plates;

d. elastically deformable seal elements provided between said intermediate plate and said first and second edge plates;

e. first downwardly extending flexible lateral supports supporting said first edge plate;

f. second downwardly extending flexible lateral supports supporting said second edge plate; and

g. downwardly extending intermediate supports supporting the intermediate plate;

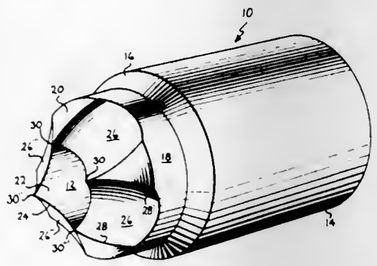
said intermediate supports each being connected to at least one of said first lateral supports and to at least one of said second lateral supports.

4,076,441

ANNULAR CUTTING DIE, AND METHOD OF CIRCUMFERENTIALLY SHAVING AWAY THE SURFACE PORTION OF A ROD

Joseph Edward Byrnes, Fairfield, Conn., assignor to General Electric Company, New York, N.Y.

Filed Sep. 27, 1976, Ser. No. 726,942
Int. Cl.² B26D *1/00*
U.S. Cl. 407—64 **12 Claims**



1. An annular cutting die for the circumferential shaving away of the surface portion of a rod passing therethrough, comprising an annular body having an outer annular tapered surface and an inner annular tapered surface which converge to form an annular cutting blade, said outer annular tapered surface of the blade having four substantially symmetrical, radially extending facets formed therein with each of the borders of each of said facets adjoining a border of the next adjacent facet of the annular cutting blade to thereby provide four splitting edges substantially equally spaced about the annular cutting blade.

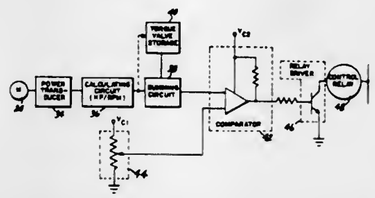
10. A method of circumferentially shaving away the peripheral surface portion of a rod as to form four discrete longitudinally extending shave sections, comprising providing an annular cutting die of a smaller circumference than the rod to be shaved, said cutting die comprising an annular body having an outer annular tapered surface and inner annular tapered surface which converge to form an annular cutting blade, with said outer annular tapered surface having four substantially symmetrical, radially extending facets formed therein with each of the borders of each of said facets adjoining a border of the next adjacent facet of the annular cutting blade to thereby provide four splitting edges substantially equally spaced about the annular cutting blade, and passing a rod through said die to circumferentially cut away the peripheral surface portion from around the rod passing through the annular die and split the circumferentially cut away peripheral surface portion of the rod into said four discrete longitudinally extending shave sections.

4,076,442

APPARATUS FOR CONTROLLING COOLANT FLOW IN ACCORDANCE TO EXTERNAL FORCES UPON A CUTTING TOOL

Joseph Henry Cox, Jr., and William Andrew Haggerty, both of Cincinnati, Ohio, assignors to Cincinnati Milacron, Inc., Cincinnati, Ohio

Filed Mar. 7, 1977, Ser. No. 774,759
Int. Cl.² B23B *39/04, 27/10*
U.S. Cl. 408—8 **12 Claims**



1. In a machine tool, an apparatus for controlling the flow of a cutting fluid to a cutting tool in accordance to tool engagement with a workpiece, comprising:

(a) a cutting tool;

(b) a cutting fluid conduit for directing cutting fluid to said cutting tool;

(c) means for generating a signal proportional to cutting forces upon said cutting tool; and

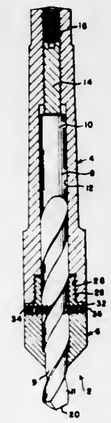
(d) a flow control valve in said cutting fluid conduit, said valve being responsive to said signal and opening when said signal exceeds a predetermined threshold level.

4,076,443

CUTTING TOOL ASSEMBLY

William Halpern, Haviland Road, Harrison, N.Y. 10528

Filed Jan. 7, 1977, Ser. No. 757,495
Int. Cl.² B23B *51/00, 31/10*
U.S. Cl. 408—191 **5 Claims**



1. A cutting tool assembly comprising, the combination of, a drill having spiral flutes presenting flute surfaces extending from a shank portion to a cutting tip, an elongated tool holder having a central cylindrical cavity extending from one end thereof and snugly receiving said shank portion of said drill and a bore extension axially aligned and extending from said cavity to the other end of said tool holder, said bore extension being threaded, an adjusting plug positioned within said bore extension and having a cylindrical array of threads mating with the threads in said bore extension and having its end nearer said other end of said tool holder shaped to receive an adjusting tool to thereby turn said plug and move it longitudinally of said bore extension, said plug being positioned whereby it engages the end of said shank of said drill and prevents movement of said drill toward said other end of said tool holder, said cavity having an enlarged portion of greater diameter than the diameter of said drill adjacent said one end of said tool holder, said tool holder being threaded around the periphery of said enlarged portion of said cavity, a cutting head having a cylindrical body portion and a shank projecting axially therefrom and mating with and threaded into said enlarged portion of said cavity with the threads being such as to support said cutting head and provide for turning said cutting head directly from said tool holder through said shank of said cutting head, said cutting head having cutter portions which extend from said drill and which present cutting edges which are adapted to engage and cut away the material around a hole drilled in a work piece by said drill, and two screws threaded into bores extending axially of said body portion and locking said drill to said cutting head to said body portion by engagement with said flute surfaces of of said drill, whereby said cutting head is driven directly by said tool holder and is maintained in precise alignment with said hole by said drill and whereby said drill is driven directly by said cutting head.

4,076,444

DRILL BIT EXTENSION

Gary L. Siebrecht, 1647 S. Mulford Road, Rockford, Ill. 61108

Filed Mar. 29, 1974, Ser. No. 456,021
Int. Cl.² B23B *31/44*
U.S. Cl. 408—226 **13 Claims**

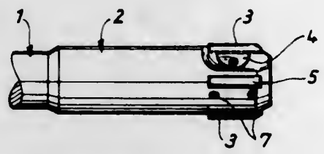


1. A drill bit extension for use with a drill bit comprising, a length of pipe having an unthreaded internal wall of preselected internal pipe size, a drill bit adapter fitting removably mounted in one end of the length of pipe and a chuck adapter fitting removably mounted in the other end of the length of pipe, said adapter fittings each including an externally threaded taper portion tapering from a minor outer diameter no larger than the internal pipe size to a major outer diameter sufficiently larger than the internal pipe size to form a binding fit with the pipe when turning threinto, said adapter fittings each including a pilot portion extending from the minor outer diameter end of the threaded taper portion and having an outer diameter substantially equal to said minor outer diameter and slidable in the pipe to maintain the axis of the respective fitting in alignment with the pipe axis when turning the threaded taper portion into the pipe, the drill bit adapter fitting having chuck means coaxial therewith for receiving the shank of the drill bit, and said chuck adapter fitting having shank means extending axially from the major end of its threaded taper portion for reception in a drill chuck.

4,076,445
MULTIPLE BLADE REAMER

Dieter Kress, Aalen, and Friedrich Haberle, Leuchheim, both of Germany, assignors to MAPAL Fabrik fur Prazisionswerkzeuge Dr. Kress KG, Aalen, Germany

Filed Nov. 2, 1976, Ser. No. 738,326
Claims priority, application Germany, Nov. 4, 1975, 2549260
Int. Cl.² B23B 27/00
U.S. Cl. 408—226 8 Claims

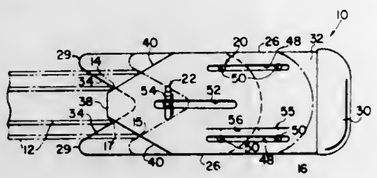


1. A reamer comprising:
(a) a shank defining an axis of rotation;
(b) a cutter head secured to one axially terminal portion of said shank;
(c) a plurality of cutting blades mounted on said cutter head,
(1) each cutting blade having a cutting edge elongated in the direction of said axis and radially projecting from said cutter head,
(2) said cutting edges being circumferentially distributed on said cutter head,
(3) each cutting edge defining two gaps extending from the cutting edge in opposite circumferential directions to another cutting edge;
(d) an axially elongated guide rib projecting from said cutter head in each of said gaps and being approximately centered circumferentially in the associated gap between the cutting edges defining said gap.

4,076,446
CONDUIT REAMER

Robert F. Lindstaedt, 717 N. McDowell - No. 501, Petaluma, Calif. 94952

Filed Mar. 15, 1977, Ser. No. 777,637
Int. Cl.² B23B 51/00
U.S. Cl. 408—227 10 Claims

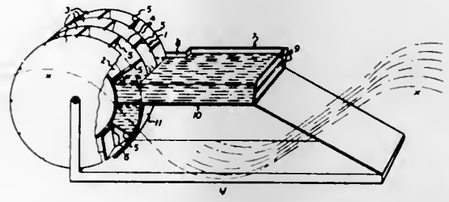


1. A reamer for use with a conduit, said reamer comprising:
a. positioning means, including engaging surfaces for maintaining the reamer in relatively fixed relationship with the front of the conduit being reamed,
b. said positioning means, being capable of engaging conduits of various diameters and rotatable relative to the conduit being reamed,
c. a reamer element mounted on each side of said positioning means, each said reamer element including a front end for positionment adjacent the aperture in the conduit being reamed and a pair of inclined sections extending outwardly from said front end and being capable of engaging the inner edge of the conduit being reamed and rotated relative thereto,
d. mounting means operatively associated with said positioning means and said reamer elements to provide relative longitudinal adjustment between said engaging surfaces and said inclined sections so as to obtain displacement therebetween, and
e. adjustment means for manually relatively linearly moving said reamer elements and positioning means to accommodate conduits of various sizes.

4,076,447
WATER-POWER MOTOR

Einar Granath, Apelvagen 15, and Alf Granath, both of Apelvagen 15, 141 46 Huddinge, Sweden

Filed Oct. 29, 1975, Ser. No. 626,962
Claims priority, application Sweden, Oct. 30, 1974, 7413654
Int. Cl.² F03B 13/12
U.S. Cl. 415—2 8 Claims



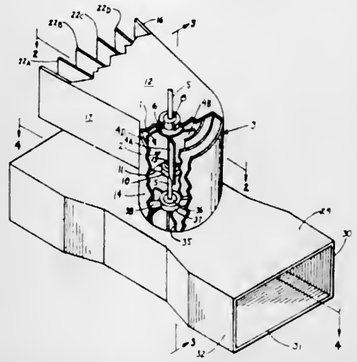
1. A water-power motor, preferably for rotating at a relatively low speed by the action of a rising and falling water surface, for instance the wave motion thereof, wherein said motor comprises at least one wheel rotatable on a horizontal axis and a plurality of compartments disposed peripherally in a suitable fashion in said at least one wheel, each compartment being defined by axially and radially disposed walls and by a pivotally mounted shutter disposed transversely of the peripheral surface of said wheel and forming when in one position the bottom of the compartment while allowing when in another position free tangential passage of water through the compartment, said shutter being mounted in such a manner that during one revolution of the wheel it will swing by gravity between a closed position and an open position, and wherein a container is arranged adjacent said wheel to cooperate therewith, from which container water successively flows into the compartments thereby causing the wheel to rotate, said container being formed so as to allow unimpeded inflow of water thereinto but permitting outflow of water therefrom only via the compartments of the wheel.

4,076,448
POWER GENERATING WATER TURBINE

Davis A. Sanders, Jr., P.O. Box 908, Baton Rouge, La. 70821

Continuation-in-part of Ser. No. 596,869, Aug. 21, 1975, abandoned. This application Oct. 22, 1976, Ser. No. 734,754
Int. Cl.² F01D 1/08
U.S. Cl. 415—2 2 Claims

1. A water turbine comprising:
(a) an impeller assembly having multiple blades mounted perpendicularly on a rotatable axle,
(b) a housing assembly having a frame fixed about and attached to said impeller assembly, said wall having an opening for receiving a water stream, said opening comprising multiple flow channels formed by a series of curved plates wherein each channel has a water entrance section wider than a water exit section, each water exit section located at a different area about said blades, said opening extending outward and angularly to said water stream,
(c) a water vortex discharge assembly having a discharge channel to receive said water from below said blades and delivering said water to a venturi eductor having a restricted passageway, and

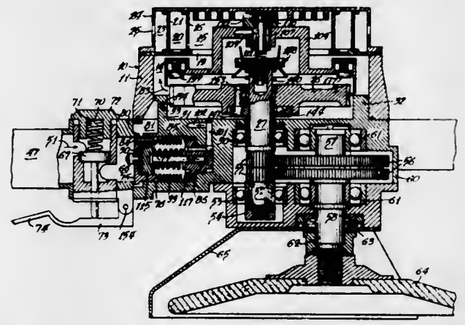


(d) a second turbine located within said discharge channel at a position within said restricted passageway.

4,076,449
PRESSURE GAS ENGINE

James V. Theis, Jr., Delray Beach; Lynn M. Davis, Boca Raton, and Donald H. Moss, Delray Beach, all of Fla., assignors to Hollymatic Corporation, Park Forest, Ill.

Filed Jun. 10, 1976, Ser. No. 694,894
Int. Cl.² F03B 15/18
U.S. Cl. 415—18 5 Claims

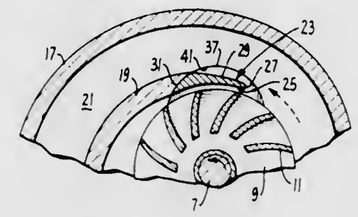


1. A pressure gas engine, comprising: a rotor having energy conversion means thereon for converting dynamic gas pressure to power; a drive axle; means for mounting said rotor on said axle for relative movement longitudinally of said axle; means interconnecting said rotor and drive axle for conjoint rotation; gas supply passage means to said engine adjacent one side of said rotor; gas exhaust passage means from said engine on the other side of said rotor; nozzle means in said supply passage for directing pressurized gas from said passage to said energy conversion means in one position of said rotor; means for moving said rotor to a second position at excessive speeds where said rotor energy conversion means are out of cooperative contact with said pressurized gas from said nozzle means; braking means on said other side of said rotor for retarding rotation of said rotor when out of said contact; and means for directing substantially the entire force of said pressurized gas from said nozzle means against said one side of said rotor for moving and holding said rotor against said braking means, the pressurized gas thereupon operating to rotate the rotor in one said longitudinal position of the rotor and for applying a braking force to the rotor in another said longitudinal position of the rotor.

4,076,450
DOUBLE VOLUTE PUMP WITH REPLACEABLE LIPS

Robert R. Ross, San Jose, Calif., assignor to United Centrifugal Pumps, San Jose, Calif.

Filed Jan. 14, 1976, Ser. No. 648,874
Int. Cl.² F04B 7/00
U.S. Cl. 415—197 5 Claims



1. In combination with a pump having an impeller chamber and double volute passages formed by curved inner and outer casings and having a throat section, the inner casing having a free terminal tip which has defined therein a rounded slot extending transversely of the inner casing and the other casing having a pair of side walls with each side wall having a slot defined therein, the pump having an impeller chamber, a separate, replaceable volute lip mounted on the inner casing free terminal tip to be located in the volute throat section and comprising:
an integral central body;
a ramp portion on said body which has a curvature similar to that of the outer surface of the inner casing and a width equal to the width of the volute throat section;
a back surface on said body rounded to conform to the rounded slot in the outer casing to be received in that slot to mount the volute lip on the casing free terminal tip;
a front surface on said body rounded to define a lip member on said body; and
a pair of identical side members each located on one side of said body and oriented to be esssentially perpendicular with a plane defined by said body, each of said side members having top and bottom edges which are curved and which intersect each other to form leading edges located forward of said lip member, said side memers each having a rear edge which is rounded to have a radius of curvature similar to that of said body rounded back surface, said side members each having a bolt receiving hole defined therein, said side members extending beyond said ramp to be located outside of the volute throat section to fit into the outer casing slots to position the lip member in the volute at a point where liquid in the pump leaves the impeller and enters the volute with the volute lip being totally confined by engagement of said side member within the outer casing slots, said side members each forming part of a corresponding outer casing side wall, said volute lip being separable from the volute casing to be replaceable thereon when worn without requiring replacement of the volute casing.

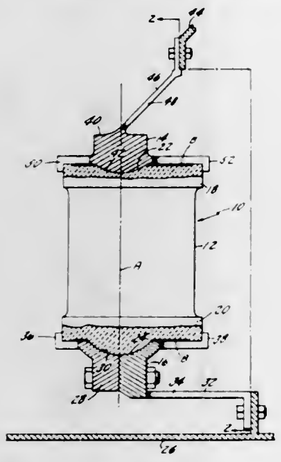
4,076,451
CERAMIC TURBINE STATOR

Alan Lewis Jankot, South Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 5, 1976, Ser. No. 664,129
Int. Cl.² F04D 29/02
U.S. Cl. 415—217 12 Claims

1. A stator vane assembly, which includes:
an inner, continuous shroud having a central ring portion including a spherical surface facing outwardly therefrom;
an outer, continuous shroud having a central ring portion including a spherical socket facing inwardly therefrom; and

a ceramic vane disposed radially between said inner and said outer shrouds wherein the vane has an inner diameter



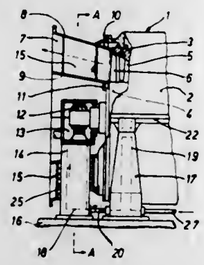
platform which is engaged by the spherical surface of the inner shroud and an outer diameter platform which is engaged by the spherical socket of the outer shroud.

4,076,452

GAS TURBINE PLANT

Max Hartmann, Baden, Switzerland, assignor to Brown, Boveri-Sulzer Turbomaschinen AG, Zurich, Switzerland

Continuation of Ser. No. 559,718, Mar. 19, 1975, abandoned.
This application Nov. 1, 1976, Ser. No. 737,515
Claims priority, application Switzerland, Apr. 9, 1974, 4978/74
Int. Cl.² F01B *25/24;* F02C *7/20*
U.S. Cl. 415—219 R **2 Claims**



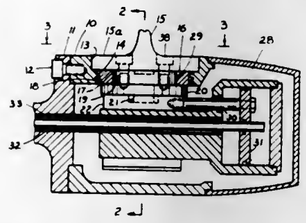
1. In a stationary gas turbine supported upon a foundation having a bearing for the turbine rotor at the exhaust end of the turbine casing and wherein the flow passage through the gas turbine merges into an outlet diffusor ring, the outer and inner peripheral walls of said diffusor ring being supported with respect to each other by means of aerofoil-shaped ribs, and the bearing and its housing being located within a hollow space established within the inner peripheral wall, the improvement wherein a support structure solely for the bearing in the form of struts passes through said ribs which are hollow, the inner ends of said struts being secured to the bearing housing and the outer ends thereof to the foundation, and a second support structure completely independent of said bearing support structure and constituted by support elements located at opposite sides of the turbine casing securing the turbine casing to the foundation serves as the sole support for said casing.

4,076,453

BEARING RING FOR BLADE OF A CONTROLLABLE PITCH PROPELLER

Arne Feroy, 1921 S. 291st St., Federal Way, Wash. 98002

Filed Jun. 23, 1975, Ser. No. 589,268
Int. Cl.² F01D *11/08;* F04D *29/10;* F16C *17/02*
U.S. Cl. 416—174 **5 Claims**



1. In a controllable pitch propeller assembly including a hub having a rotational axis, a plurality of propeller blades radiating from said hub, and means for turning each of said blades about a substantially radial rotational axis relative to the rotational axis of said hub, an improvement for journaling each of said blades in said hub comprising:

an annularly-shaped bearing ring having external threads thereon, said bearing ring having a radial gap therein, said hub having a radial bore and internal threads in said radial bore for receiving said bearing in threaded engagement, and

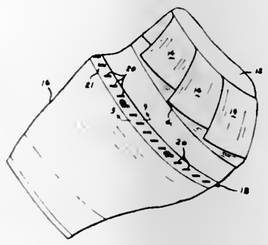
means operably associated with said gap for expanding said bearing ring to interlock said threads on said bearing ring with the threads in the radial bore of said hub, said threads on said bearing ring and said threads in the radial bore of said hub being constructed and oriented relative to each other so that when said bearing ring is expanded both sides of the threads on said ring are wedged against the corresponding threads in said bore to form a locked and solid bearing support for each of said blades.

4,076,454

VORTEX GENERATORS IN AXIAL FLOW COMPRESSOR

Arthur J. Wennerstrom, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 25, 1976, Ser. No. 699,929
Int. Cl.² F01D *1/02*
U.S. Cl. 415—208 **1 Claim**



1. In a compressor having an axial flow passage within an outer casing wall and a rotor having a plurality of rotor blades within said passage with said rotor blades being spaced from said wall with a running clearance d_1; a vortex generator system within said flow passage, comprising: an annular channel in the casing wall upstream of said rotor; a support ring in said channel having its inner surface flush with the inner surface of the casing wall; means, supported on said support ring for producing at least three co-rotating vortices in front of each of said rotor blades with the vortices co-acting with the rotor

circumferential pressure to deflect the vortices outward toward the casing wall; said vortex generator system includes a plurality of vortex generator blades equal to at least three times the number of rotor blades for producing said co-rotating vortices; said vortex generator blades having a height h greater than d_1 and less than $10d_1$, with a spacing between the blades being greater than $3h$ and less than $10h$; said vortex generator system being spaced from said rotor blades a distance greater than $10h$ with the trailing edge of the rotor being a distance less than $80h$ from the leading edge of the vortex generator system.

4,076,455

ROTOR BLADE SYSTEM FOR A GAS TURBINE ENGINE

Hans Stargardter, Bloomfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jun. 28, 1976, Ser. No. 700,693
Int. Cl.² F01D *5/22*
U.S. Cl. 416—191 **9 Claims**



1. In a gas turbine engine a rotor blade system which is adapted for reduced susceptibility to vibratory damage wherein said blade system comprises:

a rotor disk; and

a plurality of rotor blades cantilevered radially outward from the said disk wherein

each blade is pivotally joined to the disk so as to be circumferentially deflectable under bending loads, and

each blade has a shroud extending circumferentially from the airfoil surfaces of the blade into abutting relationship with the shrouds of the adjacent blades

and wherein the natural bending frequency of each blade in the system is less than the 2E frequency at the idle condition of the engine in which the blade system is installed.

4,076,456

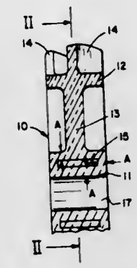
CERAMIC ROTOR FOR GAS TURBINE ENGINE

Dennis Jack Tree, Scottsdale, and F. Michael Tovey, Tempe, both of Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 512,817, Oct. 7, 1974, Pat. No. 4,011,295.
This application Apr. 12, 1976, Ser. No. 676,276
Int. Cl.² F01D *5/28*
U.S. Cl. 416—241 B **9 Claims**

1. A ceramic rotor for a gas turbine engine, comprising:

(a) a disk-type body formed of reaction bonded silicon nitride having hub, web and rim regions; and



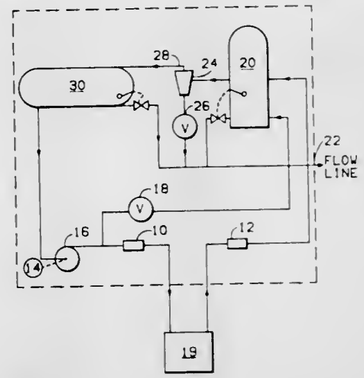
(b) at least one preformed reinforcing ring of hot pressed silicon nitride embedded in the body prior to and integrally joined therewith by the reaction bonding operation.

4,076,457

DOWNHOLE PUMP SPEED CONTROL

David R. Skinner, Odessa; Miles L. Sowell, and Marvin W. Justus, both of Levelland, all of Tex., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sep. 17, 1976, Ser. No. 724,037
Int. Cl.² F04B *49/00*
U.S. Cl. 417—45 **10 Claims**



1. In a well fluid hydraulic pumping system of the type wherein power fluid is used to hydraulically actuate a downhole pump and a portion of the return fluid is conditioned for use as power fluid, the improvement which comprises:

a. two fluid flow monitoring means for generating signals which are a function of power fluid flow rate and return fluid flow rate;

b. flow control means adapted to control the power fluid flow rate and thereby the speed of the downhole pump; and

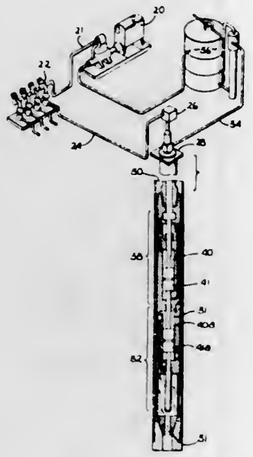
c. an automatic controller having inputs connected to said fluid flow monitoring means and having an output connected to said flow control means, said controller generating an output signal to cause the flow control means to maintain the power fluid flow rate essentially directly proportional to the return fluid flow rate.

4,076,458

AUTOMATIC PUMP SPEED CONTROLLER

Ray L. Jones, Costa Mesa, Calif., assignor to Whittaker Corporation, Burbank, Calif.

Filed May 7, 1975, Ser. No. 575,445
Int. Cl.² F04B *49/08, 49/00*
U.S. Cl. 417—46 **28 Claims**



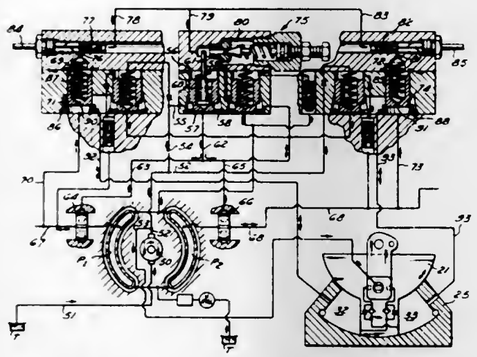
1. Apparatus for pumping oil from an oil well comprising:
(a) a reciprocating piston hydraulic pump located down the bore hole of the oil well remote from the surface;
(b) means for operating said hydraulic pump for causing said pump to reciprocate to pump oil from said down hole location remote from the surface, said pump generating pressure pulses with each stroke of the piston of said pump, which pressure pulses travel from the pump to the surface;
(c) means located at the surface of said oil well for sensing the said pressure pulses generated by said remotely located down hole reciprocating piston hydraulic pump, and for generating a signal representative of the rate of the pressure pulses sensed per unit of time and thereby of the speed in strokes per unit time of said remotely located down hole reciprocating piston pump;
(d) input means for enabling the selection of a predetermined pumping rate for said pump and for generating a signal representative of the said selected pumping rate in strokes per unit time;
(e) comparator means coupled to said input means and to said signal generating means for comparing said selected pumping rate signal with said actual pumping rate signal and for generating a difference signal representative of the difference between the actual and selected pumping rates; and
(f) means for adjusting said pumping rate of said pump, said means for adjusting said pumping rate being coupled to said pump and to said comparator means such that when said actual pumping rate differs from said predetermined pumping rate, said means for adjusting said pumping rate is activated and causes said pump to conform to said predetermined rate.

4,076,459

HORSEPOWER LIMITER CONTROL FOR A VARIABLE DISPLACEMENT PUMP

Cecil E. Adams; Leo H. Dillon; Ellis H. Born, and David L. Thurston, all of Columbus, Ohio, assignors to Abex Corporation, New York, N.Y.

Filed Sep. 14, 1976, Ser. No. 723,107
Int. Cl.² F04B *49/08*
U.S. Cl. 417—217 **11 Claims**



1. A variable displacement pump driven by a prime mover, comprising fluid motor means for setting the displacement of the pump, manual conrtrol mean for operating the fluid motor means to set the displacement at a desired value, adjustable valve means for limiting working fluid pressure, means for automatically reducing pump displacement when working fluid pressure equals the setting of said valve means and a horsepower limiter control for preventing the torque required from the prime mover from exceeding a pre-selected value, said horsepower limiter control including a source of low pressure fluid, a fluid passage for said low pressure fluid, means for channeling said low pressure fluid at a selected uniform flow rate through a variable orifice in said fluid passage, said variable orifice creating a variable fluid back pressure upstream of said variable orifice, means for adjusting said variable orifice by movement of the pump displacement varying mechanism, wherein the variable orifice is contoured to provide a variable area such that the low pressure fluid will have a back pressure-pump displacement relationship such that the product of the back pressure times the pump displacement remains constant, including an intensifier piston having one end exposed to the fluid back pressure, second valve means set by said intensifier piston for adjusting the working fluid pressure setting of the first said valve means, said intensifier piston having a constant area ratio such that the product of the first said valve means pressure setting times the pump displacement is constant.

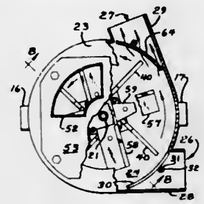
4,076,460

CONVERTIBLE LAWN CARE APPARATUS

Earl O. Roof, 1228 N. Walnut St., Pontiac, Ill. 61764

Continuation of Ser. No. 310,985, Nov. 30, 1972, abandoned. This application Jul. 19, 1976, Ser. No. 706,441
Int. Cl.² F04B *41/00; B02C 19/12;* F01D *25/00*
U.S. Cl. 417—236 **9 Claims**

1. A portable, multi-purpose lawn care apparatus for preparing and maintaining lawn areas, which is selectively convertible from a vacuum mode of operation to a blower mode of operation, including:
a chassis mounted on a pair of side wheels;
a drive motor mounted on said chassis;
an upright impeller housing fixedly mounted on said chassis, said impeller housing having a generally cylindrical side wall, a back wall and a front wall, said front wall having a central opening formed therein, an upper discharge opening and a lower discharge opening being formed in said side wall of said impeller housing;
an impeller assembly disposed in said impeller housing, said impeller assembly having a drive shaft operatively connected to said drive motor and rotatable thereby about a central axis of said drive shaft and a plurality of outwardly-extending impeller blades mounted on said drive shaft for rotation therewith about said central axis thereof;
blocking means for selective positioning within said impeller housing, said blcoking means being movable between a first operating position, and a second operating position, to convert said lawn care apparatus from said vacuum mode of operation to said blower mode of operation, said



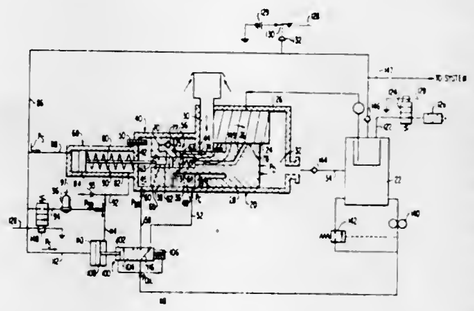
blocking means being removably mounted, in said first operating position, over said lower discharge opening such that air is drawn through said central opening in said front wall of said impeller housing and directed towards said upper discharge opening;
said blocking means being removably mounted, in said second operating position, over said upper discharge opening such that air is drawn through said central opening in said front wall of said impeller housing and directed towards said lower discharge opening; and,
operating means removably mounted on said impeller housing over said central opening formed in said front wall thereof.

4,076,461

FEEDBACK CONTROL SYSTEM FOR HELICAL SCREW ROTARY COMPRESSORS

Harold W. Moody, Jr., Farmington; Clifford T. Bulkley, Glastonbury; Joseph A. L. N. Gagnon, Windsor Locks, all of Conn., and Grover Fraser, Painted Post, N.Y., assignors to Dunham-Bush, Inc., West Hartford, Conn.

Filed Dec. 9, 1974, Ser. No. 531,121
Int. Cl.² F04B *49/00*
U.S. Cl. 417—310 **18 Claims**



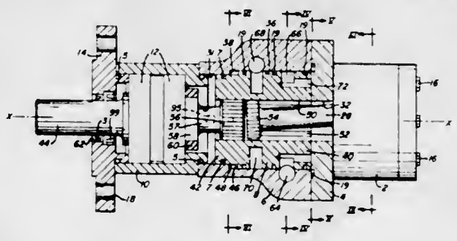
1. In a system for supplying a gas under pressure from a system supply line including a helical screw rotary compressor for compressing said gas from a low pressure at suction to a high pressure at discharge and connected to said line at compressor discharge and having a slide valve for varying compressor capacity by returning a portion of the gas to the suction side of said compressor prior to compression of the same, a first fluid motor for shifting said slide valve to match compressor output to system demand, a source of fluid under pressure, means responsive to system demand for controlling the flow of fluid under pressure from said source to said first fluid motor to effect shifting of said slide valve, and feedback means responsive to slide valve position for modulating said power controlling means to eliminate hunting of said slide valve, the improvement wherein, said power controlling means comprises means for controlling the flow of said fluid between said source and said first fluid motor, and wherein a second fluid motor operatively engages said power controlling means, said system including means for applying system gas from said supply line directly to said second fluid motor to drive said power controlling means in response to system gas pressure variation, said system further comprising a compressed air system, said second motor comprising a linear air motor including a piston slidable within a cylinder and forming with said cylinder, chambers on each side thereof, and said system further including means for subjecting one of said chambers to the system line pressure which varies with system demand, and means for supplying to said other chamber air at a fixed pressure which is normally lower than line pressure.

4,076,462

COMBINED DISTRIBUTOR AND BYPASS VALVE FOR FLUID ACTUATED PUMP OR MOTOR

John J. Pippenger, Acton, Mass., assignor to W. H. Nichols Company, Waltham, Mass.

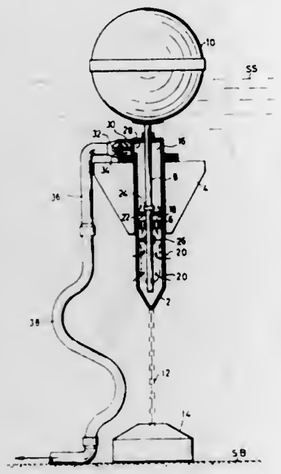
Filed Jul. 26, 1976, Ser. No. 708,638
Int. Cl.² F04B *49/08;* F04C *1/06*
U.S. Cl. 417—310 **15 Claims**



1. A fluid actuated device comprising: a housing member having an elongated open ended bore extending axially inwardly from one end thereof, said housing member having an internal chamber spaced axially from the inner end of said bore with an interior portion of said housing member being located therebetween, said housing member having a laterally and axially inwardly facing surface thereon between axially extending portions of said bore, a rotary member closely rotatively received in said axial extending portions of said bore, said rotary member having a surface thereon spaced axially inwardly of said surface on said housing member to form a bias chamber therebetween, said interior portion having an intermediate opening extending therethrough between said chamber and said bore, an elongated means having one end formed to constitute in conjunction with said chamber a displacement set with said one end being movable through an orbital path, said elongated means having an intermediate portion extending through said intermediate opening and the other end thereof in driving engagement with said rotary member to rotate said rotary member, at least one of said members having fluid supply passageway means and fluid discharge passageway means adapted to be connected to a source of pressurized fluid and a fluid receiving means, respectively, said fluid supply passageway means and said fluid discharge passageway means each extending through said interior portion and at least an adjacent portion of said rotary member to control the supply and discharge of fluid to said displacement set and orbitably rotate said one end of said elongated means, and other passageway means in at least one of said members in fluid flow com-

munication with said bias chamber and adapted to be in fluid flow communication with such a source of pressurized fluid to permit fluid from such a source to bias said rotary member into engagement with said interior portion.

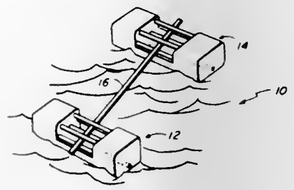
4,076,463
WAVE MOTOR
Mordechai Welczer, Busthnai 4, Ramat Hasharon, Israel
Filed Oct. 26, 1976, Ser. No. 735,316
Int. Cl.² F04B *35/00*; F03G *7/00*
U.S. Cl. 417—331 **10 Claims**

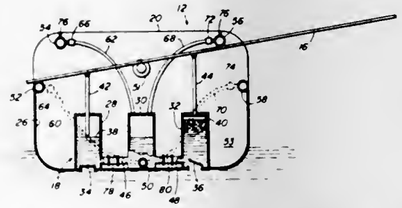


1. A wave motor for converting energy from sea waves to mechanical energy, comprising: a first member, a second member displaceable with respect to the first member; a first float secured to said first member for floating same above the sea bottom; an anchor; coupling means coupling said anchor to said first member for normally retaining same submerged beneath the sea surface in a vertical position above the sea bottom but permitting same to move in a lateral direction with respect to the sea bottom; and a second float secured to said second member, said second float being of sufficient volume to float on the surface of the sea; whereby wave crests cause said first and second members to move laterally of the sea bottom and said second member to rise with respect to said first member, whereas wave troughs permit said first member to return to its normal vertical position and said second member to descend with respect to said first member, thereby producing mechanical energy by the relative displacement between said first and second members.

4,076,464
DUAL WAVE MOTION PUMP
Paul E. Pinney, 48 Linden Ave., Lincoln Park, N.J. 07035
Filed Jan. 24, 1977, Ser. No. 761,740
Int. Cl.² F04B *17/00*
U.S. Cl. 417—332 **2 Claims**

1. A dual wave motion pump for converting the wave motion of a fluid body into usable energy comprising:
at least two hull structures connected together by means of a lever;
each of said hull structures having at least one enclosed flotation compartment and a partially open pump compartment;
each of said hull structures supporting a lever-activated pumping means in said pump compartment responsive to wave motion;
said pumping means comprising:
a pair of spaced apart cylinders, each of said cylinders having a fluid intake check valve at its base, an outlet means and a reciprocating piston with an elongated shaft operably connected to said lever;
a fulcrum for said lever located between said piston shafts;
a pressure chamber between said cylinders in fluid communication with the outlet means of both of said cylinders through pipe means having check valves therein; and
outlet pipe means from said pressure chamber whereby fluid is delivered to a load;
each end of said lever being pivotally connected to the pump compartment of one said hulls, including means for limiting the upward and downward pivotal motion of said lever, thereby converting the natural wave motion of a fluid body into leverage forces for activating said pumping means;
said pumping means further comprising:



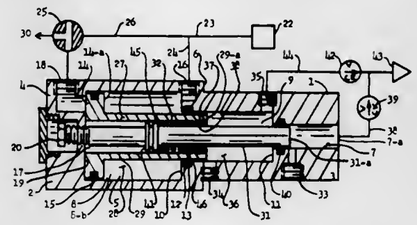


two pairs of longitudinally disposed air bumpers, one pair on each side of said fulcrum, each of said air bumpers having a stiff backing to limit the upward and downward pivotal motion of said lever;
each of said air bumpers having an air intake check valve;
an air hose having check valve therein connecting each of the upper air bumpers to said pressure chamber such that when one end of said lever impacts an upper air bumper, air is forced out of said upper air bumper and into said pressure chamber;
an air hose having a check valve therein connecting each of the lower air bumpers to said fluid outlet pipe means of said pressure chamber such that when one of said lever impacts a lower air bumper, air is forced out of said lower air bumper and into said outlet pipe means;
means for transferring the pumped fluid from said pumping means to a load;

4,076,465
VOLUMETRIC PROPORTIONING DILUTER
Richard S. Pauliukonis, 6660 Greenbriar Drive, Cleveland, Ohio 44130
Continuation-in-part of Ser. No. 434,568, Jan. 18, 1974, Pat. No. 3,940,937. This application Dec. 11, 1975, Ser. No. 639,898
Int. Cl.² F01B *7/20*; F04B *35/00*; F15B *15/17, 15/24*
U.S. Cl. 417—339 **7 Claims**

1. A volumetric proportioning diluter comprising:
an elongated housing having first and second ends interconnected by a differential diameter bore passing therethrough, an elongated piston assembly having different diameters that correspond to the diameters of said differential diameter bore is slidably received therein, said piston assembly is movable inside said bore axially,

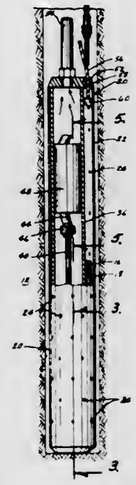
a pump actuating means for moving said piston assembly in said first housingend separated from and adjacent pumping means for fluid discharge, said pumping means spaced along said housing length toward said second housing end including at least two completely separate fluid chambers adjacent each other and capable of receiving different fluids of distinctly different displacement volumes due to a difference in said piston diameters inside said differential diameter bore, fluid supply and discharge ports in said separate fluid chambers for fluid communication therewith, including directional control means in said fluid supply and discharge ports and a first directional control in said fluid supply ports of said chambers to allow fluid flow into said fluid chambers and not vice versa and a second directional control in said fluid discharge ports of said chambers to allow fluid discharge from said fluid chambers and not vice versa, individual fluid discharge conduit means connecting said discharge ports to a single conduit for fluid discharge therefrom, said pumping means including a volume displacement piston reciprocat-



ing in a chamber pumping concentrate and being carried by said elongated piston assembly for relative axial piston reciprocation therebetween, said displacement piston being slidable therein from a first fluid suction position when said pump actuating means urges said piston assembly to assume a first piston withdrawn position to a second fluid discharge position when said pump actuating means urges said piston assembly to assume a second piston engaged position, thereby providing a simultaneous fluid suction of different volumes into said fluid chambers via said fluid supply ports when said volume displacement piston is moved to said first fluid suction position, and when said volume displacement piston is moved to said second fluid discharge position, resulting in a simultaneous fluid discharge from said fluid chambers via said fluid discharge ports for a dilution thereof in the ratio of respective volumetric proportions of said fluid chambers when delivered via said individual conduits to discharge via said single conduit therefrom, including means for control of volumetric proportions.

4,076,466
FLUID PUMP FOR USE IN EXPLOSIVE BORE HOLES
Floyd R. Swanson, Jr., Cedar Falls, Iowa, assignor to Swanson Engineering, Inc., Cedar Falls, Iowa
Continuation of Ser. No. 361,496, May 18, 1973, Pat. No. 3,989,418. This application Apr. 8, 1976, Ser. No. 675,151
The portion of the term of this patent subsequent to Nov. 2, 1993, has been disclaimed.
Int. Cl.² F04B *9/08, 17/00*
U.S. Cl. 417—390 **7 Claims**

1. A fluid pump for use in explosive bore holes comprising,
an elongated cylindrical first housing having upper and lower end plates, said first housing having means provided thereon to permit water to enter the interior thereof,
a hydraulic motor having upper and lower ends secured in said housing adjacent the lower end thereof,
a pump housing extending upwardly from said hydraulic motor within said first housing, said pump housing having a fluid intake opening means located above said hydraulic motor,
a hydraulic hose means in communication with a source of hydraulic fluid under pressure and extending through the upper end plate of said first housing and thence downwardly into said first housing between said first housing and said pump housing, said hose means being fluidly connected to the upper end of said hydraulic motor,
a drive shaft extending upwardly from said hydraulic motor within said pump housing,
a pump stator means positioned in said pump housing,
a pump rotor means connected to said drive shaft for rotation therewith and extending through said pump stator means,

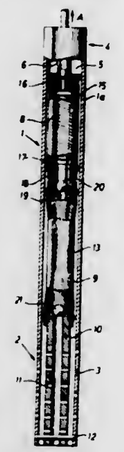


and a discharge line fluidly connected to said pump housing and extending through the upper end plate so that water in the bore hole will be pumped upwardly through said discharge line upon actuation of said hydraulic motor;
said hydraulic motor having a cross-sectional area which substantially conforms to the inner cross-sectional area of said first housing,
said pump housing having a cross-sectional area less than the cross-sectional area of said hydraulic motor and the internal cross-sectional area of said first housing and being eccentrically positioned with respect to the longitudinal axis of said first housing to provide an access space for said hydraulic hose means so that said hose means can extend through said first housing adjacent to said pump housing.

4,076,467
SPECIALLY REINFORCED FLEXIBLE TUBE PUMPING CHAMBER
Jan Edvard Persson, Henriksdalsringen 17⁵, 131 00 Nacka, Sweden
Filed Jan. 29, 1976, Ser. No. 653,392
Claims priority, application Sweden, Jan. 31, 1975, 7501054; Apr. 11, 1975, 7504177
Int. Cl.² F04B *43/08, 45/06, 11/00*
U.S. Cl. 417—478 **15 Claims**

1. A pump comprising a variable volume operating chamber means, inlet means and discharge means for pumped medium, and valves operable to communicate said chamber means with said inlet means and said discharge means, said variable volume operating chamber means comprising a tubular pump element having a wall formed of an elastomeric material and at least two separate reinforcement systems embedded therein, each of said systems comprising at least one helically wound wire, each of said systems running in opposite directions relative to the axis of said tubular element, said tubular pump element

having means for straining said wall for alternate axial extension and retraction, said extension and retraction causing an



alternating diametral alteration of said wall effecting an overall change of the internal volume of the tubular pump element.

4,076,468

MULTI-STAGE SCREW COMPRESSOR INTERCONNECTED VIA COMMUNICATION CHANNEL IN COMMON END PLATE

Walther Persson, Helsingborg, and Lauritz Benedictus Schibbye, Saltsjo-Duvnas, both of Sweden, assignors to Svenska Rotor Maskiner Aktiebolag, Nacka, Sweden

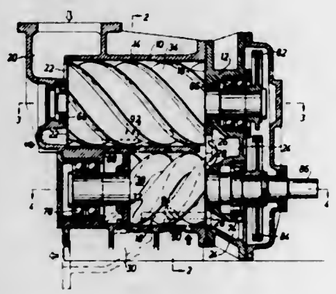
Continuation of Ser. No. 411,224, Oct. 31, 1973, Pat. No. 3,910,731, which is a continuation of Ser. No. 158,176, June 30, 1971, abandoned. This application Jul. 14, 1975, Ser. No. 595,401

Claims priority, application United Kingdom, Jul. 9, 1970, 33405/70

The portion of the term of this patent subsequent to Oct. 7, 1992, has been disclaimed.

Int. Cl.² F01C *1/16, 11/00;* F04C *23/00*

U.S. Cl. 418—9 **13 Claims**



1. Screw rotor machine for an elastic working fluid comprising:

casing means enclosing at least two working spaces, each generally comprising two intersecting bores with parallel axes and provided with barrel walls, with low pressure and high pressure end walls perpendicular to said axes, and with low pressure and high pressure ports disposed in said walls;

a pair of intermeshing rotors respectively disposed in each working space, each rotor provided with helical lands and intervening grooves having a wrap angle of less than 360°, each pair of intermeshing rotors comprising one rotor of male rotor type and one rotor of female rotor type, said rotors each including bearings mounted thereto; and

a transmission chamber containing a power transmission provided with a power shaft extending externally of said casing means, one rotor of each stage being further interconnected by said power transmission disposed in said transmission chamber;

the improvement wherein the casing means comprises:

means defining at least two barrels immediately adjacent each other and respectively enclosing at least the major portions of said at least two working spaces in parallel side by side, said at least two barrels being rigidly coupled together at least at portions along the length thereof in the axial direction of said working spaces; and

an end plate member directly connected to said means defining at least two barrels, said end plate member having:

one common plane surface defining an end wall of each of said working spaces;

means for removably connecting said end plate member to an end of each of said barrels of said means defining at least two barrels so that said common plane surface defines said end walls of said barrels;

means for removably receiving said bearings for all the rotors;

means for enclosing said transmission chamber; and

channel means in said end plate member which form at least portions of a communication channel between said at least two working spaces, said channel means having at least two ports disposed in said common plane surface.

4,076,469

ROTARY COMPRESSOR

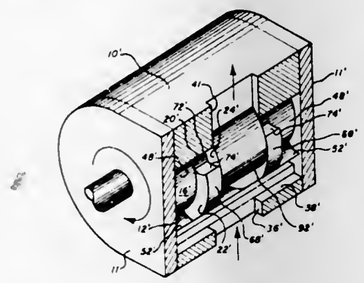
Roger C. Weatherston, Williamsville, N.Y., assignor to Calspan Corporation, Buffalo, N.Y.

Continuation-in-part of Ser. No. 654,138, Jan. 30, 1976, Pat. No. 4,033,708. This application Jun. 24, 1976, Ser. No. 699,556

The portion of the term of this patent subsequent to Mar. 2, 1993, has been disclaimed.

Int. Cl.² F04C *13/00, 17/10*

U.S. Cl. 418—9 **12 Claims**



1. A rotary compressor, comprising;

a. a housing defining two working chambers,

b. mating impellers rotatably mounted about an axis in each of said working chambers for rotation in opposite directions,

c. each impeller having two sets of profiles, each set comprised of at least two profiles of constant cross-section,

d. each of said profiles comprised of at least one lobe and at least one well, each well and each lobe being joined by a transition surface.

e. an outlet communicating with said housing,

f. means for supplying fluid at inlet pressure to the wells of each profile during portions of the rotation cycle of each impeller, whereby in one rotational position of said impellers at least one well of each profile on each impeller contains trapped fluid at inlet pressure.

g. at least one profile of each set being out of the plane of said outlet and at least one profile on each impeller being common to each of said sets and at least one profile on each set having its wells in communication with said outlet during one portion of its rotation cycle and blocked from communication therewith during another portion of its rotation cycle, and

h. the lobes and wells of any one profile of each set being angularly displaced from those of the profiles immediately adjacent thereto whereby as said impellers continue to rotate from said one rotational position, said fluid is transferred sequentially from the wells of one profile of each set to the wells of adjacent profiles and experiences an increase in pressure prior to the establishment of communication between said outlet and the wells of said profiles in communication therewith.

4,076,470

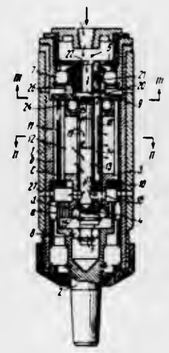
PLANETARY AIR MOTOR WITH TWO INTERNAL GEARINGS

Mikhail Danilovich Sur, ulitsa Anri Barbjusa, 22/26, kv. 28, and Daniil Andreevich Dudko, ulitsa Anri Barbjusa, 22/26, kv. 143, both of Kiev, U.S.S.R.

Filed Sep. 30, 1976, Ser. No. 728,023

Int. Cl.² F01C *1/08, 21/12*

U.S. Cl. 418—63 **4 Claims**



1. A planetary air motor with two internal gearings comprising: a casing; two internally toothed ring gears accommodated in said casing, one of said ring gears being fixed while the other one is rotatable and intended to transmit torque to the shaft of a driven unit; a pinion carrier with a flange and a crescent-shaped plate, said pinion carrier being located in said casing and provided with two concentric journals, an eccentric journal, a main longitudinal channel, an additional longitudinal channel with a smaller bore than that of the main channel, said additional channel being isolated from the main channel and positioned in a diametral plane towards the periphery of said eccentric journal of the pinion carrier; a fixed washer installed in said casing; a two-rim pinion located in said casing and mounted on said pinion carrier; one rim of said pinion meshing with said rotatable ring gear and installed on one of said concentric journals of the pinion carrier; the other rim of said pinion free-mounted on said eccentric journal of the pinion carrier, provided with radial through slots in the tooth spaces; meshing with said fixed ring gear and forming, together with it, a working inter-tooth space; said intertooth working space limited by said flange of said pinion carrier at one face of said fixed ring gear and by said fixed washer at the other face, and divided by said crescent-shaped plate into two intertooth working zones practically isolated from each other, a compressed air line communicating with said additional longitudinal channel; said pinion carrier provided with a slot located in the zone where said fixed ring gear meshes with one of said pinion rims, said slot communicating with said additional channel and being set tangentially to the cross section of said additional channel, having a length equal to the width of said radial through slots in the tooth spaces of said pinion and putting said additional longitudinal channel in communication with one of said intertooth working zones; said pinion provided with side holes located in the zone where said rotatable ring gear meshes with said pinion rim and putting said main longitudinal channel in communication with the atmosphere, and a side port communicating said main longitudinal channel with the other one of said intertooth working zones, said port being located in the zone where said fixed ring gear meshes with said pinion rim, the length of said port being equal to the length of said radial through slots, said port being limited in cross section by a side set at an angle of 120° approximately.

4,076,471

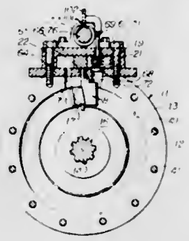
ROTARY ENGINE WITH SEPARABLE ABUTMENT AND ADJUSTABLE VALVE CAM

Troy A. McClure, General Delivery, Los Gatos, Calif. 95030

Filed Jun. 21, 1976, Ser. No. 698,187

Int. Cl.² F01C *19/00, 1/00, 21/12;* F16K *31/524*

U.S. Cl. 418—143 **5 Claims**



1. An engine comprising means forming a toroidal cylinder, a main shaft at the axis of said cylinder, a piston rotatable in said cylinder, means for turning said piston and main shaft together, a main valve in said cylinder, an intake port on one side of said main valve, an outlet port on the side of said main valve opposite said intake port and means for supplying gas under pressure to said intake port, an intake valve controlling said means for supplying gas, a cam shaft having a cam, means rotatably mounting said cam shaft on said engine for axial movement and rotative movement, means driving said cam shaft in time relation to said main shaft, means for adjusting the longitudinal position of said cam shaft, a cam follower, means articulately connecting said cam follower to said intake valve, each said cam having a high dwell with a ramp configuration such that the extent of opening of said intake vavle varies in an axial direction, whereby as said cam shaft is moved longitudinally the duration of opening of said inlet valve is adjusted.

4,076,472

CENTRIFUGAL PELLETIZER

Ivan Andreevich Barannik, prospekt Lenina, 182a, kv. 22; Alexandr Nikolaevich Kachurka, Severo-Koltsevaya ulitsa, 6 kv. 12, both of Zaporozhie; Ivan Vasilievich Zharovsky; Alexandr Fedorovich Trukhin, both of ulitsa Zhdanova, 11, kv. 32, Kalush Ivano-Frankovskoi oblasti; Viktor Georgievich Raskatov, ulitsa Khimikov, 14, kv. 18, Kalush Ivano-Frankovskoi oblasti, and Alexandr Borisovich Mazurkevich, ulitsa B.Khmelnitskogo, 22, kv. 19, Kalush Ivano-Frankovskoi oblasti, all of U.S.S.R.

Filed Dec. 1, 1976, Ser. No. 746,308

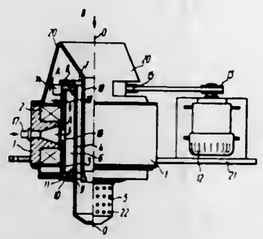
Claims priority, application U.S.S.R., Dec. 4, 1975, 2196201

Int. Cl.² B29C *5/04*

U.S. Cl. 425—8 **2 Claims**

1. A centrifugal pelletizer, comprising: a housing with bearings; a hollow drive shaft vertically mounted in the bearings inside said housing; a hollow transmission shaft accommodated in said hollow drive shaft so as to define an annular gap be-

tween said transmission shaft and said drive shaft, openings being provided in the drive shaft at the point of its interconnection with the transmission shaft to allow a fluid coolant to pass



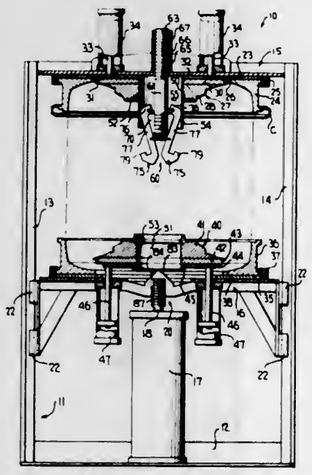
to and let out from the annular gap, a top end of said transmission shaft being rigidly coupled with said drive shaft; a perforated bowl mounted on the bottom end of said transmission shaft; and means for rotating said drive shaft.

4,076,473

RETREAD MOLD WITH LOCKING MEANS

Kenneth T. Macmillan, 4992 Wesleyan Woods Dr., Macon, Ga. 31204

Filed Nov. 30, 1976, Ser. No. 746,120
Int. Cl.[2] B29H *5/04*
U.S. Cl. 425—19 **25 Claims**



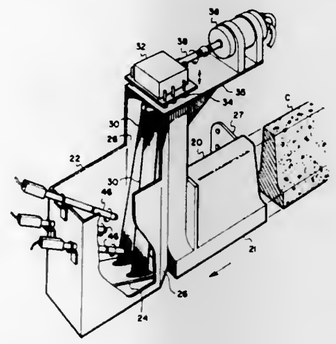
1. A retread mold comprising first and second platens, means for imparting relative movement to said platens between open and closed positions, a first matrix carried by said first platen, a second matrix carried by said second platen, said matrices defining an annular chamber adapted to receive a tire when said platens are in the closed position thereof, a first bead wheel carried by said first platen, a second bead wheel carried by said second platen, a mandrel carried by said first platen and projecting toward said second platen, said first and second bead wheels having respective first and second openings therein for telescopically receiving said mandrel in the closed position, locking means for locking said first platen to said second bead wheel, said locking means including a support member at least partially housed in said mandrel, at least one locking arm movably carried by said support member, said locking arm being movable between a first unlocked position in the open position of said platens and a second locked position in the closed position of said platens, said locking arm having a terminal end for engaging a portion of said second bead wheel in an area axially beyond any radial plane through said annular chamber, said locking arm extending through said second opening in said second locked position, and said terminal end being positioned further from the axis of said annular chamber in said locked position than in said unlocked position.

4,076,474

SLIP FORM FOR CONCRETE

Gerald Anthony Catenacci, 44 Golfvalley Lane, Toronto, Ontario, Canada

Filed Feb. 22, 1977, Ser. No. 771,170
Int. Cl.[2] B29F *3/00;* **B28B** *13/02;* **E01C** *19/48*
U.S. Cl. 425—64 **8 Claims**



1. Apparatus for slip-forming of concrete, of the type having a carriage means movable along a substrate, formwork mounted on the carriage means, and a hopper for receiving concrete, communicating with said form means whereby said concrete may be placed in said hopper and will then pass to said form means, and wherein the improvement comprises water extraction means mounted within said hopper, and vibrator motor means for vibrating said water extraction means within said concrete in said hopper, whereby to extract water from concrete thereby stabilising the same.

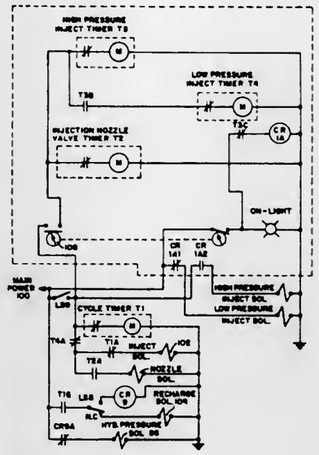
4,076,475

PRESSURE INJECTION MACHINE AND METHOD

Raymond L. Trueblood, New Carlisle, Ohio, assignor to Trueblood, Inc., Tipp City, Ohio

Continuation of Ser. No. 518,234, Oct. 29, 1974, abandoned, which is a division of Ser. No. 343,903, March 22, 1973, abandoned. This application Aug. 27, 1976, Ser. No. 718,399
Int. Cl.[2] B29F *1/06*
U.S. Cl. 425—159 **2 Claims**

1. Apparatus for the injection molding of plastic into a mold cavity, comprising an injection cylinder and a hydraulically operated reciprocating ram screw therein, an injection nozzle on said injection cylinder having a controllable nozzle shutoff valve, hydraulic source means providing two fluid pressures to said ram, valve means connected intermediate said hydraulic source means and said ram for selectively applying said fluid pressures to move said ram screw with correspondingly different forces to create a corresponding pair of plastic injection pressures, first timer means establishing a first time interval controlling said valve means to apply a first of said fluid pressure to the injection screw at the beginning of said first interval, a nozzle timer initiated simultaneously with said first timer means and connected to hold said nozzle valve closed for a predetermined short time interval followed by opening said nozzle valve at the conclusion of said short time interval, said first timer means maintaining said first pressure throughout said first time interval to effect injection of the plastic material at said first injection pressure, second timer means establishing a second time interval longer than the intervals of said first timer means and said nozzle timer, said second timer means initiated by the timing out of said first timer means and connected to operate said valve means to apply and maintain the



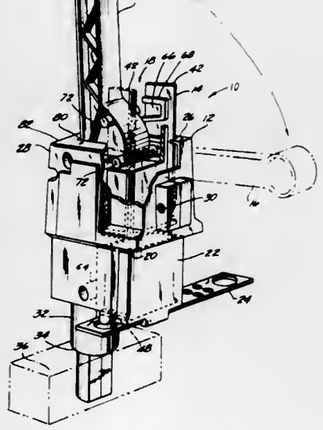
second of said fluid pressures to said screw throughout said second time interval to prevent shrinkage of the plastic within the mold cavity.

4,076,476

DOUGH MOLD PRESS

Frank D. Ventura, Commack, N.Y., assignor to Ideal Toy Corporation, Hollis, N.Y.

Filed Nov. 22, 1976, Ser. No. 743,840
Int. Cl.[2] B29F *3/00*
U.S. Cl. 425—183 **11 Claims**



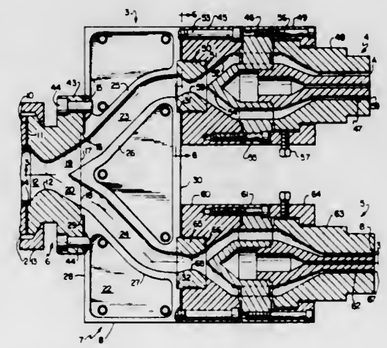
1. A toy extrusion device for use with a moldable material comprising a housing, a container defining an extrusion chamber movably mounted in said housing for movement between first and second positions these positions corresponding to extrusion and loading positions and said container having opposed end portions respectively defining an extrusion opening and a filling opening therein, a plunger slidably mounted in said housing and positioned to enter the filling opening of said container in the first position thereof to urge moldable material in the extrusion chamber through said extrusion opening, and a manually operable lever pivotally mounted on said housing, said plunger and lever having cooperating means which comprise two pairs of slots formed in said plunger, slots of each pair being formed in opposite sides of said plunger and extending generally perpendicularly of the path of travel thereof, said pairs of slots being spaced from one another along the plunger in the direction of movement thereof, and two pairs of arcuately spaced pins on said lever respectively associated with said slots and located to sequentially enter and be engaged in their associated slots during pivotal movement of the lever whereby the plunger is moved in a linear direction upon pivotal movement of the lever and the plunger may be reciprocated into and out of said extrusion chamber.

4,076,477

MULTIPLE EXTRUSION APPARATUS

Gerhard A. Hacke, Acton, Canada, assignor to Grandview Industries Limited, Canada

Filed Dec. 8, 1975, Ser. No. 638,459
Int. Cl.[2] B29F *3/06*
U.S. Cl. 425—192 R **4 Claims**



1. In apparatus for simultaneously forming two products from heat-plastified polymeric material supplied from a single supply orifice such as that at the delivery end of an extruder barrel, the combination of

distribution manifold means adapted to be mounted to receive the heat-plastified polymeric material from the supply orifice, said manifold means defining

at least two forwardly diverging flow passages having a common inlet to communicate with the supply orifice, said flow passages being of the same flow capacity; and

a plurality of die assemblies equal in number to said flow passages, each of said die assemblies comprising

an annular adapter body secured to the forward end of said manifold means in registry with the outlet of one of said flow passages,

an annular die body mounted on the adaptor body and arranged to receive the heat-plastified polymeric material flowing through the adapter body,

means operatively associated with said die assembly for securing the die assembly to the forward end of the manifold means,

said adapter body having a rearwardly opening cavity, and

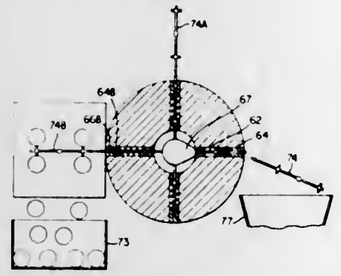
a replaceable annular flow control insert disposed in said rearwardly opening cavity of the adapter body and communicating between the corresponding one of said flow passages and the interior of the die body; said flow control inserts being so dimensioned and of such shape that the pressure drop across the entire die assembly, including the flow control insert, is the same for all of the die assemblies.

4,076,478

MEANS FOR REMOVING A MOLDED COMPONENT FROM A MOLDING MACHINE

John H. Rossio, Portage, Mich., assignor to LaRos Equipment Company, Inc., Portage, Mich.

Filed Jul. 3, 1975, Ser. No. 592,808
Int. Cl.² B29F *1/14*
U.S. Cl. 425—215 **9 Claims**



1. An apparatus for separating a runner system from molded parts produced in an injection-type mold having first and second cooperating mold halves;

at least one of said mold halves having recesses therein defining at least one mold cavity and a runner system passage connected with said mold cavity, at least one of said mold halves being movable to open said mold cavity;

removal means positioned adjacent said mold and having means establishing a physical connection with said runner system passage, said removal means being operable after said mold is opened to conduct said runner system away from said mold to one collecting zone while the molded parts are permitted to exit from said mold for collection in a different collecting zone, said removal means being a center-mounted rotatable turret whose peripheral surface bears against a peripheral surface of said mold at a port through which said runner system passage opens, said turret carrying a plurality of radially positioned circumferentially spaced openings in its peripheral surface, and a corresponding plurality of rods normally recessed in said openings, and actuating means causing said rods to shift radially outward in said openings successively as the latter attain a preselected discharge position in their orbital movement spaced away from said port.

4,076,479

APPARATUS FOR FORMING ARTICLES OF FIBROUS MATERIALS

John W. Lacon, Sarnia, Canada, assignor to Fiberglas Canada Ltd., Toronto, Canada

Continuation-in-part of Ser. No. 607,963, Sep. 26, 1975, abandoned, which is a division of Ser. No. 346,381, Mar. 30, 1973, Pat. No. 3,912,572. This application Jan. 11, 1977, Ser. No. 758,512
Claims priority, application Canada, Feb. 1, 1973, 162625
Int. Cl.² B29C *3/04*
U.S. Cl. 425—301 **22 Claims**



1. Apparatus for forming articles from a longitudinally advancing strip-shaped felt of fibrous material containing hardenable bonding material, said apparatus comprising:

inner and outer stationary forming surfaces spaced apart for receiving the felt therebetween in sliding contact with said forming surfaces at opposite sides of the felt;

said inner surface being provided on an inner die and said outer surface being provided on an outer die extending around said inner die;

said outer die defining openings therein for the flow of hot gas therethrough;

housing means extending around and spaced from said outer die for confining the gas flow;

said housing means defining openings therein;

said outer die extending longitudinally through said openings and said openings being larger than the transverse dimensions of said outer die;

closure means for closing said openings around said outer die;

readily releasable means for securing said closure means to said housing, whereby said outer die is readily replaceable by an outer die of different transverse dimensions;

gas supply means for providing the flow of hot gas through said housing means and said outer die openings to the felt for curing the felt;

means for gripping the felt and pulling the felt between said inner and outer dies, said means for gripping and pulling being disposed beyond said outer die in the direction of advance of the felt; and

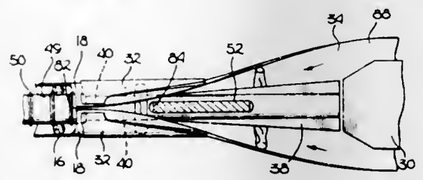
means for cutting the felt into separate lengths, said means for cutting being disposed beyond said means for gripping and pulling in the direction of advance of the felt.

4,076,480

MANDREL DESIGN FOR BAGEL MAKING MACHINE

John Francis Marano, Rosemead, Calif., assignor to Kotten Machine Co. of Calif. Inc., South El Monte, Calif.

Filed Aug. 9, 1976, Ser. No. 712,599
Int. Cl.² A21C *11/00*
U.S. Cl. 425—364 B **4 Claims**



1. In a machine, commonly used for forming a toroid from a lump of plastic material such as baking dough, comprising a frame, an endless flexible belt supported by said frame, said belt operated to carry discrete pieces of plastic material along a translatory path, means driving said endless flexible belt, means supported by said frame to cause said endless flexible belt to gradually assume a substantially circular cross sectional form and subsequently gradually resume a flat position, a pressure plate for forming said lump of plastic material into a cylindrical, a mandrel supported centrally above the endless flexible belt and extending axially into the cylindrically shaped portion of the belt, the improvement comprising;

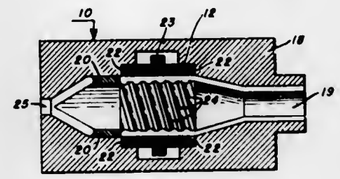
a tapered plate having a flat bottom and a wide end wider than the diameter of said mandrel and a narrow end, said tapered plate being supported above the endless belt such that the plastic material encounters the wide end of the tapered plate first; said tapered plate gradually fairing into the shape of the underside of the mandrel at the narrow end of the tapered plate such that the mandrel and tapered plate combination present a smooth surface to the plastic material as it moves beneath the tapered plate and mandrel joint.

4,076,481

ANNULAR EXTRUSION DIE

Leonard F. Sansone, Andover, N.J., assignor to Sussex Plastics Engineering, Inc., Andover, N.J.

Continuation-in-part of Ser. No. 541,198, Jan. 15, 1975, abandoned. This application Mar. 8, 1976, Ser. No. 664,905
Int. Cl.² B29D *23/04*
U.S. Cl. 425—376 B **15 Claims**



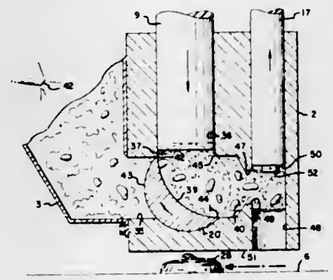
1. In a screw extruder for melt extrusion of a polymer, comprising at least one screw for advancing the polymer through the extruder under conditions of elevated temperature and pressure and an annular extrusion die at the outlet of the extruder having an annulus formed between an inner mandrel member and a surrounding outer die member, the improvement which comprises polymer pumping and shearing means spaced from the outlet of said extrusion die comprising shear ring means mounted on at least one of said members and rotatable about the common longitudinal axis of said members, said shear ring means having a surface facing said annulus and spaced from and opposed to a surface of the other of said members, and at least one helical groove is provided in at least one of said surfaces, the outer die member and the inner mandrel member being stationary at the outlet of said extrusion die.

4,076,482

CHARGE FORMING AND DEPOSITING MACHINE

Henry M. Whetstone, 282 St. George St., St. Augustine, Fla. 32084

Filed Mar. 4, 1976, Ser. No. 663,901
Int. Cl.² B29C *23/00*
U.S. Cl. 425—437 **5 Claims**



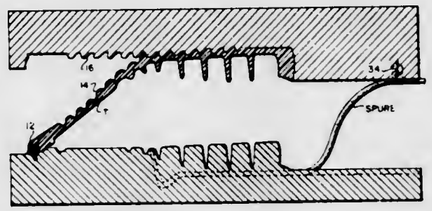
1. A charge forming and depositing machine comprising a hopper, a body having a chamber therein, a movable element exposed to the interior of said chamber for expanding and contracting said chamber, a valve connecting said hopper with said chamber, said body further defining an upright cylindrical cavity therein having an open lower end and a side port communicating with said chamber, a piston in said cylindrical cavity, said piston having an operative face at its lower end and being movable downwardly from a retracted position, with said port open into said cavity below said piston face, into an extended position, with said port closed by said piston and with said face disposed outwardly below said open end of said cavity, and sequential operating means operatively associated with said valve, with said moveable element and with said piston for opening said valve between said hopper and said chamber and for expanding said chamber, for thereafter closing said valve between said hopper and said chamber and for contracting said chamber while said valve is closed and said piston is in its said retracted position, for subsequently moving said piston downwardly from its said retracted position thereby to close said port and into its said extended position with its said face below said open lower end, and for thereafter retracting said piston into its said retracted position.

4,076,483

APPARATUS FOR EJECTING MOLDED ARTICLE

Frank S. Smirne, 1240 Washington St., Whitehall, Pa. 18052

Filed Jan. 24, 1977, Ser. No. 761,600
Int. Cl.² B29F *1/14*; B29C *7/00*; B29H *7/08*
U.S. Cl. 425—444 **5 Claims**



1. In apparatus for molding a finished article of plastic in the form of a unitary sole and heel member, which apparatus comprises first and second cooperable mold members, said mold members when operatively joined together define a molding cavity, access means to said molding cavity for supplying a heat curable plastic material to said molding cavity for molding, and means to move said mold members relative to one another from a position of operativeness to a position of inoperativeness, the improvement comprising in combination therewith the provision of an adjustable ejector pin projecting from one of said mold members into said molding cavity a predetermined depth, such that when said mold members are operatively joined together and plastic material is supplied to said molding cavity said plastic material will form about said ejector pin, said ejector pin characterized by a head portion which is adapted to grip the molded finished article and peel such finished article from a mold member when said mold members are moved to a position of inoperativeness, and characterized further in that said head portion is provided with a beveled shoulder capable of gripping without tearing the molded finished article upon removal from the mold member.

4,076,484

INJECTION-BLOW MOLDING MACHINE HAVING NON-SPLITTING INJECTION AND BLOW MOLDS

Donald F. Armour, Bloomfield, Conn., and Bernie A. Olmsted, East Longmeadow, Mass., assignors to Hercules Incorporated, Wilmington, Del.

Filed Nov. 10, 1975, Ser. No. 630,745
Int. Cl.² B29D *23/03*
U.S. Cl. 425—525 **16 Claims**

1. An injection blow molding machine for forming a container having a neck dimensionally smaller than the body of the container comprising:

a first platen and a second platen supported in generally parallel relationship with each other;

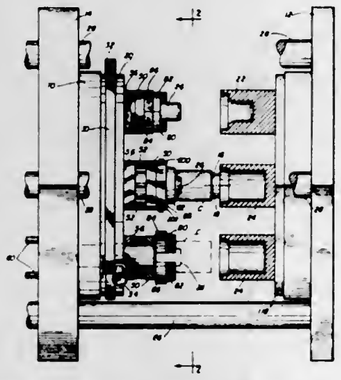
means mounted in the machine operable to move one of the platens toward and away from the other;

means mounted in the machine operable to rotate one of the platens relative to the other about a machine axis perpendicular to the two platens;

an injection mold and a blow mold mounted on the first platen, with the mold axes parallel to and spaced equidistant from the machine axis and having mold cavities extending along the mold axes, the cavities having mouths at

the openings of the cavities facing the second platen, bottoms of the cavities opposite the mouths and side walls extending between the mouths and the bottoms, at least the side walls of the mold cavities between the mouths and the bottoms of the cavities being formed by non-splitting mold portions secured to the first platen, the dimensions of the mouths of the cavities being at least as large as the parallel dimensions at any section of the respective mold cavities between the mouth and the bottom to allow a parison or blown container to be axially removed from the non-splitting molds through the mouths;

a parison pin for the molds mounted on the second platen projecting toward the first platen with the pin axis parallel to the machine axis and spaced from the machine axis by the same amount as the mold axes whereby rotation of the platens relative to one another brings the parison pin axis and one or the other of the mold axes into alignment and relative movement of the one platen toward and away from the other permits the parison pin to enter and with-



draw from the openings of one or the other of the molds and thus a parison may be carried by the pin from the injection to the blow mold; and

a set of split neckring segments mounted on the second platen about the parison pin and cooperating with the pin to define a neck portion of a container having dimensions perpendicular to the mold axis smaller than the corresponding dimensions of the container at the mouth of the cavity in the blow mold, the neckring segments being movable on the second platen relative to the parison pin between opened and closed positions to release the blown container, the segments cooperating with the injection mold to define the neck portion of the parison between the mouth of the injection mold and the finish of the parison and cooperating with the blow mold to define the narrower portion of the blown container between the mouth of the blow mold and the finish of the container whereby the neckring segment engaging a blown container at a blow mold remove the blown container from the mold when one of the platens is moved away from the other.

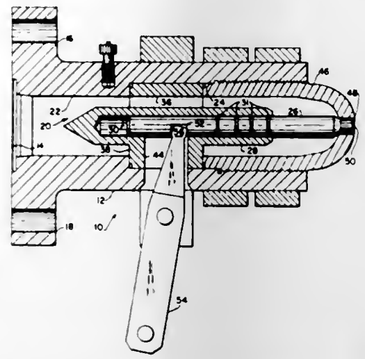
4,076,485

SHUT-OFF VALVE FOR PLASTIC MELT INJECTION

Nickolas N. Sokolow, Cheshire, Mass., assignor to Beloit Corporation, Beloit, Wis.

Filed Jun. 23, 1976, Ser. No. 699,347
Int. Cl.² B29F *1/04*
U.S. Cl. 425—562 **14 Claims**

3. A plastic molding apparatus of the type comprising a plastic melt injection apparatus and an injection mold, wherein the improvement comprises a valve means having a passageway providing communication between said injection apparatus and said mold, said valve means including an inlet end and an outlet end, a rod positioned in said passageway between said inlet end and said outlet end, the downstream end of the rod cooperating with the outlet end of the valve to permit or cut off flow of plastic melt therethrough, and a housing in which said rod is slidably mounted, said housing having a rear upstream end and a front downstream end, the rear upstream end being located in the passageway between the inlet end and the outlet end, said housing having a single leg, fixedly attached thereto and extending therefrom transverse, relative to the



direction of flow of the plastic melt, supporting said housing in said passageway, the remainder of the space about the housing, other than the space taken up by the said leg, being open to provide a single, undivided flow path about the housing such that the plastic melt flows from a point upstream of the upstream end of the housing, past the housing itself to the said outlet end, without severing the body of plastic melt passing therethrough into more than one continuous body.

4,076,486

METHOD OF BURNING A FOSSIL FUEL

James M. Whelan, La Canada, Calif., assignor to University of Southern California, Los Angeles, Calif.

Division of Ser. No. 556,670, March 10, 1975, Pat. No. 3,976,599, which is a division of Ser. No. 194,769, Oct. 8, 1971, Pat. No. 3,885,020. This application Aug. 5, 1976, Ser. No. 711,999
Int. Cl.² F23D *13/20*
U.S. Cl. 431—5 **3 Claims**

1. A method of burning a fossil fuel and air with the emission of an exhaust gas consisting essentially of atmospheric gases, carbon dioxide and water vapor and essentially free of carbon monoxide, hydrocarbons and nitric oxide, which comprises burning the fossile fuel at a temperature between about 1000° C. and about 1500° C. with less than the stoichiometric amount of atmospheric oxygen required for complete combustion of the fossil fuel to yield a combustion gas containing uncombusted fossil fuel, partially combusted fossil fuel, water vapor, carbon dioxide, carbon monoxide, and atmospheric nitrogen, said carbon dioxide and carbon monoxide being in the ratio of 100 parts carbon dioxide to between about 1 and about 11 parts carbon monoxide; combining said combustion gas with a predetermined amount of an oxygen containing gas to give at least a 1% excess of the stoichiometric amount of oxygen for oxidizing the uncombusted and partially combusted fossil fuel and carbon monoxide; and passing the resulting mixture over a ceramic catalyst of the following empirical formula at a temperature between about 200° C. and about 1000° C.

$$W_kX_JJ_i(1-k-a)ZO_{(3\pm m)}$$

wherein:

W is zirconium, tin or thorium, or mixture thereof;
X is an alkaline earth metal or mixture thereof;
J is scandium, yttrium, a rare-earth element or mixture thereof;
Z is a metal of the first transition series or a mixture thereof,

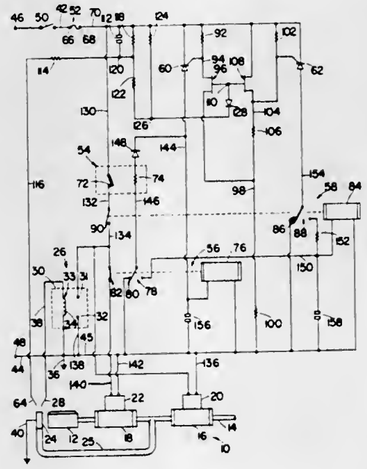
at least 0.01% of said metal having an oxidation state other than +3;
k is a number having a value between 0 and about 0.1;
m is a number having a value of from 0 to about 0.26; and
n is a number having a value from 0 to about 0.51, provided when *n* has a value of 0, *k* has a value between 0 and about 0.05.

4,076,487

IGNITION AND CONTROL SYSTEM FOR GAS BURNING APPARATUS

Richard D. Stoneking, Corunna, Ind., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Dec. 27, 1976, Ser. No. 754,490
Int. Cl.² F23N *5/24*
U.S. Cl. 431—25 **5 Claims**



1. A fail-safe, self-checking ignition and control system for a gas burning apparatus or the like that includes voltage supply means for supplying electrical energy from an electric power source for energization of said ignition and control system upon a need for operation of said gas burning apparatus, a main burner, a pilot burner, a gas supply for said burners, electrically operated ignition means operative when energized to ignite gas flowing from said pilot burner, a biased closed, electrically operated pilot valve in said gas supply and operative when energized to supply gas to said pilot burner for ignition by said ignition means to establish a pilot flame, and a biased closed, electrically operated main valve receiving its gas supply from said pilot valve and operative when energized to supply gas to said main burner for ignition by said pilot flame; said ignition and control system comprising:

first relay means including first actuating means, said first relay means having a first operational state when said first actuating means is deenergized and a second operational state when said first actuating means is energized;

second relay means including a second actuating means, said second relay means having a first operational state when said second actuating means is deenergized and a second operational state when said second actuating means is energized;

flame detecting means having first solid state switching means for controlling the energization of said first relay actuating means and second solid state switching means for controlling the energization of said second relay actuating means and including flame sensing means coupled to said two solid state switching means for rendering said first solid state switching mens conductive in the absence of flame at said pilot burner and for rendering said second solid state switching means conductive in the presence of flame at said pilot burner;

first and second power terminals connected to said voltage supply means by means including a circuit breaker responsive to the current flowing between said terminals and opening to disrupt the current flow between said terminals when said current exceeds a predetermined value;

first circuit means including means controlled by said second relay means in said second state thereof for connecting said pilot valve and said ignition means to said voltage supply means to effect energization of said pilot valve and said ignition means whereby said pilot valve permits fuel to issue from said pilot burner and be ignited by said ignition means, said first circuit means also including means controlled by said first relay means in said first state thereof for connecting said main valve to said voltage supply means when said second relay means is in said second state thereof to effect energization of said main valve whereby said main valve permits fuel to issue from said main burner for ignition by said pilot flame, said first circuit means further including time delay means in controlling relation to said pilot valve and said main valve and having electrical means operable when energized for a predetermined time interval to cause said time delay means to deenergize said pilot valve and said main valve;

second circuit means operative in response to a need for operation of said gas burning apparatus to check the non-shorted condition of said time delay actuator means prior to opening of said pilot valve including means controlled by said first relay means in said first state thereof connecting said time delay actuator means in series with said first solid state switching means to said power terminals to cause a current flow effecting opening of said current breaker when said time delay actuator means has a shorted condition;

third circuit means operative in response to a need for operation of said gas burning apparatus to check the non-conductive state of said second solid state switching means prior to said opening of said pilot valve including means controlled by said second relay means in said first state thereof connecting said second solid state switching means to said power terminals to cause a current flow effecting opening of said circuit breaker when said second solid state switching means is in a conductive condition;

fourth circuit means operative in response to a need for operation of said gas burning apparatus to check the conductive state of said first solid state switching means prior to opening of said pilot valve and to energize said first relay actuating means including means connecting said first solid state switching means and said first relay actuating means in series to said power terminals;

fifth circuit means operative in response to a need for operation of said gas burning apparctus to check the continuity of said time delay actuator means prior to opening of said pilot valve including means controlled by said first relay means in said second state thereof connecting said first solid state switching means, said time delay actuator means and said second relay actuating means in series to said power terminals to effect energization of said second relay actuating means when said time delay actuator means has a continuate condition and to thereafter maintain said time delay actuator means and said second relay actuating means energized while said first solid switching means remains in a conductive condition; and

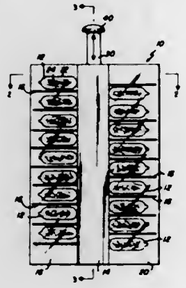
sixth circuit means for maintaining said second relay actuating means energized after establishment of said pilot flame including means controlled by said second relay means in said second state thereof connecting said second relay actuating means and said second solid state switching means in series to said power terminals.

4,076,488

SELECTIVE FIRING MECHANISM FOR ARRAY OF PERCUSSIVE FLASHLAMPS

Harold H. Hall, Jr., Marblehead, Mass., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jun. 14, 1976, Ser. No. 696,146
Int. Cl.² F21K 5/02
U.S. Cl. 431—93 **17 Claims**



1. A selective firing mechanism for a flashlamp assembly including a plurality of percussively ignitable flashlamps mounted in a row on a support member; the selective firing mechanism comprising, in combination:

a longitudinal channel in said support member located parallel to said row of flashlamps;

a spring loaded ratchet bar retained in said channel;

a single slidable member retained in said channel in releasable engagement with said ratchet bar; and,

a single striker means provided on said slidable member for resiliently engaging all of said flashlamps successively and operative to sequentially fire respective ones of said flashlamps in response to successive actuation of said ratchet bar and the resulting indexing of the slidable member releasably engaged therewith along said channel.

4,076,489

METHOD FOR COATING PHOTOFLASH LAMPS

Siegfried H. Schroeter, Schenectady; Donald A. Bolon, Scotia, and Gary M. Lucas, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 669,474, Jun. 24, 1976, abandoned, which is a continuation-in-part of Ser. No. 592,194, Jul. 1, 1975, abandoned. This application May 2, 1977, Ser. No. 792,924
Int. Cl.² B05D 1/18, 3/06; F21K 5/02
U.S. Cl. 431—94 **12 Claims**

1. A method for coating a flashbulb with an organic resin to substantially improve its shatter resistance upon flashing while not substantially altering the spectral balance of the light transmitted within the range of 360 nm to about 680 nm and between the blue region of 360 nm to 480 nm, the green region of 480 nm to 560 nm and the red region of 560 nm to above 680 nm which comprises,

(A) dipping the flashbulb in a UV curable solventless organic resin having a viscosity in the range of 100 to 10,000 centipoises at dipping temperatures,

(B) pulling the flashbulb from the UV curable solventless organic resin within a period of between 3 to 60 seconds, and

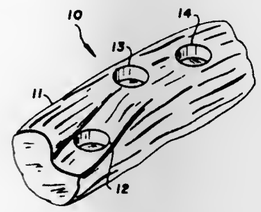
(C) thereafter effecting the cure of the UV curable solventless organic resin by irradiating the treated flashbulb with UV irradiation, where the UV curable solventless organic resin can transmit at least 70% of the radiant energy in the region of 375 nm and at least 80% of the radiant energy in the region of 400 nm when measured as a 10 mil thick cured film on a glass slide in a recording spectrophotometer.

4,076,490

FIREPLACE SYSTEM

Gloria D. Hilker, 1109 S. Landmark Trail, Hopkins, Minn. 55343

Filed Dec. 1, 1976, Ser. No. 746,387
Int. Cl.² A41G 1/00
U.S. Cl. 431—125 **4 Claims**



1. A noncombustible artificial log comprising

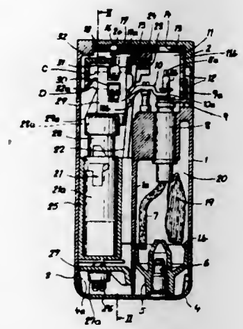
a substantially hollow tubular ceramic structure with an outer peripheral surface, fuel retaining recesses disposed at spaced axial locations along the upper solid portion of said outer peripheral surface for receiving a supply of readily combustible fuel therein at a recessed level below the normal artificial log peripheral surface, and with the fuel having a burn duration of reasonable magnitude, said recesses having a diameter which is small relative to the diameter of the hollow tubular artificial log structure and each of said recesses having a side wall and a bottom surface for retaining said fuel.

4,076,491

LIGHTER WITH SWINGABLE ACTUATOR

Walter Mohr, Frankfurt am Main, Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jun. 29, 1976, Ser. No. 700,779
Claims priority, application Germany, Aug. 21, 1975, 2537215
Int. Cl.² F21H 7/00
U.S. Cl. 431—130 **18 Claims**



1. A lighter comprising:

a housing formed with a fuel tank;

a burner valve on said housing communicating with said tank for discharging a jet of flammable fuel;

a piezoelectric igniter in said housing having a movable part linearly displaceable to generate a discharge igniting said jet;

a swingable actuator on said housing and forming part thereof for operating said valve and said igniter; and

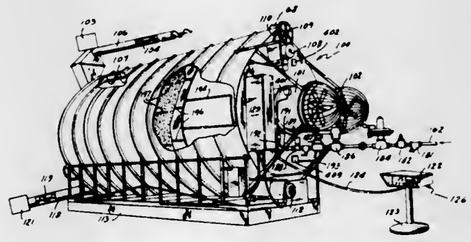
a force-transmitting device between said actuator and said movable part of said igniter, said device comprising a body, a curved-track element and a rolling running along said curved-track element, one of said elements being mounted on said actuator and the other of said elements being mounted on said body, said body bearing against said part to transform angular displacement of said actuator into linear displacement of said part, and a further rolling element riding along a wall of said housing.

4,076,492

ELECTRONIC DRYER

Erhardt E. Alms, Barrington; Donald P. DeVale, Sycamore, and William Russell, Genoa, all of Ill., assignors to AFE Industries, Inc., Lake Zurich, Ill.

Filed Dec. 27, 1976, Ser. No. 754,353
Int. Cl.² F27B 9/40; F26B 17/16
U.S. Cl. 432—43 **15 Claims**



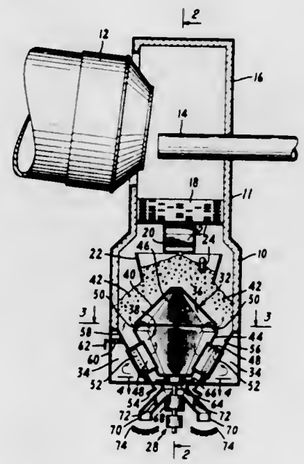
1. A dryer comprising a plenum chamber, a burner mounted in said plenum chamber to supply heated air thereto, a drying chamber mounted adjacent to said plenum chamber and formed with foraminous inner and outer sidewalls through which heated air from said plenum chamber passes, a first temperature sensing means mounted within said drying chamber adjacent said inner side wall, a second temperature sensing means mounted within said drying chamber adjacent said outer side wall, a third temperature sensing means mounted within said plenum chamber and connected to said burner to control it, and a first differential amplifier connected to said first and second temperature sensing means and producing a first output when the temperature difference between said first and second temperature sensing means exceeds a predetermined amount and producing a second output when said temperature difference between said first and second temperature means does not exceed said predetermined amount and said differential amplifier connected to said burner to prevent it from turning on when said differential amplifier produces said second output.

4,076,493

APPARATUS FOR COOLING PARTICULATE MATERIAL

Kenneth L. Gardner, Riverside, Pa., assignor to Kennedy Van Saun Corporation, Danville, Pa.

Filed Sep. 9, 1976, Ser. No. 721,673
Int. Cl.² F27D 15/02
U.S. Cl. 432—77 **37 Claims**



28. An apparatus for cooling hot, calcined particulate material comprising a housing having a cooling chamber therein for receiving and cooling the hot, calcined particulate material, an air distributor located within the cooling chamber below the upper region into which the particulate material is introduced, a discharge passage from the lower region of the housing, an annular flow passage within the cooling chamber around the outer periphery of said air distributor and connecting the upper region of the cooling chamber with the discharge passage, an upper section of said annular flow passage being defined in part by a downwardly and outwardly sloped surface of the air distributor, a lower section of said annular passage extending from the outer perimeter of said outwardly and downwardly extending surface of the air distributor toward said discharge passage and means for introducing a cooling fluid into said annular flow passage at a point at which the upward flow offers less resistance than the downward flow to generate a countercurrent flow of cooling fluid through the upper section of the annular flow passage.

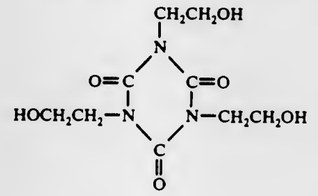
4,076,494

ORGANIC COMPOUNDS

Johann Schuster, Basel, and Karl Taubert, Ettingen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Nov. 3, 1976, Ser. No. 738,568
Claims priority, application Switzerland, Nov. 10, 1975, 14492/75
Int. Cl.² D06P *1/68;* C09D *11/04*
U.S. Cl. 8—2.5 A 17 Claims

1. A composition suitable for use in transfer printing inks which comprises, in intimate admixture, a disperse dye or dispersion optical brightener sublimable at a temperature of 180° to 220° C., or a mixture of such a dye and optical brightener, and, as a dispersing aid, a compound of the formula



4,076,495

SULPHURIZED PAPER SUPPORTS

Robert Décombe, Ferney-Voltaire, and Bernard Hugelin, Gaillard, both of France, assignors to Sublistatic Holding SA, Glaris, Switzerland

Continuation of Ser. No. 486,836, Jul. 9, 1974, abandoned. This application Mar. 29, 1976, Ser. No. 671,703
Claims priority, application Switzerland, Jul. 12, 1973 10/53
Int. Cl.² D06P *5/20*
U.S. Cl. 8—2.5 A 9 Claims

1. In a temporary carrier for use in thermoprinting textiles by transfer of vapors of at least one dyestuff vaporizing at atmospheric pressure at a temperature of above 160° C which carrier comprises a sheet or strip material containing on a face thereof a print, said print containing at least one dyestuff which, at atmospheric pressure, passes into the vapor state at a temperature above 160° C, the improvement wherein the sheet or strip material is vegetable parchment and the print contains at least one cationic dyestuff and an alkalizing agent in a single printed layer.

4,076,496

COLORING METHOD FOR SYNTHETIC RESIN

Tadashi Hamano, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Jul. 15, 1975, Ser. No. 595,900
Claims priority, application Japan, Jul. 17, 1974, 49-81153
Int. Cl.² D06P *3/00*
U.S. Cl. 8—4 9 Claims

1. A coloring method for the surfaces of synthetic resin articles comprising, the step of heating an aqueous dye solution to a temperature less than the softening temperature of said resin; and applying the heated aqueous solution to the article to be colored; wherein said aqueous solution consisting, essentially of 0.1–50 weight percent of at least one polyacid having the chemical formula $HO_2C(CH_2)_nCO_2H$ wherein n is integer of at least 4 and sufficient to inhibit esterification of said polyacid with polyhydric alcohol; 5–60 weight percent of at least one polyhydric alcohol and an effective quantity of a resin-substantive dye in water.

4,076,497

CONTINUOUS DYEING OF POLYESTER FIBERS AND CELLULOSE FIBERS

Peter Freyberg, Speyer; Dieter Horn, Heidelberg; Knut Oppenlaender; Hans Wolf, both of Ludwigshafen, and Dieter Distler, Mutterstadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Jan. 22, 1976, Ser. No. 651,431
Claims priority, application Germany, Feb. 1, 1975, 2504282
Int. Cl.² D06P *3/82;* C09B *67/00*
U.S. Cl. 8—21 C 7 Claims

1. A process for the continuous dyeing of polyester fibers, cellulose fibers or blends of these fibers, which process comprises:

continuously applying to said fibers an aqueous dye liquor which contains

I. a disperse dye for polyester fibers, and for cellulose fibers a dye selected from the group consisting of vat dyes, naphthol dyes, sulfur dyes and direct dyes, and

II. from 0.5 to 70 g/l of said aqueous dye liquor of an antimigration agent selected from the group consisting of polyoxyalkylated amines, amine oxides of polyoxyalkylated amines and quaternized polyoxyalkylated amines which in 1% strength aqueous solution have a cloud point of at least 18° C and which are each derived from amines which contain at least 2 nitrogen atoms and at least one group which can be oxyalkylated and in which the polyoxyalkylene chain contains

a. ethylene oxide units and

b. a second component selected from the group consisting of propylene oxide, butylene oxide, cyclohexene oxide and styrene oxide units in the molar ratio a:b of from 10:1 to 0.1:1,

said continuous application being carried out at a temperature below that at which the dye or dyes flocculate from the liquor;

drying the fibers while heating at an elevated temperature sufficient to flocculate the dye or dyes from the liquor; and

fixing the dye or dyes to said fibers.

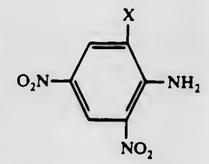
4,076,498

DYED POLYETHYLENE TEREPHTHALATE TEXTILE FIBERS WITH GREENISH BLUE SHADE

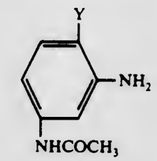
Laszlo A. Meszaros, Charlotte, N.C., assignor to Martin Marietta Corporation, Bethesda, Md.

Filed Sep. 20, 1976, Ser. No. 724,850
Int. Cl.² C09B *27/00;* D06P *1/02*
U.S. Cl. 8—41 C 5 Claims

1. Polyethylene terephthalate textile fibers dyed with the dyestuff resulting from coupling equimolar amounts of diazotized



and the coupling components obtained by reacting



with diethyl sulfate, wherein X is Cl or Br, and Y is methoxy or ethoxy.

4,076,499

METHOD FOR WASHING CONTINUOUSLY MOVING YARN

Evsei Moiseevich Mogilevsky, Kutuzovsky prospekt, 17, kv. 9, Moscow, U.S.S.R.

Filed Jun. 3, 1975, Ser. No. 583,413
Int. Cl.[2] D01F *11/00*
U.S. Cl. 8—137.5 7 Claims

1. A method for washing continuously moving freshly formed rayon yarn, which comprises effecting, subsequent to formation and afterregeneration, preliminary washing of the freshly formed continuously moving rayon yarn by way of dipping said continuously moving yarn into and removing it from a bath filled with water having a pH of from 1.5 to 2.5, and subjecting said thus prewashed continuously moving yarn to a final wash consisting of sprinkling the continuously moving yarn with warm water having a pH of from 7.0 to 7.5 and a temperature of 50° to 75° C, thereby effecting the final washing of said yarn; said water used in said preliminary washing having a temperature of at least 30° C, but lower than that of the sprinkling water.

4,076,500

TREATMENT OF TEXTILE MATERIALS

William A. Rearick, Charlotte, N.C., assignor to ICI Americas Inc., Wilmington, Del.

Filed Jun. 18, 1976, Ser. No. 697,590
Int. Cl.[2] D06L *1/02*
U.S. Cl. 8—139.1 10 Claims

1. A multi-stage process for the scouring and bleaching of textile material containing cotton which comprises contacting said textile material with an emulsion comprising (a) from about 0.1 to about 10% by weight of an aqueous solution containing from about 99.5% to about 40 parts of water and from about 0.5 to about 60 parts of an alkaline compound, (b) emulsified in from about 90 to about 99.9% by weight of a chlorinated hydrocarbon, and (c) from about 0.001 to about 5% by weight of an emulsifier; contacting the textile materials with steam to remove the chlorinated hydrocarbon; padding the textile materials in an aqueous solution of a peroxygen compound wherein the temperature of said solution is from about 25° C. to about 60° C.; subjecting the textile materials to the action of steam; and washing the textiie materials with water.

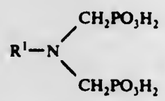
4,076,501

CORROSION INHIBITION OF WATER SYSTEMS WITH PHOSPHONIC ACIDS

Arthur Harris, Poynton; John Burrows, Congleton, and James Roger Hargreaves, Sale, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 557,569, Mar. 11, 1975, abandoned, which is a continuation of Ser. No. 265,139, Jun. 22, 1972, abandoned. This application Jan. 28, 1976, Ser. No. 653,805
Claims priority, application United Kingdom, Jun. 26, 1971, 30063/71
Int. Cl.[2] C23F *11/16*
U.S. Cl. 21—2.7 A 7 Claims

1. A process for inhibiting the attack of a corrosive water system on metals with which it comes into contact which comprises incorporating in the system a phosphonic acid of the general formula:



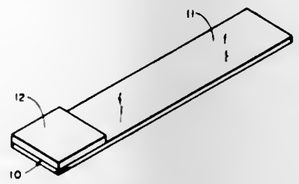
in which R^1 is a straight-chain alkyl group containing from 1 to 5 carbon atoms, an alkenyl group containing from 3 to 5 carbon atoms in which the double bond is not adjacent to the nitrogen, a tolyl group, a benzyl group or a cyclohexyl group.

4,076,502

METHOD, COMPOSITION, AND DEVICE FOR DETERMINING THE SPECIFIC GRAVITY OF A LIQUID

James B. Dugle, and C. Bradley Hager, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Continuation of Ser. No. 549,944, Feb. 14, 1975, abandoned. This application Jun. 14, 1976, Ser. No. 696,050
Int. Cl.[2] G01N *31/14, 31/22, 33/16*
U.S. Cl. 23—230 R 31 Claims



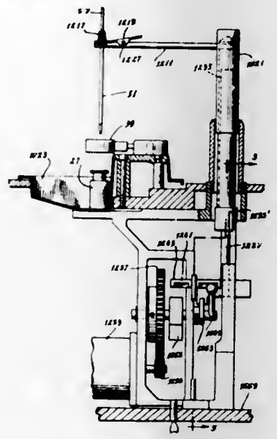
1. A method for determining the specific gravity of a urine sample, which method comprises the steps of:
(a) contacting said sample with a predetermined concentration of an enzyme and of a reagent upon which said enzyme exerts its catalytic activity, the rate of reaction of said reagent in the presence of said enzyme being affected by the aggregate solute content of said sample,
(b) determining the rate of said reaction in contact with said sample, and
(c) comparing such determined reaction rate to the rates of said reaction when carried out in contact respectively with samples of urine having known different specific gravities.

4,076,503

PIPETTING SYSTEM FOR USE IN KINETIC ANALYSIS APPARATUS AND THE LIKE

John G. Atwood; Charles F. DeMey, III, both of Redding; Hamilton W. Marshall, Jr., Ridgefield, and Lucien C. Ducret, Riverside, all of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation of Ser. No. 499,792, Aug. 22, 1974, abandoned. This application Dec. 15, 1975, Ser. No. 640,459
Int. Cl.[2] G01N *1/10*
U.S. Cl. 23—259 4 Claims



1. Apparatus for transferring a liquid reagent from a reagent container to a reaction vessel comprising:
(a) a pipette having a storage volume at least equal the volume to be taken from said reagent container;
(b) pump means including a piston and a cylinder;

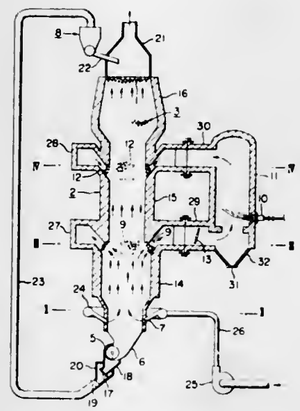
(c) a flexible conduit filled with air coupling said pipette to said pump means;
(d) means for positioning said pipette vertically and rotationally in a horizontal plane to locate said pipette above said reagent container or in either said reagent container or said reaction vessel;
(e) means for absorbing liquid disposed over said reagent container in the path of travel of the pipette to and from said reagent container said aborbing means being an irrigated sponge which is penetrable by said pipette in both directions travelled thereby to wipe the outer portions thereof; and
(f) means for controlling said pump means to cause said pipette to draw in reagent in excess of the required reagent volume to be deposited in the reaction vessel, to cause said pipette to discharge only the required amount of reagent into said reaction vessel, and then to cause said pipette to expel the excess volume onto said absorbing means when located above said reagent container.

4,076,504

WASTE GAS PURIFICATION APPARATUS

Naoichi Oshida, Yokohama, and Eiichi Ando, Kanagawa, both of Japan, assignors to Kabushiki Kaisha Sato Gijutsu Kenkyusho, Fujisawa and Shinagawa Furnace Co., Ltd., Tokyo, both of, Japan

Filed Jul. 29, 1976, Ser. No. 709,649
Claims priority, application Japan, Aug. 14, 1975, 50-98113
Int. Cl.[2] F23G *7/06*
U.S. Cl. 23—277 C 1 Claim



1. A waste gas purification apparatus comprising in combination:
(a) an elongated vertical hollow furnace shaft (2), with upper and lower ends and waste gas inlet means (7) at the lower end, said shaft being adapted to receive therein pebbles or pellets;
(b) a plurality of in series discharge hoppers (6, 18, 20) with a pebble discharge means (5, 17, 19) at said lower end;
(c) an exhaust gas duct (21) at the top of said shaft (2) said duct (21) having a lower part, a pebble feeding chute (22) coupled to said lower part, with a pebble charge device (8) and a pebble recirculating tube (23) extending from said discharge hoppers to said charge device (8);
(d) an annular waste gas supply main (24) around said lower end connected to said gas inlet means (7), blower means (25) coupled to said gas inlet means (7) for force feeding waste gas through said gas inlet means;
(e) an inactive travel zone (33) defined at said upper end having a widening section with a narrow outlet, a lower shaft (14) towards the lower end with a uniform cross-section; and,
(f) an intermediate shaft (15) between said inactive travel zone (33) and said lower shaft (14), including a temperature control chamber (11) in parallel with said intermediate shaft, branch lines (27, 28) connecting said intermediate shaft and said temperature control chamber, including damper means (13) to control the flow of gas, a dust pocket (32) in said temperature control chamber, whereby pebbles or pellets move downwards in the shaft from the inactive travel zone (33) to the discharge hoppers and are recirculated to the upper end while waste gas is fed to the lower end and travels up through the shaft, a portion of the gas passing through the temperature control chamber, the clean gas leaving the upper end.

4,076,505

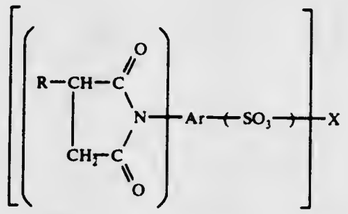
COAL DESULFURIZATION PROCESS

Ralph M. Dessau, Edison, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 22, 1976, Ser. No. 743,739
Int. Cl.[2] C10L *9/10, 9/00;* C10B *57/00*
U.S. Cl. 44—1 R 6 Claims

1. In a process for reducing the pyritic sulfur and ash content of coal under sink-float separation conditions, the improvement which comprises (1) contacting finely comminuted coal with a heavy organic liquid medium having a specific gravity of at least 1.1, and having dissolved therein a dispersant quantity of ionic surfactant which is a hydrocarbyl-succinimide derivative of an aminoarylsulfonic acid salt; and (2) separating the coal float phase from the heavy organic liquid medium, and recovering coal with a reduced sulfur and ash content.

5. A process in accordance with claim 1 wherein the ionic surfactant is a salt containing the following structural elements:



wherein R is an acyclic hyrocarbyl group containing between about 5 and 1000 carbon atoms; Ar is a polyvalent aromatic radical; X is a metal or HNR'_3 cation; and R' is hyrogen or a hydrocarbyl substituent.

4,076,506

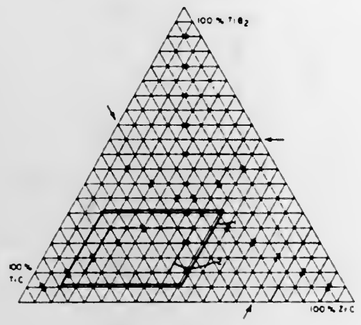
TRANSITION METAL CARBIDE AND BORIDE ABRASIVE PARTICLES

Herbert Valdsaar, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 621,821, Oct. 14, 1975, abandoned. This application Sep. 30, 1976, Ser. No. 728,414
Int. Cl.[2] B24D *3/02;* C04B *31/16;* C09C *1/68*
U.S. Cl. 51—307 14 Claims

1. Abrasive particles consisting essentially of from 69% to 94% by weight of a carbide matrix of titanium and zirconium carbide, and from 6% to 31% by weight of crystalline titanium diboride grains dispersed throughout said carbide matrix, said carbide matrix being at least partially in the form of one or more solid solutions of zirconium carbide and titanium carbide

with proviso that said zirconium carbide is present in an amount of from 10% to 46% by weight, based on the total



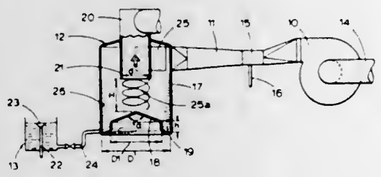
weight of the titanium and zirconium carbides and borides present.

4,076,507

CENTRIFUGAL SEPARATOR FOR SEPARATING LIQUID AND GAS

Georg Hans Henrik Hauberg, Allerod, Denmark, assignor to Aktieselskabet Niro Atomizer, Soborg, Denmark

Filed Jun. 17, 1976, Ser. No. 696,917
Claims priority, application Denmark, Jun. 18, 1975, 2757/75
Int. Cl.² B01D *45/12*
U.S. Cl. 55—1 **12 Claims**



1. A centrifugal separator for separating liquid from a gas and comprising

a. a container having a circumferential cylindrical wall shaped substantially as a surface of revolution with a substantially vertical axis and a bottom wall defining a central inner surface part having an upwardly domed shape spaced from the side wall, an annular channel being defined between said central surface part of the bottom wall and the lower part of the circumferential wall of the container

b. means for introducing a mixture of gas and liquid into the container and for causing said mixture to rotate about said vertical axis,

c. a gas discharge tube extending centrally into the upper end of the container and having an unobstructed end opening terminating at a position spaced substantially from said central surface part of the container bottom, and

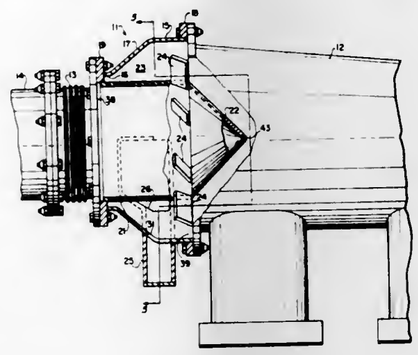
d. outlet means communicating with said channel for discharging liquid from the container and level control means for securing a predetermined minimum liquid level in the channel of the container at least above the liquid discharge outlet means and a maximum liquid level in the channel whereby the upper surface portion of said domed central inner surface is only wetted by a thin liquid film.

4,076,508

DEBRIS SEPARATOR FOR HOT GAS STREAM

Frederich M. Christensen, 10256 Prarie Road, Omaha, Nebr. 68134

Filed May 31, 1977, Ser. No. 801,779
Int. Cl.² B01D *50/00*
U.S. Cl. 55—309 **11 Claims**



1. A separator for removing entrained debris from hot gases flowing from the exhaust manifold of an engine to the inlet of an associated turbocharger, the separator comprising

a. a tubular casing having inlet and outlet openings at its opposite ends;

b. a cylindrical, perforated screen attached to the casing adjacent the outlet end thereof and extending axially through the casing in cantilever fashion,

c. the screen and the casing bounding an intervening annular chamber which communicates directly with the casing inlet, and communicates indirectly with the casing outlet through the perforations and the interior of the screen;

d. a circumferential series of slots formed in the screen at its free end;

e. a set of turning vanes carried by the screen and arranged to impart swirling motion to gases entering the annular chamber,

f. the vanes having hubs which form a sliding fit with said slots and are held against dislodgment in the radial direction by the slot margins, and tips which are spaced radially inward from a surrounding region of the casing;

g. a deflector member attached to and covering the free end of the screen,

h. the deflector member closing said slots so as to preclude axial dislodgment of the vanes and being shaped to direct approaching hot gases radially outward to the annular chamber; and

i. a collection duct which communicates with an outer peripheral region of the annular chamber and serves to withdraw from that chamber debris which separates from the hot gases.

4,076,509

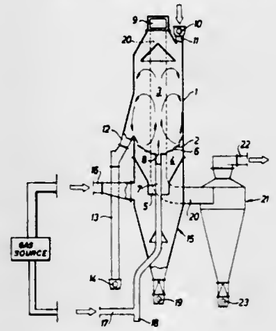
APPARATUS FOR PROCESSING DUST-CARRYING GAS AND BULK GOODS

Bo Christer Ferm, Enkoping, Sweden, assignor to AB Bahco Ventilation, Enkoping, Sweden

Filed May 20, 1976, Ser. No. 688,151
Claims priority, application Sweden, Jun. 2, 1975, 75062828
Int. Cl.² B01D *50/00*
U.S. Cl. 55—320 **5 Claims**

1. An apparatus adapted for intermingling dust-carrying gas and bulk goods for treating either one of them, e.g. drying the bulk goods or scrubbing the gas, in a bed of the bulk goods aerated by the gas and comprising a grating (2) with through-flow openings (6) for a first partial stream of the gas, an aerating bed operatively associated with said grating, said openings

being so directed that this first partial stream flows substantially horizontally from the outside and inwardly towards the middle of said bed, a further gas inlet (8) in substantially the center of the grating (2), a communicating duct (7) leading to said inlet (8) for introducing a second partial stream of the gas from below and upwardly in said bed, and a cyclone dust separator (15) having an output defined by a truncated element connected to the wall of said cyclone separator and in communication with said grating openings (6) and an input in communication with a gas supply source providing said first partial stream for cleaning the first partial stream before it is supplied to said through-flow openings (6) of said grating (2), said duct (7) extending through said truncated element, both partial streams of the gas being received from a common gas supply source so that the second partial stream is supplied to said grating more rich in dust than the first partial stream.

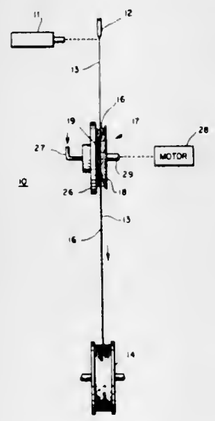


4,076,510

METHODS AND APPARATUS FOR COATING A FILAMENT

Jaroslav Mracek, Lawrence Township, Mercer County, and Un-Chul Paek, West Windsor Township, Mercer County, both of N.J., assignors to Western Electric Co., Inc., New York, N.Y.

Filed Dec. 23, 1976, Ser. No. 753,767
Int. Cl.² C03C *25/02*; C03B *37/02*
U.S. Cl. 65—3 A **13 Claims**



4. An apparatus for uniformly and concentrically coating a continuous filament, of substantially circular cross-section, with a viscous fluid material, comprising:

means for forming a substantially planar rotating body of the material;

means for forming a vortex of the material in tandem relationship with the rotating body of material; and

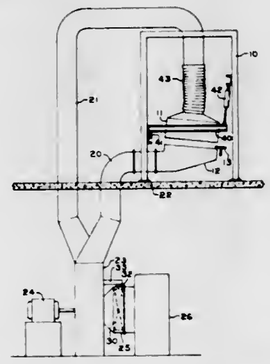
means for moving the filament through the rotating material in the plane of the rotating body of material and through the central portion of the vortex to uniformly and concentrically coat the filament.

4,076,511

METHOD OF OPERATING A GLASS SHEET TEMPERING LINE

Robert C. Fulton, Monroeville; Donald L. Edmunds, Bethel Park, and George B. Shields, Lower Burrell, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 13, 1977, Ser. No. 759,151
Int. Cl.² C03B *27/00*
U.S. Cl. 65—27 **9 Claims**



1. In the method of tempering glass sheets by heating glass sheets to a temperature suitable for tempering and then rapidly cooling surface portions of the glass sheets by directing streams by gaseous tempering medium at opposite sides of the glass sheets from opposed, closely spaced upper and lower arrays of nozzles between which the glass sheets pass while the glass sheets are supported out of contact with the lower array of nozzles by a layer of said gaseous tempering medium, wherein the streams of gaseous tempering medium are propelled by large blowers which require a substantial amount of time to halt, and wherein accidental breakage of glass sheets occasionally requires removal of glass fragments from between said arrays of nozzles, the improvement comprising upon the occurrence of glass breakage, substantially simultaneously damping the flow of tempering medium to at least one lower nozzle array section to a sufficient degree to avoid blowing glass fragments out of said lower nozzle array section without significantly reducing blower speed, and increasing the separation between said lower nozzle array section and its corresponding upper nozzle array section so as to render glass fragments more accessible for removal.

4,076,512

CONTROLLED METHOD FOR THE PRODUCTION OF CLAD GLASS ROD

James Robert Mellor, Ormskirk, and Colin Billington, Burscough, both of England, assignors to Pilkington Brothers Limited, St. Helens, England

Filed Sep. 9, 1976, Ser. No. 721,924
Claims priority, application United Kingdom, Sep. 15, 1975, 37831/75
Int. Cl.² C03B *15/16*
U.S. Cl. 65—29 **8 Claims**

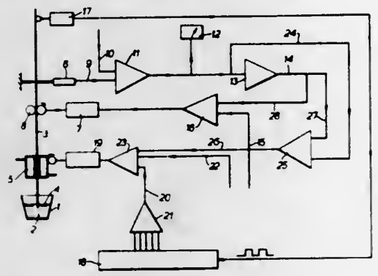
1. In a method of producing clad glass rod of substantially uniform diameter including the steps of:

supporting within the same container a glass melt of a molten layer of a first glass on a molten layer of a second glass,

said two layers being provided by two quiescent pools of glass, one overlying the other within said same container,

drawing from the free surface of the upper layer a clad glass rod comprising an outer cladding of said first glass on a core of said second glass which is entrained at the interface between said layers,

stabilizing said drawn clad glass rod by cooling said drawn glass layer by a cooling jacket which surrounds said drawn glass so as to cool said drawn glass into solid form above the surface of said upper layer, and



varying the rate of drawing of said rod to generally control the diameter of the rod,

the improvement comprising the steps of:

sensing the rate of drawing and the diameter of the drawn rod, and

moving the cooling jacket axially towards and away from the glass melt container in response to the rate of drawing and diameter sensing to render the drawn clad glass rod more uniform in diameter, particularly as the level of glass melt within the container varies.

4,076,513

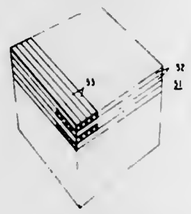
METHOD FOR MAKING TRANSVERSE TUBE RECUPERATOR

Yu K. Pei, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 650,995, Jan. 21, 1976, which is a continuation of Ser. No. 146,665, May 25, 1971, abandoned, which is a continuation-in-part of Ser. No. 30,859, Apr. 22, 1970, abandoned. This application Mar. 29, 1977, Ser. No. 782,608

Int. Cl.² C03B *32/00*

U.S. Cl. 65—33 **9 Claims**



1. A method for making a lightweight, foraminous matrix comprising an assembly of integrally fused tubes forming a first and a second series of longitudinal parallel passageways therethrough, wherein the walls defining said passageways have essentially zero porosity and an average coefficient of lineal thermal expansion of about -12 to $+12 \times 10^{-7}/°$ C. over the range 0°-300° C., which comprises

(1) arranging a plurality of layers of tubes made of a glass that is thermally crystallizable to a low expansion glass-ceramic having a coefficient of lineal thermal expansion of about -12 to $+12 \times 10^{-7}/°$ C. over the range before stated, each of the tubes being sealed at each end and containing an expansible fluid medium, the layers of tubes being superimposed one above the other in successive parallel planes, the tubes within each plane being essentially parallel to each other and transverse to tubes in adjacent layers,

(2) said tubes having a ratio of inner diameter to wall thickness of at least 6,

(3) constraining the outer periphery of the assembly of tubes to closely constrain their outward movement in any direction,

(4) subjecting said constrained closely packed tubes to a temperature sufficient to soften said tubes and thus to cause said fluid medium entrapped therein to expand and thus urge the said tubes into tight contact with adjacent tubes, thereby to aid in the fusion of such tubes, said temperature being in the temperature range of 50° to 250° F. above the annealing point of said glass, in which temperature range said glass nucleates during said expansion and fusion, and

(5) thereafter further heating said tubes to a higher temperature than the temperature in step (4) and at least 200° F. above the annealing point temperature of the original glass, and heat treating the matrix of tubes and thus effecting further expansion and crystallization, and continuing such heating until a sealed glass-ceramic matrix having a linear expansion coefficient in the range of from -12 to $+12 \times 10^{-7}/°$ C. over the range 0°-300° C. is obtained.

7. A method for making a recuperator comprising a lightweight, foraminous matrix comprising an assembly of integrally fused tubes forming a first and a second series of longitudinal parallel passageways therethrough, wherein the walls defining said passageways have essentially zero porosity and an average coefficient of lineal thermal expansion of about -12 to $+12 \times 10^{-7}/°$ C over the range of 0°-300° C, which comprises

(1) arranging a plurality of layers of tubes made of a glass thatis thermally crystallizable to a low expansion glass-ceramic having a coefficient of lineal thermal expansion of about -12 to $+12 \times 10^{-7}/°$ C over the range before stated, each of the tubes being sealed at each end and containing an expansible fluid medium, the layers of tubes being superimposed one above the other in successive parallel planes, the tubes within each plane being essentially parallel to each other and transverse to tubes in adjacent layers,

(2) said tubes having a ratio of inner diameter to wall thickness of at least 6,

(3) constraining the outer periphery of the assembly of tubes to closely constrain their outward movement in any direction,

(4) subjecting said constrained closely packed tubes to a temperature sufficient to soften said tubes and thus to cause said fluid medium entrapped therein to expand and thus urge the said tubes into tight contact with adjacent tubes, thereby to aid in the fusion of such tubes, said temperature being in the temperature range of 50° to 250° F above the annealing point of said glass, in which temperature range said glass nucleates during said expansion and fusion, and

(5) thereafter further heating said tubes to a higher temperature than the temperature in step (4) and at least 200° F above the annealing point temperature of the original glass, and heat treating the matrix of tubes and thus effecting further expansion and crystallization, and continuing such heating until a sealed glass-ceramic matrix having a linear expansion coefficient in the range of from -12 to $+12 \times 10^{-7}/°$ C over the range 0°-300° C is obtained.

4,076,514

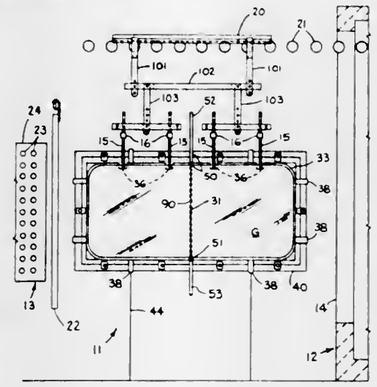
INSULATED TONGS FOR SUPPORTING GLASS SHEETS DURING PRESS BENDING TO V SHAPES AND PROCESS OF USE

Joseph B. Kelly, Crestline, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 3, 1977, Ser. No. 756,211

Int. Cl.² C03B *23/02*

U.S. Cl. 65—106 **6 Claims**



1. In a method of shaping a glass sheet to a sharp radius of bending by heating said glass sheet to a temperature at which glass is electroconductive and press bending said sheet in conjunction with applying electric current along a stripe of electroconductive material applied to said sheet along a line of sharp bending while supporting said glass sheet by glass engaging elements of metal tongs of electroconductive material supported by and connected to a grounded tong supporting carriage of electroconductive material,

the improvement comprising insulating the glass engaging elements of the tongs from the grounded tong supporting carriage, thereby avoiding uncontrolled current flow from said stripe through said electroconductive glass, said tongs and said carriage to ground by providing electrical insulator means between said tongs and the grounded tong supporting carriage of sufficient length to effectively insulate the metal tongs from the grounded tong supporting carriage and located a sufficient distance from both said glass sheet and from said grounded tong supporting carriage to minimize the occurrence of arcing and to avoid establishing a continuous electrical current flow to the grounded carriage from the stripe through the electroconductive glass, the tongs and said tong supporting carriage that reduces to a significant extent the electric current flow along the electroconductive heating stripe.

4. Apparatus for shaping a glass sheet to a sharp radius of bending, comprising: a furnace having means for heating a sheet of glass to a softened condition suitable for bending, a pair of opposed bending molds adjacent to said furnace adapted to press bend heat-softened glass sheets suspended between the molds, grounded carriage means for conveying glass sheets from said furnace and for supporting glass sheets in a bending location between said bending molds, electroconductive tong means carried by said carriage means for gripping edge portions of glass sheets to retain the glass sheets on said carriage means, electrode means at said bending location adapted to contact edge portions of the glass sheets for applying electrical current across the glass sheets along a line of sharp radius bending, a block of insulator material disposed between each tong means and the respective carriage means by which it is carried so as to electrically insulate said tong means from said carriage means, whereby electrical arcing from said electrode means to said tong means is substantially avoided.

4,076,515

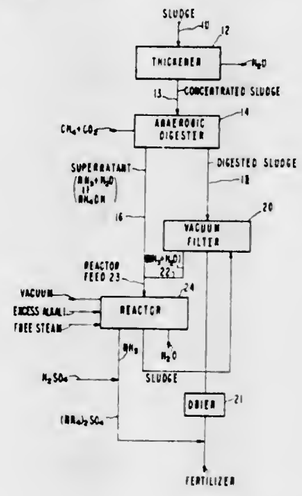
METHOD FOR TREATMENT OF DIGESTER SUPERNATANT AND OTHER STREAMS IN WASTEWATER TREATMENT FACILITIES

M. David Rickard, 3530 Silver Springs Road, Lafayette, Calif. 94549

Filed Jul. 9, 1975, Ser. No. 594,541

Int. Cl.² C02C *1/14, 5/10, 3/00*; C05F *7/00*

U.S. Cl. 71—10 **2 Claims**



1. A method of treating waste water in a sewage treatment plant to remove ammonia comprising the sequential steps of:

A. reducing said waste water to sludge;

B. placing said sludge in an anaerobic digester;

(1) converting a substantial quantity of the putrescible organic material found in said sludge to methane and carbon dioxide, and,

(2) converting a substantial quantity of nitrogen found in said sludge to ammonia;

C. removing the digester supernatant;

D. dewatering said digested sludge to separate from the sludge, dewatering liquor being substantially composed of water and water soluble ammonia;

E. combining said supernatant with said dewatering liquor;

F. reacting with said supernatant and dewatering liquor, to form a reaction product, a stoichiometric excess of lime thus converting ammonia salts found in the supernatant and dewatering liquor to free or aqueous ammonia;

G. rendering the ammonia less soluble in the reaction product by applying to said product, live steam under reduced pressure.

4,076,516

AQUATIC HERBICIDES

Joseph F. Vartiak, Naperville, Ill., and George E. Wortley, Longwood, Fla., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 740,509, Nov. 10, 1976, abandoned. This application May 19, 1977, Ser. No. 798,411

Int. Cl.² A01N *17/00*

U.S. Cl. 71—66 **12 Claims**

1. A process for improving the activity of aquatic herbicides which comprises applying these herbicides under water to the vegetation to be controlled in the presence of a minor amount of a water soluble acrylic acid polymer which has a molecular weight of at least 10,000.

4,076,517

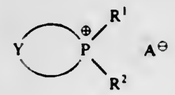
METHOD OF INHIBITING THE GROWTH OF PLANTS WITH PHOSPHOLENIUM SALTS

Klaus Naumann, Cologne; Klaus Sasse, Gladbach-Schildgen, and Klaus Lurssen, Berg.-Gladbach, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 15, 1976, Ser. No. 649,439
Claims priority, application Germany, Jan. 27, 1975, 2503210
Int. Cl.² A01N *9/36*
U.S. Cl. 71—86 **5 Claims**

1. A method of inhibiting the growth of plants which comprises applying to the plants or a plant habitat an effective amount of a composition containing as active ingredient a phospholenium salt of the general formula

(I),



in which

R^1 is alkyl of from 1 to 4 carbon atoms; substituted alkyl of from 1 to 4 carbon atoms wherein the substituents are selected from hydroxyl, methoxy, methylcarbonyl, alkoxycarbonyl with 1 to 4 carbon atoms in the alkoxy group and halogen; alkenyl of from 2 to 4 carbon atoms, cycloalkyl of from 3 to 12 carbon atoms, aralkyl of from 1 to 4 carbon atoms in the alkyl part and 6 to 10 carbon atoms in the aryl part, or aralkyl of from 1 to 4 carbon atoms in the alkyl part and 6 to 10 carbon atoms in the aryl part substituted in the aryl moiety by halogen; alkoxy and alkylthio of from 1 to 4 carbon atoms;

R^2 is alkyl of from 1 to 4 carbon atoms, substituted alkyl of from 1 to 4 carbon atoms wherein the substituents are selected from hydroxyl, methoxy, methylcarbonyl, alkoxycarbonyl with 1 to 4 carbon atoms in the alkoxy group, and halogen, alkenyl of from 2 to 4 carbon atoms, alkynyl of from 2 to 4 carbon atoms, cycloalkyl of from 3 to 12 carbon atoms, or aralkyl of from 1 to 4 carbon atoms in the alkyl part and 6 to 10 carbon atoms in the aryl part;

Y is a chain of the structure

$-CH_2\text{-}CH{=}CH\text{-}CH_2-$ or $-CH{=}CH\text{-}CH_2\text{-}CH_2-$

which can be monosubstituted or disubstituted by chlorine, bromine or alkyl of up to 4 carbon atoms, and

A^- is one equivalent of an anion of a non-phytotoxic acid.

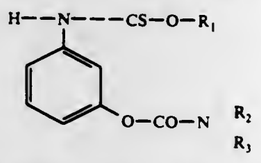
4,076,518

SUBSTITUTED PHENYL THIOCARBAMATES WITH HERBICIDAL ACTION AND METHOD FOR THEIR PRODUCTION

Gerhard Boroschewski, Berlin, and Friedrich Arndt, Aich, both of Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

Division of Ser. No. 171,757, Aug. 13, 1971, abandoned. This application Apr. 2, 1976, Ser. No. 672,940
Claims priority, application Germany, Aug. 20, 1970, 2042110
Int. Cl.² A01N *9/12*; C07C *155/09*
U.S. Cl. 71—100 **10 Claims**

1. A method for the protection of cabbage plantations against infestation by weeds which comprises treatment of the plantation with a compound of the formula:



In which R_1 is methyl or ethyl, R_2 is hydrogen, methyl, or ethyl, R_3 is an alkyl radical having from 1 to 8 carbon atoms or a radical selected from the group consisting of allyl, cyclohexyl, napthyl, and phenyl radicals said compound being employed in an amount sufficient to control growth of weeds without causing significant damage to cabbage plants.

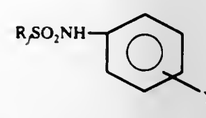
4,076,519

N-SUBSTITUTED PERFLUOROALKANESULFONAMIDES AS HERBICIDES

Joseph Kenneth Harrington, Edina; Donald C. Kvam, North Oaks; Arthur Mendel, Vadnais Heights, and Jerry E. Robertson, North Oaks, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 352,596, April 19, 1973, Pat. No. 3,920,444, which is a continuation-in-part of Ser. No. 100,404, Dec. 21, 1970, abandoned, which is a division of Ser. No. 832,829, June 12, 1969, Pat. No. 3,639,474, which is a continuation-in-part of Ser. No. 588,338, Oct. 21, 1966, abandoned. This application Oct. 1, 1975, Ser. No. 618,376
Int. Cl.² A01N *9/16*
U.S. Cl. 71—103 **48 Claims**

1. The method for terminating the life cycle of plants which comprises contacting said plants with an effective amount of a compound of the formula:



or a metal, ammonium, alkyl amine or dialkanol amine salt thereof wherein R_f is a perfluoroalkyl group containing one to four carbon atoms, each Y is a non-cyclic group selected from alkyl, alkanoylamido, halo, haloalkyl, nitro, alkoxy, alkylsulfonyl, alkylsulfinyl, alkylthio, amino, sulfamoyl, carbamyl, alkoxyalkylthio and sulfamoylamino and *m* is 1–3, provided that all of the Y groups together contain not more than about twenty carbon atoms, at least one of the Y groups contains a heteroatom selected from oxygen, sulfur, nitrogen and halogen, no single Y contains more than six carbon atoms and at least one Y is other than alkyl, halo and haloalkyl.

4,076,520

METHOD FOR CONTINUOUS PASSIVATION OF SPONGE IRON MATERIAL

Wolfgang B. Pietsch, Matthews, N.C., assignor to Midrex Corporation, Charlotte, N.C.

Division of Ser. No. 584,184, June 5, 1975, abandoned. This application Apr. 5, 1976, Ser. No. 673,788
Int. Cl.² C22B *1/14*
U.S. Cl. 75—5 **16 Claims**

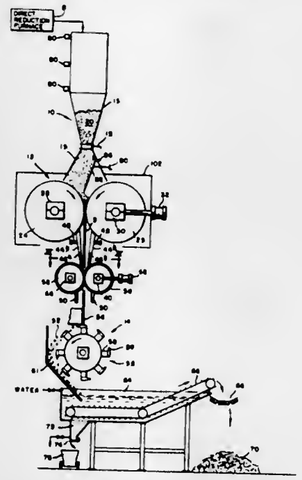
1. A method for forming a plurality of small, passivated, compact products from hot reactive particulate sponge iron comprising:

a. feeding said particulate sponge iron at a temperature of at least 600° C to a compacting apparatus;

b. compacting said particulate sponge iron to form a continuous densified elongated metal strip,

c. longitudinally cutting said densified elongated strip into a multiplicity of longitudinal strips; and

d. further dividing said multiplicity of longitudinal strips at regular intervals by shearing them transversely to their longitudinal dimension and simultaneously densifying the newly created surfaces normal to the longitudinal dimension, thus producing a plurality of small compacted sponge iron products, each having a dense skin on all faces, whereby the products are resistant to atmospheric



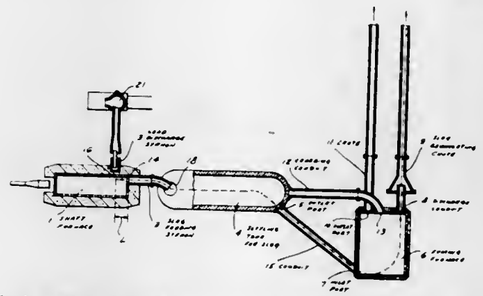
oxidation and suitable for bulk handling, storing, and shipping without additional passivating steps.

4,076,521

METHOD FOR CONTINUOUSLY BLOWING MATERIALS INTO MOLTEN SLAGS

Jordan Todorov Jordanov; Georgi Ivanov Abrashev; Velyu Dimitrov Jekov; Georgi Taney Georgiev; Georgi Alexandrov Haralampiev; Janco Hristov Janev, and Velcho Angelov Prodanov, all of Plovdiv, Bulgaria, assignors to Kombinat Za Zventi Metali "Dimiter Blagoev", Plovdiv, Bulgaria

Continuation of Ser. No. 72,484, Sep. 15, 1970, abandoned, which is a continuation-in-part of Ser. No. 620,018, Mar. 2, 1967, abandoned. This application Dec. 1, 1975, Ser. No. 636,434
Int. Cl.² C21B *3/04*; C22B *13/00*
U.S. Cl. 75—24 **5 Claims**



1. A method for the recovery of non-ferrous metals, comprising the steps of continually introducing an oxygen-containing gas under superatmospheric pressure into a shaft furnace containing a carbonaceous fuel and a mixture of agglomerates of non-ferrous metal concentrates to form a layer of molten metal and a superposed layer of molten slag at the bottom of the shaft furnace, separately tapping the metal layer and the slag from the bottom of the shaft furnace, flowing the tapped slag from the shaft furnace directly into a separate settling tank whereby a mixture of recoverable metal particles and the slag settles and defines a layer below the slag in the settling tank, locally heating the slag in the settling tank above the level of the settled metal particle layer but below the surface of the slag, continually discharging the heated slag from the settling tank to a first location of a separate slag-containing fuming furnace at a level substantially above the level of the slag already present in the fuming furnace, agitating the resulting slag mixture in the fuming furnace, and continuously tapping the slag mixture from the fuming furnace.

4,076,522

METHOD FOR THE DESULFURIZATION OF MOLTEN IRON

Hiroshi Yoshida, Kasukabe, Japan, assignor to Aikoh Co., Ltd., Tokyo, Japan

Filed Jul. 22, 1976, Ser. No. 707,651
Claims priority, application Japan, Nov. 14, 1975, 50-136199
Int. Cl.² C21C *7/02*; C22C *33/08*
U.S. Cl. 75—58 **3 Claims**

1. A method for the desulfurization of molten iron comprising blowing into the molten iron, together with an inert gas, magnesium particles in an amount sufficient to reduce the sulfur content of said molten iron, said magnesium particles having a particle size of less than 2 mm. and being coated with fine particles having a particle size of less than 0.15 mm. which are selected from the group consisting of magnesia, zirconia, titania, graphite, coke, charcoal, fluorspar, magnesium fluoride and mixtures thereof.

4,076,523

PYROMETALLURGICAL PROCESS FOR LEAD REFINING

Toshihiro Yuki, Saganoseki, Japan, assignor to Nihon Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 625,802, Oct. 28, 1975, abandoned. This application Jul. 15, 1976, Ser. No. 705,390
Claims priority, application Japan, Oct. 28, 1974, 49-123323
Int. Cl.² C22B *13/00*
U.S. Cl. 75—77 **9 Claims**

1. In a pyrometallurgical lead refining process comprising the steps of sintering raw materials including lead concentrate to produce lead oxide and reducing said lead oxide to metallic lead, the improvement comprising mixing zinc removed tailings obtained in a zinc refining process with said raw materials and said lead concentrate before said sintering step.

4,076,524

REDUCTION IN SWELLING OF IRON CAUSED BY IRRADIATION

Fred A. Smidt, Jr., Springfield, and James A. Sprague, Burke, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 15, 1973, Ser. No. 416,139
Int. Cl.² C22C *38/12*
U.S. Cl. 75—123 J **2 Claims**

1. Ferrous nuclear reactor core components having substantial resistance to swelling caused by neutron irradiation consisting essentially of 99.7 at % of iron and 0.3 at % of a solute atom selected from the group consisting of vanadium and phosphorus.

4,076,525

HIGH STRENGTH FRACTURE RESISTANT WELDABLE STEELS

Clayton D. Little, Fort Worth, and Paul M. Machmeier, Benbrook, both of Tex., assignors to General Dynamics Corporation, Fort Worth, Tex.

Filed Jul. 29, 1976, Ser. No. 709,751
Int. Cl.² C22C *38/52*
U.S. Cl. 75—128 B **25 Claims**

1. A weldable alloy steel having high strength and high fracture toughness consisting essentially of 0.12% – 0.17% carbon, 1.8% – 3.2% chromium, 0.9% – 1.35% molybdenum, 11.5% – 14.5% cobalt, and 9.5% – 10.5% nickel, all as percents by weight, the remainder being iron with minor amounts of impurities and residual elements, said steel having an ultimate tensile strength of from about 220 Ksi to about 270 Ksi, a

tensile yield strength of from about 210 Ksi to about 245 Ksi and a fracture toughness (K_{IC}) greater than about 115 Ksi $\sqrt{\text{inch}}$.

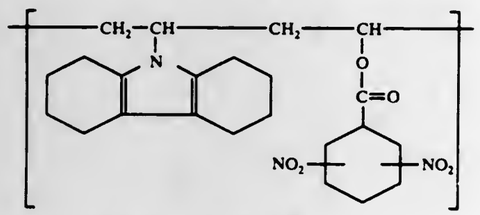
4,076,526

PHOTOCONDUCTIVE N-VINYL CARBAZOLE COPOLYMERS AND PROCESS FOR PREPARING SAME

James E. Mulvaney, Tucson, Ariz., and Raymond W. Rupp, Greenville, S.C., assignors to The Sherwin-Williams Company, Cleveland, Ohio

Filed Feb. 11, 1977, Ser. No. 768,008
Int. Cl.[2] G03G 5/04, 5/07
U.S. Cl. 96—1.5 R **4 Claims**

1. A photoconductive N-vinyl carbazole copolymer having electron donor and electron acceptor groups in the same polymer chain characterized by a repeat unit of the formula:



wherein x has a value of at least two.

4,076,527

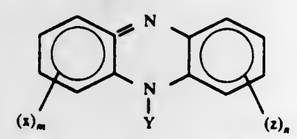
PHOTOSENSITIVE COMPOSITION USEFUL IN PHOTOELECTROPHORETIC IMAGING

Richard H. Nealy, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 26, 1976, Ser. No. 735,355
Int. Cl.[2] G03G 5/04, 16/00
U.S. Cl. 96—1 PE **8 Claims**

1. A photosensitive composition containing at least about 0.01 weight percent vanadyl phthalocyanine pigment dispersed in an insulating carrier liquid, and in at least partial association with said pigment

i. from about 0.01 to about 10 weight percent of a desensitizing dye of the formula



wherein X and Z are independently defined as members selected from the group consisting of $-NH_2$ and $-NHR$ in which R is defined as a phenyl or phenylsulfonate substituent;

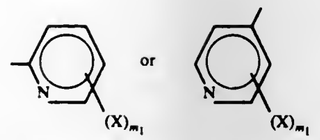
Y is defined as a phenyl group; and

m and n are individually defined as integers of 0–2, either m or n being defined as at least 1; **and**

ii. about 1 to about 5 weight percent or a mixture of polymeric materials containing from about 20 to about 80 weight percent of at least one polymer having repeating structural units of the formula



wherein Z is defined as a group of the formulae

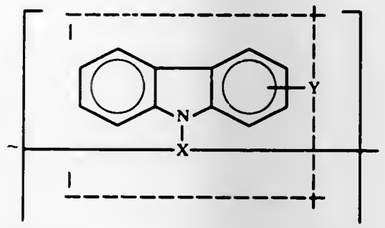


in which X is a substituent substantially incapable of withdrawing electrons from the pyridinyl moiety;

m_1 is a whole number from 0–3;

n_1 is a whole number in excess of 25;

and from about 20 to 80 weight percent of at least one polymer having structural units of the formula



wherein X is vinyl, alpha-alkyl-substituted vinyl, or alkyl of 1 to 4 carbon atoms; and

Y is vinyl, alpha alkyl-substituted vinyl or an alkyl of 1 to 4 carbon atoms, only one of either X or Y being defined as a vinyl or alpha alkyl-substituted vinyl group per structural unit.

4,076,528

XEROGRAPHIC BINDER PLATE

Lloyd F. Bean, Rochester, and Robert W. Gundlach, Victor, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 350,667, May 12, 1973, abandoned, which is a continuation-in-part of Ser. No. 94,072, Dec. 1, 1970, abandoned. This application Apr. 14, 1975, Ser. No. 567,956
Int. Cl.[2] G03G 5/02, 5/06
U.S. Cl. 96—105 R **9 Claims**

1. A photoconductive layer having improved recycling properties for use in a recycling xerographic process, said layer having a mixture of at least two photoconductive pigments dispersed in a binder, said photoconductive pigments being present in a combined concentration of up to about 15 parts by weight based on 100 parts by weight of a binder, the improvement which comprises one of said photoconductive pigments consisting essentially of cadmium sulfoselenide in a concentration of about $\frac{1}{4}$ to 5 parts by weight based on 100 parts by weight of said binder, said photoconductive pigments being present as particles, said mixture of photoconductive pigments being capable of generating and injecting holes and electrons in response to imagewise radiation of not greater than about 5×10^{14} photons/cm^2, said binder being selected from the group consisting of a vinylchloride-vinylacetate copolymer sensitized with 2,5-bis(p-N,-dimethylaminophenyl)-1,3,4-oxadiazole; a polycarbonate resin sensitized with 2,4,7-trinitro-9-fluorenone, and polyvinylcarbazole sensitized with 2,4,7-trinitro-9-fluorenone, said binder being capable of transporting holes and electrons during exposure to said imagewise radiation but being incapable of generating holes and electrons sufficient to contribute substantially to formation of an electrostatic image during said imagewise exposure, said binder being capable of generating and transporting holes and electrons during exposure to wavelengths of radiation to which said binder is sensitive at an illumination level of more than about 5×10^{15} photons/cm^2 at substantially zero electrical field to cause discharging of said photoconductive layer sufficiently to allow recycling of said photoconductive layer in a recycling xerographic process.

4,076,529

PHOTOGRAPHIC DIFFUSION TRANSFER FILMS, PROCESSES AND COMPOSITIONS WITH COLOR MOIETY RELEASING COMPOUND

Lee J. Fleckenstein, and John Figueras, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 282,796, Aug. 22, 1972, abandoned, which is a continuation-in-part of Ser. No. 176,751, Aug. 31, 1971, abandoned. This application Apr. 16, 1973, Ser. No. 351,673
Int. Cl. G03c 7/00, 5/54, 1/40, 1/10
U.S. Cl. 96—3 **53 Claims**

27. A process for producing a photographic transfer image in color comprising:

(a) imagewise-exposing a photosensitive element comprising a support having thereon a red-sensitive silver halide emulsion layer having associated therewith a cyan dye image-providing material, a green-sensitive silver halide emulsion layer having associated therewith a magenta dye image-providing material, and a blue-sensitive silver halide emulsion layer having associated therewith a yellow dye image-providing material, at least one of said dye image-providing materials being a *p*-sulfonamidoaniline or *p*-sulfonamidophenol compound having a diffusible color-providing moiety attached thereto through the sulfonamido group of said compound to the aniline or phenol moiety of said compound, said aniline or phenol moiety having a ballast group of such molecular size and configuration as to render said compound substantially nondiffusible during processing in an alkaline processing composition at a pH in excess of 11, said compound being alkali-cleavable upon oxidation to release said color-providing moiety from said aniline or phenol moiety;

(b) superposing over the layer outermost from the support of said photosensitive element a dye image-receiving layer coated on a support;

(c) Inserting an alkaline processing composition comprising a silver halide developing agent between said exposed photosensitive element and said dye image-receiving layer;

(i) thereby effecting development of each of said exposed silver halide developing agent;

(ii) said oxidized developing agent cross-oxidizing said sulfonamido compound;

(iii) said sulfonamido compound then cleaving, thus forming an imagewise distribution of diffusible color-providing moiety as a function of said imagewise exposure of each of said silver halide emulsion layers; and

(iv) at least a portion of said imagewise distribution or diffusible color-providing moiety diffusing to said image-receiving layer to provide an image; and

(d) separating said photosensitive element from said dye image-receiving layer coated on its said support.

4,076,530

DRY PHOTOGRAPHIC COPYING METHOD FOR PRODUCING TE IMAGES

Keiji Takeda; Kenji Matsumoto; Hiroshi Tamura; Masayoshi Nagata, and Masayoshi Tsuboi, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed May 5, 1976, Ser. No. 683,606
Claims priority, application Japan, May 7, 1975, 50-55074
Int. Cl.[2] G03C 5/54, 5/24, 1/48
U.S. Cl. 96—29 R **16 Claims**

1. A method for producing a image comprising image-wise exposing a light-sensitive layer containing an image-forming reducing agent which reducing agent will be transferred to an image-receiving layer upon heating to 80 to 200° C at non-exposed areas and which is changed to a non-transferable conipound at exposed areas, contacting said light-sensitive layer with said image-receiving layer containing an organic tellurium compound which can form a color image upon reaction with said image forming reducing agent, and heating said light-sensitive layer to transfer said image-forming reducing agent to said image-receiving layer at non-exposed areas, wherein said image-receiving layer comprises an organic tellurium compound and a binder formed on a support, said organic tellurium compound being reduced to Te during said method by transferred image-forming reducing agent from said non-exposed areas and wherein said organic tellurium compound is one which, when a mixture of the organic tellurium compound and the light-sensitive image-forming reducing agent is heated at 110–150° C, the mixture becomes dark.

4,076,531

IMAGE ANCHORAGE IN PHOTOGRAPHIC FILMS

Richard T. Crowell, Towanda, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 30, 1975, Ser. No. 600,369
Int. Cl.[2] G03C 5/00, 5/30, 1/76, 1/84
U.S. Cl. 96—35 **17 Claims**

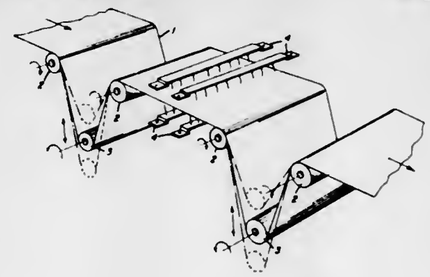
1. A photosensitive drafting film comprising a polymeric film support bearing, in order, (1) a polymeric subbing layer, (2) an acrylic polymer layer, (3) a layer comprising gelatin and a surfactant, (4) an antihalation layer comprising gelatin and an actinic radiation-absorbing material, and (5) a wash-off gelatino-silver halide emulsion layer, at least one of said layers on said support containing a compound selected from the group consisting of cyclohexylamine, cyclohexane carbamic acid cyclohexylammonium salt, cyclohexylformamide, cyclohexyl-1,3-propanediamine, 3-cyclohexylamine-1-propane sulfonic acid, and cyclohexyl sulfamic acid.

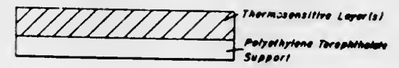
4,076,532

THERMOSENSITIVE IMAGE-FORMING ELEMENT AND METHOD OF PROCESSING THEREOF

William F. Gottermeier, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 16, 1976, Ser. No. 649,604
Int. Cl.[2] G03C 5/24, 1/78
U.S. Cl. 96—48 HD **14 Claims**





1. In a process for forming a visible image in a thermosensitive element comprising at least one thermosensitive image-forming layer and a biaxially-oriented, heatset polyethylene terephthalate film support by (1) heating said element at a processing temperature of at least 100° but not greater than 230° C while maintaining said support under tension in the range from about 50 psi to about 600 psi in its longitudinal dimension and unrestrained in its transverse dimension, and (2) thereafter cooling said element to below 100° C, the improvement wherein said support is one which expands from about 0.1 percent to about 1.3 percent in said transverse dimension and shrinks from about 0.2 percent to about 3.3 percent in said longitudinal dimension when it is subjected to heating in an unrestrained state for 6 seconds at said processing temperature,

and thereafter cooled to below 100° C, whereby necking of said element in its transverse dimension during said processing is reduced.

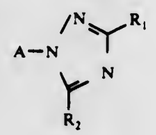
8. A thermosensitive image-forming element which exhibits reduced tendency toward necking upon heat processing under unidimensional tension in its longitudinal dimension, said element comprising (1) a biaxially-oriented, heatset polyethylene terephthalate film support which expands from about 0.1 percent to about 1.3 percent in its transverse dimension and shrinks from about 0.2 percent to about 3.3 percent in its longitudinal dimension upon being heated in an unrestrained state for 6 seconds at a temperature which is at least 100° but which does not exceed 230° C, and thereafter cooled to below 100° C, and (2) at least one thermosensitive image-forming layer.

4,076,533
SILVER HALIDE EMULSION CONTAINING TWO-EQUIVALENT COUPLER

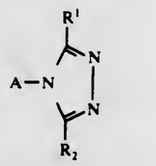
Satoshi Ota; Kotaro Nakamura; Nobuo Sakai; Nobuo Furutachi, and Yukio Yokota, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 10, 1976, Ser. No. 740,449
Claims priority, application Japan, Nov. 10, 1975, 50-135310
Int. Cl.² G03C *7/00, 1/40*
U.S. Cl. 96—56.5 **13 Claims**

1. A photographic silver halide emulsion containing a photographic coupler represented by the following general formula (I) or (II):



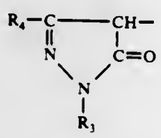
(I)



(II)

wherein

R_1 and R_2, which may be the same or different, each represents a hydrogen atom, an alkyl group, an aryl group, an aralkyl group, a heterocyclic group, an amino group, an alkylamino group, an acylamino group, a sulfonamido group, a ureido group, a thioureido group, a urethane group, a thiourethane group, a carbamoyl group, a thiocarbamoyl group, an alkoxycarbonyl group, an aryloxycarbonyl group, a carboxy group, an alkylcarbonyl group or an arylcarbonyl group and A represents a magenta coupler residue of the following general formula (III):



wherein

R_3 has up to 40 carbon atoms and is selected from the group consisting of a straight chain or branched chain alkyl group, an alkenyl group, a cycloalkyl group, an aralkyl group and a cycloalkenyl group, in which each of these groups can be substituted with one or more of a halogen atom, a nitro group, a cyano group, an aryl group, an alkoxy group, an aryloxy group, a carboxy group, an alkylthiocarbonyl group, an arylthiocarbonyl group, an alkoxycarbonyl group, an aryloxycarbonyl group, a sulfo group, a sulfamoyl group, a carbamoyl group, an acylamino group, a diacylamino group, a ureido group, a urethane group, a thiourethane group, a sulfonamido group, a heterocyclic group, an arylsulfonyl group, an alkylsulfonyl group, an arylthio group, an alkylthio group, an alkylamino group, a dialkylamino group, an anilino group, an N-arylanilino group, an N-alkylanilino group, an N-acylanilino group, a hydroxy group or a mercapto group; an unsubstituted aryl group, an aryl group substituted with one or more of a halogen atom, an alkyl group, an alkenyl group, a cycloalkyl group, an aralkyl group, a cycloalkenyl group, a nitro group, a cyano group, an aryl group, an alkoxy group, an aryloxy group, a carboxy group, an alkoxycarbonyl group, an aryloxycarbonyl group, a sulfo group, a sulfamoyl group, a carbamoyl group, an acylamino group, a diacylamino group, a ureido group, a urethane group, a sulfonamido group, a heterocyclic group, an arylsulfonyl group, an alkylsulfonyl group, an arylthio group, an alkylthio group, an alkylamino group, a dialkylamino group, an anilino group, an N-alkylanilino group, an N-arylanilino group, an N-acylanilino group, a hydroxy group and a mercapto group; an unsubstituted heterocyclic group, a heterocyclic group substituted with one or more of the substituents above described for the aryl group; an aliphatic or aromatic acyl group; an alkylsulfonyl group; an arylsulfonyl group; an alkylcarbamoyl group; an arylcarbamoyl group; an alkylthiocarbamoyl group; or an aryl thiocarbamoyl group;

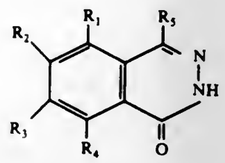
R_4 has up to 40 carbon atoms and is selected from the group consisting of a hydrogen atom, a straight chain or branched chain alkyl group, an alkenyl group, a cycloalkyl group, an aralkyl group, a cycloalkenyl group, an aryl group, a heterocyclic group, in which each of these groups can be substituted with one or more of the substituents above described for R_3; an alkoxycarbonyl group, an aryloxycarbonyl group, an aralkyloxycarbonyl group, an alkoxy group, an aryloxy group, an alkylthio group, an arylthio group, a carboxy group, an acylamino group, a diacylamino group, an N-alkylacylamino group, an N-arylacylamino group, a ureido group, a urethane group, a thiourethane group, an arylamino group, an alkylamino group, a cycloamino group, a heterocyclic amino group, an alkylcarbonyl group, an arylcarbonyl group, a sulfonamido group, a carbamoyl group, a sulfamoyl group, a cyano group, a hydroxy group, a mercapto group, a halogen atom or a sulfo group.

4,076,534
HEAT DEVELOPABLE LIGHT-SENSITIVE MATERIAL

Yasuhiro Noguchi; Nobuyoshi Sekikawa; Kenji Sashihara, and Takao Masuda, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 515,375, Nov. 16, 1974, abandoned. This application Jul. 26, 1976, Ser. No. 708,450
Claims priority, application Japan, Nov. 16, 1973, 48-116022; Nov. 17, 1973, 48-116471
Int. Cl.² G03C *5/24, 1/06, 1/02*
U.S. Cl. 96—63 **11 Claims**

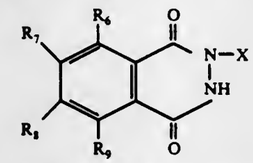
1. A process for forming images, which comprises imagewise exposing a light-sensitive material comprising a support having thereon at least one light-sensitive layer containing (1) an oxidation-reduction image-forming combination comprising (a) a silver salt oxidizing agent and (b) a reducing agent for said silver salt oxidizing agent (a) and (2) a catalytic amount of a light-sensitive silver halide or a compund capable of reacting with the silver salt oxidizing agent (a) to form a light-sensitive silver halide, the light-senstive layer further containing (3) at least one of a phthalazinone compound of the general formula (I)



(I)

wherein R_1, R_2, R_3 and R_4 each represents a hydrogen atom, an alkyl group, an alkoxy group, a nitro group, an amino group or a hydroxyl group; R_5 represents a hydrogen atom, a halogen atom, an alkyl group, an aryl group, a substituted alkyl group, a substituted aryl group, a benzylidenehydrazino group, a pyridyl group, a vinyl group or a 2-substituted vinyl group; and R_1, R_2, R_3, R_4 and R_5 are not all simultaneously hydrogen atoms, and

a 2,3-dihydro-9,4-phthalazinedione compound of the general formula (II)



(II)

wherein R_6, R_7, R_8 and R_9 each represents a hydrogen atom, a halogen atom, a hydroxyl group, an alkyl group, an aryl group, an amino group, an alkylamino group, a nitro group, an alkoxy group, an alkylthio group or an acylamido group; and X represents a hydrogen atom, an aryl group, a pyridyl group, a 2-(2-pyridyl)-ethyl group, a 2-(4-pyridyl)ethyl group, a benzoyl group or a methyl group, and then heating the exposed material at a temperature of about 90° to about 180° C for a period for about 1 to 60 seconds.

4,076,535
METHOD OF PREPARING SCREENS FOR SCREEN PRINTING

Paul R. Vander Putten, Brussels, Belgium, assignor to Carnation Company, Los Angeles, Calif.

Continuation of Ser. No. 421,369, Dec. 3, 1973, abandoned. This application Aug. 7, 1975, Ser. No. 602,861
Int. Cl.² G03C *1/76*
U.S. Cl. 96—67 **6 Claims**

1. A method of preparing screens for use in screen process printing which comprises

applying a photosensitive liquid emulsion to a prestretched screen fabric so that the emulsion fills the mesh of the screen fabric and forms a layer of substantially uniform thickness on the outer surface of the screen fabric,

placing the liquid emulsion layer in line contact across the width of the layer with the end portion of a film of dry emulsion carried on a flexible backing sheet,

maintaining said line contact while drawing the liquid emulsion layer downwardly against the dry emulsion film until the entire surface of the dry emulsion film is in contact with and wetted by the liquid emulsion, and

drying the emulsion whereby the emulsion layer and emulsion film are coalesced into a unitary photosensitive emulsion layer having the screen fabric embedded therein.

4,076,536
DRY PHOTOPOLYMER IMAGING ARTICLE HAVING A DIAZONIUM SALT AND EPOXIDE COPOLYMER

Sheldon Irwin Schlesinger, East Windsor Township, Mercer County, and Ronald J. Boszak, Trenton, both of N.J., assignors to American Can Company, Greenwich, Conn.

Division of Ser. No. 486,169, Jul. 5, 1976, Pat. No. 3,997,344. This application May 26, 1976, Ser. No. 690,310
Int. Cl.² G03C *1/54, 1/70, 1/94*
U.S. Cl. 96—75 **7 Claims**

1. A presensitized plate capable of being imaged comprising a substrate having applied to at least one surface thereof, a composition comprising (1.) (a) a copolymer of glycidyl acrylate and allyl glycidyl ether of (b) a terpolymer of glycidyl acrylate, glycidyl methacrylate and allyl glycidyl ether containing up to about 0.25 mole of glycidyl methacrylate per mole of glycidyl acrylate, said copolymers and terpolymers having an inherent viscosity of from about 0.09 to about 0.28; an epoxide equivalent of at least about 0.64 per 100 **grams of polymer and being substantially non-tacky at room temperature, tacky at elevated temperature and convertible to a non-tacky condition upon exposure to irradiation and**

(2.) a radiation-sensitive aryl diazonium salt of a complex halogenide which decomposes upon exposure to irradiation to release a Lewis Acid effective to initiate polymerization of said copolymer or terpolymer, said radiation-sensitive salt being present in an amount sufficient to effect polymerization of said polymerizable material,

the surface of said coated substrate being non-tacky at room temperature.

4,076,537
LIGHT-SENSITIVE MATERIALS CONTAINING ORGANO TELLURIUM OR SELENIUM COMPOUNDS AND SENSITIZERS

Masayoshi Tsuboi, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jan. 2, 1976, Ser. No. 646,109
Int. Cl.² G03C *1/00, 1/52, 1/64*
U.S. Cl. 96—88 **15 Claims**

1. A light-sensitive material comprising a layer (A) containing:

(a) at least one organic compound containing tellurium or and/or selenium selected from the group consisting of

(i) an elemental compound in which tellurium or selenium is connected, directly or through a nitrogen or oxygen atom, to a carbom atom constituting a part of an organic group through a chemical bond, and which is capable of liberating tellurium or selenium on exposure and heating wherein said organic group is selected from the group consisting of (I) Ar-$COCH_2$-, (II) Ar-CH_2- and(III) R-$COCH_2$-, wherein Ar is an aryl group and R is an alkyl group or an aliphatic hydrocarbon group containing a carbonyl group; or

(ii) a tellurium or selenium complex composed of tellurium halide or selenium halide and an organic base group; and

(b) at least one sensitizing compound selected from the group consisting of the oxides, basic halides, halides, sulfates, nitrates, perchlorates, and organic acid salts of In (III), Sb (III), Ti (IV), Zn (II), Bi (III), Ge (IV), and Sn (IV); and further comprising in said layer (A) or in a layer (B) adjacent thereto,

(c) at least one light-sensitizing agent selected from the group consisting of a quinone compound, an aryl ketone compound, a tetracyanoquinodimethane, a benzene or naphthalene substituted with a hydroxy group or an alkoxy group having 1 to 7 carbon atoms, an arylamine compound, a diazonium salt, a metal acetoacetonate or a salt of Fe, Co, Ni, Zr or Mo with a mono- or di-basic organic acid having 1 to 4 carbon atoms, ferricyanic acid or a halogen

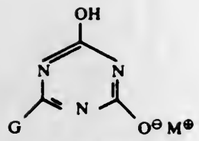
wherein component (b) is present in an amount of about 0.5 to about 50 parts by weight per 100 parts by weight of component (a) and component (c) is present in an amount of about 0.1 to about 100 parts by weight per 100 parts by weight of component (a).

4,076,538
PROCESS FOR CROSSLINKING HYDROPHILIC COLLOIDS WITH TRIAZINE COMPOUNDS

Norman Alfred Smith, Ilford, England, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Nov. 13, 1975, Ser. No. 631,566
Claims priority, application United Kingdom, Dec. 3, 1974, 52241/74
Int. Cl.² C09H *7/00*
U.S. Cl. 96—111 **11 Claims**

1. A process for cross-linking hydrophilic colloids which contain amino and/or hydroxyl groups, which comprises incorporating into the hydrophilic colloid as a cross-linking agent a compound of the formula



wherein G is a halogen atom and M is a cation.

4. A process according to claim 1 wherein the hydrophilic colloid is polyvinyl alcohol, gelatin or a gelatin derivative.

4,076,539

PROCESS FOR PREPARING SILVER HALIDE DISPERSIONS

Shinpei Ikenoue, and Takao Masuda, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 491,006, July 23, 1974, abandoned. This application Jun. 7, 1976, Ser. No. 693,670
Claims priority, application Japan, Jul. 23, 1973, 48-82851
Int. Cl.² G03C *1/38, 1/02*
U.S. Cl. 96—114.5 **21 Claims**

1. A process for preparing silver halide dispersion in the absence of a binder as a protective colloid which comprises reacting an aqueous solution of a compound capable of releasing halogen ions with an aqueous solution of a compound capable of releasing silver ions wherein said compound capable of releasing silver salt having a solubility of higher than about 0.2g/100g. H_2O at 20° C. to form a silver halide product wherein a surface active agent is present in the reaction mixture and wherein an organic solvent sightly soluble in water is added to one of said two solutions before said reaction or to the reaction mixture during said reaction or after said reaction wherein said organic solvent slightly soluble in water has a solubility of 10 parts or less per 100 parts of water at 20° C.

4,076,540

FIRE EXTINGUISHING COMPOSITION

Ernest Stossel, 203 W. 81st St., New York, N.Y. 10024

Filed Dec. 9, 1976, Ser. No. 748,724
Int. Cl.² C09D *5/18*; A62D *1/00*
U.S. Cl. 106—15 FP **17 Claims**

1. A fire extinguishing composition comprising (A) an ionic complex containing in an anionic portion of the molecule complexed nitrogen, phosphorus, oxygen, and aluminum, as evidenced by tests for anoinic nitrogen and aluminum, and having a P:N molar ratio of 10:1 to 2:6, a P:Al molar ratio of 1:1 to 100:1, an acid number less than 400, and a pH in a 2% aqueous solution above 2.5; (B) a boric acid compound selected from the group consisting of orthoboric acid, metaboric acid, and boric anhydride, and (C) urea.

7. A composition of reduced flammability comprising cellulose and a composition according to claim 1.

4,076,541

GLASSES SUITABLE FOR LASER APPLICATION, GLASS LASERS, AND METHOD FOR MAKING SAME

Charles F. Rapp, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 22, 1976, Ser. No. 669,067
Int. Cl.² C03C *3/16, 3/28, 3/30*
U.S. Cl. 106—47 Q **11 Claims**

1. A glass suitable for use as an active laser component and having a composition consisting essentially of

	Mole Percent
P_2O_5	39 - 65
Al_2O_3	4 - 13
K_2O	19 - 36
BaO	3 - 18.5
La_2O_3	O - 3

and a laseable amount of Nd_2O_3 up to 6 mole percent, wherein the total moles of $P_2O_5+Al_2O_3+La_2O_3+Nd_2O_3$ is at least 50 and the transparency of the glass to light of a wavelength of 2.1 microns is at least 0.65 per cm. of thickness.

5. In the method for making a phosphate laser glass having Nd_2O_3 as the active lasing species and having at least 39 mole percent P_2O_5 which comprises melting the batch materials at elevated temperature in an atmosphere containing oxygen gas for a time sufficient to produce a homogeneous glass melt and thereafter cooling the melt to a solid glass, the improvement which comprises maintaining a dry atmosphere containing oxygen gas in contact with the melt during the final stages of melting for a time sufficient to produce a sufficiently dry glass such that the transparency thereof with respect to light of a wavelength of 2.1 microns is at least 0.65 per cm. of thickness.

4,076,542

PROCESS FOR PRODUCING PHOTOCHROMIC SILICATE GLASS FILM CONTAINING SILVER HALIDE PARTICLES

Emil W. Deeg, Woodstock, Conn., and Donald O. Hoffman, Sturbridge, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Jun. 4, 1976, Ser. No. 692,938
Int. Cl.² C03C *21/00*
U.S. Cl. 106—52 **8 Claims**

1. A process for producing photochromic silicate glass films, said process being characterized by the steps of:

1. preparing a light sensitive solution comprising a film forming silicate, silver ions, and a suitable solvent;
2. removing the solvent from said solution to form a silver ion impregnated silicate glass film; and
3. exposing the silicate to the vapors of halogen ions selected from the group consisting of chloride, bromide, iodide, and mixtures thereof to produce photochromic silver halide particles in said film.

4,076,543

GLASS FOR ENCAPSULATION OF DIODES

Pascal Adrien Jean Joly, Avon, and Jean-Claude Alphonse Henri Prat, Maincy, both of France, assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 30, 1977, Ser. No. 782,626
Claims priority, application France, Apr. 9, 1976, 76 10507
Int. Cl.² C03C *3/10*
U.S. Cl. 106—53 **1 Claim**

1. A glass suitable for the encapsulation of germanium or silicon crystal diodes exhibiting a softening point below about 550° C., a mismatch in thermal expansion with Dumet at about 400° C. of no more than about 200 PPM, and a viscosity at the liquidus of at least 20,000 poises consisting essentially, in weight percent on the oxide basis, of about

SiO_2	27-33
K_2O	2-6
PbO	62-70
K_2O + PbO	64-72
B_2O_3	1-4
GeO_2	0-4
SiO_2 + B_2O_3 + GeO_2	27-33
ZnO	0-4
PbO + ZnO	62-70

and being essentially free from Li_2O, Na_2O, Al_2O_3, and TiO_2.

4,076,544

COPPER-CADMIUM-SILVER PHOTOCHROMIC GLASS

David J. Kerko, and Paul A. Tick, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jul. 28, 1976, Ser. No. 709,320
Int. Cl.² C03C *3/04, 3/08, 3/26*
U.S. Cl. 106—54 **3 Claims**

1. A photochromic glass article comprising a body of a silicate glass having in at least a portion thereof a separated photochromic phase including second phase droplets 300–100A in size containing third phase particles 20–50A in size, said separated phase containing copper, cadmium, silver, and at least one halogen selected from the group consisting of chlorine, bromine and iodine, said silicate glass having a composition which comprises, in weight percent as calculated from the batch, about 40–75% SiO_2, 4–26% Al_2O_3, 4–26% B_2O_3, 2–30% total of alkali metal oxides selected in amounts not exceeding the indicated proportions from the group consisting of up to 8% Li_2O, up to 15% Na_2O, up to 20% K_2O, up to 25% Rb_2O, and up to 30% Cs_2O, at least about 0.01% Ag, 0.03% CuO, 0.4% CdO, and 0.3% total of halogens selected from the group consisting of chlorine, bromine and iodine, and said glass exhibiting an absorption inflection at 370 nm and both optical bleaching and surface darkening properties.

2. A composition for a photochromic glass consisting essentially, in weight percent on the oxide basis, as calculated from the batch of about 40–75% SiO_2, 4–26% Al_2O_3, 4–26% B_2O_3, 2–30% total of alkali metal oxides selected in amounts not exceeding the indicated proportions from the group consisting of up to 8% Li_2O, up to 15% Na_2O, up to 20% K_2O, up to 25% Rb_2O and up to 30% Cs_2O, 0.03–0.7% CuO, 0.4–5% CdO, 0.03–0.7% Ag, 0–2% F, and 0.3–3% total of halogens selected from the group consisting of Cl, Br and I.

4,076,545

PROCESS OF PRODUCING CALCIUM ALUMINATE MONOSULFATE HYDRATE

Tomisaburo Azuma; Kazuto Ichimaru; Kouichi Tateno, and Takeru Murakami, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Kadoma, Japan

Filed Nov. 17, 1975, Ser. No. 632,596
Claims priority, application Japan, Nov. 15, 1974, 49-132187
Int. Cl.² C01B *17/96*
U.S. Cl. 423—544 **11 Claims**

1. A process of producing calcium aluminate monosulfate hydrate which consists essentially of reacting a mixture of a lime component, an alumina component selected from the group consisting of alumina, hydrated alumina, activated alumina, and aluminum hydroxide, a calcium sulfate component, and water at temperatures of 100°–200° C.

4,076,546

METHOD FOR PRODUCTION OF EXPANSIVE CEMENT

Yurdan Todorov Simeonov, and Nikola Borissov Djabarov, both of Sofia, Bulgaria, assignors to Centralna Laboratoria Po Physiko-Chimicheska Mechanika pri Ban, Sofia, Bulgaria

Filed Dec. 17, 1976, Ser. No. 751,864
Claims priority, application Bulgaria, Dec. 30, 1975, 31971
Int. Cl.² C04B *7/35*
U.S. Cl. 106—89 **2 Claims**

1. A method for expanding cement compositions from portland cement and an expanding additive, which comprises dry mixing portland cement and an expanding additive containing 2 to 8% bialuminium pentachloride hydrate, and 4 to 15% gypsum.

4,076,547

POLYMERIC MOLDING COMPOSITION

David Lester, Arlington, and Robert R. Alexander, Milford, both of Mass., assignors to Polymerics, Inc., Waltham, Mass.

Filed Jun. 10, 1976, Ser. No. 693,023
Int. Cl.² C04B *11/00, 11/24*; C08L *1/08, 1/00*
U.S. Cl. 106—109 **16 Claims**

1. A polymeric molding composition admixed to have a quick initial set time and to have a delayed set time comprising:

a water soluble gel-forming polymeric compound selected from the group consisting of starches, modified starches and modified cellulosics, and having a functional group attached to a molecular unit having the ability to form an alkoxide;

at least one electrolytic salt selected from the group consisting of alkaline earth metal salts to act as an ionic initiator in the formation of said alkoxide and to modify reagent reaction rates;

a water-soluble gel-modifying alcoholic compound selected from the group consisting of diols, triols and other low to high molecular weight alcohols having more than one hydroxyl functional group; and

water to act as a solubilizing medium wherein said composition includes:

35–85 parts gel-forming polymeric compound by weight;

7–19 parts alkaline earth metal electrolytic salts by weight,

70–128 parts gel-modifying alcoholic compound by weight; and

140–210 parts water by weight.

4,076,548

HIGH BULKING CLAY PIGMENTS AND METHOD OF MAKING THE SAME

Wayne M. Bundy, Westfield; Joseph P. Berberich, Barnegat, and David Sastre, Elizabeth, all of N.J., assignors to Yara Engineering Corporation, Elizabeth, N.J.

Continuation-in-part of Ser. No. 591,851, Jun. 30, 1975. This application Dec. 27, 1976, Ser. No. 754,905
Int. Cl.² C04B *31/26*
U.S. Cl. 106—288 B **7 Claims**

1. A method of improving the opacity of kaolinite comprising the steps of:

a. selectively flocculating a kaolinite in the presence of an effective amount of fine mica below 150 mesh in size to cause voids to occur between the particles of kaolinite to recover a mixture of ultrafine particle clay and mica mixture, and

b. collecting and drying the selectively flocculated ultrafine kaolinite and mica mixture as a high bulking dry pigment material.

4,076,549

AMORPHOUS PRECIPITATED SILICEOUS PIGMENTS FOR COSMETIC OR DENTIFRICE USE AND METHODS FOR THEIR PREPARATION

Satish K. Wason, Havre de Grace, Md., assignor to J. M. Huber Corporation, Locust, N.J.

Division of Ser. No. 285,966, Sept. 5, 1972, Pat. No. 3,928,541. This application Feb. 18, 1975, Ser. No. 550,325
Int. Cl.² C09C *1/28*
U.S. Cl. 106—288 B **7 Claims**

1. A method for producing amorphous, precipitated silicas which exhibit a low wet cake moisture content of less than 70%, and are characterized by their low structure, oil absorption of less than 125 cc/100 gm, valley abrasions of greater than 5 milligrams wire loss, and pack density of greater than 12 lb./cu.ft., said method comprising the steps of: providing an aqueous solution of an alkali metal silicate selected from the group consisting of sodium silicate, potassium silicate and lithium silicate, said silicate solution having a concentration of from 1.0 to about 2.5 lbs./gal., contacting the said silicate solution with an electrolyte salt of an alkali or alkaline earth metal to prepolymerize said silicate solution and to otherwise affect the size of the silica micelles such that they attach themselves to form particles and aggregates to thereby form a pre-polymerized reaction product having a silicon dioxide to alkaline metal dioxide molar ratio of about 2.3 to 2.7; introducing about one-half to about two-thirds of said pre-polymerized silicate solution to a stirred reaction vessel and heating to a temperature of about 100–200° F.; acidulating said pre-polymerized silicate solution in said reaction vessel by adding thereto a mineral acid, said acid being the same acid used to form said electrolyte salt, while simultaneously adding the remaining portion of the silicate solution therewith; continuing said addition of said acid and said silicate solution simultaneously to said reaction vessel in a manner such that a substantially constant pH of said reaction mass is maintained until the precipitation of said precipitated silica is substantially complete, continuing said acid addition to a final pH of from about 5.5 to 6.5, and recovering the precipitated silicas.

4,076,550
REINFORCING ADDITIVE

Friedrich Thurn, Bruhl; Kurt Burmester, Overath-Steinenbruck; Johannes Pochert, Walberberg, and Siegfried Wolff, Bruhl, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Division of Ser. No. 529,568, Dec. 4, 1975, Pat. No. 3,997,356, which is a division of Ser. No. 415,176, Nov. 12, 1973, Pat. No. 3,873,489, which is a continuation-in-part of Ser. No. 277,043, Aug. 1, 1972, Pat. No. 3,842,111. This application May 26, 1976, Ser. No. 690,150

Claims priority, application Germany, Aug. 17, 1971, 2141159; Aug. 17, 1971, 2141160; Mar. 14, 1972, 2212239

The portion of the term of this patent subsequent to Dec. 14, 1993, has been disclaimed.

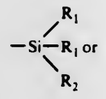
Int. Cl.² C09C *1/28*

U.S. Cl. 106—288 Q **15 Claims**

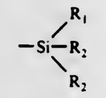
1. A composition comprising (a) 0.1 to 50 parts of an organosilane compound having the formula

$$Z - alk - S_n - alk - Z,$$

in which Z is



(1)



(2)

wherein R_1 is alkyl of 1 to 4 carbon atoms, cyclohexyl or phenyl and R_2 is alkoxy of 2 to 8 carbon atoms, cycloalkoxy with 5 to 8 carbon atoms or alkylmercapto with 1 to 8 carbon atoms, alk is a divalent hydrocarbon of 1 to 18 carbon atoms and n is a number of 2 to 6, and (b) 10 to 250 parts of a siliceous filler.

4,076,551
CARBON BLACK-CONTAINING PIGMENTS AND PROCESS FOR THEIR PREPARATION

Horst Bernhard, and Reiner Esselborn, Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed Dec. 10, 1976, Ser. No. 749,245

Claims priority, application Germany, Dec. 22, 1975, 2557796

Int. Cl.² C09C *1/00*

U.S. Cl. 106—291 **14 Claims**

1. In a particulate pigment comprising a substrate coated with a pigmentaceous coating which includes an amount of carbon black of between 0.1 and 25% by weight of the pigment, the improvement wherein the carbon black is embedded in a precipitated layer on the substrate of a pigmentaceous metal hydroxide or metal oxide or of bismuth oxychloride.

4,076,552
PROCESS FOR DECOLORIZING SUGAR SOLUTIONS WITH PEROXIDE

Souly Atalla Farag, and Lloyd Wendell Norman, both of Moses Lake, Wash., assignors to U and I Incorporated, Salt Lake City, Utah

Filed Aug. 24, 1976, Ser. No. 717,154

Int. Cl.² C13D *3/06, 3/10*

U.S. Cl. 127—50 **7 Claims**

1. A process for recovering sugar from a raw sugar-containing juice extracted from sugar-containing plant material, comprising adding lime, slaked lime, milk of lime, or saccharate milk to the juice; adding from about 0.01 to 0.4 percent by weight of peroxide selected from the group consisting of alkali metal peroxides and hydrogen peroxide to the juice; contacting the juice with sufficient carbon dioxide so that the pH of the juice is about 10.4 or greater, said addition of peroxide being made either prior to or simultaneously with the contacting of the juice with carbon dioxide; filtering the juice to remove precipitated calcium carbonate, together with colored matter, and color precursors, therefrom; treating the filtered juice with SO_2; concentrating the so treated juice by evaporation; and crystallizing sugar solids from the concentrated juice, whereby the sugar-containing juice is decolorized and rendered thermally stable relative to further color formation, and the viscosity and the bacterial content of the juice are reduced.

4,076,553
SPILL CONTROL COMPOSITION AND USE THEREOF

James W. Seidenberger, Bethlehem, Pa., assignor to J. T. Baker Chemical Company, Phillipsburg, N.J.

Filed Jan. 24, 1977, Ser. No. 761,888

Int. Cl.² B01J *23/06, 23/80;* **B08B** *7/00;* **B01J** *35/02*

U.S. Cl. 134—6 **9 Claims**

1. Metal wool plated with 0.5% by weight or more of zinc.

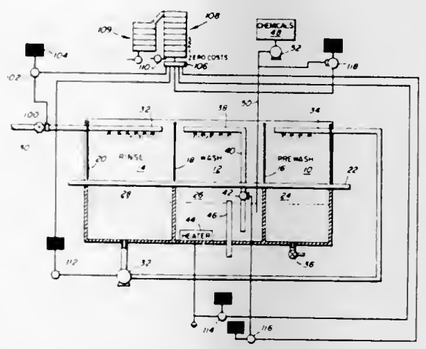
4,076,554
APPARATUS AND METHOD FOR DISPLAYING THE COST OF OPERATION OF A COMMERCIAL DISHWASHING MACHINE

Clyde R. Weibe, 17 Lindbergh Ave., Needham, Mass. 02192

Filed Nov. 1, 1976, Ser. No. 737,348

Int. Cl.² B08B *3/02*

U.S. Cl. 134—10 **9 Claims**



8. A method for monitoring the amount of costs attendant with a dishwashing operation where there is at least a wash step and a rinse step wherein articles to be cleaned are sequentially washed and rinsed in a wash zone and a rinse zone respectively, and pumps and valves provide for the movement of liquids through nozzles to effect the washing and rinsing of the articles, which method includes:

placing articles to be cleaned in a wash zone;

introducing water and chemicals into the wash zone;

contacting the articles to be cleaned with the water and chemicals;

measuring the cost of water and chemicals used to clean the articles;

providing a first liquid volumetric output corresponding to the cost of said water and chemicals;

transporting the articles from the wash zone to the rinse zone;

providing rinse water at a predetermined temperature to rinse said articles;

contacting the articles to be rinsed with the rinse water;

providing a second liquid volumetric output corresponding to the cost of the water used to rinse the articles, the basis of the cost of the water used in the rinse zone being identical to the basis of the cost of the water and chemicals used in the wash zone;

combining the first and second liquid volumetric outputs in a common receptacle; and

displaying visually the combined volume to reflect the total cost.

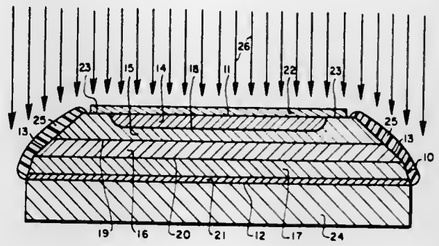
4,076,555
IRRADIATION FOR RAPID TURN-OFF REVERSE BLOCKING DIODE THYRISTOR

Chang K. Chu; John Bartko, both of Pittsburgh, and Patrick E. Felice, Jeannette, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 17, 1976, Ser. No. 686,857

Int. Cl.² H01L *21/263*

U.S. Cl. 148—1.5 **5 Claims**



1. A method of decreasing the turn-off time of a reverse blocking diode thyristor without significantly affecting other electrical characteristics comprising the steps of:

A. positioning a reverse blocking diode thyristor semiconductor body with a major surface thereof to be exposed to a radiation source; and

B. thereafter irradiating the reverse blocking diode thyristor semiconductor body with the radiation source to a dosage corresponding to between about 4×10^{13} and 2×10^{14} electrons/cm² with 2 MeV electron radiation.

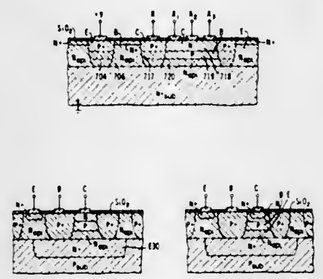
4,076,556
METHOD FOR FABRICATION OF IMPROVED BIPOLAR INJECTION LOGIC CIRCUIT

Jorge Agraz-Guerena, Puebla, Mexico, and Alan William Fulton, Batavia, Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 502,674, Sep. 3, 1974. This application Jun. 1, 1976, Ser. No. 691,594

Int. Cl.² H01L *21/265, 27/02*

U.S. Cl. 148—1.5 **6 Claims**



1. A method of manufacture of integrated semiconductor devices comprising the following steps which are performed in the stated order on a chip which comprises an epitaxial layer of one conductivity type overlying a substrate of the same conductivity type and having higher conductivity than said epitaxial layer:

a. By diffusion forming in the epitaxial layer a region of the opposite conductivity type extending through the epitaxial layer to the substrate and shaped to encircle a selected region of the epitaxial layer;

b. Implanting within said selected region a region of the said opposite conductivity type between, but spaced apart from, the surfaces of said epitaxial layer and extending only to said encircling region thereby forming in each encircled region a vertical three-element semiconductor device;

c. Forming for each encircled region a corresponding metallized contact at the exposed surface of the epitaxial layer and overlying a part of the corresponding encircled region.

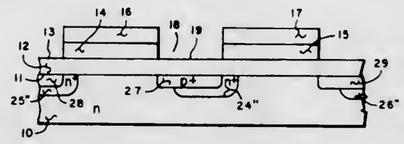
4,076,557
METHOD FOR PROVIDING SEMICONDUCTOR DEVICES

Jack S. T. Huang, New Hope, Minn., and Susumu Kohyama, Kawasaki, Japan, assignors to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 19, 1976, Ser. No. 715,737

Int. Cl.² H01L *21/26*

U.S. Cl. 148—1.5 **12 Claims**



1. A method for constructing a self-aligned conductively connected charge-coupled device through use of a first semiconductor material layer of a first conductivity type and of a first conductivity, said first semiconductor material layer having an outer major surface with a first insulating layer provided thereon, said first insulating layer having a first insulating layer surface not in contact with said outer major surface, said method comprising:

providing a plurality of sequential, spaced apart electrodes on said first insulating layer surface including first and second electrodes, said first and second electrodes, in being spaced apart as aforesaid, exposing between them a first area of said first insulating layer surface to thereby provide an electroded structure;

providing a first blocking material layer on said electroded structure where said first blocking material layer is capable, as provided and where not opened, of preventing implantation in said first semiconductor material layer of any kinds of ions which are to be implanted in said first semiconductor material layer in a manner set out in any implantation steps following in said method in which said first blocking material layer is present, said first blocking material layer having a first ion implantation opening therein which exposes only a portion of said first area;

implanting ions of a first kind in said first semiconductor material layer, as a first implantation, by impinging said first kind ions on said electroded structure with said first blocking material layer including impinging them through said first ion implantation opening to thereby form a first region in said first semiconductor material layer of a second conductivity type;

enlarging said first region by diffusion to become an enlarged first region of said second conductivity type and of a second conductivity which extends laterally in said first semiconductor material layer to locations therein both beyond projections of said first area in said first semiconductor material layer and within projections in said first

semiconductor material layer of a selected one of said first and second electrodes; and

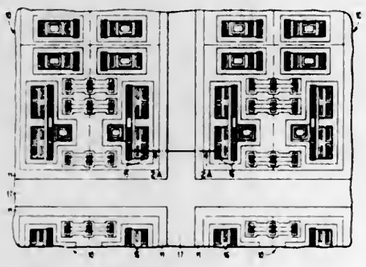
providing a second region in said first semiconductor material layer of a third conductivity type extending laterally in said first semiconductor material layer at least between projections therein of said first and second electrodes.

4,076,558

METHOD OF HIGH CURRENT ION IMPLANTATION AND CHARGE REDUCTION BY SIMULTANEOUS KERF IMPLANT

Hans Stephen Rupprecht, Yorktown Heights, and Robert Otto Schwenker, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 31, 1977, Ser. No. 763,789
Int. Cl.² H01L *21/265, 21/461, 21/425*
U.S. Cl. 148—1.5 **10 Claims**



1. In the fabrication of integrated circuits, a method of ion implantation into wafers of semiconductor material having a plurality of spaced areas which are to be formed into a plurality of integrated circuit chips and a kerf area surrounding and separating said chips, said method comprising:

forming a layer of electrically insulative material over said wafer,

forming a plurality of openings through the insulative layer over said chip areas to expose the semiconductor wafer in said chip area openings,

forming openings through the insulative layer over said kerf area to expose the wafer kerf adjacent to the chip area openings, the total area exposed in the wafer kerf being greater than the total area exposed in said chip area openings,

directing a beam of ions at said wafer having sufficient energy to implant ions in the exposed wafer in said chip area and kerf openings, and

removing the kerf area to separate the wafer into a plurality of chips.

4,076,559

TEMPERATURE GRADIENT ZONE MELTING THROUGH AN OXIDE LAYER

Mike F. Chang, Liverpool; Thomas R. Anthony, and Harvey E. Cline, both of Schenectady, all of N.Y., assignors to General Electric Company, Auburn, N.Y.

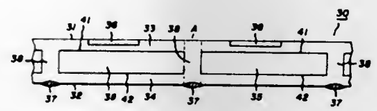
Filed Mar. 18, 1977, Ser. No. 778,859
Int. Cl.² H01L *21/225*
U.S. Cl. 148—1.5 **20 Claims**

1. A method of manufacturing semiconductor devices, said method comprising the steps of:

providing a body of semiconductor material, providing an oxide layer on at least selected portions of at least one surface of said body, the oxide of said oxide layer being selected from the group consisting of silicon oxide and germanium oxide;

selectively depositing an impurity material on said oxide layer; and

exposing said body to an elevated temperature and to a thermal migration temperature gradient through said



body and said oxide layer, whereby said impurity material thermally migrates through said oxide and said body.

4,076,560

WROUGHT COPPER-SILICON BASED ALLOYS WITH ENHANCED ELASTICITY AND METHOD OF PRODUCING SAME

Joseph B. Hoyt, Jr., Bethany, and Eugene Shapiro, Hamden, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Mar. 15, 1976, Ser. No. 666,879
Int. Cl.² C22C *9/10*
U.S. Cl. 148—11.5 C **9 Claims**

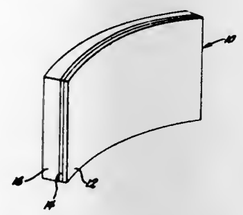
1. A wrought copper base alloy having high fatigue strength and improved elastic properties, said alloy consisting essentially of 4.4 to 5.2 weight percent silicon, 0.1 to 3.0 weight percent zinc, a combination of titanium, zirconium and chromium including titanium, zirconium and chromium, from 0.05 to a total for the three elements of 0.6 weight percent, 0.1 to 2.0 weight percent for a combination of cobalt and iron, balance copper.

4,076,561

METHOD OF MAKING A LAMINATED RARE EARTH METAL-COBALT PERMANENT MAGNET BODY

Robert W. Lee, Troy, and John J. Croat, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 15, 1976, Ser. No. 732,924
Int. Cl.² H01F *1/02*
U.S. Cl. 148—103 **4 Claims**



1. A method of making a laminate permanent magnet body having a rare earth metal-cobalt permanent magnet layer supported on a base layer, said method comprising

forming in a die a first powder layer containing an RCo_5 composition where R denotes a rare earth metal, a second powder layer containing an R_2Co_{17} composition, and a third powder layer of a composition selected from the group consisting of iron and iron-based ferromagnetic alloys,

subjecting the layers to a magnetic field to magnetically orient the rare earth metal-cobalt composition powder,

compressing the distinct layers to form a self-sustaining laminated green compact, and

sintering the compact at a temperature in the range of about 950° to 1200° C. to densify the compact, the thickness of the R_2Co_{17} layer in said compact being at least sufficient to form a continuous layer between the RCo_5 layer and the iron-containing layer.

4,076,562

EXPLOSIVE COMPOSITION WITH ADHERED AIR ENTRAPPING MATERIAL

Richard Wells Forsythe, 13601 Preston Road, Carillon Tower, Ste. 815W, Dallas, Tex. 75240

Filed Nov. 5, 1976, Ser. No. 739,282
Int. Cl.² C06B *45/34*
U.S. Cl. 149—7 **38 Claims**

1. An explosive composition comprising an air entrapment material supported by and adhering to the surfaces of a solid component and a combustible liquid contacting the surfaces of at least a portion of said air entrapment material, said combustible liquid being capable of sustained combustion in air.

4,076,563

EXPLOSIVE COMPOSITION FOR HIGH TEMPERATURE APPLICATIONS

Peter D. Zavitsanos, Norristown; Martin M. West, Philadelphia, and William G. Browne, Gladwyne, all of Pa., assignors to General Electric Company, Philadelphia, Pa.

Filed Nov. 19, 1975, Ser. No. 633,244
Int. Cl.² C06B *33/00*
U.S. Cl. 149—37 **3 Claims**

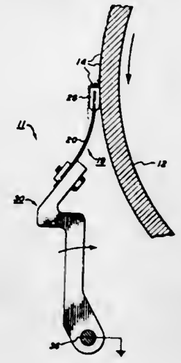
1. An explosive composition, which comprises thorium and molybdenum trioxide.

4,076,564

ROUGHENED IMAGING SURFACE FOR CLEANING

Donald J. Fisher, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 506,135, Sep. 16, 1974, Pat. No. 3,992,091. This application Mar. 5, 1976, Ser. No. 664,118
Int. Cl.² C23F *1/00*
U.S. Cl. 156—664 **1 Claim**



1. A method for making a photoconductive member with an imaging surface with improved cleaning blade cleanability comprising the steps of:

providing a smooth conductive substrate,

etching said substrate surface to form a surface on said substrate having substantially all of the substrate surface substantially uniformly and continuously covered with a first surface roughness pattern of recesses in the substrate surface averaging 3 to 5 microns in lateral dimensions and averaging 1 to 2 microns in depth and a substantially lesser amount as compared to the surface covered by said first surface roughness pattern but greater than zero of the substrate covered with a second surface roughness pattern, said second surface roughness pattern having recesses in the substrate surface of about 10 to 20 microns in lateral dimensions and averaging 1 to 2 microns in depth, and

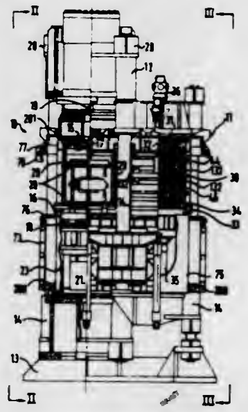
then uniformly overcoating said substrate with a thin uniform layer of photoconductive material which conforms to the substrate surface to form said imaging surface, to cause, a reduction in friction between said cleaning blade and said imaging surface without adversely affecting image reproduction.

4,076,565

MANUFACTURE OF MOULDED ARTICLES

Anthony Gerald Goodfellow, Erdington, England, assignor to Dunlop Limited, England

Division of Ser. No. 665,429, March 10, 1976, Pat. No. 4,006,053. This application Aug. 17, 1976, Ser. No. 715,116
Claims priority, application United Kingdom, Mar. 20, 1975, 11567/75
Int. Cl.² B29H *17/00*
U.S. Cl. 156—125 **1 Claim**



1. A method of moulding a pneumatic tire having sidewalls joined by a tread portion the method comprising:

locating at a filling station two transfer units, each unit comprising in its face remote from the other transfer unit a mould surface for one of the sidewalls, each unit comprising at least two parts relatively movable axially of the unit between an open position in which the volume of at least one reservoir for uncured rubber defined between said parts is relatively large and a closed position in which said volume is relatively small, and passageway means communicating the axially opposite faces of each unit with a reservoir thereof,

charging the reservoirs of the transfer units with moulding material at the filling station,

opening a press so that sidewall die members thereof are relatively spaced, the faces of the sidewall die members presented toward one another comprising mould surfaces for the sidewalls and locking spue grooves adjacent the mould surfaces,

locating the transfer units in the press so they are positioned between the sidewall die members with the sidewall mould surfaces of the transfer units presented towards the mould surfaces of the sidewall die members,

closing the press whereby a mould cavity for the tread portion is defined between the transfer unit and a mould cavity and locking spue groove for one of the sidewalls is defined between each sidewall die member and the mould surface of the adjacent transfer unit, each said cavity communicating with a passageway of at least one of the transfer units,

applying pressure to the closed press relatively to move the parts of each transfer unit to the closed positions thereof whereby moulding material is transferred from the reservoirs to the cavities via the passageways,

re-opening the press and removing the transfer units therefrom, the moulded tread portion remaining in the press and the moulded sidewalls being held on the respective sidewall die members by the moulded locking spues and

re-closing the press to bring the moulded sidewalls, held by the locking spues, into contact with the moulded tread portion on opposite sides of the latter and bonding the sidewalls to the tread portion, the method additionally comprising subjecting the moulding components of the press to superatmospheric pressure during the moulding operation and subsequent bonding operation.

4,076,566

METHOD OF PREPARING DECORATIVE TEXTURED LAMINATES

George Edward Power, Cincinnati, Ohio, assignor to Formica Corporation, Cincinnati, Ohio

Filed Jan. 28, 1976, Ser. No. 653,064
Int. Cl.² B32B *31/20;* B24C *1/10;* B32B *27/42*
U.S. Cl. 156—153 **4 Claims**

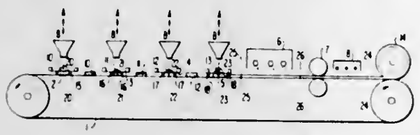
1. A process for the production of a textured decorative laminate which is substantially free of grayness and mottling which comprises heat and pressure consolidating an assembly comprising, in superimposed relationship, a supporting base member, a melamine-formaldehyde resin impregnated decorative, cellulosic sheet and a peened metal press plate having a texture over substantially its entire surface, the textured surface of said plate facing said sheet and having an arithmetic average roughness of from about 30 microinches to about 200 microinches, a Gardner Glossmeter 60° gloss of from about 20 to about 100 and comprising a myriad of craters having radii of curvature of from about 0.003 to about 0.050 inch, said texture having been provided by (1) first peening said surface with large size shot and then with smaller size shot or (2) first peening with shot and then carefully blasting with grit.

4,076,567

METHOD OF PRODUCING PLASTIC SHEETS WITH INTEGRATED GEOMETRIC DECORATIVE PATTERNS

Yoshinobu Yoshikawa, Suita; Kosuke Iida, Himeji; Tadayuki Morikawa, Hyogo, and Akinori Satomi, Himeji, all of Japan, assignors to Takiron Co., Ltd., Osaka, Japan

Filed Dec. 9, 1975, Ser. No. 639,021
Claims priority, application Japan, Dec. 28, 1974, 50-149154
Int. Cl.² B29C *27/02;* B29B *1/02*
U.S. Cl. 156—219 **19 Claims**



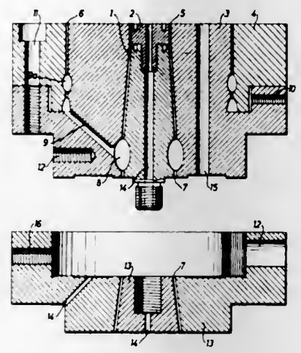
1. A method for producing resin sheets having geometric decorative patterns with individual patterns being substantially identical throughout the thickness thereof, which comprises depositing first colored resin particles into a pattern space defined by the surface of a support and a guide member extending downward from the bottom of a pattern screen and making an angle between 60° and 85° with the support; removing said guide member to leave a pre-formed pattern mass of said colored resin particles on said support; conveying intermittently with one or more movements said support having said pre-formed pattern mass thereon to a position such that said pre-formed pattern mass is below a subsequent pattern screen; depositing second colored resin particles into a second pattern space defined by said support and a guide member extending downward from said second pattern screen to form a second pre-formed pattern mass on said support; successively conveying said support having said pre-formed pattern masses thereon to subsequent additional pattern forming positions and repeating the steps for forming the resin particle pattern masses to produce a pre-formed sheet assembly comprising the desired number of separately formed pattern masses of colored resin particles; and heating the resulting pre-formed sheet assembly to sinter the resin particle masses in the sheet assembly, thereby producing a fused, integral sheet product having colored patterns extending in a substantially identical pattern configuration throughout the thickness of said sheet at least two of said colored patterns differing in color.

4,076,568

PROCESS FOR THE PREPARATION OF A MULTILAYER FILM

Josef Kubát, Solparksvagen 3, 171 35 Solna, and Kenneth S. Berggren, Delbancogatan 9 A, 413 35 Molndal, both of Sweden

Continuation of Ser. No. 448,640, Mar. 6, 1974, abandoned. This application Nov. 11, 1975, Ser. No. 630,786
Int. Cl.² B30B *11/22;* B31B *31/30;* B29D *23/04*
U.S. Cl. 156—229 **5 Claims**



1. A continuous process for preparation of a multilayer film from thermoplastic materials comprising processing in an extruder, feeding into a film blowing die having at least two concentric slots, stretching, blowing, bonding and winding up, characterized in that the material for the exterior layer is fed through an exterior slot which has a diameter at least four times larger than the diameter of the slot through which the material for the interior layer is fed and that the layers are bonded together when the exterior layer has been oriented to the desired extent in the longitudinal direction by stretching and the interior layer in the transverse direction by blowing by means of gas medium said bonding occurring before any of the material layers has been cooled to a temperature which corresponds to the frost point of the material in question and otherwise before any of the materials has lost its viscous flowability, thereby to produce a film laminate having high strength in both longitudinal and transverse directions.

4,076,569

PROCESS FOR UPGRADING PLYWOOD PANELS

Arnold Buchbinder, 10331 Almayo, Los Angeles, Calif. 90064

Filed Apr. 14, 1976, Ser. No. 676,698
Int. Cl.² B05D *7/06, 3/12;* B29D *7/02*
U.S. Cl. 156—242 **18 Claims**

18. A process for coating the surface of a panel of cellulosic material which comprise the steps of:

feeding such a panel along a horizontal path;

applying a thermoplastic resin to the upper surface of said panel while maintaining said thermoplastic resin at a temperature above its melting point so that said resin remains liquid;

passing said panel beneath a doctor blade so that said liquid resin is spread across said upper surface and forms a resin layer completely across such surface;

maintaining the upper portion of the resin layer at a temperature sufficient to maintain such portion in a liquid, tacky condition while permitting the lower portion of the layer to cool and solidify;

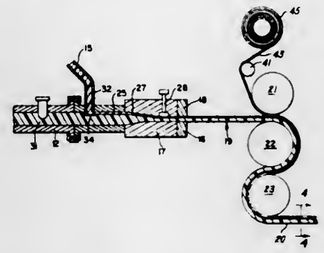
forming a smooth upper surface on said upper portion; and thereafter causing said upper portion to solidify.

4,076,570

PROCESS FOR THE PRODUCTION OF A MULTIPLE LAYER LAMINATE

Ronald D. Medley, Big Spring, Tex., and James R. Chapman, Atlanta, Ga., assignors to Cosden Technology, Inc., and Mead Corporation, Big Spring, Tex.

Filed Nov. 20, 1974, Ser. No. 525,480
Int. Cl.² B29G *3/00*
U.S. Cl. 156—244 **17 Claims**



1. A process for the manufacture of a laminated structure comprising a base layer of styrene polymer, an intermediate layer of an ABS polymer and a surface layer of a barrier material comprising a vinylidene chloride copolymer having copolymerized therein vinylidene chloride monomer and up to 30% of a monomeric material copolymerizable therewith comprising the steps of extruding from a single die orifice a a heat plastified laminate structure comprising a base layer of styrene polymer and at least one surface layer of an ABS polymer, capable of adhering to said styrene polymer with a bond of at least about 3 lbs/inch, thence laminating a pre-formed layer of said barrier material to the ABS surface layer(s) of said co-extruded laminate and controlling the temperature of said co-extruded laminate and said pre-formed layer of barrier material so that upon lamination said barrier material is heated to a temperature from slightly below its melting temperature to its degradation temperature.

4,076,571

METHOD OF BONDING ELECTROLYTIC DIAPHRAGMS OF PERFLUOROSULFONIC ACID RESINS

Steven J. Specht, Cleveland, and John O. Adams, Englewood, both of Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Oct. 19, 1976, Ser. No. 733,733
Int. Cl.² B32B *7/04, 17/04, 27/06*
U.S. Cl. 156—305 **12 Claims**

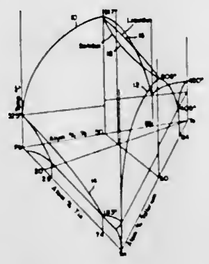
1. In a method for heat sealing an electrolytic diaphragm comprised of a perfluorosulfonic acid resin in the alkali metal ion form, said method comprising heat sealing juxtaposed sections of said electrolytic diaphragm, the improvement which comprises contacting said heat sealed sections of said electrolytic diaphragm with an aqueous fluid to restore elasticity to said heat sealed sections.

4,076,572

CRYSTAL GROWTH AND ANNEAL OF LEAD TIN TELLURIDE BY RECRYSTALLIZATION FROM A HETEROGENEOUS SYSTEM

Hiroshi Kimura, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 376,869, July 5, 1973, abandoned, which is a continuation of Ser. No. 176,157, Aug. 30, 1971, abandoned. This application Feb. 9, 1976, Ser. No. 656,548
Int. Cl.² B01J *17/02;* C01G *21/00;* C01B *19/00*
U.S. Cl. 156—603 **9 Claims**



1. A method for synthesizing at least a one cubic centimeter single crystal of lead tin telluride having the approximate composition of 40 mole percent lead, 10 mole percent tin, and 50 mole percent tellurium comprising the steps of:

reacting charge materials of lead, tin and tellurium at a temperature of approximately 950° C for approximately 4 hours in an enviroment evacuated to approximately 10^{-6} Torr to form a source material;

heating a quantity of the source material sufficient to form the single crystal at an isothermal temperature of approximately 850° C for a time span of approximately five to fourteen days in an enviroment evacuated to approximately 10^{-6} Torr to form the single crystal with an as-grown carrier concentration arising as a consequence of having vacancies in which metal vacancies predominate; cutting the single crystal into wafers; and

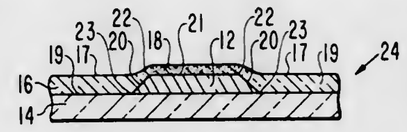
annealing wafers of the single crystal by heating the wafers for about 5 days at a temperature within the range of about 600° C to 660° C in a closed environment having a solid metal-rich source of lead, tin and tellurium vapors and having the composition of $(Pb_{1-x}Sn_x)_{0.51}Te_{0.49}$ wherein x is the mole fraction of tin approximately equalling the mole fraction of tin in the single crystal said source being in an atmosphere of inert gas at a pressure of one-third atmosphere, sufficient to establish and maintain an equilibrium vapor pressure over the wafers, corresponding to the annealing temperature, for a period of time sufficient to reduce the as-grown carrier concentration of the crystal.

4,076,573

METHOD OF MAKING PLANAR SILICON-ON-SAPPHIRE COMPOSITE

Joseph Michael Shaw, Middlesex, and Karl Heinz Zaininger, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 30, 1976, Ser. No. 755,966
Int. Cl.² H01L *21/205*
U.S. Cl. 156—613 **3 Claims**



1. A method for making a planar composite of at least one

silicon island imbedded in single crystal aluminum oxide comprising the steps of:

growing monocrystalline aluminum oxide adjacent an exposed surface of a substrate of sapphire and simultaneously growing polycrystalline aluminum oxide adjacent an exposed surface of an epitaxial island of silicon deposited on said substrate, by the pyrohydrolysis of aluminum trichloride, hydrogen, and carbon dioxide at a temperature between 875° C and 990° C, and

selectively removing said polycrystalline aluminum oxide whereby a major surface of said island is exposed and said island remains surrounded by said monocrystalline aluminum oxide.

4,076,574

REACTIVE ATMOSPHERE CRYSTAL GROWTH METHOD

Ricardo C. Pastor, Manhattan Beach, and Antonio C. Pastor, Santa Monica, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 29, 1975, Ser. No. 645,866
Int. Cl.² B01J *17/08*; C01D *3/20*
U.S. Cl. 156—616 R **18 Claims**

1. A processing method for growing ultra pure laser quality single crystals from alkali metal halide powders selected from the group consisting of alkali metal chlorides, alkali metal bromides, and alkali metal iodides whereby material purification and crystal growth occurs in a continuous uninterrupted sequence, comprising:

charging a crucible with said powders and mounting said crucible in a furnace,

increasing the temperature of said furnace to a level sufficient to cause said powders to melt and remain molten thereby creating an environment which will ensure the dissociation of selected halogen source gasses which are subsequently introduced into said furnace,

purging contaminants from the interior surface of said crucible, which simultaneously scrubbing said molten charge to remove cation and anion impurities, by flowing a nascent halogen source gas, selected from the group whose formula is RY_nX_{4-n} where R is carbon, Y is a strongly covalently bonded atomic substituent, X is a halogen and n ranges from 1 to 3, having a dissociatable halogen which corresponds to the halide of the alkali halide being grown, in a carrier gas selected from the group consisting of He, CO_2 and mixtures of He and CO_2, through said furnace at a preselected carrier gas - halogen source material ratio and a gaseous flow rate based on the preselected halogen source material decay constant whereby the formation of nascent halogens is favored for an extended time interval ranging from 50 to 70 hours, and

causing a single crystal to be formed from said melt in the presence of said flowing halogen gas by slowly removing said crucible from said furnace and allowing said crystal to slowly cool to ambient temperature while maintaining a constant purge of said halogen gas.

4,076,575

INTEGRATED FABRICATION METHOD OF FORMING CONNECTORS THROUGH INSULATIVE LAYERS

Keaneth Chang, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1976, Ser. No. 701,451
Int. Cl.² H01L *21/312*; B44C *1/22*
U.S. Cl. 156—656 **15 Claims**

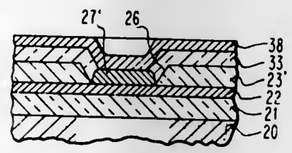
1. In integrated circuit fabrication, a method of forming metallic connectors through a layer of electrically insulative material and a metallization pattern for connecting such connectors on said layer comprising

forming a layer of electrically insulative material on a substrate,

forming on said insultative layer, a mask of photoresist material having a plurality of openings through which said insulative layer is exposed,

etching to selectively remove the exposed insulative layer to form insulative layer openings through which the underlying substrate is exposed,

depositing a first layer of metal over the masked substrate, said metal layer being thinner than said insulative layer whereby said insulative layer openings are partially filled with metal,



removing said photoresist mask to thereby remove the metal layer deposited on said photoresist with only the metal deposited in said insulative layer openings remaining,

depositing a second layer of metal over said first insulative layer and the metal remaining in said openings, and

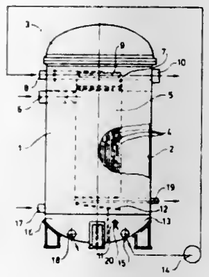
selectively removing portions of said second metal layer over said insulative layer to form said metallization pattern connected to the metal remaining in said openings.

4,076,576

METHOD AND APPARATUS FOR THE EVAPORATION OF LIQUIDS

Lauri Tapani Marttala, Varkaus, Finland, assignor to A. Ahlstrom Osakeyhtio, Finland

Filed Dec. 29, 1975, Ser. No. 644,714
Claims priority, application Finland, Jan. 20, 1975, 750130
Int. Cl.² B01D *1/22*
U.S. Cl. 159—13 B **13 Claims**



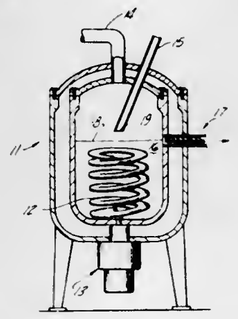
1. An apparatus for evaporating liquids which, when dilute, tend to froth during mixing or boiling, the apparatus having an evaporation chamber and in the chamber: a heat exchanger and means for causing the liquid to be evaporated to flow along the heat exchange surfaces of the heat exchanger in order to boil and concentrate the liquid, a feed inlet for feeding into the chamber the liquid to be evaporated, an outlet, in the lower part of the chamber, for removing the concentrated liquid, and an outlet, in the upper part, for removing the vapor from the chamber; and means for recirculating onto the heat exchange surfaces of the heat exchanger the concentrated liquid from the heat exchanger accumulated in the lower part of the chamber, and a member which divides the lower part of the evaporation chamber into two liquid compartments having a joint vapor space, said means for recirculating the concentrated liquid having the inlet connected to the first liquid compartment and to the feed inlet for the liquid to be expansion evaporated and the outlet for concentrated liquid having been connected to the second liquid compartment.

4,076,577

PROCESS FOR THE SEPARATION OF RESIDUES OF TOLUENEDIISOCYANATE PRODUCTION

Eckard Hetzel; Waldemar Koehler, both of Frankenthal; Georg Friedrich Vock, Ludwigshafen, and Rolf Bittler, Heidelberg, all of Germany, assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Nov. 3, 1975, Ser. No. 628,358
Claims priority, application Germany, Nov. 7, 1974, 2452805
Int. Cl.² B01D *1/00*
U.S. Cl. 159—47 R **11 Claims**



1. A method of separating residues from a mixture of (1) residues and (2) toluenediisocyanate and solvent, said mixture being obtained by reaction of toluenediamine with phosgene in the presence of organic solvent, comprising the steps of

feeding the mixture to the central portion of an evaporator equipped with a helical agitator,

said evaporator being partly filled with residue and the temperature therein being maintained at least 5° C higher than the boiling point of the higher boiling component of the class consisting of toluenediisocyanate and solvent present in the mixture at the pressure within the evaporator,

agitating the mixture by rotating said helical agitator at a speed of 2–100 rpm. while the mixture is fed to said evaporator, and

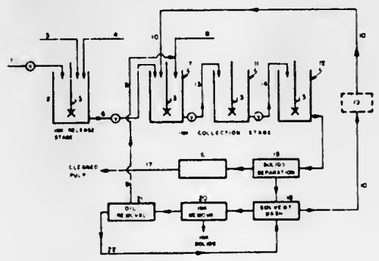
removing the volatile components of the mixture from the evaporator in vapor form.

4,076,578

INK REMOVAL FROM WASTE PAPER

Ira E. Puddington; Bryan D. Sparks, both of Ottawa, and Ernest A. Sexton, St. Catharines, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa and The Ontario Paper Company Ltd., St. Catharines, both of, Canada

Continuation-in-part of Ser. No. 516,775, Oct. 21, 1974, abandoned. This application Aug. 2, 1976, Ser. No. 711,058
Int. Cl.² D21C *5/02*
U.S. Cl. 162—5 **22 Claims**



1. A method of treating waste inked paper to collect and remove ink particules therefrom comprising:

a. forming an aqueous pulp of said paper in the presence of soluble ink dispersing agent, said agent being at least one of a soap and sodium silicate, thereby releasing the ink particles adhering to the paper fibers and dispersing the ink solids in the pulp,

b. inactivating the ink dispersing agent present by precipitation with added insolubilizing cation, agitating the resulting aqueous mixture containing ink solids and paper fibers in the presence of inserted selected non-soap collecting solids and collecting ink solids on the surface of the collection solids, said collecting solids having hydrophobic surfaces with strong affinity for said ink solids, the collecting solids being dispersed directly in the aqueous pulp the collecting solids being at least about 0.04 mm. in diameter and large enough that many ink particles or agglomerates thereof adhere side-by-side on the collecting surface, the mixture being brought into intimate contact with the hydrophobic collecting surfaces,

c. separating the ink-coated collecting solids in easily handled solid form from the paper fibers by a mechanical separation without froth flotation, and

d. recovering relatively clean paper stock.

22. A method of treating waste inked paper to collect and remove ink therefrom, comprising:

a. forming an aqueous pulp of said paper and releasing the ink from the paper fibers to form fine dispersed ink solids in the pulp,

b. providing that no active ink dispersant is present and agitating the resulting pulp mixture in the presence of inserted sulphur solids having a diameter of at last about 10 micrometers until said sulphur solids pick up and retain a multiplicity of ink particles or agglomerates thereof side-by-side on the surfaces of the sulphur solids.

c. separating the ink-coated sulphur solids from the pulp by a mechanical separation without froth flotation, and

d. recovering the cleaned paper stock.

4,076,579

PULPING OF LIGNOCELLULOSIC MATERIAL BY SEQUENTIAL TREATMENT THEREOF WITH NITRIC OXIDE AND OXYGEN

David L. Brink, Berkeley, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 385,878, Aug. 6, 1973, abandoned, which is a continuation-in-part of Ser. No. 149,589, Jun. 3, 1971, abandoned. This application Apr. 7, 1975, Ser. No. 565,524
Int. Cl.² D21C *3/16, 3/26*
U.S. Cl. 162—53 **9 Claims**

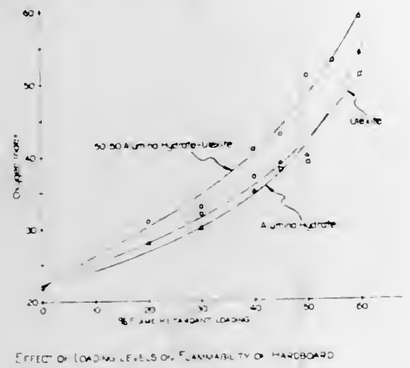
1. A process of preparing high strength pulp from particles of lignocellulosic material having a capillary structure which comprises treating said material with 2 to 8% nitric oxide, based on the dry weight of said material, and then reacting said nitric oxide treated material with molecular oxygen to form nitric acid in situ, said reaction being carried out at a temperature below 40° C for a time sufficient to substantially effect consumption of nitric acid and at a moisture content of 10 to 80% of the lignocellulosic material, the nitric oxide being added sufficiently prior to the oxygen to effect substantially thorough penetration of the material with the nitric oxide before reaction occurs with the oxygen, washing the nitric acid treated material with an alkaline solution and delignifying the washed material by extracting the washed material with a strong alkali at a temperature above about 140° C resulting in a cellulosic pulp.

4,076,580

FLAME RETARDANT CELLULOSIC BOARDS

Erwin Panusch, Livermore; Igor Sobolev, Orinda, and Stephen C. Carniglia, Byron, all of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Mar. 24, 1977, Ser. No. 780,725
Int. Cl.² D21D 3/00
U.S. Cl. 162—159 **11 Claims**



EFFECT OF LOADING LEVELS ON FLAMMABILITY OF HARDBOARD

1. A process for producing flame-retardant cellulosic board which comprises incorporating in the board furnish a synergistically acting flame-retarding composition consisting of alumina hydrate and ulexite, wherein the quantity of alumina hydrate in the composition is maintained within the range of about 30–70% by weight of the composition and wherein this composition is incorporated in the board in an amount corresponding to about 30–50% by weight of the total weight of the flame-retarded board and forming the flame-retarded board.

4,076,581

METHOD FOR INCREASING WET STRENGTH CURE RATE OF PAPER

Robert P. Avis, West Chester, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Jan. 16, 1976, Ser. No. 649,647
Int. Cl.² D21D 3/00; D21H 3/24, 3/52
U.S. Cl. 162—167 **6 Claims**

1. In a wet lay papermaking process employing a papermaking slurry containing a substantive urea-formaldehyde resin in the papermaking slurry for imparting wet strength to paper produced by depositing fibers contained in the slurry upon a foraminous surface with the water component of the slurry draining through the foraminous surface, the improvement which comprises;

separately adding to the papermaking slurry a water soluble salt of carboxymethylcellulose and the substantive urea-formaldehyde, said carboxymethylcellulose having a degree of substitution of from about 0.3 to about 1.1 and added to the slurry in an amount sufficient to increase the wet strength cure rate of the paper.

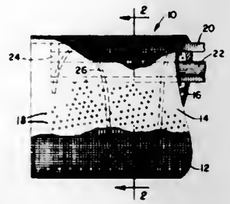
4,076,582

SUCTION ROLL SEALING STRIP CLEANING STRUCTURE

James H. Burkhart, Monroe, Ohio, assignor to Diamond International Corporation, New York, N.Y.

Filed Apr. 4, 1977, Ser. No. 784,311
Int. Cl.² D21F 3/10
U.S. Cl. 162—272 **14 Claims**

1. A self-cleaning suction roll assembly comprising a generally cylindrical shell having an outer radial surface, an inner radial surface, means defining groups of passages extending from said outer surface to said inner surface, and sealing means disposed within said shell and extending both longitudinally and circumferentially of said shell to define a pressure zone, said sealing means in operation of said suction roll assembly being in sealing engagement against said inner surface and secured at a fixed location whereby as said shell is rotated a sweeping action is effected between said inner surface of said shell and said sealing means, each of said groups of passages including a plurality of perforations formed in generally similar



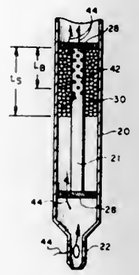
geometric patterns spaced-apart from each other in said shell, said shell also having recess means formed in said inner surface for reception and removal of fibers and/or other deleterious matter finding their way through said perforations and into said pressure zone, said recess means being formed in said inner surface in a pattern generally similar to that of the perforations of each of said groups of passages.

4,076,583

CONTROL FOR NUCLEAR REACTOR

Edward B. Ash, Marina Del Rey; Louis Bernath, San Diego, and Joseph V. Facha, Reseda, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 4, 1976, Ser. No. 729,539
Int. Cl.² G21C 7/16
U.S. Cl. 176—35 **5 Claims**



1. A nuclear reactor comprising a pressure vessel, a core located within said vessel and containing a sufficient quantity of fissionable material to establish and sustain a chain-type fission reaction;

a plurality of elongated conduits disposed in a regular arrangement within said vessel, each of said conduits defining a fluid flow path and comprising;

a first section located within and extending through said core and a second section located exteriorly of said core and positioned above said first section;

a plurality of bodies comprising a high neutron absorption cross-section material positioned within each of said conduits in a sufficient quantity to substantially fill the first sections thereof, each of said bodies being substantially spherical in shape and having a diameter of less than about one-half that of the narrowest part of the fluid flow path of said conduit so that said bodies are freely movable through said conduits;

a first fluid connection to a lower part of the first section of each of said elongated conduits and a second fluid connection to an upper part of the second section of each of said elongated conduits and forming a hydraulically supported stacked bed of said bodies;

means for preventing movement of said plurality of bodies beyond said first and second sections of each of said elongated conduits; and

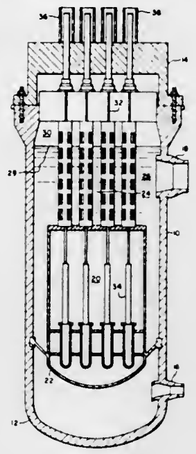
bypass means located intermediate said second fluid connection and said second section of each of said conduits, said bypass means including a plurality of fluid passageways distributed along the length of said second section to provide a ratio of the length of said second section provided with said fluid passageways to the length of said second section occupied by the stacked bed of said bodies of from about 0.5:1 to 1.2:1 for permitting a portion of said fluid to bypass the stacked bed of bodies during normal operation of the reactor, each of said plurality of fluid passageways having a cross-sectional area less than that of said bodies.

4,076,584

RODDED SHUTDOWN SYSTEM FOR A NUCLEAR REACTOR

Martin P. Golden, Penn Township, Allegheny County, and Aldo R. Govi, Greensburg, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 28, 1976, Ser. No. 653,175
Int. Cl.² G21C 7/08
U.S. Cl. 176—36 R **2 Claims**



1. A shutdown system for a nuclear reactor having a pressure vessel with an upper head, a support plate within said vessel, a vertically oriented core supported atop said support plate and means for circulating a coolant through said support plate and core, said system comprising:

a. a vertical pressure tube sealingly affixed to said head having an internal circumferential shoulder;

b. an upper radiation shield disposed within said tube having a circular seating surface;

c. means for removably supporting and sealing said upper shield within said pressure tube including a circumferential metallic seal matingly disposed between said support ledge and said seating surface, a circumferential spring ring disposed about said upper shield below said seal sized to contact the bottom of said seal upon vertical lifting of said upper shield, and a closure plug and jacking bolts assembly disposed above said upper shield and positionable to tightly seat said support ledge and seating surface against said seal;

d. a generally cylindrical lower radiation shield sized to removably fit within said outer pressure tube and having a vertical opening therethrough, said lower shield disposed at the elevation of said head;

e. an inner tube arranged concentrically within said pressure tube sealingly affixed at its upper portion to said upper shield, and at its lower portion to said lower shield;

f. an electromagnet assembly sealingly affixed within said inner tube below and spaced from said upper shield and above said lower shield having a vertical aperture therethrough;

g. an inner shaft sealingly affixed to said electromagnet assembly extending from the upper end of said electromagnet downward through said aperture;

h. an inner tubular wall sealingly affixed to said electromagnet assembly and said lower shield forming a pressurized gas annulus between said inner tube and said inner tubular wall;

i. a magnetically responsive armature sized to matingly abut the bottom of said electromagnet within the magnetic flux formed by said electromagnet, said armature having a vertical opening through which said inner shaft passes;

j. a main shaft affixed to said armature surrounding said inner shaft throughout the length of said inner shaft, and said main shaft extending through said lower shield opening;

k. a set of metallic bellows disposed concentrically about said main shaft and within said inner tubular wall sealingly affixed at the top to said armature and at the bottom to said lower shield so as to form a pressure bearing bellows annulus between said set and an atmosphere annulus between the outer bellows of said set and said inner tubular wall;

l. a flexible shaft affixed to the bottom of said main shaft;

m. a neutron absorbing control rod coupled to said flexible shaft;

n. tubular means for conducting said coolant affixed at the top to said lower shield and terminating at the bottom in an inlet nozzle receiving said circulating coolant from below said support plate;

o. means for selectively conducting and venting a pressurized gas between the top of said pressure tube and the bottom of said bellows annulus including, in series, a conduit passing through said upper shield and affixed to said electromagnet assembly, an upper passageway through said electromagnet assembly to said pressurized gas annulus, and a lower passageway through said lower shield from said last-named annulus to said bellows annulus;

p. means for allowing fluid communication between the atmosphere surrounding the top of said pressure tube and said atmosphere annulus including, in series, an opening extending vertically through said upper shield and a magnet passageway through said magnet to said atmosphere annulus; and

q. means for conducting electrical energy from atop said pressure tube to said electromagnet assembly including a conduit for containing electrical leads which passes vertically through said top shield and to said electromagnet assembly.

4,076,585

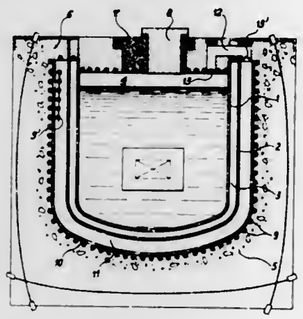
METHOD OF CONTINUOUS TESTING FOR LEAK-TIGHTNESS AND MECHANICAL RESISTANCE OF A REACTOR VESSEL JACKET AND A REACTOR IN WHICH SAID METHOD IS EMPLOYED

Pierre Charles Cachera, Saint German en Laye, France, assignor to Electricite de France (Service National), Paris, France

Continuation of Ser. No. 500,558, Aug. 26, 1974, abandoned.
This application Jun. 8, 1976, Ser. No. 693,879
Claims priority, application France, Sep. 7, 1973, 73 32374
Int. Cl.² G21C 9/00
U.S. Cl. 176—38 **4 Claims**

1. A method for continuous testing of the leak-jacket of a sodium-cooled fast reactor of the type comprising a first enclosure or primary vessel which contains the reactor core and the sodium and above which is located an inert gas blanket, and a second enclosure or leak-jacket which surrounds said first enclosure, both enclosures being placed within a safety enclo-

sure which is closed at the top by a shield slab, the steps of filling the space between the two first enclosures with an inert gas, maintaining the inert gas at a pressure substantially equal to atmospheric pressure, the second enclosure being under the same conditions of restraint as the first enclosure, maintaining



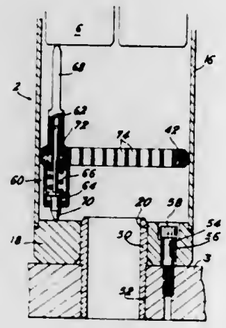
a vacuum within the space between said second enclosure and said safety enclosure, and continuously testing the leak-tightness and mechanical resistance of said enclosure by detecting any loss of vacuum within the space between said second enclosure and said safety enclosure by leaking of the inert gas into said space.

4,076,586

NUCLEAR REACTOR OF THE PRESSURIZED WATER TYPE

Jean Bideau, Breuillet; Jacques Levy, Paris, and Jean-Luc Viaud, Bures-sur-Yvette, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Sep. 21, 1976, Ser. No. 725,063
Claims priority, application France, Oct. 2, 1975, 75 30244
Int. Cl.² G21C *3/30, 3/06;* F16G *11/00*
U.S. Cl. 176—78 **12 Claims**



1. A nuclear reactor comprising a pressure vessel and, within said vessel,

a lower grid for supporting the reactor core, said grid being rigidly fixed to said vessel,

a plurality of fuel wrappers each adapted to contain at least one fuel assembly, each wrapper being designed in the shape of a right-angled parallelepiped, said wrapper being open at the upper end and closed at the lower end by a base plate provided with a bore,

said fuel assemblies being each provided with an upper end component which rests on the upper end of one of said fuel wrappers,

said lower support grid being such as to have a top face and provided with sleeves equal in number to that of the fuel wrappers, said sleeves being intended to project from said top face of said lower support grid, each sleeve being adapted to penetrate into a bore of a base plate of a fuel wrapper, said sleeve being fabricated from a material having a higher coefficient of thermal expansion than the material forming the base plate of said fuel wrapper, the external diameter of said sleeve being smaller in the cold state than that of the bore of the base plate and equal thereto at the operating temperature of the reactor so that there should take place at this temperature between said sleeve and the bore of said base plate a take-up of play by thermal expansion and an effect of clamping of said fuel wrapper, and

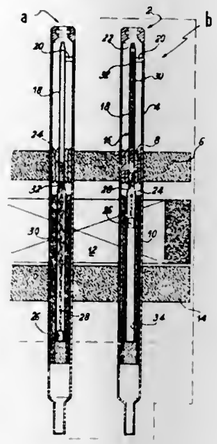
a plurality of maintaining units for locking said fuel assemblies in position within said fuel wrappers in a resilient manner.

4,076,587

FUSE AND APPLICATION OF SAID FUSE TO THE CONSTRUCTION OF AN EMERGENCY SHUTDOWN SYSTEM FOR A NUCLEAR REACTOR

Hubert Henri Léon Taulier, Maisons Laffitte, and Gérard Brugeille, Chatou, both of France, assignors to Electricite de France (Service National), Paris, France

Division of Ser. No. 469,907, May 14, 1974, Pat. No. 3,981,598.
This application Mar. 1, 1976, Ser. No. 662,911
Int. Cl.² G21C *7/12*
U.S. Cl. 176—86 R **5 Claims**



1. A coupling device between two components of elongate shape, said device having a first state corresponding to the coupling of said components and a second state corresponding to the breaking of said coupling device, to initiate the shutdown of a fast nuclear reactor of the liquid sodium cooled type having a core region by the introduction by gravity of solid neutron absorbing material into the core region, said absorbing material being normally maintained above the core region by one of said two components when said coupling device is in the first state, said coupling device breaking if a given physical characteristic of the core region of the reactor exceeds a predetermined threshold value, so that said absorbing material falls into the core region, said coupling device comprising in combination with said nuclear reactor a first element, a second element and separating means between said first and second elements to physically separate said first and second elements, said first element providing a mechanical connection between the two components, said first element being a material which retains its mechanical properties when said physical characteristic is below said threshold value, said second element being a material generating heat when said physical characteristic attains said threshold value and causing when fused and in contact with the material of said first element an exothermic reaction with said material producing a temperature which is higher than the melting point of the material of said first element and also the formation of an alloy of the materials of said two elements, said alloy having a melting point below said threshold value, and said separating means separating said first element from said second element when said characteristic is below said threshold value and allowing contact of said materials of said first and second elements after melting of said material of said second element, said contact causing breaking of said coupling device corresponding to the second state and the fall by gravity of the neutron absorbing material into the core region of the nuclear reactor.

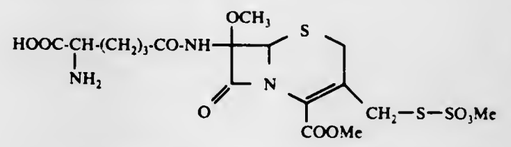
4,076,588

ANTIBIOTIC SF-1623 SUBSTANCE AND THE PRODUCTION THEREOF

Shigeharu Inouye; Takashi Shomura, both of Yokohama; Michio Kojima, Tokyo; Yasuaki Ogawa, Yokohama; Hiroshi Watanabe, Yokohama; Yasumitsu Kondo, Yokohama, all of Japan; Kazuo Saito, deceased, late of Fujisawa, Japan (by Nobuko Saito, administrator); Yujiro Yamada, and Taro Nilda, both of Yokohama, Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Division of Ser. No. 526,731, Nov. 25, 1974, Pat. No. 4,010,155.
This application Jul. 8, 1976, Ser. No. 703,589
Claims priority, application Japan, Nov. 28, 1973, 48-132594
Int. Cl.² C12D *9/14*
U.S. Cl. 195—36 C **4 Claims**

1. A process for the production of an alkali metal salt of SF-1623 substance having the formula:



wherein Me is selected from the group consisting of sodium, potassium, and ammonium,

which process comprises cultivating an SF-1623 substance-producing strain of *Streptomyces chartreusis* in a culture medium containing assimilable carbon and nitrogen sources under aerobic conditions in the presence of an alkali metal thiosulfate to produce and accumulate the alkali metal salt of the SF-1623 substance in the culture, and then isolating the salt form of this antibiotic from the culture.

4,076,589

PROCESS FOR THE PRODUCTION OF DIHYDROXYACETONE

William Charney, Montclair, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 364,771, May 29, 1973, abandoned. This application Jul. 17, 1975, Ser. No. 596,935
Int. Cl.² C12D *1/10*
U.S. Cl. 195—49 **9 Claims**

1. A method for producing dihydroxyacetone which comprises cultivating *Acetobacter suboxydans* under submerged aerobic conditions for from about 24 to about 48 hours in a fermentation medium consisting of water, from about 5% to about 15% of glycerol, from about 0.2% to about 1.0% of a single nutrient selected from the group consisting of yeast hydrolysate and fish hydrolysate at a temperature of from about 27° C to about 33° C, at a pH from 3.3 to 4.3 wherein said percentages are weight to volume, and isolating the dihydroxyacetone therefrom to obtain thereby from about 75 to about 90% by weight based upon the glycerol added.

4,076,590

PROCESS FOR ENHANCING THE PRODUCTION OF ENTEROTOXIN BY *VIBRIO CHOLERAE*

Mark H. Levner, St. Davids, Pa., assignor to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 607,649, Aug. 25, 1975, Pat. No. 3,984,285.
This application May 14, 1976, Ser. No. 686,617
Int. Cl.² C12D *13/02*
U.S. Cl. 195—96 **1 Claim**

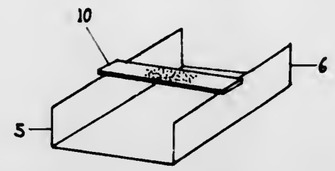
1. A process for producing *Vibrio cholerae* enterotoxin comprising growing *Vibrio cholerae* Inaba 569B [ATTC 25870] in the presence of lincomycin.

4,076,591

METHOD IN MICROBIOLOGICAL ANALYSIS

Carl-Goran Heden, Solna Kyrkvag 11, Solna, Sweden

Filed Jan. 12, 1976, Ser. No. 648,024
Claims priority, application Sweden, Jan. 15, 1975, 75003905; Oct. 7, 1975, 75111963
Int. Cl.² C12K *1/04*
U.S. Cl. 195—103.5 K **6 Claims**



1. Method of microbiological analysis wherein a simultaneous study is to be made of the effect of a number of different reagents on a strain of microorganisms comprising the steps of:

a. forming an elongated plate of a substrate material which comprises a culture medium combined with a microorganism strain to analyzed;

b. simultaneously inserting in a transverse direction into said elongated substrate plate a plurality of troughs, said troughs comprising a bottom and two opposite side walls but being open in the direction of said inserting, the bottom and side walls of the troughs constituting a plurality of completely isolated segments of substrate containing samples of said strain of microorganisms, and;

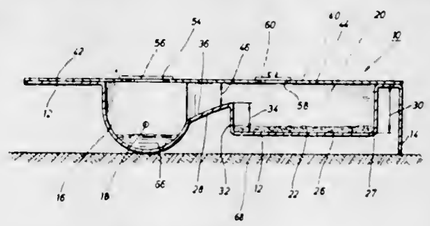
c. introducing substantially simultaneously with said partitions a plurality of reagents for reaction with the microorganisms in the isolated segments of substrate.

4,076,592

METHOD AND APPARATUS FOR TESTING THE EFFECT OF VARIOUS ANTIBIOTICS ON A BACTERIAL SUSPENSION

Rex L. Bradley, 6620 Manor Road, Austin, Tex. 78751

Filed Jun. 21, 1976, Ser. No. 698,487
Int. Cl.² C12K *1/04*
U.S. Cl. 195—103.5 K **16 Claims**



1. Apparatus for testing a substance comprising:

a substantially planar base;

a reservoir carried by said base and having an axis extending therethrough;

a plurality of side-by-side test zones carried by said base, each test zone having a chemical substance therein, each of said test zones being separated from its next adjacent test zone by a sidewall, each sidewall extending upwardly above a predetermined point in each test zone for a first predetermined distance, each of said test zones being adjacent to and in fluid communication with said reservoir; and,

a barrier disposed between each of said test zones and said reservoir, said barrier extending upwardly above said predetermined point in each test zone for a second predetermined distance less than said first predetermined distance;

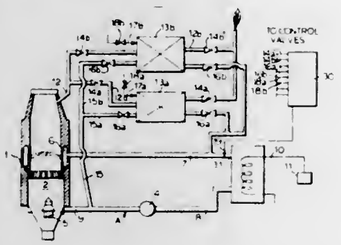
said test zones, reservoir and barrier being cooperably arranged so that a substance to be tested disposed in said reservoir may be introduced therefrom over said barrier and into each of said test zones by the angular movement of said base about said axis extending through said reservoir.

4,076,593

METHOD AND APPARATUS FOR CONTROLLING HEAT INPUT TO A WASTE HEAT BOILER BY USE OF BLEEDER GAS FROM A COKE DRY QUENCHING STATION

Kunihei Koizumi; Takeshi Ueda, both of Yokohama, and Tatu Otani, Yokosuka, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 12, 1977, Ser. No. 758,864
Claims priority, application Japan, Jan. 13, 1976, 51-2424
Int. Cl.² C10B *39/02*
U.S. Cl. 201—39 **8 Claims**



1. In a coke dry quenching system having a waste heat boiler wherein heated quenching gas drawn from the quenching station is cooled and recirculated for use in subsequent quenching operations, and having means for bleeding gas from the top of the quenching station, the method of controlling heat input to said boiler comprising the steps of

A. passing said bleeder gas through regenerator means for storing heat contained in said bleeder gas in said regenerator means;

B. measuring the heat input to said boiler;

C. redirecting at least part of said recirculating quenching gas after cooling in said boiler to said regenerator means when heat input to said boiler is below a predetermined level;

D. heating said recirculated quenching gas in said regenerator means using said stored heat from said bleeder gas; and

E. supplying the recirculated gas after heating in said regenerator means to the input of said boiler thereby to maintain substantially constant the heat input to said boiler.

4,076,594

PURIFICATION OF FORMIC ACID BY EXTRACTIVE DISTILLATION

Horst Buelow, Frankenthal; Heinz Hohenschutz, Mannheim; Johannes E. Schmidt, and Werner Sachsze, both of Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhine, Germany

Filed Oct. 4, 1976, Ser. No. 729,858
Claims priority, application Germany, Oct. 11, 1975, 2545730
Int. Cl.² B01D *3/40*; C07C *51/44*
U.S. Cl. 203—15 **4 Claims**

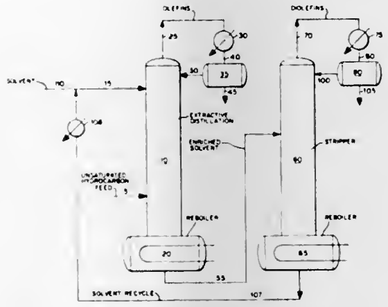
1. A process for recovery of formic acid from its aqueous solution which comprises vaporizing said aqueous solution of formic acid, passing the vapor into the middle zone or a lower zone of a distillation column and passing a liquid basic extractant into the top of said column, distilling off water from said column, extracting the formic acid in said extractant as it passes downwardly through the column, the extractant forming a liquid bottoms product, using N-formylmorpholine as the extractant, removing the bottoms product containing the formic acid from said column, and distilling off formic acid from said removed bottoms product in a second distillation column.

4,076,595

EXTRACTIVE DISTILLATION OF C_4 HYDROCARBONS WITH AN EXTRACTANT MIXTURE

Donald M. Haskell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 13, 1976, Ser. No. 731,955
Int. Cl.² B01D *3/40*; C07C *11/16*
U.S. Cl. 203—51 **10 Claims**



1. A process for separating a mixture containing olefins and diolefins which comprises:

a. introducing the mixture together with a selective solvent comprising methylethylsulfone and at least one solvent modifier selected from the group including methylethylketone, acetone, and tetrahydrofuran into a fractionation zone having a top and a bottom and therein subjecting the mixture, methylethylsulfone and the solvent modifier to extractive distillation conditions including such pressure and corresponding temperature to separate these into a column overhead containing substantially all olefin and an extract bottoms containing mainly diolefin and the selective solvent; and

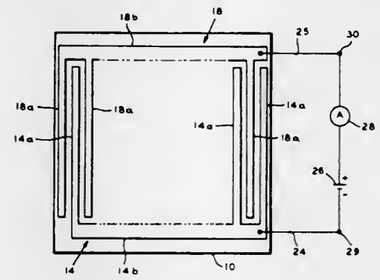
b. withdrawing a column overhead stream containing substantially all olefin and an extract bottoms stream containing mainly diolefin and the selective solvent.

4,076,596

APPARATUS FOR ELECTROLYTICALLY DETERMINING A SPECIES IN A FLUID AND METHOD OF USE

James Gerard Connery, North Wales; Emil Christopher Muly, Doylestown, and Robert Morgan Taylor, Lansdale, all of Pa., assignors to Leeds & Northrup Company, North Wales, Pa.

Filed Oct. 7, 1976, Ser. No. 730,409
Int. Cl.² G01N *27/46*
U.S. Cl. 204—1 T **10 Claims**



1. In an electrode assembly for measuring the concentration of oxygen in a fluid of the type which includes in combination:

an electrolytic medium;

first electrode means having surfaces in contact with said medium;

barrier means for separating said medium from said fluid, and being selectively permeable to said oxygen, and in contact with said medium;

an electrical power source connected for biasing said first electrode means at a potential at which said oxygen in said medium will be consumed at said surfaces of said first electrode means; and

second electrode means having surfaces in contact with said medium and connected to said power source for completing a circuit in which a current from said source can flow through both said electrode means at a level which is a function of such consumption;

said second electrode means and said medium being such that with the combination substantially only said oxygen is electrolytically generable at said second electrode means at said current level, said second electrode means being biased by said power source at a potential at which said oxygen is generable from said medium; the improvement comprising,

the positioning of said second electrode means with respect to said first electrode means so that said surfaces of said first electrode means are interleaved in side by side relationship with said surfaces of said second electrode means with said surfaces of said electrodes equidistant from said barrier means and the periodicity of said positioning sufficiently small with respect to the thickness and permeability of both said barrier means and said medium to chlorine so that the oxygen generated at said second electrode is consumed at said first electrode without any substantial transfer of oxygen across the interface between said barrier means and said fluids.

9. In an electrode assembly for measuring the concentration of chlorine in a fluid of the type which includes in combination:

an electrolytic medium;

first electrode means having surfaces in contact with said medium;

barrier means for separating said medium from said fluid, and being selectively permeable to said chlorine, and in contact with said medium;

an electrical power source connected for biasing said first electrode means at a potential at which said chlorine in said medium will be consumed at said surfaces of said first electrode means; and

second electrode means having surfaces in contact with said medium and connected to said power source for completing a circuit in which a current from said source can flow through both said electrode means at a level which is a function of such consumption;

said second electrode means and said medium being such that with the combination substantially only said chlorine is electrolytically generable at said second electrode means at said current level, said second electrode means being biased by said power source at a potential at which said chlorine is generable from said medium; the improvement comprising,

The positioning of said second electrode means with respect to said first electrode means so that said surfaces of said first electrode means are interleaved in side by side relationship with said surfaces of said second electrode means with said surfaces of said electrodes equidistant from said barrier means and the periodicity of said positioning sufficiently small with respect to the thickness and permeability of both said barrier means and said medium to chlorine so that the chlorine generated at said second electrode is consumed at said first electrode without any substantial transfer of chlorine across the interface between said barrier means and said fluid.

10. The method of measuring the concentration of an electrochemically active species in a fluid comprising the steps of:

immersing in said fluid an electrode assembly including:

an electrolytic medium from which only said species is electrolytically generable,

barrier means selectively permeable to said species,

first electrode means of material electro-chemically inert to both said medium and said species and having surfaces in contact with said medium,

second electrode means of material electro-chemically inert to both said medium and said species, said second electrode means having surfaces in contact with said medium,

means for supporting said first and second electrode means to position their respective surfaces in contact with said medium in an interleaved side by side relationship with said surfaces equidistant from said barrier means and positioned so that the periodicity of the spacing of said electrode surfaces is sufficiently small with respect to the thickness and species permeability of both said barrier means and said medium so that the species generated at the surfaces of said second electrode is consumed at the adjacent surfaces of said first electrode without any substantial transfer of said species across the interface between said barrier means and said fluid, and

means connecting said first and second electrodes to a power source operable to bias said first and second electrodes at potentials to produce a current between said electrodes such that said species will be generated at said second electrode and consumed at said first electrode in quantity dependent upon the tendency of said species to establish an equilibrium condition across said barrier means between the respective concentrations of said species in said medium and said fluid; and

measuring said current flow as an indication of said species concentration in said fluid.

4,076,597

METHOD OF FORMING IRON FOIL AT HIGH CURRENT DENSITIES

Palliyil K. Subramanyan, Shaker Heights; Mieczyslaw Paul Makowski, Wickliffe, and Robert Joseph Setele, Eastlake, all of Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Filed Dec. 6, 1976, Ser. No. 747,719
Int. Cl.² C25D *1/04, 3/20*
U.S. Cl. 204—13 **5 Claims**

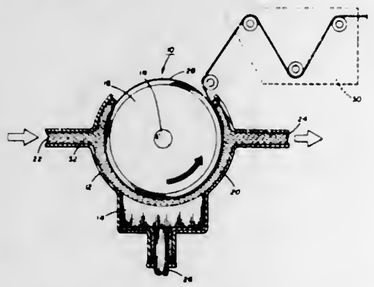
1. A method of electrolytically producing a sheet of iron foil on a rotating drum cathode comprising the steps of:

providing an iron containing anode spaced apart from a rotatably mounted drum cathode so as to form a gap between said cathode and said anode for containing elec-

trolyte, said anode being capable of forming iron ions which are soluble in said electrolyte;

flowing electrolyte between said cathode and said anode while maintaining the concentration of ferrous ion in said electrolyte within the range of from about 120 to less than about 162 grams per liter;

maintaining the pH of said electrolyte at a value ranging from about 3.3 to about 4.7 to prevent said ferrous ions from precipitating;



heating said electrolyte to a temperature in excess of ambient but below its boiling point;

rotating at least a portion of said cathode through said electrolyte;

passing direct electrical current between said cathode and anode at a cathode current density of at least about 800 amperes per square foot to cause iron to be deposited on said cathode; and

removing said so-formed iron foil from said cathode.

4,076,598

METHOD, ELECTROLYTE AND ADDITIVE FOR ELECTROPLATING A COBALT BRIGHTENED GOLD ALLOY

Lewis Brian Lerner, Linglestown, and Thomas Francis Davis, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 17, 1976, Ser. No. 742,955
Int. Cl.² C25D *3/62*
U.S. Cl. 204—43 G **13 Claims**

1. An aqueous bath for depositing from an electrolyzed solution thereof gold and, as an alloying additive to gold, variously closely controllable amounts of cobalt in an amount from 0.05 to 0.4 in percent by weight in the deposit based on amount of gold, said bath solution consisting essentially of:

1.0 - 4.0 troy oz/gal Au^+, added as $KAu(CN)_2$;

50 - 150 g/l K_2HPO_4;

50 - 200 g/l KH_2PO_4;

5 - 60 g/l nitrilotriacetic acid; and

0.1 - 7.0 g/l Co^+, as a soluble salt of cobalt, from at least one salt selected from the group consisting of cobalt sulfate, halide, nitrate and carbonate, said bath having a pH of 4.0 to 6.0.

3. A salt composition suitable for depositing gold and cobalt from an electrolyzed aqueous bath solution thereof, said composition consisting essentially of the salts as defined in claim 1, in the proportions thereof.

4,076,599

METHOD AND COMPOSITION FOR PLATING PALLADIUM

Jerome Joseph Caricchio, Jr., Binghamton, and Edward Robert York, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 627,493, Oct. 30, 1975, abandoned. This application Aug. 24, 1976, Ser. No. 717,419
Int. Cl.² C25D *3/50*
U.S. Cl. 204—47 **17 Claims**

14. An aqueous bath solution for the electro-plating of palladium consisting essentially of:

20–30 grams/liter of palladosamine chloride;

30–60 grams/liter of ammonium chloride;

30–40 grams/liter of ammonium sulfamate;

50–100 cc/liter of concentrated ammonium hydroxide so that said bath has a pH of about 8.5 to 9.6; and

1–1000 parts/million of a sulfite ion concentration derived from an alkali metal sulfite.

4,076,600

LEVELING AGENT FOR ACID ZINC ELECTROPLATING BATHS AND METHOD

Karen Huebner, Parma, Ohio, assignor to R. O. Hull & Company, Inc., Cleveland, Ohio

Filed Dec. 20, 1976, Ser. No. 752,079
Int. Cl.² C25D *3/22*
U.S. Cl. 204—55 R **66 Claims**

1. An aqueous acidic plating bath for the electrodeposition of a zinc coating on a substrate which comprises zinc ions, and an amount, sufficient to provide a level zinc electrodeposit, of one or more bath-soluble leveling phosphorus cations having the formula:

$$R_4P^{\oplus}$$

wherein each R is independently a hydroxy alkyl group.

50. An additive composition for an aqueous acidic zinc electroplating bath comprising a mixture of

a. one or more bath-soluble phosphorus cations having the formula

$$R_4P^{\oplus}$$

wherein each R is independently a hydroxy alkyl group, and

b. at least one thiourea having the formula

$$[R'_2N]_2CS$$

wherein each R' is independently hydrogen or an alkyl or alkenyl group.

4,076,601

ELECTROLYTIC PROCESS FOR THE PREPARATION OF ETHANE-1,1,2,2-TETRACARBOXYLATE ESTERS AND RELATED CYCLIC TETRACARBOXYLATE ESTERS

Donald A. White, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 22, 1976, Ser. No. 744,006
Int. Cl.² C25B *3/10*
U.S. Cl. 204—59 R **17 Claims**

1. An electrolytic process for the preparation of tetramethyl ethane-1,1,2,2-tetracarboxylate from dimethyl malonate, which process comprises subjecting a liquid electrolysis medium containing the dimethyl malonate, substantially anhydrous methanol, and iodide ion electrolyte to electrolysis at elevated temperatures sufficient to cause dehydrodimeric coupling of the dimethyl malonate at a current efficiency in excess of about 65 percent, using a graphite anode and a graphite cathode, and thereafter recovering the tetramethyl ethane-1,1,2,2-tetracarboxylate.

4,076,602

METHOD OF PRODUCING MAGNESIUM METAL AND CHLORINE FROM $MgCl_2$ CONTAINING BRINE

Roger M. Wheeler, 1957 E. 41, Tulsa, Okla. 74105

Filed Apr. 14, 1975, Ser. No. 567,512
Int. Cl.² C25C *3/04, 3/12, 3/08*
U.S. Cl. 204—70 **9 Claims**

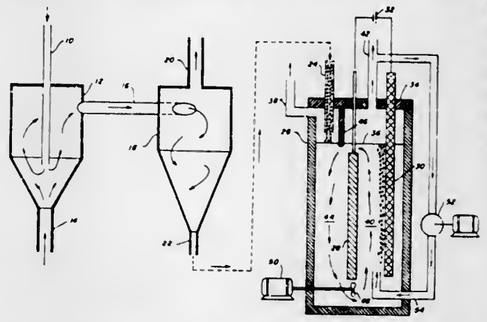
1. A method of producing magnesium metal and chlorine using $MgCl_2$ cell feed having hydrogen and oxygen impurities, comprising:

immersing spaced apart anode and cathode elements in a closed bath of molten electrolyte;

applying a voltage potential across the electrodes;

depositing the impure cell feed onto an area of the surface of the molten electrolyte, the impure cell feed being in the form of a powder of discrete porous particles in which the $MgCl_2$ content is at least 50%, the hydrogen contaminant content is less than 1%, the oxygen contaminant content is less than 13%, and the average porosity is greater than 30% at least a portion of the cell feed impurities being flash vaporized as the cell feed contacts the molten electrolyte;

withdrawing said impurities vaporized by contact of the impure cell feed with the surface of the molten electrolyte;



circulating the electrolyte upwardly in the inter-electrode space by the effect of gas produced therein, the electrolyte flowing up and out of the inter-electrode space towards the area where said cell feed is deposited;

circulating the electrolyte downwardly in the bath carrying said cell feed therewith into the lower portion of the inter-electrode space whereby at least a portion of the remaining impurities are chlorinated by chlorine gas generated at the anode element as the electrolyte rises in the inter-electrode space; and

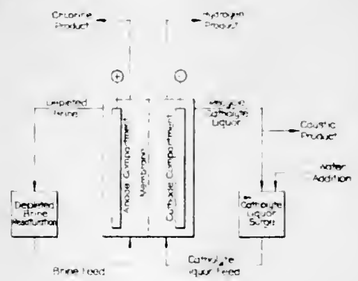
withdrawing chlorine gas produced at the anode and molten magnesium produced at the cathode from the cell.

4,076,603

CAUSTIC AND CHLORINE PRODUCTION PROCESS

John N. Andersen, Moraga, CA, assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Apr. 7, 1977, Ser. No. 785,722
Int. Cl.² C25B *1/16, 1/26*
U.S. Cl. 204—98 **5 Claims**



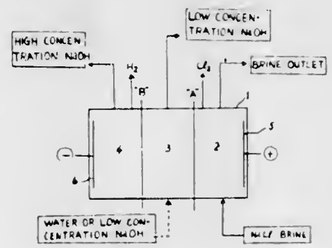
1. In the process of producing sodium hydroxide and chlorine by the stage-wise electrolysis of sodium chloride-containing brine, wherein in the first stage an electrolytic cell, consisting of anode and cathode compartments separated by at least one interposed buffer zone, is provided and wherein membranes separate the anode and cathode compartments from the buffer zone and brine is charged to the anode compartment and water is charged to both the buffer zone and to the cathode compartment and as a result of the electrolysis a concentrated sodium hydroxide solution of more than 250 g/l NaOH content is recovered from the cathode compartment and a dilute sodium hydroxide solution of 50–200 g/l NaOH content is recovered from the buffer zone; and the dilute sodium hydroxide solution is then charged to the cathode compartment of at least one second stage electrolysis cell consisting of membrane-separated anode and cathode compartments wherein charging of brine to the anode compartment and electrolysis of the same produces a concentrated sodium hydroxide solution of at least 250 g/l NaOH content in the cathode compartment of this second-stage cell; the improvement which comprises providing at least one first-stage electrolytic cell consisting of membrane-separated anode and cathode compartments without an intermediate buffer zone and wherein brine is charged to the anode compartment and electrolysis of the brine is conducted in a manner so as to produce in the cathode compartment a dilute sodium hydroxide solution containing about 10–25% by weight sodium hydroxide; charging the dilute sodium hydroxide solution to the cathode compartment of at least one second-stage electrolytic cell in lieu of water, introducing brine in the anode compartment of the second-stage cell, electrolyzing the brine and recovering from the cathode compartment of the second-stage cell a sodium hydroxide solution containing 25–50% by weight sodium hydroxide.

4,076,604

PROCESS FOR THE ELECTROLYTIC TREATMENT OF ALKALI HALIDE

Naohiro Murayama; Kenichi Nakamura; Makoto Fukuda; Teruo Sakagami, and Shirou Suzuki, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 13, 1976, Ser. No. 732,095
Claims priority, application Japan, Oct. 13, 1975, 50-123078; Oct. 29, 1975, 50-130088
Int. Cl.² C25B *1/16, 1/26*
U.S. Cl. 204—98 **6 Claims**



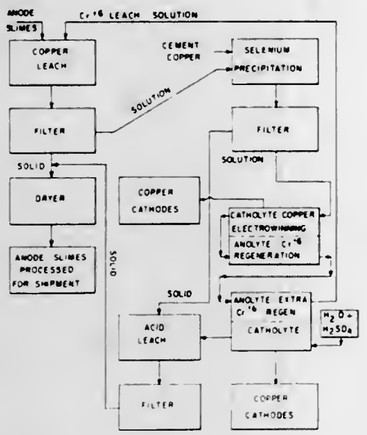
1. In a process for the electrolytic treatment of alkali halide in an electrolytic bath having an anodic chamber, an intermediate chamber and a cathodic chamber arranged in succession and separated from one another by an ion exchange membrane so as to provide low concentration caustic alkali solution from the intermediate chamber and high concentration caustic alkali solution from the cathodic chamber, the improvement comprising selecting said ion exchange membranes so that the membrane arranged between the anodic and intermediate chambers has a higher water penetration capability than that of the membrane arranged between the intermediate and cathodic chambers, the latter membrane having a water penetration capability of from about 1.3–4.0 g/A.h, and forming the high concentration caustic alkali solution in the cathodic chamber without the direct addition of any water to said cathodic chamber, said high concentration caustic alkali solution being produced exclusively from the metal ions and the water which have passed from said intermediate chamber through the ion exchange membrane into said cathodic chamber.

4,076,605

DICHROMATE LEACH OF COPPER ANODE SLIMES

Edward A. Bilson, Inspiration, Ariz., assignor to Inspiration Consolidated Copper Company, Morristown, N.J.

Filed Aug. 26, 1976, Ser. No. 717,910
Int. Cl.² C25C *1/12*; C22B *7/00*
U.S. Cl. 204—108 **8 Claims**



1. A process for the recovery of metal values from copper refinery anode slimes composed largely of copper, selenium, insolubles, and precious metals including silver comprising leaching the slimes with a solution containing from 20 to 200 g/l H_2SO_4 and from 2 to 25 g/l hexavalent chromium at a temperature not exceeding about 80° C., whereby copper dissolution is maximized and selenium and silver dissolution are minimized, separating the leach solution from the undissolved slimes residue, precipitating selenium from the separated leach solution by treatment with metallic copper, and electrowinning copper from the resulting purified solution.

4,076,606

METHOD OF DECOMPOSING NITROGEN OXIDE (NO_x)

Shin Suzuki, Chiba; Kazuo Matsumoto, Obizumi, and Ichiro Nakaoka, Machida, all of Japan, assignors to Kabushiki Kaisha Pollution Preventing Research Laboratory, Tokyo, Japan

Continuation-in-part of Ser. No. 653,258, Jan. 20, 1976, abandoned. This application Aug. 2, 1976, Ser. No. 710,471
Int. Cl.² B01J *1/10*
U.S. Cl. 204—157.1 R **12 Claims**

1. A method for removing NO_x from an effluent gaseous mixture comprising NO_x and N_2 which comprises irradiating said gaseous mixture with microwave radiation at a gas pressure from about 1 to 14 mm Hg whereby the NO_x in said gaseous mixture is decomposed to nitrogen and oxygen.

4,076,607

PROCESS FOR COAL DESULFURIZATION

Peter D. Zavitsanos, 3018 Oak Drive, Norristown, Pa. 19403, and Kenneth W. Bleiler, 223 Crestview Road, Hatboro, Pa. 19040

Filed Dec. 22, 1975, Ser. No. 642,900
Int. Cl.² B10J *1/10*; C10L *9/10*
U.S. Cl. 204—162 R **8 Claims**

1. A process for desulfurization of carbonaceous aggregates containing a relatively high percentage of sulfur, which comprises:
(a) crushing said aggregates to an average particle diameter of a size of about less than 5 centimeters;
(b) irradiating said aggregates with electromagnetic microwave energy for a duration to obtain an average temperature of said aggregates of no more than 150° C to induce chemical reactions to break bonds uniting gaseous elements and sulfur contained in said aggregates;
(c) liberating said sulfur from said aggregate upon forming gaseous compounds.

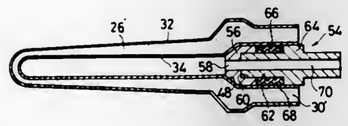
3. A process for desulfurization of carbonaceous aggregates as recited in claim 1 wherein said aggregate is coal.

4,076,608

OXYGEN SENSOR

Takeshi Fujishiro, and Toru Kita, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Nov. 4, 1976, Ser. No. 739,020
Int. Cl.² G01N *27/46*
U.S. Cl. 204—195 S **11 Claims**



1. An oxygen sensor for determining oxygen concentration in a gas mixture, comprising:
a solid-state axially elongated tubular electrolyte having an axial closed end and an axial open end;
first and second electrodes respectively covering the outer and inner surfaces of said electrolyte, said second electrode defining a generally hollow chamber near said open end;
means comprising a metallic holder for stationarily supporting said tubular electrolyte and said first and second electrodes, said holder being in electrical contact with said first electrode;
an electrically conducting annular head member tightly disposed in said chamber;
an electrically conducting elongated member including an elongated section of a diameter smaller than that of said chamber and a radially outwardly raised section of a diameter equal to that of said chamber, said elongated member being inserted into said chamber so that said elongated section to located between said annular head member and said raised section and said raised section is tightly engaged with said inner surface of said tubular electrolyte via said second electrode; and
a corrugated, cylindrical metallic member coaxially disposed around said elongated section, the corrugations thereof being in contact with the outer surface of said elongated section and with the inner surface of said tubular electrolyte via said second electrode.

4,076,609

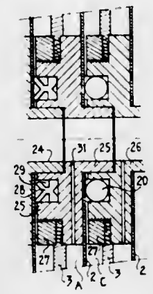
ELECTROLYSIS APPARATUS

Louis Mas, Buc, France, assignor to Societe de Recherches Techniques et Industrielles, Paris, France

Filed Jan. 9, 1976, Ser. No. 647,990
Claims priority, application France, Jan. 14, 1975, 75 00993
Int. Cl.² C25B *1/02, 1/04, 1/08*
U.S. Cl. 204—258 **13 Claims**

1. An electrolysis apparatus formed by a stack of cells containing electrodes each of which is held in a pressure-resistant annular ring, the space between pairs of electrodes within said ring being separated into two compartments by a diaphragm, the said compartments being filled with electrolyte which generates the two gases produced by electrolysis in alternate ones of the compartments, the compartments having passing through them at least three ducts, at least one of which is an infeed duct for the electroyte and the two others are outlet ducts for a mixture of electrolyte and one or other of the gases, the ducts being in communication with respective compartments by means of passages which pass through the ducts, the

assembly of stacked rings being held between two end-plates and compressed by tie-rods; said apparatus comprising a first compression resisting and electrical isolating element cooperating with a second elastic sealing element to form a system separating each ring from adjoining rings, said first element being formed as a first annular ring and from a hard electrical



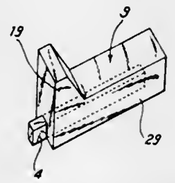
insulating material for electrically insulating adjacent cells from each other and resisting compression forces and said second element being formed as a second annular ring with said first ring from an elastic insulating material which is chemically inert with respect to the electrolyte for sealing said compartments.

4,076,610

CATHODE IN CELLS FOR PRODUCING ALUMINIUM BY ELECTROLYSIS OF SMELTED SALTS THEREOF

Cesare Bizzarri, Terni, Italy, assignor to Elettrocarbonium S.p.A., Milan, Italy

Filed Jul. 10, 1975, Ser. No. 594,703
Claims priority, application Italy, 25258/74
Int. Cl.² C25C *3/06, 7/02*
U.S. Cl. 204—290 R **7 Claims**



1. A cathode of a cell for producing aluminum by electrolysis of smelted salts thereof, prepared by providing a block of a carbonaceous material selected from the group consisting of carbon, graphite and semi-graphite, inserting a current bus-bar into said block and then molding and firing said block in direct contact with said bus-bar to form a cathode with said bus-bar at least partially embedded in said block.

4,076,611

ELECTRODE WITH LANTHANUM-CONTAINING PEROVSKITE SURFACE

Thomas J. Gray, Halifax, Canada, assignor to Olin Corporation, New Haven, Conn.

Filed Apr. 19, 1976, Ser. No. 677,875
Int. Cl.² C25B *11/06, 11/10, 1/34*
U.S. Cl. 204—290 F **11 Claims**

1. An electrode for the electrolysis of aqueous brine comprised of an electroconductive substrate and a perovskite surface of the emperical formula:

$$A\,A'\,B\,O_3 \qquad (I)$$

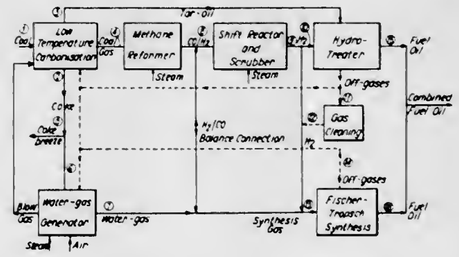
a. wherein A is lanthanum,
b. wherein A' is an alkaline earth metal selected from the group consisting of calcium, strontium, barium, and mixtures thereof,
c. wherein B is a transition metal selected from the group consisting of cobalt, chromium, tungsten, molybdenum, manganese, iron, nickel, rhenium, uranium, and mixtures thereof,
d. wherein the atomic ratio of A:A' is in the range from about 0.05:1 to about 0.95:1, and
e. wherein the valence of A + A' B = 6.

4,076,612

PROCESS FOR OBTAINING LIQUID FUEL-OIL AND/OR GASEOUS HYDROCARBONS FROM SOLID CARBONACEOUS FEED STOCKS

John William Hollaway, Eiffel Flats, Rhodesia, assignor to Rio Tinto (Rhodesia) Limited, Salisbury, Rhodesia

Filed Dec. 9, 1974, Ser. No. 530,557
Claims priority, application Rhodesia, Dec. 7, 1973, 475; May 22, 1974, 201
Int. Cl.² C10G *1/02*; C07C *27/00*
U.S. Cl. 208—8 **10 Claims**



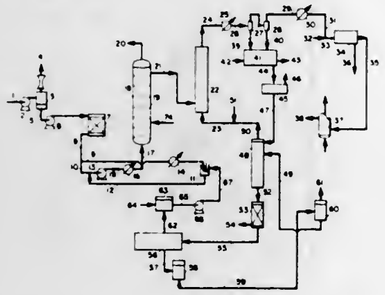
1. In a process of obtaining hydrocarbon fuel-oils from coal, comprising the steps of:
(a) treating the coal by low temperature carbonization at a temperature of 500° – 1000° C to form tar-oil, coal-gas and coke;
(b) passing said coke formed at low temperature direct to a water-gas reaction and producing a gas mixture containing hydrogen and carbon monoxide from the coke by said water-gas reaction;
(c) synthesizing the gas mixture into fuel-oil by a Fischer-Tropsch type synthesis;
(d) treating the coal-gas to form hydrogen and carbon monoxide;
(e) generating a hydrogen stream from the gas produced in step (d) by passing the hydrogen and carbon monoxide through a a water-gas shift reactor and a carbon dioxide scrubber.
(f) adding part of the gas from step (e) to step (c); and
(g) hydrogenating the tar-oil with the remainder of the gas from step (e);
the improvement comprising
(h) adding part of the gas produced in one of steps (b) and (d) to the gas produced in the order of steps (b) and (d), the addition being in the direction (b) to (e) when the amount of hydrogen that would otherwise arrive in (c) is less than twice the amount of carbon monoxide and in the direction (d) to (c) when the amount of hydrogen that would otherwise arrive in (c) is more than twice the amount of carbon monoxide, thereby to make maximum use of the hydrogen contained in the coal and consequently minimize carbon loss due to the water-gas shift reaction occurring in (b) and (e), and to maintain a 2:1 ratio of hydrogen to carbon monoxide in (c).

4,076,613

COMBINED DISULFURIZATION AND CONVERSION WITH ALKALI METALS

Roby Bearden, Jr., Baton Rouge, La., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Apr. 28, 1975, Ser. No. 571,903
Int. Cl.² C10G *13/06*; B01J *27/04*
U.S. Cl. 208—108 **18 Claims**



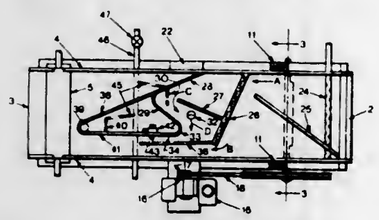
7. A process for the combined desulfurization and hydroconversion of a sulfur-containing residuum feedstock containing at least about 10 weight % materials boiling above about 1,050° F, which comprises contacting said feedstock with a metal selected from the group consisting of the alkali metals and alloys thereof, in a conversion zone, said conversion zone being maintained at a temperature of above about 750° F and in the presence of sufficient added hydrogen to produce a hydrogen pressure of at least about 2000 psig and wherein said alkali metal is present in said conversion zone in an amount such that the alkali metal to feed sulfur mole ratio is maintained at between about 1.0 and 3.0, whereby at least about 50 weight % of said materials boiling above 1,050° F are converted to lower boiling products, whereby the sulfur content of said feedstock is reduced by at least about 50 weight % and further wherein said alkali metal is at least partially converted to alkali metal sulfide in said conversion zone.

4,076,614

INCLINED, VIBRATED, SIFTER AND STRATIFIER WITH GATES

Edmond F. Todd, Suite 202-Block 8, Regency Court, Grande Prairie, Canada

Filed Mar. 1, 1976, Ser. No. 663,126
Claims priority, application Canada, Sep. 13, 1974, 209221
Int. Cl.² B03B *7/00*
U.S. Cl. 209—13 **4 Claims**



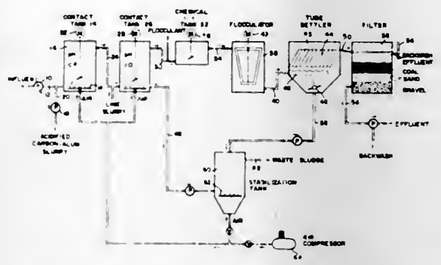
1. An apparatus for separating heavy metal values from granular material comprising an inclined chute having an open bottom end; hopper means in the top end of the chute for receiving granular material; dispensing means above the hopper for dispensing liquid into the hopper; a screen in and normal to the chute and adjacent and downstream of said hopper for receiving coarse portions of said granular material; a first trough downstream of said screen for receiving fines from said granular material; means for flushing light material from said first trough; normally closed gate means in said first trough; a second trough for receiving heavy particulate material from said first trough when the gate means is opened; means for flushing any remaining light material from said second trough; a discharge opening in the bottom of said second trough for discharging heavy metal values remaining in the second trough after flushing of light material therefrom; a shaft pivotally supporting the bottom end of the chute for oscillation of said chute about a horizontal axis; an eccentric shaft supporting the top end of said chute; and drive means rotating said eccentric shaft for imparting said oscillation to said chute.

4,076,615

PROCESS AND SYSTEM FOR TREATING WASTE WATER

Douglas E. Olesen, Kennewick, and Alan J. Shuckrow, Pasco, both of Wash., assignors to Battelle Pacific N. W. Laboratories, Richland, Wash.

Continuation of Ser. No. 446,308, Feb. 27, 1974, abandoned.
This application Oct. 6, 1975, Ser. No. 619,628
Int. Cl.² C02C *5/04*
U.S. Cl. 210—5 **7 Claims**



1. An improved process for the removal and degradation of dissolved organic pollutants in waste water containing such using a combined powdered, activated carbon/aerated biological treatment process with relatively short retention time, comprising:

1. contacting an influent waste water stream containing the organic pollutants in an aerated contact vessel with an oxygen-containing gas and a slurry containing an acidified mixture of powdered, activated carbon and alum for adsorption of organic pollutants in the waste water on the carbon and coagulation of the adsorbed carbon particles by the alum, the activated carbon and alum added in amounts to the influent waste water stream to give at least 50 mg/l carbon and 100 mg/l alum,
2. adjusting to the pH of the treated influent waste water stream to cause precipitation of the alum as aluminum hydroxide,
3. adding a polyelectrolyte flocculant to the treated influent waste water stream as an aid in effecting solid-liquid separation,
4. effecting solid-liquid separation into sludge and a supernatant,
5. aerating the sludge by discharge of an oxygen-containing gas therethrough for metabolism of the adsorbed organics therein,
6. thermally regenerating a portion of the sludge to oxidize the organics absorbed on the carbon contained in the sludge for reactivation of the carbon and to convert aluminum hydroxide contained in the sludge to alumina,
7. recycling a part of the aerated sludge to the aerated contact basin for contact with the influent waste water stream,
8. acidifying another part of the thermally regenerated sludge with sulfuric acid to convert the alumina therein to alum, and

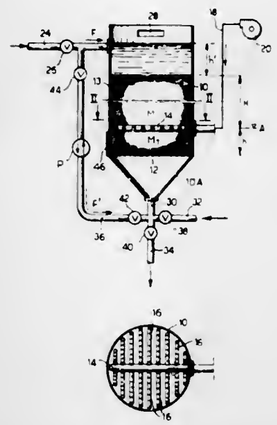
9. recycling the acidified and thermally regenerated sludge portion containing reactivated carbon and alum for contact with the incoming influent wste water stream.

4,076,616

PROCESS FOR THE BIOLOGICAL PURIFICATION OF SEWAGE

Luigi Verde, via S. Maria Mazzarello, 30/9, Turin, Italy

Filed Jun. 11, 1976, Ser. No. 695,297
Claims priority, application Italy, Jun. 12, 1975, 68517/75
Int. Cl.² C02C *1/02*
U.S. Cl. 210—17 **6 Claims**



1. A process for the biological purification of sewage by percolation through a submerged fixed bed of activated carbon under aerobic conditions, wherein:

(a) the particle size of the bed of activated carbon is between 1.5 and 8mm;
(b) oxygenation air is blown into the carbon bed at an intermediate level, in order to oxygenate directly only the mass of carbon disposed above the said intermediate level;
(c) the linear velocity of the water through the bed does not exceed 2 m/hour;
(d) the water remains in contact with the mass of carbon above the intermediate level for a time of contact of at least 30 minutes;
(e) the said intermediate level is such that, under the said operating conditions, a lower layer of the mass of carbon below the said intermediate level is substantially free of active colonies of bacteria.

4,076,617

SONIC CAVITATION AND OZONATION OF WASTE MATERIAL

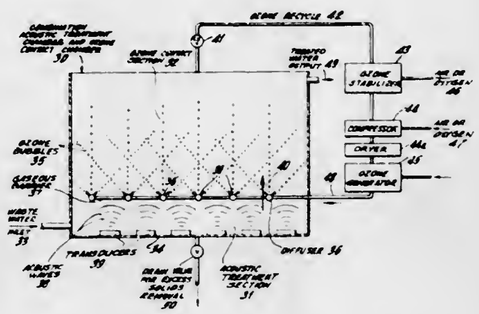
David Bybel, N. Bellmore; Richard F. Furey, Brentwood, and Donald P. Stahl, N. Bellmore, all of N.Y., assignors to TII Corporation, Lindenhurst, N.Y.

Continuation of Ser. No. 575,505, May 8, 1975, abandoned, which is a continuation of Ser. No. 470,452, May 16, 1974, abandoned, which is a continuation of Ser. No. 384,242, July 31, 1973, abandoned, which is a continuation of Ser. No. 136,404, April 22, 1971, abandoned. This application Jan. 17, 1977, Ser. No. 760,005
Int. Cl.² C02B *1/78, 1/38, 3/08*
U.S. Cl. 210—19 **18 Claims**

1. A process for combined acoustic treatment and ozonation of liquid waste material, comprising the steps of, placing the waste material in a vessel,

providing the vessel with diffusers that emit gaseous bubbles thereinto, said diffuser causing said bubbles to cover at least 90 percent of the cross-sectional area of the vessel so as to divide the vessel by a gaseous barrier into a generally lower acoustic treatment section with a generally upper ozone contact section,

initially placing said waste material into the acoustic treatment section, imparting acoustic energy to said material in



said section at an energy level sufficient to cavitate and to emulsify said waste material,

transferring said cavitated liquid to said ozone contact section, and diffusing a gas stream containing 0.5 to 10% ozone into said ozone contact section.

4,076,618

TREATMENT OF LIQUIDS CONTAINING COMPLEXED HEAVY METALS AND COMPLEXING AGENTS

Rudolph J. Zeblisky, Hauppauge, N.Y., assignor to Photocircuits Division of Kollmorgen Corporation, Glen Cove, N.Y.

Filed Jul. 9, 1976, Ser. No. 703,969
Int. Cl.² B01D *15/04, 15/06*
U.S. Cl. 210—30 R **34 Claims**

14. A method of separating alkali metal salt by-products of an electroless copper deposition bath from an alkanolamine complexing agent and a complex species of copper complexed with an alkanolamine complexing agent in an alkaline electroless copper deposition bath, said method comprising:

a. lowering the pH of said alkaline bath or alkaline effluent thereof to less than 11, to render said alkanolamine-complexed copper and said alkanolamine complexing agent extractable by an ion exchange medium;
b. contacting the pH-adjusted bath liquid of step (a) with an ion exchange medium capable of extracting said alkanolamine-complexed copper and said alkanolamine complexing agent from the pH-adjusted bath liquid, said ion exchange medium being selected from the group consisting of cation exchange resins and chelating exchange resins;
c. removing from said exchange medium a bath liquid comprises alkali metal salt by-products and which is substantially free of said alkanolamine-complexed copper and said alkanolamine complexing agent;
d. removing said alkanolamine-complexed copper and said alkanolamine complexing agent from the exchange medium, and
e. returning said alkanolamine-complexed copper and said alkanolamine complexing agent to an alkaline electroless metal deposition bath.

4,076,619

HYDROPHILIC ACRYLIC POLYMERS AS MARINE FILTERS, ALGAE GROWTH CATALYSTS, AND BREEDING STIMULUS FOR FISH AND INVERTEBRATES

Kenneth A. Howery, South Orange, N.J., assignor to Polymetrics International Inc., New York, N.Y.

Continuation-in-part of Ser. No. 627,384, Oct. 30, 1975, abandoned. This application May 9, 1977, Ser. No. 795,193
Int. Cl.² B10D *15/00*; C02B *1/14*
U.S. Cl. 210—36 **6 Claims**

1. An aqueous system comprising a body of water constituting the habitat of fish and invertebrates, water contacting means within said body of water, said water contacting means comprising a material formed from a composition consisting of 48 to 62 weight percent water; 10 to 18 weight percent of an aqueous solution containing 70 weight percent of a polymer consisting essentially of 60–95 weight percent of at least one alkylacrylate or alkylmethacrylate and 5–40 weight percent acrylic acid; 14 to 22 weight percent of a forty percent by weight solids, prepolymer solution; 2.5 to 7.2 weight percent of a 3 percent by volume ammonia solution; and 3.5 to 7.2 weight percent of an epoxy resin; said contacting means functioning to selectively absorb toxic marine life waste materials from said body of water.

3. A water contacting material for improving the fish and invertebrate life maintaining chemical balance within a body of water constituting the habitat of fish and invertebrates, said material being formed from a composition consisting of 48 to 62 weight percent water; 10 to 18 weight percent of an aqueous solution containing 70 weight percent of a polymer consisting essentially of 60–95 weight percent of at least one alkylacrylate or alkylmethacrylate and 5–40 weight percent acrylic acid; 14 to 22 weight percent of 40 percent by weight solids, prepolymer solution; 2.5 to 7.2 weight percent of a 3 percent by volume ammonia solution; and 3.5 to weight 7.2 percent of an epoxy resin; said contacting material functioning to selectively absorb toxic marine life waste materials from said body of water.

5. The process for improving the fish and invertebrate life sustaining chemical balance within a body of water constituting the habitat of fish and invertebrates, said process comprising the step of contacting said water with a material formed from a composition consisting of 48 to 62 weight percent water; 10 to 18 weight percent of an aqueous solution containing 70 weight percent of a polymer consisting essentially of 60–95 weight percent of at least one alkylacrylate or alkylmethacrylate and 5–40 weight percent acrylic acid; fourteen to twenty-two weight percent of a forty percent solids, prepolymer solution; 2.5 to 7.2 weight percent of an epoxy resin; said material functioning to selectively absorb toxic marine life waste materials from said body of water.

4,076,620

PROCESS FOR THE DISPOSAL OF SEWAGE

Robert E. Opferkuch, Jr., Kettering, Ohio, and George M. Wong-Chong, Ithaca, N.Y., assignors to Monsanto Research Corporation, St. Louis, Mo.

Continuation of Ser. No. 200,827, Nov. 22, 1971, abandoned, which is a continuation-in-part of Ser. No. 103,658, Jan. 4, 1971, abandoned. This application Oct. 15, 1973, Ser. No. 406,725
Int. Cl.² C02C *1/40*
U.S. Cl. 210—45 **4 Claims**

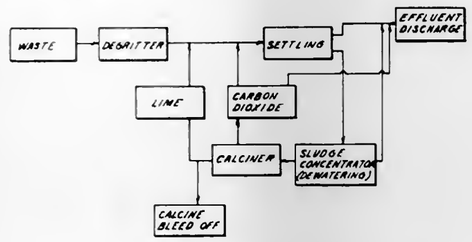
1. A high rate process for treating sanitary sewage which comprises the steps of:

a. removing from the raw sewage objects injurious to equipment in subsequent steps;

b. adding sufficient lime to the raw sewage to exceed a 1:1 weight ratio of lime to the chemical oxygen demand, but not less than 500 parts per million lime, the amount of lime being sufficient to permit the sewage to be treated including carbonation in step (C) and separation of step (d) is not more than 30 minutes with the separated effluent having a Jackson Turbidity of less than 50;

c. immediately treating the limed sewage with carbon dioxide to reduce the pH of the sewage to about 10.6 to about 11.2;

d. permitting the solids in the carbonated, limed sewage to settle and separating the solids and liquid effluent in not more than 30 minutes from lime treatment in step (b);



e. concentrating the solids to remove additional fluids;

f. combining the effluent from the solids concentration step with the effluent from the settling step; and

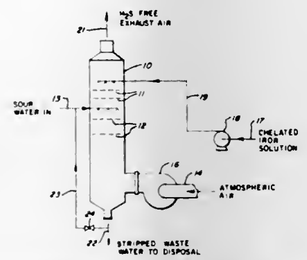
g. treating the combined effluents with carbon dioxide to reduce the pH of the treated effluents to about 6 to 8, and thereafter discharging the effluents.

4,076,621

CHELATE OXIDATION OF HYDROGEN SULFIDE IN SOUR WATER

Leslie C. Hardison, Barrington, Ill., assignor to Air Resources, Inc., Palatine, Ill.

Filed Mar. 15, 1976, Ser. No. 667,111
Int. Cl.² C02B *1/18*
U.S. Cl. 210—60 **9 Claims**



1. A process for treating sour water to remove hydrogen sulfide therefrom, which comprises:

introducing sour water into an intermediate portion of a treating tower between upper and lower contact zones thereof, and passing the sour water downwardly through said lower contact zone;

introducing air into the lower portion of said tower and passing the air upwardly through said lower contact zone countercurrently to said sour water, thereby stripping hydrogen sulfide gas from said sour water;

introducing an aqueous chelated iron solution into said tower above said upper contact zone, and passing said solution downwardly through said upper contact zone;

passing the evolved gas containing hydrogen sulfide and air from said lower contact zone upwardly through said upper contact zone countercurrently to said solution, whereby said solution removes hydrogen sulfide from the gas and oxidizes it to sulfur;

discharging the treated gas from the upper portion of said tower;

passing said solution downwardly from said upper contact zone through said lower contact zone wherein said solution mixes with the sour water introduced thereto and whereby said solution oxidizes residual dissolved hydrogen sulfide in said sour water to sulfur;

said air passing upwardly through said lower contact zone and through said upper contact zone functioning to oxidize said chelated iron solution and maintain its activity; and

withdrawing from the lower portion of said tower an aqueous stream comprising the treated sour water, said chelated iron solution, and sulfur solids.

4,076,622

MICROBIOCIDAL MACRORETICULAR ION EXCHANGE RESINS, THEIR METHOD OF PREPARATION AND USE

C. Richard Costin, Jenkintown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Jun. 22, 1976, Ser. No. 698,626
Int. Cl.² C02B *3/10*
U.S. Cl. 210—64 **9 Claims**

1. A microbiocidal composition which comprises a large pore macroreticular strong base anion exchange resin containing quaternary ammonium groups, wherein the average critical dimension of the macroreticular anion exchange pore is in the range of from about 8,000 A to about 500,000 A which contains a physically bound silver chloride microbiocide.

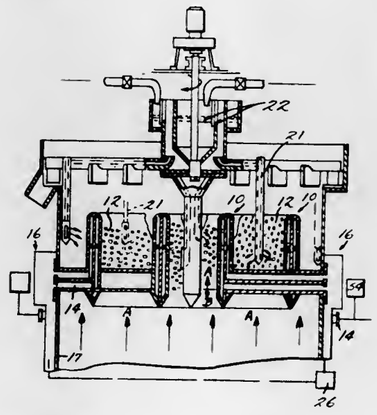
2. A method of purifying microbially contaminated water which comprises passing said contaminated water through a microbiocidal composition according to claim 1.

4,076,623

CONTINUOUS OSCILLATION OF LIQUID SEPARATOR

Stefan Golston, Bellevue, Ohio, assignor to Kamyr, Inc., Glens Falls, N.Y.

Filed Dec. 7, 1976, Ser. No. 748,286
Int. Cl.² B01D *33/00*
U.S. Cl. 210—77 **11 Claims**



1. Apparatus for effecting separation of a liquid from a suspension of finely comminuted fiber material and the liquid, which suspension is flowing in a first direction, including at least one non-rotatable screen member having an apertured face thereof disposed in the flow of suspended fiber material and having a conduit leading away from said face to an area remote from said flow to remove separated liquid from the flow, and apparatus for moving the screen member with respect to the flowing suspension both generally in the first direction and in a second direction opposite the first direction, wherein the improvement comprises

said apparatus for moving said screen member comprising oscillating means for continuously oscillating the screen member said oscillating means further comprising frequency inducing means which functions to produce a frequency below the natural frequency of said apparatus, and amplitude inducing means which functions to produce an amplitude larger than the apertures in the face of said screen member; from a middle position with substantially the same average speed in both the first and second directions so that fiber mat build-up on said screen face does not take place during movement of said screen face either in said first or said second directions, so as to essentially eliminate backflushing through said face while said screen is oscillating.

7. A method for effecting separation of a liquid from a suspension of finely comminuted fiber material and the liquid comprising the steps of establishing flow of said suspension in a first direction, contacting the flowing suspension with at least one non-rotatable screen member having an apertured face and having a conduit leading away from the face to an area remote from said flow, removing separated liquid from the flow through said conduit, and moving said screen member alternately generally in said first direction and in a second direction opposite said first direction, wherein the improvement comprises

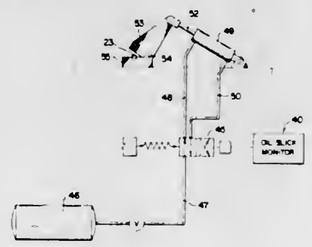
effecting said screen-moving step by continuously oscillating said screen member with an oscillating means; the oscillating means comprising frequency inducing means which functions to vibrate at least said screen member at a frequency below the natural frequency of said screen member, and amplitude inducing means which functions to produce an amplitude larger than the apertures in the face of said screen member; from a middle position with substantially the same average speed in both the first and second directions so that fiber mat build-up on said screen face does not take place during movement of said screen face either in said first or said second directions, so as to essentially eliminate backflushing through said face while said screen is oscillating.

4,076,624

SELF-DEPLOYING BOOM

Peter John Tolan, Scituate, Mass., assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jan. 28, 1977, Ser. No. 763,400
Int. Cl.² E02B *15/04*
U.S. Cl. 210—96 R **8 Claims**



1. An apparatus for controlling a spill of liquid pollutant on a body of water having a current, comprising: a flexible elongated longitudinally extending flotatable boom, said boom having a pair of spaced ends, a tow line having a pair of ends, one end of said towline secured to one portion of said boom intermediate the ends thereof to fold said boom into a pair of parallel elongated portions by the current retaining means located upstream of said boom, the other end of said tow line secured to said retaining means to secure said boom in said folded condition, a pair of spaced mooring blocks located in said body of water, one of said ends of said boom being secured to one of said mooring blocks by a mooring line, the other one of said ends of said boom being secured to the other one of said mooring blocks, sensing means mounted on said retaining means operative to monitor for a liquid pollutant in such cur-

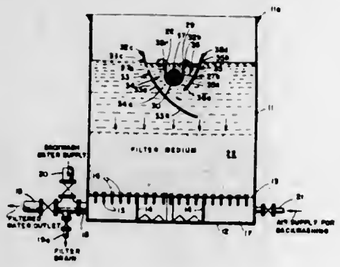
rent and provide an output signal in response to pollutant in said current, and cutting means mounted on said retaining means operative to sever said tow line in response to said signal from said sensing means to deploy said flexible extending flotatable boom.

4,076,625

BAFFLE AND WASH TROUGH ASSEMBLY FOR GRANULAR-MEDIA FILTERS

John James Scholten, and James Clinton Young, both of Ames, Iowa, assignors to General Filter Company, Ames, Iowa

Filed Jan. 16, 1976, Ser. No. 649,902
Int. Cl.² B01D *23/24*
U.S. Cl. 210—274 **14 Claims**



1. Water filtration apparatus of the kind providing a vertically-extending tank having a filter medium bed of granular filtering material supported in the lower portion thereof, and means for washing said bed, said washing means including means for passing water upwardly through said bed and additional means for increasing the agitation of said filter material while said wash water is passed therethrough, wherein the improvement comprises at least one baffle and wash trough assembly for reducing filtering material loss during washing, comprising:

a. a wash water collection trough supported in said tank to extend horizontally across the upper portion thereof, said trough having upwardly-extending side portions and an upper edge on at least one side thereof functioning as an overflow weir, the lower portion of said trough converging downwardly and inwardly from each side thereof; and

b. substantially imperforate baffle means supported adjacent each weir-providing side of said trough in spaced relation thereto and extending horizontally along the adjacent weir edge, each baffle means having an upwardly concave arcuate portion in opposed relation to said trough lower portion on the adjacent side thereof, said baffle means also including a portion extending below said trough and a portion extending to a level above the adjacent weir edge, each baffle means providing an open-bottom restricted flow channel into said trough for backwash water, said lower and upper portions of said baffle means merging smoothly with said opposed arcuate portion.

4,076,626

HIGH STRENGTH CAST MODULES FOR SUPPORTING REVERSE OSMOSIS MEMBRANES

Joseph F. Meier, Export, and James D. B. Smith, Wilkins Township, Allegheny County, both of Pa., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jan. 19, 1976, Ser. No. 650,357
Int. Cl.² B01D *31/00*
U.S. Cl. 210—496 **10 Claims**

7. A rigid, hollow, porous, strongly consolidated reverse osmosis membrane support module having a wall containing bonded, resin coated filler, wherein the resin is the cured reaction product of a 100% solids, solventless, latent catalyzed epoxy resin composition consisting essentially of:

1. one part of liquid epoxy resin,

2. from about 0.75 to about 1.55 parts of liquid organic acid anhydride curing agent,

3. from about 0.25 to about 0.95 part of liquid diepoxide reactive diluent, and

4. from about 0.0001 to about 0.0025 part of a latent catalyst selected from the group consisting of quaternary ammonium salts, quaternary phosphonium salts and quaternary arsonium salts,

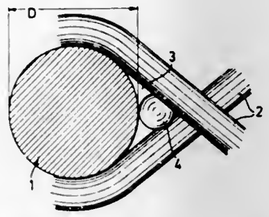
wherein the resin constitutes from about 1 to about 18 percent of the resin coated filler weight, the filler comprises particles having a granular structure and an average particle size between about 40 microns and about 500 microns, the inside of said wall supporting a reverse osmosis membrane.

4,076,627

MESH WEAVE FILTER

Dieter Friedrichs, 47 Eichendorffstrasse, Neu-Ehrenfeld, Germany

Filed Nov. 10, 1975, Ser. No. 630,238
Claims priority, application Germany, Nov. 16, 1974, 2454390; Jul. 12, 1975, 2531222
Int. Cl.² B01D *39/10*
U.S. Cl. 210—499 **8 Claims**



1. In a filter fabric composed of single strand filaments consisting of filaments disposed in a first system intersecting with a second system,

the filaments in said first system being thicker than the filament in said second system,

said first system consisting of a plurality of mutually equidistantly spaced filaments,

the axes whereof lies substantially in a common plane, said second system consisting of a plurality of filaments disposed in substantially sinusoidal form,

adjacent filaments in said second system being juxtaposed in contact with each other substantially at 0° and 180° points on said sinusoidal curve,

said mutually adjacent filaments being displaced exactly out of phase to provide interstices of equal cross-sectional area and shape therebetween,

said second system interacting with said first system in a manner that the filaments of said first system are embraced in the interstices formed between the filaments of said second system,

the apertures in said filter fabric having substantially triangular cross-section, the sides of said triangle being defined by the inner edges of any predetermined adjacent pair of thinner filaments and the corresponding thicker filament embraced in the interstices therebetween, said thinner filaments being designated as having a diameter *d*, said thicker filaments being designated as having a diameter D and the pitch between the axes of said thicker filaments being designated as *t*, the filter gauge of said filter fabric being defined as the diameter of the sphere to which all the edges of said triangular aperture formed by said two thinner and one thicker filaments are tangential, the diameter of said sphere being designated as μ, the improvement which comprises

providing the maximum distance between the mutually facing surfaces of any predetermined pair of adjacent mutually contacted, out of phase, thinner filaments of said second system, between which a thicker filament of said first system is disposed, designated as H, is greater than the cross-sectional width, designated as B, of said thicker filament measured in the common plane of axes of said first system of thicker filaments,

providing the filaments in such a relationship that *d* is between 0.7 μ and 1.2 μ, **and 1.2 μ, and the relationship between the pitch-spacing of the thicker filaments** *t* to the diameter of the thicker filaments D corresponds to the following Table:

Where D is:	then *t* is:
2 to 2.5 times μ	7.15 to 6.8 times μ
2.5 to 3 times μ	6.8 to 7.1 times μ
3 to 3.5 times μ	7.1 to 7.35 times μ
3.5 to 4 times μ	7.35 to 7.7 times μ.

4,076,628

DRILLING FLUID COMPOSITIONS AND METHODS OF PREPARING SAME

Richard L. Clampitt, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 372,825, June 22, 1973, Pat. No. 3,921,733, which is a continuation-in-part of Ser. No. 224,914, Feb. 9, 1972, abandoned. This application Oct. 8, 1975, Ser. No. 620,728
The portion of the term of this patent subsequent to Sep. 30, 1992, has been disclaimed.
Int. Cl.² C09K *7/02*
U.S. Cl. 252—8.5 C **22 Claims**

1. A water-base drilling fluid useful in drilling a well, comprising:

water having an initial total dissolved solids content which is not greater than about 40,000 ppm by weight;

a water thickening amount, within the range of from 0.0025 to 5 weight percent based upon the weight of said water, of a water dispersible polymer selected from the group consisting of: polyacrylamides and polymethacrylamides wherein up to about 75 percent of the carboxamide groups are hydrolyzed to carboxyl groups; previously crosslinked polyacrylamides and previously crosslinked polymethacrylamides wherein up to about 75 percent of the carboxamide groups are hydrolyzed to carboxyl groups; polyacrylic acid and polymethacrylic acid; polyacrylates; polymers of N-substituted acrylamides wherein the nitrogen atoms in the carboxamide groups have from 1 to 2 alkyl substituents which contain from 1 to 4 carbon atoms, and wherein up to about 75 percent of the carboxamide groups are hydrolyzed to carboxyl groups; copolymers of acrylamide or methacrylamide with another ethylenically unsaturated monomer copolymerizable therewith, sufficient acrylamide or methacrylamide being present in the monomer mixture to impart said water-dispersible properties to the resulting copolymer when it is mixed with water, and wherein up to about 75 percent of the carboxamide groups are hydrolyzed to carboxyl groups; and mixtures of said polymers;

an amount, within the range of from 0.05 to 60 weight percent based upon the weight of said polymer, of a water-soluble compound of chromium selected from the group consisting of ammonium chromate, ammonium dichromate, the alkali metal chromates and dichromates, chromium trioxide, and mixtures thereof, wherein the chromium present is capable of being reduced from +6 valence to +3 valence, and which amount is sufficient to cause gelation of said water containing said polymer when the valence of at least a portion of said chromium is reduced to said lower valence state;

an amount of a water-soluble reducing agent selected from the group consisting of hydroquinone, sodium sulfide, sodium hydrosulfite, sodium metabisulfite, potassium sulfite, sodium bisulfite, potassium hydrosulfrite, potassium metabisulfite, sodium sulfite, sodium thiosulfate, ferrous sulfate, hydrogen sulfide, ferrous chloride, p-hydrazinobenzoic acid, hydrazine phosphite, hydrazine dihydrochloride, thioacetamide, and mixtures thereof, and which is effective to reduce at least a portion of said chromium to said lower valence state and cause said gelation, said amount being within the range of from 0.1 to about 200 percent of the stoichiometric amount required to reduce said chromium to said lower valence state; and

sufficient suspended finely divided solids to form a filter cake on the wall of said well.

4,076,629

SOLVENT SOLUBLE WARP SIZE

Gerald P. Beaumont, and William C. Jones, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 28, 1976, Ser. No. 691,130
Int. Cl.² D06M *15/26, 15/32*; C08F *112/08, 114/02*
U.S. Cl. 252—8.6 **10 Claims**

1. In a resin composition for sizing textile yarns, the improvement wherein said resin composition is a mixture of a chlorinated polyolefin having a crystallinity of less than about 10 percent and about 10–50 percent based on the weight of chlorinated polyolefin of an aromatic hydrocarbon polymer having an average molecular weight of at least about 100,000.

4,076,630

EMULSIFIERS FOR DURABLE FLAME RETARDANT TEXTILE FINISHES

Ray E. Smith, Ann Arbor, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Aug. 5, 1976, Ser. No. 711,771
Int. Cl.² B27K *3/00*
U.S. Cl. 252—8.1 **45 Claims**

1. An aqueous tris-haloaliphatic phosphate emulsion concentrate wherein the emulsifier for said phosphate is a water soluble mono- or bis-haloalkyl ester of phosphoric acid, a water soluble salt of said acid and mixtures thereof, said water comprising from about 1 percent to about 40 percent by weight of the total concentrate.

4,076,631

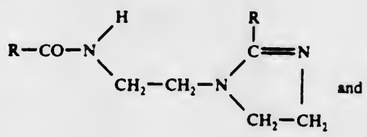
ANTISOILING AND ANTISTATIC TEXTILE TREATING COMPOSITION

Michael G. Caruso, Jamestown, N.C., and Réne A. Eckert, Simpsonville, S.C., assignors to Chas. S. Tanner Co., Greenville, S.C.

Filed Jun. 14, 1976, Ser. No. 692,687
Int. Cl.² D06M *13/34*
U.S. Cl. 252—8.8 **5 Claims**

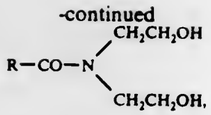
1. A textile treating composition adapted to provide a relatively permanent antistatic and dirt repellent finish and consisting essentially of a nonionic surfactant-containing aqueous dispersion of:

1. about 10% to about 20% of an antistatic agent comprising a mixture of



and

-continued



R being alkyl of 14 to 20 carbon atoms in both formulas

2. about 3% to about 35% of an aqueous dispersion of hard particles having a weight average particle diameter of from about 0.05 micron to about 1 micron;
3. about 1% to about 6% of a fluorine-free inorganic or organic monobasic or polybasic acid;
4. 0% to about 5% of an antimicrobic agent; and
5. about 1% to about 35% of a fluorocarbon agent which provides a low free energy surface, said fluorocarbon being a polymer containing the $-CF_3$ group.

4,076,632

FABRIC SOFTENER

James E. Davis, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 22, 1977, Ser. No. 770,487
Int. Cl.² D06M *13/34, 13/40, 13/46*
U.S. Cl. 252—8.8 **13 Claims**

1. A liquid fabric conditioning composition comprising:

(a) from about 3% to about 12% by weight of the composition of cationic fabric conditioning agents;

(b) from about 0.2% to about 1.3% by weight of the composition of protonated di-polyethoxy monoalkyl amine;

(c) from about 1% to about 6% by weight of the composition of urea; and

(d) water; wherein the weight ratio of urea to protonated di-polyethoxy monoalkyl amine is from about 18:1 to about 3:1.

4,076,633

FABRIC TREATING ARTICLES WITH IMPROVED CONDITIONING PROPERTIES

James B. Edwards, Cincinnati, and Francis L. Diehl, Wyoming, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 18, 1974, Ser. No. 516,051
Int. Cl.² D06M *13/46, 15/04, 15/22, 15/24*
U.S. Cl. 252—8.75 **13 Claims**

1. An article adapted for concurrently softening and conditioning fabrics in an automatic clothes dryer wherein a softener and a water-insoluble particulate material are transferred to fabrics thereby giving the fabrics softening, anti-wrinkling and ease-of-ironing benefits, comprising:

a. a softening amount of a fabric softener characterized by a melting point above about 38° C;

b. a fabric conditioning amount of a substantially water-insoluble particulate material characterized by:

i. an average particle size of from about 1.0 μm to about 50 μm;

ii. a shape having an anisotropy of from about 5:1 to about 1:1;

iii. a hardness of less than about 5.5 on the Mohs scale;

iv. a melting temperature above about 150° C; and

v. substantial freedom from exchangeable calcium and magnesium ions; said softener and said particulate material being in releasable combination with;

c. a water-insoluble dispensing means.

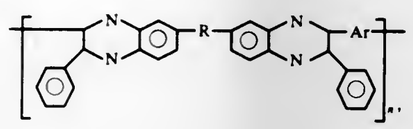
4,076,634

COMPOSITION FOR ANTIFRICTION MATERIAL

Vasily Vladimirovich Korshak, ulitsa Gubkina, 4, kv. 81; Irina Alexandrovna Gribova, ulitsa Vavilova, 12, kv. 31; Alexandr Petrovich Krasnov, prospekt Kalinina, 31, kv. 28; Evgenia Semenovna Krongauz, Leningradsky prospekt, 26, kv. 60; Alla Markovna Berlin, ulitsa Obrucheva, 3, korpus 4, kv. 67; Olga Vladimirovna Vinogradova, 5 Parkovaya ulitsa, 56, korpus 6, kv. 35; Georgy Viktorovich Mamatsashvili, Ierusalimskaya ulitsa, 6, kv. 119; Saga-Silviya Alexandrovna Pavlova, ulitsa Garibaldi, 19, korpus 3, kv. 74; Pelageya Nikolaevna Gribkova, ulitsa Krasny Kazanets, 19, korpus 1, kv. 61; Nina Ivanovna Bekasova, Profsojuznaya ulitsa, 43"B", kv. 15; Ljudmila Grigorievna Komarova, B. Akademicheskaya ulitsa, 53a, kv. 6; Vladimir Dmitrievich Vorobiev, Novocheremushkinskaya ulitsa, 43/30, kv. 152; Irina Vladimirovna Vlasova, ulitsa Veernaya, 3, korpus 5, kv. 300, all of Moscow, and Alexandr Vasilievich Vinogradov, prospekt RKKA, 180, kv. 56, Moskovskaya oblast, Zagorsk, all of U.S.S.R.

Filed Oct. 28, 1975, Ser. No. 626,205
Claims priority, application U.S.S.R., Oct. 28, 1974, 2066134
Int. Cl.² C10M *5/00, 7/00;* F16D *69/00*
U.S. Cl. 252—12 **8 Claims**

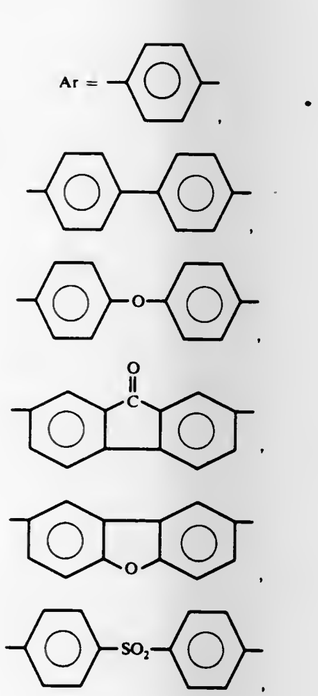
1. A composition for antifriction material, containing from 5 to 98 parts by weight of a polyphenylquinoxaline of the formula:



where

n = 50–300

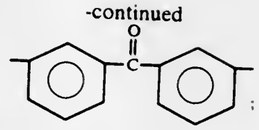
R is a single bond; —O—; $-SO_2-$ or —CO;



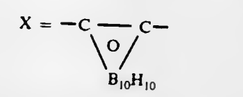
Ar =

or

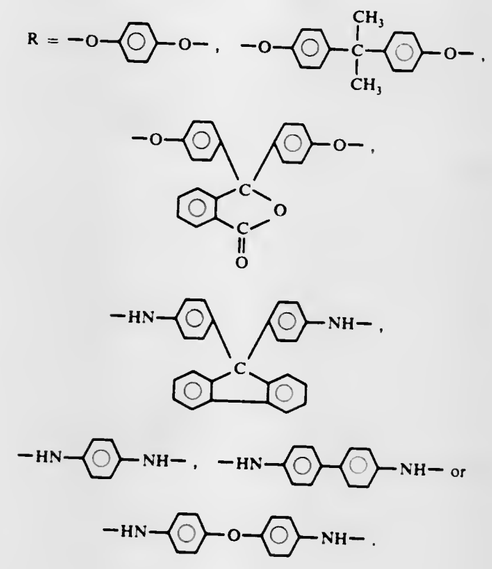
-continued



from 1 to 94 parts by weight of an antifriction filler, selected from the group consisting of powdered graphite, molybdenum disulphide, highly dispersed carbon and mixtures thereof; from 0 to 40 parts by weight of a reinforcing filler selected from the group consisting of powdered metallic copper, silver, nickel, zinc, molybdenum, asbestos and mixtures thereof; and from 0.1 to 10 parts by weight of a modifying dopant selected from the group consisting of terephthalaldehyde, tetranitrile of pyromellitic acid, metal polyphosphinates of the general formula $\{M[OP(RR')O]_x\}_n$ /1/, where M is a bi- or trivalent metal, X=2–3, and R and R′ are each selected from the group consisting of alkyl, cycloalkyl, alkylaryl and aryl, and carborane-containing compounds of the general formula R-X-R /2/, where



or $[-CH_{10}H_{10}C-]-CB_{10}H_{10}C-$ R= —H; $-C_6H_5$; $-CH_2OH$; $-C_6H_5OH$; —COOH, or of the general formula $-OC CB_{10}H_{10}C COR-_n$ /3/, where n = 5–10 for oligomers and n = 200–300 for polymers, while



4,076,635

LUBRICANTS AND THEIR METHOD OF PREPARATION

Bryan Henry Baxter, Stevenage, England, assignor to British Aircraft Corporation Limited, London, England

Filed Aug. 10, 1976, Ser. No. 713,185
Claims priority, application United Kingdom, Aug. 16, 1975, 34181/75
Int. Cl.² C10M *3/18, 5/14, 7/20, 7/24*
U.S. Cl. 252—18 **11 Claims**

1. A lubricant comprising a colloidal form of a metal oxide hydrate,

said metal selected from the group consisting of the elements in the first transition period of the periodic table such that the molecules in the colloid have uncancelled positive ionic charges, and

a fatty acid selected such that each molecule has a negative ionic charge and a chain length of about 16 to 24 carbon molecules;

wherein said fatty acid molecules are combined with said metal oxide hydrate molecules on the surface of the colloidal particles thereby balancing the ionic charges thereof and forming a stable surface layer on the colloidal particles.

5. A method of preparing the lubricant of claim 1 including the steps of forming a suspension of colloidal particles of metal oxide hydrate in a suspending medium, adding the fatty acid to the suspension in a proporation not substantially greater than 20% by weight of the metal oxide hydrate, dispersing the fatty acid such that it combines with a surface region of the colloidal particles, and removing the suspending medium.

4,076,636

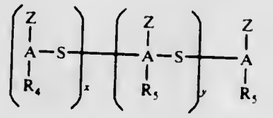
OVERBASED POLYARYLAMINE-ARYLHYDROXY (ALKOXY) SULFIDES AND LUBRICANT COMPOSITIONS CONTAINING SAME

John C. Nnadi, Lagos, Nigeria, assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 2, 1976, Ser. No. 646,126
Int. Cl.² C10M *1/10*
U.S. Cl. 252—25 **13 Claims**

1. An oil-soluble overbased compound obtained by the process comprising

reacting a polyarylamine-arylhydroxy (alkoxy) sulfide having the general chemical formula:



wherein

x is an integer of from 1 to about 10;

y is an integer of from 0 to about 10;

A is an aromatic hydrocarbon moiety;

Z is a radical selected from the group consisting of $-NR_1R_2$ and $-OR_3$;

R_1 and R_2 are alkyl of from 1 to about 10 carbon atoms, aryl, hydrogen,

or combinations thereof;

R′ is alkyl of from 1 to about 10 carbon atoms, aryl or hydrogen;

R_3 is hydrogen, alkyl of from 1 to about 200 carbon atoms, aryl or alkyl-substituted aryl where the alkyl substituent is comprised of from 1 to about 200 carbon atoms;

R_4 is aryl or alkyl-substituted aryl where the alkyl substituent is comprised of from 1 to about 200 carbon atoms;

R_5 is alkyl of from 1 to about 200 carbon atoms, aryl or alkyl-substituted aryl where the alkyl substituent is comprised of from 1 to about 200 carbon atoms

with one or more basic metallic compounds selected from the group consisting of NaOH, LiOH, KOH, $Mg(OH)_2$, $Ca(OH)_2$, $Sr(OH)_2$ and $Ba(OH)_2$

in the presence of CO_2 and methanol.

2. A lubricant composition comprising a major portion of an oil of lubricating viscosity or grease thereof and an oxidation property improving amount of the overbased compound of claim 1.

4,076,637

METAL DISPERSIONS AND METHOD FOR PRODUCING SAME

Gerald L. Hurst, Austin, Tex., assignor to Tyler Corporation, Dallas, Tex.

Filed Sep. 29, 1976, Ser. No. 727,679
Int. Cl.² C10M *1/10, 3/02, 5/02, 7/02*
U.S. Cl. 252—26 **26 Claims**

1. A method of manufacturing a high density metal-containing lubricant comprising:
   a. heating a solid metal and a lubricant fluid which is thermally stable at the melting point of said metal until the metal becomes molten, the lubricant fluid present in an amount effective to maintain a homogeneous dispersion of microspheres of said molten metal;
   b. admixing said molten metal with said lubricant fluid to form a homogeneous dispersion of microspheres of said metal within the lubricant fluid; and
   c. cooling said lubricant fluid containing said molten metal microspheres to thereby solidify said microspheres.

15. A method of manufacturing high density metal-containing lubricant comprising:
   a. heating a solid metal and a carrier fluid which is thermally stable at the melting point of said metal until said metal becomes molten, the carrier fluid present in an amount effective to maintain a homogeneous dispersion of microspheres of said molten metal;
   b. admixing said molten metal with said carrier fluid to form a homogeneous dispersion of microspheres of said molten metal within said carrier fluid and then cooling the resulting mixture to solidify said microspheres;
   c. separating said carrier fluid from the resulting metal microspheres; and
   d. admixing said metal microspheres with a lubricant fluid which is thermally unstable at the melting point of said metal until a homogeneous dispersion results.

4,076,638

OIL-SOLUBLE ALUMINUM COMPOSITIONS

Derek Redmore, Ballwin, and Frederick T. Welge, Webster Groves, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Sep. 22, 1975, Ser. No. 616,174
Int. Cl.² C10M *1/40*
U.S. Cl. 252—33.2 **17 Claims**

1. The process of preparing an oil-soluble aluminum dispersion which comprises reacting alumina with a mixture of oil-soluble sulfonic and carboxylic acids, the mole ratio of sulfonic to carboxylic acids being from about 4:1 to 1:2.

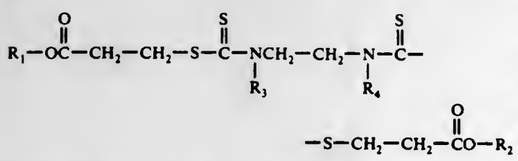
4,076,639

LUBRICANT COMPOSITIONS

Robert F. Bridger, Hopewell, and Ronald J. Cier, East Windsor, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

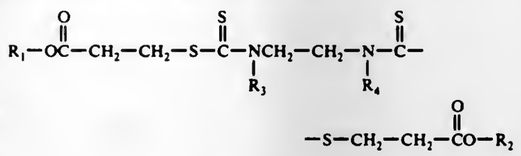
Filed Aug. 30, 1976, Ser. No. 718,699
Int. Cl.² C10M *1/38, 3/32;* **C07C** *153/00, 154/00*
U.S. Cl. 252—47.5 **18 Claims**

1. A lubricant composition containing a major amount of an oil of lubricating viscosity or a grease prepared therefrom and a minor amount sufficient to improve the antiwear properties thereof an alkyl-beta-thiopropionic acid ester having the structure



wherein R_1 and R_2 are alkyl groups straight or branched, containing from 1 to about 30 carbon atoms and R_3 and R_4 are alkyl groups, straight or branched, containing from 1 to about 12 carbon atoms.

11. A method of decreasing wear of bearing surfaces having at least two movable parts, wherein said bearing surfaces are steel or wherein one of said bearing surfaces is steel and another of said bearing surfaces is bronze, which comprises dispersing between said surfaces a lubricant composition characterized by a major amount of an oil of lubricating viscosity or a grease prepared therefrom and a minor amount sufficient to improve the antiwear properties thereof of an alkyl-beta-thiopropionic acid ester having the structure



wherein R_1 and R_2 are alkyl groups, straight or branched, containing from 1 to about 30 carbon atoms and R_3 and R_4 are alkyl groups, straight or branched, containing from 1 to about 12 carbon atoms.

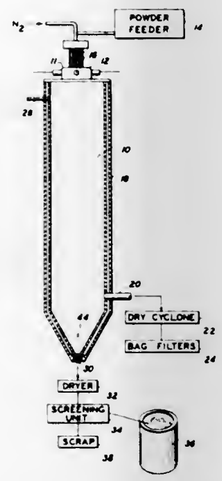
18. Dioctyl 6,9-diaza-6,9-dimethyl-4,11-dithia-5,10-dithio tetradecanoate.

4,076,640

PREPARATION OF SPHEROIDIZED PARTICLES

Rudolph Forgensi, Webster, and Robert J. Hagenbach, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 24, 1975, Ser. No. 552,589
Int. Cl.² C21C *5/52;* **H05B** *7/18*
U.S. Cl. 252—62.1 R **8 Claims**



1. A method of manufacturing spheroidized electrostatographic magnetic carrier beads comprising the steps of providing a substantially closed spheroidization column, purging said spheroidization column with nitrogen, providing said spheroidization column with a carbon arc plasma flame assembly comprising a 400 kw arc head with one cathode and three carbon anodes, energizing said arc head with a DC power supply to provide an electrical current flow of between about 650 and 750 amperes between said cathode and each of said anodes, providing a supply of argon gas to said cathode and a supply of nitrogen gas to said anodes to form a plasma flame having temperatures of up to about 10,000° K, providing a supply of oxygen to said plasma flame at a flow rate of between about 100 and about 200 standard cubic feet per hour, feeding to said plasma flame magnetic raw ore particles selected from the group consisting of magnetite, hematite, taconite, and ilmenite wherein said ore particles have an average particle diameter of from between about 5 microns and about 600 microns and are fed to said plasma flame in the presence of nitrogen carrier gas for said ore particles whereby said ore particles are at least partially melted to form globules thereof, and allowing said globules to fall by gravity in said spheroidization chamber wherein said globules cool and solidify into spheroidized particles having an average saturation magnetic moment of between about 50 and about 85 electromagnetic units per gram.

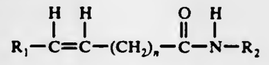
4,076,641

ω-AND CIS ALKENOIC ACID AMIDES IN ELECTROSTATOGRAPHIC DEVELOPERS

Charles G. Scouten, Webster, N.Y., and Willard C. Hamilton, Morganville, N.J., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 3, 1976, Ser. No. 692,257
Int. Cl.² G03G *9/08;* **G03Q** *9/10*
U.S. Cl. 252—62.1 P **6 Claims**

1. An image developing material comprising particles, said particles includng finely divided toner material and a minor proportion based on the weight of said toner material of an additive comprising



where R_1 is H or an alkyl of 1 to about 18 carbon atoms and n is an integer having a value such that the total number of carbon atoms is from about 10 to about 22 and where R_2 is H, phenyl, lower alkyl substituted phenyl, and lower alkyl groups where lower alkyl includes from 1 to about 7 carbon atoms in either branched, straight chained, or cyclic configuration.

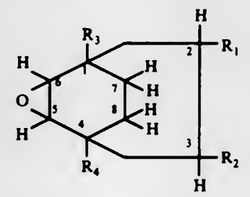
4,076,642

NOVEL MONOEPOXY COMPOUNDS AS ACID SCAVENGERS IN FUNCTIONAL FLUIDS

John F. Herber, St. Louis; William R. Richard, Jr., and Robert W. Street, both of Kirkwood, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

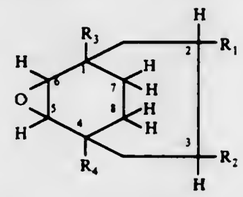
Continuation-in-part of Ser. No. 454,539, Mar. 25, 1974, abandoned. This application May 11, 1976, Ser. No. 685,222
Int. Cl.² C10M *3/40, 3/20, 3/14;* **C07D** *303/12*
U.S. Cl. 252—78.5 **18 Claims**

1. A compound represented by the formula



wherein R_1 is $-(CH_2)_{0-3}-C(O)OR$, $-C(O)R$ or $-CH_2OR$; R is an alkyl radical having from 3 to about 15 carbon atoms; R_2 is R_1, hydrogen or an alkyl radical having from 1 to about 9 carbon atoms; R_3 and R_4 are individually hydrogen or an alkyl radical having from 1 to about 4 carbon atoms.

7. A hydraulic fluid composition comprising
   (A) at least about 50 percent by weight of a base stock material selected from the group consisting of esters and amides of an acid of phosphorus, di- or tricarboxylic acid esters, esters of polyhydric compounds, and mixtures thereof, and
   (B) from about 0.1 to 15 percent by weight of an epoxide compound represented by the structure



wherein R_1 is $-(CH_2)_{0-3}-C(O)OR$, $-C(O)R$, or $-CH_2OR$ where R is an alkyl radical having from 1 to about 18 carbon atoms, R_2 is R_1, hydrogen or an alkyl radical having from 1 to about 9 carbon atoms; R_3 and R_4 are individually hydrogen or an alkyl radical having from 1 to about 4 carbon atoms.

4,076,643

PRE-MIXES INTENDED TO BE ADDED TO DETERGENT POWDERS BY POST-ADDITION

Jacques Brahm, Grimbergen, and Julien Mulders, Dworp, both of Belgium, assignors to Solvay & Cie., Brussels, Belgium

Filed Oct. 9, 1974, Ser. No. 513,501
Claims priority, application Belgium, Nov. 9, 1973, 137587
Int. Cl.² C11D *3/37, 3/20, 11/00*
U.S. Cl. 252—89 R **13 Claims**

1. In a free-flowing pre-mix intended to be post-added to detergent or washing powders, the improvement wherein the pre-mix consists of particles which consist essentially of, in the form of a water-soluble salt, a linear or branched hydroxycarboxylic polymer or copolymer, the main chain of which contains essentially carbon and carries carboxyl and hydroxyl groups in the respective proportion of 1:10 and 20:1, and one or more surface-active agents which are liquid or paste-like at a temperature below 180° C, and supported by said polymer or copolymer, the amount of said surface-active agent being from about 20% to 120% by weight of the amount of said polymer or copolymer.

10. Process for the manufacture of a free-flowing pre-mix of particles intended to be post-added to detergent or washing powders, consisting essentially of mixing a water-soluble salt of a linear or branched hydroxycarboxylic polymer or copolymer, the main chain of which contains essentially carbon and carries carboxyl and hydroxyl groups in the respective proportions of 1:10 to 20:1, with one or more surface-active agents which are liquid or paste-like at a temperature below 180° C to form a mixture, and then granulating the mixture.

4,076,644

STORAGE STABILE POLYOL-CHLOROFLUOROALKANE COMPOSITION

James Gordon Burt, Oxford, Pa., and Howard Elliot Phillips, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 8, 1976, Ser. No. 647,562
Int. Cl.² C08G *18/14;* **C08K** *5/02*
U.S. Cl. 252—182 **1 Claim**

1. A mixture comprising polyol suitable for polyurethane foam preparation and about from 1 to 40 parts by weight per 100 parts by weight of polyol, of $CHCl_2CF_3$.

4,076,645

CHEMICAL LIGHTING PROCESS AND COMPOSITION

Mary-Louise Vega, Califon, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jan. 10, 1977, Ser. No. 758,253
Int. Cl.[2] C09K *11/00*
U.S. Cl. 252—188.3 CL 5 Claims

1. In a process for generating chemiluminescence comprising reacting bis(6-carbopentoxy-2,4,5-trichlorophenyl) oxalate with a peroxide component in a suitable diluent in the presence of a 9,10-bis(phenylethynyl)anthracene the improvement which comprises carrying out the reaction in sufficient diluent to provide an initial concentration of bis(6-carbopentoxy-2,4,5-trichlorophenyl)oxalate of about 0.05 to about 0.09 mole per liter of reaction mixture.

4,076,646

LIQUID CRYSTAL COMPOSITION FOR FIELD EFFECT DISPLAY DEVICES

Fumio Nakano; Hisao Yokokura, and Kenji Murao, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 8, 1976, Ser. No. 721,410
Claims priority, application Japan, Sep. 12, 1975, 50-110105
Int. Cl.[2] C09K *3/34;* G02F *1/13*
U.S. Cl. 252—299 7 Claims

1. A liquid crystal composition for field effect display devices, which comprises a nematic liquid crystal composition having a positive dielectric anisotropy and at least one of o-terphenyl and m-terphenyl.

4,076,647

OPTICAL GLASS

Marga Faulstich, Mainz, and Franz Reitmayer, Drais, both of Germany, assignors to Jenaer Glaswerk Schott & Gen., Mainz, Germany

Filed Jul. 22, 1975, Ser. No. 598,137
Claims priority, application Germany, Jul. 24, 1974, 2435554
Int. Cl.[2] C09K *11/42, 11/46;* C03C *3/16*
U.S. Cl. 252—301.4 P 6 Claims

1. Optical glass with a path length substantially independent of temperature and optical properties within the range: n_e = 1.59 to 1.65, and ν_e = 55 to 46, of which the value $Ge_{abs} \times 10^6$/° C is not more than 2.0 and the coefficient of expansion $\alpha \times 10^7$/° C is not more than 123 in the temperature range −30° to 70° C, said glass having a modulus of elasticity (kp/cm²) of between 5600 and 4600, a Poisson's ratio of between 0.270 and 0.300, and consisting essentially of, in weight percent:

P_2O_5 = 40 to 55
BaO = 25 to 54
Nb_2O_5 = 6 to 12
SiO_2 = 0 to 5
B_2O_3 = 0 to 5
K_2O = 0 to 4
MgO = 0 to 5
CaO = 0 to 15
ZnO = 0 to 5
PbO = 0 to 8
CdO = 0 to 15
Sb_2O_3 = 0 to 15
Nd_2O_3 = 0 to 10
Al_2O_3 = 0 to 3
La_2O_3 = 0 to 5
ZrO_2 = 0 to 2
Ta_2O_5 = 0 to 5
WO_3 = 0 to 3

with the sum of the alkaline earth oxides + Nb_2O_5 at least 46% by weight.

4,076,648

SELF-DISPERSIBLE ANTIFOAM COMPOSITIONS

Meyer Robert Rosen, Spring Valley, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jun. 1, 1976, Ser. No. 691,395
Int. Cl.[2] B01D *19/04*
U.S. Cl. 252—358 12 Claims

1. A non-aqueous silicone antifoam composition consisting essentially of a lipophilic nonionic surface active agent having a hydrophilic-lipophilic balance value of up to about 10 homogeneously dispersed in a non-emulsified hydrophobic diorganosiloxane antifoam agent, wherein said surface active agent is selected from the group consisting of organic surface active agents and siloxane surface active agents consisting essentially of siloxy units of the formula $R_3SiO_{0.5}$, R_2SiO and $[R'''(R'')_nR']Si(R)O$ wherein R is a methyl radical, R' is a divalent propylene radical, R'' is an oxyalkylene group, R''' is an alkoxy radical of 1 to 4 carbon atoms and *n* is an integer, and wherein the amount ratio of said surface active agent to said antifoam agent ranges from about 0.2 to about 25 parts by weight of the surface active agent per 100 parts by weight of the antifoam agent.

4,076,649

PRODUCTION OF N-ALKYLATED AMINES AND CATALYST THEREFOR

Seymour Baron, Wayne, N.J., assignor to Hexcel Corporation, Dublin, Calif.

Filed Apr. 2, 1976, Ser. No. 673,142
Int. Cl.[2] B01J *27/02;* C01B *17/96;* C07C *87/00*
U.S. Cl. 252—440 4 Claims

1. A process for preparing a catalyst comprising an inert carrier impregnated with thorium sulfate, which comprises contacting said inert carrier with an aqueous solution of thorium nitrate to impregnate the inert carrier with thorium nitrate, heating the thus impregnated carrier to a temperature above about 150° C. for a time sufficient to allow said thorium nitrate to be converted to thorium oxide, and reacting said thorium oxide with sulfur trioxide to convert the thorium oxide to thorium sulfate.

2. A process for preparing a catalyst comprising an inert carrier impregnated with thorium sulfate, which comprises contacting the inert carrier with an aqueous solution of thorium nitrate to impregnate the inert carrier with thorium nitrate, heating the carrier to a temperature below the decomposition temperature of thorium nitrate to remove water therefrom, and converting the thorium nitrate to thorium sulfate by contacting the carrier impregnated with thorium nitrate with a mixture of concentrated sulfuric acid and an organic solvent, the ratio by volume of sulfuric acid to organic solvent being in the range of from about 5:1 to about 20:1.

4,076,650

CATALYST SYSTEM FOR FLAME RETARDANT FINISHING

Harold McDonald, Harrington Park, N.J., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Mar. 1, 1976, Ser. No. 662,474
Int. Cl.[2] B01J *27/02*
U.S. Cl. 252—440 1 Claim

1. A composition for curing an unsaturated flame retardant on a textile comprising copper sulfate and hydrogen peroxide wherein said unsaturated flame retardant comprises at least one copolycondensed oligomeric vinylphosphonate consisting essentially of the product resulting from the reaction, in stoichiometric ratio of from about 1:10 to 10:1, between a bis (2-haloalkyl) vinylphosphonate and at least one pentavalent phosphorus ester of the structure ROP(=O)XY where *R* is selected from the class consisting of C_1-C_{20} alkyl and C_1-C_{20} chloro- or bromoalkyl groups and X and Y are groups selected from the class consisting of RO—, C_1-C_{20} alkyl, C_2-C_{20} alkenyl, phenyl, phenoxy, amino, C_1-C_{20} alkyl substituted amino, phenyl substituted amino, C_2-C_{20} alkylene bonded to the same or to another ROP(=O) moiety and C_2-C_{20} alkyleneoxy and C_2-C_{20} alkylenedioxy bonded to the same or to another ROP(=O) moiety, wherein said reaction is carried out at an elevated temperature for a period of time sufficient to evolve R-halide as a byproduct and to form a P(O)-O-alkylene-O-P(O) linkage, with the proviso that said product is not the homocondensed product of said bis (2-haloalkyl) vinylphosphonate and the weight ratio of copper sulfate to hydrogen peroxide is from about 1:1 to about 1:210.

4,076,651

AGGLOMERATED SILICEOUS BODIES

Roland Jacques, Ales, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Nov. 16, 1976, Ser. No. 742,243
Claims priority, application France, Nov. 20, 1975, 75 35453
Int. Cl.[2] B01J *21/08, 29/00;* C01B *33/12*
U.S. Cl. 252—451 15 Claims

1. A method for preparing agglomerated siliceous bodies of large dimensions, exhibiting improved physical strength and wear-resistance, from silica hydrogel particles, comprising the steps of:

a. partially desiccating silica hydrogel particles by heating for a period of less than about 5 seconds in a medium having a temperature in the range of from about 300° to about 1,000° C to yield modified particles having a water content within the range of from about 25 to about 50%; and,

b. compressing said modified particles to form a shape-sustaining, agglomerated siliceous body.

2. The method of claim 1, wherein said silica hydrogel particles employed in the partial desiccating step have a pH greater than or equal to about 6.

3. The method of claim 2, further comprising the step of preparing said silica hydrogel particles prior to said partial desiccating step by gelling droplets of silica sol in a liquid which is substantially immiscible with water.

4,076,652

ELASTIC RESISTOR COMPOSITIONS CONTAINING METALLIC-CONDUCTIVE PARTICLES AND CONDUCTIVE LUBRICANT PARTICLES

James Barry Ganci, Wilmington, and Sebastian V. R. Mastrangelo, Hockessin, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 24, 1976, Ser. No. 689,387
Int. Cl.[2] H01B *1/06*
U.S. Cl. 252—504 9 Claims

1. An elastic resistor composition comprising:

i. from 15 to 45 volume percent of metallic-conductive transition metal compound particles, said particles having a Knoop microhardness at 100 grams of applied load (K_{100}) of at least 500 kg/mm² and an electrical resistivity of less than 1000 microohm-cm,

ii. from 4 to 30 volume percent of electrically conductive graphite particles having lamellarly ordered, mobile crystalline planes and a bulk conductivity of at least about 10^{-3} reciprocal ohm-cm, the sum of (i) and (ii) being 25 to 55 volume percent, and

iii. from 45 to 75 volume percent of elastomer.

4,076,653

DETERGENT COMPOSITIONS

Charles Bloor Davies, Wallasey; James Francis Davies, Wirral, and William Frederick Soutar Neillie, Birkenhead, all of England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 386,827, Aug. 8, 1973, Pat. No. 3,957,695. This application Feb. 27, 1976, Ser. No. 662,094
The portion of the term of this patent subsequent to May 18, 1993, has been disclaimed.
Int. Cl.[2] C11D *3/065*
U.S. Cl. 252—532 18 Claims

1. A detergent composition comprising from about 5% to about 40% of a detergent active compound selected from the group consisting of an anionic active which does not form an insoluble calcium salt during use, a nonionic active, an amphoteric active, a zwitterionic active and mixtures thereof, from about 10% to about 75% of sodium or potassium carbonate, and from about 5% to about 60% of finely divided precipitated calcium carbonate prepared by passing carbon dioxide into a suspension of calcium hydroxide said calcium carbonate having a surface area of about 10 to about 150 square meters per gram (m^2/g), the percentages being expressed by weight of the composition.

4,076,654

PROCESS FOR PRODUCING A FLAME- AND SMOKE-RETARDED, NON-SHRINKABLE, FLEXIBLE POLYURETHANE FOAM

Toshio Yukuta, Kodaira; Takashi Ohashi, Iruma; Minoru Kojima, Kodaira, and Akira Suzuki, Higashi-Murayama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Oct. 20, 1976, Ser. No. 734,167
Claims priority, application Japan, Oct. 24, 1975, 50-127418
Int. Cl.[2] C08G *18/14, 18/66*
U.S. Cl. 260—2.5 AM 12 Claims

1. A process for producing a flame- and smoke-retarded, non-shrinkable, flexible polyurethane foam, which comprises reacting

A. a polyol having at least two active hydrogen atoms and a molecular weight of from 1,000 to 10,000,

B. a low molecular weight polyhydroxyl compound having a molecular weight of from 60 to 700,

C. an organic polyisocyanate, and

D. an ammonium compound which prevents shrinkage of said flexible polyurethane foam upon production, which generates ammonia gas at a temperature below 100° C and which decomposes at a temperature beneath the temperature of the reaction to provide said polyurethane foam, said ammonium compound also functioning as a catalyst for the reaction,

wherein the equivalent weight ratio of the low molecular weight polyhydroxyl compound (B) to the polyol (A) is ranging from 0.5 to 2.0 and the amount of the ammonium compound (D) based on 100 parts by weight of the polyol (A) is ranging from 0.5 to 10 parts by weight.

4,076,655

PHOTODEGRADABLE ATACTIC POLYSTYRENE COMPOSITIONS

Arne O. Finberg, Edison, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 436,322, Jan. 24, 1974, abandoned. This application Mar. 31, 1976, Ser. No. 672,083
Int. Cl.[2] C08K *5/07*
U.S. Cl. 260—2.5 HB 7 Claims

1. A composition of atactic polystyrene blended with a small amount of benzoin, based on the weight of the polystyrene, sufficient to accelerate the photodegradation of said composition.

4,076,656

METHOD OF PRODUCING POROUS PLASTIC MATERIALS

LeRoy A. White, Somers, and William H. Holley, Rockville, both of Conn., assignors to DeBell & Richardson, Inc., Enfield, Conn.

Continuation-in-part of Ser. No. 203,471, Nov. 30, 1971, abandoned. This application Jul. 20, 1973, Ser. No. 381,258

Int. Cl.[2] C08J *9/10, 9/26*

U.S. Cl. 260—2.5 M **5 Claims**

1. Method of making porous plastic bodies comprising the steps of dispersing in a fluxable polymer, substantially unplasticized, at least about 45 volume percent of a water-soluble material in particle form and blending therewith a channel-forming water-soluble liquid of less than 10,000 poise at the processing temperature of the polymer, the amount of said liquid being from 0.1 to 15 volume percent to form a network of channels interconnecting the dispersed particles, fluxing and solidifying the polymer blend containing said particles and liquid into a polymer body, and thereafter extracting with water said solid and liquid materials to form a porous plastic body.

4,076,657

POLYURETHANE SMOKE SUPPRESSION ADDITIVE

John J. Kracklauer, Boulder, Colo., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 485,855, Jul. 5, 1974, abandoned, which is a continuation-in-part of Ser. No. 227,254, Feb. 17, 1972, abandoned. This application Mar. 12, 1976, Ser. No. 666,529

Int. Cl.[2] C08G *18/14;* C08K *5/56*

U.S. Cl. 260—2.5 AJ **7 Claims**

1. A polyurethane foam plastic, having improved smoke suppression properties, consisting essentially of a polyurethane foam plastic containing in chemically uncombined form about from 0.1 to 1%, by wt., based on the polyurethane polymer content of said plastic, of a dicyclopentadienyl iron compound selected from the group consisting of monoalkyl dicyclopentadienyl iron; dialkyl dicyclopentadienyl iron; mono alkanoyl-dicyclopentadienyl iron dialkanoyldicyclopentadienyl iron; ferrocene condensation dimers and polymers with aldehydes or ketones; vinyl ferrocene copolymers with vinyl chloride, acrylic acid, methyl methacrylate, butadiene, or cyclopentane; and mixtures thereof, and wherein as used herein above the terms alkyl and alkanoyl refer, respectively, to alkyl groups and alkanoyl groups having from one through 20 carbon atoms.

4,076,658

POLY(ARYLOXYPHOSPHAZENE) COPOLYMER FOAMS

Ronald L. Dieck, and Edwin J. Quinn, both of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Division of Ser. No. 661,862, Feb. 27, 1976. This application May 13, 1977, Ser. No. 796,742

Int. Cl.[2] C08J *9/06*

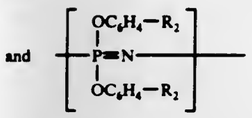
U.S. Cl. 260—2.5 R **10 Claims**

1. A process of foaming the copolymers having randomly distributed repeating units represented by the formulas



-continued

and



wherein R_1 is C_1–C_4 linear or branched alkyl and R_2 is hydrogen, C_1–C_{10} linear or branched alkyl or C_1 –C_4 linear or branched alkoxyl with the proviso that when R_2 is alkoxy, OR_1 and R_2 are different, the ratio of $(OC_6H_4OR_1)$:$(OC_6H_4R_2)$ being from about 1:6 to about 6:1 wherein said copolymers are admixed with a chemical blowing agent and heated to a temperature sufficient to decompose said blowing agent.

4,076,659

L-VAL[10]-SOMATOSTATIN AND INTERMEDIATES THERETO

James E. Shields, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 627,492, Oct. 30, 1975, abandoned. This application Mar. 17, 1976, Ser. No. 667,752

Int. Cl.[2] C07C *103/52;* C08L *37/00*

U.S. Cl. 260—8 **9 Claims**

1. A compound of the formula

H-L-Ala-Gly-L-Cys-L-Lys-L-Asn-L-Phe-

L-Phe-L-Trp-L-Lys-L-Val-L-Phe-L-Thr-L-Ser-L-Cys-OH

and its pharmaceutically acceptable non-toxic acid addition salts, and intermediates to said compound, said intermediates having the formula R-L-Ala-Gly-L-Cys(R_1)-L-Lys(R_2)-L-Asn-L-Phe-L-Phe-L-Trp(R_5)-L-Lys(R_2)-L-Val-L-Phe-L-Thr(R_3)-L-Ser(R_4)-L-Cys(R_1)-X; in which

R is hydrogen or an α-amino protecting group;

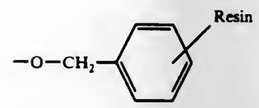
R_1 is hydrogen or a thio protecting group;

R_2 is hydrogen or an ε-amino protecting group;

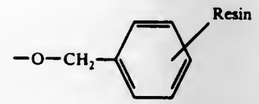
R_3 and R_4 each are hydrogen or a hydroxy protecting group;

R_5 is hydrogen or formyl; and

X is hydroxy or



in which the resin is polystyrene; with the proviso that, when X is hydroxy, R, R_1, R_2, R_3, R_4, and R_5 each are hydrogen, and, when X is



R, R_1, R_2, R_3, and R_4 each are other than hydrogen.

4,076,660

NON-ELASTOMERIC RAPID-SETTING POLYURETHANES

Franciszek Olstowski, Freeport, and Donald Bob Parrish, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 4, 1974, Ser. No. 448,129

Int. Cl.[2] C08K *5/10;* C08L *75/04, 75/08*

U.S. Cl. 260—9 **10 Claims**

1. A non-elastomeric non-cellular product having a density of at least about 1 gram/cc which is demoldable within about

5 minutes after admixture of the components of a composition which is the reaction product of a polyurethane-forming composition comprising:

A. a polyol component consisting of

1. a liquid monomeric aliphatic triol having from 3 to about 6 carbon atoms or mixtures thereof and
2. a liquid propylene oxide derivative having at least 2 hydroxyl groups and an OH equivalent weight of less than about 230 or mixtures thereof, wherein Components (A1) and (A2) are present in quantities such that the hydroxyl equivalent ratio of (A1): (A2) is from about 0.25:1 to about 2:1;

B. an organic polyisocyanate;

C. as a modifier substance a liquid ester of a carboxylic acid or mixtures thereof, said modifier having a boiling point above about 150° C;

D. a non-amine containing catalyst for urethane formation; wherein Components (A) and (B) are present in quantities so as to provide an NCO:OH equivalent ratio of from about 0.8:1 to about 1.5:1; Component (C) is present in quantities of from about 10% to about 40% by weight based upon the sum of the weights of Components (A), (B) and (C); and Component (D) is present in quantities of from about 0.001% to about 2% by weight based upon the sum of the weights of Components (A), (B) and (C).

4,076,661

ADHESIVES BASED ON AQUEOUS DISPERSIONS OF BUTADIENE COPOLYMERS, POLYVINYLPYRROLIDONES AND ANIONIC MACROMOLECULAR COMPOUNDS

Karl-Heinz Kassner, Dusseldorf, Germany, assignor to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Dusseldorf-Holthausen, Germany

Filed Jun. 29, 1976, Ser. No. 700,890

Claims priority, application Germany, Jul. 2, 1975, 2529512

Int. Cl.[2] C08L *1/28*

U.S. Cl. 260—17 R **5 Claims**

1. An adhesive consisting essentially of an aqueous dispersion containing from 20% to 50% by weight of adhesive solids consisting of a mixed polymerizate of butadiene with monomers selected from the group consisting of styrene and acrylonitrile, containing from 0.5% to 3% by weight of the mixed polymerizate of carboxyl groups derived from monomers polymerizable with butadiene, having a further content, based on said mixed polymerizate of

a. from 1% to 3% by weight of a vinylpyrrolidone compound having a K value of between 30 and 90 selected from the group consisting of polyvinylpyrrolidone and water-soluble copolymers of vinylpyrrolidone, and

b. from 0.1% to 0.5% by weight of at least one carboxyl-group-containing, water-soluble, macromolecular compound and its water-soluble salts.

4,076,662

MODIFIED AMINOPLAST COMPOSITIONS

Karl Schnee, Maintal; Steffen Piesch, Oberursel, Taunus, and Dieter Tichy, Frankfurt am Main, all of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Germany

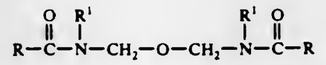
Filed Dec. 15, 1976, Ser. No. 750,859

Claims priority, application Germany, Dec. 23, 1975, 2558149

Int. Cl.[2] C08G *2/00, 14/02;* B32B *21/00;* C08L *1/00*

U.S. Cl. 260—17.3 **7 Claims**

1. An uncured condensate of formaldehyde with melamine and/or urea, the condensate being mixed with from about 0.5 to about 40% based on its solids weight, of a plasticizing ether



in which each R is hydrogen or methyl and each R^1 is hydrogen or $-CH_2OH$, the condensate being unetherified or etherified with a C_1 to C_4 alcohol.

4,076,663

WATER ABSORBING STARCH RESINS

Fusayoshi Masuda; Kazuo Nishida, and Akira Nakamura, all of Kyoto, Japan, assignors to Sanyo Chemical Industries, Ltd., Kyoto, Japan

Filed Mar. 29, 1976, Ser. No. 671,148

Claims priority, application Japan, Mar. 27, 1975, 50-37669

Int. Cl.[2] C08L *3/06*

U.S. Cl. 260—17.4 GC **21 Claims**

1. A process for producing a water-absorbing resin which comprises polymerizing (a) at least one of natural starch and α starch, (b) at least one monomer having a single polymerizable double bond which is a water-soluble or becomes water-soluble by hydrolysis, and (c) a crosslinking agent, and if the monomer (b) is one which becomes water soluble by hydrolysis, thereafter subjecting the resulting product to hydrolysis.

4,076,664

612 OR 610/6I OR 6T/636 POLYAMIDE TERPOLYMER

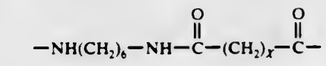
Rolando Umali Pagilagan, Parkersburg, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 13, 1975, Ser. No. 631,692

Int. Cl.[2] C08G *69/26*

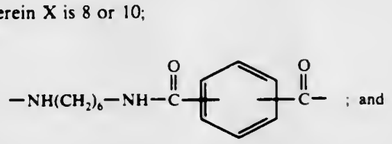
U.S. Cl. 260—18 N **3 Claims**

1. A terpolymer resin of sufficiently high molecular weight to be molded into shaped articles consisting essentially of the following repeating segments



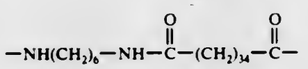
(1)

wherein X is 8 or 10;



(2)

; and



(3)

wherein segment (1) is present in an amount up to 80% by weight, based upon the resin weight, segment (2) is present in an amount between about 15% and about 25% by weight, based upon the resin weight, and segment (3) is present in an amount between about 3% and about 10% by weight, based upon the resin weight.

4,076,665

POLYACRYLATE REACTION PRODUCTS

Nelson E. Lawson, Trenton, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Division of Ser. No. 604,488, Aug. 14, 1975, Pat. No. 4,035,320, and a continuation-in-part of Ser. No. 274,409, Jul. 24, 1972, abandoned, and Ser. No. 434,440, Jan. 18, 1974, abandoned. This application Dec. 22, 1976, Ser. No. 753,612

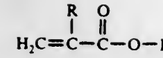
The portion of the term of this patent subsequent to Jul. 12, 1994, has been disclaimed.

Int. Cl.[2] C09D *3/66, 3/81, 11/10*

U.S. Cl. 260—22 CB **6 Claims**

1. The polyacrylate reaction of product of,

a. an equivalent excess of an acrylic compound of the formula:



wherein R is selected from hydrogen and methyl; R' is selected from hydrogen, methyl and ethyl; and

b. a polyester polyol obtained by the condensation of

i. an aliphatic polycarboxylic acid having a molecular weight of at least 325 and at least 19 carbon atoms, inclusive, said acid being the adduct of a fatty acid and acrylic acid; with

ii. an equivalent excess of an aliphatic polyol having at least two hydroxyl groups and a molecular weight of between about 60 to about 250; said reaction of (a) and (b) being under conditions wherein said acrylic compound does not polymerize.

4,076,666

RELEASE COMPOSITION

George Edward Power, and Donald Louis Bolling, both of Cincinnati, Ohio, assignors to Formica Corporation, Cincinnati, Ohio

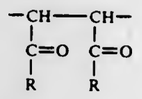
Filed Nov. 3, 1976, Ser. No. 738,214
Int. Cl.² C09D *3/52, 3/66*
U.S. Cl. 260—22 CB **10 Claims**

1. A self-releasing coating composition comprising an organic solvent solution containing from about 0.5 to about 80.0%, by weight, based on the total weight of the composition, of an organic solvent soluble mixture comprising

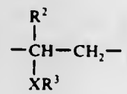
(1) from about 75 to about 99%, by weight, based on the total weight of (1) and (3), of an oil-modified alkyd resin

(2) from about 30 to about 70%, by weight, based on the total weight of (1), of a polyalkylether of a polymethylol melamine and

(3) from about 1 to about 25%, by weight, based on the total weight of (1) and (3), of a copolymer containing from about 15 to about 85 mole percent of recurring units having the formula



wherein each R is, individually, OR^1, R^1 being hydrogen or C_1-C_{22} alkyl, or the two R groups taken together form an oxa group, and the remaining units are recurring units of the formula



wherein R^2 is hydrogen or methyl, R^3 is a C_9-C_{30} alkyl radical and X is O or CH_2.

4,076,667

GRANULES AND PELLETS FOR THE MODIFICATION OF POLYCONDENSATES WHICH CAN BE SHAPED, AS WELL AS THE PROCESS FOR OBTAINING THESE GRANULES AND PELLETS AND SHAPED ARTICLES THUS OBTAINED

Daniel Fontanel, Bron, and Jean Rampin, Theoule-sur-Mer, both of France, assignors to Rhone-Poulenc Textile, France

Filed Mar. 12, 1976, Ser. No. 666,345
Int. Cl.² C08L *67/00, 77/00*
U.S. Cl. 260—22 A **7 Claims**

1. Granules and pellets for modifying polycondensates which can be shaped in the molten state, characterised in that they consist of:

at least 37.5% of polycondensates serving as a carrier, of which at least a part consists of the same polycondensate as that which is to be shaped, in the form of a powder of particle size at least 50 microns,

from 12.5 to 40% of a binder of melting point 70°-100° C which is compatible with the polycondensate to be shaped, and

up to 50% of at least one compound useful to modify the polycondensate which is to be shaped.

4,076,668

RUBBER COMPOSITION

Kunihiro Kaneda; Masashi Kida; Akihiko Nakayama, all of Hiratsuka; Atsushi Kanazawa, Ise; Hiroyuki Kaido, Hiratsuka; Yasuhiro Mizumoto, Hiratsuka, and Tsuneo Koyama, Hiratsuka, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1976, Ser. No. 661,858
Claims priority, application Japan, Oct. 4, 1975, 50-119373
Int. Cl.² C08K *5/09*
U.S. Cl. 260—23.7 M **10 Claims**

1. A rubber composition which comprises more than 0.5 wt. parts of a cobalt salt of organic acid, more than 0.5 wt. part of monohydroxybenzoic acid component and 100 wt. parts of a rubber.

4,076,669

AMORPHOUS POLYPROPYLENE IN HYDROGENATED RUBBERY BLOCK COPOLYMERS

Bobby R. Harper, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 3, 1976, Ser. No. 720,318
Int. Cl.² C08L *9/00*
U.S. Cl. 260—23.7 R **10 Claims**

1. A composition comprising:

a hydrogenated plastomer of a monovinyl-substituted aromatic compound and a conjugated diene; and

amorphous polypropylene in an amount within the range of 6-60 parts by weight per 100 parts by weight of said plastomer.

4,076,670

HOT-MELT ADHESIVES HAVING IMPROVED PROPERTIES AT ELEVATED TEMPERATURES

Darryl A. Godfrey, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 27, 1977, Ser. No. 763,266
Int. Cl.² C08L *93/00*
U.S. Cl. 260—27 R **21 Claims**

1. An adhesive composition capable of being used as a hot melt adhesive comprising a blend of

(1) 30 to 70 weight percent polyethylene having a melt index at 190° C. of about 1 to about 50 and a density of about 0.910 g/cm³ to about 0.940 g/cm³

(2) 10 to 50 weight percent of at least one tackifying resin selected from the group consisting of hydrocarbon resins, polyterpene resins, and rosin esters, and

(3) 10 to 40 weight percent crystalline polypropylene or crystalline propylene/ethylene copolymers containing not more than 20 percent by weight ethylene having a melt flow rate at 230° C. of 30 to 180.

4,076,671

FAST CURING RESINOUS COMPOSITIONS

Alan Bright, Washington, England, assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Jan. 23, 1976, Ser. No. 651,916
Claims priority, application United Kingdom, Jan. 24, 1975, 3222/75
Int. Cl.² C08L *91/00*
U.S. Cl. 260—28.5 AV **20 Claims**

1. A coating composition which comprises:

(A) a polymer-monomer mixture comprising:

(a) at least 25% by weight of a homopolymer or copolymer of one or more (C_1-C_8)-alkyl esters of acrylic acid or methacrylic acid;

(b) at least 30% by weight of one or more ethylenically unsaturated polymerizable monomers comprising one or more (C_1-C_8)-alkyl esters of acrylic acid or methacrylic acid;

(c) 1-40% by weight of at least one compound containing at least two ethylenically unsaturated groups per molecule;

optionally,

(d) 0.5-3% by weight of ethylenically unsaturated carboxylic acid;

optionally,

(e) 0.25-1% by weight of paraffin wax;

and,

(B) a catalyst system comprising:

(a) 0.5-10% by weight, based on the weight of polymer-monomer mixture (A), of organic peroxide as catalyst;

(b) 0.1-10% by weight, based on the weight of the polymer-monomer mixture (A), of tertiary amine as accelerator; the relative amounts of the components being chosen so as to give a fast-curing composition, as hereinbefore defined.

4,076,672

LUBRICANTS FOR ORGANIC FIBRES

Peter Huber; Helga Lampelzammer; Ewald Pirson, and Franz Wimmer, all of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Jul. 29, 1976, Ser. No. 709,700
Claims priority, application Germany, Aug. 11, 1975, 2535768
Int. Cl.² C08J *3/00*
U.S. Cl. 260—29.2 M **11 Claims**

1. A process for preparing a lubricant for organic fibers which comprises polymerizing an aqueous emulsion of (a) a diorganopolysiloxane having the general formula

$$(HO)_x—(SiR_2O)_n—H_x$$

in which each R is selected from the class consisting of an alkyl radical having up to 5 carbon atoms, a phenyl radical, a halohydrocarbon radical and an aminohydrocarbon radical, x is 0 or 1 and n is an integer of from 3 to 500, with the provision that when x is 0, n is 3, 4 or 5, in the presence of component (b) which is selected from the class consisting of (i) a paraffin wax (ii) polytetrafluoroethylene and (iii) polytrifluorochloroethylene, in which component (b) is present in an amount of from 1 to 70 percent by weight based on the weight of components (a) and (b) to form an aqeuous emulsion in which the diorganopolysiloxane has a viscosity of at least 20,000 cSt at 25° C.

4,076,673

ABSORBENT ARTICLES AND METHODS FOR THEIR PREPARATION

Nelson D. Burkholder, Jr., Hong Kong, Hong Kong, assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 565,880, Apr. 7, 1975, abandoned. This application Sep. 27, 1976, Ser. No. 727,106
Int. Cl.² C08L *31/02*
U.S. Cl. 260—29.2 EP **20 Claims**

1. A method of preparing a substantially dry, water-swellable polyelectrolyte film which comprises the steps of

(1) preparing a solution of

(A) a member selected from the group consisting of water, lower alcohols, and mixtures thereof,

(B) about 5 to about 60% by weight based on the amount of (A) of a carboxylic polyelectrolyte or mixtures thereof, and

(C) an amount of a water soluble polyamidopolyamine/epichlorohydrin adduct sufficient to cure said polyelectrolyte into a water swellable article,

(2) spreading a coating of said solution on an impervious substrate,

(3) drying said coated substrate to crosslink said polyelectrolyte and

(4) separating said crosslinked polyelectrolyte film from said substrate.

2. A method of preparing substantially water swellable polyelectrolyte fibers which comprises

(1) preparing a solution of

(A) a member selected from the group consisting of water, lower alcohols, and mixtures thereof,

(B) about 5 to about 60% by weight based on the amount of (A) of a carboxylic polyelectrolyte or mixtures thereof, and

(C) an amount of a water soluble polyamidopolyamine/epichlorohydrin adduct sufficient to cure said polyelectrolyte into a water swellable article.

(2) extruding said solution into a bath comprising lower alkyl ketones or chlorinated hydrocarbons to form an extruded fiber,

(3) separating the extruded fiber from said bath, and

(4) drying said fibers to crosslink said polyelectrolyte.

4,076,674

BLENDS OF AQUEOUS ACRYLIC LATEX AND WATER SOLUBLE CARBOXYL MODIFIED POLYCAPROLACTONE ADDUCT

Joseph Victor Koleske, Charleston, and Oliver Wendell Smith, South Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed May 26, 1976, Ser. No. 690,354
Int. Cl.² C08L *61/28*
U.S. Cl. 260—29.4 UA **21 Claims**

1. A coating composition comprising a blend of an aqueous acrylic latex and from about 5 to about 50 weight percent, based on the total solids content of said latex, of a water soluble carboxyl modified polycaprolactone adduct selected from the group of:

(Type 1) the water soluble carboxyl modified polycaprolactone adduct reaction product mixture of (i) a polycaprolactone polyol and (ii) from 0.1 to 1 carboxylic anhydride equivalent for each hydroxyl equivalent present in the polycaprolactone polyol of an intramolecular anhydride of a polycarboxylic acid, neutralized with (iii) a base; or

(Type 2) the water soluble carboxyl modified polycaprolactone urethane adduct reaction product mixture of (i) a polycaprolactone polyol, (ii) from 0.025 to 0.9 isocyanato equivalent for each initial hydroxyl equivalent present in the polycaprolactone polyol of an organic polyisocyanate, (iii) from 0.1 to 1 carboxylic anhydride equivalent per

each unreacted hydroxyl equivalent present of an intramolecular anhydride of a polycarboxylic acid, neutralized with (iv) a base; or

(Type 3) the water soluble carboxyl modified polycaprolactone-epoxide adduct reaction product mixture of (i) a polycaprolactone polyol, (ii) from 0.2 to 1 mole of an organic oxirane diepoxide per mole of polycaprolactone polyol initially charged, (iii) from 0.1 to 0.5 carboxylic anhydride equivalent per each unreacted hydroxyl equivalent present of an intramolecular anhydride of a polycarboxylic acid, neutralized with (iv) a base;

wherein said polycaprolactone polyol has at least two hydroxyl groups in the molecule, a hydroxyl number of from 15 to 600 and an average molecular weight of from 290 to about 6,000, and wherein said anhydride has at least one intramolecular carboxylic anhydride group; and a crosslinking agent.

4,076,675

AQUEOUS COATING COMPOSITION FROM AMINOPLAST AND REACTION PRODUCT OF TERTIARY AMINE AND POLYMER CONTAINING RANDOMLY DISTRIBUTED EPOXY GROUPS

Eugene G. Sommerfeld, Penn Valley, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 4, 1975, Ser. No. 547,001

Int. Cl.² C08L *37/00, 61/28;* C25D *13/06*

U.S. Cl. 260—29.4 UA **21 Claims**

1. A water-borne thermosetting coating composition consisting essentially of:

(A) 50–97 parts by weight, based on the weight of components (A) plus (C), of an epoxy polymer containing, on the average, 10–150 randomly distributed 1,2-epoxy groups per molecule and having a weight average molecular weight, determined by gel permeation chromatography, using a polystyrene standard, of 25,000–75,000; reacted to the substantially complete consumption of the epoxy groups with

(B) an aqueous solution of about 1–1.25 equilvalents, per equivalent of epoxy group of said epoxy polymer of (A), of a tertiary amine selected from the group consistinng of $R_1R_2R_3N$, pyridine, N-methylpyrrole, N-methyl pyrrolidine, N-methyl morpholine, and mixtures thereof and where R_1 and R_2 are hydroxy-substituted or unsubstitued mono-valent alkyl groups containing one or two carbon atoms and R_3 is a hydroxy-substituted or unsubstituted mono-valent alkyl group containing 1–4 carbon atoms; and

(C) 3–50 parts by weight, based on the weight of components (A) plus (C), of an alkylated aminealdehyde resin, an alkylated amide-aldehyde resin or mixtures thereof;

dissolved or dispersed in water and an organic liquid or mixture of such liquids wherein the water and said organic liquid are in a ratio of from 70:30 to 90:10 and said coating composition having a pH of 10 or above.

4,076,676

AQUEOUS COATING COMPOSITION FROM AMINOPLAST AND REACTION PRODUCT OF TERTIARY AMINE AND POLYMER CONTAINING TERMINAL EPOXY GROUPS

Eugene G. Sommerfeld, Penn Valley, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 4, 1975, Ser. No. 547,000

Int. Cl.² C08L *61/28, 63/00;* C25D *13/06;* C08G *59/14*

U.S. Cl. 260—29.4 R **21 Claims**

1. A water-borne thermosetting coating composition consisting essentially of:

(A) 50–97 parts by weight, based on the weight of components (A) plus (C), of an epoxy resin containing, on the average, two terminal 1, 2-epoxy groups per molecule and having a molecular weight of 1,000–5,000 reacted to the substantially complete consumption of the epoxy groups with

(B) an aqueous solution of about 1–1.25 equivalents, per equivalent of epoxy group of said epoxy resin of (A), of a tertiary amine selected from the group consisting of $R_1R_2R_3N$, pyridine, N-methylpyrrole, N-methyl pyrrolidine, N-methyl morpholine, and mixtures thereof wherein R_1 and R_2 are hydroxy-substituted or unsubstituted monovalent alkyl groups containing one or two carbon atoms and R_3 is a hydroxy-substituted or unsubstituted monovalent alkyl group containing 1–4 carbon atoms; and

(C) 3–50 parts by weight, based on the weight of components (A) plus (C), of an alkylated aminealdehyde resin, an alkylated amide-aldehyde resin or mixtures thereof;

dissolved or dispersed in water and an organic liquid or mixture of such liquids wherein the water and said organic liquid are in a ratio of from 70:30 to 90:10 and said coating composition having a pH of 10 or above.

4,076,677

AQUEOUS COPOLYMER DISPERSIONS AND METHOD OF PRODUCING THE SAME

Kazys Sekmakas, Chicago, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed Jun. 23, 1976, Ser. No. 698,860

Int. Cl.² C08L *33/02*

U.S. Cl. 260—29.6 E **14 Claims**

1. A method of producing a dispersion of copolymer particles in water which is adapted for use in electrocoating comprising, forming a liquid mixture consisting essentially of monoethylenic monomers including from about 1% to about 30% by weight of monoethylenic carboxylic acid, dispersing said liquid mixture in water containing from about 15–40% of a C_3–C_4 alkanol, based on the weight of the aqueous medium, to form a dispersion, polymerizing said dispersion in the presence of an organic peroxide polymerization catalyst at an elevated temperature, while agitating the dispersion, to form copolymer particles dispersed in the aqueous alcohol-containing medium.

4,076,678

PLASTICIZED POLYMERS OF VINYL ACETATE

Frank Lamb, Oldham; Malcolm Combey, Mellor, and Hugh Melvin Cooper, Cheadle, all of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation-in-part of Ser. No. 406,175, Oct. 12, 1973, abandoned, which is a continuation-in-part of Ser. No. 192,625, Oct. 26, 1971, abandoned. This application Aug. 7, 1975, Ser. No. 602,890

Claims priority, application United Kingdom, Oct. 27, 1970, 50906/70

Int. Cl.² C08K *5/11, 5/12;* C08L *3/04*

U.S. Cl. 260—31.6 **9 Claims**

1. A composition comprising a vinyl acetate polymer or copolymer of between 55 and 100% of vinyl acetate with one or more ethylenically unsaturated nonhalogenated comonomers and from 10 to 100% by weight based on the weight of the polymer, of a polyester having a molecular weight, of from 350 to 1500 derived from the reaction of

(i) a polyethylene glycol having a molecular weight up to 500,

(ii) an aliphatic alcohol containing from 3 to 6 carbon atoms and

(iii) a mixture of dibasic acids or anhydrides comprising a mixture of

(a) a phthalic acid or anhydride and

(b) an acid or anhydride selected from succinic, glutaric or adipic or any mixture thereof;

the dibasic acid or anhydride mixture being reacted with the theoretical amounts of alcohol and glycol needed to effect the reaction with the proviso that the glycol may be reacted with the dibasic acids or anhydrides in amounts ranging from 0–10 mol % below the theoretical amount necessary to effect the reaction to up to 20% in excess of the theoretical amount and the alcohol may be reacted in amounts ranging from 0 to 50 mol % below the theoretical amount to up to 20 mole % in excess of the theoretical amount needed to produce the final product and wherein the dibasic acid or anhydride mixture contains phthalic acid or the anhydride thereof in amounts from 5% to 80% by weight of the mixture.

4,076,679

RAPID SETTING POLYURETHANE ELASTOMERS AND PROCESS OF PREPARATION

Robert B. Turner, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 651,327, Jan. 21, 1976, abandoned, which is a continuation-in-part of Ser. No. 545,691, Jan. 30, 1975, abandoned. This application Jan. 21, 1977, Ser. No. 761,190

Int. Cl.² C08K *5/11, 5/01;* C08G *18/04*

U.S. Cl. 260—31.2 N **20 Claims**

1. Non-cellular, non-elastomeric polyurethanes having a density of at least about 1 g/cc, a percent elongation of less than about 100, a heat distortion temperature of at least about 180° F (82° C) and which can be demolded within a period of about 5 minutes without the addition of an external source of heat which polyurethane results from the admixture and reaction of a composition which comprises:

(A) a polyhydroxyl-containing material having from about 2 to about 8 hydroxyl groups and an average OH equivalent weight of not greater than about 250;

(B) an organic polyisocyanate;

(C) as a modifier, from about 1% to about 20% weight based upon the combined weight of Components (A), (B) and (C) of a polymer of one or more ethylenically unsaturated monomers said polymer having the following characteristics:

(1) a molecular weight such that the polymer has a grease melt flow index as determined with a 0.02 inch orifice employing a total weight of 2160 grams at 80° C of from about 1 to about 250 decigrams/minute;

(2) a solubility parameter at 25° C of at least about 8;

(3) and a specific heat of at least about 0.35 cal/g/° C and

(D) a non-amine containing catalyst for urethane formation;

wherein Components (A) and (B) are present in quantities so as to provide an NCO:OH ratio of from about 0.8:1 to about 1.5:1 and with the proviso that when Component (A) has an average functionality of substantially less than about 3, then the average functionality of Component (B) is at least about 2.5.

11. A process for preparing polyurethanes having a density of at least about 1 g/cc, a percent elongation of less than about 100, a heat distortion temperature of at least about 180° F (82° C) and which can be demolded within a period of about 5 minutes without the application of an external source of heat which process comprises:

(1) admixing the components of a composition comprising:

(A) a polyhydroxyl-containing material having from about 2 to about 8 hydroxyl groups and an average OH equivalent weight of not greater than about 250;

(B) an organic polyisocyanate;

(C) as a modifier, from about 1% to about 20%, by weight based upon the combined weight of Components (A), (B) and (C) of a polymer of one or more ethylenically unsaturated monomers having the following characteristics:

(a) a molecular weight such that the polymer has a grease melt flow index as determined with a 0.02 inch orifice employing a total weight of 2160 grams at 80° C of from about 1 to about 250 decigrams/minute;

(b) a solubility parameter at 25° C of at least about 8;

(c) and a specific heat of at least about 0.35 cal/g/° C; and

(D) a non-amine containing catalyst for urethane formation;

wherein Components (A) and (B) are present in quantities so as to provide an NCO:OH ratio of from about 0.8:1 to about 1.5:1 and with the proviso that when Component (A) has an average functionality of substantially less than about 3, then the average functionality of Component (B) is at least about 2.5;

(2) placing the admixed composition into a suitable mold wherein said composition solidifies within less than about 5 minutes to a solid having the aforesaid density, percent elongation and heat distortion temperature; and

(3) subsequently demolding the resultant article from the mold.

4,076,680

POLY(HYDROXYMETHYLENE) SOLUTIONS

Murali K. Akkapeddi, Succasunna, and Herbert K. Reimschuessel, Morristown, both of N.J., assignors to Allied Chemical Corporation, Morristown, N.J.

Filed Aug. 5, 1976, Ser. No. 712,108

Int. Cl.² C08K *5/17*

U.S. Cl. 260—32.6 R **7 Claims**

1. A solution in hydrazine of a polymer selected from the group consisting of (a) poly(hydroxymethylene), (b) copolymers of hydroxymethylene with up to about 30 mol percent of ethylenically unsaturated comonomers, and (c) mixtures thereof, said solution containing not more than about 10 percent by weight of water, based on the combined weight of the hydrazine and water.

4,076,681

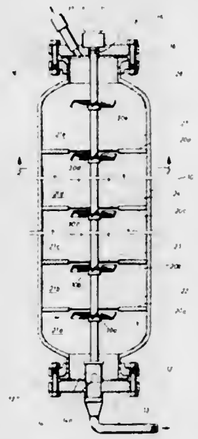
PROCESS FOR DISSOLVING HIGH MOLECULAR WEIGHT OLEFIN POLYMERS IN LIQUID HYDROCARBONS

Robert Emerson Boehme, and Clarence Rhodes Murphy, both of Houston, Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Aug. 19, 1976, Ser. No. 715,803

Int. Cl.² C08K *5/01*

U.S. Cl. 260—33.6 PQ **5 Claims**



1. A process for preparing a hot solution of a high molecular weight olefin polymer that contains essentially no undissolved polymer particles which consists essentially of:

a. Preparing a polymer slurry by dispersing fine particles of a high molecular weight olefin polymer in a liquid hydrocarbon heated to a temperature of at least about 190° C,

b. Feeding the polymer slurry of (a) to a first fluid chamber having an inlet and an outlet therein with screens covering both of said inlet and said outlet; the screen covering the

outlet having a smaller mesh than the screen covering the inlet,

c. Discharging polymer solution from said first fluid chamber and passing it through a series of one or more additional fluid chambers, each of which also has an outlet therein with screens covering both the inlet and the outlet, with the screen covering the outlet having a smaller mesh than the screen covering the inlet; the outlet screen of each successive downstream fluid chamber having a smaller mesh than the outlet screen of the upstream fluid chambers,

d. providing stirring in each fluid chamber to sweep retained resin particles free of the covering of the outlet of said chamber,

e. supplying heat to the polymer slurry passing through the fluid chambers to maintain a temperature of at least about 190° C, and

f. recovering from the final fluid chamber a hydrocarbon solution of olefin polymer substantially free of undissolved polymer particles;

said olefin polymer being an olefin polymer having an inherent viscosity of at least 3.5.

4,076,682

FLAMEPROOF NYLON MOLDING COMPOSITIONS

Rainer Theysohn, Ludwigshafen; Rolf Würmb, Heidelberg; Bernd Leutner, Frankenthal, and Hans-Ulrich Schlimper, Speyer, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Sep. 13, 1976, Ser. No. 722,518
Int. Cl.² C08K *3/22, 5/02*
U.S. Cl. 260—37 N **14 Claims**

1. A thermoplastic molding composition comprising a linear nylon, from about 4 to 20% by weight based on the molding composition of an addition produce of hexachlorocyclopentadiene and a dienophile as an organic flameproofing agent, from about 2 to 10% by weight, based on the molding composition of a synergistic metal compound and from about 10 to 60% by weight, based on the molding composition of an inorganic filler, wherein the synergistic metal compound is a zinc oxide which has been manufactured by adding an aqueous solution of a base simultaneously with an aqueous solution of a zinc salt to an aqueous suspension of an inorganic carrier in such a way as to maintain a pH of from 10 to 12 in the suspension, and then separating the solids from the aqueous phase.

4,076,683

MOLDING COMPOSITIONS OR MASSES SUITABLE FOR MANUFACTURING FOUNDRY MOLDS AND CORES USING THE COLD BOX METHOD

Martin Cherubim, Rheinkamp; Karl-Heinz Heinemann, Neukirchen-Vluyn, and Friedrich Josten, Rheinkamp, all of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Filed Aug. 15, 1975, Ser. No. 605,111
Int. Cl.² C08K *3/36*; C08G *6/02, 18/28*
U.S. Cl. 260—37 N **4 Claims**

1. In the manufacture of quick curing foundry molds and cores by the cold box method employing sand and a two component binder system of a) acetone-formaldehyde condensate and b) a polyisocyanate, said binding system being curable by contact with gaseous amine, the improvement comprising increasing the bending strength of the sand-binder system by conducting the acetone condensation with formaldehyde in a mole ratio of 1.0 mole of acetone to 1.0 to 2.5 moles of formaldehyde, in the presence of 0.005 to 0.015 moles of alkali, acidifying to a pH of 4 and below, followed by the removal of water to produce a low molcular weight non-resinous polymethylol containing a solids content of at least 95%.

4,076,684

ORGANOPOLYSILOXANE COMPOSITIONS AND ELASTOMERS PREPARED THEREFROM

Ernst Wohlfarth; Wolfgang Hechtl, both of Burghausen; Klaus Matejcek, Munich, and Adolf Kleinschwarzer, Marktl, all of Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Dec. 2, 1976, Ser. No. 746,907
Claims priority, application Germany, Dec. 15, 1975, 2556420
Int. Cl.² C08L *83/04*
U.S. Cl. 260—37 SB **11 Claims**

1. A diorganopolysiloxane composition curable at room temperature to elastomers containing glass fibers which have an average length up to about 0.2 mm.

4,076,685

CYANOACRYLATE FOUNDRY BINDERS AND PROCESS

Hubert P. Kögler, Metzkausen, Germany, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Jan. 26, 1973, Ser. No. 326,648
Claims priority, application Germany, Jan. 25, 1972, 2203411
Int. Cl.² C08K *3/36*
U.S. Cl. 260—42.53 **31 Claims**

1. A foundry mix containing sand as the major constituent and a binding amount of up to 10% based on the weight of the sand of a polymerizable binder comprising a cyanoacrylate and a small but effective amount of a polymerizable inhibitor.

4,076,686

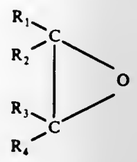
HEAT STABILIZED POLYCARBONATE RESIN

Thornton Ross Calkins, Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 326,008, Jan. 23, 1973, abandoned, which is a continuation-in-part of Ser. No. 102,211, Dec. 28, 1970, abandoned. This application Nov. 6, 1974, Ser. No. 521,479
Int. Cl.² C08R *5/00*
U.S. Cl. 260—45.8 A **6 Claims**

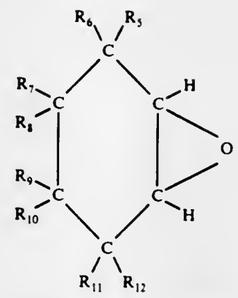
1. An unpigmented aromatic polycarbonate composition stabilized against heat degradation with (a) a minor amount of a phosphite selected from the group consisting of diaryl hydrogen phosphite, dialkyl hydrogen phosphite and alkyl aryl hydrogen phosphite and mixtures thereof wherein the alkyl portion contains 2–25 carbon atoms and the aryl portion contains 1–3 phenyl rings, and (b) 0.01 – 0.5 weight percent of an epoxy compound selected from the group consisting of:

I. Derivatives of epoxy ethane represented by the following formula:



wherein R_1, R_2, R_3 and R_4 are independently selected from the group consisting of hydrogen, an alkyl radical of 1–24 carbon atoms, an aryl radical of 6–24 carbon atoms, $—CH_2OR'$, $—CH_2OCOR'$, $—CH_2OCOR''COOCH_2X$, $CH_2OR''OCH_2X$ wherein R′ is selected from the group consisting of an alkyl radical of 1–24 carbon atoms or an aryl radical of 6 to 24 carbon atoms and wherein R″ is an alkylene radical of 1–24 carbon atoms and X is an oxirane ring.

II. Derivatives of epoxy cyclohexane represented by the following formula:



wherein R_5 through R_{12} are independently selected from the group consisting of hydrogen, alkyl radicals of 1–24 carbon atoms, $—COOR_{13}$, $—OCOR_{13}$, $—COOR_{14}X$, $—OCOR_{14}—COOX$ wherein R_{13} is an alkyl radical of 1–24 carbon atoms and R_{14} therein is an alkylene radical of 1–24 carbon atoms and X is an oxirane ring.

4,076,687

BICHROMOPHORIC BENZOTRIAZOLE-BENZOXAZOLE ULTRAVIOLET STABILIZERS AND THEIR USE IN ORGANIC COMPOSITIONS

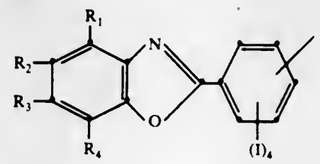
Gether Irick, Jr.; Charles A. Kelly, both of Kingsport, and James C. Martin, Johnson City, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 16, 1976, Ser. No. 715,015
Int. Cl.² C08K *5/34*
U.S. Cl. 260—45.8 NT **65 Claims**

1. An organic composition susceptible to ultraviolet light degradation stabilized against such degradation with a stabilizing amount of at least one bichromophoric compound having the formula:

A-B-C

wherein A is a group having the structure

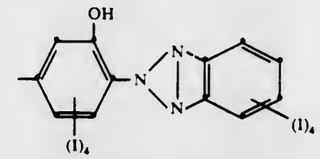


wherein

R_1, R_2, R_3 and R_4 are hydrogen, chloro, bromo, lower alkyl, substituted lower alkyl, cyclohexyl, substituted cycloalkyl, phenyl, substituted aryl, lower alkylaryl, aryl-substituted-aryl, alkoxy, substituted amino, carboalkoxy and the substituents R_1 and R_2, R_2 and R_3 and R_3 and R_4, combined with the carbon atoms to which they are attached, are joined alkylene groups completing a carbocyclic ring, which ring can also be substituted with one or more of the substituents listed above for R_1, R_2, R_3 and R_4;

I is the same as R_1, R_2, R_3 and R_4 and is present on all positions of the benzenoid ring, except the carbon atom attached to the heterocyclic ring and the carbon atom attached to the B group connecting the heterocyclic aromatic A group with the aromatic C group, wherein B is a linking group connecting A and C and is alkylene, arylene, oxy, carbonyloxy, oxycarbonylalkyleneoxy, oxycarbonyl, alkyleneoxycarbonyloxy, oxyalkylenecarbonyloxy, oxycarbonyloxy, alkyleneoxy, oxyalkylene, alkyleneoxyalkyleneoxy, oxyalkylenearylenealkyleneoxy, thio, thioalkyleneoxy, sulfinyldioxy, oxy(alkoxy)phosphinooxy, aminocarbonyl, carbonylamino, N-alkylcarbonylamino, N-alkylaminocarbonyl, N-arylaminocarbonyl, N-arylcarbonylamino, aminocarbonylalkyleneoxy, N-alkylaminocarbonylalkyleneoxy, N-arylaminocarbonylalkyleneoxy, aminocarbonylamino, N-alkylaminocarbonylamino, N-arylaminocarbonyl, N-alkylaminocarbonyl, amino, N-alkylamino, N-arylamino, N-alkylaminoalkyleneoxy, N-arylaminoalkyleneoxy, oxyalkyleneoxy, oxyaryleneoxy, alkyleneaminoalkylene, aryleneaminoarylene, aryleneaminoalkylene and alkyleneaminoarylene; and

wherein C is a group having the formula



wherein I is the same substituent as listed above and is present in all positions of the benzenoid rings except the carbon atom attached to the B group connecting the A and C moieties, and said I substituents can all be one of the substituents listed above or different listed substituents and R_5 is an alkyl group containing 1 to 20 carbon atoms.

4,076,688

POLYCARBONATE STABILIZERS

William F. Cordes, III, East Brunswick, and Robert E. Diehl, Trenton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sep. 22, 1975, Ser. No. 615,872
Int. Cl.² C08J *3/20*; C08K *5/16*
U.S. Cl. 260—45.9 QA **7 Claims**

1. Polycarbonate stabilized against the deteriorating effects of ultraviolet radiation by an effective amount of a stabilizer which is α-cyano-β-(N-cyanoethyl-p-methoxyanilino)acrylonitrile or α-cyano-β-(N-methyl-p-ethoxyanilino)acrylonitrile.

5. A compound selected from the group consisting of α-cyano-β-(N-cyanoethyl-p-methoxyanilino)acrylonitrile and α-cyano-β-(N-methyl-p-ethoxyanilino)acrylonitrile.

4,076,689

ULTRAVIOLET LIGHT STABILIZER COMBINATION FOR POLYMERS

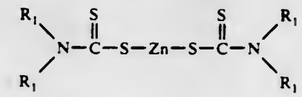
Kenneth R. Mills, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 14, 1976, Ser. No. 686,967
Int. Cl.² C08K *5/53*
U.S. Cl. 260—45.75 W **12 Claims**

7. A stabilized polymeric composition comprising a major amount of a polymer of a mono-1-olefin having incorporated therein

a. a small but effective amount, sufficient to stabilize said composition against the deteriorative action of ultraviolet light, of zinc oxide;

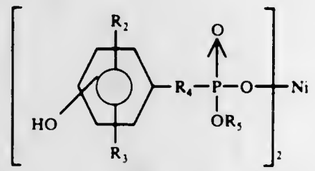
b. a small but effective amount, sufficient to stabilize said composition against the deteriorative action of ultraviolet light, of at least one zinc dihydrocarbyldithiocarbamate represented by the formula



wherein each R_1 group is independently selected from the group consisting of acyclic hydrocarbon radicals having from 1 to 20 carbon atoms and cyclic hydrocarbon radicals having from 5 to 20 carbon atoms; and

c. a small but effective amount, sufficient to stabilize said

composition against the deteriorative action of ultraviolet light, of at least one nickel phosphonate represented by the formula



wherein R_2 is an alkyl radical having from 1 to 6 carbon atoms, R_3 is selected from the group consisting of hydrogen and alkyl having from 1 to 6 carbon atoms, R_4 is a divalent alkylene radical having from 1 to 4 carbon atoms and R_5 is selected from the group consisting of hydrogen and alkyl having from 1 to 30 carbon atoms, and wherein the weight ratio of said zinc oxide to said compound (b) is in the approximate range of 10:1 to 1:3.2 and the weight ratio of said zinc oxide to said compound (c) is in the approximate range of 10:1 to 1:2.

4,076,690

PHOSPHONATES, PROCESS FOR THEIR MANUFACTURE AND ORGANIC MATERIALS STABILIZED THEREWITH

Siegfried Rosenberger, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

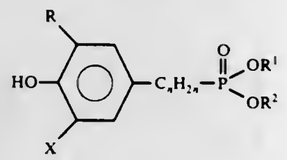
Filed Mar. 4, 1976, Ser. No. 663,953

Claims priority, application Switzerland, Mar. 10, 1975, 3001/75

Int. Cl.² C08K *5/53*

U.S. Cl. 260—45.95 D **19 Claims**

1. A phosphonate of the general formula I



(I)

wherein

X represents chlorine,

R represents a linear or branched alkyl radical of 1 to 18 carbon atoms, a cycloalkyl radical of 5 to 8 carbon atoms or an aralkyl radical of 7 to 9 carbon atoms,

R^1 represents an alkyl radical of 1 to 22 carbon atoms, a cycloalkyl radical of 5 to 7 carbon atoms, or phenyl or benzyl which is unsubstituted or substituted by alkyl,

R^2 independently has the same meaning as R^1 or represents a hydrogen atom, and

n is 0, or 1, 2 or 3.

17. A mixture consisting of an organic material which is sensitive to degradation induced by heat and oxygen and of 0.005 to 5 percent by weight of a phosphonate of the formula I according to claim 1.

4,076,691

POLYACRYLATES CONTAINING PRIMARY AMINO GROUPS

Otto Wichterle, and Jiri Coupek, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Continuation-in-part of Ser. No. 383,044, July 27, 1973, abandoned. This application Nov. 29, 1976, Ser. No. 745,967

Claims priority, application Czechoslovakia, Aug. 18, 1972, 5741-72

Int. Cl.² C08F *6/06, 8/12, 12/08, 26/02*

U.S. Cl. 260—47 UA **19 Claims**

1. A method of producing a polymeric material containing primary amino groups, which comprises copolymerizing (a) a monomer having the general formula:



wherein

R^1 is selected from the group consisting of H and CH_3,

Ar is a bifunctional aromatic residue,

R^2 is an acyl group, and

x is 1 to 20,

and (b) an amount of a comonomer which is 2 to 30 times greater than the amount of said monomer by weight, said comonomer being selected from the group consisting of a hydroxyalkyl ester of acrylic acid, a hydroxyalkyl ester of methacrylic acid, an amide of acrylic acid, an amide of methacrylic acid, and styrene, the copolymerization being conducted at a temperature of 60° to 90° C; and treating the resulting copolymeric material at a temperature of 75° - 100° C. with a hydrolytic agent selected from the group consisting of a strong mineral acid and a strong mineral base to convert the acylamino groups into primary amino groups.

4,076,692

PROCESS FOR MANUFACTURING NOVALOID FIBER

Howard Dean Batha, and Glenn John Hazelet, both of Tonawanda, N.Y., assignors to American Kynol, Inc., Altamonte Springs, Fla.

Filed Jul. 15, 1976, Ser. No. 705,383

Int. Cl.² C08G *8/28*

U.S. Cl. 260—59 R **12 Claims**

1. A process for forming cured novoloid fibers comprising:

a. blending uncured novolac resin with from about 3 to about 12 weight percent of a novolac cross-linking agent selected from the group consisting of hexamethylenetetramine and paraformaldehyde at a temperature below the curing temperature of the resulting blend;

b. melting the resulting blend at a temperature of from about 125 to about 500° C;

c. fiberizing said melted blend before it cures to an extent which prevents such fiberizing; and

d. curing the resulting uncured fibers by contacting them with an acidic gas at from about 20° to about 300° C and from about 1 to about 10 atmospheres of pressure for a curing time to obtain the desired degree of curing.

4,076,693

TEREPHTHALIC ACID/P,P-SULFONYLDIBENZOIC ACID/ETHYLENE GLYCOL/NEOPENTYL GLYCOL POLYESTER COMPOSITIONS AND CONTAINERS MADE THEREFROM

Santos W. Go, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

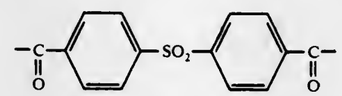
Filed Dec. 22, 1975, Ser. No. 643,282

Int. Cl.² C08G *63/68*

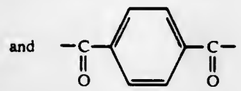
U.S. Cl. 260—75 S **3 Claims**

1. A linear copolyester which can be melted and molded to

a clear container, the repeating units of said polyester consisting essentially of



(a)



(b)

and $-O-CH_2-CH_2-O-$ (c)

and $-O-CH_2-C(CH_3)_2-CH_2-O-$, (d)

said polyester having an oxygen permeability of less than 15 cc.mil/100 in.²-day·atm. and a glass transition temperature in excess of 72° C., said (a) and (b) units and said (c) and (d) units respectively being the units formed by reactively combining polyester forming precursors thereof in an amount of at least one mole of the precursors of said (c) and (d) units per mole of precursors of said (a) and (b) units and wherein the precursors of said units in forming said polyester by said reactive combining are in a molar ratio of said (b) unit precursor to said (a) unit precursor of about 90:10 to about 40:60 and a molar ratio of said (c) unit precursor to said (d) unit precursor of about 80:20.

4,076,694

PROCESS FOR THE PRODUCTION OF POLYCONDENSATES CONTAINING IMIDE GROUPS

Wilfried Zecher; Werner Clarenz, and Rudolf Merten, all of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Jul. 27, 1976, Ser. No. 708,943

Claims priority, application Germany, Aug. 7, 1975, 2535335

Int. Cl.² C08G *18/30, 18/80;* **C08K** *5/20, 5/34*

U.S. Cl. 260—77.5 MA **6 Claims**

1. A product produced by the process of polycondensing at a temperature of from 0° to 450° C a mixture containing an organic polyisocyanate or masked polyisocyanate, a carboxylic acid cyclic anhydride substituted by at least one further cyclic anhydride group, a carboxyl group, an ester group or an SO_3H group and a monohydroxyalkyl ether, the relative proportions of the organic polyisocyanate or masked polyisocyanate and the substituted carboxylic acid cyclic anhydride being selected so that the reactive groups are present in equivalent amounts or up to an excess of 10% thereof and the monohydroxyalkyl ether being present in an amount of from 0.1 to 40% gram equivalents per gram equivalent of isocyanate.

4,076,695

SILICONE CONTAINING REACTION INJECTION MOLDED POLYURETHANES

Joseph W. Keil, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Feb. 7, 1977, Ser. No. 766,176

Int. Cl.² C08G *18/30*

U.S. Cl. 260—77.5 AM **10 Claims**

1. In a process of reaction injection molding of polyurethanes which include the mixing of one or more of each of polyols, polyisocyanates and catalysts, the reaction of the foregoing ingredients, and the molding and curing of the foregoing mixture into the desired configuration, the improvement comprising mixing with the other ingredients a carboxy functional siloxane.

4,076,696

EXTRUSION OF POLYPYRROLIDONE

James D. Neafsey, Annapolis, Md., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 9, 1976, Ser. No. 749,121

Int. Cl.² C08G *20/16*

U.S. Cl. 260—78 P **10 Claims**

1. A process of melt extruding normally solid poly-2-pyrrolidone comprising the steps of admixing with said poly-2-pyrrolidone a C_2-C_{30} alkylamine to form a composition comprising a minor amount of said alkylamine, and extruding said composition at a melt temperature in the range of 260°-280° C.

4,076,697

PROCESS FOR THE MANUFACTURE OF POLYADDITION PRODUCTS CONTAINING IMIDE GROUPS

Imre Forgó, Birsfelden; Alfred Renner, Munchenstein, both of Switzerland, and André Schmitter, Hegenheim, France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

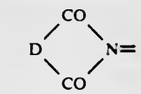
Filed Dec. 18, 1974, Ser. No. 534,106

Claims priority, application Switzerland, Dec. 21, 1973, 18049/73; Dec. 21, 1973, 18050/73

Int. Cl.² C08G *73/12*

U.S. Cl. 260—78 UA **34 Claims**

1. Process for the manufacture of a polyaddition product containing imide groups, said process consisting essentially of reacting a polyimide which contains, per molecule, at least two radicals of the general formula



(I)

in which D denotes a divalent radical containing a carbon-carbon double bond, with a saturated aliphatic polycarboxylic acid in the presence of a di-, tri- or tetra-primary amine with 2 to 40 carbon atoms or a primary polyamine obtained by reaction of a primary aromatic amine with an aldehyde or ketone, said primary polyamine being employed in such a ratio as to provide, per 1 equivalent of polyimide, such an amount of polycarboxylic acid and primary polyamine that the sum of the equivalents of said polycarboxylic acid and said polyamine is 0.3 to 1.5 equivalents and the equivalent ratio of said polycarboxylic acid to said polyamine is 1:1 to 4:1, at temperatures between 50° and 280° C to provide a polyaddition product in which said polycarboxylic acid forms a part.

4,076,698

HYDROCARBON INTERPOLYMER COMPOSITIONS

Arthur William Anderson, Wilmington, and Gelu Stoeff Stamatoff, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 568,707, March 1, 1956, abandoned. This application Jan. 4, 1957, Ser. No. 632,416

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

Int. Cl.² C08F *210/14, 210/16*

U.S. Cl. 260—88.2 F **15 Claims**

1. An interpolymer composed of interpolymerized comonomers consisting essentially of ethylene and at least one normal aliphatic mono-alpha-olefinic hydrocarbon containing from 5 to 10 carbon atoms per molecule, the proportion of said monoolefinic hydrocarbon being from 3 to 7% of the weight of the interpolymer, said interpolymer having a melt index within the range of 0.3 to 20, and, when in the form of a film, an Elmendorf tear strength in the range of 150 to 400 grams per mil, and a density of 0.93 to 0.94.

4,076,699

ALKALI SALTS OF A SULPHONATED STYRENE POLYMER OR COPOLYMER AS FLUIDIZING AGENTS AND A PROCESS FOR PREPARING THE SAME

Edouard Grimaud, Saint Genis Laval, and Robert Koeppel, Bron, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Oct. 10, 1975, Ser. No. 621,353
Claims priority, application France, Oct. 16, 1974, 74 34731
Int. Cl.[2] C04B *7/02*; C08G *75/18*
U.S. Cl. 260—79.5 C 9 Claims

1. A process for the manufacture of alkali salts of a sulphonated polystyrene polymer or copolymer which comprises:

a. telomerizing a styrene monomer to a degree a polymerization of less than about 140;

b. sulphonating the resulting polymer by means of an acid sulphonating agent, said sulphonation being carried out in two stages which comprises reacting in a first stage the styrene polymer with a portion less than all of the acid sulphonating agent at ambient temperature and then adding the balance of the acid sulphonating agent in a second stage at a temperature of from about 40° C to about 50° C; and

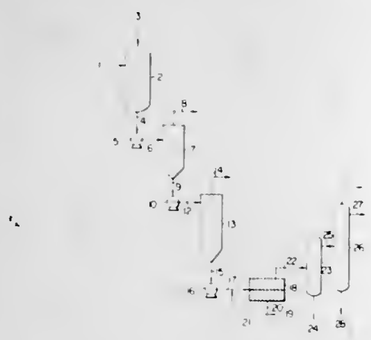
c. neutralizing the resulting sulphonic acid with an alkaline liquor.

4,076,700

PROCESS FOR RECOVERING HIGH PURITY FATTY ACIDS AND/OR ROSIN ACID AND STEROLS

Tetsuya Harada, Tokyo, and Tunemasa Yumoto, Chiba, both of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Sep. 16, 1976, Ser. No. 723,996
Claims priority, application Japan, Sep. 22, 1975, 50-114492
Int. Cl.[2] C09F *8/07*
U.S. Cl. 260—97.6 7 Claims



1. A process for recovering isomerized fatty acids and/or rosin acid in high purity, comprising: introducing a tall oil skimming soap or a tall oil soap into a thin film evaporator equipped with a rake in which the clearance between the blade tips and the surrounding tube wall is zero or not more than 1 mm; heating the contents of said thin film evaporator at a temperature higher than the melting point of the soap contained therein to evaporate and remove water and low-boiling unsaponifiable matter; adding an alkali to the thus obtained crude soap in an amount of 1.2 to 3.5 times the amount required to saponify the saponifiables in said tall oil skimming soap or tall oil soap at 120° to 210° C over a period of 20 minutes to 3 hours, thereby simultaneously decomposing esters of rosin acid and fatty acids with sterols and other alcohols and isomerizing non-conjugated double bond containing fatty acids to conjugated fatty acids; and then subjecting the saponification product to acid decomposition and then to distillation to obtain the desired isomerized fatty acids and/or rosin acid.

4,076,701

TUMOR COMPLEMENT FRACTION RECOVERY METHOD AND PRODUCT

Lawrence Burton, Commack, and Frank Friedman, New York, both of N.Y., assignors to Immunology Research Foundation, Inc., Great Neck, N.Y.

Filed Jul. 29, 1975, Ser. No. 600,027
Int. Cl.[2] A23J *1/06*
U.S. Cl. 260—112 B 11 Claims

1. A process for the isolation of TCF which comprises:

(a) suspending in an alkaline buffer a blood clot from an animal having cancer

(b) homogenizing the resultant suspension to give an homogenizate

(c) centrifuging the resultant homogenizate at 5400 - 10,000g to get a first supernatant

(d) centrifuging the first supernatant at 5400 - 10,000g to give a second supernatant

(e) centrifuging the second supernatant at 20,000 - 25,000g to give a third supernatant

(f) centrifuging the third supernatant at 25,000 - 30,000g to give a first sediment

(g) suspending the first sediment in a highly alkaline medium and centrifuging at 22.5 - 30 $\times$ 10^3g to give a fourth supernatant

(h) titrating the fourth supernatant with an alkaline material to raise the pH to over 11 and centrifuging the resultant material at 35 - 42 $\times$ 10^3g giving a fifth supernatant

(i) heating the fifth supernatant to 55° - 60° C. and centrifuging the resultant colloidal polypeptide at 25 - 30 $\times$ 10^3g giving a sixth supernatant, and

(j) heating the sixth supernatant to 55° - 60° C. and cooling the resultant material to cause agglommeration of the resultant TCF particles.

4,076,702

DIPEPTIDE DERIVATIVES AND THEIR PRODUCTION

Kentaro Hirai, Kyoto; Teruyuki Ishiba, Takatsuki; Kazuyuki Sasakura, Tondabayashi, and Hirohiko Sugimoto, Ikeda, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Division of Ser. No. 601,134, Aug. 1, 1975, abandoned. This application Aug. 20, 1976, Ser. No. 716,265
Claims priority, application Japan, Aug. 6, 1974, 49-90565; Aug. 6, 1974, 49-90566
Int. Cl.[2] C07C *103/52*
U.S. Cl. 260—112.5 R 1 Claim

1. A process for preparing 2-o-chlorobenzoyl-4-chloro-N-methyl-N$^{\alpha}$-glycyl-glycinanilide which comprises reacting 2',5-dichloro-2-methylaminobenzophenone with phthalyl-glycyl-glycyl chloride in an inert solvent and subjecting the resultant 2-o-chlorobenzoyl-4-chloro-N-methyl-N$^{\alpha}$-phthalyl-glycyl-glycinanilide to hydrazinolysis in an inert solvent.

4,076,703

DIPEPTIDE DERIVATIVES AND THEIR PRODUCTION

Kentaro Hirai, Kyoto; Teruyuki Ishiba, Takatsuki; Kazuyuki Sasakura, Tondabayashi, and Hirohiko Sugimoto, Ikeda, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Division of Ser. No. 601,134, Aug. 1, 1975, abandoned. This application Aug. 20, 1976, Ser. No. 716,266
Claims priority, application Japan, Aug. 6, 1974, 49-90565; Aug. 6, 1974, 49-90566
Int. Cl.[2] C07C *103/52*
U.S. Cl. 260—112.5 R 1 Claim

1. A process for preparing 2-o-chlorobenzoyl-4-chloro-N-methyl-N$^{\alpha}$-glycyl-glycinanilide which comprises (1) reacting 2',5-dichloro-2-methylaminobenzhydrol with phthalylglycylglycine in the presence of thionyl chloride in an inert solvent; (2) oxidizing the resultant 2-o-chloro-α-hydroxy-benzyl-4-chloro-N-methyl-N-phthalylglycyl-glycinanilide with Jones' reagent in an inert solvent; and (3) subjecting the resultant 2-o-chloro-benzoyl-4-chloro-N-methyl-N$^{\alpha}$-phthalylglycyl-glycinanilide to hydrazinolysis in an inert solvent.

4,076,704

DIPEPTIDE DERIVATIVES AND THEIR PRODUCTION

Kentaro Hirai, Kyoto; Teruyuki Ishiba, Takatsuki; Kazuyuki Sasakura, Tondabayashi, and Hirohiko Sugimoto, Ikeda, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Division of Ser. No. 601,134, Aug. 1, 1975, abandoned. This application Aug. 20, 1976, Ser. No. 716,267
Claims priority, application Japan, Aug. 6, 1974, 49-90565; Aug. 6, 1974, 49-90566
Int. Cl.[2] C07C *103/52*
U.S. Cl. 260—112.5 R 1 Claim

1. A process for preparing 2-o-chlorobenzoyl-4-chloro-N-methyl-N$^{\alpha}$-glycyl-glycinanilide which comprises reacting 1-methyl-2-aminomethyl-3-o-chlorophenyl-5-chloroindole with phthalyl-glycyl chloride in an inert solvent, oxidizing the resultant 1-methyl-2-(N$^{\alpha}$-phthalyl-glycylaminomethyl)-3-o-chlorophenyl-5-chloroindole with chromic anhydride/acetic acid and subjecting the resultant 2-o-chlorobenzoyl-4-chloro-N-methyl-N$^{\alpha}$-phthalylglycyl-glycinanilide to hydrazinolysis in an inert solvent.

4,076,705

DIPEPTIDE DERIVATIVES AND THEIR PRODUCTION

Kentaro Hirai, Kyoto; Teruyuki Ishiba, Takatsuki; Kazuyuki Sasakura, Tondabayashi, and Hirohiko Sugimoto, Ikeda, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Division of Ser. No. 601,134, Aug. 1, 1975, abandoned. This application Aug. 20, 1976, Ser. No. 716,268
Claims priority, application Japan, Aug. 6, 1974, 49-90565; Aug. 6, 1974, 49-90566
Int. Cl.[2] C07C *103/52*
U.S. Cl. 260—112.5 R 1 Claim

1. A process for preparaing 2-o-chlorobenzoyl-4-chloro-N-methyl-N$^{\alpha}$-glycyl-glycinanilide which comprises reacting 2-o-chlorobenzoyl-4-chloro-N-methyl-glycinanilide in the form of acid addition salt thereof with phthalyl-glycyl chloride in an inert solvent and subjecting the resultant 2-o-chloro-benzoyl-4-chloro-N-methyl-N$^{\alpha}$-phthalylglycyl-glycinanilide to hydrazinolysis in an inert solvent.

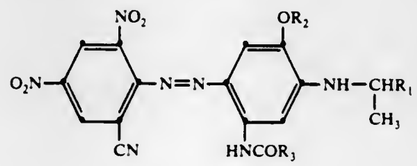
4,076,706

DISPERSE DYES FROM 2-CYANO-4,6-DINITROANILINE AND SELECTED 2(2'-ALKOXY-5'-ACYLAMIDOANILINO)ALKANES

Gary T. Clark, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 15, 1976, Ser. No. 741,906
Int. Cl.[2] C09B *29/26*; D06P *1/18, 3/54*
U.S. Cl. 260—207 7 Claims

1. A compound of the formula



wherein R_1 is straight chain alkyl of 4–10 carbons or the group

and R_2 and R_3 are selected from straight or branched alkyl of 1–4 carbons.

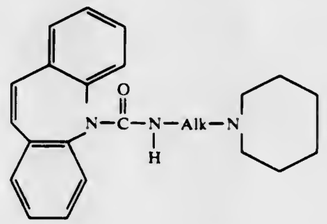
4,076,707

N-(2-HEXAMETHYLENIMINOETHYL)-5H-DIBENZ[b,f]-AZEPINE-5-CARBOXAMIDES AND QUATERNARY AMMONIUM DERIVATIVES THEREOF

Peter K. Yonan, Morton Grove, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 492,454, Jul. 29, 1974, abandoned. This application May 24, 1976, Ser. No. 689,446
Int. Cl.[2] G07D *223/26*; A61K *31/55*
U.S. Cl. 260—239 D 6 Claims

1. A member selected from the group consisting of compounds of the formula



wherein Alk is lower alkylene separating the nitrogen atoms attached thereto by at least 2 carbon atoms; and the pharmaceutically acceptable acid addition and lower alkyl halide having 1 to 6 carbon atoms quaternary ammonium salts thereof.

4,076,708

PROCESS FOR THE PREPARATION OF 7α-HALOGENO-3-OXO-4-DEHYDRO STEROIDS AND NOVEL 7α-HALOGENO DERIVATIVES PRODUCED THEREBY

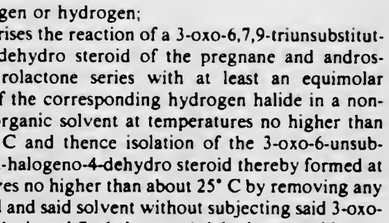
Michael J. Green, Kendall Park; Ho-Jane Shue, Belleville; Elliot L. Shapiro, Cedar Grove, and Margaret A. Gentles, Bloomfield, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Dec. 22, 1976, Ser. No. 753,257
Int. Cl.[2] C07J *71/00*
U.S. Cl. 260—239.57 18 Claims

1. The process for the preparation and isolation of a 3-oxo-6,9-di-unsubstituted-7α-halogeno-4-dehydro steroid of the pregnane and androstane-17-spirolactone series wherein said halogen has an atomic weight greater than 20, and wherein said 17-spirolactone is defined by one of following formula I and II:



I



II

V being oxygen or hydrogen;

which comprises the reaction of a 3-oxo-6,7,9-triunsubstituted-4,6-bis-dehydro steroid of the pregnane and androstane-17-spirolactone series with at least an equimolar quantity of the corresponding hydrogen halide in a non-reactive, organic solvent at temperatures no higher than about 30° C and thence isolation of the 3-oxo-6-unsubstituted-7α-halogeno-4-dehydro steroid thereby formed at temperatures no higher than about 25° C by removing any excess acid and said solvent without subjecting said 3-oxo-6,9-di-unsubstituted-7α-halogeno-4-dehydro steroid to a basic medium, so as to obtain said 3-oxo-6,9-di-unsubstituted-7α-halogeno-4-dehydro steroid substantially free of acid or base.

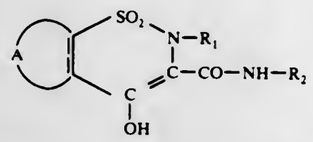
4,076,709

THIENOTHIAZINES

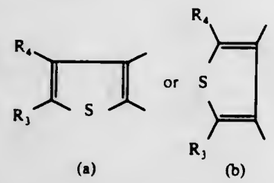
Otto Hromatka; Dieter Binder, both of Vienna, Austria; Rudolf Pfister, Basel, and Paul Zeller, Allschwil, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 21, 1975, Ser. No. 606,563
Claims priority, application Switzerland, Aug. 26, 1974, 11582/74; Sep. 19, 1974, 12157/74; Jul. 9, 1975, 8963/75
Int. Cl.² C07D *513/04*
U.S. Cl. 544—48 **8 Claims**

1. A compound of the formula



wherein A together with the two carbon atoms to which it is attached forms the group



and the broken line represents the double bond present in group (a); R_1 represents a lower alkyl group; R_2 is selected from the group consisting of a 2-thiazolyl, 4-methyl-2-thiazolyl, 4,5-dimethyl-2-thiazolyl, 5-methyl-1,3,4-thiadiazolyl, 2-pyrazinyl, 2-pyrimidinyl, 1,2,4-triazin-3-yl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 3-methyl-2-pyridyl, 4-methyl-2-pyridyl, 5-methyl-2-pyridyl, 6-methyl-2-pyridyl, 4,6-dimethyl-2-pyridyl, 5-isoxazolyl, 5-methyl-3-isoxazolyl, 3,4-dimethyl-5-isoxazolyl, 2,6-dimethyl-4-pyrimidinyl and 6-methyl-2-pyridyl group or a phenyl group which may be substituted by halogen, hydroxy, lower alkyl, trifluoromethyl or lower alkoxy; and R_3 and R_4 each represent a hydrogen atom or a lower alkyl group.

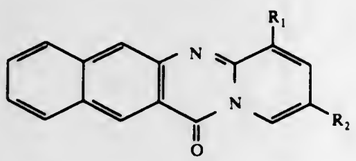
4,076,710

BENZO[g]PYRIDO[2,1-b]-QUINAZOLINONES

Charles F. Schwender, Lebanon, and Brooks R. Sunday, Hackettstown, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 614,399, Sep. 18, 1975, Pat. No. 4,012,387. This application Oct. 18, 1976, Ser. No. 733,602
Int. Cl.² C07D *471/04*; A61K *31/505*
U.S. Cl. 260—256.4 F **3 Claims**

1. A compound of the structure:



wherein R_1 and R_2 are selected from the group consisting of hydrogen and tetrazolyl with the proviso that R_1 and R_2 are not identical and its pharmaceutically acceptable salts.

4,076,711

TRIAZOLO [4,5-d]-PYRIMIDINES

Ashit K. Ganguly, Upper Montclair, N.J.; Edwin A. Peets, New York, N.Y., and Anil K. Saksena, Upper Montclair, N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 673,785, Apr. 5, 1976, abandoned. This application Dec. 22, 1976, Ser. No. 753,205
Int. Cl.² A61K *31/41*; C07D *487/04*
U.S. Cl. 260—256.4 F **6 Claims**

1. A compound selected from the group consisting of 7-chloro-3-cyclohexyl-3H-γ-triazolo[4,5-d]-pyrimidine,
7-chloro-3-cycloheptyl-3H-γ-triazolo[4,5-d]-pyrimidine,
7-chloro-3-cyclobutyl-3H-γ-triazolo[4,5-d]-pyrimidine,
7-iodo-3-cyclohexyl-3H-γ-triazolo[4,5-d]-pyrimidine, and
7-methoxy-3-cyclopentyl-3H-γ-triazolo[4,5-d]-pyrimidine.

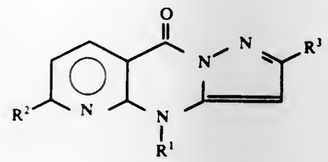
4,076,712

DERIVATIVES OF PYRAZOLO[1,5-a]PYRIDO[2,3-d]PYRIMIDIN-9(4H)-ONE

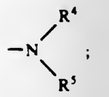
Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 31, 1977, Ser. No. 783,253
Int. Cl.² C07D *471/14*; A61K *31/415*
U.S. Cl. 260—256.4 F **12 Claims**

1. A compound of the formula



wherein
R^1 is hydrogen, lower alkyl or -lower alkyl



R^2, R^3, R^4 and R^5 each is hydrogen or lower alkyl; and salts physiologically acceptable thereof.

4,076,713

INDANTHRENE DYES

Jean Claude Henri Raoul Hardouin, Chantilly, and Maurice René Jean Vallette, Precy sur Oise, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Jun. 16, 1975, Ser. No. 587,018
Claims priority, application France, Jun. 21, 1974, 74 21585
Int. Cl.² C09B *5/48*
U.S. Cl. 260—263 **13 Claims**

1. A process for the preparation of a vat dye of the dianthraquinone-azine or dianthraquinone-N,N'-dihydroazine series, or a higher cyclic homologue therof, which consists essentially of reacting a primary amine selected from the group consisting of amino anthraquinones, their substitution products and higher cyclic homologues, with an alkaline condensing agent, wherein the reaction is effected in the presence of at least one oxide of an organic derivative of a metalloid element of group 5B of the periodic classification of the elements and which is selected from the group consisting of an oxide of an aliphatic or aromatic amine, an oxide of a heterocyclic nitrogenous base, alkylphosphine oxide, arylphosphine oxide, alkylaminophosphine oxide, alkylarylaminophosphine oxide and an arsine oxide, and wherein said oxide is present in sufficient quantity for the reaction.

4,076,714

1-METHYL-4-(2-CARBOXY-THIOXANTHEN-9-YLIDENE)-PIPERIDINE AN APPETITE STIMULANT AND ANTIHISTAMINIC AGENT

Paul S. Anderson, Lansdale, and David C. Remy, North Wales, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 526,483, Nov. 25, 1974, abandoned. This application Oct. 29, 1975, Ser. No. 626,899
Int. Cl.² A61K *31/445*; C07D *211/06, 275/00*
U.S. Cl. 424—267 **3 Claims**

1. 1-Methyl-4-(2-carboxy-thioxanthen-9-ylidene)-piperidine or a nontoxic pharmaceutically acceptable salt thereof.

2. A method of treatment of histaminically induced allergies which comprises administering to a patient in need of such treatment an effective amount of 1-methyl-4-(2-carboxy-thioxanthen-9-ylidene)-piperidine or a nontoxic pharmaceutically acceptable salt thereof.

3. A pharmaceutical composition in unit dosage form comprising an appetite stimulant or antihistaminic effective amount of 1-methyl-4-(2-carboxy-thioxanthen-9-ylidene)-piperidine or a nontoxic pharmaceutically acceptable salt thereof and a pharmaceutical carrier therefor.

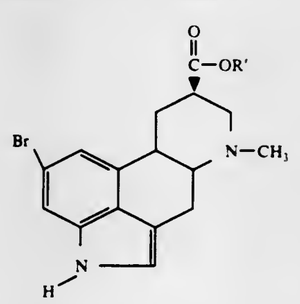
4,076,715

13-BROMO LYSERGIC ACID COMPOUNDS

Theodor Fehr, Dornach, and Hartmut Hauth, Riehen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Division of Ser. No. 399,167, Sep. 20, 1973, Pat. No. 3,901,891. This application May 23, 1975, Ser. No. 580,362
Claims priority, application Switzerland, Sep. 26, 1972, 14032/72; Sep. 26, 1972, 14033/72
Int. Cl.² C07D *457/04*; A61K *31/48*
U.S. Cl. 260—285.5 **6 Claims**

1. A compound of the formula,



VIII

wherein R' is alkyl of 1 to 6 carbon atoms or hydrogen.

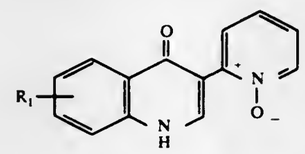
4,076,716

SUBSTITUTED 3-(2-PYRIDINYL)-4(1H)-QUINOLINONE N-OXIDES

David T. Connor, Parsippany; Patricia A. Young, Madison, and Maximilian von Strandtmann, Rockaway Township, Morris County, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 611,036, Sept. 8, 1975, Pat. No. 4,007,193. This application Jun. 25, 1976, Ser. No. 699,911
Int. Cl.² C07D *401/04*
U.S. Cl. 260—288 CE **4 Claims**

1. A compound of the formula II:



II

wherein R_1 is hydrogen, halogen, lower-alkyl of 1 to 7 carbon atoms, hydroxy or alkoxy of 1 to 7 carbon atoms; and the pharmaceutically acceptable acid addition salts thereof.

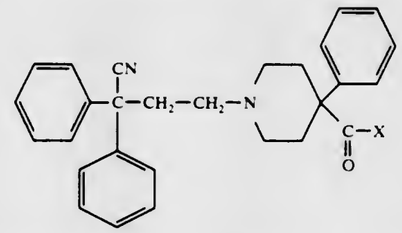
4,076,717

DERIVATIVES OF 1-(3-CYANO-3,3-DIPHENYLPROPYL)-4-PHENYL-PIPERIDINE-4-CARBOXYLIC ACID

Eunice M. Kreider, Chicago, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Division of Ser. No. 208,445, Dec. 15, 1971, Pat. No. 3,843,646. This application Jul. 22, 1974, Ser. No. 490,765
Int. Cl.² C07D *211/06*
U.S. Cl. 260—293.75 **4 Claims**

1. A compound of the formula



and the non-toxic pharmaceutically acceptable acid addition salts thereof, wherein X is 2-pyridylmethyloxy, 4-chlorophenylcarboxy, and 3-methyl-(4-methylthio)phenyloxy.

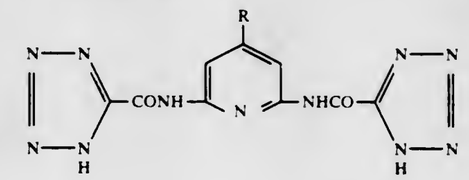
4,076,718

2,6-PYRIDINEDIYL-BIS-TETRAZOL-5-CARBOXAMIDES

John H. Sellstedt, Pottstown, and Dieter H. Klaubert, West Chester, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Jan. 21, 1977, Ser. No. 761,150
Int. Cl.² C07D *401/14*; A61K *31/455*
U.S. Cl. 260—295 PA **5 Claims**

1. A compound of the formula:



in which
R is hydrogen, halo or lower alkoxy,
or a pharmaceutically acceptable salt thereof.

4,076,719

SUBSTITUTED PYRIDINYL METHOXY (OR 1-METHYL METHOXY)BENZENEAMINES

Alin H. Gulbenk, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 622,195, Oct. 14, 1975, Pat. No. 4,003,906, which is a division of Ser. No. 435,608, Jan. 22, 1974, Pat. No. 3,931,200. This application Oct. 22, 1976, Ser. No. 734,896
Int. Cl.² C07D *213/36*
U.S. Cl. 260—296 R **1 Claim**

1. The compound which is 4-((3,6-dichloro-2-pyridyl)methoxy)benzeneamine.

4,076,720

1-SUBSTITUTED-2-(2-PYRIDINYL)ETHANONE N-OXIDES

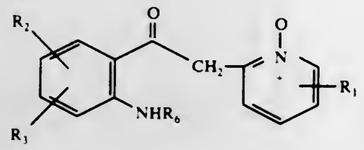
David T. Connor, Parsippany; Patricia A. Young, Madison, and Maximilian von Strandtmann, Rockaway Township, Morris County, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 611,282, Sep. 8, 1975. This application Jan. 25, 1977, Ser. No. 762,549

Int. Cl.² C07D *213/50*

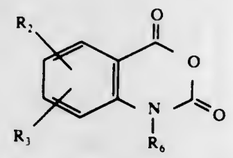
U.S. Cl. 260—296 R **1 Claim**

1. A process for preparing a compound of the formula VII:



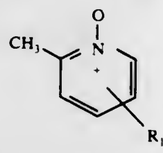
VII

wherein R_1 is hydrogen or lower alkyl; R_2 and R_3 are each hydrogen, halogen, hydroxy, lower alkyl, lower alkoxy or benzyloxy; and R_6 is hydrogen or lower alkyl; which comprises reacting a compound of the formula VIII:



VIII

wherein R_2, R_3 and R_6 are as defined above in VII with a substituted 2-picoline N-oxide of the formula V:



V

wherein R_1 is as defined above in VII, in liquid ammonia in the presence of an alkali metal amide, to obtain a compound having the formula VII above.

4,076,721

PROCESS FOR PRODUCING SACCHARIN

Wataro Koike; Takahiro Kimoto, both of Shizuoka, and Sadayoshi Matsui, Shimizu, all of Japan, assignors to Ihara Chemical Industry Co., Ltd., Tokyo, Japan

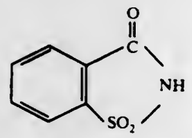
Filed Apr. 15, 1976, Ser. No. 677,255

Claims priority, application Japan, Feb. 7, 1976, 51-12461; Jun. 11, 1975, 50-70311

Int. Cl.² C07D *275/06*

U.S. Cl. 260—301 **11 Claims**

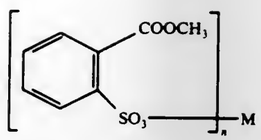
1. A process for producing o-sulfobenzimide having the formula:



which comprises:

reacting phosgene with a methylbenzoate-o-sulfonate having the formula:

(I)



wherein M represents potassium or calcium, n is 1 when M is K and n is 2 when M is Ca, in an inert organic solvent in the presence of dimethylformamide;

reacting ammonia with the reaction product to form the ammonium salt of said o-sulfobenzimide; and

converting said ammonium salt to said o-sulfobenzimide.

4,076,722

COMPOSITION CONTAINING ALKYL 2-{[({[(5-METHYL-3-ISOXAZOLYL)-AMINO]CARBONYL}METHYL)AMINO]SULFONYL}BENZOATE AND AN ALKALI METAL ALKOXIDE OF A LOWER ALCOHOL IN AN INERT SOLVENT

Arthur C. Fabian, Flanders; Jerome D. Genzer, Livingston; Charles Francis Kasulanis, Hopatcong; John Shavel, Jr., Mendham, and Harold Zinnes, Rockaway, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 577,567, May 21, 1975, Pat. No. 3,987,038. This application Feb. 10, 1976, Ser. No. 657,007

Int. Cl.² C07D *261/14*

U.S. Cl. 260—307 H **4 Claims**

1. A composition which is a reaction mixture suitable for the preparation of 1-{[5-(4-hydroxy-2H-1,2-benzothiazin-3-yl)-1,2,4-oxadiazol-3-yl]methyl}-ethanone S,S-dioxide consisting essentially of lower alkyl 2-{[({[(5-methyl-3-isoxazolyl)amino]-carbonyl}methyl)amino]sulfonyl}benzoate and from about 2 to about 5 moles of an alkali metal alkoxide of a lower alcohol per mole of lower alkyl 2-{[({[(5-methyl-3-isoxazolyl)amino]-carbonyl}methyl)amino]sulfonyl}benzoate in an inert solvent selected from the group consisting of dimethylformamide and dimethyl sulfoxide.

4. Methyl 2-{[({[(5-methyl-3-isoxazolyl)amino]carbonyl}• methyl)amino]sulfonyl}benzoate.

4,076,723

CERTAIN DIBENZOTHIACYCLIC-S-OXIMIDES

Peter Stoss, Wildtal, and Gerhard Satzinger, Denzlingen, both of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 663,312, Mar. 3, 1976, Pat. No. 4,033,981, which is a division of Ser. No. 496,600, Mar. 3, 1975, Pat. No. 3,978,052. This application Feb. 17, 1977, Ser. No. 769,641

Claims priority, application Germany, Aug. 17, 1973, 2341653

Int. Cl.² C07D *337/14, 335/12, 335/16*

U.S. Cl. 260—327 B **4 Claims**

1. Dibenzothiophene-S-oximide.

4,076,724

POLYCYCLIC MACROCYCLIC COMPOUNDS

Jean-Marie Lehn, Strasbourg, France, assignor to L'Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Oct. 4, 1972, Ser. No. 295,083

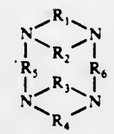
Claims priority, application France, Oct. 15, 1971, 71.37116

Int. Cl.² C07D *498/18, 513/18*

U.S. Cl. 260—338 **9 Claims**

1. A polycyclic macrocyclic compound selected from the group consisting of a compound of the following formula I:

I



wherein each R is a bridging chain having not more than twelve directly connecting atoms between the two nitrogen atoms to which it is attached and having a saturated carbon atom directly connected to each of said nitrogen atoms, R being a member selected from the group consisting of a hydrocarbon radical having from 2 to 24 carbon atoms, and a radical defined by following formula II:

$$-A-(D-A)_n- \qquad \text{II}$$

wherein n is an integer from 1 to 3, each A may be the same or different and is a hydrocarbon having from 2 to 12 carbon atoms; and each D is a member selected from the group consisting of oxygen, sulfur, and =N—R', R' being a member selected from the group consisting of hydrogen, a hydrocarbon radical selected from the group consisting of a straight and branched alkyl group having from 1 to 8 carbon atoms and a straight and branched alkenyl group having from 2 to 8 carbon atoms, and a hydrocarbonsulfonyl radical having up to twelve carbon atoms, each D may be the same only when D is oxygen, or sulfur; ech of said R chains may be the same or different with the proviso that at least two of said R chains are defined by formula II and when R_5 and R_6 are defined by formula II, the integer n is 1; and with the proviso that the number of both the carbon and hetero directly connecting atoms in R_2, R_3 and R_4 is the same as in R_1, and all the hetero atoms in R_2, R_3 and R_4 are spaced symmetrically with the hetero atoms in R_1; and the number of both the carbon and hetero directly connecting atoms in R_5 is the same as R_6, any hetero atom in R_6 being spaced symmetrically with any hetero atom in R_5.

4,076,725

DERIVATIVES OF STREPTOVARICIN ANSAMYCINS

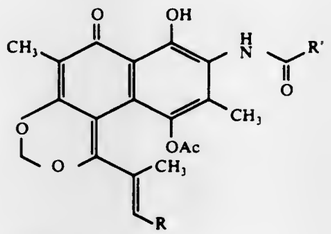
Kenneth L. Rinehart, Jr., Urbana, Ill.; Frederick J. Antosz, Kalamazoo, Mich., and Kazuya Sasaki, Higashikurume, Japan, assignors to University of Illinois Foundation, Urbana, Ill.

Continuation of Ser. No. 328,727, Feb. 1, 1973, abandoned. This application Jan. 6, 1976, Ser. No. 646,966

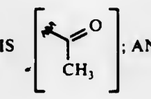
Int. Cl.² C07D *319/08*

U.S. Cl. 260—340.3 **50 Claims**

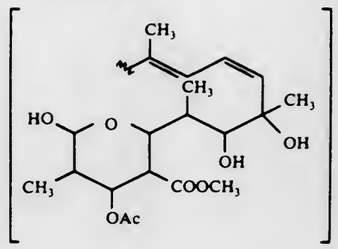
1. A compound of the formula



wherein

R IS  ; AND R' IS

-continued



and Ac is an acyl residue of a C_2 to C_{18} carboxylic acid.

4,076,726

AMIDINO-HYDRAZONE DERIVATIVES

Harm Jan Panneman, and Antonius Hermanus Nicolaas Maria Bruins, both of Oss, Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

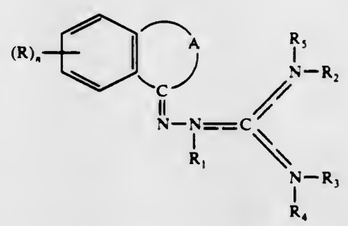
Filed May 21, 1975, Ser. No. 579,633

Claims priority, application Netherlands, Jun. 1, 1974, 7407469

Int. Cl.² C07C *123/00;* C07D *317/44*

U.S. Cl. 260—340.5 R **4 Claims**

1. A compound selected from the group consisting of a compound of the formula:



and a pharmaceutically acceptable acid addition salt thereof, in which the dotted lines signify one extra bond starting from the (guanidine-) carbon atom to one of the adjacent nitrogen atoms, and wherein

A is a member of the group consisting of methylene, ethylene propylene, and butylene, which groups may optionally be substituted with alkyl having 1 to 4 carbon atoms;

R is a member of the group consisting of hydroxy, alkyl having 1 to 4 carbon atoms, alkylthio having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, halogen, trifluoromethyl, nitro, amino, hydroxymethyl, acyloxy derived from a lower aliphatic carboxylic acid having 1 to 4 carbon atoms, and alkylenedioxy; n is the number 0, 1, 2, 3, or 4;

R_1, R_4 and R_5 are each a member of the group consisting of hydrogen and alkyl having 1 to 4 carbon atoms, with the proviso that one member is absent in view of the presence of the double bond; and

R_2 and R_3 is each a member of the group consisting of hydrogen, alkyl having 1 to 4 carbon atoms, aralkyl, aryl, hydroxy and amino.

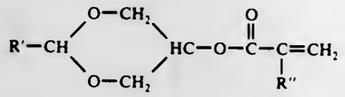
4,076,727

CYCLIC ACETAL ACRYLATES OR METHACRYLATES AND PROCESSES FOR PREPARING SAME

Edward G. Zey, Corpus Christi, Tex., and William A. Hoffmann, III, North Bergen, N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Jan. 19, 1976, Ser. No. 650,214
Int. Cl.² C07D *319/04*
U.S. Cl. 260—340.7 **5 Claims**

1. A new composition of matter comprising:



wherein R′ is hydrogen, C_1-C_3 alkyl or C_1-C_3 halogenated alkyl, and R″ is hydrogen or methyl.

2. A process for preparing the composition of claim 1 which comprises:

a. reacting an aldehyde having the general formula

R′-CHO

wherein R′ is hydrogen, C_1-C_3 alkyl, or C_1-C_3 halogenated alkyl, with glycerine, at temperatures up to 150° C., and

b. esterifying the resulting product with acrylic acid or methacrylic acid at temperatures up to about 200° C.

4,076,728

PROCESS FOR MANUFACTURING CRYSTAL VIOLET LACTONE

Donald Roy Maulding, Somerville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Mar. 17, 1977, Ser. No. 778,399
Int. Cl.² C07D *307/88*
U.S. Cl. 260—343.4 **8 Claims**

1. A process for preparing 3,3-bis(4-dimethylaminophenyl)-6-dimethylaminophthalide which comprises reacting one mole proportion of tetramethyl-4,4′-diaminobenzhydrol with from about 0.9 to about 1.2 mole proportions of 3-dimethylaminobenzoic acid in aqueous sulfuric acid at a temperature of 65°-100° C. to form 2-[4,4′-bis(dimethylamino)benzhydryl]-5-dimethylaminobenzoic acid, adding sodium hydroxide to the reaction mixture to form the sodium salt of the said benzoic acid therein, contacting the reaction mixture at a temperature of about 40°-90° C. with a solvent selected from a liquid aromatic hydrocarbon and a mixture of liquid aromatic hydrocarbon and a water-immiscible alkane, whereby impurities present in said solution are extracted therefrom; separating the organic extract phase from the aqueous reaction mixture phase, treating the reaction mixture phase with an inorganic oxidizing agent to oxidize the sodium salt of the 2-[4,4′-bis(-dimethylamino)benzhydryl]-5-dimethylaminobenzoic acid to the 3,3-bis-(4-dimethylaminophenyl)-6-dimethylaminophthalide product and recovering said product from the reaction mixture.

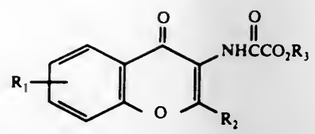
4,076,729

(4-OXO-4H-1-BENZOPYRAN-3-YL)AMINOOXOACETIC ACIDS AND THEIR DERIVATIVES

David T. Connor, Parsippany; Patricia A. Young, Madison, and Max von Strandtmann, Rockaway, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Aug. 2, 1976, Ser. No. 710,996
Int. Cl.² C07D *311/02, 311/72*; A61K *31/35, 31/355*
U.S. Cl. 260—345.2 **9 Claims**

1. A compound of the formula:



I

wherein R_1 is hydrogen, halogen, lower alkoxy or lower alkyl; R_2 is hydrogen or lower alkyl; R_3 is hydrogen or lower alkyl and the corresponding pharmaceutically acceptable salts thereof.

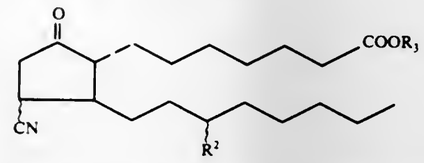
4,076,730

PROSTAGLANDIN DERIVATIVES

Donald P. Strike, St. Davids, Pa., assignor to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 384,769, Aug. 1, 1973, Pat. No. 3,845,042, which is a continuation-in-part of Ser. No. 282,200, Aug. 21, 1972, abandoned. This application Aug. 2, 1974, Ser. No. 494,118
Int. Cl.² C07C *121/46*; C07D *309/22*
U.S. Cl. 260—345.7 P **1 Claim**

1. A compound of the formula:



wherein R^2 is hydroxy, acetoxy or tetrahydropyranyloxy and R_3 is hydrogen or lower alkyl.

4,076,731

PROCESS FOR PREPARING PHTHALIC ANHYDRIDE

Serge R. Dolhyj, Parma; Ernest C. Milberger, Solon, and James F. White, Akron, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 572,260, Apr. 28, 1975, abandoned, which is a continuation of Ser. No. 362,412, May 21, 1973, abandoned. This application Nov. 12, 1976, Ser. No. 741,176
Int. Cl.² C07D *307/89*
U.S. Cl. 260—346.4 **12 Claims**

1. In the process for preparing phthalic anhydride by contacting a mixture of ortho-xylene and molecular oxygen at a temperature of about 200° to about 600° C. in the presence of an oxidation catalyst, the improvement comprising

using an oxidation catalyst consisting of:

a. an essentially inert, at least partially porous support having a particle size of at least about 20 microns, said inert support having an outer surface; and

b. a coating of a catalytically active material on said outer surface of said support which strongly adheres to said outer surface of said inert support, said catalytically active material containing boron, antimony or mixture thereof and an oxide of vanadium such that the weight of vanadium is less than 10% of the total weight of the oxidation catalyst, and wherein the active material optionally contains silica.

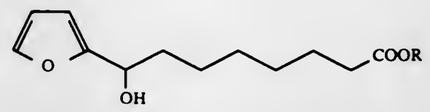
4,076,732

DERIVATIVES OF α-(6-CARBOXYHEXYL) FURFURYL ALCOHOL

Middleton Brawner Floyd, Jr., Suffern, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Mar. 30, 1977, Ser. No. 782,861
Int. Cl.² C07D *307/54*
U.S. Cl. 260—347.3 **5 Claims**

1. A compound of the formula:



wherein R is selected from the group consisting of hydrogen and C_1-C_6 alkyl.

4,076,733

PROCESS FOR THE PREPARATION OF FURFURAL

Stig Åke Dahlgren, Lidingo, Sweden, assignor to Carbos AG, Zurich, Switzerland

Filed Mar. 31, 1976, Ser. No. 672,296
Int. Cl.² C07D *307/50*
U.S. Cl. 260—347.9 **13 Claims**

1. A process for the preparation of furfural comprising subjecting a lactose-containing material essentially free of milk proteins to steam distillation under acidic conditions, whereby at least part of the lactose present is converted to furfural.

4,076,734

PROCESS FOR PREPARING DINITROANTHRAQUINONES

Eiji Yamada; Mutuo Yamada, both of Ibaraki, and Kazuyuki Nobuoka, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 4, 1972, Ser. No. 296,496
Claims priority, application Japan, Oct. 7, 1971, 46-79165; Oct. 29, 1971, 46-86644
Int. Cl.² C07C *79/37*
U.S. Cl. 260—369 **5 Claims**

1. A process for preparing 1,5- and 1,8-dinitroanthraquinones, which comprises reacting anthraquinone and sulfuric acid and nitric acid at a temperature of 0° to 50° C., nitric acid being used in an amount 3 to 30 times by weight that of anthraquinone, the concentration of said nitric acid not being lower than 96%, and sulfuric acid being used in an amount less than that of nitric acid and more than 0.5 mole per mole of anthraquinone, the concentration of said sulfuric acid not being lower than 98% and recovering a mixture of 1,5- and 1,8-dinitroanthraquinones according to the conventional procedure.

4. A process for preparing 1,5- and 1,8-dinitroanthraquinones, which comprises

(1) reacting anthraquinone and sulfuric acid and nitric acid at a temperature of 0° to 50° C., nitric acid being used in an amount of 3 to 30 times by weight that of anthraquinone and the concentration of said nitric acid being 96%, and sulfuric acid being used in an amount less than that of nitric acid and more than 0.5 mole per mole of anthraquinone and the concentration of said sulfuric acid-being 98%.

(2) dissolving the resultant mixture in nitrobenzene or a nitrotoluene or a mixture thereof by heating to 170° to 230° C., the amount of nitrobenzene, a nitrotoluene of mixture thereof being 2 to 10 time the amount of the mixture from step (1),

(3) cooling the resulting solution to 100° to 160° C. to precipitate 1,5-dinitroanthraquinone,

(4) separating the precipitated 1,5-dinitroanthraquinone by hot filtration,

(5) cooling the filtrate obtained above to 10° to 70° C. to precipitate 1,8-dinitroanthraquinone, and

(6) separating the precipitated 1,8-dinitroanthraquinone by filtration.

4,076,735

PROCESS FOR THE MANUFACTURE OF AMINOANTHRAQUINONES

Zdenek Seha, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Sep. 12, 1975, Ser. No. 612,811
Claims priority, application Switzerland, Sep. 20, 1974, 12793/74
Int. Cl.² C09B *1/16*
U.S. Cl. 260—378 **4 Claims**

1. A process for the manufacture of aminoanthraquinones, wherein mononitroanthraquinone or dinitroanthraquinone or mononitroanthraquinone or dinitroanthraquinone substituted by alkoxy, carboxyl, sulpho, hydroxy, amino or halogen, is reacted in dipolar aprotic solvents which contain —SO_2— or —SO— groups and are inert to the reactants, with aliphatic, aliphaticaromatic, cycloaliphatic, substituted or unsubstituted primary or secondary amines of the formulae R—NH_2 or R—R′—NH, in which R and R′ are radicals that are the same or different alkyl, aralkyl, cycloalkyl, hydroxyalkyl radicals of 1 to 8 carbon atoms.

4,076,736

PREPARATION OF AMINOANTHRAQUINONES FROM NITROANTHRAQUINONES

Karl-Julius Reubke, Cologne, Germany; Hans-Samuel Bien, deceased, late of Burscheid, Germany (by Else Bien, nee Geriche, heiress); Gabriele Bien, and Dorothee Bien, both of Berscheid, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jun. 4, 1976, Ser. No. 693,038
Claims priority, application Germany, Jun. 14, 1975, 2526651
Int. Cl.² C07C *87/67, 97/24*
U.S. Cl. 260—382 **10 Claims**

1. In the reaction of a nitroanthraquinone with ammonia in a solvent at elevated temperature to produce the corresponding aminoanthraquinone, the improvement which comprises effecting the reaction in the presence of an ammonium halide.

4,076,737

ALDEHYDES OF THE PREGNANE SERIES AND DERIVATIVES THEREOF

Georg Anner, Basel, and Charles Meystre, Reinach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 551,482, Feb. 20, 1975, abandoned, which is a continuation-in-part of Ser. No. 447,791, Mar. 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 883,326, Dec. 8, 1969, abandoned. This application Aug. 26, 1976, Ser. No. 717,854
Int. Cl.² C07J *17/00*
U.S. Cl. 260—397.45 **4 Claims**

1. A 20-acylate of the $\Delta^{1,4,17(20)}$-16α-methyl-6α,9α-difluoro-11β,20-dihydroxy-3,21-dioxo-pregnatriene, in which the acylate group is derived from a lower aliphatic carboxylic acid having from 1 to 7 carbon atoms.

4,076,738

POLYISOBUTYLENE OXIDATION PROCESS

Joseph Michael Pecoraro, Burlington, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 30, 1976, Ser. No. 701,748
Int. Cl.² C09F *7/02*
U.S. Cl. 260—406 **2 Claims**

1. A process for oxidizing polyisobutylene having an average molecular weight of about 300 to 3000 to form a polyisobu-

tylcarboxylic acid composition characterized by at least about 80% by weight of said composition being polyisobutylcarboxylic acid wherein substantially all carboxyl groups are attached to tertiary carbon atoms, the acid composition having no more than about 20% by weight of a nonacidic polyisobutyl component, said process comprising:

i. contacting the polyisobutylene in a liquid phase at a temperature of about −80° C to 60° C with 1 to 10% by weight of ozone in a carrier gas for a time sufficient to convert substantially all of the polyisobutylene to ozonized polyisobutylene, and

ii. contacting the ozonized polyisobutylene with aqueous nitric acid of specific gravity of about 1.18 to 1.48 at a temperature of about 20° C to 110° C for a time sufficient to convert substantially all of said ozonized polyisobutylene to said polyisobutylcarboxylic acid composition.

4,076,739

SYNTHESIS OF VITAMIN E

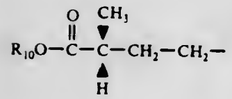
Ka-Koog Chan, Stanhope, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 587,570, Jun. 17, 1975, Pat. No. 4,016,178. This application Dec. 8, 1976, Ser. No. 747,111

Int. Cl.² C11C *1/00, 3/02*

U.S. Cl. 260—410.9 R **4 Claims**

1. A optical isomer of the formula:





where R_{10} is hydrogen or lower alkyl; *n* is an integer of from 0 to 1.

3. The compound of claim 1 wherein said compound is 2(R),6-dimethylheptanoic acid methyl ester.

4,076,740

PERFLUOROALKYLTHIO NORBORNANE COMPOUNDS

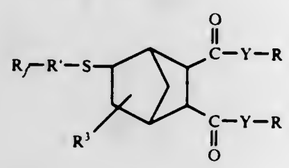
Neal O. Brace, Wheaton, Ill., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 608,932, Aug. 29, 1975, Pat. No. 3,989,725. This application Nov. 1, 1976, Ser. No. 737,463

Int. Cl.² C07C *153/11, 153/01*

U.S. Cl. 260—455 R **8 Claims**

1. A compound having the formula



wherein

Y is independently oxygen or sulfur provided that at least one Y is sulfur,

R′ is a divalent radical of the formula $-C_nH_{2n}-$, $-C_nH_{2n}-S-C_nH_{2n}-$, $-C_nH_{2n}-O-C_nH_{2n}-$ or

$-C_nH_{2n}-$, $-C_nH_{2n}-S-C_nH_{2n}-$,

-continued

$-C_nH_{2n}-O-C_nH_{2n}-$ or $-C_nH_{2n}-N(R^2)-C_nH_{2n}-$

where *n* is 1 to 12 and R^2 is hydrogen or alkyl of 1 to 6 carbon atoms, R_f is a straight or branched chain perfluoroalkyl of 1 to 18 carbon atoms or said perfluoroalkyl substitited by a perfluoroalkoxy group of 2 to 6 carbon atoms, R^3 is hydrogen or methyl and R is independently hydrogen or alkyl of 1 to 24 carbons.

4,076,741

HERBICIDAL 4-TRIFLUOROMETHYL-4-NITRODIPHENYL ETHERS

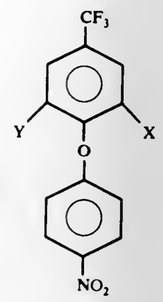
Horst O. Bayer, Levittown; Colin Swithenbank, Perkasie, and Roy Y. Yih, Doylestown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 234,656, March 14, 1972, Pat. No. 3,888,932. This application Feb. 12, 1973, Ser. No. 331,947

Int. Cl.² C07C *121/75, 43/20*

U.S. Cl. 260—465 F **7 Claims**

1. A compound of the formula



wherein

X is a hydrogen atom, a trifluoromethyl group, a (C_1-C_4) alkyl group, or a cyano group, and

Y is a hydrogen atom, a halogen atom, or a trifluoromethyl group, provided that when X is a hydrogen atom, Y is other than a halogen atom.

4,076,742

ANAEROBIC COMPOSITION COMPRISING OLIGOCARBONATEACRYLATES BENZOYL PEROXIDE AND FERROCENE

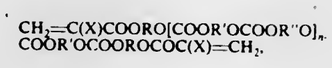
Alfred Anisimovich Berlin, Leninsky prospekt, 57, kv. 9, Moscow; Khaim-Mordkhe Aronovich Brikenshtein, p/o Chernogolovka, ulitsa, Vtoraya 5, kv. 1, Moskovskaya oblast, Noginsky raion; Nikolai Sviridovich Gavrjushenko, ulitsa Karla Marxa, 20, kv. 181, Moscow; Fedor Ivanovich Dubovitsky, Vorobievskoe shosse, 2, kv. 12, Moscow; Tamara Yakovlevna Kefeli, Krasnoprudnaya ulitsa, 22/24, kv. 103, Moscow; Raisa Vasilievna Kronman, Prospekt Lenina, 30, korpus 2, kv. 47, Gorky; Ljudmila Alexeevna Konkhina, ulitsa Tereshkovoi, 58, kv. 67, Dzerzhinsk Gorkovskoi oblasti; Natalya Lvovna Marshavina, prospekt Vernadskogo, 95/2, kv. 252; Galina Leonidovna Popova, 11 Parkovaya ulitsa, 44, korpus 3, kv. 39, both of Moscow; Anna Alexandrovna Radugina, p/o Chernogolovka, ultisa pervaya, 32, kv. 59, Moskovskaya oblast, Noginsky raion; Jury Mikhailovich Sivergin, Sobinovsky pereulok, 1, kv. 12, Moscow; Iosif Grigorievich Sumin, prospekt Lenina, 81, kv. 58, Dzerzhinsk Gorkovskoi oblasti; Nikolai Nikandrovich Tvorogov, Matveevskaya ulitsa, 10, korpus 2, kv. 22, Moscow; Galina Pavlovna Shilova, p/o Chernogolovka, ulitsa Pervaya, 2a, kv. 21, Moskovskaya oblast, Noginsky Raion, and David Alexeevich Kardashov, Frunzenskaya naberezhnaya, 52, kv. 57, Moscow, all of U.S.S.R.

Filed Jul. 14, 1975, Ser. No. 595,682

Int. Cl.² C08F *4/34, 18/24*; B01F *9/00*

U.S. Cl. 260—47 UA **4 Claims**

1. An anaerobic composition on the basis of a polymerizable oligomer of the acrylic series, consisting of at least one oligocarbonateacrylate of the general formula



where

X is a radical selected from the group consisting of —H, $—CH_3$ and a halogen;

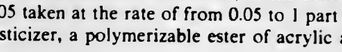
R is a radical selected from the group consisting of glycol and bisphenol radicals;

R′ is a radical selected from the group consisting of glycol, bisphenol and polyol radicals;

R″ is a radical selected from the group consisting of alkyl and aryl radicals;

n is equal to 0 or 1,

taken in a quantity of 98 parts by weight; a polymerization inhibitor, bis[5-methyl-3-tertiary butyl-2-oxyphenyl]methane, taken in a quantity of from 0.02 to 0.03 part by weight; a polymerization initiator, benzoyl peroxide, combined with a polymerization accelerator, ferrocene, in the ratio of from 1:1 to 1:0.005 taken at the rate of from 0.05 to 1 part by weight; and a plasticizer, a polymerizable ester of acrylic acid of the formula



where R‴ is alkyl radical C_8—C_{12}, taken in a quantity of from 2 to 5 parts by weight.

4,076,743

NOVEL BETAINES, PROCESSES FOR THE PREPARATION THEREOF AND RECOVERY OF UNDERGROUND PETROLEUM THEREWITH

Karlheinz Koch, Haan, and Horst Rutzen, Langenfeld, both of Germany, assignors to Henkel KGaA, Dusseldorf and Durtsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, both of, Germany

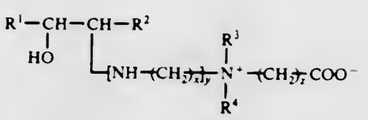
Filed Jan. 10, 1977, Ser. No. 758,035

Claims priority, application Germany, Jan. 10, 1976, 2600779

Int. Cl.² C07C *101/12, 101/24*; C09K *3/00*

U.S. Cl. 260—501.13 **7 Claims**

1. Water-soluble betaines of the formula:



wherein R^1 and R^2 each represents a C_{1-17} alkyl group, the sum of the number of carbon atoms in R^1 and R^2 being 9 to 18; R^3 and R^4 represents the same or different C_{1-6} alkyl or alkylol group; *x* represents 2,3 or 4; *y* represents 0 or 1, and *z* represents 1, 2, 3 or 4.

4,076,744

AMPHOTERIC SURFACTANTS

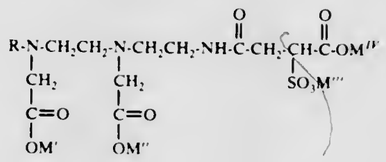
Saul Kaplan, Teaneck; John J. Merianos, Jersey City, both of N.J.; Harold A. Green, Havertown, Pa., and Alfonso N. Petrocci, Glen Rock, N.J., assignors to Kewanne Industries, Inc., Bryn Mawr, Pa.

Filed May 23, 1977, Ser. No. 799,697

Int. Cl.² C07C *143/15*; C11D *3/48*

U.S. Cl. 260—501.19 **1 Claim**

1. Compound having the structure:



where R is an alkyl group of from 8 to 14 carbon atoms, and where M′, M″, M‴, and M^{IV} may be the same or different and constitute monovalent moieties selected from the group consisting of hydrogen, alkali metal, ammonium ion, and ammonium ion that is substituted by from 1 to 3 lower alkyl groups, each of from 1 to 3 carbon atoms, and wherein each of said alkyl groups is either unsubstituted or is substituted by one hydroxyl group.

4,076,745

PROCESS FOR CALCIUM SALTS α-KETOCARBOXYLIC ACIDS

Eric Lodewyk, Boulder, Colo., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jul. 8, 1976, Ser. No. 703,498

Int. Cl.² C07C *53/24, 87/08*

U.S. Cl. 260—526 R **1 Claim**

1. A process for the preparation of a calcium salt of an α-ketocarboxylic acid selected from the group consisting of α-ketoisovaleric acid, α-ketoisocaproic acid, and α-keto-β-methylvaleric acid, which process comprises:

(a) treating said α-ketocarboxylic acid with substantially an equimolar amount of triethylamine in methanol at a temperature between about 0° and 40° C for a sufficient period of time to afford a methanolic solution of the triethylamine salt of said α-ketocarboxylic acid,

(b) treating the product of step (a) with a methanolic solution of substantially one-half mole calcium chloride relative to said triethylamine salt at a temperature between about 0° and 80° C for a sufficient period of time to afford a precipitate of the calcium salt of said α-ketocarboxylic acid, and

(c) isolating said calcium salt.

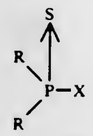
4,076,746

PROCESS FOR PREPARING DIALKYL AND DIARYL PHOSPHONOTHIOIC HALIDES

Arthur D. F. Toy, Stamford, Conn., and Eugene H. Uhing, Ridgewood, N.J., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 502,702, Sept. 3, 1974, abandoned. This application Jun. 9, 1976, Ser. No. 694,270
Int. Cl.² C07F *9/04*
U.S. Cl. 260—543 P **6 Claims**

1. A method of preparing compounds of the formula:



wherein R is selected from the group consisting of alkyl having 1 to about 20 carbon atoms, monocyclic and bicyclic fused ring aryl derivatives thereof; cycloalkyl having 5 to 6 ring carbons; aryl having up to 3 fused rings; biphenyl; and alkyl of 1 to about 4 carbon atoms, substituted derivatives of said cycloalkyl, aryl and biphenyl; and X is selected from the group consisting of chlorine and bromine, which method consists of contacting under at least an autogenous pressure at a temperature of from about 250° C. to about 330° C. a halide reactant of the formula:

RX II

wherein R and X are as defined above, with a phosphorus sulfide reactant of the formula:

P_4S_3 III

4,076,747

PROCESS FOR HYDRATION OF ACRYLONITRILE TO PRODUCE ACRYLAMIDE

Ken Matsuda, Stamford, and Kin Hsueh-Yuan Tsu, Norwalk, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 558,999, Mar. 17, 1975, abandoned. This application Jun. 14, 1976, Ser. No. 696,087
Int. Cl.² C07C *102/08*
U.S. Cl. 260—561 N **1 Claim**

1. In the catalytic hydration of acrylonitrile to product acrylamide wherein an aqueous feed solution of acrylonitrile is contacted in a reactor with a solid heterogeneous catalyst for the hdyration reaction, the improvement wherein the solubility of acrylonitrile in said aqueous feed solution is increased by addition of acrylamide up to about 35% of the feed solution as fed to said reactor as a cosolvent in said feed solution and acrylonitrile is dissolved in said feed solution containing the acrylamide cosolvent in an amount to make an enriched feed solution having acrylonitrile concentration higher than the saturation concentration of acrylonitrile in water without a cosolvent.

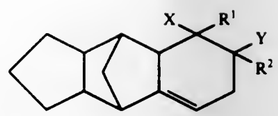
4,076,748

POLYCYCLIC SCENTS

Werner Hoffmann, Neuhofen, and Karl von Fraunberg, Bobenheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Jul. 26, 1976, Ser. No. 708,994
Int. Cl.² C07C *49/36*
U.S. Cl. 260—586 F **4 Claims**

1. A Diels-Alder adduct of the formula



(I)

where R^1 and R^2 are independently —H or $—CH_3$, or R^1 and R^2 together are a further bond between the carbon atoms on which they are present, one of X and Y is —H or $—CH_3$ and the other is $—COOH_3$, $—COOC_2H_5$, —CHO, —CO $—CH_3$, or —CO $—C_2H_5$.

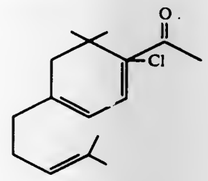
4,076,749

SUBSTITUTED ACETONAPHTHONES, PROCESSES FOR PREPARING SAME, USES OF SAME IN PERFUMERY, AND INTERMEDIATES USED IN SAID PROCESSES

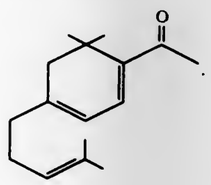
William L. Schreiber, Jackson; James N. Siano, Keyport, both of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Nov. 11, 1976, Ser. No. 740,890
Int. Cl.² C07C *49/48*
U.S. Cl. 260—586 R **2 Claims**

1. A compound having the structure:



2. A compound having the structure:



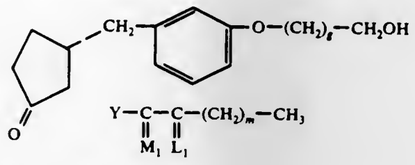
4,076,750

2-DECARBOXY-2-HYDROXYMETHYL-3,7-INTER-M-PHENYLENE-3-OXA-9-DEOXY-PGD$_1$ COMPOUNDS

Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,363, Jan. 8, 1976, Pat. No. 4,028,419. This application Mar. 17, 1977, Ser. No. 778,773
Int. Cl.² C07C *49/82*
U.S. Cl. 260—590 C **22 Claims**

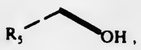
1. A prostaglandin analog of the formula



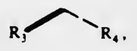
wherein Y is trans-CH=CH—;
wherein M_1 is



or

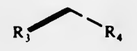


wherein R_5 is hydrogen or methyl; wherein L_1 is

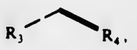




or a mixture of



and



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein *g* is one, 2, or 3; and
wherein *m* is one to 5, inclusive.

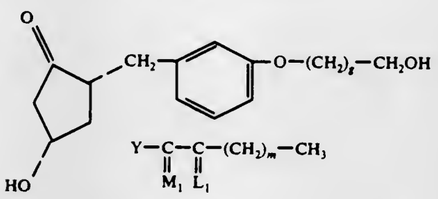
4,076,751

2-DECARBOXY-2-HYDROXYMETHYL-3,7-INTER-M-PHENYLENE-3-OXA-PGE$_1$ COMPOUNDS

Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,363, Jan. 8, 1976, Pat. No. 4,028,419. This application Mar. 17, 1977, Ser. No. 778,777
Int. Cl.² C07C *49/84*
U.S. Cl. 260—590 C **22 Claims**

1. A prostaglandin analog of the formula

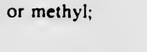


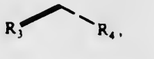
wherein Y is trans—CH=CH—;
wherein M_1 is



or

wherein R_5 is hydrogen or methyl;
wherein L_1 is





or a mixture of

and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, the same of different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein *g* is one, 2, or 3; and
wherein *m* is one to 5, inclusive.

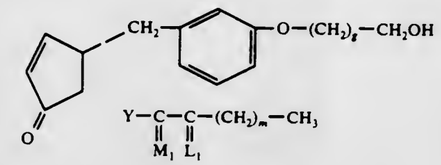
4,076,752

2-DECARBOXY-2-HYDROXYMETHYL-3,7-INTER-M-PHENYLENE-3-OXA-9-DEOXY-9,10-DIDEHYDRO-PGD$_1$ COMPOUNDS

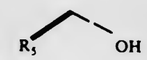
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,363, Jan. 8, 1976, Pat. No. 4,028,419. This application Mar. 17, 1977, Ser. No. 778,776
Int. Cl.² C07C *49/84*
U.S. Cl. 260—590 C **22 Claims**

1. A prostaglandin analog of the formula



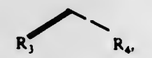
wherein Y is trans-CH=CH-; wherein M_1 is

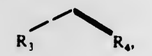


or

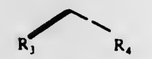


wherein R_5 is hydrogen or methyl; wherein L_1 is

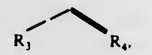




or a mixture of



and



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein *g* is one, 2, or 3; and wherein *m* is one to 5, inclusive.

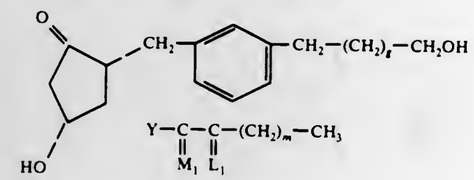
4,076,753

2-DECARBOXY-2-HYDROXYMETHYL-3,7-INTER-M-PHENYLENE-PGE$_1$ COMPOUNDS

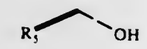
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,363, Jan. 8, 1976, Pat. No. 4,028,419. This application Mar. 17, 1977, Ser. No. 778,644
Int. Cl.[2] C07C *49/82*
U.S. Cl. 260—590 C **22 Claims**

1. A prostaglandin analog of the formula



wherein Y is trans—CH=CH—;
wherein M_1 is



or



wherein R_5 is hydrogen or methyl;
wherein L_1 is



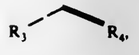
-continued



or a mixture of



and



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein *g* is one, 2, or 3; and
wherein *m* is one to 5, inclusive.

4,076,754

FORMALDEHYDE MANUFACTURING PROCESS

Gary L. Kiser, Seabrook, and Bobby G. Hendricks, Deer Park, both of Tex., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 20, 1976, Ser. No. 650,801
Int. Cl.[2] C07C *45/16*
U.S. Cl. 260—603 C **9 Claims**

1. In a process for the manufacture of formaldehyde by the silver catalyzed oxidation of methanol in two series stages in which the second stage is typically operated with mole ratio of air to methanol of 1.70 -2.40, adiabatic temperature of 500°-700° C and space velocity of 50,000–3,000,000 hr^{-1}, the improvement comprising using as catalyst for the second oxidation stage a fixed composite catalyst prepared by sintering (a) an upstream layer of foraminous silver having a void volume of 75 to 90% and thickness of from about 10 to about 100 mm, the upstream layer being contiguous to (b) a downstream layer of crystalline silver particles having a void volume of 65 to 75%, which is at least about 5% below the void volume of the upper layer, and thickness ranging from about 5 to about 20 mm.

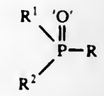
4,076,755

PRODUCTION OF HYDROXYALKYLPHOSPHINE OXIDES

Bernd Lippsmeier, Hurth-Knapsack, and Klaus Hestermann, Erftstadt-Bliesheim, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 15, 1976, Ser. No. 666,699
Claims priority, application Germany, Mar. 19, 1975, 2511932
Int. Cl.[2] C07F *9/53*
U.S. Cl. 260—606.5 P **16 Claims**

1. A process for making tertiary hydroxyalkylphosphine oxides of general formula (I)



(I)

in which R^1 and R^2 are identical or different radicals selected from the group consisting of branched and unbranched alkyl, cycloalkyl, aryl, alkylaryl and aralkyl groups having from 1 to 18 carbon atoms, where R^1 may be identical with R^2 and R^2 may be identical with R, which is a radical of general formula (II)



(II)

in which R^3 and R^4 are identical or different radicals selected from the group consisting of branched and unbranched alkyl, cycloalkyl, aryl, alkylaryl and aralkyl groups having from 1 to 18 carbon atoms and hydrogen, which process comprises subjecting phosphines of general formula (III)



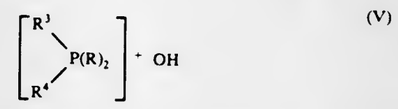
(III)

in which R^3 and R^4 have the meanings given above to a single step reaction with carbonyl compounds of general formula (IV)



(IV)

in which R^3 and R^4 have the meanings given above, the reaction being effeted by introducing the phosphine of general formula (III) into an aqueous phase containing the carbonyl compound of formula (IV) and being adjusted to a pH-value of from 8 to 13.5 by adding thereto a water soluble base yielding hydroxyl ions selected from the group consisting of NaOH, KOH, NH_4OH and phosphonium hydroxides of general formula (V)



(V)

and separating the resulting hydroxyalkylphosphine oxide of general formula (I) from the reaction product obtained.

4,076,756

PROCESS FOR THE PREPARATION OF TRIARYLBORANE

Nicholas Nazarenko, and William Carl Seidel, both of Orange, Tex., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 12, 1975, Ser. No. 630,994
Int. Cl.[2] C07F *5/04*
U.S. Cl. 260—606.5 B **3 Claims**

1. In a process for recovering a triarylborane from an aqueous solution of the alkali metal hydroxide salt of the triarylborane obtained by reacting an alkali metal, an aryl halide and an orthoborate ester in an inert organic solvent at a ratio of halide to ester in the range of about 3.5:1 to 3:1, contacting the reaction mixture with water to thereby obtain an aqueous solution comprising said hydroxide salt and the alcohol derived from said ester and thereafter neutralizing said salt to obtain said triarylborane, the improvement which comprises separating said alcohol from the aqueous solution of said hydroxide salt before neutralization of said hydroxide salt.

4,076,757

3-METHOXYCYCLOOCTADIENE-(1,5)

Gunther Wilke, and Paul Heimbach, both of Mulheim (Ruhr), Germany, assignors to Studiengesellschaft Kohle m.b.H., Mulheim (Ruhr), Germany

Division of Ser. No. 585,287, Jun. 9, 1975, Pat. No. 4,032,585, which is a division of Ser. No. 463,087, Apr. 22, 1974, Pat. No. 3,929,921, which is a division of Ser. No. 109,949, Jan. 26, 1971, Pat. No. 3,849,506, which is a division of Ser. No. 843,220, Jul. 18, 1969, Pat. No. 3,586,727, and Ser. No. 845,901, Jul. 29, 1969, Pat. No. 3,629,347, and Ser. No. 845,904, Jul. 29, 1969, abandoned, each is a continuation-in-part of Ser. No. 582,775, Sep. 27, 1966, abandoned. This application Nov. 1, 1976, Ser. No. 737,766
Claims priority, application Germany, Sep. 29, 1965, 1493221
Int. Cl.[2] C07C *43/18*
U.S. Cl. 260—611 R **1 Claim**

1. 3-Methoxycyclooctodiene-(1,5) having a boiling point of 86° C and n_D^{20} of 1.4887.

4,076,758

SYNTHESIS OF VICINAL GLYCOLS

Dennis C. Owsley, St. Louis, and Jordan J. Bloomfield, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 9, 1976, Ser. No. 749,127
Int. Cl.[2] C07C *29/00, 31/14*
U.S. Cl. 260—618 R **18 Claims**

1. In the process of coupling relatively low molecular weight primary alcohols to form relatively higher molecular weight vicinal glycols, the improvement comprising employing a trialkylsilyl protecting group on the hydroxyl position of said low molecular weight primary alcohol during said coupling reaction.

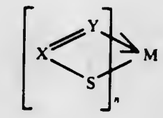
4,076,759

PRODUCTION OF PHENOLS

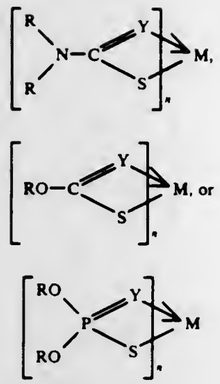
Peter Graham Spencer Field, St-Foy-les-Lyons, France, and Ronald Bennett, Chester, England, assignors to Burmah Oil Trading Limited, Wirral, Great Britain

Filed May 5, 1975, Ser. No. 574,756
Claims priority, application United Kingdom, May 6, 1974, 19806/74
Int. Cl.[2] C07C *37/08, 39/06, 45/08*
U.S. Cl. 260—621 C **23 Claims**

1. In the process comprising decomposing a secondary aralkyl hydroperoxide, in which the aryl nucleus is substituted by at least one secondary alkylhydroperoxide group containing from 2 to 24 carbon atoms and said aryl nucleus may be further substituted by one or more other substituents selected from halogen atoms and alkyl, alkoxy and nitro groups, to produce a correspondingly substituted or unsubstituted mono- or polyhydric phenol, the improvement comprising:
effecting the decomposition at a temperature of from ambient temperature to 180° C in the presence of a catalysts comprising a complex having the formula



wherein Y represents an atom of sulphur or oxygen, M is tin, antimony or a transition metal appearing in Group VIII, Ib or IIb of the Periodic Table. N is the oxidation state of M, and X is selected such that said formula is



wherein each R represents an unsubstituted hydrocarbyl group containing 1 to 12 carbon atoms; and

recovering said correspondingly substituted or unsubstituted mono- or polyhydric phenol from the decomposition product.

4,076,760

PROCESS FOR THE PREPARATION OF FLUOROCARBON WAXES

Robert Hartwimmer, Burghausen, Salzach, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 155,650, Jun. 22, 1971, abandoned. This application Mar. 24, 1975, Ser. No. 561,230

Claims priority, application Germany, Jun. 24, 1970, 2031046

Int. Cl.² C07C *19/00*

U.S. Cl. 260—653.1 R **4 Claims**

1. Process for the preparation of solid fluorocarbon waxes which process consists essentially of thermic cracking of polytetrafluorethylene or copolymers of tetrafluorethylene and higher perfluoro-olefins at elevated temperatures and under increased pressures, wherein the pyrolysis is carried out at temperatures of from 350° to 700° C and under partial pressures of the degradation products of from 5 to 100 atmospheres gauge.

4,076,761

PROCESS FOR THE MANUFACTURE OF GASOLINE

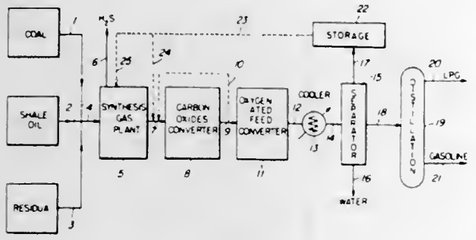
Clarence D. Chang, Princeton, N.J., and Anthony J. Silvestri, Morrisville, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 387,220, Aug. 9, 1973, abandoned. This application Dec. 5, 1974, Ser. No. 529,779

The portion of the term of this patent subsequent to Jul. 8, 1992, has been disclaimed.

Int. Cl.² C07C *15/00*; C10G *1/06*

U.S. Cl. 260—668 R **4 Claims**



1. In the process for manufacture of liquid hydrocarbon fuels boiling in the gasoline boiling range from coal which comprises converting the coal to a gaseous mixture of hydrogen and carbon oxides and converting said gaseous mixture to normally liquid hydrocarbons and oxygen-substituted hydrocarbons comprising methanol; the improvement comprising the additional step of contacting at least said oxygen-substituted hydrocarbons including said methanol with a catalytically active aluminosilicate zeolite having a silica to alumina ratio of at least about 12, a constraint index of about 1 to 12 and a crystal density, in the hydrogen form, of not substantially below about 1.6 grams per cubic centimeter at a temperature of about 500° to 1000° F, a space velocity of about 0.1 to 50 liquid hourly space velocity, and a pressure of about 1 to 50 atmospheres; and, covering liquid hydrocarbons.

4,076,762

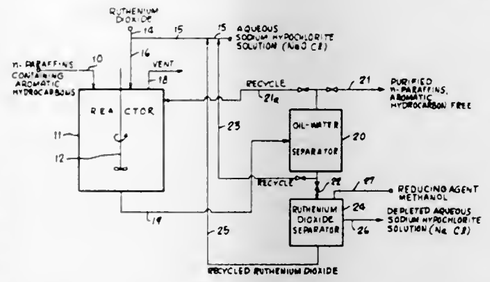
CONTINUOUS PROCESS FOR THE REMOVAL OF OTHER HYDROCARBONS FROM SATURATED ALIPHATIC HYDROCARBONS

Miron Abramovici, Somerset, and Eric W. Stern, Mountainside, both of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Iselin, N.J.

Filed Apr. 29, 1977, Ser. No. 792,175

Int. Cl.² C07C *9/14, 7/00*; C10G *27/02*

U.S. Cl. 260—676 R **17 Claims**



1. A method for treating saturated aliphatic hydrocarbons containing in admixture therewith compounds selected from the group consisting of aromatic hydrocarbons, substituted aromatic hydrocarbons, unsaturated aliphatic hydrocarbons, saturated cycloaliphatic hydrocarbons and unsaturated cycloaliphatic hydrocarbons for the removal of said compounds which comprises (a) contacting said admixture with a selective oxidizing aqueous hypochlorite solution containing a low oxidation state ruthenium compound convertible in the presence of said hypochlorite to a higher oxidation state ruthenium compound capable of selectively oxidizing said compounds, said aqueous hypochlorite being present in a stoichiometric excess relative to said compounds in said admixture, said contacting resulting in the selective oxidation of said compounds to carbon dioxide and/or water-soluble oxygenated compounds, (b) recovering the resulting hydrocarbon reaction phase from the aqueous phase, (c) withdrawing from said recovered hydrocarbon phase at least a portion of said saturated aliphatic hydrocarbons as product, (d) returning at least a portion of the aqueous phase from step (b) to said contacting step (a), (e) intermittently withdrawing a portion of said aqueous phase separated from step (b), (f) adding to said intermittently withdrawn portion of said aqueous phase a reducing agent for the conversion of hypochlorite in said aqueous phase to corresponding chloride and for the reduction of the higher oxidation state ruthenium compound to said low oxidation state ruthenium compound, (g) recycling said low oxidation state ruthenium compound from step (f) to said contacting step (a), and (h) withdrawing from step (f) said resulting aqueous phase containing said corresponding chloride and said water-soluble oxygenated organic compounds derived from the selective oxidation of said compounds.

4,076,763

POLYSILOXANE/POLYCARBODIIMIDE COPOLYMERS

Karl-Friedrich Thom, and Reinhard Schliebs, both of Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

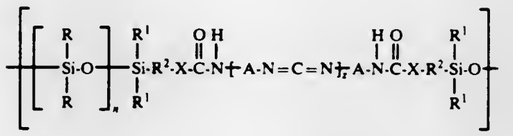
Filed Jan. 11, 1977, Ser. No. 758,528

Claims priority, application Germany, Jan. 23, 1976, 2602413

Int. Cl.² C08L *83/00*

U.S. Cl. 260—824 R **7 Claims**

1. An organopolysiloxane/polycarbodiimide copolymer comprising optionally repeating structural units of the formula



wherein

R is an alkyl, alkenyl or aryl radical with up to 12 carbon atoms,

R^1 is an alkyl radical with up to 4 carbon atoms,

R^2 is a divalent hydrocarbon radical with up to 6 carbon atoms,

X is oxygen or the group —N—R^3,

R^3 is hydrogen or an alkyl, aryl, aralkyl or cycloalkyl radical with up to 8 carbon atoms,

A is a divalent aromatic radical with up to about 40 carbon atoms,

n is an integer from 0 to about 10,000,

z is an integer from 1 to about 1500.

4,076,764

EPOXY RESIN COMPOSITION HAVING IMPROVED PHYSICAL PROPERTIES

Ronald S. Bauer, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 22, 1976, Ser. No. 707,909

Int. Cl.² C08L *63/00*

U.S. Cl. 260—834 **9 Claims**

1. A heat-curable composition comprising (1) a glycidyl ether of a polyhydric phenol having at least one vicinal epoxy group and wherein the carbon-to-carbon bonds within the six-membered phenolic group are saturated, (2) a curing amount of an urea-formaldehyde or melamine-formaldehyde resin and (3) from about 0.01 to about 5.0 parts per hundred parts by weight of the glycidyl ether of at least one stabilizer selected from the group consisting of actinic stabilizers and heat stabilizers.

4,076,765

UNSATURATED EPOXY ESTER RESIN

Makoto Nakahara, Osaka; Yoshiya Fukuyama, Hirakata; Kazuo Sumiyoshi, Toyonaka, and Katsuo Akagane, Ashiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Sep. 2, 1976, Ser. No. 720,079

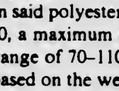
Claims priority, application Japan, Sep. 9, 1975, 50-109744

Int. Cl.² C08L *63/00*

U.S. Cl. 260—835 **18 Claims**

1. An unsaturated epoxy ester which comprises the reaction product of the following three components:

1. the first component selected from the group consisting of
   i. a partial esterification compound obtained by the reaction of trimellitic anhydride with an unsaturated monoalcohol,
   ii. a partial esterification compound obtained by the reaction of pyromellitic anhydride with an unsaturated monoalcohol, and
   iii. a mixture of (i) and (ii),
2. the second component selected from the group consisting of
   i. a partial esterification compound obtained from a dicarboxylic anhydride and an unsaturated monoalcohol,
   ii. a polymerizable unsaturated monobasic acid, and
   iii. a mixture of (i) and (ii), and
3. as the third component a compound containing at least two epoxy groups in the molecule, the unsaturated monoalcohol employed in (1)-(i) or (ii) being the same or different from that of (2)-(i) and the amount of unsaturated monoalcohol being equimolar to or slightly in excess of the whole acid component, and the ratio of total —COOH groups to the total



groups in the reaction system being 0.9 to 1.1.

4,076,766

FLEXIBLE THERMOSETTING ACRYLIC ENAMELS

John Alvin Simms, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 562,938, March 27, 1975, abandoned. This application Dec. 31, 1975, Ser. No. 645,696

Int. Cl.² B32B *15/04*; C08L *61/26*

U.S. Cl. 260—850 **26 Claims**

12. A thermosetting acrylic enamel wherein the film-forming constituents consist essentially of:

(A) 20% by weight, based on the weight of (A) plus (B) plus (C), of an acrylic polymer consisting essentially of:

(1) 61% by weight, based on the weight of the polymer, of butyl acrylate;

(2) 10% by weight, based on the weight of the polymer, of 2-hydroxyethyl acrylate;

(3) 26% by weight, based on the weight of the polymer, of methyl methacrylate; and

(4) 3% by weight, based on the weight of the polymer, of acrylic acid; and

10% by weight, based on the weight of (A) plus (B) plus (C), of an acrylic polymer consisting essentially of:

(1) 38% by weight, based on the weight of the polymer, of butyl acrylate;

(2) 8% weight, based on the weight of the polymer, of 2-hydroxyethyl acrylate;

(3) 50% by weight, based on the weight of the polymer, of styrene; and

(4) 4% by weight, based on the weight of the polymer, of acrylic acid;

said acrylic polymer has an inherent viscosity, at 25° C, of 0.1–0.3 as determined as a 0.5% solution in 1,2-dichloroethane;

(B) 40% by weight, based on the weight of (A) plus (B) plus (C), of a polyester prepared from neopentyl glycol and adipic acid; wherein said polyester has a molecular weight not exceeding 2,000, a maximum acid number of 5, and a hydroxyl number range of 70–110; and

(C) 30% by weight, based on the weight of (A) plus (B) plus (C), of a butylated melamine formaldehyde crosslinking agent;

wherein the enamel also contains pigment.

22. A metallic substrate coated with the thermosetting acrylic enamel of claim 12.

4,076,767

CURABLE MIXED POLYESTER RESIN COMPOSITIONS

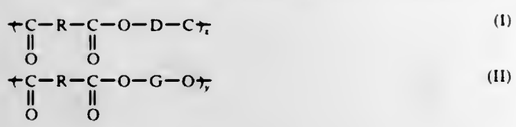
Hiroshi Samejima, Ibaragi, Japan, assignor to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Division of Ser. No. 595,304, Jul. 11, 1975, Pat. No. 4,032,593. This application Jun. 22, 1976, Ser. No. 698,608
Claims priority, application Japan, Jul. 12, 1974, 49-79862
Int. Cl.² C08L 67/06
U.S. Cl. 260—862 11 Claims

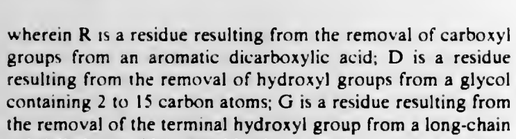
1. A curable unsaturated polyester resin composition which comprises

A. an unsaturated polyester having a molecular weight of 500 to 5,000,

B. an aromatic copolyester having a weight average molecular weight of 10,000 to 100,000 and composed of recurring units of formula (I) and recurring units of formula (II)



(I)



(II)

wherein R is a residue resulting from the removal of carboxyl groups from an aromatic dicarboxylic acid; D is a residue resulting from the removal of hydroxyl groups from a glycol containing 2 to 15 carbon atoms; G is a residue resulting from the removal of the terminal hydroxyl group from a long-chain poly(alkylene oxide) glycol having a number average molecular weight of 350 to 6,000; and

$$\frac{x}{x+y}$$

is from 0.2 to 0.8, and

C. an ethylenic monomer polymerizable with the unsaturated polyester (A), the amount of the aromatic copolyester (B) being 1 to 35 parts by weight per 100 parts by weight in total of the unsaturated polyester (A) and the ethylenic monomer (C).

4,076,768

CROSS-LINKED BLOCK COPOLYMER BLENDS WITH IMPROVED IMPACT RESISTANCE

Frank L. Saunders, Midland, and Ronald R. Pelletier, Bay City, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 473,642, May 28, 1974, Pat. No. 3,936,365. This application Nov. 13, 1975, Ser. No. 631,765
The portion of the term of this patent subsequent to Feb. 3, 1993, has been disclaimed.
Int. Cl.² C08L 51/00, 53/00
U.S. Cl. 260—876 B 11 Claims

1. A method for improving the impact resistance of a normally solid non-elastomeric monovinylidene aromatic polymer which is subjected to mechanical processing, said method comprising the steps of (1) subjecting colloidal size particles of an elastomeric block copolymer of from about 20 to about 80 weight percent of an elastomeric block of conjugated diene and from about 80 to about 20 weight percent of a non-elastomeric block of monovinylidene aromatic monomer to conditions sufficient to effect crosslinking of the copolymer and (2) combining an amount of the resulting crosslinked copolymer particulate with the non-elastomeric monovinylidene aromatic polymer containing at least 70 weight percent of polymerized monovinylidene aromatic monomer wherein the amount of copolymer is sufficient to improve the impact strength of the non-elastomeric polymer, said crosslinking being sufficient to enable the block copolymer to remain in the form of colloidal size particles during mechanical processing, but less than that required to render the copolymer non-elastomeric.

4,076,769

ABS FILMS

William A. Watts, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 448,088, Mar. 4, 1974, abandoned. This application Jan. 15, 1976, Ser. No. 649,384
Int. Cl.² C08L 9/02, 25/04
U.S. Cl. 260—893 8 Claims

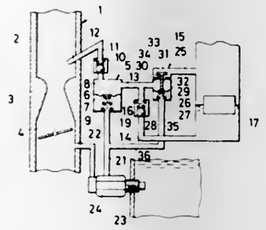
1. An ABS film substantially 0.5 to 2 mils thick composed of a rubber phase of natural rubber or butadiene-containing rubber dispersed in a continuous phase of a resin composed essentially of styrene-containing copolymer, which film has been biaxially stretched to the unoriented ABS film to 2 to 36 times the area of the unoriented film, which film has a haze of no more than substantially zero to 25 measured according to ASTM method D-1003 and is substantially free from whitening when stressed or creased.

4,076,770

CARBURETOR WITH AUXILIARY ACCELERATOR-PUMP SYSTEM

Haruhiko Saito, Nagoya, and Michio Morishita, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 29, 1977, Ser. No. 782,347
Claims priority, application Japan, Nov. 16, 1976, 51-136857
Int. Cl.² F02M 7/08
U.S. Cl. 261—34 A 9 Claims



1. A carburetor with an auxiliary accelerator-pump system, comprising:

an intake passage including a venturi portion and a throttle valve;

a fuel reservoir or bowl;

an auxiliary acceleration-pump including a fuel chamber and a vacuum chamber separated by a spring-loaded diaphragm, said fuel chamber being communicated by way of a first check valve to a pump jet opening into said intake passage upstream of said venturi portion and by way of a second check valve to said fuel reservoir, said fuel chamber being further communicated with a portion of said fuel reservoir above the level of fuel therein, and said vacuum chamber being communicated with a portion of said intake passage downstream of said throttle valve; and

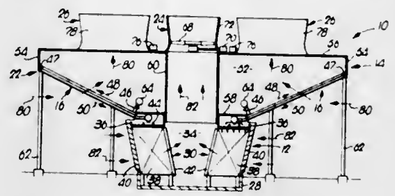
a vacuum responsive valve means positioned between said fuel chamber and said portion of said fuel reservoir above the level of fuel, said vacuum responsive valve means including a vacuum chamber communicated with a portion of said intake passage downstream of said throttle valve, and means controlled by said vacuum chamber to communicate said fuel chamber with a portion of said fuel reservoir above the level of fuel.

4,076,771

BOTTOM VENTED WET-DRY WATER COOLING TOWER

James R. Houx, Jr.; Richard D. Landon, both of Shawnee Mission, and Paul A. Lindahl, Jr., Overland Park, all of Kans., assignors to The Marley Cooling Tower Company, Mission, Kans.

Filed Nov. 19, 1976, Ser. No. 743,359
Int. Cl.² B01F 3/04
U.S. Cl. 261—159 19 Claims



1. A wet-dry water cooling tower, comprising: a central evaporative water cooling section;

a dry surface water cooling section;

means for supplying hot water to be cooled to said dry section for flow therethrough;

means supporting said dry section above said evaporative section and in at least partial surrounding relationship to said central evaporative section for serial flow of said hot water through said dry and evaporative sections;

structure defining separate air discharge paths for air currents passing from said dry and evaporative sections for preventing mixing of the air from each section prior to discharge thereof from the tower; and

first and second fan means respectively for pulling corresponding ambient-derived cooling air currents through said dry section and said evaporative section and along respective air discharge paths provided for each of the same for thermal interchange with the hot water passing through each of the sections to thereby produce hot moist discharge air to the atmosphere from the evaporative section and hot dry discharge air to the atmosphere from the dry section,

said path-defining structure and air-pulling means being cooperatively constructed and arranged for independent generally upright discharge of said hot moist air at the central region of said tower, and for independent generally upright discharge of said hot dry air separately from the hot moist air and in spaced, substantial surrounding relationship to the latter for lessening characteristic low level deflection and spreading of the hot moist air caused by ambient wind currents.

4,076,772

LARGE, NONPLANAR POLY(METHYL METHACRYLATE) PRE-HOLOGRAPHIC ELEMENT

Warren J. Murbach, China Lake, and Arnold Adicoff, Ridgecrest, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 29, 1976, Ser. No. 671,902
Int. Cl.² B05D 1/38, 5/06, 7/04; G02B 5/32
U.S. Cl. 264—2 6 Claims

1. A method of manufacturing a pre-holographic element comprising the steps of:

Providing a flat poly(methyl methacrylate) support;

applying to said support a smooth coating of a solution comprising 2-methoxyethanol and nitrocellulose;

drying said coating;

denitrating said coating by completely immersing it in a stirred bath of denitrating solution comprising ammonium sulfide and ethanol;

washing said coating;

applying a uniform layer of a gelatin solution to said coating;

hardening said layer;

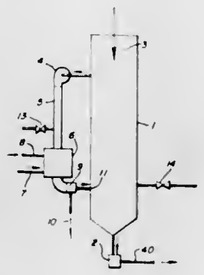
forming said element, comprising said support, coating, and layer, by partially supporting it in a dust-free environment at a temperature from 110° to 150° C for a time sufficient to cause said element to be bent about at least one axis.

4,076,773

PROCESS FOR PRILLING AMMONIUM NITRATE

Harry L. Mahl, Jr., and Franklin D. Clark, both of Wilmington, N.C., assignors to W. R. Grace & Co., New York, N.Y.

Continuation of Ser. No. 526,702, Nov. 25, 1974, abandoned. This application Mar. 18, 1976, Ser. No. 668,013
Int. Cl.² C06B 21/00
U.S. Cl. 264—3 E 2 Claims



1. In a process for producing granular ammonium nitrate comprising feeding molten ammonium nitrate containing not more than 5 wt% water into a prill tower containing a cooling gase to form spheroidal granules while maintaining ammonia gas in the cooling gas to retard thermal dissociation of the ammonium nitrate and to decrease formation of aerosol particles of ammonium nitrate, the concentration of ammonia gas in the cooling gas being at least as great as shown in the concentration-temperature curve of FIG. 4, with prilling temperature within the corresponding FIG. 4 values for said respective concentrations, the improvement comprising;

a. withdrawing cooling gas from an upper portion of the prill tower;

b. cooling and dehumidifying the withdrawn gas; and

c. recycling the cooled and dehumidified gas to a lower portion of the prill tower.

4,076,774

DUAL-WALLED MICROCAPSULES AND A METHOD OF FORMING SAME

William T. Short, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

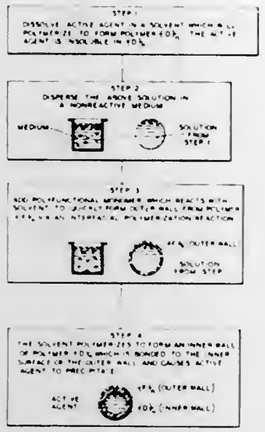
Filed Feb. 27, 1976, Ser. No. 662,027
Int. Cl.² B01J 13/02
U.S. Cl. 264—4 4 Claims

1. A method of encapsulating an active agent in a dual-walled microcapsule, said method comprising the steps of:

a. forming a liquid dispersion of beads of a first solution uniformly dispersed throughout a substantially nonreactive medium, said first solution comprising: a polymerizing monomer or mixture of monomers as the solvent which monomers or mixture of monomers polymerize via a condensation mechanism and dissolved therein said active agent, which is compatible with and nonreactive in said monomer solvent and is insoluble in the polymer formed by the polymerization of said monomer solvent; then before said active agent has precipitated;

b. forming a polymeric outer wall around said beads by vigorously stirring said dispersion and simultaneously adding a polyfunctional monomer which rapidly reacts with said solvent monomer at the surface of said beads via an interfacial polymerization reaction to quickly form said

polymeric outer wall around each bead, and which outer wall polymer then presents inwardly to the polymerizing monomer solution a functionality which reacts with said polymerizing monomer solvent to covalently bond said polymerizing monomer solvent and/or polymer formed therefrom to the inner surface of said outer wall, said



monomer solvent continuing to polymerize and form a solid polymeric second wall against the inner surface of said first wall and causing the active agent to precipitate and migrate towards the center of the microcapsule, said active agent being thereby encapsulated in a dual-walled microcapsule.

4,076,775

BLOCK FUEL ELEMENTS FOR HIGH TEMPERATURE POWER REACTORS

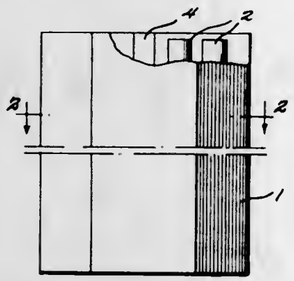
Karl-Gerhard Hackstein, Hanau; Milan Hrovat, Rodenbach, and Willi Wolff, Kahl, all of Germany, assignors to Nuken G.m.b.H., Hanau, Germany

Continuation of Ser. No. 326,151, Jan. 23, 1973, abandoned, which is a continuation-in-part of Ser. No. 218,244, Jan. 17, 1972, abandoned. This application Jan. 22, 1976, Ser. No. 651,563

Claims priority, application Germany, Feb. 15, 1972, 2207011; Jan. 30, 1971, 2104431

Int. Cl.² G21C *21/00*

U.S. Cl. 264—0.5 **11 Claims**



1. A process for the production of a block fuel element with parallel cooling channels having an isotropic structure and useful for gas cooled high temperature reactors consisting of preparing isotropic granulates by molding resin containing graphite molding powder by an isotropical consolidation process to obtain a molded product with isotropic properties, comminuting and sieving said product to form said isotropic granulates, compression molding said isotropic granulates into a block containing parallel fuel channels and coolant channels, inserting into said fuel channels premolded fuel compacts made of fuel particles coated with resin containing graphite molding powder completing the molding of the block fuel element by compressing said block containing said fuel compacts at a pressure not over 300 kg/cm² and cooling channels to final dimensions and thereafter carbonizing the resin binder and heat-treating the molded block, the sole mechanical processing steps in said process being the said steps of molding, grinding and sieving the isotropic granulate and the steps of molding the block with cooling channels and fuel channels therein and of compressing the block shaped element from the molded block containing the fuel compacts and cooling channels.

4,076,776

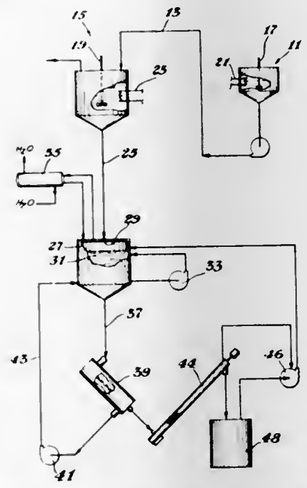
CALCIUM CHLORIDE PRILLING

William G. Moore, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 2, 1975, Ser. No. 564,248

Int. Cl.² B01J *2/06*

U.S. Cl. 264—13 **13 Claims**



1. A method to produce calcium chloride particulate comprising:

a. passing a molten aqueous solution of calcium chloride into an enclosed container of boiling liquid refrigerant, said refrigerant having a boiling temperature of less than the freezing temperature of the calcium chloride solution;

b. allowing the calcium chloride solution to fall a sufficient distance from above the boiling liquid refrigerant to permit the calcium chloride solution to form droplets before contacting the liquid refrigerant;

c. solidifying the calcium chloride solution droplets in the boiling liquid refrigerant as prills; and

d. removing the formed prills from the boiling liquid refrigerant.

4,076,777

METHOD AND APPARATUS FOR FORMING A CONCRETE ROOF

Vladimir Petrovitch, 4 Putnam Hill, Greenwich, Conn. 06830

Continuation of Ser. No. 586,366, Jun. 12, 1975, abandoned. This application Feb. 16, 1977, Ser. No. 769,399

Int. Cl.² E04B *1/16*

U.S. Cl. 264—32 **14 Claims**

1. A method of constructing a concrete roof on top of a large structure having an open interior with the aid of a plurality of prefabricated elongated sector-shaped form members, each sector-shaped form member having a wide end and a narrow end with each being disposed at a different opposite end portion of the length thereof, each form member having a sector-shaped upper surface for receiving and supporting a layer of reinforced concrete and an integral supporting beam extending below the upper surface between the ends thereof to enable the form to resist bending mounts applied thereto either by the weight of the form when the form is suspending from a single suspension point disposed intermediate with respect of its ends or by the weight of a layer of concrete on the top surface of the form when the form member is supported only at its ends, the method including the steps of:

erecting a staging extending vertically to a predetermined height above the structure in the center of the interior of the structure, the staging being self-supporting and independent of the structure;

successively positioning each sector-shaped form member with its wide end being supportably engaged by the upper portion of the structure and with the under side of each form member adjacent its narrow end being supportably engaged by the erected staging, such that the upper sector-shaped surface of each form member extends inwardly and upwardly from the structure and is adapted to receive and support a layer of reinforced concrete, each form member being otherwise unsupported, and each form member being flanked by adjacent form members to provide a substantially continuous upper surface having a centrally disposed access opening therein which is substantially in alignment with the narrow ends of the form members;

covering the upper surfaces of the form members with a layer of reinforced concrete to form a roof having an opening corresponding to the access opening in the continuous upper surface provided by the form members and that is large enough to permit removal of each form member intact through said opening;

suspending each of the form members at said single suspension point from the roof after the concrete has cured to a predetermined strength, thereby enabling the roof to carry up to all the weight of each form member that was heretofore carried by the structure and the erected staging;

removing the staging from engagement with the form members and from the interior of the structure through the opening in the roof, the suspending of each form from the roof supporting each form member upon the removing of the staging;

applying a lifting force to a form member at said suspension point thereof to remove the load of the form member at said suspension point away from the roof;

disengaging from the structure the wide end of the form member to which the lifting force is applied;

reducing the lifting force on the form member to which the lifting force is applied to lower the form member out of engagement with the inner surface of the roof;

repeating the steps of applying a lifting force, disengaging the wide end, and lowering for each of the form members; and

removing each form member intact through said opening in the roof.

4,076,778

CLIMBING FORMWORK

Alan Charles Whitting, 48 Chandos St., St. Leonards, Australia

Filed Apr. 20, 1976, Ser. No. 678,540

Claims priority, application Australia, Apr. 22, 1975, 1322/75

Int. Cl.² E04B *1/16*

U.S. Cl. 264—33 **2 Claims**



1. A method of erecting a concrete structure utilizing climbing formwork, said method comprising the steps of: constructing footings for said structure; erecting inner and outer forms on said footings; supporting vertically extending open tubular support means on said footings between said inner and outer forms; casting a first storey of said structure between said inner and outer forms and around said open tubular support means; inserting, into said open tubular support means, respective double-acting hydraulic jacks, each including a cylinder supported on said footings, a piston movable in the cylinder and an upwardly extending piston rod secured to the piston, with each jack having an extended height exceeding the height of two storeys of said structure; attaching the outer forms to means carried on the upper ends of said piston rods, after the concrete of said first storey has sufficiently set, extending said jacks to take the weight of said forms; stripping said forms from said first storey of said structure; further extending said jacks to elevate said outer forms into positions for pouring the next storey of said structure; supporting said outer forms on the set concrete of the previously cast story of said structure; elevating said inner forms into position for pouring the next storey of said structure; supporting said piston rods on said outer forms while operating said jacks to elevate said cylinders a height corresponding to one storey of said structure; supporting said cylinders in the elevated position; positioning further vertically extending open tubular support means on said first-mentioned tubular support means coaxially of the latter; pouring concrete between said inner and outer forms and around said further open tubular support means, for the next storey of said structure; and repeating the foregoing steps for each storey of the structure.

4,076,779

METHOD OF RESTORING THE FLUID PERMEABILITY OF A USED, CERAMIC FLUID-RELEASE MOLD

Rudolph A. Skriletz, Marysville, Ohio, assignor to Wallace-Murray Corporation, New York, N.Y.

Filed Aug. 1, 1975, Ser. No. 601,086

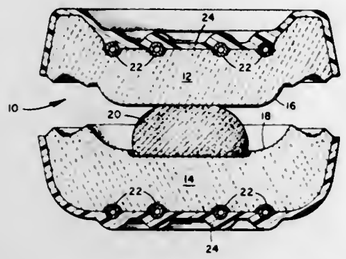
Int. Cl.² B28B *7/38*

U.S. Cl. 264—39 **31 Claims**

1. A method of restoring the fluid permeability of a used, ceramic, fluid-release mold body comprising at least 70% alumina and having a mold face on one exterior surface thereof, said mold face having accumulated thereon a quantity of amorphous, silicon containing material restricting the fluid permeability of said mold body, said method comprising the steps of:

a. applying to said mold face an effective amount of fluorine containing acid capable of chemically removing said accu-

mulated material from said mold face without significant damage to the mold body;



b. maintaining contact between said acid and said mold body for a period of time sufficient for said acid to attack said accumulated material, and

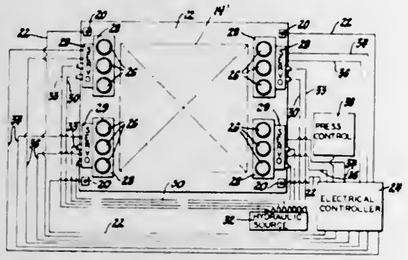
c. thereafter removing said acid from said mold body.

4,076,780

PROGRAMMABLE VELOCITY AND FORCE CONTROL METHOD FOR COMPRESSION MOLDING

Edwin D. Ditto, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 27, 1977, Ser. No. 762,852
Int. Cl.² B29G *1/00*
U.S. Cl. 264—40.5 **8 Claims**



1. The method of molding a mass of molding compound in a press having spaced apart mold halves defining a mold cavity containing the molding compound wherein the press successively operates in a mold closing mode to effect movement of the molding compound into all areas of the mold cavity to define the shape of the desired article and a cure mode wherein high force is applied by the press on the molds while the molding compound cures, comprising the steps of

measuring the position of the mold halves in relation to each other in the direction of mold closing movement at a plurality of monitoring locations spaced in relation to the direction of mold closing movement,

during the closing mode applying a mold closing press force and controlling the net force on the mold by applying individual controllable forces to the press at locations substantially at the said monitoring locations while controlling each of said individual forces in response to the measurements of the relative position of the mold halves so as to maintain a predetermined tilt relationship of the mold halves and controlling the total closing force to effect predetermined mold closing velocity values,
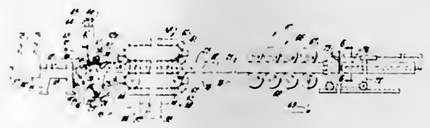
and during the subsequent cure mode, maintaining the individual forces at values to obtain the net press force on the mold at a predetermined value while curing the molding compound, and maintaining parallelism of the mold halves by controlling the individual forces in response to the measured mold position to correct any deviations from a parallel mold condition.

4,076,781

METHOD OF MAKING FOAM PIPE INSULATION INCLUDING CONTROLLING RATE OF PRODUCT DRAW-OFF ACCORDING TO FOAM TEMPERATURE

Frank M. Clay; Leland G. Moran, and Russell R. Lawyer, all of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 545,953, Jan. 31, 1975, Pat. No. 3,985,483.
This application Jun. 23, 1976, Ser. No. 699,021
Int. Cl.² B29D *23/00, 27/04*
U.S. Cl. 264—40.7 **3 Claims**



1. In a method of making tubular, foamed plastic pipe insulation by a continuous process wherein at a dispensing station foamable hardenable liquid material is dispensed between an inner liner and an outer jacket for the pipe insulation to foam and harden by an exothermic reaction and motor-driven pulling means is provided to pull the formed pipe insulation away from the dispensing station, the improvement comprising:

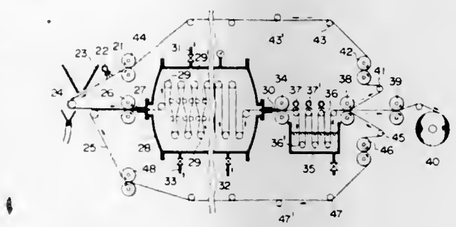
sensing the temperature of the foaming liquid and controlling the speed of the pulling means in accordance with the sensed temperature.

4,076,782

SUPPLYING METHOD FOR PRELIMINARILY EXPANDED POLYSTYRENE BEADS IN A THIN AND UNIFORM LAYER

Masahide Yazawa; Teruo Kubo, and Kunio Suzuki, all of Tokyo, Japan, assignors to Polymer Processing Research Institute Ltd, Tokyo, Japan

Continuation of Ser. No. 503,825, Sep. 6, 1974, abandoned. This application Feb. 17, 1976, Ser. No. 658,659
Claims priority, application Japan, Sep. 7, 1973, 48-100860
Int. Cl.² B29D *27/00*
U.S. Cl. 264—51 **3 Claims**



1. In the known method for continuously producing a foamed sheet of polystyrene by enclosing preliminarily expanded beads of polystyrene in a circulating steam-permeable belt means and passing the belt means through a pressurized steam-heating zone provided with pressure sealing means at both the inlet and outlet thereof, whereby the beads are cohered into an integrated sheet through softening and re-expanding of the beads by steam-heating and the resultant sheet is thereafter cooled and separated from said belt means, the improvement which comprises:

a. wetting one surface of said circulating belt means,

b. depositing a mass of individual preliminarily expanded beads on said wetted surface of said circulating belt means,

c. offering the angle of inclination of said circulating belt means so that

1. a portion of said deposited mass of individual beads will adhere directly to said wetted belt surface to form a single layer of deposited beads thereon, and

2. the remainder of said deposited individual beads will fall off of said belt due to gravitational forces,

d. enclosing said single layer of deposited beads within said belt means,

e. subjecting said single layer of enclosed beads in the belt means to heat in said pressurized steam-heating zone and while doing so changing the direction of movement of said belt means a plurality of times within said steam heating zone during which time said layer of beads will be re-expanded and cohered into an integrated sheet in said steam-heating zone, the beads enclosed in said belt means being compressed in the direction of thickness of the enclosed layer of the beads due to the tension caused by the changing direction of the belt means, such tension preventing the enclosed layer of the beads from becoming unevenly thick by overlapping due to pushing up caused by hustling and jostling of said beads and permitting reexpansion of the beads only in the lateral direction thereof, and

f. recovering a soft and flexible uniformly thin foamed sheet of polystyrene.

3. In the known method for continuously producing a foamed sheet of polystyrene by enclosing preliminarily expanded beads of polystyrene in a circulating stream-permeable belt-means and passing the belt means through a pressurized steam heating zone provided with pressure sealing means at both the inlet and outlet thereof, whereby the beads are cohered into an integrated sheet through softening and re-expanding of the beads by steam heating and the resultant sheet is thereafter cooled and separated from said belt means, the improvement which comprises:

a. wetting each surface of the upper and lower cloth belts composing the circulating belt means,

b. depositing a mass of individual preliminarily expanded beads on each of said wetted cloth surfaces of said circulating belt means,

c. altering the angle of inclination of each of said cloth belts of the circulating belt means so that:

1. a portion of said deposited mass of individual beads will adhere directly to each of said wetted cloth belt surfaces to form a single layer of deposited beads on each of said surfaces, and

2. the remainder of said deposited individual beads will fall off from said cloth belts due to gravitational forces,

d. enclosing both of said single layers of deposited beads together within said belt means, so as to be overlapped on one another,

e. subjecting said overlapped layers of enclosed beads in the belt means to heat in said pressurized steamheating zone and while doing go changing the direction of movement of said belt means a plurality of times within said steam heating zone during which time said layers of beads will be re-expanded and cohered into an integrated sheet in said steam-heating zone, the beads enclosed in said belt means being compressed in the directions of thickness of the enclosed layer of the beads due to the tension caused by the changing direction of the belt means, such tension preventing the enclosed layer of the beads from becoming unevenly thick by overlapping due to pushing up caused by hustling and jostling of said beads and permitting re-expansion of the beads only in the lateral direction thereof, and

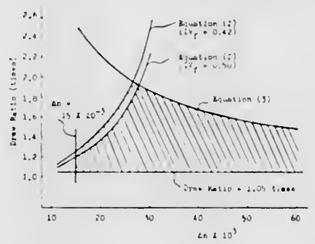
f. recovering a soft and flexible foamed sheet of polystyrene having a uniform thickness.

4,076,783

METHOD FOR PRODUCING POLYESTER FIBERS

Hiroshi Yasuda, and Susumu Omori, both of Otsu, Japan, assignors to Toyobo Co., Ltd., Osaka, Japan

Filed Dec. 13, 1974, Ser. No. 532,466
Claims priority, application Japan, Dec. 13, 1973, 48-140153
Int. Cl.² D01F *1/04*
U.S. Cl. 264—78 **8 Claims**



1. A method for producing polyester fibers having excellent dyeability, and capable of being dyed with basic or disperse dyes at a temperature of less than 100° C. with no deterioration of said fibers, which comprises melt-spinning a polyester comprising predominantly repeating units of ethylene terephthalate and containing 0.5% by mol or more of an ester unit derived from a dicarboxylic acid or diol containing at least one metal sulfonate group under the condition of being highly oriented so as to give filaments having a birefringence (Δn) of 0.015 to 0.100 and drawing the resulting filaments at a temperature of less than the melting point of the polymer and satisfying the following equation (1):

$$100 \leqq T \leqq 4 \times (\Delta n \times 10^3) + 70 \quad (1)$$

wherein T is the drawing temperature (° C) and Δn is the birefringence of the filaments obtained after the melt-spinning, and at a draw ratio of from 1.05 times up to the maximum draw ratio of the following equations (2) and (3):

$$DR_{max_1} = \frac{1}{1.61 + 1.01(IV_f) - 0.0518(\Delta n \times 10^3)} + 0.5 \quad (2)$$

$$DR_{max_2} = \frac{30}{\Delta n \times 10^3 + 5} + 1.05 \quad (3)$$

wherein Δn is as defined above, DR_{max_1} and DR_{max_2} are each the maximum draw ratio, and IV_f is the intrinsic viscosity of the filaments obtained after the melt-spinning which is measured at 30° C in a mixed solvent of phenol:tetrachloroethane = 3:2.

4,076,784

PROCESS FOR COLOR AND SURFACE STABILIZATION IN FORMING WATER-EXTENDABLE POLYESTER RESIN PLASTICS AND THE LIKE

Maurice Wright Hart, Jr., and William Carlo Hart, both of 714 Anastia Ave., both of Coral Gables, Fla. 33055

Filed Feb. 9, 1976, Ser. No. 656,637
Int. Cl.² C08L *67/06*
U.S. Cl. 264—102 **27 Claims**

1. A process for forming products from water-extendable polyester plastic resin chemically curable under the action of a catalyst, while stabilizing the texture and color of the surfaces of the product contacting the mold walls, that comprises, mixing the polyester plastic resin with water to extend the same into a homogeneous viscous mass while limiting air bubbles therein; adding and mixing curing catalyst into said mass to initiate the chemical curing of the same; inserting the curing mass into a mold having air-impervious side and bottom walls capable of exerting a substantial restraining pressure on the curing mass to prevent relative shrinkage at the interfaces

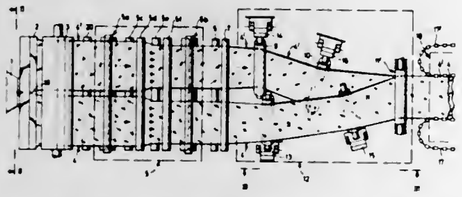
between the mass and the mold walls and having a side wall region spaced from the bottom wall and defining the periphery of a surface of the curing mass that is not restrained by the mold except at said periphery; developing, and maintaining as the cure continues, an adherent seal between at least said periphery and the adjacent side wall region of the mold to keep air from the interfaces between the mass and the mold walls; and breaking said seal when gelation of the mass has progressed to the point where the texture and color of the mold-contacting surfaces of the mass are stable and removing the plastic from the said mold.

4,076,785

METHOD OF AND APPARATUS FOR INCREASING THE PRODUCTION OUTPUT OF STRETCHED FLAT FILM WEBS COMPOSED OF THERMOPLASTIC MATERIAL

Willi Johann Schmidt, Taunusstein, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Filed Jun. 26, 1975, Ser. No. 590,501
Claims priority, application Germany, Jun. 29, 1974, 2431385
Int. Cl.² B29D *7/24*
U.S. Cl. 264—146 **3 Claims**



1. In an improved method for increasing the production of stretched flat film webs of thermoplastic material in which a melt of thermoplastic material is extruded from a slot die, the melt is solidified to form a film, the film is transversely stretched, the stretched film is heat-set, the heat-set film is divided into narrower webs, and wound up,

the improvement comprising extruding the melt from a slot die wider than the die normally employed for the production of a preliminary film, which usually corresponds to the width of a transverse stretching frame, using an extruder having an output corresponding to the width of said wider die,

dividing the melt in the longitudinal direction into at least two films,

superposing the film webs so that they are in register and non-laminated,

transversely stretching said superposed non-laminated films,

heat-setting the superposed films,

separating the stretched and heat-set films into individual layers, and winding them up.

4,076,786

METHOD FOR PRODUCING CONTAINER LABEL BLANKS FROM A WEB

Stephen W. Amberg, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 526,124, Nov. 22, 1974, Pat. No. 4,013,496.
This application May 19, 1976, Ser. No. 687,730
Int. Cl.² B29D *7/22*
U.S. Cl. 264—146 **2 Claims**

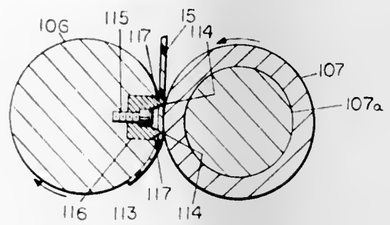
1. The method of handling a web of flexible organic thermoplastic material that is highly oriented along the longitudinal dimension of the web comprising

supplying a continuous web of said oriented material,

engaging the web by a cooperating pair of nip rolls and pulling the web forward in the longitudinal dimension thereof from the supply at a substantially constant speed,

penetrating one face of the moving web with a knife for slitting the web to partial depth along a line running in the longitudinal dimension of the web,

engaging the moving web between a cooperating pair of pleating rolls and compressing the material along a line for forming longitudinally spaced apart lateral pleats in the web extending across the web,



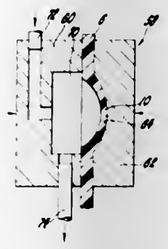
engaging the web thereafter on the surface of a drum, and driving the drum surface for advancing the web longitudinally at a speed in excess of the speed of the web for keeping the web in tension.

4,076,787

UNIVERSAL BATTERY CASE HAVING EMBOSSED INTERCELL PARTITIONS AND PROCESS FOR MAKING SAME

William W. Ervin, Sun City, Ariz., and Lee A. Fleck, Markleville, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 30, 1976, Ser. No. 718,464
Int. Cl.² B29C *17/00*; B29E *5/00*
U.S. Cl. 264—250 **2 Claims**



1. A process for making a multicell, thermoplastic, storage battery case having a plurality of individual compartments for containing the battery's electrochemically active cell elements, said process comprising the steps of: molding a case with substantially planar intercell partitions dividing said case into said compartments; softening localized portions of said partitions; and pushing said portions into said compartments so as to produce a plurality of bosses on said partitions for spacing said elements from said partitions and substantially centrally of said compartments.

4,076,788

MOLD COATING OF FRESHLY MOLDED ARTICLES

Edwin D. Ditto, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 2, 1976, Ser. No. 746,865
Int. Cl.² B29D *9/00*; B29F *1/10*
U.S. Cl. 264—255 **2 Claims**

1. A method of molding a composite polymeric article comprising a substrate and a special purpose skin of predetermined thickness on a surface of said substrate, said method comprising the steps of:

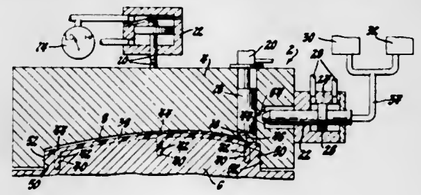
molding said substrate between separable dies which coact in a first fully-closed position to define a mold cavity

corresponding in size and shape to said substrate, and nest one within the other to provide a polymer containment seal around said cavity;

allowing said substrate to harden in said cavity;

separating one of said dies from said surface of said substrate to provide a first gap therebetween which is greater than said predetermined thickness of said skin but insufficient to unnest said dies;

injecting a metered amount of skin-forming material into said gap in such a manner as to substantially hydraulically immobilize said substrate in said cavity during said separating, said amount being sufficient to provide said predetermined thickness but insufficient to fill said gap;



applying molding pressure to said one die to reduce said one gap to a second gap which is commensurate with said predetermined thickness, and to distribute said injected material substantially uniformly throughout said second gap and over said surface;

maintaining said pressure while said material bonds to said surface and solidifies sufficiently to permit complete separation of said dies without disruption of the skin thusly formed; and

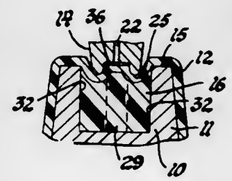
completely separating said dies and removing said composite from said cavity.

4,076,789

METHOD OF FORMING AN EMBOSSED AND COATED DESIGN ON THE SURFACE OF A FORMABLE PLASTIC SHEET

Rodger E. Geller, Vandalia; Stanley E. Smith, Dayton, and Wayne A. Wilson, Kettering, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 12, 1976, Ser. No. 675,874
Int. Cl.² B29C *5/00*; B29D *9/08*; B29F *1/10*
U.S. Cl. 264—259 **2 Claims**



1. A method of forming an embossed design on a surface of a thermoformable plastic sheet and at substantially the same time forming a coating layer on at least a portion of the embossment, comprising the steps of

pressing a thermoformable plastic sheet, which has been heated to a thermoforming temperature, between an elastomeric anvil member and an embossing die, the die having a surface shaped to emboss a desired design in the surface of said sheet and to define a coating area on at least a portion of the embossment, the die having at least one passage connecting said surface with a source of liquid coating material,

restraining at least the portion of said elastomeric anvil member opposing said die while the sheet is being pressed so that the anvil is not displaced laterally from under the sheet but reacts to the pressure of the die by urging the sheet into substantially full contact with the embossing surface of the die to more faithfully reproduce the desired design,

forcing liquid coating composition through said passage against at least a portion of the embossed surface of the sheet, the force of the liquid pushing the sheet away from the die surface against the elastomeric anvil to deposit a layer of coating material in a desired pattern on the sheet, and thereafter

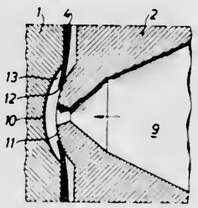
separating the embossing die and the anvil and removing the embossed and coated sheet.

4,076,790

METHOD OF EMBODYING A FOIL SHEET IN A THERMOPLASTIC OBJECT DURING THE PROCESS OF MANUFACTURING SAID OBJECT

Evald Torbjörn Gustav Lind, Silfverloodsgatan 9, S-461 00 Trollhattan, Sweden (S-461 00)

Continuation of Ser. No. 424,829, Dec. 14, 1973, abandoned.
This application Aug. 29, 1975, Ser. No. 609,057
Claims priority, application Sweden, Dec. 18, 1972, 16547/72
Int. Cl.² B29D *3/00*; B29C *6/02*
U.S. Cl. 264—266 **1 Claim**



1. A method of incorporating a sheet of foil in an object made from a thermoplastic material by injection moulding techniques during the process of making said object, said method comprising inserting foil piece between the plunger and die of an open mould in an injection moulding machine prior to the closing of the mould and to the injection of a moulding compound into the mould via an injection nozzle in said die, said foil piece being cut to size being inserted singularly between the open mould halves, said foil piece having a hole therein, said foil piece being inserted laterally between said mould halves from one side thereof at the same time as the mould is opened to eject a moulded object therefrom from the other side thereof, holding said foil piece in a localized position between the plunger and die so as to substantially cover the free end of the plunger with the hole facing said free end and the injection nozzle in the die, the foil piece having at least one flap projecting outside the end surface of the plunger, closing the mould while transporting the foil piece into the mould between the plunger and die so that the foil piece is bent to shape as the flap is folded into the die and located along one side portion of the plunger, said die being formed with a convex protrusion at said injection nozzle facing a central recess formed in the plunger such that when the mould is closed the convex protrusion on the die comes into contact with the edge of the foil surrounding the hole to displace the foil edge into the recess in the plunger while pressing the foil into contact with the plunger at the edge of said recess, injecting moulding compound into the mould through the injection nozzle in the die and through the hole in the foil piece, the foil piece being moved into abutment with the die by the influence of the moulding compound acting on said foil piece as a result of contact of the foil piece around the hole with the convex protrusion of the die around the injection nozzle, the flow of moulding compound from the nozzle being so deflected by the recess in the plunger, that said moulding compound is guided outwardly towards the foil piece away from the hole edge, so that the foil piece is caused to adopt a position on the outside

of the moulding compound so as to adhere to said compound as a result of the heat and pressure exerted therefrom while cooling a mould portion abutting the foil piece so as to avoid damage to said foil piece.

4,076,791

MOLDS FOR ENCAPSULATING ELECTRICAL COMPONENTS

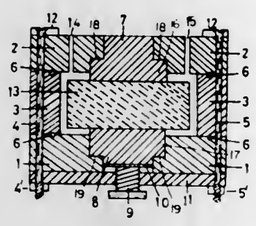
Frederick William Barter, Newmarket, and Peter James Douglas Victor Brett, Sawston, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 1, 1976, Ser. No. 691,968

Claims priority, application United Kingdom, Jun. 4, 1975, 24062/75

Int. Cl.² B22D *19/00*; B29C *6/04*; B29F *1/10*

U.S. Cl. 264—272 **9 Claims**



1. A mold for encapsulation of a component with a thermosetting resin composition which comprises

i. a rigid outer case provided with means for introduction and removal of the component,

ii. fitted into opposing walls of the case, at least one pair of solid plugs of a flexible material, the plugs extending beyond the inner face of the walls into the interior of the mold and being constructed of a material having a higher coefficient of cubic expansion than that of which the mold is constructed,

iii. detent means present in said opposing walls for engaging said plugs and preventing their movement in a direction opposite to the position of said component, and

iv. means located in the wall of the case for advancing at least one such plug towards the center of the mold to grip the component,

the plugs expanding to retain substantially their grip on the component when the mold is heated.

4,076,792

CATALYST SYSTEMS FOR THE REDUCTION OF THE OXIDES OF NITROGEN

Gordon F. Foster, Campbell; Helmuth E. Meissner, and Janice L. Stiles, both of Painted Post, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Apr. 12, 1972, Ser. No. 243,255

Int. Cl.² B01D *53/00*

U.S. Cl. 423—213.5 **3 Claims**

1. A process for treating the exhaust gases from an internal combustion engine to obtain the reduction of the oxides of nitrogen therein while suppressing the formation of ammonia by-products during said reduction which comprises contacting said exhaust gases prior to the introduction of air or neutralizing fuel gases thereto with a catalytic device comprising a monolithic refractory support structure of the honeycomb type supporting on the surface thereof a mixed noble metal catalyst consisting essentially, in weight percent, of 10–70% iridium and the remainder noble metals selected from the group consisting of platinum, palladium, and mixtures thereof, said mixed noble metal catalyst making up about 0.1–0.5% by weight of said support structure, said engine being operated at a substoichiometric air-to-fuel ratio ranging from 90% of stoichiometric up to but not including a stoichiometric ratio to maintain an overall reducing gaseous environment, said exhaust gases being passed through said support structure at a space velocity in the range of about 15,000–200,000 hr.$^{-1}$, and said exhaust gases being at a temperature at least sufficient to initiate the catalytic reduction of the oxides of nitrogen upon contact with said mixed noble metal catalyst.

4,076,793

METHOD FOR SULFUR DIOXIDE CONTROL

William L. Nikolai, Rte. 4, Box 80, Platteville, Wis. 53818

Filed Jan. 22, 1976, Ser. No. 651,239

Int. Cl.² C01B *17/00*; B01J *8/00*

U.S. Cl. 423—242 **15 Claims**

1. A method for removing sulfur dioxide from a gas stream containing sulfur dioxide, comprising the steps of

conducting the gas stream into contact with an aqueous slurry of manganous hydroxide absorbant comprising from about 1 to about 30 percent by weight crystalline manganous hydroxide

absorbing and oxidizing sulfur dioxide from the gas stream in said slurry to convert manganous hydroxide in said slurry into manganous sulfate, and

regenerating manganous hydroxide by aqueous phase electrochemical precipitation from said manganous sulfate for sulfur dioxide absorbant reuse.

4,076,794

PROCESS FOR THE PRODUCTION OF HIGH PURITY ALKALI METAL TETRAHALOALUMINATES AND PRODUCTS PRODUCED THEREBY

William Novis Smith, Exton, Pa., assignor to Foote Mineral Company, Exton, Pa.

Filed Aug. 1, 1974, Ser. No. 493,568

Int. Cl.² C01D *3/00*; C01F *7/04, 7/48*

U.S. Cl. 423—463 **13 Claims**

1. A process for the production of high purity alkali metal tetrahaloaluminates of the formula

$$M_xM'_zM''_{1-(x+z)}AlX_{4-(y+w)}X'_yX''_w$$

wherein M, M′ and M″ are different alkali metals of the group consisting of Na, K and Li, X, X′ and X″ are different halogens of the group consisting of Cl, Br and I, the values of x and z range from 0 up to 1 and $[1-(x+z)]+x+z$ is about 1, the values of y and w range from 0 up to about 4 and $[4-(y+w)]+y+w$ is about 4, which comprises:

(a) reacting an aluminum halide selected from the group consisting of aluminum chloride, aluminum bromide, aluminum iodide and mixtures thereof with at least the stoichiometric amount of an alkali metal halide selected from the group consisting of sodium, potassium and lithium chloride, bromide and iodide, mixtures and double salts thereof in the presence of powdered aluminum metal and a stable liquid hydrocarbon at a temperature in the range from about 60° C. up to the reflux temperature of the reaction mixture,

(b) filtering the hot reaction mixture to remove the aluminum metal and other solids,

(c) cooling the filtrate to below about 30° C., and

(d) separating the resulting crystals of substantially pure alkali metal tetrahaloaluminate from the filtrate; the entire process being carried out under anhydrous conditions and an inert atmosphere.

4,076,795

HYDROSULFITE PRODUCTION

Jack A. Tiethof, South Plainfield, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Edison, N.J.

Filed Sep. 9, 1976, Ser. No. 721,875

Int. Cl. C01B *17/66*

U.S. Cl. 423—515 **13 Claims**

1. In a process for producing iron hydrosulfite liquor by reacting particulate metallic iron with a strongly acidic aqueous solution of sulfur dioxide at a low temperature, the improvement which comprises: adding a base selected from the group consisting of sodium hydroxide and sodium carbonate to said aqueous solution of sulfur dioxide in amount within the range of about 0.05 to less than 0.3 equivalent of said base per mole SO_2 before contacting the solution of sulfur dioxide with said iron, reacting said iron with said solution of sulfur dioxide containing said base at −3° to 15° C. to form iron hydrosulfite liquor and thereafter immediately adding a base selected from the group consisting of sodium hydroxide and sodium carbonate to said iron hydrosulfite liquor to increase the pH to a value at which decomposition is significantly retarded, thereby producing stabilized iron hydrosulfite liquor.

4,076,796

CARRYING OUT ENDOTHERMIC PROCESSES IN FAST FLUIDIZED REACTOR WITH CONVENTIONALLY FLUIDIZED HOLDING REACTOR

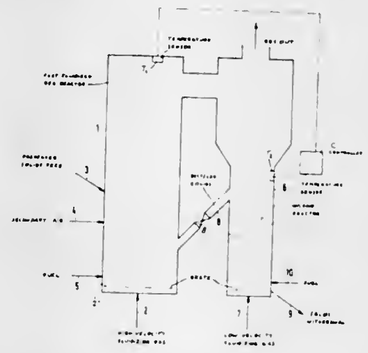
Lothar Reh, Bergen-Enkheim; Hans-Werner Schmidt, Frankfurt am Main, and Ludolf Plass, Kronberg, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 27, 1976, Ser. No. 690,525

Claims priority, application Germany, Jun. 3, 1975, 2524540

Int. Cl.² B01J *8/26*

U.S. Cl. 423—659 **11 Claims**



1. In a method of carrying out an endothermic process involving a solid other than the thermal decomposition of aluminum chloride hydrate followed by calcination, wherein solids capable of endothermic reaction are treated in a fast fluidized-bed reactor supplied with secondary air introduced by an inlet at a level above a gas distributor, particles of the solids are entrained from the bed in a gas stream, and said particles are separated from the gas stream and are at least in part returned to the fast fluidized-bed reactor, the improvement which comprises:

(a) introducing the gas stream together with the entrained particles from said fast fluidized-bed reactor into a holding reactor for separation in an upper position thereof;

(b) fluidizing the separated particles in said holding reactor in a bed with a fluidizing gas introduced into said holding reactor at a velocity such that the solids occupy at least 35% of the volume of the bed of said holding reactor;

(c) feeding particles from an overflow point of a lower portion of said holding reactor via a descending passage into said fast fluidized-bed reactor in a recirculation cycle at a rate sufficient to maintain a predetermined density of solids in said fast fluidized-bed reactor, said predetermined density of the solids in said fast fluidized-bed reactor corresponding to a solids volume of 2 to 20% of the volume of said fast fluidized-bed reactor between said gas distributor and said level and to a solids volume of 0.2 to 2% of the volume of said fast fluidized-bed reactor above the secondary-air inlet;

(d) withdrawing particles from the cycle formed by said fluidized-bed reactor and said holding reactor in a partial stream;

(e) maintaining the particles in said holding reactor for a residence time in excess of the residence time of the solids in said fast fluidized-bed reactor; and

(f) maintaining a substantially constant temperature in both said reactors by regulating the rate at which particles are fed in step (c) from said holding reactor to said fast fluiidized-bed reactor, said rate being regulated by varying the flow cross section of said passage between said overflow point and a low point of said fluidized-bed reactor.

4,076,797

RADIOIMMUNOASSAY

Raymond Vincent Davis, North Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Sep. 28, 1976, Ser. No. 727,548

Int. Cl.² A61K *43/00*; G01N *33/16*

U.S. Cl. 424—1 **3 Claims**

1. An indirect, solid phase radioimmunoassay for syphilis comprising the steps of

(a) fixing *Treponema pallidum* reiter variant to the inner surface of a test tube,

(b) dispensing test samples of human serum diluted with a sorbent containing group specific antibody binders into the test tube in contact with the *Treponema pallidum* reiter variant and incubating,

(c) washing the inner surface of the test tube to remove unreacted elements of the test sample,

(d) dispensing ^{125}I antihuman gamma globulin into the test tube in contact with the antigenic surface and incubating,

(e) washing the inner surface of the test tube to remove unreacted ^{125}I antihuman gamma globulin,

(f) measuring the radioactivity in the test tube and comparing to a standard to determine the presence or absence of syphilis.

4,076,798

HIGH MOLECULAR WEIGHT POLYESTER RESIN, THE METHOD OF MAKING THE SAME AND THE USE THEREOF AS A PHARMACEUTICAL COMPOSITION

Donald J. Casey, Ridgefield, and George C. Gleckler, Stamford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 582,001, May 29, 1975, which is a division of Ser. No. 418,138, Nov. 21, 1973, abandoned. This application Nov. 2, 1976, Ser. No. 737,940

Int. Cl.² A61K *47/00*

U.S. Cl. 424—22 **4 Claims**

1. A pharmaceutical composition for the controlled continuous administration of a predetermined dosage of a drug to a living animal comprising a normally solid biodegradable, hydrolyzable polyester resin of diglycollic acid and an unhindered glycol, having a molecular weight sufficiently high so as to provide a polymeric material possessing self-supporting film forming properties, which has dispersed uniformly throughout said polyester resin, a drug formulation.

4,076,799

METHOD OF INHIBITING SKIN IRRITATION

Sharon Gail Willer, Loveland; Paul Ronald Yust, and Ralph Kelly, both of Cincinnati, all of Ohio, assignors to Cincinnati Milacron, Inc., Cincinnati, Ohio

Filed Dec. 27, 1972, Ser. No. 319,030

Int. Cl.² A61L *9/04*; A61K *31/205, 31/20, 31/23*

U.S. Cl. 424—45 **16 Claims**

1. A method for preventing or reducing irritation of the skin caused by contact with a skin irritating allergenic agent which comprises applying to the skin of a subject sensitized to said

allergenic agent, prior to contact with said skin irritating allergenic agent, a protective agent containing at least two polar groups separated by a chain of at least 15 atoms, the majority of which are carbon atoms; wherein said protective agent is the unsaturated polymerized product obtained from the polymerization of 2 to 4 molecules of a monomeric ethylenically unsaturated C_{12} to C_{26} fatty acid or the saturated derivative product of said polymerized product, said polymerized product or saturated derivative thereof containing instead of 2 to 4 carboxy groups carboxyl salt groups; said irritation of the skin being an allergic contact dermatitis, said skin irritating allergenic agents being allergic contact dermatitis producing agents and said protective agent being present in an amount effective to reduce skin irritation compared to skin irritation produced in the absence of said protective agent.

4,076,800

PROTEIN-CONTAINING DETERGENT COMPOSITIONS FOR PROTECTING KERATINOUS MATERIALS

Robert Anthony Marsh, Newcastle-upon-Tyne, England; Gordon John Mackie, Strombeek-Bever, and Peter Hale, Tervueren, both of Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 7, 1976, Ser. No. 647,245

Claims priority, application United Kingdom, Jan. 13, 1975, 1319/75

The portion of the term of this patent subsequent to Sep. 14, 1993, has been disclaimed.

Int. Cl.² A61K *7/06, 7/48*

U.S. Cl. 424—70 **8 Claims**

1. A composition for protecting keratinous material from the deleterious effects of detergents or from adverse climatic conditions, said composition comprising

(a) from 0.1 to 90% by weight of a foaming non cationic detergent material; and

(b) from 0.1 to 20% by weight of a chemically modified protein having an isoionic point (pI) less than pH of 6, said chemically modified protein being selected from the group consisting of oxybutylated hydrolyzed protein and acetylated hydrolyzed protein.

4,076,801

IMMUNOSTIMULANT AGENT, COMPOSITIONS THEREOF AND METHODS FOR THEIR PREPARATION

Robert Fauve, Sevres, France, assignor to Institut Pasteur, Paris, France

Continuation of Ser. No. 317,022, Dec. 20, 1972, abandoned. This application May 2, 1975, Ser. No. 573,925

Int. Cl.² A61K *39/02, 39/04*

U.S. Cl. 424—92 **33 Claims**

1. Method for the extraction of a chloroform-soluble immunostimulant agent effective for the control of pathogenic bacteria, comprising forming a suspension of bacteria with a mixture of solvents containing a halogenated hydrocarbon and alcohol, both selected from those capable of dissolving a soluble fraction containing the immunostimulant agent from the cells, separating the insoluble fractions, evaporating the soluble fraction under reduced pressure and at reduced temperature, taking up the solid residue again in chloroform and recovering the chloroform solution containing the above-mentioned immunostimulant agent by filtration.

4,076,802

ANTIBIOTIC X-4357B

John Westley, Cedar Grove, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 30, 1977, Ser. No. 782,680

Int. Cl.² A61K *35/74*

U.S. Cl. 424—122 **2 Claims**

1. Antibiotic X-4357B which has a melting point of 179–180° C., a molecular weight of 891, elementary analysis values of C 63.18%, N 1.53% and methoxyl 6.98%, the field desorption mass spectrograph illustrated in FIG. 1, the nuclear magnetic resonance curve illustrated in FIG. 2 and the infrared curve illustrated in FIG. 3 hereof.

4,076,803

SYNERGISTIC COMBINATION OF METAL PROTEINATES WITH BETA-CHLOROVINYL DIALKYL PHOSPHATES

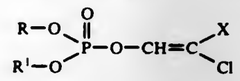
Harvey H. Ashmead, 719 E. Center Street, Kaysville, Utah 84037

Filed Mar. 15, 1976, Ser. No. 666,868

Int. Cl.² A61K *37/00, 31/66*

U.S. Cl. 424—177 **17 Claims**

1. A synergistic mixture for increasing the metal uptake of essential bivalent metals into the tissues of a mammal comprising an effective amount of a bivalent metal proteinate and a beta-chlorovinyl dialkyl phosphate of the formula



wherein R and R^1 are the same or different alkyl groups having from 1 to 4 carbon atoms and X is either hydrogen or chlorine.

4,076,804

ERYTHROMYCIN THERAPY

Robert E. Singiser, Gurnee; Alexander Hing Chinn Chun, Waukegan, and Shashi Pal Mehta, Libertyville, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 597,057, Jul. 18, 1975, abandoned. This application Dec. 13, 1976, Ser. No. 749,637

Int. Cl.² A61K *31/71*

U.S. Cl. 424—181 **4 Claims**

1. The process of combatting an erythromycin sensitive infection in a warm-blooded animal in non-fasting condition, comprising, administering to said animal a pharmaceutical preparation of erythromycin ethylsuccinate in granulated form, said granules comprising per 100 parts of erythromycin ethylsuccinate between 3 and 100 parts of a pharmaceutically acceptable gum and between 20 and 4000 parts of a physiologically acceptable sugar.

4,076,805

UTERO-EVACUANT EXTRACTS FROM PLANT SUBSTANCES

Jose Luis Mateos; Luis Noriega, both of Mexico City, Mexico; Richard E. Huettemann, Hazlet, and Ramesh M. Kanojia, Somerville, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Continuation-in-part of Ser. No. 489,688, Jul. 18, 1974, Pat. No. 3,996,132. This application May 27, 1976, Ser. No. 690,765

Int. Cl.² A61K *35/78*

U.S. Cl. 424—195 **5 Claims**

1. A composition of matter obtained from extracts containing utero-evacuant materials present in the zoapatle plant and obtained by:

a. treating said extract with a water-immiscible organic solvent,

b. treating the resulting solution with an aqueous solution of a mild base to remove water soluble and acidic impurities,

c. passing the materials soluble in the organic phase at least once over a chromatographic column of adsorbent material selected from silica gel, alumina, polymeric copolymers and florisil to separate from said phase said materials, and

d. eluting the column with a second solvent or a mixture of solvents, said composition having the following physical constants:

I.R. 2.91μ, 5.89μ, 5.95μ

N.M.R. $_{TMS}^{CDCl_3}$ 5.47, 5.29, 4.14, 4.11, 3.53, 3.15, 1.75, 1.62, 1.14, 1.08 ppm.

3. A method of interrupting pregnancy which comprises administering to a female animal an effective amount of the purified material of claim 1.

4. A method of treating disorders of the central nervous system in mammals which comprises administering an effective amount of the purified material of claim 1 to said mammal.

4,076,806

O-ALKYL-S-[3-OXO-1,2,4-TRIAZOLOBENZOPYRAZIN(-2)YL-METHYL]-(THIONO)THIOLPHOSPHORIC(PHOSPHONIC) ACID ESTERS

Walter Lorenz, deceased, late of Wuppertal, Germany (by Erika Lorenz, heiress); Ingeborg Hammann, Cologne, Germany; Bernhard Homeyer, Leverkusen, Germany, and Wilhelm Stendel, Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

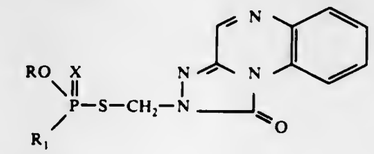
Filed Mar. 24, 1976, Ser. No. 669,781

Claims priority, application Germany, Apr. 11, 1975, 2515794

Int. Cl.² C07F *9/40, 9/165;* **A01N** *9/36*

U.S. Cl. 424—200 **10 Claims**

1. An O-alkyl-S-[3-oxo-1,2,4-triazolobenzopyrazin-(2)ylmethyl]-(thiono)thiolphosphoric(phosphonic) acid ester of the formula



in which

R is alkyl with 1 to 4 carbon atoms,

R_1 is alkyl or alkoxy with 1 to 4 carbon atoms, and

X is oxygen or sulfur.

9. A method of combating insects which comprises applying to the insects or an insect habitat an insecticidally effective amount of a compound according to claim 1.

4,076,807

PHOSPHITE-BASED FUNGICIDE COMPOSITIONS

Stephane Trinh, Champagne-au-Mont d'Or; Alain Moraly, Lyon, and Jean-Michel Gaulliard, Orlienas, all of France, assignors to Philagro S.A., France

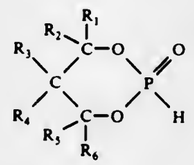
Filed Oct. 7, 1975, Ser. No. 620,379

Claims priority, application France, Oct. 8, 1974, 74 34529

Int. Cl.² A01N *9/36*

U.S. Cl. 424—209 **4 Claims**

1. A process for the protection of plants against fungal diseases which comprise applying to said plants a fungicidally effective amount of at least one dioxaphosphorinane of the formula



in which each R_1, R_2, R_3, R_4, R_5 and R_6 may be identical or different and represent hydrogen, an alkyl radical, or a halogenated alkyl radical containing from 1 to 5 carbon atoms.

4,076,808

O,S-DIALKYL-O-(N-METHOXY-BENZIMIDOYL)-THIONOTHIOL PHOSPHORIC ACID ESTERS AND ARTHROPODICIDAL USE

Walter Lorenz, Wuppertal, and Ingeborg Hammann, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

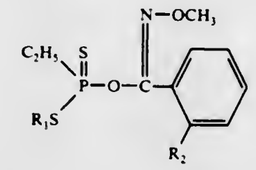
Filed Sep. 9, 1976, Ser. No. 721,725

Claims priority, application Germany, Oct. 10, 1975, 2545392

Int. Cl.² A01N *9/36;* **C07F** *9/40*

U.S. Cl. 424—211 **7 Claims**

1. An O,S-dialkyl-O-(N-methoxy-benzimidoyl)-thionothiolphosphoric acid ester of the formula



in which

R^1 is alkyl with 3 or 4 carbon atoms, and

R^2 is hydrogen or nitro.

4,076,809

PHOSPHONOUREIDE AND PHOSPHONOTHIOUREIDE ANTHELMINTICS

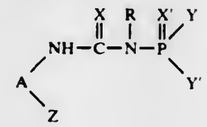
W. David Weir, Levittown, and Edward E. Kilbourn, Chalfont, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 28, 1975, Ser. No. 625,998

Int. Cl.² A01N *9/36;* **C07F** *9/02;* **A61K** *31/66*

U.S. Cl. 424—211 **25 Claims**

1. A compound of the formula:



wherein

A is a divalent arylene group optionally substituted with

a. halogen;

b. cyano;

c. nitro;

d. di(C_1-C_{18}) alkylamino;

e. vicinal alkylene of from 2 to 6 carbon atoms; or

f. a group of the formula:

$R^1(A')_a$

wherein

R^1 is

1. an alkyl group of from 1 to 4 carbon atoms;

2. a substituted or unsubstituted aromatic group containing from 6 to 10 carbon atoms in the aromatic ring;

A′ is oxygen, sulfur, sulfinyl, sulfonyl or carbonyl; and *a* is an integer of 0 to 1;

R is

a. hydrogen;

b. (C_1-C_{10}) alkyl;

c. (C_1-C_{10}) haloalkyl;

d. (C_3-C_6) cycloalkyl;

e. (C_2-C_{11}) alkoxyalkyl;

f. (C_1-C_{10}) cyanoalkyl;

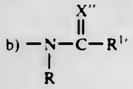
g. (C_3-C_6) alkenyl;

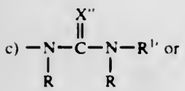
h. (C_3-C_6) haloalkenyl;

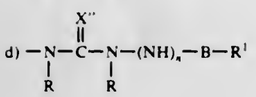
i. (C_3-C_6) alkynyl;

j. (C_3-C_6) haloalkynyl;
k. optionally substituted aralkyl of up to 11 carbon atoms;
l. substituted or unsubstituted (C_6-C_{10}) aryl;
Y is R', OR', N(R')$_2$ or SR' and
Y' is OR', N(R')$_2$ or SR' wherein R' is alkyl (C_1-C_4), substituted alkyl (C_1-C_4), aralkyl (C_7-C_{10}), alkenyl (C_1-C_4), substituted alkenyl (C_1-C_4), phenyl, substituted phenyl, naphthyl or substituted naphthyl
X is oxygen or sulfur; X' is oxygen or sulfur; and Z is a group of the formula:

a) $-NH_2$, provided X is oxygen;

b) 

c) 

d) 

wherein

R and R^1 are as defined above; *n* is an integer of 0 to 1; B is carbonyl, sulfinyl, or sulfonyl; Q is alkylene of from 2 to 4 carbon atoms; and X'' is oxygen or sulfur, provided that when X'' is sulfur, X is oxygen; or a pharmacuetically acceptable salt of said compound.

4,076,810

BENZYLPYRIMIDINE ANTIBACTERIAL COMPOSITION

Ivan Kompis, Oberwil, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 521,384, Nov. 6, 1974, Pat. No. 4,024,145. This application Feb. 18, 1977, Ser. No. 769,971
Claims priority, application Switzerland, Nov. 8, 1973, 15680/73; Oct. 24, 1974, 14243/74
Int. Cl.[2] A61K *31/625, 31/505*
U.S. Cl. 424—229 **1 Claim**

1. An antibacterial pharmaceutical composition comprising an antibacterially effective amount of one part by weight of 2,4-diamino-5-(4-bromo-3,5-dimethoxybenzyl)-pyrimidine to 1 to 40 parts by weight of an antibacterially active sulfonamide and a carrier.

4,076,811

NOVEL AGENTS AND METHODS FOR TREATMENT OF CLIMACTERIC DISTURBANCES

Ursula Lachnit-Fixson, and Friedmund Neumann, both of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Berkamen, Germany

Filed Jun. 23, 1976, Ser. No. 699,192
Claims priority, application Germany, Jun. 30, 1975, 2529523
Int. Cl.[2] A61K *31/56*
U.S. Cl. 424—239 **5 Claims**

1. A method of alleviating the physiological and psychological disturbances of menopause comprising administering for about 21 successive days to a female afflicted therewith a first course of dosage units, in admixture with a pharmaceutically acceptable carrier, of an estradiol estrogen and an estriol estrogen in a ratio of about 1 : 1 to about 1 : 10, wherein the estradiol estrogen in each daily dosage unit corresponds in activity to 0.5 -2 mg. of estradiol valerate, followed by about 7 days without hormone administration, with administration of a placebo, or with successive daily administration of the same or different estratriol estrogen, in admixture with a pharmaceutically acceptable carrier, corresponding in activity to 1 -8 mg. of estriol.

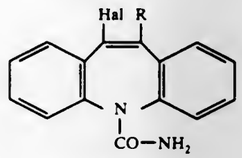
4,076,812

10-HALOGENO- OR 10,11-DIHALOGENO DERIVATIVES OF 5H-DIBENZ[b,f]AZEPINE

Hans Allgeier, Haagen, Germany, and Erich Schmid, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

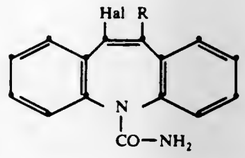
Filed Sep. 22, 1975, Ser. No. 615,256
Claims priority, application Switzerland, Sep. 27, 1974, 13095/74
Int. Cl.[2] A61K *31/55;* **C07D** *223/22*
U.S. Cl. 424—244 **15 Claims**

1. A compound 5H-dibenz[b,f]azepine of formula I

 (I)

wherein Hal represents halogen with an atomic number up to 35 and R represents hydrogen or halogen with an atomic number up to 35.

8. A pharmaceutical composition useful in the treatment of states of convulsion comprising an anticonvulsively effective amount of a compound according to claim 1 and having the formula I

 (I)

wherein Hal represents halogen with an atomic number up to 35 and R represents hydrogen or halogen with an atomic number up to 35 together with pulverulent carriers or a suppository base composition.

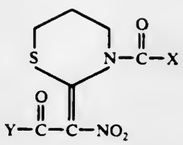
4,076,813

DERIVATIVES OF 3-OXOMETHYL-2-(1-NITRO-2-OXOETHYLIDENE)-TETRAHYDRO-2H-1,3-THIAZINES AS INSECTICIDES

Steven A. Roman, Oakdale, Calif., and James E. Powell, Rodmersham Green near Sittingbourne, England, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 663,317, Mar. 3, 1976, Pat. No. 4,022,775, which is a continuation-in-part of Ser. No. 564,258, Apr. 2, 1975, abandoned. This application Jan. 14, 1977, Ser. No. 759,598
Int. Cl.[2] A01N *9/12, 9/22*
U.S. Cl. 424—246 **2 Claims**

1. A method for killing flies, aphids, and insects of the genus Heliothis, which comprises contacting such insects with a dosage that is lethal to them of a compound of the formula:



wherein X and Y each is R, R—O— or R—S, R containing up to 30 carbon atoms and being alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkylalkyl, haloalkyl, haloalkenyl, mono-and poly(alkoxy)alkyl, alkylthioalkyl, alkylsulfinylalkyl, alkylsulfonylalkyl; phenyl, or phenalkyl, or any of these substituted on the ring by one to two of one or more of halogen, nitro, cyano, alkyl, phenyl, alkoxy or phenoxy; is aminoalkyl, $-(CH_2)_mNR^1R^2$, wherein *m* is 1 or 2, R^1 and R^2 each is alkyl, alkenyl, cycloalkyl, phenyl or phenalkyl; or is $-(CH_2)_nR^5$, wherein *n* is 0, 1 or 2, and R^5 is a heterocyclic moiety selected from furanyl, tetrahydrofuranyl, dioxolanyl, thienyl, thiopyranyl, pyridinyl, pyrrolidinyl and morpholinyl.

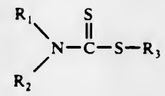
4,076,814

PREVENTIVE AND CURATIVE COMPOSITIONS AGAINST MYCOPLASMOSIS

Isao Seki; Noritoshi Kitano, and Fusao Kondo, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

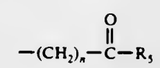
Filed May 28, 1976, Ser. No. 690,863
Claims priority, application Japan, Jun. 9, 1975, 50-69324; Oct. 1, 1975, 50-118580
Int. Cl.[2] A61K *31/535, 31/54*
U.S. Cl. 424—248.5 **12 Claims**

1. A preventive and curative composition against mycoplasmosis which comprises an effective amount of an active ingredient a compound having the formula

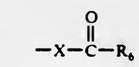


wherein

R_1 and R_2 form, jointly with the nitrogen atom to which they are attached, a 6-membered heteroalicyclic ring which also contains oxygen as another hetero atom and which may be substituted with alkyl of 1 to 4 carbon atoms; and
R_3 is a group $-CH_2-R_4$ in which R_4 is a 5-7 membered 2-oxocycloalkyl group optionally substituted with 1-3 C_1-C_4 alkyl groups;
a group



in which *n* is an integer of 1 or 2 and R_5 is naphthyl group, a phenyl group optionally substituted with 1-2 groups selected from the group consisting of hydroxy, C_1-C_{12} alkyl, C_1-C_4 alkoxy, nitro and halogen or a 5-7 membered heterocyclic group which has as hetero atom 1 or 2 atoms of oxygen atom, nitrogen atom and sulfur atoms and may be substituted with 1-3 groups selected from the group consisting of C_1-C_4 alkyl, hydroxy, hydroxymethyl, halogenomethyl, dihalogenomethyl, trihalogenomethyl, nitro and halogen;
a group



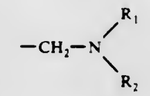
in which R_6 is an alkyl group of 1 to 12 carbon atoms, a 5-6 membered cycloalkyl group, an aralkyl group which has 6 or 10 carbon atoms in the aryl moiety and 1 to 4 carbon atoms in the alkyl moiety and may be substituted with C_1-C_4 alkyl, hydroxy, nitro, C_1-C_4 alkoxy or halogen or an alkenyl group of 2 to 5 carbon atoms which may be substituted with cycloalkenyl or phenyl, said phenyl being optionally substituted with C_1-C_4 alkyl, hydroxy, nitro, C_1-C_4 alkoxy or halogen and X is a group



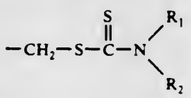
wherein R_7 is hydrogen, C_1-C_{12} alkyl, cyclohexyl, aralkyl of C_6 or C_{10} in the aryl moiety and C_1-C_4 in the alkyl moiety, C_2-C_4 alkenyl, C_2-C_3 alkynyl or phenyl or a group

wherein R_8 is hydrogen, C_1-C_{12} alkyl, cyclohexyl, aralkyl of C_6 or C_{10} in the aryl moiety and C_1-C_4 in the alkyl moiety, said aryl moiety being optionally substituted with C_1-C_4 alkyl, hydroxy, C_1-C_4 alkoxy or halogen, or phenyl optionally substituted with C_1-C_4 alkyl, hydroxy, C_1-C_4 alkoxy or halogen; or
a group

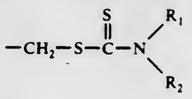
in which R_9 is hydrogen atom, an alkyl group of 1 to 4 carbon atoms, cyclohexyl group or phenyl group and R_{10} is a phenyl group which has one hydroxy group at the o- or p-position and 2-4 groups selected from the group consisting of C_1-C_4 alkyl, halogen, C_1-C_4 alkoxy, C_2-C_4 alkenyl, hydroxyalkyl of C_1-C_4, a group



wherein R_1 and R_2 are as defined above and a group

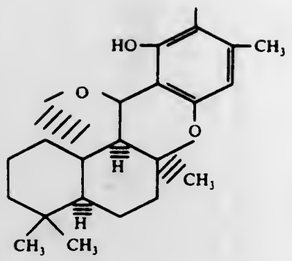


wherein R_1 and R_2 are as defined above, a naphthyl group which has one hydroxy group at the 1- or 2-position and optionally halogen or a group



wherein R_1 and R_2 are as defined above, a group

or a group



or a salt thereof and an inert carrier.

4,076,815

QUINOXALINE COMPOUND AND COMPOSITION, PROCESS FOR PREPARING COMPOUND, AND METHOD OF COMBATTING CHOLERA THEREWITH

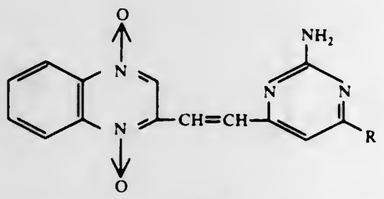
Aldo Garzia, Lodi (Milano); William Ferrari, Modena, and Andrea Bottazzi, Lodi, all of Italy, assignors to Istituto Chemioterapico Italiano, S.p.A., Italy

Continuation-in-part of Ser. No. 672,123, Mar. 31, 1976, abandoned. This application Feb. 23, 1977, Ser. No. 771,118

Int. Cl.[2] A61K *31/505;* **C07D** *403/06*

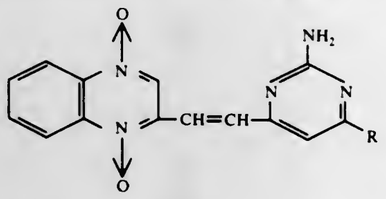
U.S. Cl. 424—251 **29 Claims**

11. A method of combatting cholera by administration to an individual exposed to a cholera-producing organism an effective amount of a substituted quinoxaline represented by the formula



wherein R is hydrogen or lower alkyl of 1 to 5 carbon atoms.

20. A quinoxaline compound represented by the formula



where R is hydrogen or lower alkyl of 1 to 5 carbon atoms.

4,076,816

ANTIBIOTIC MIXTURE

Leif Tybring, Gentofte, Denmark, assignor to Leo Pharmaceutical Products Ltd. A/S, Ballerup, Denmark

Filed May 1, 1975, Ser. No. 573,453

Claims priority, application United Kingdom, May 17, 1974, 22171/74

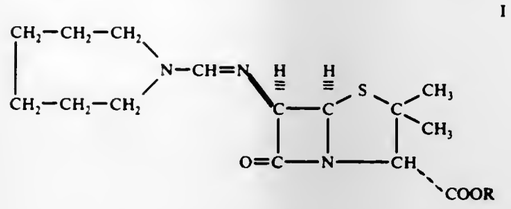
Int. Cl.[2] A61K *31/305, 31/43*

U.S. Cl. 424—251 **13 Claims**

13. The method of treating patients suffering from bacterial infections which comprises administering by the parenteral route to the patients, in antibacterially effective amounts, dosage units of an antibacterial synergistic composition consisting essentially of a mixture of:

An amidinopenicillanic acid derivative of the general formula

I



in which R is hydrogen, or its pharmaceutically acceptable non-toxic salts, in combination with trimethoprim, or pharmaceutically acceptable non-toxic salts thereof, which composition contains amounts of the active ingredients so as to provide a ratio of 1:19 to 19:1 when used in the body.

4,076,817

CERTAIN THIAZOLO COMPOUNDS AS ACARICIDAL AGENTS

Richard M. Acheson, Oxford; Ian R. Cox, North Harrow; John K. Stubbs, and Alexander B. Penrose, both of Deal, all of England, assignors to Pfizer Inc., New York, N.Y.

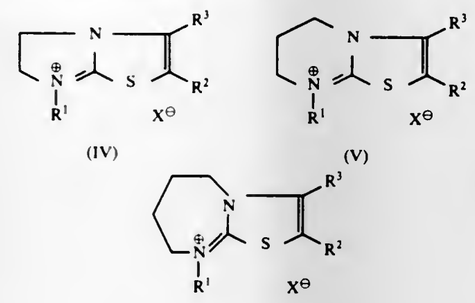
Filed Nov. 2, 1976, Ser. No. 738,382

Claims priority, application United Kingdom, Nov. 5, 1975, 45961/75; Nov. 5, 1975, 45962/75

Int. Cl.[2] A61K *31/505;* **C07D** *239/70*

U.S. Cl. 424—251 **5 Claims**

1. A method for protecting an animal subject to skin infection by acarids which comprises externally applying to said animal an acaricidal amount of a compound selected from those of the formulae (IV), (V) and (VI),



wherein X^- is a pharmaceutically acceptable anion; R^1 is an alkyl group having from 10 to 20 carbon atoms; when taken separately, each of R^2 and R^3 is selected from the group consisting of hydrogen, alkyl having from one to six carbon atoms, phenyl and phenyl substituted by up to two members which may be the same or different and are selected from the group consisting of fluoro, chloro, bromo, hydroxyl, alkyl having from one to three carbon atoms, alkoxy having from one to three carbon atoms, cyano, nitro and trifluoromethyl, and when R^2 and R^3 are taken together they form a tetramethylene group; with the proviso that in formula (IV) R^2 is other than hydrogen, phenyl or said substituted phenyl and R^3 is other than hydrogen.

4,076,818

PYRAZOLO [1,5-C]QUINAZOLINE DERIVATIVES AND RELATED COMPOUNDS

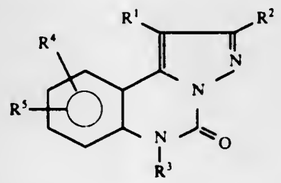
B. Richard Vogt, Yardley, Pa., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jul. 2, 1976, Ser. No. 702,364

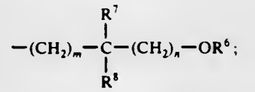
Int. Cl.[2] A61K *31/305;* **C07D** *487/04*

U.S. Cl. 424—251 **11 Claims**

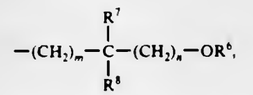
1. A compound of the structure



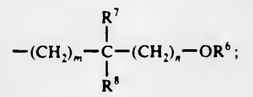
wherein R^1 and R^2 are the same or different, and R^1 is selected from the group consisting of hydrogen, lower alkyl, phenyl, phenyl having an R^4 substituent, or



R^2 is selected from the group consisting of



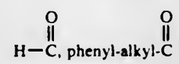
hydrogen, lower alkyl, phenyl or phenyl having an R^2 substitutent, with the proviso that at least one of R^1 and R^2 is



R^6 is selected from the group consisting of



having 1 to 8 carbons in the alkyl group,



having 1 to 8 carbons in the alkyl group or



wherein phenyl includes unsubstituted phenyl, mono-, or di-lower-alkylphenyl, or halophenyl;

R^3 is selected from the group consisting of hydrogen, lower alkyl, benzyl, phenyl, or phenyl having an R^4 sustituent;

R^4 and R^5 are the same or different and are selected from the group consisting of hydrogen, alkyl of 1 to 4 carbons, alkoxy of 1 to 4 carbons, lower alkanoyloxy of 1 to 4 carbons, nitro, benzyloxy, benzyloxy having a lower alkoxy, halogen, hydroxy, or trifluoromethyl substituent;

R^7 and R^8 may be the same or different and are selected from the group consisting of hydrogen, alkyl of 1 to 3 carbons, phenyl, phenyl having a lower alkoxy substituent, benzyl, or benzyl having a lower alkoxy substituent, or R^7 and R^8 taken together is a single cycloalkyl ring of 3 to 7 carbons;

$(CH_2)_m$ and $(CH_2)_n$ represent straight chain alkylene radicals or mono- or di-alkyl substituted alkylene radicals wherein the alkyl group has 1 to 8 carbons, m and n are integers which represent the number of carbon atoms in the longest normal chains and may be the same or different and are 0 to 10, with the proviso that $m + n \leqq 10$,

and physiologically acceptable salts thereof.

10. A pharmaceutical composition for use in treating allergic conditions comprising a compound as defined in claim 1 and a pharmaceutically acceptable carrier therefor.

4,076,819

THIENO-PYRIDINE DERIVATIVES AND THERAPEUTIC COMPOSITION CONTAINING SAME

Jean-Pierre Maffrand, Toulouse, France, assignor to Parcor, Paris, France

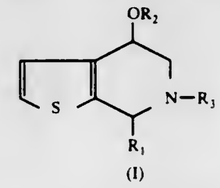
Filed Apr. 14, 1976, Ser. No. 676,796

Claims priority, application France, May 30, 1975, 75 17007

Int. Cl.[2] A61K *31/44;* **C07D** *407/04*

U.S. Cl. 424—256 **4 Claims**

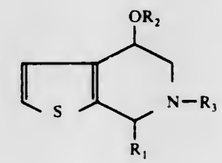
1. A compound selected from the group consisting of the thieno-pyridine derivatives having the formulae



(I)

in which R_1 is selected from the group consisting of hydrogen and the alkyl groups having 1-6 carbon atoms; R_2 is selected from the group consisting of hydrogen, acetyl and lower alkyl-carbamoyl; and R_3 is selected from methyl, nitrobenzyl, chlorobenzyl, methoxybenzyl, chlorobenzoyl, trimethoxybenzoyl, pyrrolidinoacetyl, p.toluene-sulfonyl, phenylcarbamoyl, phenylthiocarbamoyl, 3-oxo-butyl, lower alkyl-carbamoyloxy, phenethyl, dichloroacetyl, 2-chlorophenoxy-2-methyl-propionyl and chlorophenyl-carbamoyl; and the pharmaceutically acceptable acid addition salts thereof.

2. Therapeutic composition having an anti-inflammatory activity and an inhibitor activity on blood plate aggregation, comprising an effective amount of a compound selected from the group consisting of the thieno-pyridine derivatives having the formulae:



(I)

in which R_1 is selected from the group consisting of hydrogen and the alkyl groups having 1-6 carbon atoms; R_2 is selected from the group consisting of hydrogen, acetyl and lower alkyl-carbamoyl; and R_3 is selected from the group consisting of oxybenzyl, chlorobenzoyl, trimethoxybenzoyl, pyrrolidinoacetyl, p.toluene-sulfonyl, phenylcarbamoyl, phenylthiocarbamoyl, 3-oxo-butyl, lower alkyl-carbamoyloxy, phenethyl, dichloroacetyl, 2-chlorophenoxy-2-methyl-propionyl and chlorophenyl-carbamoyl; and the pharmaceutically acceptable acid addition salts thereof, together with an inert pharmaceutical vehicle.

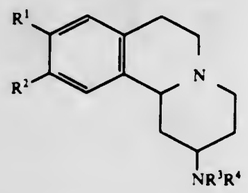
4,076,820

BENZOQUINOLIZINES AND HYPOTENSIVE COMPOSITIONS CONTAINING THEM

John Leheup Archibald, Windsor, and John Lambert Jackson, Royston, both of England, assignors to John Wyeth & Brother, Limited, Maidenhead, England

Filed May 13, 1976, Ser. No. 685,834
Claims priority, application United Kingdom, May 22, 1975, 22030/75
Int. Cl.[2] A61K *31/47*; C07D *455/06*
U.S. Cl. 424—258 **6 Claims**

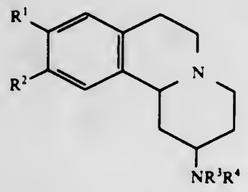
1. A compound selected from the group consisting of a benzoquinolizine of formula



(I)

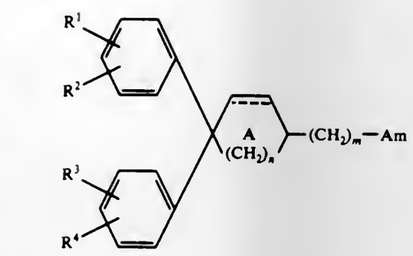
and a pharmaceutically acceptable acid addition salt thereof, wherein R^1 and R^2 each represents a member from the group consisting of hydrogen, lower alkyl, lower alkoxy and halogen, R^3 represents a member of the group consisting of hydrogen, lower alkyl and aryl, R^4 represents $-SO_2R^5$ (wherein R^5 represents lower alkyl or aryl), and aryl represents phenyl and mono-substituted phenyl, wherein the substituents are selected from halogen, alkoxy, lower alkyl, methylenedioxy, ethylenedioxy, amino, lower alkylamino, dilower alkylamino and trifluoromethyl.

6. A hypotensive composition comprising a hypotensively effective amount of a compound selected from the group consisting of a benzoquinolizine of formula

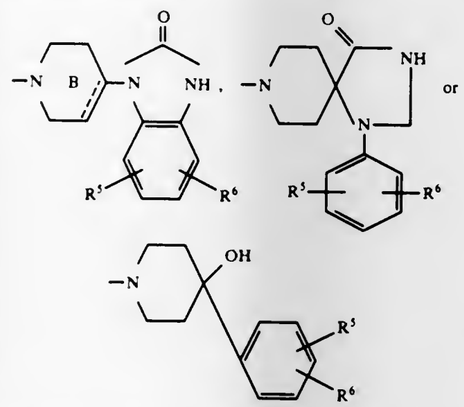


(I)

and a pharmaceutically acceptable acid addition salt thereof, wherein R^1 and R^2 each represents a member from the group consisting of hydrogen, lower alkyl, lower alkoxy and halogen, R^3 represents a member of the group consisting of hydrogen, lower alkyl and phenyl, R^4 represents $-SO_2R^5$ (wherein R^5 represents lower alkyl, phenyl and lower alkylphenyl), in association with a pharmaceutically acceptable carrier.



wherein:
the dotted line in Ring A indicates an optional bond;
R^1, R^2, R^3 and R^4 are independently a hydrogen atom, a halogen atom, a trifluoromethyl group or a lower alkyl group;
n is 1 or 2;
m is 0 or 1;
Am is a piperidino group of the formula:



or

where the dotted line in Ring B indicates an optional bond; and R^5 and R^6 are independently a hydrogen atom, a halogen atom, a trifluoromethyl group or a lower alkyl group; and a pharmaceutically acceptable salt thereof.

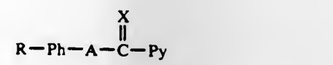
4,076,821

4,4-DIPHENYLCYCLOALKYLPIPERIDINES AND PSYCHOTROPIC COMPOSITIONS THEREOF

Yoshinao Tsuda, Fukuoka; Masafumi Arita, Nakatsu; Toshio Hamasaki, Nakatsu; Tatsumi Tsumagari, Nakatsu, and Takenori Kenjo, Fukuoka, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

Filed Feb. 27, 1976, Ser. No. 662,197
Int. Cl.[2] C07D *401/04*
U.S. Cl. 424—263 **52 Claims**

1. A compound of the formula:



wherein R denotes cycloalkenyl or cycloalkyl radical with 5 to 10 ring members which is unsubstituted or substituted by C_1-C_4-alkyl, C_2-C_4-alkenyl, C_1-C_4-alkoxy, hydroxyl or oxo, or a 2- or 3-bicyclo[4,4,0]-decyl or -dec-2-enyl, 2-bicyclo[2,2,2]-oxtyl or -oct-2-enyl, 2-bornyl, 2-norbornyl, 2-bornenyl, 2-norbornenyl radical which is unsubstituted or substituted by

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4,076,822

CERTAIN PYRIDYL METHANONES AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Georges Haas, and Alberto Rossi, both of Oberwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 443,289, Feb. 19, 1974, Pat. No. 3,980,657. This application Apr. 28, 1976, Ser. No. 680,946
Claims priority, application Switzerland, Feb. 19, 1973, 2381/73; Oct. 23, 1973, 14936/73
Int. Cl.[2] C07D *213/50*; A61K *31/44*
U.S. Cl. 424—263 **9 Claims**

1. An anti-inflammatory pharmaceutical composition comprising an anti-inflammatory effective amount of a compound of the formula

C_1-C_4-alkyl or C_1-C_4-alkoxy or 1- or 2- adamantyl, Ph denotes p-phenylene unsubstituted or substituted by nitro, trifluoromethyl, C_1-C_4-alkyl, C_1-C_4-alkoxy, chlorine, fluorine or bromine, A denotes 1,3- or 1,2- propylene, propylidene, isopropylidene, ethylene, methylene, ethylidene, X denotes an oxo group, two C_1-C_4-alkoxy or C_1-C_4-alkylthio radicals or a C_2-C_4-alkylenedioxy or C_2-C_4-alkylene dithio group, and Py denotes a pyridyl radical which is unsubstituted or C-substituted by C_1-C_4-alkoxy or a therapeutically acceptable acid addition salt thereof.

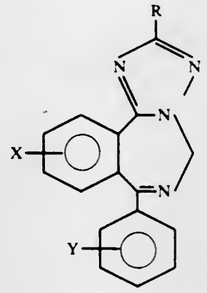
4,076,823

TRIAZOLO-2,4-BENZODIAZEPINES

Peter C. Wade, Pennington, N.J.; B. Richard Vogt, Yardley, Pa., and Thomas P. Kissick, Princeton, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 18, 1977, Ser. No. 825,744
Int. Cl.[2] A61K *31/55*; C07D *487/04*
U.S. Cl. 424—269 **10 Claims**

1. A compound of the structure



wherein X is hydrogen, halogen, lower alkyl, lower alkoxy, trifluoromethyl or nitro; Y is hydrogen, halogen, lower alkyl, lower alkoxy, trifluoromethyl or nitro; and R is hydrogen, lower alkyl or trifluoromethyl.

8. A pharmaceutical composition comprising a compound as defined in claim 1 and a physiologically acceptable carrier therefor.

9. A method for treating an inflammatory condition in mammals which comprises administering a therapeutic amount of a composition as defined in claim 8.

10. A method for treating anxiety in mammals, which comprises administering a therapeutic amount of a composition as defined in claim 8.

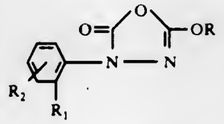
4,076,824

ANTHELMINTIC OXADIAZOLINONE DERIVATIVES

Roger Boesch, Vitry-sur-Seine, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Feb. 2, 1976, Ser. No. 654,587
Claims priority, application France, Feb. 3, 1975, 75 03281; Feb. 3, 1975, 75 03282
Int. Cl.[2] A61K *31/42*
U.S. Cl. 424—272 **14 Claims**

1. A method for the treatment of helminth infections in domestic animals and humans which comprises administering orally to a dometic animal or a human being infected with helminths an anthelmintically effective amount of an oxadiazolinone derivative of the formula:



wherein R represents alkyl of 1 through 4 carbon atoms, R_1 represents halogen, alkyl of 1 through 4 carbon atoms, alkoxy of 1 through 4 carbon atoms or alkylthio of 1 through 4 carbon atoms, and R_2 represents hydrogen, halogen, alkyl of 1 through 4 carbon atoms, alkoxy of 1 through 4 carbon atoms or alkylthio of 1 through 4 carbon atoms.

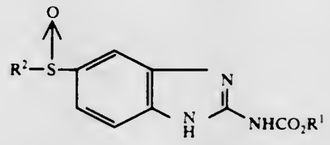
4,076,825

METHOD OF TREATING HELMINTHIASIS BY PARENTERAL OR TOPICAL ADMINISTRATION OF SULFOXIDE DERIVATIVES OF BENZIMIDAZOLES

Rudiger D. Haugwitz, Titusville, and Larry R. Cruthers, Flemington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jun. 22, 1977, Ser. No. 809,150
Int. Cl.[2] A61K *31/415*
U.S. Cl. 424—273 R **13 Claims**

1. A method of treating or preventing helminthiasis, which comprises parenterally administering to a mammalian host an effective amount of a compound of the structure



wherein R^1 is lower alkyl or phenyl-lower alkyl, R^2 is lower alkyl containing 1 to 7 carbons, dispersed in a non-toxic non-pyrogenic physiologically acceptable carrier.

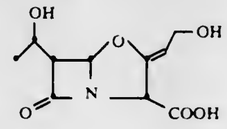
4,076,826

3-(β-HYDROXYETHYLIDENE)-6-(α-HYDROXYETHYL)-7-OXO-4-OXAAZABICYCLO[3.2.0]HEPTENE-2-CARBOXYLIC ACID AND DERIVATIVES THEREOF

Burton A. Christensen, Scotch Plains; Robert B. Morin, Warren, and Edward Walton, Scotch Plains, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

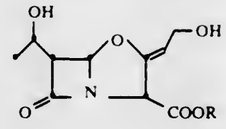
Continuation-in-part of Ser. No. 676,263, Apr. 12, 1976, abandoned. This application Aug. 6, 1976, Ser. No. 712,453
Int. Cl.[2] A61K *31/42*; C07D *498/04*
U.S. Cl. 424—272 **5 Claims**

1. A compound having the structure:



and the pharmaceutically acceptable salts thereof.

2. A compound having the structure:



wherein R is selected from the group consisting of alkyl having 1 to 6 carbon atoms; pivalolyloxymethyl, halo- and perhaloalkyl having 1 to 6 carbon atoms wherein the halogen is chloro, fluoro or bromo; alkenyl having from 2 to 6 carbon atoms; benzyl, benzhydryl, p-t-butylbenzyl, p-bromobenzyl, phthalidyl, 5-indanylmethyl, phenyl, 5-indanyl, acetylthiomethyl, acetylthioethyl, pivaloythiomethyl, and alkylthioalkyl, having 2 to 6 carbon atoms.

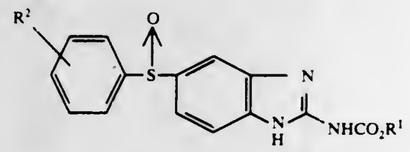
4,076,827

METHOD OF TREATING HELMINTHIASIS BY PARENTERAL ADMINISTRATION OF SULFOXIDE DERIVATIVES OF BENZIMIDAZOLES

Rudiger D. Haugwitz, Titusville, and Larry R. Cruthers, Flemington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

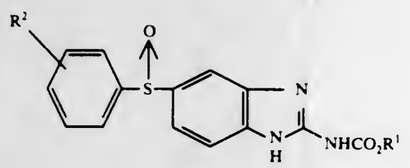
Filed Apr. 28, 1977, Ser. No. 791,828
Int. Cl.[2] A61K *31/415*
U.S. Cl. 424—273 R **8 Claims**

1. A method of treating or preventing helminthiasis, which comprises parenterally administering to a mammalian host an effective amount of a compound of the structure



wherein R^1 is lower alkyl or phenyl-lower alkyl, R^2 is hydrogen, lower alkyl, lower alkoxy, halogen or nitro dispersed in a non-toxic non-pyrogenic physiologically acceptable carrier.

7. An injectable composition for use in treating or preventing helminthiasis in mammalian species comprising an effective amount of a compound of the structure



wherein R^1 is lower alkyl or phenyl-lower alkyl, R^2 is hydrogen, lower alkyl, lower alkoxy, halogen or nitro, and a non-toxic non-pyrogenic physiologically acceptable carrier therefor selected from the group consisting of sterile water for injection, benzyl benzoate, 1,3-butylene glycol, ethyl oleate, glyceryl triacetate, mixtures thereof and a mixture of benzyl benzoate and sesame oil.

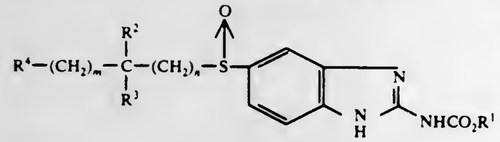
4,076,828

METHOD OF TREATING HELMINTHIASIS BY PARENTERAL ADMINISTRATION OF SULFOXIDE DERIVATIVES OF BENZIMIDAZOLES

Rudiger D. Haugwitz, Titusville, and Larry R. Cruthers, Flemington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

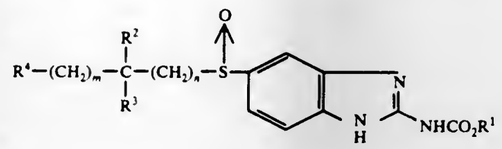
Filed Feb. 17, 1977, Ser. No. 769,632
Int. Cl.[2] A61K *31/415*
U.S. Cl. 424—273 R **16 Claims**

1. A method of treating or preventing helminthiasis, which comprises parenterally administering to a mammalian host an effective amount of a compound of the structure



wherein R^1 is lower alkyl, phenyl-lower alkyl, R^2 and R^3 are the same or different and are selected from the group consisting of hydrogen or lower alkyl, and R^4 is cycloalkyl, m is 0 to 3, n is 0 to 3 and $m + n$ is $\leqq 5$, dispersed in a non-toxic nonpyrogenic physiologically acceptable carrier.

11. An injectable composition for use in treating or preventing helminthiasis in mammalian species comprising an effective amount of a compound of the structure



wherein R^1 is lower alkyl, phenyl-lower alkyl, R^2 and R^3 are the same or different and are selected from the group consisting of hydrogen or lower alkyl, and R^4 is cycloalkyl, m is 0 to 3, n is 0 to 3 and $m + n$ is $\leqq 5$, and a non-toxic non-pyrogenic physiologically acceptable carrier therefor selected from the group consisting of benzyl benzoate, 1,3-butylene glycol, ethyl oleate, glyceryl triacetate, mixtures thereof and a mixture of benzyl benzoate and sesame oil.

4,076,829

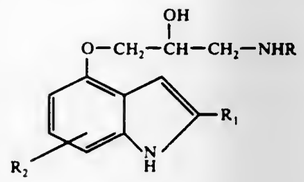
AMINOPROPANOL COMPOUNDS AND COMPOSITIONS FOR THE TREATMENT OF CARDIAC AND CIRCULATORY DISEASES

Wolfgang Kampe, Heddesheim; Kurt Stach, Mannheim-Waldhof; Max Thiel, Mannheim; Wolfgang Bartsch, Viernheim; Karl Dietmann, Mannheim-Vogelstang; Egon Roesch, Mannheim, and Wolfgang Schaumann, Heidelberg, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

Filed Oct. 28, 1975, Ser. No. 626,512
Claims priority, application Germany, Nov. 16, 1974, 2454406; Jun. 27, 1975, 2528771; Feb. 11, 1975, 2505681; Feb. 26, 1975, 2508251
Int. Cl.[2] A61K *31/40*; C07D *209/14*
U.S. Cl. 424—274 **19 Claims**

1. Aminopropanol compound of the formula

(I)



wherein

R is lower alkyl or cycloalkyl

R_1 is hydrogen or lower alkyl, hydroxyalkyl, alkoxyalkyl, and

R_2 is in the 6- position and is selected from lower alkyl, hydroxyalkyl, and alkoxyalkyl

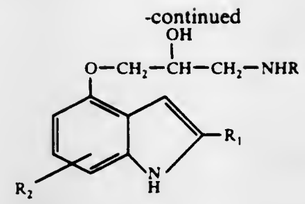
and the pharmacologically acceptable salts thereof.

14. Therapeutic composition for the treatment or prophylaxis of cardiac and circulatory diseases which composition comprises a pharmaceutically acceptable carrier and in amounts effective for treatment or prophylaxis of cardiac or circulatory diseases an aminopropanol compound as claimed in claim 1.

15. Method of combatting or preventing cardiac and circulatory infirmities which method comprises administering to a mammal in amounts effective for treatment or prophylaxis of cardiac or circulatory diseases an aminopropanol compound of the formula

(I)

-continued



wherein

R is lower alkyl or cycloalkyl

R_1 is hydrogen or lower alkyl, hydroxyalkyl, alkoxyalkyl, and

R_2 is in the 6- position and is selected from lower alkyl, hydroxyalkyl, and alkoxyalkyl

and the pharmacologically acceptable salts thereof.

4,076,830

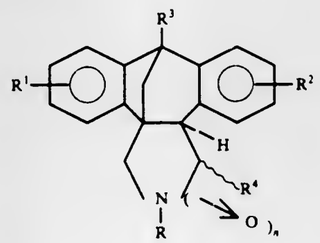
ALKYLMETHANODIBENZOCYCLOHEPTAPYRROLES

Engelbert Ciganek, Kennett Square, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 674,667, Apr. 7, 1976, abandoned, which is a continuation-in-part of Ser. No. 663,430, Mar. 3, 1976, which is a continuation-in-part of Ser. No. 545,001, Jan. 30, 1975, abandoned, which is a continuation-in-part of Ser. No. 448,686, Mar. 6, 1974, abandoned. This application Jun. 29, 1976, Ser. No. 700,964
Int. Cl.[2] C07D *209/70*; A61K *31/40*
U.S. Cl. 424—274 **27 Claims**

1. A compound

(A) of the formula



wherein

n is zero or 1;

R is hydrogen, alkyl of 1-4 carbons or cycloalkylalkyl of 5-10 carbon atoms, with the proviso that when R is hydrogen n is zero;

R^1 and R^2 individually are hydrogen, alkyl or alkoxy each of, 1-4 carbons, nitro, amino, hydroxyl or cyano, with the proviso that at least one of R^1 and R^2 is hydrogen;

R^3 and R^4 individually are H, methyl or ethyl, with the proviso that only one of R^3 and R^4 can be H; and

(B) a pharmaceutically acceptable acid addition salt of (A) where n is zero.

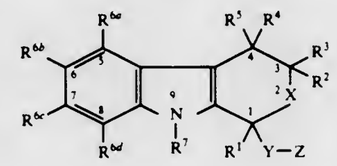
4,076,831

PYRANO[3,4-B]-INDOLE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS AND METHODS OF USE

Christopher A. Demerson, Montreal; Leslie G. Humber; Thomas A. Dobson, both of Dollard des Ormeaux, and Ivo L. Jirkovsky, Montreal, all of Canada, assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 555,506, Mar. 5, 1975, Pat. No. 4,012,417, which is a continuation-in-part of Ser. No. 513,693, Oct. 10, 1974, Pat. No. 3,974,179, which is a continuation-in-part of Ser. No. 311,023, Nov. 30, 1972, abandoned, which is a continuation-in-part of Ser. No. 289,714, Sep. 15, 1972, Pat. No. 3,939,178, which is a continuation-in-part of Ser. No. 148,895, Jun. 1, 1971, Pat. No. 3,843,681. This application Dec. 13, 1976, Ser. No. 749,931
Claims priority, application South Africa, May 16, 1972, 72/3344
Int. Cl.[2] A61K *31/40*; C07D *491/04, 495/04*
U.S. Cl. 424—274 **17 Claims**

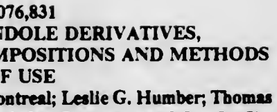
1. A compound of the formula Ia



in which R^1 is selected from the group consisting of lower alkyl, lower alkenyl, lower alkynyl, lower cycloalkyl, phenyl, benzyl and 2-thienyl, R^2, R^3, R^4 and R^5 are the same or different and are each selected from the group consisting of hydrogen and lower alkyl, R^{6a}, R^{6b}, R^{6c}, and R^{6d} are the same or different and selected from the group consisting of lower cycloalkyl and phenyl R^7 is selected from the group consisting of hydrogen, lower alkyl and lower alkenyl, X is selected from the group consisting of oxy and thio, Y is selected from the group consisting of carbonyl,



and

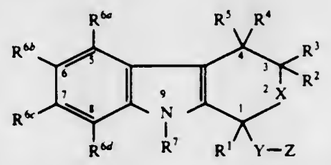


in

which each of R^8, R^9, R^{10}, R^{11}, R^{12} and R^{13} is hydrogen or lower alkyl, and Z is selected from the group consisting of hydroxy and lower alkoxy.

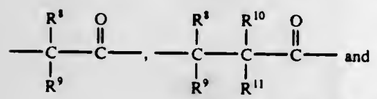
6. A method of treating inflammation in a warm-blooded animal, comprising: administering perorally to said animal an antiinflammatorily effective amount of the compound of the following formula Ib

Ib

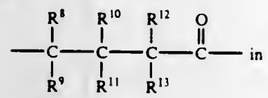


in which R^1 is selected from the group consisting of lower alkyl, lower alkenyl, lower alkynyl, lower cycloalkyl, phenyl, benzyl and 2-thienyl, R^2, R^3, R^4 and R^5 are the same or different and are each selected from the group consisting of hydrogen and lower alkyl, R^{6a}, R^{6b}, R^{6c}, and R^{6d} are the same or different and selected from the group consisting of hydrogen, lower

alkyl, lower cycloalkyl, hydroxy, lower alkoxy, benzyloxy, lower alkanoyloxy, phenyl, nitro, halo, mercapto, lower alkylthio, trifluoromethyl, amino and sulfamoyl, R^7 is selected from the group consisting of hydrogen, lower alkyl and lower alkenyl, X is selected from the group consisting of oxy and thio, Y is selected from the group consisting of carbonyl,



and



in

which each of R^8, R^9, R^{10}, R^{11}, R^{12} and R^{13} is hydrogen or lower alkyl, and Z is selected from the group consisting of hydroxy and lower alkoxy.

9. A pharmaceutical composition, comprising: an analgesically effective amount of the compound of Formula Ib of claim 6 and a pharmaceutically acceptable carrier.

4,076,832

CYCLODIENE INSECTICIDES

Gerald Thomas Brooks, Burgess Hill, England, assignor to National Research Development Corporation, England

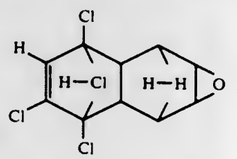
Filed Nov. 5, 1976, Ser. No. 739,323

Claims priority, application United Kingdom, Nov. 6, 1975, 46077/75

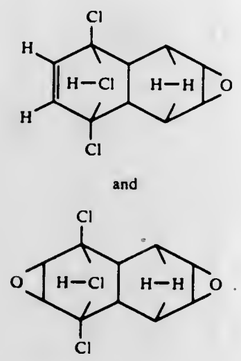
Int. Cl.² C07D *303/08*

U.S. Cl. 424—278 **6 Claims**

1. A compound selected from the group consisting of a syn-dechloro dieldrin derivative of the formula:



and



4,076,833

DERIVATIVES OF 1,3-BENZODIOXOLE, THE PREPARATION AND USE THEREOF

Pierre M. Vanhoof, and Pierre M. Clarebout, both of Brussels, Belgium, assignors to A. Christiaens Societe Anonyme, Brussels, Belgium

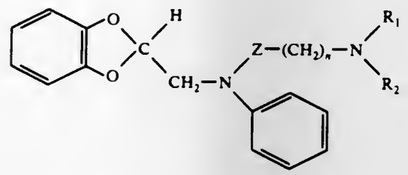
Division of Ser. No. 533,558, Dec. 17, 1974, Pat. No. 4,016,284. This application Jan. 3, 1977, Ser. No. 756,529

Claims priority, application United Kingdom, Dec. 17, 1973, 58292/73

Int. Cl.² A61K *31/36*

U.S. Cl. 424—282 **3 Claims**

1. Derivatives of 1,3-benzodioxole of the following general formula



in which Z represents



R_1 and R_2 which may be identical or different represent each a lower alkyl group containing 1 to 4 carbon atoms and R_1 may also represent hydrogen, *n* is equal to 2 or 3, and the pharmaceutically acceptable acid addition salts thereof.

3. A pharmaceutical composition for the treatment of heart arrhythmia which comprises as the active ingredient an amount effective to treat arrhythmia of a derivative according to claim 1 together with a pharmaceutical excipient.

4,076,834

THERAPEUTIC AGENTS FOR IMPROVING CARDIOVASCULAR FUNCTION

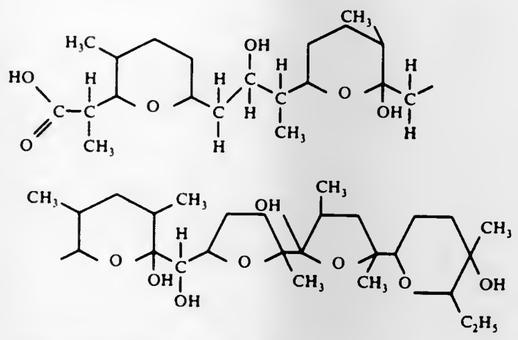
John Westley, Mountain Lakes, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 489,977, Jul. 19, 1974, abandoned. This application Dec. 19, 1975, Ser. No. 642,226

Int. Cl.² A61K *31/35*

U.S. Cl. 424—283 **1 Claim**

1. A method of therapeutic treatment by producing myocardial stimulation in a patient requiring such an effect which comprises administering to the patient an amount which is effective in producing myocardial stimulation, of antibiotic X-206, a compound represented by the formula



or pharmaceutically acceptable salts thereof.

4,076,835

ESTER OF CHRYSANTHEMIC ACID, PROCESS FOR THE PREPARATION THEREOF AND INSECTICIDAL COMPOSITIONS CONTAINING THEM

Keisuke Murayama; Motoji Asai, and Hideakira Tsuji, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Division of Ser. No. 292,262, Sep. 25, 1972, abandoned, which is a continuation of Ser. No. 42,450, Jun. 1, 1970, abandoned. This application Dec. 12, 1975, Ser. No. 640,229

Claims priority, application Japan, Jun. 2, 1969, 44-43143; Aug. 16, 1969, 44-64809

Int. Cl.² A01N *9/28*

U.S. Cl. 424—285 **2 Claims**

1. An insecticidal composition comprising an insecticidally effective amount of 2,3-dihydro-7-methyl-3-benzofuranyl chrysanthemate and a compatible carrier.

4,076,836

ACYLATED PHENYLAMINE THIOPROPIONATES USEFUL IN COMBATTING PLANT FUNGI

Adolf Hubele, Magden; Walter Kunz, Oberwil, both of Switzerland, and Wolfgang Eckhardt, Lorrach, Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

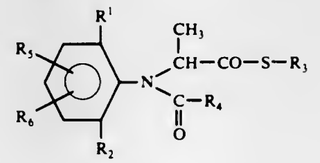
Filed Sep. 24, 1976, Ser. No. 726,348

Claims priority, application Switzerland, Sep. 30, 1975, 12648/75

Int. Cl.² A61K *31/34*

U.S. Cl. 424—285 **11 Claims**

1. A compound of the formula I



(I)

wherein

R_1 represents a C_1-C_4-alkyl or C_1-C_4-alkoxy group or a halogen atom,

R_2 represents a C_1-C_3-alkyl or C_1-C_4-alkoxy group or a halogen atom,

R_5 represents a hydrogen atom, a C_1-C_3-group or a halogen atom,

R_6 represents a hydrogen atom or a methyl group, with the proviso that the total number of carbon atoms contained by the substituents R_1, R_2, R_5 and R_6 in the phenyl ring does not exceed 8,

R_3 represents a methyl or ethyl group, and

R_4 represents 2-furanyl or 2-tetrahydrofuranyl unsubstituted or substituted by methyl or halogen.

9. A phytopathogenic fungicidal composition which contains as active ingredient a fungicidally effective amount of a compound as claimed in claim 1, together with a suitable inert carrier therefor.

4,076,837

PESTICIDAL FORMAMIDINE COMPOUNDS

Manfred Boger, Weil am Rhine, Germany, and Jozef Drabek, Allschwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

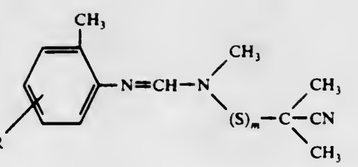
Filed Nov. 11, 1976, Ser. No. 740,899

Claims priority, application Switzerland, Nov. 20, 1975, 15032/75; Oct. 21, 1976, 13308/76

Int. Cl.² A01N *9/20;* **C07C** *121/52*

U.S. Cl. 424—304 **9 Claims**

1. A compound of the formula I



(I)

wherein R_1 is hydrogen or alkyl of 1 or 2 carbon atoms, R_2 is hydrogen, R_3 and R_4 together are oxygen, R_5 is hydrogen or alkyl of 1 to 4 carbon atoms, R_6 is hydrogen or alkyl of 1 to 4 carbon atoms; R_7 is attached to any carbon atom of ring B except those marked • in the formula and is hydrogen or, provided that R_6 is hydrogen, R_7 may alternatively be alkyl of 1 to 4 carbon atoms; or R_5 and R_7 are attached to the same carbon atoms and form an alkylene chain of 3 to 6 carbon atoms, and A is $-(CH_2)_2-$.

wherein R represents chlorine or methyl in the 4- or 6-position and *m* represents 1 or 2.

6. An insecticidal and acaricidal composition which comprises an insecticidally and acaricidally effective amount of a compound of claim 1, together with a suitable carrier therefor.

4,076,838

BENZOCYCLOHEPTENE-2-ACETIC ACIDS

Trevor Glyn Payne, Arlesheim, Australia, assignor to Sandoz Ltd., Basel, Switzerland

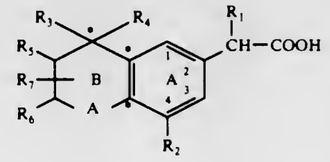
Continuation-in-part of Ser. No. 625,815, Oct. 28, 1975, abandoned. This application Nov. 1, 1976, Ser. No. 737,213

Claims priority, application Switzerland, Oct. 29, 1974, 14472/74

Int. Cl.² A61K *31/19;* **C07C** *63/00*

U.S. Cl. 424—317 **18 Claims**

1. A compound of the formula



where

R_1 is hydrogen or alkyl of 1 or 2 carbon atoms,

R_2 is hydrogen,

R_3 and R_4 together are oxygen,

R_5 is hydrogen or alkyl of 1 to 4 carbon atoms,

R_6 is hydrogen or alkyl of 1 to 4 carbon atoms;

R_7 is attached to any carbon atom of ring B except those marked • in the formula and is hydrogen or, provided that R_6 is hydrogen, R_7 may alternatively be alkyl of 1 to 4 carbon atoms; or

R_5 and R_7 are attached to the same carbon atoms and form an alkylene chain of 3 to 6 carbon atoms, and

A is $-(CH_2)_2-$.

4,076,839

URICOSURIC COMPOSITION AND METHOD OF PRODUCING URICOSURIA AND HYPOURICEMIA

Alfred Roland Maass, Swarthmore, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed Jun. 27, 1977, Ser. No. 810,244

Int. Cl.² A61K *31/19*

U.S. Cl. 424—317 **9 Claims**

1. A pharmaceutical composition in dosage unit form for producing uricosuria and hypouricemia comprising a pharmaceutical carrier and an amount sufficient to produce uricosuria and hypouricemia of the compound 2,3-dichloro-4-carboxyphenoxyacetic acid or an alkali metal salt of said acid.

4. A method of producing uricosuria and hypouricemia which comprises administering internally to a subject in need thereof a nontoxic amount sufficient to produce uricosuria and hypouricemia of the compound 2,3-dichloro-4-carboxyphenoxyacetic acid or an alkali metal salt of said acid.

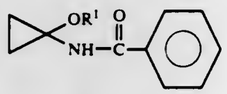
4,076,840

SUBSTITUTED CYCLOPROPYL BENZAMIDES AND PHARMACEUTICAL PREPARATIONS AND METHODS OF USE EMPLOYING SUCH COMPOUNDS

Per Arvid Emil Carlsson, Goteborg; Per Lennart Lindberg, and Borje Vilhelm Wickberg, both of Lund, all of Sweden, assignors to Astra Lakemedel Aktiebolag, Sodertalje, Sweden

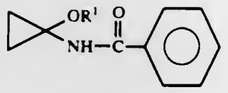
Filed May 25, 1976, Ser. No. 689,824
Claims priority, application Sweden, Jun. 9, 1975, 7506546
Int. Cl.² C07C *103/78;* A61K *31/165*
U.S. Cl. 424—324 **12 Claims**

1. A compound of the formula



wherein R^1 is selected from the group consisting of a hydrogen atom, a methyl group and an ethyl group.

9. A method for the treatment of alcoholism comprising administering to a host suffering from the symptoms of alcoholism a therapeutically effective amount of a compound of the formula



wherein R^1 is selected from the group consisting of a hydrogen atom, a methyl group and an ethyl group.

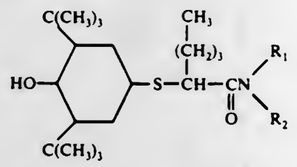
4,076,841

HYPOLIPIDEMIC 2-(3,5-DI-TERT-BUTYL-4-HYDROXYPHENYL)THIO CARBOXAMIDES

Eugene R. Wagner, Midland, and Larry G. Mueller, Ypsilanti, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

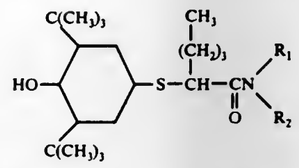
Division of Ser. No. 658,971, Feb. 18, 1976, Pat. No. 4,029,812. This application Mar. 4, 1977, Ser. No. 774,561
Int. Cl.² A61K *31/15, 31/165;* C07C *103/75, 103/78*
U.S. Cl. 424—324 **10 Claims**

1. A compound of the formula:



wherein R_1 and R_2 independently represent hydrogen, lower alkyl, or lower hydroxyalkyl.

4. A method for lowering elevated serum lipids in a mammal which comprises administering internally to the mammal a hypolipidemically effective amount of a compound of the formula:



wherein R_1 and R_2 independently represent hydrogen, lower alkyl, or lower hydroxyalkyl.

4,076,842

CRYSTALLINE ZEOLITE ZSM-23 AND SYNTHESIS THEREOF

Charles J. Plank, Woodbury; Edward J. Rosinski, Pedricktown, both of N.J., and Mae K. Rubin, Bala Cynwyd, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 585,632, Jun. 10, 1975, abandoned. This application Nov. 8, 1976, Ser. No. 739,414
Int. Cl.² C01B *33/28*
U.S. Cl. 423—328 **21 Claims**

1. A synthetic crystalline aluminosilicate zeolite having a composition in the anhydrous state, expressed in terms of mole ratios of oxides, as follows:

$$(0.58\text{-}3.4)M_2O : Al_2O_3 : (40\text{-}250)\ SiO_2$$

wherein M is at least one cation having a valence *n*, said zeolite having the X-ray diffraction lines of Table I of the specification.

10. A method for preparing the crystalline aluminosilicate zeolite defined in claim 1 which comprises preparing a mixture containing sources of an alkali metal oxide, an oxide of aluminum, an oxide of silicon, a nitrogen-containing organic cation and water and having a composition, in terms of mole ratios of oxides, falling within the following ranges:

$R+/(R+ + M+)$: 0.85–0.95
$OH-/SiO_2$: 0.01–0.049
$H_2O/OH-$: 200–600
SiO_2/Al_2O_3 : 55–70

wherein R is a nitrogen-containing cation derived from pyrrolidine and M is an alkali metal ion, maintaining the mixture at a temperature of above 280° F until the crystals of said aluminosilicate are formed.

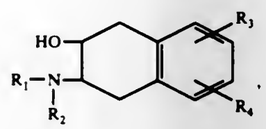
4,076,843

5,6,7,8-TETRAHYDRONAPHTHALENE HYPOTENSIVE AGENTS

Frederic Peter Hauck, Somerville; Christopher M. Cimarusti, Hamilton, both of N.J., and Joseph E. Sundeen, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 268,314, Jul. 3, 1972, abandoned. This application Dec. 26, 1973, Ser. No. 428,466
Int. Cl.² A61K *31/135*
U.S. Cl. 424—330 **20 Claims**

1. A method of lowering the blood pressure of a mammalian host in need thereof which comprises orally administering to said mammalian host an effective dose of a compound having the structure



or a pharmaceutically acceptable salt thereof, wherein R_1 is hydrogen or alkyl; R_2 is alkyl; and R_3 and R_4 are each hydrogen, hydroxyl, alkoxy, or arylalkoxy, at least one of R_3 and R_4 being other than hydroxyl; wherein the terms alkyl and alkoxy refer to groups having 1 to 8 carbon atoms and wherein the term arylalkoxy refers to an alkoxy group substituted with phenyl or mono- or di-substituted phenyl wherein the substituents are halogen, alkyl or alkoxy.

4,076,844

TWO STAGE PROCESS FOR THE PRODUCTION OF VINEGAR WITH HIGH ACETIC ACID CONCENTRATION

Heinrich Ebner, Bonn-Ippendorf, and Anton Enenkel, Bonn-Roettgen, both of Germany, assignors to Firma Heinrich Frings, Bonn, Germany

Filed Dec. 22, 1975, Ser. No. 643,297
Int. Cl.² C12J *1/04*
U.S. Cl. 426—17 **9 Claims**

1. A two-stage submerged fermentation process for the production of vinegar with an acetic acid concentration of more than 15%, wherein

1. the first fermentation stage is characterized by
   A. a total concentration, defined as the sum of the alcohol concentration expressed in percent volume by volume and the acetic acid concentration expressed in percent weight by volume, which
      i. is at substantially a starting level of between 12 and 15% thereof during an initial part of said first fermentation stage,
      ii. increases from said starting level thereof to above 15% during a middle part of said first fermentation stage, and
      iii. is continuously above 15% and substantially constant during a final part of said first fermentation stage, and
   B. an acetic acid concentration which increases from the starting level thereof but does not exceed 15% during the entire first fermentation stage,

   and insures both multiplication of bacteria and acidification, and
2. the second fermentation stage is characterized by
   A. said total concentration which is above 15% and substantially constant and
   B. an acetic acid concentration which is above 15% and permits acidification to continue while multiplication of bacteria ceases;

said process comprising:

a. starting a submerged vinegar fermentation and thereby starting said initial part of said first fermentation stage by aerating, at substantially constant temperature between 27° and 34° C, a mixture of materials, constituting the fermenting liquid, which includes acetic acid, alcohol, bacteria (Acetobacter), and nutrients for the bacteria and which is characterized by a starting level of the acetic acid concentration, expressed in percent weight by volume, between 7 and 10% and by the said starting level of the total concentration between 12 and 15%;
b. adding to the fermenting liquid, for effecting said middle part of said first fermentation stage, a 30–100% solution of ethyl alcohol in a quantity and at a rate sufficient to effect the increase of the total concentration to above 15%;
c. dividing the fermenting liquid into a transferred and a remaining portion during said first fermentation stage;
d. bringing the acetic acid concentration of said remaining portion of the fermenting liquid back to the starting level thereof, and subjecting said remaining portion further to at least the initial part of said first fermentation stage at a total concentration of substantially said starting level thereof;
e. subjecting said transferred portion of the fermenting liquid to at least said second fermentation stage by aerating it under substantially constant temperature of between 27° and 34° C without further addition of alcohol until the alcohol concentration decreases to substantially zero; and
f. terminating the fermentation of said transferred portion of the fermenting liquid when the alcohol concentration therein has decreased to substantially zero.

4,076,845

PROCESS FOR USING A POWDERED GLUTEN COMPOSITION IN BAKING

Harold P. Johannson, London, Canada, assignor to Industrial Grain Products, Limited, Montréal, Canada

Continuation-in-part of Ser. No. 549,274, Feb. 12, 1975, abandoned. This application Apr. 21, 1976, Ser. No. 679,077
Int. Cl.² A21D *2/26;* A23J *3/00*
U.S. Cl. 426—19 **5 Claims**

1. A short-time baking process which comprises mixing the ingredients of a dough formulation, subjecting the dough formulation to mechanical working until the dough formulation is developed or to chemical dough developing, proofing the dough and baking the dough, the improvement comprising incorporating into said dough formulation up to and including 20 percent by weight, based on dry flour, a dry powder composition comprising vital gluten modified by reaction with up to 5 percent by weight, based on dry gluten, of a non-toxic chelating agent.

4,076,846

PROTEIN-STARCH BINARY MOLDING COMPOSITION AND SHAPED ARTICLES OBTAINED THEREFOR

Ryuzo Nakatsuka; Setsuo Suzuki; Shinichi Tanimoto, and Eiji Funatsu, all of Yokohama, Japan, assignors to Sumitomo Bakelite Company Limited, Tokyo, Japan

Filed Nov. 12, 1975, Ser. No. 631,405
Claims priority, application Japan, Nov. 22, 1974, 49-133580; Nov. 22, 1974, 49-133581; Nov. 22, 1974, 49-133582; Nov. 22, 1974, 49-133584; Dec. 23, 1974, 49-146797; Dec. 28, 1974, 49-149221
Int. Cl.² A23L *1/00*
U.S. Cl. 426—62 **23 Claims**

1. A water-soluble and edible thermoplastic molding composition comprising:

a starch material; a protein material; water; an organic, low-molecular-weight plasticizer; and a lubricant;

said starch material being at least one edible, natural, unmodified starch;

said protein material being at least one edible protein salt selected from the group consisting of sodium, potassium and calcium salts of edible, natural protein concentrates;

said organic low-molecular-weight plasticizer being at least one edible, polyhydric alcohol selected from the group consisting of glycerol, ethylene glycol, diethylene glycol, sorbitol, sorbitan, mannitol, maltitol, hydrogenated starch syrup, and sucrose; and

said lubricant being at least one lubricant selected from the group consisting of mono-, di and tri-esters of said edible, polyhydric alcohols with edible higher fatty acids having at least 10 carbon atoms, phosphoric acid derivatives of said esters and lecithin;

said starch containing at least 50% by weight of amylose; the weight ratio of said starch to said protein salt being 30/70 to 70/30; the water content of the composition being 10 to 40% by weight based on the total weight of the composition; and the amount of said organic, low-molecular-weight plasticizer and that of said lubricant being, respectively, 20 to 60 parts by weight and 1 to 11 parts by weight per 100 parts by weight, in total, of said starch and said protein salt.

4,076,847

TEA-COLORED FLAVOR GRANULES

Richard Shaw Johnson, Irby, and John Kenneth Potter, Bromborough, both of England, assignors to Thomas J. Lipton, Inc., Englewood Cliffs, N.J.

Filed Oct. 26, 1976, Ser. No. 735,136
Claims priority, application United Kingdom, Oct. 24, 1975, 43848/75
Int. Cl.[2] A23F *3/00*
U.S. Cl. 426—78 7 Claims

1. Tea-colored flavor granules adapted to blend uniformly with broken leaf tea comprising water soluble granular carriers, each having a particle size between 0.5 and 2 mm and each containing from 2 to 10% by weight of an extrinsic flavor incorporated therein, each of said carriers being coated with tea powder which, upon infusion, together with said broken leaf tea, forms a beverage which is enhanced by or contrasted with the flavor contained in said carrier, said tea powder having a particle size in the range of 45 to 250 microns.

4,076,848

ENCAPSULATED PULVERIZED DEHYDRATED FRUIT AND VEGETABLE PRODUCT

Eleanor de Limur, 111 Sutter St., San Francisco, Calif. 94104

Filed Mar. 18, 1976, Ser. No. 668,106
Int. Cl.[2] A23B *7/02*
U.S. Cl. 426—89 3 Claims

1. A food article comprising a hollow capsule having an interior cavity, said cavity having a volume approximately 1 to 1½ inches long and ⅜ to ½ inch diameter; said cavity filled with a quantity of dehydrated, pulverized fruit and/or vegetable edible matter, hermetically sealed therein, said capsule being formed of a flexible polymeric material and consisting of a hollow cylindrical body portion closed at one end, with an opening at the other end defined by a circular lip portion, a circular cap portion attached to said body portion at said lip portion by a flexible integrally formed tab, said cap portion having an annular groove at its periphery which mates with said circular lip portion when said cap portion is placed across said opening to provide a hermetic seal.

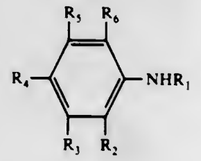
4,076,849

CONTROL OF NITROSAMINE FORMATION IN NITRITE CURED MEAT

Kekhusroo R. Bharucha; Leon J. Rubin, both of Toronto, and Charles K. Cross, Rexdale, all of Canada, assignors to Canada Packers Limited, Toronto, Canada

Filed Oct. 2, 1975, Ser. No. 619,068
Int. Cl.[2] A23B *4/02*
U.S. Cl. 426—266 20 Claims

1. a meat treating composition comprising a solution or dispersion of an aromatic secondary amine in a nitrite-containing meat curing solution, the amount of said aromatic secondary amine being effective to reduce the nitrosamine content of nitrite cured meat treated by said composition and cooked at frying temperature, said aromatic secondary amine having the formula:



I

wherein:

R_1 is a hydrocarbon radical of one to eighteen carbon atoms; and R_2, R_3, R_4, R_5 and R_6 are each selected from:

(a) hydrogen,

(b) a hydrocarbon radical as defined for R_1 above,

(c) $-OR_7$ where R_7 is hydrogen or a hydrocarbon radical as defined for R_1 above; or

two adjacent members R_2, R_3, R_4, R_5 and R_6 are cyclized to form the group $-CH_2-_n$ where n is 3 to 5, with the remaining substituents being as defined above; with the proviso that at least one of R_2, R_3, R_4, R_5 and R_6 is $-OR_7$ as defined above.

4,076,850

COMPOSITION AND METHOD FOR SAFELY EXTENDING STORAGE LIFE OF FOODS

John T. R. Nickerson, Onset, and John R. Darack, Framingham, both of Mass., assignors to Dirigo Corporation, Boston, Mass.

Filed Jan. 2, 1976, Ser. No. 646,018
Int. Cl.[2] A23B *4/00*
U.S. Cl. 426—332 18 Claims

1. A process for inhibiting the bacterial growth of certain food products while maintaining flavor and texture, said food products consisting of shelled hard-cooked eggs, cooked deshelled shellfish and cooked mushrooms; said process comprising storing such food products under refrigeration in an aqueous solution comprising:

A. a bacterial inhibitor selected from the class consisting of

(1) approximately 0.08 to 0.20% methyl parabenzoic acid, and

(2) a mixture of approximately 0.075 to 0.15% sorbic acid with approximately 0.22 to 0.45% sodium propionate, and

B. a buffering agent in amounts sufficient to maintain the pH of the solution in the range of approximately 4.5 to 5.5 and selected from the group consisting of

(1) a mixture of citric acid and sodium or potassium hydroxide, and

(2) a mixture of

a) sodium or potassium monohydrogen phosphate,

b) sodium or potassium dihydrogen phosphate, and

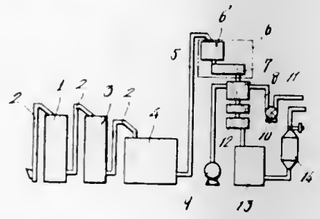
c) phosphoric acid.

4,076,851

METHOD AND APPARATUS FOR PRODUCING FINE DEODORIZED SOYBEAN POWDER

Tutae Tunoda, Oaza Joshikimen 944-1, Fukaya (Saitama), Japan

Filed Jan. 6, 1977, Ser. No. 757,147
Claims priority, application Japan, Sep. 9, 1976, 51-108241
Int. Cl.[2] B02B *3/00*
U.S. Cl. 426—431 10 Claims



1. A method of producing fine deodorized soybean powder, comprising the steps of:

washing raw soybeans;

pressing said soybeans flat to a degree not to remove fat from said soybeans;

drying the pressed soybeans in a substantially low temperature environment of approximately 50°–60° C to attain a first predetermined moisture content of approximately 3%;

coarsely grinding the soybeans to a coarse grain size and separating the soybean seed coats from the soybean seed leaves;

deodorizing said soybean leaves by digesting said leaves;

removing excess moisture from said soybean leaves so that said soybean leaves attain a second predetermined moisture content lower than said first predetermined moisture content;

intermediately grinding said soybean leaves to an intermediate grain size; and

finely grinding the intermediately ground soybean leaves to a fine grain size.

8. An apparatus for producing fine deodorized soybean powder from raw soybeans, comprising:

means for washing said raw soybeans;

said washing means communicating by way of soybean conveying means with means for pressing said soybeans flat to a degree not to remove fat from said soybeans;

said pressing means communicating by way of soybean conveying means with means for drying the pressed soybeans in a substantially low temperature environment of approximately 50°–60° C to attain a first predetermined moisture content of approximately 3%;

said drying means communicating by way of soybean conveying means with means for coarsely grinding the soybeans to a coarse grain size and separating the soybean seed coats from the soybean seed leaves;

said coarse grinding and separating means communicating by way of soybean conveying means with digesting means for deodorizing said soybean leaves;

said digesting means communicating by way of soybean conveying means with means for removing excess moisture from said soybean leaves so that said soybean leaves attain a second predetermined moisture content lower than said first predetermined moisture content;

said excess moisture removing means communicating by way of soybean conveying means with means for intermediately grinding said soybean leaves to an intermediate grain size; and

said intermediate grinding means communicating by way of soybean conveying means with means for finely grinding the intermediately ground soybean leaves to a fine grain size.

4,076,852

EDIBLE COMPOSITIONS HAVING A MEAT FLAVOR AND PROCESSES FOR MAKING SAME

Andries Van Delft, Nieuw Loosdrecht, Netherlands, and Christopher Giacino, Califon, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 334,894, Feb. 22, 1973, abandoned. This application Mar. 15, 1974, Ser. No. 451,470
The portion of the term of this patent subsequent to Jan. 21, 1992, has been disclaimed.
Int. Cl.[2] A23L *1/227*
U.S. Cl. 426—533 4 Claims

1. A process for preparing an edible poultry-flavored foodstuff flavor composition comprising the steps of (A) intimately admixing in the absence of any natural meat products except enzymatic chicken meat digest, a composition consisting essentialy of (i) a poultry egg product selected from the group consisting of powdered chicken egg yolk, enzymatic digest of the whole internal contents of poultry egg and enzymatic digest of poultry egg yolk; (ii) L-cysteine hydrochloride; (iii) thiamine hydrochloride and (iv) enzymatic chicken meat digest, said poultry egg product, said L-cysteine hydrochloride, said thiamine hydrochloride and said enzymatic chicken meat digest each being present in an amount to produce a poultry meat flavor, the weight ratio of said thiamine hydrochloride:-cysteine hydrochloride being from 0.25:1 up to 1:1, and (B) heating the resulting mixture at a temperature of from 100° C up to 350° C and for a period of time of from 0.2 hrs. up to 10 hrs. whereby a poultry meat flavored product is produced.

4,076,853

FLAVORING WITH SUBSTITUTED NORBORNANE DERIVATIVES

Kenneth K. Light, Long Branch; James Milton Sanders, Eatontown; Manfred Hugo Vock, Locust, all of N.J.; Edward J. Shuster, Brooklyn, N.Y.; Joaquin Vinals, Red Bank, N.J.; William L. Schreiber, Jackson, N.J.; John B. Hall, Rumson, N.J.; Denis E. Hruza, Sr., Bricktown, N.J.; Venkatesh Kamath, Red Bank, N.J.; Braja Dulal Mookherjee, Holmdel, N.J.; Ching Y. Tseng, Middletown, N.J., and Mark A. Sprecker, Sea Bright, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Feb. 4, 1977, Ser. No. 765,847
Int. Cl.[2] A23L *1/226*
U.S. Cl. 426—538 4 Claims

1. A process for augmenting or enhancing the flavor of a foodstuff comprising adding to said foodstuff from about 0.5 ppm up to about 500 ppm of at least one compound selected from group consisting of alpha-allyl-3,3-dimethyl-2-norbornanemethanol, alpha-methallyl-3,3-dimethyl-2-norbornanemethanol and alpha-allyl-alpha-3, 3-trimethyl-2-norbornanamethanol.

4,076,854

FLAVORING WITH A CYCLOHEXADIENE DERIVATIVE

Kenneth K. Light, Long Branch; Bette M. Spencer, Ocean Grove; Joaquin F. Vinals, Red Bank, all of N.J.; Jacob Kiwala, Brooklyn, N.Y.; Manfred Hugo Vock, Locust, N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Mar. 3, 1977, Ser. No. 774,058
Int. Cl.[2] A23L *1/226*
U.S. Cl. 426—538 2 Claims

1. A process for augmenting or enhancing the organoleptic properties of a foodstuff comprising the step of adding to said foodstuff from 0.5 parts per million up to about 100 parts per million based on the total composition of 4-butyl-3,4,5 -trimethyl-2,5-cyclohexadiene-1-one.

4,076,855

SOLUBLE COFFEE PROCESS

William S. Ryder, Orangeburg, and Joseph F. Mezzino, Pearl River, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Feb. 16, 1973, Ser. No. 333,100
Int. Cl.[2] A23F *1/08*
U.S. Cl. 426—594 4 Claims

1. A soluble coffee process which renders soluble normally insoluble constituents of coffee extract comprising the steps of:

a. obtaining a coffee extract,

b. removing said insoluble constituents from the coffee extract,

c. adding to an aqueous dispersion of said constituents an alkaline material in an amount sufficient to raise the pH of said dispersion to at least about 7.0 but below 9.0,

d. incorporating the alkaline-containing dispersion into a coffee extract from which insolubles have been removed, and then

e. drying the extract of step (d).

4,076,856

METHYL XANTHINE ANTAGONISM

Benjamin R. Zeitlin, Suffern; Alan B. Pritchard, Ithaca, both of N.Y., and Harold S. Levenson, Stamford, Conn., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 431,797, Jan. 9, 1974, Pat. No. 4,007,290, and Ser. No. 511,405, Oct. 2, 1974, abandoned. This application Mar. 23, 1976, Ser. No. 669,573

The portion of the term of this patent subsequent to Feb. 8, 1994, has been disclaimed.

Int. Cl.² A23F *1/00, 3/00;* A23G *1/00*

U.S. Cl. 426—594 9 Claims

1. A composition for preparing a coffee beverage comprising (a) coffee containing caffeine said coffee being selected from the group consisting of roasted coffee, soluble coffee and combinations thereof, and (b) a caffeine antagonist added to said coffee to provide an amount effective to at least partially antagonize the sleep disturbing effects of the caffeine present in the coffee beverage, said antagonist being comprised of (1) nicotinic acid or soluble salt thereof added to said coffee to provide an amount of from about 4% to 85% by weight of the caffeine present and sufficient to provide from about 6 mg to about 50 mg per cup of coffee beverage prepared from said coffee material, wherein a cup of coffee beverage comprises an aqueous solution containing from about 1.5 to 2.0 grams of soluble coffee solids, and (2) a member selected from the group consisting of nicotinamide or a salt thereof added to said coffee to provide an amount of from about 6 to 500% by weight of the caffeine present, trigonelline or a salt thereof added to said coffee to provide an amount of from about 7 to 500% by weight of the caffeine present, pyridine-2, 3-dicarboxylic acid or a salt thereof added to said coffee to provide an amount of from about 0.3 to 330% of the weight of caffeine present, 3-hydroxymethyl pyridine or a salt thereof added to said coffee to provide an amount of from about 0.6 to 330% by weight of the caffeine present and, pyridoxine or salt thereof added to said coffee to provide an amount of from about 0.4 to 85% of the weight of the caffeine present.

4,076,857

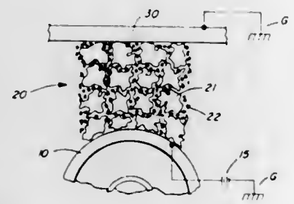
PROCESS FOR DEVELOPING ELECTROGRAPHIC IMAGES BY CAUSING ELECTRICAL BREAKDOWN IN THE DEVELOPER

George Philip Kasper, and John Walter May, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 28, 1976, Ser. No. 700,248

Int. Cl.² G03G *13/06, 13/08, 13/09*

U.S. Cl. 427—18 13 Claims



1. An electrographic process wherein a support bearing an electrostatic charge pattern is developed using an electrographic developer composition comprising marking particles and having a predetermined electrical breakdown value, said process comprising:

contacting the electrostatic charge pattern with the developer composition in a development area for a time period sufficient to deposit marking particles onto the electrostatic charge pattern thereby developing the image;

controlling the development process in the development area to establish across the developer composition in the development area during such time period an electrical field greater than the electrical breakdown value of the developer, thereby causing the developer composition to undergo electrical breakdown in the development of the electrostatic charge pattern.

4,076,858

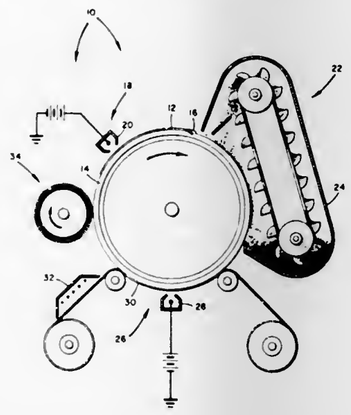
ELECTROSTATIC COPYING PROCESS WITH CHARGING OF THE ORIGINAL

Richard C. Keezer, Los Altos, Calif., and Werner E. L. Haas, Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 10, 1974, Ser. No. 513,768

Int. Cl.² G03G *13/04, 13/08, 13/22*

U.S. Cl. 427—19 6 Claims



1. A method for electrostatically copying an original document using an electrically conductive grounded plate, said document being comprised of ordinary paper having a fused toner image on a front side thereof, said paper and said image having different electrical properties comprising either the acceptance of different amounts of electrostatic charge, respectively, or if the charge is accepted equally, then discharging differently, respectively, comprising the steps of:

placing the front side of said document in contact with said conductive plate;

uniformly depositing an electrostatic charge on the backside of said document whereby portions of said charge are dissipated to form an electrostatic image thereon;

developing said electrostatic image, and

transferring the developed image to a support material.

4,076,859

PROCESS FOR METALLIZING STRIPS, SHEETS OR THE LIKE

Hermann Johannes Schladitz, Munich, Germany, assignor to Schladitz-Whiskers AG, Zug, Switzerland

Division of Ser. No. 486,956, Jul. 10, 1974, abandoned. This application Jul. 23, 1975, Ser. No. 598,337

Claims priority, application Germany, Aug. 29, 1973, 2342499

Int. Cl.² C23C *11/02*

U.S. Cl. 427—55 2 Claims

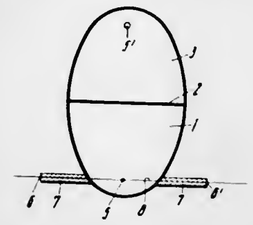
1. A process for metallizing strips, sheets or other generally flat material by depositing metal out of an atmosphere containing a gaseous metallic compound, consisting essentially of the steps of:

providing a heat decomposable gaseous metallic compound;

providing a focal line closely adjacent to or on one surface of said material to be metallized using an optical system,

focusing heat radiation at the focal line to heat said focal line to a temperature above the decomposition temperature of said gaseous metallic compound whereby metal for deposition is produced from said compound along said focal line,

said step of heating being carried out such that heat is substantially confined to said focal line adjacent to or on said one surface and the heating of said material is substantially confined to said one surface such that the temperature of



the entire cross section of said material being metallized is not raised to said decomposition temperature; and,

continuously moving said material to be metallized transversely past said focal line to accomplish surface metallization thereof.

4,076,860

METHOD OF FORMING ELECTRODE WIRINGS IN SEMICONDUCTOR DEVICES

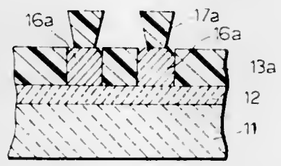
Hiroshi Kuroda, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 18, 1976, Ser. No. 715,643

Claims priority, application Japan, Aug. 20, 1975, 50-101336

Int. Cl.² B05D *1/32, 5/12;* C23C *13/02*

U.S. Cl. 427—91 6 Claims



1. A method of forming electrode wirings in semiconductor devices, which comprises the steps of:

forming a first masking pattern having a configuration inverse to the pattern of the desired electrode wirings on the surface to be provided with such electrode wirings;

evaporation depositing a conductor onto said masking pattern from above for forming a conductor layer covering both said masking pattern and the nonmasked areas of said surface and having depressions therein over the nonmasked areas of said surface;

applying a layer of mask-forming material on said conductor layer;

removing the surface portion of said layer of mask-forming material only to the extent that all the upper surfaces of the parts of said conductor layer above the parts of said first masking pattern are exposed to form a second masking pattern;

etching said exposed parts of the conductor layer with said second masking pattern as the etching mask to the extent that said first masking pattern is exposed; and removing said first and second masking patterns.

4,076,861

MAGNETIC RECORDING SUBSTANCE

Masahiko Furukawa; Hiroshi Ogawa; Masashi Aonuma; Yasuo Tamai; Hiromi Nakahara, and Masaaki Igarashi, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Jan. 5, 1976, Ser. No. 646,597

Claims priority, application Japan, Jan. 14, 1975, 50-5895

Int. Cl.² C22C *1/00;* H01F *1/02*

U.S. Cl. 427—132 8 Claims

1. A process for the production of a magnetic recording substance comprising a support and a magnetic layer containing a ferromagnetic metal powder in a binder, which process comprises:

a. reducing a ferromagnetic metal salt in aqueous solution with a reducing agent to produce a ferromagnetic metal powder, said ferromagnetic metal powder containing 50% by weight of one or more of at least one metal selected from the group consisting of Fe, Co, Ni, Fe-Co, Fe-Ni, Co-Ni and Fe-Co-Ni;

b. forming an aqueous slurry containing said ferromagnetic metal powder in a ratio of powder to water of 100:1 to 1:50 by weight;

c. adding to said aqueous slurry an organic solvent selected from the group consisting of butyl acetate, m-xylene, isoamyl alcohol, chloroform, butyl ether and methylisobutyl ketone, in a water to organic solvent ratio of 30:1 to 1:100 by weight of said organic solvent to water;

d. subjecting the resultant mixture of c) to azeotropic distillation to form a minimum boiling azeotrope to thereby substantially remove the water from said slurry and yet leave sufficient organic solvent to form a dispersion of said ferromagnetic powder therein;

e. dispersing a binder in said dispersion of ferromagnetic metal powder in said organic solvent and

f. coating the resultant dispersion of e) onto a support.

4,076,862

METHOD OF TREATING EARTHEN AREAS

Walter Dan Kobeski, Milton, W. Va.; Sigismund Walter Srocki, Streamwood; William Ivan Blosser, Wheeling, both of Ill., and James Joseph Needham, Marietta, Ga., assignors to United States Gypsum Company, Chicago, Ill.

Continuation of Ser. No. 408,034, Oct. 19, 1973, abandoned. This application Aug. 7, 1975, Ser. No. 602,869

Int. Cl.² B05C *1/16*

U.S. Cl. 427—136 12 Claims

1. A method of preventing combustion in combustible earthen banks which comprises the steps of:

(1) forming a composition consisting essentially of an aqueous slurry of calcium sulfate hemihydrate and a minor amount of a defoamer, the hemihydrate particles having a surface area of about 4000 to about 16,000 square centimeters per gram with less than about 0.5% by weight of greater than 50 mesh particles, the water being present in an amount of about 25% by volume to about 56% by volume above normal consistency for the hemihydrate;

(2) applying said composition to the surface of the area to be treated; and

(3) allowing the applied composition to set whereby there is formed a dense, substantially air-impermeable and nonporous layer substantially inhibiting gas flow and radiant heat from the surface of the treated area.

4,076,863

PROCESS FOR CUTTING AND EDGING CHEMICALLY PRE-STRENGTHENED FINISHED UNCUT LENS BLANKS WITHOUT LOSS OF IMPACT RESISTANCE

Fumio Onoki, Tokorozawa; Kazuo Namiki, Tokyo, and Tetsuo Osora, Fussa, all of Japan, assignors to Hoya Lens Corporation, Tokyo, Japan

Filed Sep. 2, 1976, Ser. No. 719,720
Claims priority, application Japan, Feb. 23, 1976, 51-18630
Int. Cl.² G02B *1/10*; B05D *3/02, 1/38, 5/06*
U.S. Cl. 427—165 8 Claims

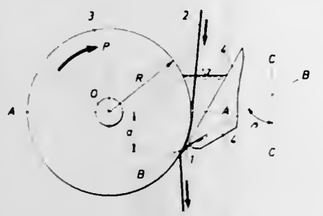
1. A process for preventing a decrease in the impact resistance of chemically strengthened ophthalmic glass lens blanks after a cutting and edging process, which comprises coating the surface of the lens edge with one or more coatings of at least one of the starting material compositions for epoxy resins, alkyd resins, polyurethane resins, unsaturated polyester resins, acrylic resins, or cyanoacrylates, and then polymerizing the resulting edge coating or coatings at a temperature of up to 200° C to form a polymeric edge coating.

4,076,864

METHOD AND APPARATUS FOR COATING BOTH SIDES OF A MOVING WEB

Hans Ivar Wallsten, Lausanne, Switzerland, assignor to Inventing S.A., Lausanne, Switzerland

Filed Aug. 24, 1976, Ser. No. 717,187
Claims priority, application Sweden, Aug. 26, 1975, 7509461
Int. Cl.² B05D *3/12*
U.S. Cl. 427—209 10 Claims



1. A method of coating both faces of a moving web, such as a paper web, comprising feeding the web longitudinally at a speed in excess of 300 meters per minute between a moving support member and a blade, the blade and the support member forming a nip, feeding coating material into the nip to produce a dam of coating material whereby the web is coated on both faces, controlling the angle of the blade so that it extends at an angle less than 20° to the web and choosing the bevel width, measured in the direction of movement of the web, to be at most 0.15 cm, said blade being urged against the web with a force not exceeding 2 kgf per cm width of web.

4,076,865

METHOD AND APPARATUS FOR COATING BOTH SIDES OF A MOVING WEB, USING BLADES

Hans Ivar Wallsten, Lausanne, Switzerland, assignor to Inventing S.A., Lausanne, Switzerland

Filed Aug. 24, 1976, Ser. No. 717,383
Claims priority, application Sweden, Aug. 26, 1975, 7509460
Int. Cl.² B05D *3/12*
U.S. Cl. 427—209 9 Claims

1. A method of coating both faces of a moving web, such as a paper web, comprising feeding the web longitudinally at a speed in excess of 200 meters per minute, applying a coating material to each face of the web, smoothing the coating material by means of two blades, one biased against each face, said blades each having a bevel at the point of contact with the web, controlling the angle of the blades so that they each extend at an angle less than 25° to the web and choosing the bevel width, measured in the direction of movement of the web, to be at most 0.08 centimeters, said blade being urged



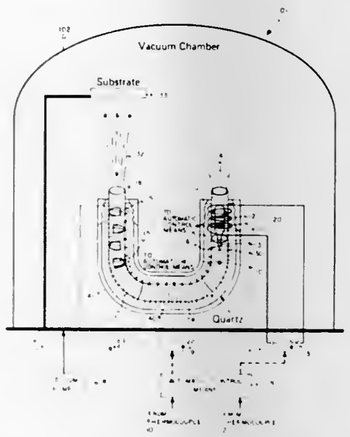
against the web with a force not exceeding 0.20 kgf per centimeter width of web.

4,076,866

METHOD OF GROWING FILMS BY FLASH VAPORIZATION

Nicolaos S. Platakis, San Jose, Calif., and Harry C. Gatos, Weston, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 30, 1975, Ser. No. 573,240
Int. Cl.² C23C *13/02*
U.S. Cl. 427—250 4 Claims



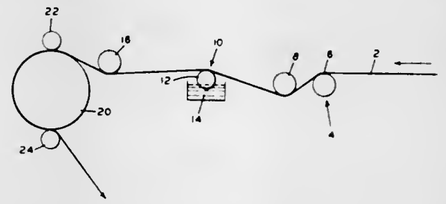
1. A method of making a film from a feed material whose constituents have large differences in vapor pressure, that comprises, disposing said feed material in an ampoule whose only outlet is a capillary tube, disposing the ampoule in a partly closed and heated environment, establishing the temperature of the environment to be well above the vaporization temperature of the consituent of the feed material having the highest vaporization temperature, establishing a temperature within the ampoule at a level that will effect melting of all the feed material constituents therein into a homogeneous liquid melt and cause the melt thereby formed to emit from the ampoule through the capillary tube into the heated environment where the emitted melt is wholely and instantly vaporized, and depositing the vapor, thus formed, upon a surface to form a film thereon, the film containing constituents in the same ratio as the constituents of the feed material.

4,076,867

MULTILEVEL EMBOSSING OF FOAMED-SHEET MATERIALS

Walter J. Lewicki, Jr., Lancaster, and William M. McQuate, Reinholds, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Feb. 28, 1975, Ser. No. 554,321
Int. Cl.² B05D *5/00*
U.S. Cl. 427—264 5 Claims



1. In a process for embossing a web of material wherein said material is composed of a composite structure having a carrier, a non-foamed embossable wear layer and a foamed layer therebetween, said foamed layer on the surface thereof adjacent the wear layer having a decorative pattern printed thereon, said above composite structure being in the form of a web which is first heated to a temperature of about 250° F. to 350° F., the improvement comprising:

a. then after heating, wetting the carrier of the web, which is the back surface of the web, so as to lower the temperature of the back surface of the foam and the backing approximately 100° below the temperature of the top surface of the web, which is the non-foamed embossable layer,

b. embossing the top surface of the web wherein the embossing means and its resulting embossing deeply penetrate the web, both the land areas and valley areas of the embossing means contact and impress a pattern on the top surface of the web, and

c. cooling the embossed surface of the web to set the embossed pattern in the web.

4,076,868

RENDERING BUILDING MATERIALS HYDROPHOBIC

Michael Roth, and Erhard Bosch, both of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Continuation of Ser. No. 522,660, Nov. 11, 1974, abandoned. This application Apr. 29, 1976, Ser. No. 681,354
Claims priority, application Germany, Nov. 9, 1973, 2356142
Int. Cl.² B05D *3/12*; B32B *13/12*
U.S. Cl. 427—348 15 Claims

1. A process for simultaneously cleaning and rendering a preformed building material hydrophobic, which comprises (1) applying to the surface of the building material selected from the group consisting of concrete, bricks, glazed ceramic tiles and plaster, a composition consisting essentially of a hydrophobic agent selected from the group consisting of organopolysiloxanes having siloxane units of the general formula $R_nH_mSiO_{(4-m-n)/2}$, silanes of the formula R_nSiX_{4-n} and partial hydrolysates thereof, alkali metal hydrocarbon siliconates of the formula $R'Si(OH)_2OM$ and polymers having units of the formula $R'SiO(OM)$ and mixtures thereof, wherein R is selected from the group consisting of alkyl and aryl radicals having up to 18 carbon atoms, R' is selected from the group consisting of a monovalent hydrocarbon radical having up to 5 carbon atoms and a phenyl radical, M represents an alkali metal atom, X represents a hydrolyzable radical, *n* denotes 0, 1, 2, or 3 and *m* denotes 0 or 1, and in the polysiloxane the average value of the *n* is from 0.9 to 1.8, and *n* is 1 in at least 50 percent of the number of siloxane units, a solvent for the hydrophobic agent in which the hydrophobic agent is present in an amount of from 0.2 to 50 percent by weight based on the weight of the hydrophobic agent and solvent and a residue forming filler having a surface area of at least 50 m^2/g, in an amount of from 1 to 25 percent by weight based on the total weight of the hydrophobic agent and solvent, (2) removing the solvent by evaporation to form a filler residue on the surface of said building material and thereafter (3) removing the filler residue from said surface to simultaneously clean and render said building material hydrophobic.

4,076,869

HARDENABLE EPOXY RESIN COMPOSITIONS AND PROCESS FOR MAKING THE SAME

Robert Flynn, Toms River, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 271,872, July 14, 1972, Pat. No. 3,901,833, which is a continuation-in-part of Ser. No. 83,626, Oct. 23, 1970, Pat. No. 3,679,465, which is a continuation-in-part of Ser. No. 877,477, Nov. 17, 1969, abandoned. This application Aug. 15, 1975, Ser. No. 605,084
Int. Cl.² B05D *3/02*
U.S. Cl. 427—386 11 Claims

1. A method for making a reinforced epoxy composition which comprises dissolving an 1,2-epoxy resin containing two or more epoxy groups, and a conventional curing agent therefor in a nonreactive solvent boiling at from 30° to about 100° C, passing a reinforcing substrate through the solution and exposing the impregnated substrate to a temperature of from 400° to 950° F to evaporate the solvent, the conditions of temperature and time of exposure being so adjusted and controlled that the resulting composite has a retained solvent level below 0.5% and is substantially uncured.

4,076,870

PROCESS FOR TREATING FIBROUS PRODUCTS CONTAINING CELLULOSIC FIBERS

Kazuhide Yamamoto, Uji, Japan, assignor to Daido-Maruta Finishing Co. Ltd., Kyoto, Japan

Filed Sep. 27, 1976, Ser. No. 726,955
Claims priority, application Japan, Oct. 1, 1975, 50-117636; Oct. 1, 1975, 50-117637
Int. Cl.² D06M *1/00, 13/34*; D05D *3/02*
U.S. Cl. 427—390 C 11 Claims

1. In a process for modifying a fibrous product containing cellulosic fibers, by impregnating said fibrous product with a treating liquor containing a chemical textile finishing agent, and then heat-treating the impregnated fabric in the presence of an acid catalyst, the improvement which comprises using as said acid catalyst a fluorocarboxylic acid of the formula

$$C_nF_pH_qCOOH$$

wherein *n* is an integer of 1 to 5, *p* is 2 to 10, and *q* is 0 or 1, with the proviso that the sum of *p* and *q* equals $2n + 1$ the amount of said fluorocarboxylic acid being 0.01 to 1.5% by weight based on the weight of the treating liquor.

4,076,871

METHOD OF IMPREGNATING WOOD WITH BORIC ACID

Buddy M. Short, Ovett, and Jerry W. Rayfield, Laurel, both of Mich., assignors to Masonite Corporation, Chicago, Ill.

Filed Nov. 2, 1976, Ser. No. 738,278
Int. Cl.² B05D *3/02, 1/18*
U.S. Cl. 427—397 6 Claims

1. Method of impregnating wood with boric acid or boron oxide, which comprises applying thereto a boric acid ester of an organic alcohol, heating the wood to cause the ester to penetrate into the wood, and hydrolyzing said ester to deposit boric acid or boron oxide therein.

4,076,872

INFLATABLE CELLULAR ASSEMBLIES OF PLASTIC MATERIAL

Stephen Lewicki, 7 Forest View Road, Wallingford, Pa. 19086; Gregory David Lewicki, 47 Springhouse Lane, Media, Pa. 19063, and Stephen Jon Lewicki, 7 Forest View Road, Wallingford, Pa. 19086

Filed Mar. 16, 1977, Ser. No. 778,249
Int. Cl.² A45B 19/00; A45C 7/00
U.S. Cl. 428—12 11 Claims



1. An inflatable laminated pad of plastic sheet material, comprising
(a) an elongated outer wear-resistant sheet of plastic material provided with a plurality of discrete collapsed but extensible bubbles along the length thereof,
(b) a second elongated outer wear-resistant sheet of plastic material sealed to said first sheet along the longitudinal edges common to both sheets, whereby the injection of a compressed gas into the space between said sheets effects the distension of said bubbles, and
(c) at least one intermediate layer of thin apertured plastic sheeting between said outer layers to permit the expansion of said bubbles to a degree sufficient to build up a pressure of such intensity on the solid areas of said intermediate layer as will force said apertured layer into contact with said second sheet to seal off the communication between said outer sheets when the gas pressure is removed from the inner face of said second outer sheet.

4,076,873

RESORCINOL-ALDEHYDE RESINS USED TO BIND REINFORCING MATERIALS SUCH AS GLASS FIBERS IN SHAPED OBJECT FORM

Lawrence E. Shea, 165 Lake Drive, San Bruno, Calif. 94066

Division of Ser. No. 691,290, Jun. 1, 1977, Pat. No. 4,053,447, which is a continuation-in-part of Ser. No. 492,881, Jul. 29, 1974, abandoned. This application Jul. 6, 1977, Ser. No. 813,338
Int. Cl.² B29F 23/12; B65H 81/06; E04C 2/22; F16L 9/04, 9/12, 9/16
U.S. Cl. 428—35 10 Claims

1. A fire-resistive duct comprising wound glass filaments formed of rovings coated with a tough, fire-resistive resin exhibiting low flame spread and low smoke evolution under exposure to direct flame or to radient heat and being the reaction product of a partially cured resin of resorcinol, phenol and formalin, and paraformaldehyde and at least one substance chosen from the group consisting of furfural and furfuryl alcohol, said paraformaldehyde and said substance being added in amounts sufficient to provide said fire-resistive resin.

3. A construction panel comprising a laminate of glass cloth and a fire-resistive resin which is the reaction product of 100 parts by weight of an A component which is a partially cured resin of resorcinol, phenol, and formalin, and 30 parts by weight of a B component which consists essentially of 3 parts by weight paraformaldehyde and 12 parts by weight of furfural.

6. A method of making a fire-resistive shaped product including tanks, ducts and pipes, which comprises:
(1) coating glass roving with an admixture consisting essentially of: (a) a resorcinol component chosen from the group consisting of resorcinol, a mixture of resorcinol and phenol, and a partially cured resin of resorcinol, phenol and formalin, (b) paraformaldehyde, plus, (c) at least one substance chosen from the group consisting of furfuraldehyde and furfuryl alcohol, (d) said paraformaldehyde and said substance being each added in an amount sufficient to produce with said resorcinol component a tough, fire-resistive resin,
(2) forming filaments of such coated roving,
(3) winding said filaments on a form or mold to produce a shaped product,
(4) curing to form of said admixture a tough, fire-resistive resin exhibiting low flame spread, good heat release and low smoke evolution when exposed to direct flame or to radiant heat and being resistant to embrittlement and cracking upon curing, and
(5) removing said cured product from said form or mold.

10. A method of making a fire-resistive shaped product which comprises:
(1) incorporating a reinforcing agent in an admixture consisting essentially of: (a) a resorcinol component chosen from the group consisting of resorcinol, a mixture of resorcinol and phenol, and a partially cured resin or resorcinol, phenol and formalin, (b)paraformaldehyde and (c) at least one substance chosen from the group consisting of furfural and furfuryl alcohol, (d) said paraformaldehyde and said substance being added in amounts sufficient to provide said fire-resistive resin,
(2) forming such incorporated agent and resin into a desired shape, and
(3) curing to form of said admixture a fire-resistive resin exhibiting low flame spread, good heat release and low smoke evolution when exposed to direct flame or to radiant heat and being resistant to embrittlement and cracking upon curing.

4,076,874

TACK SPUN PILE SURFACED PRODUCTS

Anton Alfred Arthur Giovanelli, Oestringen, and Eckhard Wolfgang Schmidt, Kirrlach, both of Germany, assignors to Imperial Chemical Industries Limited, London, England

Filed Sep. 8, 1975, Ser. No. 611,242
Claims priority, application United Kingdom, Sep. 13, 1974, 40001/74
Int. Cl.² D03D 27/00; D04H 11/00
U.S. Cl. 428—35 14 Claims



1. A process for the production of pile surfaced products in which the pile is produced by tack-spinning thermoplastic polymer composition onto one or both external surfaces, of a foundation layer which comprises at least two sheets which adhere together using an adhesive having a softening point similar to that of the thermoplastic polymer composition.

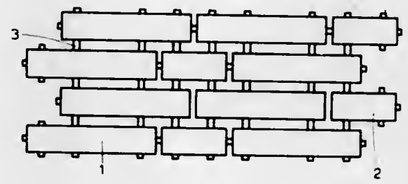
4,076,875

ORNAMENTAL DESIGN

Rene L. E. Van Gasse, Opglabbeek, Belgium, assignor to All Decostone, N.V., Opglabbeek, Belgium

Filed Feb. 2, 1976, Ser. No. 654,235
Claims priority, application Netherlands, Feb. 7, 1975, 7501450
Int. Cl.² B32B 3/10, 7/02
U.S. Cl. 428—44 13 Claims

13. An ornamental tile-shaped part suitable for being embedded in a base material or joined to similar tile-shaped parts, each of said parts having a front face, a rear face, a plurality of sides and a predetermined thickness, one or more leg members being fixedly attached to said rear face adjacent the side edge of said rear face along each of said plurality of sides and a bridging section fixedly attached to each said leg member and spaced vertically above said rear face a first predetermined distance, said bridging section extending away from said tile-



shaped part and beyond the sides thereof by a second predetermined distance whereby when said tile-shaped parts are joined together in a base material bridging sections of adjacent tile-shaped parts will connect to bridging sections of adjacent tile-shaped parts thereby spacing apart said tile-shaped parts by a third predetermined distance with said first predetermined distance together with the thickness of said tile-shaped parts being equal to or larger than said third predetermined distance.

4,076,876

FOOT TENSION RELAXER

Alfred H. Bowles, W. 904 Lincoln Place, Apt. No. 4, Spokane, Wash. 99204

Filed May 2, 1977, Ser. No. 792,777
Int. Cl.² A47C 9/12
U.S. Cl. 428—71 7 Claims



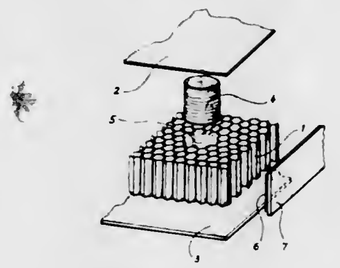
1. A foot tension relaxer, comprising:
a flat base of selected length and width dimensions and having areal upper and lower surfaces;
a first cushion member formed of a resilient material with a lesser length and width dimension that the base and having upper and lower areal surfaces thereon with the lower areal surface thereof affixed to the upper surface of the base;
a second cushion member formed of a resilient material having a length dimension equal to that of the first cushion member and a width dimension less than the width dimension of the first cushion member and also having an upper and lower areal surface with the lower areal surface affixed to the upper areal surface of the first cushion member and extending along the longitudinal center line of the first cushion member;
a third cushion member formed of resilient material having a length dimension equal to that of the first cushion member and a width dimension less than that of the second cushion member and also having an upper and a lower areal surface with the lower areal surface affixed to the upper areal surface of the second cushion member and extending along the longutidinal center line of the first cushion member; and
a flexible cover member similar in size to the flat base and joined to the base at the peripheral edges thereof such that it covers the first, second and third cushion members and assumes an arched configuration similar to that of the arch of the human foot due to the configuration of the three joined cushion members.

4,076,877

CELLULAR STRUCTURE PLATE

Wilhelm Tanzen, Nordenham, Germany, assignor to Vereinigte Flugtechnische Werke - Fokker GmbH, Bremen, Germany

Filed May 12, 1975, Ser. No. 576,786
Claims priority, application Germany, May 24, 1974, 2425014
Int. Cl.² B32B 3/12
U.S. Cl. 428—73 3 Claims



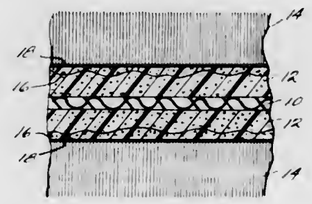
1. Cellular structure plate with well defined locations for taking up external forces, comprising:
a flat filler plate having cell structure and a plurality of recesses, respectively at the said locations, each recess being larger than the cells of the structure;
insert bodies inserted in the recesses and made of heat curable, laminated resin plastic, heat cured when inserted;
a skin covering top and bottom of the filler plate including the insert bodies and being also made of plastic heat cured when applied to the plate, the skins being bonded to the insert bodies as a result from curing when in place; and
a laminated ribbon having a precured resin outer layer a curable resin inner layer wrapped around the plate and heat cured thereafter.

4,076,878

FLAME-RETARDANT FLOCKED FABRIC

Lianey C. Norby, Kennebunkport, Me., assignor to West Point-Pepperell, Inc., West Point, Ga.

Continuation-in-part of Ser. No. 611,684, Sep. 9, 1975, abandoned. This application Sep. 27, 1976, Ser. No. 726,438
Int. Cl.² B32B 33/00
U.S. Cl. 428—90 15 Claims



1. A flame-retardant flocked fabric comprising:
(a) a reinforcing support of textile material;
(b) a sheet of closed cell polyurethane foamed material bonded to at least one surface of said textile material;
(c) a flame-retardant adhesive system disposed over an exposed surface of said sheet in two separate layers,
one of said layers comprising in a cured adhesive vehicle a flame-retardant component combination of a brominated aromatic compound and antimony trioxide, said one layer impregnating the exposed surface of said sheet, and
the other of said layers comprising in a cured adhesive vehi-

cle, aluminum hydroxide as a flame-retardant component, said other layer covering said one layer,

said flame-retardant component combination being present in said one layer in an amount between 71–99 percent by weight of the total weight of flame-retardant components in both said layers, the total flame-retardant components in both said layers being between 21–49 percent by weight of the total weight of both said layers, the flame-retardant component in said other layer being about 1–30 percent by weight of the weight of the adhesive vehicle (wet basis) present in said other layer, the brominated aromatic compound in said one layer being present in an amount between 3 and 22 percent by weight based on the total weight of both said layers and the antimony trioxide and the aluminum hydroxide together being present in an amount between 1 and 15 percent by weight based on the total weight of said layers, and

(d) flock fibers bonded to said other layer.

4,076,879

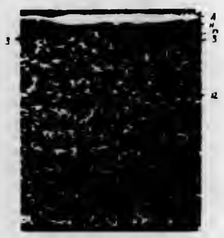
SHEET MATERIAL

Stuart Paul Suskind, Montclair, and Stanley George Sova, Clifton, both of N.J., assignors to Inmont Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 512,265, Oct. 4, 1974, abandoned. This application Sep. 25, 1975, Ser. No. 616,714

Int. Cl.² B32B *5/12, 7/02*

U.S. Cl. 428—113 **6 Claims**



1. A sheet product having a thickness of about 30 to 60 mils and an elongation over 200% and having a leather-like "break," comprising a base sheet of criss-crossing elastomeric polyurethane fibers, having an average diameter of about 5 to 20 microns, running parallel to the surfaces of the sheet, said fibers being bonded together at their points of contact, said product having a substantially non-porous elastomeric surface skin layer up to about 100 microns thick, comprising a substantially non-porous elastomeric polyurethane preformed skin about 20 to 50 microns thick, said preformed skin being bonded to said base sheet by spaced fingers of elastomeric adhesive which extend from said layer into said fibrous base sheet and which reinforce the fiber-to-fiber bonds in the zone of the base sheet below said skin layer, the bases of said fingers adjacent to said layer comprising less than half the length of said layer, as viewed in cross section perpendicular to said layer, the lower third of said base sheet having a density below 0.4 g/cc.

4,076,880

MASTIC COMPOSITION AND COMPOSITE STRUCTURAL PANELS FORMED THEREFROM

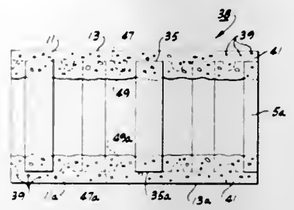
Robert C. Geschwender, Lincoln, Nebr., assignor to Lancaster Research and Development Corporation, Lincoln, Nebr.

Continuation of Ser. No. 381,073, Jul. 20, 1973, abandoned. This application Apr. 30, 1975, Ser. No. 573,129

Int. Cl.² B32B *3/12*

U.S. Cl. 428—116 **7 Claims**

1. A composite structural panel comprising a cellular honeycomb core of thermally insulative material having opposite faces and walls between each cell, the cells extending from one face thereof to the other, the walls having opposite edges constituting the opposite faces of the core, a layer of an imporous heat and sound retardant composition on each of the opposite faces and penetrating into each cell, said composition comprising a hardened homogeneous mixture of low density closed cell expanded synthetic resin beads and a slurry prepared from calcined gypsum and water, and facing material on the outside surface of each layer, the walls having notches in the opposite edges defining openings between each cell and adjacent the opposite faces predetermining the penetration of



the layers into the cells to extend into each cell just beyond the notches thereby closing the openings and trapping air in the cells to limit the penetration of the edges into the layers, controlling the thickness of the layers between the facing material and the opposite core faces and providing additional thermal and sound insulation, the layers further including reinforcing fibers which extend between adjacent cells and through the notches thereby to provide strengthening ties with the portions of the layers in adjacent cells and between adjacent cells.

4,076,881

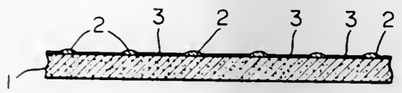
INTERLINING STRUCTURE FOR APPAREL AND METHOD FOR ITS PRODUCTION

Koichi Sato, Tokyo, Japan, assignor to Sanyo Shokai Ltd., Tokyo, Japan

Filed Sep. 2, 1975, Ser. No. 609,730

Int. Cl.² B05D *1/36, 5/10;* **B32B** *3/16*

U.S. Cl. 428—195 **5 Claims**



1. An apparel interlining structure comprising:

an interlining base;

a plurality of raised areas of hot-melt sealant synthetic resin applied to one surface of said interlining base; and

a water-repellent synthetic resin entirely, except for at least a part of the surfaces of the sealant-applied areas, impregnating said interlining base, said water-repellant synthetic resin having a poor co-meltability with said hot-melt sealant synthetic resin.

4. Waterproof wearing apparel comprising:

a waterproofed fabric, and

an interlining structure at least partially hot-melt sealed to said water-proofed fabric, said interlining structure comprised of:

an interlining base,

a plurality of raised areas of hot-melt sealant synthetic resin applied to one surface of said interlining base, and

a water-repellant composition resin entirely, except for at least a part of the surfaces of the sealant-applied areas, impregnating said interling base, said water-repellant composition resin having a poor co-meltability with said hot-melt sealant synthetic resin.

5. A process for preparing an apparel interlining structure, which comprises applying a hot-melt sealant synthetic resin partly to one surface of an interlining base for apparel to form a plurality of areas to which the hot-melt sealant resin has been adhered, and applying a solution of a water-repellent composition resin having poor co-meltability with the above sealant synthetic resin to that surface of the base which is opposite to the sealant-applied surface thereby to impregnate the base entirely, except for at least a part of the surfaces of the sealant-applied areas, with the water-repellent synthetic resin areas.

4,076,882

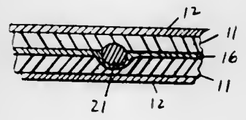
SHARPS DISPOSAL PADS

Larry A. Fenster, 301 Birch Drive, Roslyn, N.Y. 11576, and Leo Fenster, 20100 W. Country Club Drive, N. Miami Beach, Fla. 33180

Filed Dec. 30, 1976, Ser. No. 755,951

Int. Cl.² B32B *7/02, 3/26*

U.S. Cl. 428—215 **4 Claims**



1. In a foldable sharps disposal pad comprising a layer of elastomeric polyurethane foam on a layer of cardboard, said polyurethane carrying a pressure sensitive adhesive layer covered by a release sheet, the improvement wherein said pressure sensitive adhesive layer comprises a substantially impermeable polymer film carrying a pressure sensitive rubber base adhesive on both sides of the film.

4,076,883

FLAME-SPRAYABLE FLEXIBLE WIRES

Ferdinand J. Dittrich, Massapequa, and John D. Weir, Huntington, both of N.Y., assignors to Metco, Inc., Westbury, N.Y.

Filed Jul. 30, 1975, Ser. No. 600,741

Int. Cl.² B05D *7/00, 3/08, 1/08*

U.S. Cl. 428—242 **26 Claims**

1. A flexible wire for use in a flame spraying process comprising a mineral powder having a particle size of less than about 140 mesh held together by about 5 to 75% by volume of the wire of a cross-linked polyurethane or epoxy polymer.

4,076,884

FIBRE REINFORCING COMPOSITES

Victor Riley; Ian Macnab; John Timusk, all of Toronto, Canada, and Edward English, Downey, Calif., assignors to The Governing Council of the University of Toronto, Toronto, Canada Division of Ser. No. 343,863, Mar. 22, 1973, Pat. No. 3,903,879. This application Jun. 11, 1975, Ser. No. 586,140

Claims priority, application United Kingdom, Mar. 22, 1972, 13333/72

Int. Cl.² D03D *15/00*

U.S. Cl. 428—255 **5 Claims**

1. A fibre reinforced gypsum composite comprising gypsum matrix material having embedded therein a woven tape, said woven tape comprising an interweave of absorbent fibres with reinforcing glass fibres, said reinforcing glass fibres being glass yarn coated with a thermoplastic organic polymer, said polymer being selected from the group consisting of polyethylene, polyvinyl chloride, polypropylene, nylon and polystyrene.

4,076,885

WATER PROOFING AGENT

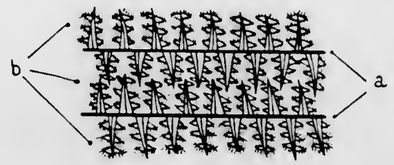
Maurice Brossel, Ruell-Malmaison; Gilbert Laurent, and Daniel Bertannier, both of Neuf-Brisach, all of France, assignors to Holzstoff. S.A., Basel, Switzerland; Viafrance S.A., Paris and Societe Nationale Elf Aquitaine (Production) - SNEA(P), Courbevole, both of, France

Filed Oct. 16, 1975, Ser. No. 623,003

Claims priority, application Switzerland, Oct. 16, 1974, 13874/74

Int. Cl.² B32B *27/00*

U.S. Cl. 428—286 **9 Claims**



1. In a waterproofing agent comprising a combination of a non-woven fabric and a bituminous material the improvement which resides in employing as the non woven fabric material, material obtained from continuous filaments of isostatic polypropylene and as the bituminous material a mixture of elemental sulphur and bitumen of sufficient fluidity at a temperature in the range 120° to 160° C to permit dispersion of sulphur therein.

4,076,886

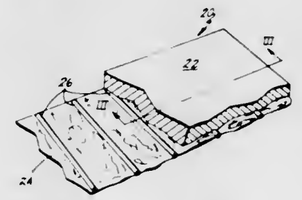
STRUCTURAL LAMINATE FOR SEATING

Jack C. Corcoran, Grand Rapids, Mich., assignor to Sackner Products, Inc., Grand Rapids, Mich.

Filed Jun. 14, 1976, Ser. No. 695,939

Int. Cl.² B32B *5/02, 5/22;* **D04H** *1/04*

U.S. Cl. 428—294 **16 Claims**



1. A structural laminate useful in making upholstered seats, furniture, and the like comprising:

a sheet of cushioning material;

a plurality of spaced, bendable, yet relatively stiff and resilient, elongated, self-adherent, organic polymer strips which become adhesive at elevated temperatures and are bonded to one surface of said sheet;

a relatively thin, relatively closed sheet of nonwoven covering material selected from the group comprising spunbonded polyester, polyethylene, polypropylene, fiberglass cloth and dense, calendered fabric, said covering material applied over said spaced, self-adherent strips and said one surface of said cushioning material such that said strips are intermediate said cushioning material and covering sheet;

said strips being bonded along their lengths to said sheet of cushioning material and to said sheet of covering material without the use of additional adhesive material such that said covering and cushioning sheets are adhered together only by said spaced strips.

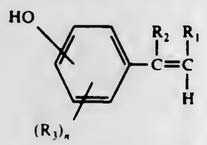
4,076,887

RECORDING SHEETS

Nobuo Tsuji; Sadao Ishige; Akio Miyamoto, and Hajime Kato, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 28, 1976, Ser. No. 736,669
Claims priority, application Japan, Oct. 28, 1975, 50-130079
Int. Cl.[2] B41M *5/12;* B41C *1/06*
U.S. Cl. 428—307 9 Claims

1. A pressure-sensitive recording sheet comprising a support having a developer layer on the support, said developer layer being capable of developing color images on reacting with a color former, wherein the developer layer contains as a developer a dimer of the compound represented by the formula:



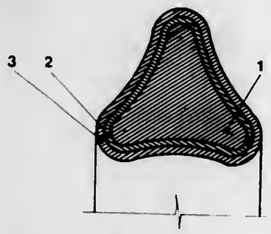
wherein R_1, R_2, and R_3 each represents a hydrogen atom, an alkyl group, an aryl group, or an aralkyl group, and n is 1 to 4.

4,076,888

PROCESS FOR THE PREPARATION OF METALLIC AND/OR METAL-CERAMIC AND/OR CERAMIC SPONGES

Giancarlo Perugini, Merano (Bolzano), and Enzo Marcaccioli, Perugia, both of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Jul. 6, 1976, Ser. No. 702,934
Claims priority, application Italy, Jul. 9, 1975, 25214/75; Jul. 9, 1975, 25215/75
Int. Cl.[2] C08J *9/36;* C03C *7/00*
U.S. Cl. 428—313 6 Claims



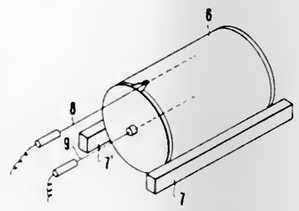
1. A process for the production of metallic and/or metal-ceramic and/or ceramic sponges having a three-dimensional cellular structure of filiform morphology, starting from a foamed polyurethane sponge having a three-dimensional cellular structure of filiform morphology, and previously metallized, said process comprising coating a metallized polyurethane sponge, having a number of pores not exceeding 30 pores/inch and a thickness not exceeding 25 mm, with at least one layer of at least one coating material selected from the class consisting of metal, metal-ceramic and ceramic materials, using a dry high-temperature coating technique consisting essentially of molten-spray deposition by a plasma spray.

4,076,889

HEAT-INSULATION MATERIAL

Tohru Sasaki; Syuuzi Terasaki, and Takao Ichii, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1975, Ser. No. 622,412
Claims priority, application Japan, Nov. 21, 1974, 49-133196
Int. Cl.[2] B32B *15/08*
U.S. Cl. 428—333 10 Claims



1. A heat-insulation laminate comprising:
a. a layer of a film of polyfluoroolefin or fluoroolefin copolymer having not more than a 50% transmission ratio of visible ray and not less than a 30% transmission ratio of infrared ray, said film of polyfluoroolefin or fluoroolefin copolymer containing from 0.5 to 50 parts by weight, based on 100 parts by weight of said polyfluoroolefin or fluoroolefin copolymer, of a filler selected from the group consisting of titanium dioxide, zinc oxide, aluminum oxide, calcium carbonate, gypsum, magnesium oxide and calcium sulfite; and
b. a layer of metal on one surface of said film, said metal layer having a thickness of from 30 A to several microns.

4,076,890

MAGNETIC RECORDING MEDIUM

Yasuyuki Yamada; Goro Akashi, and Hiroshi Ogawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 4, 1973, Ser. No. 403,351
Claims priority, application Japan, Oct. 5, 1972, 47-100083
Int. Cl.[2] H01F *10/02*
U.S. Cl. 428—337 8 Claims

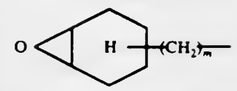
1. A magnetic recording medium comprising a flexible support with a thickness of about 5 to 50 μ and having thereon a magnetizable recording layer containing an inorganic ferromagnetic powder and from 0.1 to 25% by weight of solid inorganic and organic powders, based on 100% by weight of said ferromagnetic powder and said inorganic powders present in said magnetizable recording layer having been processed with a silane coupling agent present in an amount of about 0.5 to about 5% by weight based on the weight of said ferromagnetic powder and said inorganic powder, said silane coupling agent reacting to form chemical bonds between organic and inorganic substances in said magnetizable layer, wherein said silane coupling agent has the following general formula:

$$(A)_q\text{-}\ Si\ (R_1)_n(R_2)_{3-n}$$

wherein R_1 and R_2 each represents a hydrogen atom, a halogen atom, $-OR_3$, $-OCOR_3$ or $-R_3$; A represents a hydrogen atom, a halogen atom, $-R_3$, ClR'_3-, $CH_2{=}CH-$, $HS-CH_2)_m$, $NH_2-CH_2)_m$, $NH_2-CH_2)_mNH-CH_2)_m$, $CH_2{=}CCH_3COO-CH_2)_m$,

$$CH_2{=}CHCOO\text{-}(CH_2)_m\text{-},\quad CH_2\text{-}\underset{\diagdown\ \diagup}{\overset{}{}}CHCH_2O\text{-}(CH_2)_m\text{-},$$
$$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad O$$

-continued



or a phenyl group; R_3 represents a monovalent alkyl group having from 1 to 5 carbon atoms; R'_3 is the divalent moiety of said R_3; n represents number of from 0 to 3; m represents a number of 2 or 3; and q represents a number of 0 to 1, with said R_1 and R_2 not being simultaneously a hydrogen atom; such that one terminal of said silane coupling agent is bonded to a halogen atom or a methoxy group and the other terminal of said silane coupling agent is bonded to a group reactive with said organic substances.

4,076,891

PRODUCT AND METHOD OF MOLDING PLASTIC-RUBBER COMPOSITES

James Frank Yardley, Shenston, near Lichfield, and Allen Frederick Nightingale, Birmingham, both of England, assignors to Dunlop Limited, London, England

Continuation of Ser. No. 303,050, Nov. 2, 1972, abandoned. This application Feb. 14, 1975, Ser. No. 550,001
Claims priority, application United Kingdom, Nov. 18, 1971, 53556/71; Sep. 20, 1972, 43525/72
Int. Cl.[2] B32B *25/08;* B29H *9/00*
U.S. Cl. 428—517 6 Claims

1. A method of producing a molded plastic-rubber composite comprising
injection or transfer molding a substantially linear crystalline low pressure solution olefin polymer with a melt index or minimum flow rate of not less than 0.25 when measured according to the test conditions specified in ASTM D 1238-65T selected from the group consisting of polypropylene, high density polyethylene, copolymers of ethylene and propylene; copolymers of ethylene, propylene, and a minor amount of at least one other olefin monomer; copolymers of ethylene and a minor amount of at least one other olefin monomer other than propylene, and copolymers of propylene and a minor amount of at least one other olefin other than ethylene
so that it is brought, in a molten state, into contact with a prevulcanized rubber composition, containing from 5 to 70 percent by volume of a prevulcanized rubbery olefin polymer selected from the group consisting of ethylene/-propylene copolymers containing from 20 to 85 mole percent of units derived from ethylene and ethylene/alpha-olefin/polyene terpolymers containing from 20 to 85 mole percent of units derived from ethylene and from 0.1 to 10 mole percent of units derived from said polyene, the remainder of the composition being comprised of ingredients normally used in compounding rubbery olefin polymers.

2. An injection or transfer-molded composite made by the method of claim 1.

4,076,892

TREATMENT OF PARTICULATE CARBON

Jack Fennimore, Welwyn; Gary Ruder, Harlow Essex, and Donald Simmonite, Hertford, all of England, assignors to T. J. Smith & Nephew Limited, Hull, England

Filed Jul. 24, 1974, Ser. No. 491,293
Claims priority, application United Kingdom, Jul. 26, 1973, 35676/73; Jul. 26, 1973, 35677/73
Int. Cl.[2] A61K *9/30, 9/32;* B01D *39/20*
U.S. Cl. 428—407 3 Claims

1. A particulate absorbtive material comprising absorbtive carbon granules, said granules being coated at their surface only with a protective permeable layer of a polymer which is compatible with blood selected from the group consisting of poly (hydroxyethylmethacrylate), cellulose acetate, polyurethane, silicone, and polyamide, said layer being formed by spray coating, said layer being from about 1 to 10 microns in thickness and present in an amount of up to about 20% by weight of the total material, and said layer having a smooth



permeable surface and hindering mechanical breakdown of the particles without impregnation and consequent plugging of the pores of the absorbtive granules by the polymeric layer.

4,076,893

TRIBO MODIFIED CARRIER MATERIALS VIA ACYLATION

Harry W. Gibson, Penfield; Frank C. Bailey, Webster, both of N.Y., and Joseph L. Mincer, Lewisville, Tex., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 26, 1974, Ser. No. 500,772
Int. Cl.[2] B32B *27/14;* G03G *9/10*
U.S. Cl. 428—407 6 Claims

1. An electrostatographic carrier composition for use in developing electrostatic latent images on a recording surface, said carrier composition comprising carrier particles having an average particle diameter between about 50 microns and about 1,000 microns, each of said carrier particles comprising a core surrounded by from about 0.1 percent to about 10.0 percent by weight based on the weight of said carrier particles of an outer coating of a polymer selected from the group consisting of styrene-alkylmethacrylate and styrene-alkylacrylate containing pendant hydroxyl and amino moieties, said polymer having been exposed to systematic chemical modification of the pendant hydroxyl and amino moieties of said polymer by acylation to provide carrier particles characterized as having controlled triboelectric charging properties.

4,076,894

ELECTRICAL CIRCUIT ELEMENT COMPRISING THICK FILM RESISTOR BONDED TO CONDUCTOR

Robert C. Langley, Millington, and Muriel Abrash, Paterson, both of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Iselin, N.J.

Division of Ser. No. 521,937, Nov. 7, 1974, Pat. No. 3,951,672, which is a continuation of Ser. No. 301,102, Oct. 26, 1972, abandoned. This application Oct. 28, 1975, Ser. No. 626,136
Int. Cl.[2] B32B *17/06*
U.S. Cl. 428—428 4 Claims

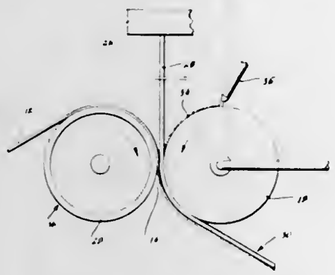
1. An electrical circuit element comprising a thick film resistor comprising preformed glass frit, wherein the glass frit is produced by heating a finely-divided mixture of glass-forming proportions of lead oxide and silica, and a minor amount of a member selected from the group consisting of ruthenium dioxide and iridium dioxide to a temperature sufficient to form a glass melt containing lead ruthenate or lead iridate, whereat the viscosity of the melt is sufficiently high to maintain the lead ruthenate or lead iridate in relatively uniform dispersion in the glass melt, cooling and comminuting the mixture to provide the glass frit, said resistor being bonded to a conductor comprising glass frit and a sufficient amount of an electrically-conductive component to provide the desired electrical properties.

4,076,895

TRANSPARENT MULTI-LAYERED FILM AND PROCESSES THEREFOR

Mark Henry Theno, Anoka, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed May 5, 1976, Ser. No. 683,253
Int. Cl.² B05B *5/00;* B05D *3/12. 3/00;* B32B *27/08*
U.S. Cl. 428—516 **9 Claims**



1. Process for imparting transparency to a multi-layered polymeric film comprising passing a continuous polymeric web into the nip formed by a pair of counter-rotating rolls, one of said rolls being a pressure roll and the other, a chill roll having a matte surface; extruding a molten polymeric film into the nip between said polymeric web and said chill roll to form a multi-layered film, while maintaining an inert liquid film on at least that portion of the chill roll which contacts said extruded film.

4,076,896

PAPER CONTAINING RAPID CURING MELAMINE-FORMALDEHYDE RESIN COMPOSITION

Kenneth Dana Bunkowski, Cincinnati, Ohio, assignor to Formica Corporation, Cincinnati, Ohio

Continuation of Ser. No. 697,083, Jun. 16, 1976, abandoned, which is a continuation of Ser. No. 600,012, Jul. 29, 1975, abandoned. This application Dec. 1, 1976, Ser. No. 746,445
Int. Cl.² B32B *27/42;* C08G *12/32*
U.S. Cl. 428—530 **12 Claims**

1. Paper of at least about 60% α-cellulose content having a basis weight of from about 50 to about 90 pounds per 3000 square foot ream, a pH of from about 6.25 to about 7.25, a Gurley porosity of from about 15 to about 25 seconds per 100 c.c. of air and, impregnated therein, from about 55% to about 65%, by weight, based on the weight of the paper, of a β-staged resin composition comprising

a. the resinous reaction product of melamine, formaldehyde and from about 0.07 to about 0.16%, by weight, of diethylethanolamine, having a ratio of formaldehyde to melamine of from about 1.7 to about 1.9 to 1, respectively,

b. at least about 1.0%, by weight, of ortho- or para- or mixtures of ortho- and para-toluene sulfonamide,

c. from about 1.0% to about 5%, by weight, of ethyleneglycol phenyl ether

d. from about 40% to about 45%, by weight, of water, the remainder being melamine-formaldehyde resin, all percentages being based on the total weight of the composition, and

e. a curing catalyst.

4,076,897

LOW LAG LUMINESCENT PHOSPHORS AND X-RAY SCREEN CONTAINING THE SAME

James Ray Joiner, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 637,953, Dec. 5, 1975, abandoned. This application Mar. 14, 1977, Ser. No. 777,320
Int. Cl.² C09K *11/46*
U.S. Cl. 428—539 **3 Claims**

1. A luminescent phosphor of the formula $Ba_{1-(x+y)}Eu_xSr_yFQ$ wherein

Q = *Br, Cl,* or *I*

x = 0.0001 to 0.2, and

y = 0 to 0.8

and wherein the crystal structure of the phosphor contains potassium or rubidium ions in an amount sufficient to reduce lag.

4,076,898

Nb OR Ta COATED WITH FIRED Zr-Mo FOR METAL-CERAMIC SEALS

Charles I. McVey, Shaker Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 5, 1976, Ser. No. 664,148
Int. Cl.² B22F *7/04*
U.S. Cl. 428—553 **4 Claims**

1. A strongly adherent surface layer on a substrate of niobium or tantalum, said surface layer consisting of a powder mixture of zirconium and from about 2 to 50 atom percent of molybdenum fired in a non-oxidizing atmosphere at a temperature above 1520° C but not above the minimum liquidus temperature of zirconium and molybdenum with the substrate.

4,076,899

ELECTROCHEMICAL GAS ELECTRODE

Elbert Victor Kring, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 3, 1973, Ser. No. 356,911
Int. Cl.² H01M *4/86*
U.S. Cl. 429—42 **4 Claims**

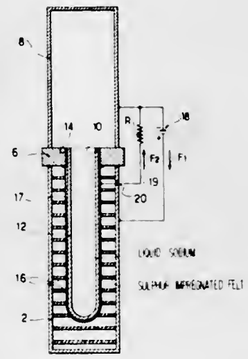
1. Improved electrochemical nitric oxide gas detection or gas separation cell comprising an anode, a cathode which is separated from the anode by an electrolyte, a cathode depolarizer and means for electrically connecting the anode and cathode, said anode being an improved electrochemical gas electrode consisting essentially of a cohesive, gas-permeable conductive mass having a thin, gas-permeable hydrophobic film bonded to its gas-contacting surface, the conductive mass consisting essentially of 8–75 weight % of silicon and 25–92 weight % of one or more metals selected from vanadium, chrominum, molybdenum, tungsten, manganese, iron, cobalt and nickel, said depolarizer selected so as to provide a voltage difference between the anode and the cathode during cell operation that is sufficient to produce a measurable current response when nitric oxide gas is oxidized at the anode, said depolarizer being an electrolyte-soluble reducible permanganate or dichromate salt of an element of Group IA or Group IIA of the Periodic Chart of the Elements or a ceric salt, in contact with the cathode, and said electrolyte being an acid electrolyte.

4,076,900

SODIUM-SULPHUR TYPE ELECTRIC CELL

Alain Le Méhauté, Gif sur Yvette, and Philippe Bordet, Sartrouville, both of France, assignors to Compagnie Generale d'Electricite S.A., Paris Cedex, France

Filed Nov. 4, 1976, Ser. No. 738,983
Claims priority, application France, Nov. 20, 1975, 75 35470
Int. Cl.² H01M *12/00*
U.S. Cl. 429—49 **3 Claims**



1. In combination an electric cell of the sodium-sulphur type, and a charging circuit, said electric cell comprising:

a cathode tank containing a cathode reagent which is liquid at operation temperature and is a material selected from the group consisting of sulphur, phosphorus, selenium and the alkaline salts of these substances,

at least one solid electrolyte tube closed at its bottom end, containing an anode reagent which is liquid at operation temperature, constituted by an alkaline metal, said tube being disposed in said cathode tank so as to be immersed in said cathode reagent with the walls of the tube being made of beta alkaline alumina;

an insulating ceramic support for holding said electrolyte tube in said cathode tank, a glass part forming the connection between the support and the tube;

an anode tank containing a supply of said anode reagent and being disposed above said cathode tank so that said electrolyte tube opens at its top into said anode tank, said insulating support comprising a plate separating the open ends of said anode tank and of said cathode tank, said cathode tank being fitted with washers made of graphite felt ensuring cathode collection of the generated current, and

said charging circuit for said cell including a charging current source having positive and negative terminals and means for connecting said negative terminal to said anode tank and said positive terminal to said cathode tank for cell recharging, the improvement wherein:

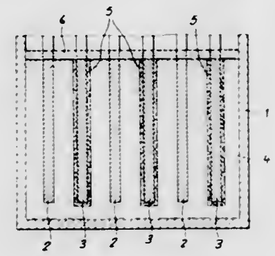
said electrolyte tube is surrounded by a sleeve or grid which is electronically conductive, said grid being positioned between said electrolyte tube and said graphite felt washers and being connected to the negative terminal of the recharging current source through a resistor.

4,076,901

HIGH-TEMPERATURE METHOD OF OPERATING A LEAD-ACID CELL

Heinz Peter Fritz, Garching near Munich; Jürgen Besenhardt, Neu-Sass, and Gerhard Rauschenbach, Essen, all of Germany, assignors to Rheinisch-Westfalisches Elektrizitatswerk AG, Essen, Germany

Filed Oct. 19, 1976, Ser. No. 733,702
Claims priority, application Germany, Oct. 20, 1975, 2546972
Int. Cl.² H01M *10/44*
U.S. Cl. 429—50 **10 Claims**



1. In a method of operating a lead-acid cell comprising a housing, at least one positive electrode having a lead dioxide active mass in the charged state of the positive electrode and disposed within said housing, a negative electrode consisting predominantly of lead disposed in said housing, and a sulfuric acid electrolyte in said housing in contact with said electrodes, the improvement which comprises:

enveloping said negative electrode in a sheath of a material inert to said electrolyte but permeably thereby and capable of retaining particles of the negative electrode, said sheath being selected from the group which consists of a woven fabric or nonwoven mat of glass fiber, a woven fabric or nonwoven mat of perhalogenated polyolefin, a woven fabric or nonwoven mat of unsubstituted polyolefin, or a ceramic material;

cycling said cell through alternate charge and discharge periods with at least the discharging thereof being effected at a temperature above 55° C; and

maintaining a layer of a vaporization-resistant low-volatility material having a specific gravity less than that of said electrolyte and insoluble therein above the electrolyte in said housing.

7. A lead-acid storage cell comprising:

a housing forming a receptacle;

a sulfuric acid electrolyte in said receptacle;

at least one positive electrode immersed in said electrolyte and having as an active mass lead dioxide in a charged state of said positive electrode;

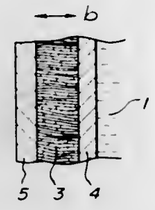
a negative electrode in said electrolyte juxtaposed with said positive electrode and having in a charged state of said negative electrode an active mass consisting predominantly of lead;

a sheath of a material permeable to said electrolyte but substantially impenetrable to particles of said negative electrode, said sheath enveloping said negative electrode, said sheath being selected from the group which consists of a woven fabric or nonwoven mat of glass fiber, a woven fabric or nonwoven mat of perhalogenated polyolefin, a woven fabric or nonwoven mat of unsubstituted polyolefin, or a ceramic material;

a layer of low-volatility material overlying said electrolyte in said receptacle and

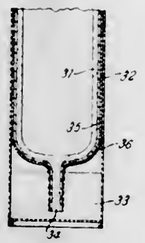
means for automatically operating said cell at least during the discharge thereof at a temperature between substantially 65° and 75° C.

4,076,902
SODIUM-SULFUR STORAGE BATTERY
Keizi Senoo, Takatsuki, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan
Filed Oct. 15, 1976, Ser. No. 732,770
Claims priority, application Japan, Nov. 11, 1975, 50-134681
Int. Cl.² H01M 10/39
U.S. Cl. 429—104 3 Claims



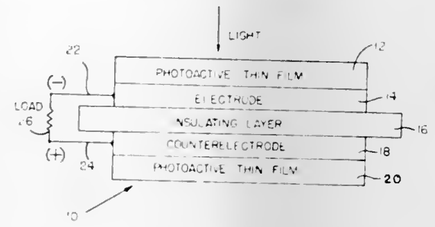
1. A sodium-sulfur storage battery comprising
a sealed housing, said housing containing a solid electrolyte tube incorporating an anodic reactant therein,
a cathodic current collector extending in a direction generally parallel to said solid electrolyte tube,
cathodic electro-conductive material made of graphite felt including a fiber content the individual fibers of which have a direction normal to the direction of said cathodic current collector and being impregnated with a cathodic reactant, said graphite felt being disposed between and in contact with said solid electrolyte tube and cathodic current collector with no space remaining except for spaces between fibers in graphite felt,
and the weight ratio of the graphite felt to the cathodic reactant is restricted to a range of from 4 to 20%.

4,076,903
ALKALI METAL-SULPHUR CELLS
James L. Sudworth, and John M. Bird, both of Burton-on-Trent, England, assignors to British Railways Board, London, England
Filed Jul. 22, 1976, Ser. No. 707,579
Claims priority, application United Kingdom, Aug. 16, 1975, 32818/75
Int. Cl.² H01M 10/00
U.S. Cl. 429—104 10 Claims



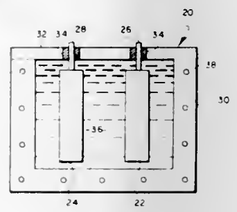
1. An alkali metal-sulphur cell comprising an outer tubular casing, an inner tubular solid electrolyte dividing the cell into anode and cathode compartments and whose interior provides one of said compartments of the cell, the inner tubular solid electrolyte being spaced from the outer casing to define an annular space, providing the other of said compartments, a primary porous coating provided on at least one surface of said solid electrolyte and an outer layer on said primary porous coating, said outer layer being more dense than said primary porous coating.

4,076,904
SOLID STATE PHOTOGALVANIC DEVICE UTILIZING SEA WATER AS AN ELECTROLYTE
Schoen-nan Chen, North Brunswick, N.J., assignor to Optel Corporation, Princeton, N.J. and Grumman Aerospace Corporation, Bethpage, N.Y.
Filed Nov. 11, 1976, Ser. No. 740,873
Int. Cl.² H01M 6/30
U.S. Cl. 429—111 6 Claims



1. An unenclosed photogalvanic cell comprising:
a first electrode;
a second electrode spaced from the first;
an insulating layer having opposite surfaces upon which the first and second electrodes are deposited, the insulating layer preventing electrical shorting of the electrodes;
a photoactive thin film outwardly deposited on the first electrode and capable of converting light energy to electrical energy;
means connected to the electrodes for transferring current from the cell as current becomes available;
the photoactive thin film adapted to be in contact with a surrounding fluid electrolyte when the cell is immersed therein thus creating a photoactive interface between the photoactive thin film and the electrolyte which enables conversion of light to electrical energy when light impinges upon the photoactive thin film.

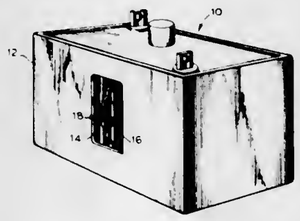
4,076,905
ELECTRODE FOR ELECTRICAL ENERGY STORAGE DEVICE
Anthony F. Sammells, Newbury Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.
Filed May 5, 1977, Ser. No. 793,815
Int. Cl.² H01M 6/36
U.S. Cl. 429—112 12 Claims



1. An electrical energy storage device having positive and negative electrodes spaced from one another and in contact with a lithium-containing electrolyte, wherein the negative electrode is a composite electrode structure which comprises an alloy of lithium, silicon, and boron having the empirical formula Li_xSiB_y, where x has a value from 1 to 5 and y has a value from 0.1 to 3, and wherein a current-collecting matrix supporting said alloy is in intimate contact therewith.

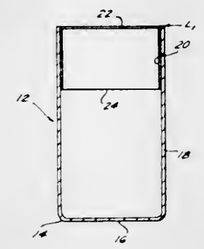
7. A composite negative lithium electrode structure for an electrical energy storage device wherein said composite electrode structure comprises:
an alloy of lithium, silicon, and boron having the empirical formula Li_xSiB_y, where x has a value from 1 to 5 and y has a value from 0.1 to 3, and
a current-collecting matrix supporting said alloy and in intimate contact therewith.

4,076,906
APPARATUS FOR INDICATING BATTERY CELL CONDITION
Henry E. Jensen, Lafayette Hill, Pa., assignor to Eltra Corporation, Toledo, Ohio
Filed Jun. 29, 1977, Ser. No. 811,004
Int. Cl.² H01M 2/00
U.S. Cl. 429—90 6 Claims



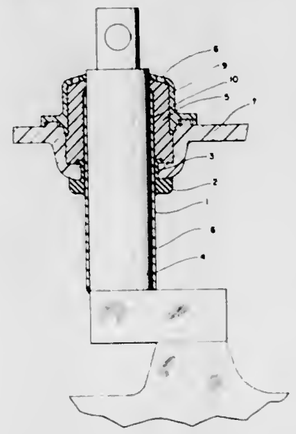
1. A cell condition indicator for battery cells having a plurality of cell plates, comprising:
a cell container, and
indicator means visible through said container responsive to a change in plate size.

4,076,907
PAPER-LINED DRY CELL BATTERIES WITHOUT SMEARS
Anton H. Oswald, and John Peters, both of Wayne, N.J., assignors to Bright Star Industries, Inc., Clifton, N.J.
Filed Aug. 12, 1976, Ser. No. 713,668
Int. Cl.² H01M 2/18
U.S. Cl. 429—133 9 Claims



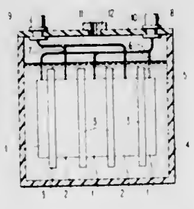
1. In a paper lined dry cell battery comprising:
(A) a first terminal comprising a receptacle having a base and a sidewall extending upwardly therefrom to a given height;
(B) a second terminal disposed within said receptacle but spaced therefrom;
(C) an ion-permeable liner disposed within said receptacle between said second terminal and said receptacle and extending upwardly to a second height less than said given height; and
(D) a mass of depolarizer mix including an electrolyte disposed between said second terminal and said liner and extending upwardly to a third height less than said second height;
the improvement comprising a band formed substantially of electrically insulating material and disposed over the full circumference of the inner surface of said receptacle sidewall substantially from a first point below the level of the upper end of said liner to a second point substantially thereabove, thereby to electrically insulate a segment of said receptacle sidewall, said band being a separate entity and from said liner unattached thereto and secured to said inner surface of said receptacle sidewall.

4,076,908
POLE BOLT SEAL FOR STORAGE BATTERIES
Karl-Heinrich Bäcker, Eneppetal, and Hermann Schlachta, Hagen, both of Germany, assignors to Varta Batterie Aktiengesellschaft, Germany
Filed Jul. 8, 1976, Ser. No. 703,542
Claims priority, application Germany, Aug. 12, 1975, 2535871
Int. Cl.² H01M 2/06
U.S. Cl. 429—184 6 Claims



1. In a lead storage battery having pole bolts protruding through apertures in the battery cover, the improvement comprising;
a section of shrink tubing shrunk onto the pole bolt shaft,
a hollow cap slipped over the shaft and having its bottom edge resting on the upper edge of the cover aperture,
a cast body filling the space between the inner wall of the cap and the shrink tubing, and
a sealing ring between the shrink tubing and the inner edge of the cover aperture.

4,076,909
ALKALINE LEAD BATTERY
Olle B. Lindstrom, Taby, Sweden, assignor to AB Olle Lindstrom, Taby, Sweden
Continuation of Ser. No. 616,662, Sep. 25, 1975, abandoned.
This application Jan. 17, 1977, Ser. No. 759,834
Int. Cl.² H01M 6/04
U.S. Cl. 429—207 7 Claims



1. An electric storage battery comprising at least one electrochemical cell having a positive electrode, a negative electrode, and an electrolyte comprising an alkaline-reacting aqueous solution containing an alkaline hydroxide in sufficient amount to impart an alkaline reaction during the complete

electrochemical cycle and a salt whose anion forms a difficultly soluble compound with the positive electrode material at least in its discharged condition, the active material of said negative electrode in its charged condition being a member of the group consisting of iron, cadmium, magnesium, indium, and zinc, the active material of said positive electrode in its charged condition comprising lead dioxide or a difficultly soluble tetravalent lead compound formed by the reaction of lead dioxide and the anion in the electrolyte, the active material of said positive electrode in its discharged condition comprising a difficultly soluble divalent lead compound formed by reaction of the electrode material with the anion in said electrolyte, said salt being present in an amount sufficient to prevent the active material of the positive electrode in its charged and discharged condition from going into solution.

4,076,910

NUCLEATION OF ISOTACTIC POLYSTYRENE

Henry Nelson Beck, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 293,823, Oct. 2, 1972, Pat. No. 3,817,966. This application Mar. 21, 1974, Ser. No. 453,465

Int. Cl.² C08K *5/34*

U.S. Cl. 526—6 **3 Claims**

1. A readily crystallizable isotactic polystyrene composition, the composition comprising in intimate admixture from about 99.995 to about 95 parts by weight of isotactic polystyrene and from about 0.005 to about 5 parts by weight of melamine.

4,076,911

ETHYLENE-CARBON MONOXIDE COPOLYMERS

Donald M. Fenton, Anaheim, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Nov. 5, 1975, Ser. No. 628,643

The portion of the term of this patent subsequent to Sep. 22, 1987, has been disclaimed.

Int. Cl.² C08F *4/26*

U.S. Cl. 526—11.1 **11 Claims**

1. The process of producing a high melting point, thermoplastic telomer of ethylene and carbon monoxide having a number of repeating monomeric units within the range of 2 to about 30, which process comprises reacting ethylene and carbon monoxide in a liquid medium containing an alkanoic acid having from 2 to about 6 carbons and bearing at least one halo group on an alpha carbon under reaction conditions including a temperature of about 50° to about 205° C. and a pressure of about 1 to about 200 atmospheres, in the presence of palladium cyanide, the initial ratio of ethylene to carbon monoxide being about 1/5 to about 5/1, sufficient to produce said high melting point, thermoplastic telomer.

4,076,912

TETRAPOLYMERS COMPRISING (A) UNSATURATED ACIDS (B) VINYL ESTERS (C) BRANCHED ALLYL OR METHALLYL ESTERS AND (D) VINYL ETHER OR VINYL FATTY ESTER OR LINEAR ALLYL OR METHALLYL ESTERS

Christos Papantoniou, Epinay-sur-Seine, and Jean-Claude Grognet, Gagny, both of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 563,460, Mar. 31, 1975, Pat. No. 3,966,403. This application Apr. 6, 1976, Ser. No. 674,273

Claims priority, application Luxembourg, Apr. 1, 1974, 69759

Int. Cl.² C08F *20/04, 220/00*; C08C *19/00, 19/22*

U.S. Cl. 526—16 **13 Claims**

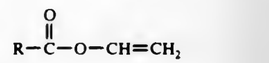
1. Copolymer of

(a) an unsaturated acid having the formula

$$R - CH = CH - (CH_2 - O - CH_2)_n - COOH$$

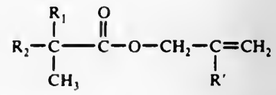
wherein $n = 0$ or 1, and when $n = 0$, R = CH_3 and when $n = 1$, R = H,

(b) a vinyl ester having the formula



wherein R is $-CH_3$ or C_2H_5,

(c) at least one branched allyl or methallyl ester having the formula



wherein R' represents hydrogen or $-CH_3$, R_1 represents a saturated hydrocarbon chain, linear or branched, having 1-6 carbon atoms and R_2 represents $-CH_3$ or $-CH(CH_3)_2$, with the proviso that the sum of the number of the carbon atoms in $R_1 + R_2$ is equal to or less than 7, and

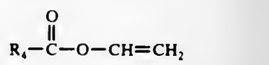
(d) a monomer selected from the group consisting of

(i) a vinyl ether having the formula

$$CH_2 = CH - O - R_3$$

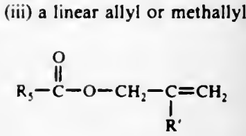
wherein R_3 is linear or branched alkyl having 1-12 carbon atoms,

(ii) a vinyl ester having a fatty chain and having the formula



wherein R_4 is linear alkyl having 7-11 carbon atoms, and

(iii) a linear allyl or methallyl ester having the formula



wherein R' is hydrogen or $-CH_3$ and R_5 is linear alkyl having 1-11 carbon atoms.

4,076,913

SOLID OR GEL POLYMERS CONTAINING A PLURALITY OF FREE HYDRAZONE GROUPS

Derek Walker, Windermere, and Philip Howard Chapman, Ulverston, both of England, assignor to Glaxo Laboratories Limited, United Kingdom

Continuation of Ser. No. 597,675, June 21, 1975, abandoned, which is a continuation-in-part of Ser. No. 493,051, Jul. 30, 1974, Pat. No. 4,038,469. This application Sep. 27, 1976, Ser. No. 726,784

Claims priority, application United Kingdom, Jul. 31, 1973, 36384/73

Int. Cl.² C08F *236/00, 210/00*; C08C *19/12*; C08G *2/00*

U.S. Cl. 526—19 **8 Claims**

1. A solid or gel polymer which is insoluble in dilute aqueous acid and possesses a plurality of hydrazone groups, $>C{=}N{-}NH_2$, wherein each hydrazone group either forms part of the polymer backbone chain or forms part of a side-chain attached to the polymer backbone chain in which case one of the valencies of each hydrazone group is linked to the polymer backbone chain and the other valency is bonded to an organic substituting group.

4,076,914

TREATMENT OF COUPLED POLYMERS PRIOR TO HYDROGENATION

George A. Moczygemba, and Henry L. Hsieh, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 8, 1976, Ser. No. 694,121

Int. Cl.² C08F *8/04*

U.S. Cl. 526—25 **31 Claims**

1. The process of hydrogenation of an organopolyhalide-coupled rubbery conjugated diene polymer which comprises:

treating said organopolyhalide-coupled rubbery conjugated diene polymer as a solution in a hydrocarbon diluent with an effective minor treating amount of an organometal treating agent under treating conditions, wherein said organometal treating agent is represented by R_aH_bM wherein M is selected from the group consiting of lithium, sodium, potassium, magnesium, calcium, zinc, and aluminum, R is a hydrocarbyl radical of 1 to 12 carbon atoms, a is an integer of 1 to 3, and b is 0 or an integer 1 or 2, depending on the valence of M, and

thereafter hydrogenating the resulting treated polymer to substantially reduce at least the olefinic unsaturation thereof employing a hydrogenation catalyst and effective hydrogenation conditions, wherein said minor effective amount is sufficient to result in reduced olefinic unsaturation of said coupled conjugated diene polymer after said hydrogenation.

4,076,915

TREATMENT OF COUPLED POLYMERS PRIOR TO HYDROGENATION

William J. Trepka, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 8, 1976, Ser. No. 694,123

Int. Cl.² C08F *8/04*

U.S. Cl. 526—25 **26 Claims**

1. The process of hydrogenation of a silicon-coupled or germanium-coupled conjugated diene polymer which comprises:

treating said coupled conjugated diene polymer as said solution in hydrocarbon diluent with a minor effective amount of an organometal treating agent which is hydrocarbonlithium, -sodium, -potassium, -magnesium, -calcium, -zinc, or -aluminum compound, wherein said minor effective amount of said organometal treating agent is effective to reduce the residual olefinic unsaturation of said coupled polymer on subsequent hydrogenation of said coupled polymer, and

thereafter hydrogenating said organometal-treated coupled polymer under hydrogenation conditions to substantially reduce at least the olefinic unsaturation,

wherein said organometal treating agent is represented by R_aH_bM wherein b is 0 for all metals except aluminum, and is 0, 1, 2, or 3 where M is aluminum, and $a + b$ = valence of M.

4,076,916

FLUORINATED FUNCTIONALIZED POLYMERS

Richard J. Lagow, Manchester, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Nov. 3, 1975, Ser. No. 627,999

Int. Cl.² C08F *8/22*

U.S. Cl. 526—43 **9 Claims**

1. A process for producing a fluorinated polymer having functionalized pendant groups thereon, comprising:

a. placing a polymer having a hydrocarbon backbone and having pendant ester, carboxylic acid, acid halide or acid anhydride groups into an enclosed fluorination reactor maintained at a temperature below the decomposition point of said polymer;

b. flowing a mixture of fluorine gas and an inert gas through said reactor, said mixture having a low initial concentration of fluorine gas;

c. increasing the concentration of fluorine gas in said mixture on a gradual basis until a high concentration of fluorine gas is reached; and,

d. maintaining the flow of said mixture having a high concentration of fluorine gas through said reactor until said polymer is substantially fluorinated.

4,076,917

METHOD FOR CURING POLYMERS CONTAINING ONE OR MORE CARBOXY OR ANHYDRIDE FUNCTIONS AND COMPOSITIONS

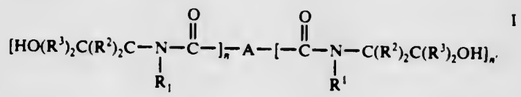
Graham Swift, Blue Bell, and Harry J. Cenci, Warminster, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 454,645, Mar. 25, 1974. This application May 13, 1976, Ser. No. 686,004

Int. Cl.² C08F *8/30*

U.S. Cl. 526—49 **24 Claims**

1. A method of curing polymers which comprises (1) mixing a polymer containing carboxy groups or carboxylic anhydride groups or salts of said carboxy groups with a β-hydroxyalkyl amide of the formula:



I

wherein A is a bond, hydrogen, a monovalent or polyvalent organic radical derived from a saturated or unsaturated alkyl containing from 1 to 60 carbon atoms, aryl, tri-lower alkyleneamino or an ethylenically unsaturated radical; R^1 is hydrogen, lower alkyl having 1 to 5 carbon atoms, or hydroxyalkyl having from 1 to 5 carbon atoms; R^2 and R^3 are the same or different radicals selected from hydrogen, straight or branched chain lower alkyl having from 1 to 5 carbon atoms, or one of the R^2 and one of the R^3 radicals joined together with the carbon atoms to which they are attached to form cycloalkyl; n is an integer of 1 or 2 and n' is an integer of 0 to 2; n being 2 when n' is 0; and (2) heating the mixture at a temperature of from about 125° to about 400° C. until a cured polymer is obtained.

4,076,918

CELLULOSE THIOCYANATE AND PROCESS FOR PREPARING THE SAME

Shaul Gladstone, Arden, and Clifton R. Neumoyer, Newark, both of Del., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Feb. 12, 1975, Ser. No. 549,420

Int. Cl.² C08B *3/00*

U.S. Cl. 536—59 **5 Claims**

1. Cellulose thiocyanate having from 0.015 to 1 SCN group per anhydroglucose unit of the cellulose and no other esterifying groups, and having the following characteristics:

Carbon content	38.00 - 44.40%
Nitrogen content	0.10 - 6.30%
Sulfur content	0.23 - 14.50%
Flammability	Self-extinguishing
Solubility	Insoluble in cold water, sparingly soluble in hot water; insoluble in aromatic solvents, aliphatic solvents, alcohols, and heterocyclic solvents.

4,076,919

MANUFACTURE OF ETHYLENE POLYMERS IN A TWO-ZONE TUBULAR REACTOR AT PRESSURE ABOVE 500 BARS

Friedrich Urban, Limburgerhof; Oskar Buechner, Dudenhofen; Ulrich Hartig, Neckargemuend, and Hans Gropper, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Nov. 15, 1976, Ser. No. 741,939
Claims priority, application Germany, Dec. 20, 1975, 2557653
Int. Cl.[2] C08F *4/28, 10/02*
U.S. Cl. 526—64 5 Claims

1. A process for the manufacture of an ethylene polymer by homopolymerization of ethylene or copolymerization of ethylene with a copolymerizable comonomer, in a continuously operated tubular polymerization system at a pressure of from 500 to 5,000 bars and at a temperature of from 50° to 450° C, in the presence of a polymerization initiator which generates free radicals, by feeding a mixture of ethylene, oxygen and regulator, with or without comonomer, into the polymerization system at its inlet and at the same time at a second point downstream from the inlet along the polymerization system where the reaction temperature reaches a maximum, wherein a co-initiator which has a half-life temperature, measured in benzene, of above 140° C is additionally fed in exclusively at the second feed point.

4,076,920

PROCESS FOR PRODUCING HOMO- OR COPOLYMERIZATION OF VINYL OR VINYLIDENE HALIDES HAVING REDUCED POLYMER BUILD-UP IN THE REACTOR

Bela Kalman Mikofalvy, Sheffield Lake, and Thomas Joseph Doyle, Lorain, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 737,951, Nov. 2, 1976, abandoned, which is a continuation of Ser. No. 592,183, July 1, 1975, abandoned. This application Apr. 29, 1977, Ser. No. 792,361
Int. Cl.[2] C08F *2/00, 14/06;* C08L *91/00*
U.S. Cl. 526—74 14 Claims

1. A process for producing polymers of vinyl and vinylidene halides and copolymers thereof with each other or either with one or more vinylidene monomers having at least one terminal $CH_2{=}C<$ grouping comprising forming a monomer premix containing the monomer or monomers to be polymerized, the aqueous reaction medium, from about 0.01% to about 0.5% by weight of a free radical yielding catalyst based on the weight of 100 parts of monomer or monomers being polymerized, said catalyst being free of alkali metals, an ammonium salt of a saturated fatty acid containing from 8 to 20 carbon atoms, and at least one long straight chain saturated alcohol containing from 14 to 24 carbon atoms, and wherein the ratio of alcohol to fatty acid is greater than 1.0, homogenizing said premix at a temperature below the reactivity of the catalyst or catalysts employed, passing said homogenized premix to a reaction zone, emulsion polymerizing said homogenized premix in said zone at a temperature in the range of about 30° C. to about 70° C., maintaining the pH in the reaction zone in the range of 7.0 to about 12.0 until the reaction is complete, and thereafter recovering the polymer or copolymer, whereby polymer build-up in said reaction zone is substantially reduced.

4,076,921

METHOD OF PRODUCING GLYCOL METHACRYLATE OR GLYCOL ACRYLATE POLYMERS AND COPOLYMERS

Miroslav Stol; Vladimir Stoy, and Zdenek Tuzar, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Oct. 13, 1972, Ser. No. 297,390
Claims priority, application Czechoslovakia, Oct. 14, 1971, 7234-71
The portion of the term of this patent subsequent to Oct. 26, 1993, has been disclaimed.
Int. Cl.[2] C08F *220/20*
U.S. Cl. 526—89 10 Claims

1. The method of producing hydrophilic polymer products comprising a mixture of both soluble and insoluble components which comprises forming a starting monomer mixture consisting essentially of (1) a major portion of monoesters of methacrylic and/or acrylic acids and polyvalent alcohols selected from the group consisting of ethylene glycol, diethylene glycol, triethylene glycol, 1,2-propylene glycol, 1,4-butylene glycol, glycerol, pentaerythritol, mannitol and sorbitol, and (2) a minor amount of a crosslinking agent selected from the group consisting of di- and triesters of methacrylic and/or acrylic acid and polyvalent alcohols selected from the group consisting of ethylene glycol, diethylene glycol, triethylene glycol, 1,2-propylene glycol, 1,4-butylene glycol, glycerol, pentaerythritol, mannitol and sorbitol; combining said starting monomer mixture with (3) a member selected from the group consisting of monocyclic and bicyclic aromatic and partly hydrogenated monocyclic and bicyclic aromatic hydrocarbons, halogenated aliphatic and cycloaliphatic hydrocarbons, esters of carboxylic acids and aliphatic and aromatic alcohols, ethers, cycloethers, ketones and cycloketones, said last mentioned group member being capable of unlimitedly dissolving all of the monomer components but being a nonsolvent and/or swelling agent for the polymer product, said monomer being present in an amount of less than 66% by weight of the total polymerization mixture including said last mentioned group member; polymerizing said monomer mixture under conditions of free radical polymerization to form a polymeric product which is in part soluble and in part insoluble in a member selected from the group consisting of lower aliphatic alcohols, dimethylformamide, glycol methacrylate and glycol acrylate; and effecting the combination of the monomer mixture with the group (3) member during such polymerization in small quantities under controlled stirring at a rate at which the polymeric product formed separates out of the polymerization solution and at which the concentration of the crosslinking agent is maintained within the critical range of 0.02 to 0.2% by volume based on the total volume of the polymerization mixture.

4,076,922

METHOD FOR PRODUCING ETHYLENE POLYMERS

Akihiro Satoh, Kimitsugun; Akio Takahashi; Jun Masuda, both of Ichiharashi; Masato Harada, Chibashi, and Sadahiko Yamada, Ichiharashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Aug. 2, 1976, Ser. No. 711,022
Claims priority, application Japan, Aug. 8, 1975, 50-96427
Int. Cl.[2] C08F *4/02, 10/02*
U.S. Cl. 526—97 18 Claims

1. In the method for producing ethylene polymers by homopolymerization of ethylene or copolymerization of ethylene with a small amount of another α-olefin or a diolefin in the presence of a catalyst obtained by combining a solid product having on its surface, atoms of a transition metal of Group IVA or VA of the Periodic Table, with an organoaluminum compound,

an improvement which comprises using as said solid product, (III) a solid product obtained by reacting (A) $AlCl_3$ or $FeCl_3$ with (B) a divalent metal hydroxide, oxide or carbonate or a double salt containing these compounds or a hydrate of divalent metal compound; reacting the resulting reaction product with (D) a compound of a transition metal of Group IVA or VA of the Periodic Table in the form of liquid; reacting (I) the resulting solid product with an aluminum trialkoxide or boron trialkoxide; and reacting (II) the resulting solid product again with (D') a compound of a transition metal of Group IVA or VA of the Periodic Table, same as or different from said (D), in the form of liquid.

4,076,923

PROCESS FOR PREPARING POLYOLEFINS

Kazuo Matsuura, Kawasaki; Masaomi Matsuzaki, Yokohama; Fumiaki Oshimi, Kawasaki; Nobuyuki Kuroda, Yokohama, and Mituji Miyoshi, Kanagawa, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Filed Mar. 22, 1976, Ser. No. 669,299
Claims priority, application Japan, Apr. 3, 1975, 50-39745
Int. Cl.[2] C08F *4/02, 10/02*
U.S. Cl. 526—97 8 Claims

1. A process for preparing polyolefins which comprises polymerizing or copolymerizing olefins using as catalyst a component comprising a solid carrier and a titanium compound and/or a vanadium compound supported thereon, and an organometallic compound of a metal of Groups I to IV of the Periodic Table, said solid carrier containing 0.5 to 20% by weight of sulfur and being prepared by mixing and heating aluminum oxide and ammonium sulfate at a temperature of from 50° to 1,000° C.

4,076,924

PROCESS FOR POLYMERIZATION OR COPOLYMERIZING OLEFINS CONTAINING AT LEAST 3 CARBON ATOMS

Akinori Toyota, Iwakuni; Kiyoshi Odawara, Waki, and Norio Kashiwa, Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Filed Aug. 27, 1975, Ser. No. 608,278
Claims priority, application Japan, Sep. 3, 1974, 49-100553; Jun. 25, 1975, 50-77555
Int. Cl.[2] C08F *4/02, 10/06*
U.S. Cl. 526—125 25 Claims

1. A process for preparing a highly crystalline olefin polymer or copolymer, which comprises polymerizing or copolymerizing an olefin containing at least 3 carbon atoms in the presence of a catalyst comprising

(a) a solid titanium catalyst component obtained by reacting a solid magnesium component (1) with a liquid or solid titanium compound (2) of the formula

$$Ti(OR^1)_lX_{4-l}$$

wherein X is a halogen atom, R^1 is an alkyl group containing 1 to 8 carbon atoms and l is an integer of 0 to 4,

in the absence of a free organometallic compound of a metal of Groups I to III of the periodic table, the reaction between the solid magnesium component (1) and titanium compound (2) being carried out in the suspended state by suspending the solid magnesium component in the liquid titanium compound or in a solution of the liquid or solid titanium compound in an inert solvent and separating the solid component of the resulting reaction product, said solid magnesium component being obtained by separating a solid from a suspension of a reaction product derived from (i) a magnesium dihalide, (ii) an alcohol, (iii) an organic acid ester selected from the group consisting of primary alkyl esters of aliphatic monocarboxylic acids, alkyl esters of alicyclic carboxylic acids and primary alkyl esters of aromatic monocarboxylic acids and (iv) an organometallic compound of a metal of Groups I to III of the periodic table, and

(b) an organometallic compound of a metal Groups I to III of the periodic table.

4,076,925

STABILIZING CROSSLINKABLE COPOLYMERS COMPRISING ACRYLONITRILE, N-METHYLOL ALKYL ETHER OF UNSATURATED CARBOXYLIC ACID AMIDE WITH (A) AMIDE (B) LACTAM OR (C) UREA COMPOUNDS

Theo Neukam; Ulrich Reinehr, both of Dormagen; Francis Bentz, Cologne, and Günther Nischk, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Dec. 16, 1976, Ser. No. 751,364
Claims priority, application Germany, Dec. 19, 1975, 2557502
Int. Cl.[2] C08F *2/00, 2/16, 20/70*
U.S. Cl. 526—204 7 Claims

1. A process for the production of a crosslinkable copolymer of acrylonitrile, prepared from 88 parts by weight of a mixture of the following monomers

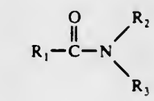
a. at least 72 parts by weight of acrylonitrile,

b. 0.1–12 parts by weight of N-methylol alkyl ether of an ethylenically α,β-unsaturated carboxylic acid amide, and

c. 0.5–4 parts by weight of at least one other comonomer;

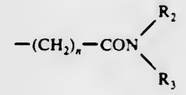
the process comprising polymerizing said mixture in an acidic aqueous medium in the presence of a redox catalyst and in the presence of 2–12 parts by weight of a water-soluble stabilizer which prevents crosslinking during polymerization and which is selected from the group consisting of

a. a carboxylic acid amide of the formula



in which

R_1 is hydrogen, C_1–C_6-alkyl, aryl, or

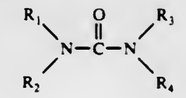


wherein

R_2 and R_3 are hydrogen, methyl, or ethyl; and

n is an integer from 1 to 3;

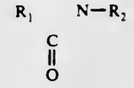
b. a urea of the formula



in which

R_1 to R_4, are hydrogen, C_1–C_3-alkyl; or

c. a lactam of the formula



in which

R_1 is C_3–C_6-alkylene and

R_2 is hydrogen or C_1–C_3-alkyl;

and recovering said crosslinkable copolymer.

4,076,926

POLYMERIZATION CATALYST COMPRISING ALUMINUM HALIDE AND AN ALCOHOL OR ETHER

David Lee Milner, and Ian Stanley Ripley, both of Middlesbrough, England, assignors to Imperial Chemical Industries Limited, London, England

Filed May 10, 1976, Ser. No. 684,953

Claims priority, application United Kingdom, May 14, 1975, 20379/75

Int. Cl.² C08F *4/06, 10/14, 32/00, 36/02*

U.S. Cl. 526—209 **6 Claims**

1. A process for the polymerisation of an unsaturated organic compound or mixture of unsaturated organic compounds selected from the group consisting of cyclic or acyclic mono- or di-olefines containing 4 to 20 carbon atoms, styrene or a styrene homologue, a mixture of coumarone and indene, or an aromatic fraction of petroleum origin containing 9 to 12 carbon atoms which comprises:

contacting the compound or compounds at a temperature in the range −100° to +200°C with 0.1 to 5 weight percent based on the compound or compounds to be polymerised of a catalyst comprising aluminium chloride, aluminium bromide or aluminium iodide, a hydrogen halide, and an alcohol selected from the group consisting of an alkanol containing up to 30 carbon atoms, a polyalkylene glycol, benzyl alcohol and a ring substitute benzyl alcohol or a saturated aliphatic ether containing 7 to 40 carbon atoms in the molecule, said alcohol or ether being used in an amount which corresponds from 0.1 to 1.0 mole per mole of aluminium halide selected from the group consisting of aluminium chloride, aluminium bromide and aluminium iodide.

4,076,927

PROCESS FOR PRODUCING SULFUR MODIFIED POLYCHLOROPRENE

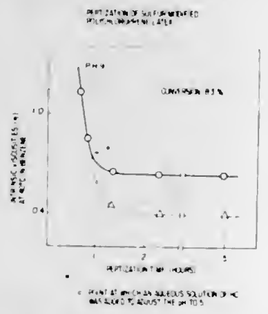
Akihiko Shimizu, and Atsushi Kita, both of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Filed Aug. 5, 1975, Ser. No. 601,997

Claims priority, application Japan, Aug. 6, 1974, 49-89497

Int. Cl.² C08F *36/18*

U.S. Cl. 526—217 **1 Claim**



1. A process for producing sulfur modified polychloroprene polymers which comprises polymerizing at 10-50° C chloroprene and a comonomer in an acidic emulsion using a cationic emulsifier of alkylallylbenzyl trimethyl ammonium chloride in the presence of 0.25 to 10.0 wt. % of sulfur relative to the amount of monomer and a peroxide initiator, and then performing a peptization of the resulting sulfur modified polychloroprene latex by addition thereto of an alkaline aqueous solution to produce an alkaline pH greater than 8, which peptization is terminated by addition of an acidic solution to produce a neutral or acid pH.

4,076,928

SUBSTANTIALLY DRY WATER SWELLABLE PARTICULATE POLYELECTROLYTE

James R. Gross, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 494,439, Aug. 5, 1974. This application Aug. 20, 1975, Ser. No. 606,147

Int. Cl.² C08F *220/34;* **B29B** *1/02*

U.S. Cl. 526—240 **6 Claims**

1. A substantially dry water swellable particulate polyelectrolyte produced by the method which comprises

1. preparing a solution,

I. which comprises a solvent selected from the group consisting of water, lower alcohols and mixtures thereof, and

II. about 5 to about 60% by weight based on (I) of a crosslinkable carboxylic copolymer which contains in the copolymer

A. about 25 to about 98% by weight based on the total weight of the copolymer of units derived from an alkali metal salt of an olefinically unsaturated monosulfonic or monocarboxylic acid;

B. about 2 to about 50% by weight of units derived from an olefinically unsaturated monocarboxylic acid; and

C. about 0.1 to about 5.0% by weight of units derived from an N-substituted acrylamide or methacrylamide having the formula

$$H_2C{=}CR{-}C(O){-}NHCH_2{-}O{-}R'$$

wherein R is selected from hydrogen or methyl and R' is hydrogen or an alkyl group of 1-8 carbons,

2. spreading a coating of said solution on an impervious substrate,

3. heating said coated substrate to a temperature greater than about 30° C to crosslink said polyelectrolyte,

4. separating said crosslinked polyelectrolyte film from said substrate, and

5. disintegrating said film to form flakes, strips, or powders thereof.

4,076,929

VINYLIDENE FLUORIDE POLYMER HAVING IMPROVED MELT FLOW PROPERTIES

Julius Eugene Dohany, Berwyn, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Oct. 30, 1975, Ser. No. 627,481

Int. Cl.² C08F *14/22*

U.S. Cl. 526—255 **8 Claims**

1. A high molecular weight vinylidene fluoride polymer resin which is a homopolymer or a copolymer of at least 75 mol percent vinylidene fluoride copolymerized with at least one other monomer selected from the group consisting of halogenated ethylenes, halogenated propylenes and halogenated butylenes, said polymer having a distinct bimodal molecular weight distribution, as indicated by gel permeation chromatography, and a critical shear stress of at least 3 million dynes per square centimeter.

4,076,930

POLYSACCHARIDE POLYOLS

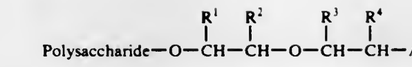
James Ellingboe, 35 Hollis St., South Weymouth, Mass.; Ernst Holger Nystrom, Skoldvagen 21, 182 64 Djursholm, and Jan Bertil Sjövall, Nybrogaten 23, 114 39 Stockholm, both of Sweden

Continuation-in-part of Ser. No. 783,736, Dec. 13, 1968, abandoned. This application Jan. 29, 1971, Ser. No. 110,931

Int. Cl.² C08B *11/08, 31/08, 37/00*

U.S. Cl. 536—1 **4 Claims**

1. A solid derivative of a polysaccharide containing more than 6 pentose or hexose groups, said derivative containing at least one radical of the formula



a. wherein said A is sulfur, and

b. said R^1 and R^2 are each hydrogen alkyl, aryl, alkylene, or alkoxyalkyl, and

c. wherein said R^3 and R^4 are each hydrogen, alkyl, aryl, alkylene, or alkoxy alkyl,

i. said R^1 and R^2 containing not more than 6 carbon atoms,

ii. said R^3 and R^4 containing not more than 28 carbon atoms.

4,076,931

DERIVATIVES OF AN ANTIBIOTIC XK-62-2 AND THE PROCESS FOR THE PRODUCTION THEREOF

Shinji Tomioka, Machida, and Yasuki Mori, Kawasaki, both of Japan, assignors to Abbott Laboratories, North Chicago, Ill.

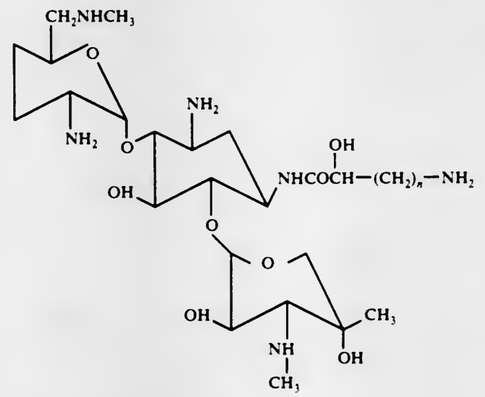
Filed Aug. 4, 1975, Ser. No. 601,361

Claims priority, application Japan, Aug. 5, 1974, 49-88998

Int. Cl.² C07H *15/22*

U.S. Cl. 536—17 **5 Claims**

1. A composition of matter having an antibacterial activity represented by the formula:



wherein *n* is the integer 3 or 4.

4,076,932

PROCESS FOR PRODUCING REGENERATED CELLULOSIC ARTICLES

Richard Benjamin Hammer, Morris Plains; Albin Frank Turbak, Convent Station; Norman A. Portnoy, Hopatcong, all of N.J., and Arthur C. West, St. Paul, Minn., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Feb. 27, 1976, Ser. No. 662,137

Int. Cl.² C08B *16/00*

U.S. Cl. 536—30 **9 Claims**

1. In a process for producing a regenerated cellulosic article comprising nitrosating cellulose with a nitrosating agent selected from the group consisting of an oxide of nitrogen and nitrosyl chloride and dissolving the cellulose in a dialkylacylamide solvent and then regenerating the dissolved cellulose by contacting the dissolved cellulose with a regenerant, said process introducing substantial quantities of nitric acid into the regenerant,

the improvement in which the regenerant comprises a liquid selected from the group consisting of water and a 1 - 4 carbon atom aliphatic monohydric alcohol, and a reactive base which is soluble in the regenerant in an amount ranging from 6% to 25% by weight of the regenerant, said improvement producing a regenerated cellulosic article of improved resistance to alkaline solubility.

4,076,933

PROCESS FOR PRODUCING A REGENERATED SHAPED CELLULOSIC FIBER

Albin Frank Turbak, Convent Station; Richard Benjamin Hammer, Morris Plains; Norman A. Portnoy, Hopatcong, all of N.J., and Arthur C. West, St. Paul, Minn., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Feb. 27, 1976, Ser. No. 662,138

Int. Cl.² C08B *16/00*

U.S. Cl. 536—30 **12 Claims**

1. A process for producing a regenerated shaped cellulosic fiber comprising nitrosating cellulose with a nitrosating agent selected from the group consisting of an oxide of nitrogen and nitrosyl chloride and dissolving the cellulose in an aprotic solvent selected from the group consisting of a dialkylacylamide and dimethylsulfoxide and regenerating the dissolved cellulose by spinning the cellulosic solution into a regenerant, said regenerant being selected from the group consisting of butanol, pentanol and benzyl alcohol, where the solvent is a dialkylacylamide and from the group consisting of propanol, butanol and benzyl alcohol where the solvent is dimethylsulfoxide, said regenerated fiber being trilobal or quadrilobal in cross-sectional shape as a result of the use of said regenerants.

4,076,934

METHOD FOR CONTROLLING OXYGEN LEVEL DURING CONTINUOUS XANTHATION OF ALKALI CELLULOSE

Gordon D. Mills, Veedersburg, Ind., assignor to Olin Corporation, Pisgah Forest, N.C.

Filed Oct. 22, 1976, Ser. No. 734,826

Int. Cl.² C08B *9/04*

U.S. Cl. 536—60 **1 Claim**

1. A continuous process for xanthating and dissolving alkali cellulose in a single chamber under an atmosphere containing less than 3% oxygen comprising continuously feeding crumbs of alkali cellulose into a closed reaction chamber where it is continuously contacted with carbon disulfide, continuously diffusing nitrogen upwardly into said alkali cellulose as it enters said chamber to displace any air entrained in said alkali cellulose with nitrogen prior to its entering said chamber, maintaining said alkali cellulose free of ambient air after diffusing nitrogen therethrough, holding said alkali cellulose within said reaction chamber for a period of time sufficient to complete the reaction thereof with carbon disulfide and convert said alkali cellulose to cellulose xanthate, dissolving said cellulose xanthate within said chamber in an aqueous solution, and continuously removing said dissolved cellulose xanthate from said reaction chamber while maintaining the atmosphere in said chamber at less than 3% oxygen solely by said continuous purging of the alkali cellulose with nitrogen as it is fed into said chamber.

4,076,935

GRINDING METHOD FOR CELLULOSE

Franz Eichenseer, Wiesbaden-Biebrich; Dieter Steidl, Hofheim-Diedenbergen, and Walter Müller, Kelkheim-Hornau, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Dec. 12, 1975, Ser. No. 640,171

Int. Cl.² B27J *7/00;* **B27L** *11/00;* **C08B** *1/00, 11/20*

U.S. Cl. 536—86 **14 Claims**

1. A method of reducing the particle size of a cellulose compound, selected from the group consisting of cellulose and an ether derivative thereof, which comprises grinding the compound in a vibration mill in contact with air and with sufficient water to yield a product having a water content of from 2 to 10% by weight and wherein at least 50% of the particles in the product have a particle size of 100μ or less.

4,076,936

7β-(2-ARYL-2-HYDROXYIMINOACETAMIDO)CEPH-3-EM-4-CARBOXYLIC ACIDS CARRYING A 7α-LOWER ALKOXY SUBSTITUENT

Brian Laundon, Grange-over-Sands, England, assignor to Glaxo Laboratories Limited, Greenford, England

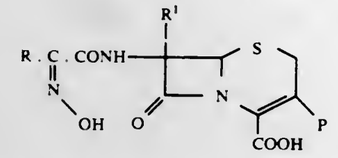
Division of Ser. No. 485,233, Jul. 1, 1974, Pat. No. 4,007,174. This application Dec. 1, 1976, Ser. No. 746,596

Claims priority, application United Kingdom, Jul. 6, 1973, 32273/73

Int. Cl.² C07D *501/20*; A61K *31/545*

U.S. Cl. 544—21 **4 Claims**

1. A compound selected from the group consisting of a compound of the formula:



wherein R is phenyl, thienyl or furyl; R^1 is C_1-C_4 alkoxy; P is a group $-CH_2Y$ wherein Y is $-OCOR^9$ or $-OCOAR^{10}$ where A is O, S or NH, R^9 is methyl and R^{10} is hydrogen or R^9; which is the syn isomer or a mixture of syn and anti isomers containing at least 75% of the syn isomer and a physiologically acceptable salt thereof.

4,076,937

DIBENZYL GLYCOLIC ACID DERIVATIVES

Wolf-Dieter Vigelius; Gerhard Satzinger, both of Denzlingen, and Manfred Herrmann, St. Peter, all of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 528,612, Dec. 2, 1974, abandoned. This application Jun. 16, 1976, Ser. No. 696,665

Claims priority, application Germany, Dec. 17, 1973, 2362708

Int. Cl.² C07D *295/10*

U.S. Cl. 544—171 **19 Claims**

1. An Acetyl-dibenzyl-glycolic acid-β-R-ester wherein R is selected from the group consisting of:
piperidinoethyl,
2,2,6,6-tetramethyl-piperidino-ethyl,
dimethylaminoethyl,
diethylaminoethyl,
dimethylaminopropyl,
pyrrolidinoethyl,
morpholinoethyl,
piperidino-isopropyl,
piperidinopropyl,
(2-methyl-piperidino)-ethyl,
(3-methyl-piperidino)-ethyl,
(4-methyl-piperidino)-ethyl,
(2,6-dimethylpiperidino)-ethyl,
(4-phenyl-piperidino-ethyl,
(4,4-pentamethylene-piperidino)-ethyl, and
hexamethyleneiminoethyl and pharmaceutically compatible quaternary lower alkyl ammonium salts and pharmaceutically compatible inorganic and organic acid salts thereof.

4,076,938

PROCESS FOR THE PRODUCTION OF 3-HYDROXY-1,2,4-TRIAZOLE DERIVATIVES

Beat Böhner, Binningen, Switzerland; Dag Dawes, Voyenenga, Norway, and Willy Meyer, Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

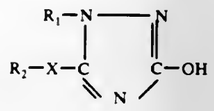
Continuation-in-part of Ser. No. 606,265, Aug. 20, 1975, abandoned. This application Mar. 22, 1977, Ser. No. 780,135

Claims priority, application Switzerland, Aug. 29, 1974, 11771/74

Int. Cl.² C07D *249/12, 249/14, 403/04, 413/04*

U.S. Cl. 544—132 **9 Claims**

1. Process for the production of 3-hydroxy-1,2,4-triazole derivatives of the formula I



(I)

wherein

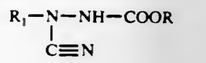
R_1 represents an alkyl group having 1 to 6 carbon atoms or a cycloalkyl group having 3 to 8 carbon atoms,

R_2 represents an alkyl group having 1 to 6 carbon atoms, a cycloalkyl group having 3 to 8 carbon atoms, an alkenyl group having 3 to 6 carbon atoms, an alkynyl group having 3 to 6 carbon atoms, or a benzyl group optionally mono- to disubstituted by alkyl, alkoxy or alkylthio groups each having 1 to 4 carbon atoms, halogen, trifluoromethyl or nitro, and

X represents oxygen, sulphur or a group $>N-R_3$, wherein R_3 denotes an alkyl group having 1 to 6 carbon atoms, an alkenyl group having 3 to 6 carbon atoms, an alkynyl group having 3 to 6 carbon atoms, or together with the radical R_2 and the adjacent nitrogen atom it denotes a pyrrolidino or morpholino group in which process a hydrazinecarboxylic acid ester of the formula II

$$R_1 - NH - NH - COOR \quad \text{(II)},$$

wherein R_1 has the meaning given under formula I, and R represents an alkyl radical having 1 to 4 carbon atoms, is firstly reacted with cyanogen chloride to yield the corresponding 2-substituted 2-cyanohydrazinecarboxylic acid ester of the formula III



(III)

wherein R_1 and R have the meanings given under the formulae I and II, and the resulting intermediate product is subsequently cyclised under alkaline conditions in the presence of a compound R_2XH.

4,076,939

2-(4-SUBSTITUTED-1,2,5-THIADIAZOLE-3-YLOXY)-ACETALDEHYDES

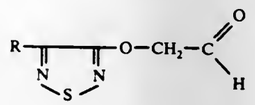
Patrice C. Belanger, Dollard des Ormeaux, Canada, assignor to Merck Sharp & Dohme (I.A.) Corporation, Rahway, N.J.

Continuation-in-part of Ser. No. 602,720, Aug. 7, 1975, abandoned. This application Feb. 8, 1977, Ser. No. 766,637

Int. Cl.² C07D *417/04*

U.S. Cl. 544—134 **1 Claim**

1. Compounds having the formula:



wherein

R is morpholino.

4,076,940

CONVERSION OF ACID S, PRODUCED BY THE ORGANISM *POLYANGIUM CELLULOSUM* VAR. *FULVUM* INTO ACID F

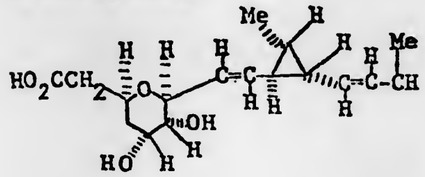
David T. Connor, Ann Arbor, Mich., and Maximilian von Strandtmann, New Castle, Del., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 5, 1977, Ser. No. 794,180

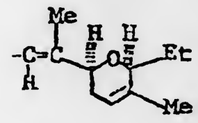
Int. Cl.² C09B *23/00*

U.S. Cl. 542—447 **3 Claims**

1. A process for preparing the substance acid F (V) having the following formula:



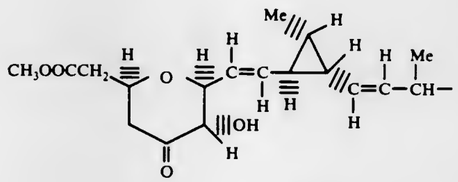
V

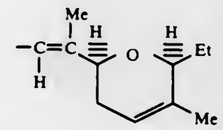


V

which comprises the following steps:

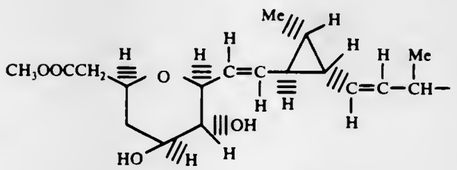
A. Reducing an alcoholic solution of keto ester S (III) wherein the keto ester S has the following formula:

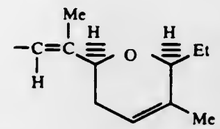




III

with an alkali metal borohydride to obtain a mixture of acid S methyl ester II and acid F methyl ester IV having the following formulas:

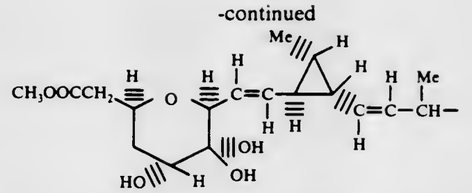


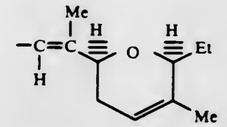


II

AND

-continued





IV

B. Separating acid S methyl ester II and acid F methyl ester IV by preparative thin layer chromatography;

C. Hydrolyzing acid F methyl ester IV to obtain the desired acid F (V).

4,076,941

PROCESS FOR THE PREPARATION OF 1-CARBAMOYL-3-(3,5-DICHLOROPHENYL)-HYDANTOINS

Michel Sauli, Paris, France, assignor to Philagro, Lyon, France

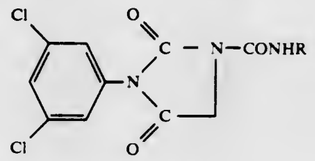
Filed Dec. 15, 1976, Ser. No. 750,704

Claims priority, application France, Dec. 22, 1975, 75 39905

Int. Cl.² C07D *233/80*

U.S. Cl. 548—312 **13 Claims**

1. A process for the preparation of a 1-carbamoyl-3-(3,5-dichlorophenyl)-hydantoin of the formula:



in which R represents alkyl of 1 to 4 carbon atoms in a straight or branched chain or an alkenyl of 2 to 4 carbon atoms, wherein an isocyanate of the formula:

$$R-N=C=O$$

in which R is defined as above, is reacted with 3-(3,5-dichlorophenyl)-ureidoacetic acid in an anhydrous medium in the presence of a tertiary amine capable of increasing the rate of reaction, said isocyanate being present in an amount of from 2.9 to 4 mols per mol of said ureidoacetic acid.

4,076,942

CRYSTALLINE DIPILOCARPINIUM PAMOATE

Robert L. Smith, Lansdale, and Ta-Jyh Lee, Hatfield, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

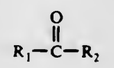
Filed Oct. 1, 1975, Ser. No. 618,538

Int. Cl.² C07D *405/06*

U.S. Cl. 548—336 **4 Claims**

1. Substantially crystalline, optically pure dipilocarpinium pamoate.

3. A dipilocarpinium pamoate ketone solvate wherein the ketone moiety is:



wherein R_1 and R_2 are independently selected from alkyl

groups of from 1 to 3 carbon atoms, having a molar ratio of ketone to dipilocarpinium pamoate of about 1:1.

4,076,943

1-SUBSTITUTED-3-AMINO-PYRAZOL-5-ONES

Harald Horstmann; Karl Meng, both of Wuppertal, and Egbert Wehinger, Neviges, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

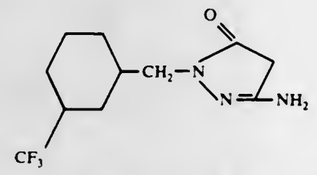
Division of Ser. No. 521,906, Nov. 7, 1974, abandoned, which is a continuation of Ser. No. 371,959, Jun. 21, 1973, abandoned. This application Jan. 3, 1977, Ser. No. 756,179

Claims priority, application Germany, Jun. 23, 1972, 2230792; Jun. 23, 1972, 2230675

Int. Cl.² C07D *231/52*

U.S. Cl. 548—360 **4 Claims**

1. A compound of the formula



or a pharmaceutically acceptable non-toxic salt thereof wherein

R is

(a) naphthyl having 1 or 2 identical or different substituents selected from the group consisting of halogen and alkyl of 1 to 4 carbon atoms; or

(b) unsubstituted β-naphthyl.

4,076,944

3β,14β-DIHYDROXY-14,17-SECO-D-BISNORANDROSTAN-17-OIC ACID DERIVATIVES

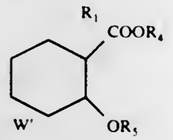
Perry Rosen, North Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 528,115, Nov. 29, 1974, Pat. No. 3,987,066, which is a division of Ser. No. 217,956, Jan. 14, 1972, Pat. No. 3,872,076. This application Jul. 2, 1976, Ser. No. 702,264

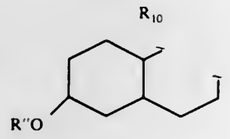
Int. Cl.² C07C *69/74*

U.S. Cl. 560—5 **8 Claims**

1. A compound of the formula



wherein R_1 is lower alkyl of from 1 to 5 carbon atoms, W' is



R_4 is hydrogen or lower alkyl, R_5 is hydrogen or lower alkanoyl, R'' is hydrogen, or lower alkanoyl and R_{10} is hydrogen or methyl.

4,076,945

METHOD FOR MAKING URETHANE-TERMINATED POLYCARBODIIMIDES AND PRODUCTS THEREOF

Otto C. Elmer, Akron, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 186,779, Oct. 5, 1971, abandoned. This application Feb. 24, 1977, Ser. No. 771,708

Int. Cl.² C07C *101/44*

U.S. Cl. 560—25 **5 Claims**

1. A urethane-terminated polycarbodiimide prepared by:

1 reacting at a temperature of no more than about 50° C. an arylene diisocyanate in which the isocyanate groups are of unequal reactivity and being selected from the group consisting of toluene 2,4-diisocyanate, 2-methyl napthalene 1,5-diisocyanate, 3-methyl-4,4'-diisocyanatodiphenylmethane, 3-chloro-4,4'-diisocyanatodiphenylmethane, 3-methoxy-4,4'-diisocyanatodiphenylmethane, 2,4-diisocyanatochlorobenzene, cumene 2,4-diisocyanate, m-xylene 2,5-diisocyanate and 3,5-dimethylbiphenyl-4,4'-diisocyanate with a stoichiometric deficiency of a primary or secondary aliphatic alcohol selected from the group consisting of methyl alcohol, ethyl alcohol, isopropyl alcohol, secondary buyl alcohol, isoamyl alcohol, n-hexanol, cyclohexanol, 2-chloro-1-propanol, 2-octanol, methylphenylcarbinol, benzyl alcohol, diethylene glycol mono-n-butyl ether, cinnamyl alcohol and 2-ethyl hexanol to convert less than all of the isocyanate groups to urethane groups;

2 cooling the mixture to near room temperature; and

3 admixing therewith a carbodiimide-forming catalyst and polymerizing the partially urethane-terminated arylene diisocyanate to a urethane-terminated polycarbodiimide that exhibits a single N=C=N peak at 2130 cm.$^{-1}$ and is free of other peaks in the 2000 to 2500 cm.$^{-1}$ band under infra-red inspection.

4,076,946

HYDROGENATION OF MOLTEN ALDEHYDIC DIMETHYL TEREPHTHALATE

William H. Millick, III, New Castle, Del., assignor to Hercofina, Wilmington, Del.

Filed Jan. 2, 1974, Ser. No. 430,102

Int. Cl.² C07C *67/48, 69/82*

U.S. Cl. 560—78 **5 Claims**

1. In a process for treating molten aldehydic DMT by subjecting it to catalytic hydrogenation with a catalyst that not only promotes hydrogenation of the aldehydic content, but also tends at the temperature of the molten DMT to promote ring hydrogenation, the improvement for minimizing said ring hydrogenation, which comprises dissolving in said molten aldehydic DMT a quantity of molecular hydrogen sufficient to hydrogenate at least a substantial portion of said aldehydic content without substantially enhancing the rate of formation of dimethyl hexahydroterephthalate, and contacting the resulting solution with a catalytic quantity of said catalyst for a period of time sufficient for the molecular hydrogen to hydrogenate at least a substantial portion of the aldehydic content with minimal ring hydrogenation.

4,076,947

CYCLOALKYL AND CYCLOALKENYL PROSTAGLANDIN CONGENERS

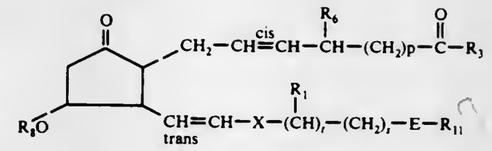
Robert Eugene Schaub, Upper Saddle River, and Martin Joseph Weiss, Oradell, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 457,321, Apr. 2, 1974, abandoned. This application Jan. 12, 1977, Ser. No. 758,743

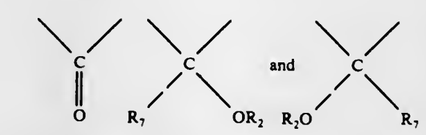
Int. Cl.² C07C *177/00*

U.S. Cl. 560—121 **42 Claims**

1. A compound selected from the group consisting of an optically active compound of the formula:



and a racemic compound of that formula and the mirror image thereof wherein p is an integer from 1 to 5, inclusive; R_6 is hydrogen or an alkyl group having up to four carbon atoms; R_1 is an alkyl group having up to three carbon atoms; X is a divalent radical selected from the group consisting of those of the formulae:



wherein R_2 is selected from the group consisting of hydrogen, triphenylmethyl, and mono- or di-methoxy substituted triphenylmethyl and R_7 is hydrogen or an alkyl group having up to three carbon atoms with the proviso that when R_7 is alkyl then R_2 must be hydrogen; R_3 is selected from the group consisting of hydroxy, alkoxy having up to twelve carbon atoms, tetrahydropyranyloxy and tri(lower alkyl)-silyloxy; R_8 is selected from the group consisting of hydrogen, tetrahydropyranyl and tri(lower alkyl)silyl; s is zero or an integer from 1 to 5, inclusive; t is zero or one; E is selected from the group consisting of cyclopropyl, cyclononyl and cycloalkenyl having from 5 to 9 carbon atoms; R_{11} is selected from the group consisting of hydrogen and lower alkyl; with the proviso that when E is a saturated cycloalkyl group then the sum of s and t is at least one; and the pharmaceutically acceptable cationic salts thereof when R_3 is hydroxy.

4,076,948

PROCESS FOR TREATMENT OF ADIPIC ACID MOTHER LIQUOR

Samuel S. Mims, Odessa, Tex., assignor to El Paso Products Company, Odessa, Tex.

Filed Oct. 10, 1968, Ser. No. 766,476

Int. Cl.² C07C *69/34, 69/44, 69/48*

U.S. Cl. 560—191 **11 Claims**

1. In a process for the treatment of the mother liquor resulting from the nitric acid oxidation of cyclohexanol and/or cyclohexanone and the recovery of valuable components therefrom, which mother liquor contains a mixture of aliphatic dibasic acids, nitric acid and metal catalyst values, the improved process which comprises:

a. contacting said mother liquor with a water-miscible lower alkyl alcohol at a temperature of from 25° C. to the boiling point of the alcohol used and in a sufficient amount to esterify at least a portion of the aliphatic dibasic acids present and form an esterifying mixture;

b. contacting said esterifying mixture with a sufficient amount of a substantially water-immiscible organic solvent to extract the esters formed into said organic solvent, said organic solvent being selected from the group consisting of aromatic hydrocarbons, halogenated aliphatic hydrocarbons, halogenated aromatic hydrocarbons and mixtures thereof;

c. continuing contact of said esterifying mixture and said organic solvent until at least a portion of the esters formed are partitioned into an organic phase comprising the esters dissolved in said organic solvent and there is formed said organic phase and an aqueous phase containing water, nitric acid, metal catalyst values, any excess alcohol and any unesterified organic acids;

d. separating said organic phase and said aqueous phase;

e. distilling said organic phase to remove the organic solvent and recover the lower alkyl esters of the aliphatic dibasic acids;

f. distilling the aqueous phase to remove any excess lower alkyl alcohol and excess water; and

g. recovering a residue which comprises an aqueous nitric acid solution containing metal catalyst values.

4,076,949

PROCESS FOR THE PREPARATION OF OXALATE ESTERS

Lee R. Zehner, Media, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 685,833, May 13, 1976, abandoned. This application May 9, 1977, Ser. No. 794,778

Int. Cl.² C07C *69/36*

U.S. Cl. 560—204 **34 Claims**

1. A process for the preparation of oxalate esters of an alcohol which comprises reacting a monohydric saturated aliphatic, alicyclic or aralkyl alcohol containing from 1 to 20 carbon atoms and which may contain other substituents which do not interfere with the reaction, with a mixture of carbon monoxide and oxygen at a pressure of between about 500 psig to 5000 psig and at a temperature in the range of about 40° C. to 150° C. in the presence of an effective amount of a catalytic mixture of

(a) a palladium, rhodium, platinum, copper or cadmium metal salt compound or mixtures thereof,

(b) an aliphatic, cycloaliphatic aromatic or heterocyclic amine or ammonia,

(c) a copper (I), copper (II), iron (II) or iron (III) oxidant salt compound and

(d) from about 0.1 to 40 weight percent of an ammonium or substituted ammonium salt compound with a counterion other than a halide, and recovering the desired oxalate ester.

26. A process according to claim 1 wherein the reaction is carried out in the presence of a catalytic amount of an organic mono- or poly-dentate ligand or coordination complex selected from the group consisting of alkyl, aryl and halogen substituted phosphines, arsines, stibines and halide salts.

4,076,950

PROCESS FOR MANUFACTURE OF ALKYL ESTERS OF ALIPHATIC CARBOXYLIC ACIDS

Thomas Stewart, Andalusia, and Frederick W. Landau, Havertown, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jul. 19, 1976, Ser. No. 706,646

Int. Cl.² C07C *69/54*

U.S. Cl. 560—218 **5 Claims**

1. In a process for the preparation of acrylic and methacrylic acid esters by conventional esterification, wherein crude product ester is recovered as distillate from an esterification reactor together with unreacted alkanol, unreacted carboxylic acid and water of esterification by fractional distillation, the improvement of obtaining a crude ester distillate substantially free of unreacted carboxylic acid by adding to the reactor sufficient substantially anhydrous product ester, thereby satisfying combined ester/alkanol and ester/water azeotropes so that substantially all of the unreacted carboxylic acid remains in the reactor and the combined azeotropes are distilled over as crude product.

4,076,951

METHOD OF POLYMERIZING VINYL CHLORIDE

Kazuhiko Katayama, Kobe; Masahiko Nishigaki, Nishinomiya; Akira Ohtani, Kobe; Nobutaka Tani, Kobe; Minoru Nishizawa, Kobe, and Hirokazu Nakanishi, Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 3, 1976, Ser. No. 747,410
Claims priority, application Japan, Dec. 10, 1975, 50-147863
Int. Cl.² C08F *2/18, 2/20, 14/06*
U.S. Cl. 526—62 **12 Claims**

1. In a method of suspension polymerizing vinyl chloride or a monomer mixture of vinyl chloride as major component and other monomers copolymerizable therewith as minor component, in an aqueous medium, in the presence of a suspension agent and an oil soluble catalyst, the improvement comprising the step of coating the interior surfaces of the polymerization vessel and auxiliary equipment prior to said polymerization with at least one compound selected from the group consisting of hydroxyhydroquinone and pyrogallol.

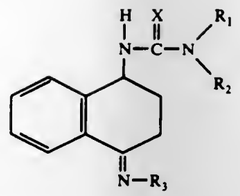
4,076,952

CERTAIN TETRAHYDRO-4-IMINO-1-NAPHTHYLUREAS

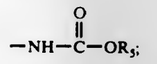
Goro Asato, Titusville, and Terence James Bentley, South Cranbury, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 705,313, Jul. 14, 1976, Pat. No.4,041,070. This application Mar. 25, 1977, Ser. No. 781,233
Int. Cl.² C07C *101/44;* **A01N** *9/20*
U.S. Cl. 560—28 **4 Claims**

1. A compound of formula:



wherein X is oxygen or sulfur; R_1 is hydrogen or alkyl C_1-C_4; R_2 is hydrogen, alkyl C_1-C_4, 2-propynyl, alkoxy C_1-C_4 or benzyloxy; R_3 is the moiety



R_5 is alkyl C_1-C_4; the racemic mixtures and the optical isomers thereof.

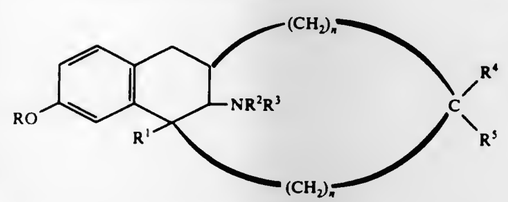
4,076,953

1,3-BRIDGED AMINO TETRALINS

Meier E. Freed, Paoli, and John R. Potoski, Spring City, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 588,021, Mar. 13, 1975, Pat. No. 4,034,041. This application Feb. 17, 1977, Ser. No. 769,605
Int. Cl.² C07C *69/00, 79/46*
U.S. Cl. 560—142 **2 Claims**

1. A compound of the formula:



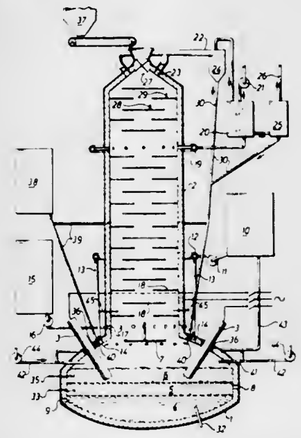
wherein R is lower alkanoyl; R^1 is lower alkyl of from 1 to 4 carbon atoms; R^2 and R^3 are independently selected from hydrogen, or lower alkyl of from 1 to 4 carbon atoms; R^4 and R^5 are independently selected from the group lower alkyl, or R^4 and R^5 may be concatenated to form a 5 or 6 membered carbocyclic ring; and n is 1 or 2 and the pharmaceutically acceptable addition salts thereof.

4,076,954

METHOD AND AN ELECTRICALLY HEATED DEVICE FOR PRODUCING MOLTEN METAL FROM POWDERS OR LUMPS OF METAL OXIDES

Rolf Linder, Skjutarevagen 7, 77 200, Grangesberg, Sweden

Continuation-in-part of Ser. No. 469,983, May 15, 1974, Pat. No. 3,976,472. This application May 28, 1976, Ser. No. 690,742
Claims priority, application Sweden, May 17, 1973, 7307022
Int. Cl.² H05B *7/18;* **C21C** *5/52*
U.S. Cl. 13—9 R **11 Claims**



1. In a device for reducing and smelting metal oxides to a metal melt including a prereduction furnance in which powdery or lumpy metal oxide is prereduced by the introduction of a suitable reducing gas and a final reduction furnance having a heated smelting furnace for final reduction arranged to directly receive the prereduced metal oxide from the prereduction furnace for final reduction of this material with a reducing agent selected from the group comprising coal, oil, natural gas and other solid, liquid and gaseous hydrocarbon-containing materials as a reducing agent, wherein the improvement comprises the device being equipped with means for directly feeding the reducing gas evolved in the smelting furnace used for the final reduction into the lower end of the prereduction furnace, and with means for bringing said reducing gas which is fed from the smelting furnace to the prereduction furnance into contact with a cooling agent selected from the group consisting of gaseous, liquid and solid cooling agents so as to cool the reducing gas to a temperature at which sticking of the metal oxide treated in the prereduction furnace is prevented and simultaneous efficient prereduction with the reduoing gas in the prereduction furnace is achieved.

4,076,955

PACKAGE FOR HERMETICALLY SEALING ELECTRONIC CIRCUITS

Louis E. Gates, Jr., Westlake Village, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

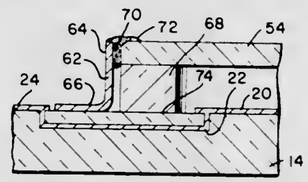
Continuation of Ser. No. 554,788, Mar. 3, 1975, abandoned. This application Feb. 10, 1977, Ser. No. 767,583
Int. Cl.² H05K *5/06*
U.S. Cl. 174—52 FP **13 Claims**

1. A hermetically sealed package for housing an electronic device, comprising:

a base for supporting the electronic device and having a sealing area on said base for describing an enclosure for completely surrounding the electronic device, electrical conductors connectable to the electronic device and extending under said sealing area for electrically coupling the electronic device into an electronic system;

means hermetically bonded to said base sealing area and extending above and completely around said base sealing area for enclosing the electronic device, said means including a lid sealing area extending substantially perpendicular to said base and facing substantially inwardly of said means;

a lid having a peripheral surface extending substantially perpendicular to said base, facing outwardly of said described enclosure and spaced from said lid sealing area for defining a gap located between said surface and said lid sealing area and extending substantially perpendicular to said base; and



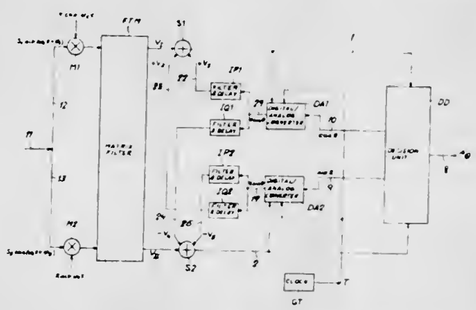
solder in the gap and hermetically bonding said lid sealing area to said lid peripheral surface, the location of the gap thereby encouraging the exertion of at least shear forces on the bonding of said solder and thereby substantially avoiding exertion of cantilever and tensile forces between said lid and said means and therefore on said solder, and for enabling removal and replacement of said lid from said means while avoiding at least thermal harm to the electronic device.

4,076,956

DECISION NETWORK FOR RECEIVER OF PSK DIGITAL SIGNALS

Renato Dogliotti, and Umberto Mazzei, both of Turin, Italy, assignors to CSELT - Centro Studi e Laboratori Telecomunicazioni, Torino, Italy

Filed Mar. 25, 1976, Ser. No. 670,534
Claims priority, application Italy, Mar. 27, 1975, 67780/75
Int. Cl.² H04L *15/24*
U.S. Cl. 178—88 **10 Claims**



1. In a receiver for digital message signals transmitted via two conjugate carrier waves of like frequency identifying $4b$ different signal levels, b being an integer, in combination:

first and second demodulating means for deriving from said carrier waves a first and a second bipolar input voltage defining respective coordinates of an imaginary coordinate system divided by its coordinate axes into four quadrants, the input voltages concurrently derived by said first and second demodulating means defining a point on one of said quadrants in the vicinity of one of $4b$ predetermined locations on respective radii emanating from the origin of said coordinate system, each of said radii including with a fixed reference direction an angle representing one of said signal levels, each quadrant being divided into $b+1$ zones of possible signal deviation, each of said zones encompassing one of said predetermined locations, said zones being

identically distributed in all quadrants, said first and second demodulating means comprising a pair of coherent detectors followed by a pair of analog-digital converters for quantizing said input voltages, thereby forming binary words each including a sign bit and a multiplicity of modular bits; and

decision means connected to said first and second demodulating means for identifying the corresponding signal level in response to said input voltages, said decision means including a first stage for converting the relationship of the absolute magnitudes of said input voltages into a zone-identifying code and a second stage in cascade with said first stage for deriving an angle code from said zone-identifying code and from the polarities of said input voltages;

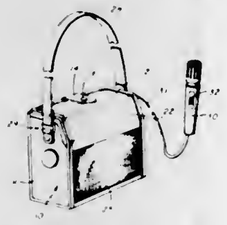
said first stage comprising a first read-only memory with first cells jointly addressable by the modular bits of said first and second input voltages, each of said first cells storing one of $b+1$ binary-zone-identifying codes, said second stage comprising a second read-only memory with second cells jointly addressable by said zone-identifying codes and by the sign bits of said first and second input voltages, each of said second cells storing one of $2b+1$ angle codes.

4,076,957

PORTABLE SOUND DEVICE FOR PUBLIC ADDRESS

Ira Molay, Wenham, Mass., assignor to Audiophonics Corporation, Beverly, Mass.

Filed Jul. 15, 1976, Ser. No. 705,474
Int. Cl.² H04R 3/00
U.S. Cl. 179—1 AT **14 Claims**



1. A portable sound device comprising, in combination;

a speaker,

a microphone including a microphone cable,

amplifier means coupled intermediate the microphone and speaker,

a rechargeable power source coupled to the amplifier means,

a carrying case containing at least the speaker, power source and amplifier means, and having a top opening flap,

a securing strap on the carrying case for holding the top flap closed,

bracket means for mounting the speaker with the core of the speaker adjacent a sound pervious wall of the carrying case,

a removable box disposed at the top of the case for housing the microphone and microphone cable

and snap means on the removable box for securing the box in position in the carrying case.

4,076,958

SIGNAL SYNTHESIZER SPECTRUM CONTOUR SCALER

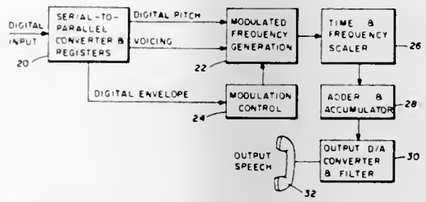
Donald P. Fulghum, Dallas, Tex., assignor to E-Systems, Inc., Dallas, Tex.

Filed Sep. 13, 1976, Ser. No. 722,814
Int. Cl.² G10L 1/00
U.S. Cl. 179—1.5 A **31 Claims**

1. A synthesizer for converting consecutive frames of digital words into analog signals, such consecutive frames including frequency and amplitude information relating to consecutive predetermined instants of time of a first signal, and one word of each frame comprising a channel containing fundamental frequency information bits relating to the fundamental frequency of the original signal at one instant of time, and other consecutive words of each frame comprising channels containing amplitude information bits of consecutive, predetermined frequency bands of the first signal, said bands having a predetermined relation to the fundamental frequency of the first signal at one instant of time, said synthesizer including:

input means for receiving consecutive frames of digital words;

first means connected to said input means and including memory means for storing digital signals indicative of the predetermined frequency and predetermined amplitude of the words in channels of sequential frames, and means operatively associated with said memory means for causing said memory means to transmit successive digital signals indicative of the amplitude and frequency of words of subsequent frames;



second means connected to said first means and including storage means of the differential of amplitude values of words at time interpolation intervals between subsequent frames, and means for receiving successive digital signals indicative of the amplitude of words of subsequent frames, and for generating from the differential of amplitude values and the received digital signals a time scaled value for one of the words of one frame for the receive digital signal; and

adder means for receiving the digital words from said second means and for producing a digital signal corresponding to each frame and indicative of the sum of the time scaled signals corresponding to the words of each frame; and

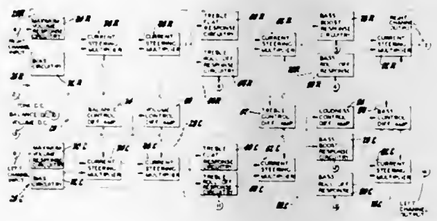
a digital-to-analog converter for receiving the output of said adder means and producing an analog signal corresponding to said first signal.

4,076,959

VOLUME, TONE AND BALANCE CONTROL FOR MULTI-CHANNEL AUDIO SYSTEMS

William F. Gilbert; Burtron D. Schertz, and Lester Wilkinson, all of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 8, 1976, Ser. No. 730,950
Int. Cl.² H03G 5/10, 3/10; H03F 3/45
U.S. Cl. 179—1 D **9 Claims**



1. Audio tone control apparatus providing a base tone control function comprising,

signal processing means including a bass shaping network responsive to an audio voltage signal for producing a first modulated direct current signal the amplitude of which decreases with increasing frequency of said audio signal to effect a bass boost and for providing a second modulated direct current signal the amplitude of whieh increases with increasing frequency of said audio signal to effect a bass cut,

current steering means for producing an output current which is a summation of complementary percentages of said first and second modulated direct current signals,

means establishing a DC control voltage related to a desired bass response,

a bass response control differential amplifier providing a differential output related to said DC control voltage,

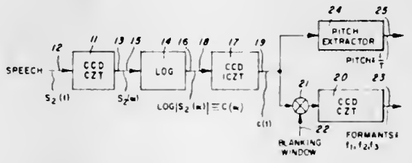
means applying the differential output of said bass response control differential amplifier to said current steering means for establishing said complementary percentages to thereby effect the desired bass response.

4,076,960

CCD SPEECH PROCESSOR

Dennis D. Buss, and Charles Robert Hewes, both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 27, 1976, Ser. No. 735,916
Int. Cl.² G10L 1/00
U.S. Cl. 179—1 SA **28 Claims**



1. Apparatus for performing the homomorphic deconvolution of speech comprising:

(a) First charge transfer device transform means having an input coupled to receive analog electrical signals representing speech for sampling said signals and performing thereon an analog discrete Fourier transform via the chirp Z transform algorithm to produce analog output signals $S_2(\omega)$ representing the components of said discrete Fourier transform.

(b) Circuit means coupled to receive said $S_2(\omega)$ signals from said first transform means for generating in response thereto analog output signals $C(\omega)$ comprising a non-linear function of the magnitude of said $S_2(\omega)$ signals;

(c) Second charge transfer device transform means coupled to receive said $C(\omega)$ signals from said circuit means for performing thereon an analog inverse discrete Fourier transform via the chirp Z transform algorithm to produce analog cepstrum signals $c(t)$.

4,076,961

AUTOMATIC SWITCHING UNIT FOR DATA COMMUNICATIONS NETWORK

Jerry L. Holsinger, Boston, and David E. Williams, Andover, both of Mass., assignors to Intertel, Inc., Burlington, Mass.

Continuation-in-part of Ser. No. 508,278, Sep. 23, 1974, abandoned. This application Mar. 9, 1976, Ser. No. 665,256
Int. Cl.² H04M 9/00, 11/00; H04B 3/00
U.S. Cl. 179—2 DP **50 Claims**

1. An automatic switching unit for connecting an interfacing unit selectively to a primary transmission path and to a secondary transmission path, the secondary transmission path being adapted to convey a secondary path condition signal, said automatic switching unit comprising:

A. switching means having stable and astable states and including:

i. a primary switching means for connecting, in its stable state, the interfacing unit to the primary transmission path, and

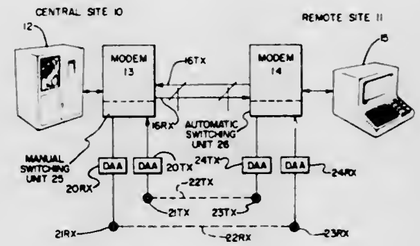
ii. a secondary switching means for connecting, in its astable state, the interfacing unit to the secondary transmission path, and

B. switch control means including:

i. means for generating a control signal that shifts said primary and secondary switching means to their astable states in response to the secondary path condition signal, and

ii. resetting means for terminating the control signal thereby to shift said primary and secondary switching means to their stable states.

33. Apparatus for controlling communications in a data communications network that includes a central site, a remote



site, and a primary communications path that normally is used during communications between the central and remote sites, said apparatus comprising:

A. switching means at the central site,

B. means at the central site for establishing communications between said switching means and an alternate communications path from the remote site that is in parallel with the primary communications path,

C. means at the remote site for establishing communications between the remote site and the alternate communications path in response to the establishment of communications between said switching means and the alternate communications path, and

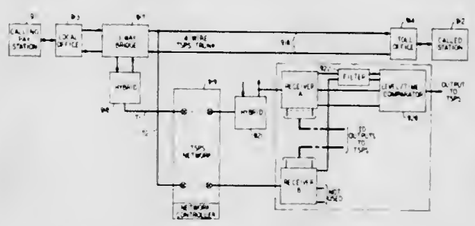
D. means for isolating the remote site from the primary communications path after communications are established over the alternate communications path, said switching means establishing communications between the central site and the alternate communications path after said isolating means are activated.

4,076,962

METHOD AND APPARATUS FOR RECEIVING DISPARATE SEQUENCES OF SPACED TONE BURSTS

Kenneth Streisand, East Brunswick, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N. J. 07974

Filed Mar. 7, 1977, Ser. No. 774,969
Int. Cl.² H04M 17/00
U.S. Cl. 179—6.3 R **14 Claims**



1. Apparatus for detecting and identifying disparate prese-

lected signal sequences of spaced tone bursts corresponding to predetermined criteria wherein portions of the sequences may be subjected to signal interference, which comprises:

detecting means for providing an output signal indicative of the occurrence of a tone burst;

first timing means for indicting when said output signal persists continuously for a first predetermined duration;

second timing means responsive to said detecting means and said first timing means for measuring the total duration of said output signal while bridging interruptions therein after the first predetermined duration and indicating if the total exceeds a first predetermined minimum duration, said second means also accumulating the total duration of said interruptions to indicate if the accumulation exceeds a second predetermined duration to reset said apparatus into an initial state before the occurrence of said first predetermined minimum duration;

third timing means responsive to the indication of the end of said first minimum duration for measuring the total duration of interruptions that occur after said first minimum duration is exceeded to ascertain the end of said output signal and continuing to determine the duration of the space following the tone burst; and

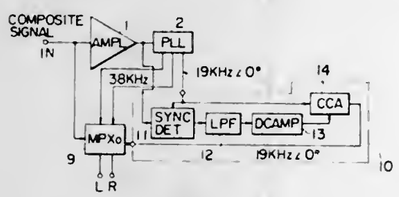
logic means responsive to said second and third timing means for indicating the occurrence of a valid one of said preselected signal sequences.

4,076,963

PILOT SIGNAL CANCELLING CIRCUIT FOR FM MULTIPLEX DEMODULATOR

Seijiro Fujie, Tokyo, Japan; Susumu Yokoyama, deceased, late of Tokyo, Japan, and by Toshikazu Yokoyama, administrator, Onomichi, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 18, 1977, Ser. No. 788,497
Claims priority, application Japan, Apr. 19, 1976, 51-43636
Int. Cl.² H04H *5/00*
U.S. Cl. 179—15 BT **12 Claims**



1. In a pilot signal cancelling circuit for an FM multiplex demodulator, including a composite signal source, a phase lock loop for deriving a fixed amplitude 19 KHz pilot signal and 38 KHz sub-carrier switching signals from the composite signal, a multiplex demodulator for deriving right and left channel stereophonic output signals from the composite signal in response to the switching signals, said output signals containing pilot signal components, circuit means for generating pilot signal cancelling signals from the fixed amplitude pilot signal, and circuit means for combining the cancelling signals with the demodulator output signals to cancel said pilot signal components therein, the improvements characterized by:

a. synchronous detector means for producing a pulsating signal from the composite signal in response to the fixed amplitude pilot signal, said pulsating signal having an amplitude proportional to the amplitude of the pilot signal contained in the composite signal,

b. filter circuit means for converting the pulsating signal into a variable voltage d.c. signal,

c. circuit means for converting the filter circuit means output from a variable voltage signal to a variable current signal,

d. current controlled attenuator means for varying the magnitude of the fixed amplitude pilot signal in response to the converting circuit means output, and

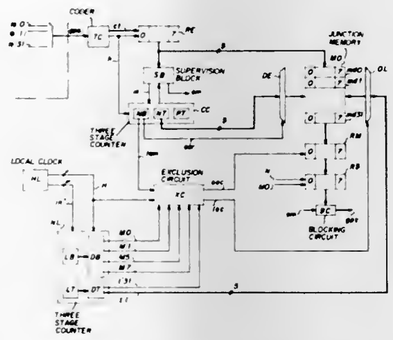
e. means coupling the attenuator means output to the generating circuit means.

4,076,964

TIME DIVISION SYSTEM FOR SYNCHRONIZING FUNCTIONS CONTROLLED BY DIFFERENT CLOCKS

Michel André Robert Henrion, Boulogne, and André Lucien Coudray, Rueil-Malmaison, both of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jul. 26, 1976, Ser. No. 708,816
Claims priority, application France, Jul. 28, 1975, 75 23460
Int. Cl.² H04J *3/06*
U.S. Cl. 179—15 BS **5 Claims**



1. A synchronizing circuit for a time division multiplex system having an exchange in which a series of plural bit words is received during successive time frames comprising a time slot for each word with each bit being received serially during a time element of a time slot and with each word being received at the clock rate of a distant office from which the series of words is transmitted, each word being forwarded within said exchange at a local clock rate of the same duration and extent as the clock rate of the distant office, said circuit including a memory for storing therein a word in parallel form in response to a storage signal based on said distant clock rate during a time element thereof, means in said exchange for sensing the occurrence of a storage signal, means responsive to a read signal during a preselected time element for reading a bit from said memory, means for comparing a check signal derived from said storage signal but longer in duration than said storage signal against said read signal for reading a word from said memory to ensure that only one word is read during a time slot, means responsive to a condition in which a check signal coincides with a read signal for shifting said read signal to a time element spaced in time a predetermined plural number of time elements from the present time interval, and means for causing reading of words at successive shifted time elements of subsequent time slots to prevent reading and storing of words at the same time.

4,076,965

UNIVERSAL RECEIVER/SENDER

Rolf Einar Olsen, and Ernst August Munter, both of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

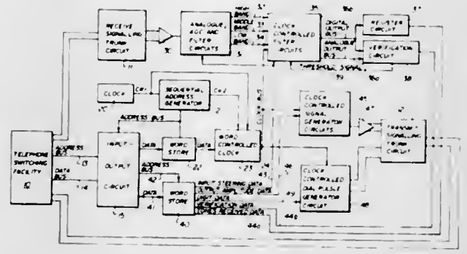
Filed Aug. 25, 1976, Ser. No. 717,618
Int. Cl.² H04Q *1/50*
U.S. Cl. 179—16 EC **4 Claims**

1. A universal receiver sender apparatus for use in combination with a telephone switching facility including a digital data processing unit, bus means for connecting the processing unit to the receiver sender apparatus, and a supervisory signalling trunk means having receiving and sending portions for connecting the receiver sender apparatus to a telephone transmission facility selected by the telephone switching facility, the receiver sender being responsive in its operation to instruction words directed thereto by the processing unit, the receiver sender apparatus comprising:

means for generating a plurality of clock signals, each appearing at a respective output thereof, each clock signal having a pulse repetition frequency directly proportional to a predetermined frequency multiplied by the value of a respective instruction word from the processor;

means for receiving signals from the receive portion of the supervisory trunk and passing only those received signals having frequencies within a passband as determined by the response of the receiving means to a control word from the processor;

a plurality of commutating filter means each having an analogue input connected to the receiving means for receiving the signals passed by the receiving means, and a



control input connected to the generating means for receiving a respective one of the plurality of clock signals, each commutating filter having a passband center frequency as determined by the pulse repetition frequency of said clock signal, each commutating filter means having a digital output for indicating that a signal within the passband has been received;

signal generating means having an analogue output connected to the sending portion of the supervisory signalling trunk, and an input connected to the generating means, said input for receiving a predetermined one of said plurality of clock signals, the signal generating means being responsive to said one clock signal to generate at said analogue output a substantially sinusoidal signal having a frequency directly proportional to the pulse repetition frequency of said one clock signal;

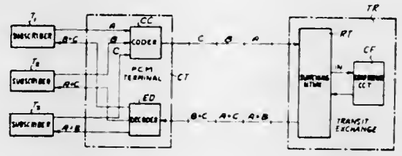
whereby the receiver sender apparatus is programmable to receive and transmit multiple frequency signalling in a plurality of different signalling formats.

4,076,966

METHOD OF AND SYSTEM FOR HANDLING CONFERENCE CALLS IN DIGITAL TELEPHONE EXCHANGE

Amilcare Bovo, Milan, and Giuseppe Valsecchi, Lecco (CO), all of Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Aug. 2, 1976, Ser. No. 710,636
Int. Cl.² H04M *3/56*
U.S. Cl. 179—18 BC **12 Claims**



1. A method of linearly superposing significant portions of logarithmically coded coincident voice samples in a conference call, each voice-sample code consisting of a polarity bit, a plurality of higher-order range bits and a plurality of lower-order quantum bits, the numerical weights of said quantum bits depending on the rank of the code as determined by said range bits, comprising the steps of:

a. separately storing a higher-ranking code and a lower-ranking code derived from a pair of coincident voice samples to be arithmetically combined;

b. downshifting the quantum bits of the lower-ranking code to less significant bit positions in which they would have their original numerical weights if prefaced by the range bits of the higher-ranking code;

c. comparing the polarity bits of the two codes stored in step (a); and

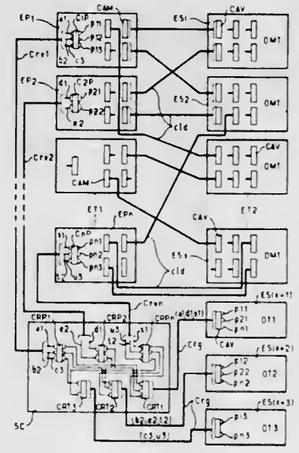
d. subjecting the quantum bits of the higher-ranking code and the downshifted quantum bits of the lower-ranking code to an algebraic summing operation with a sign depending on the relative values of the corresponding polarity bits as determined by step (c).

4,076,967

TRUNKING PROCEDURE AND ARRANGEMENT FOR THE CONNECTION OF FUNCTIONAL UNITS

Philippe Cailloux, Antony, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel S. A., Paris, France

Filed Dec. 6, 1976, Ser. No. 747,852
Claims priority, application France, Dec. 31, 1975, 75 40326
Int. Cl.² H04Q *3/06*
U.S. Cl. 179—18 AG **7 Claims**



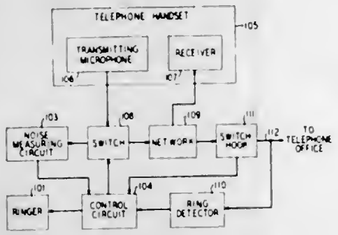
2. A trunking system of connections between blocks in a telecommunications exchange structure having at least two stages, each stage comprising a plurality of blocks and each block comprising a plurality of functional units of a majority type and a minority type, comprising: direct trunk connections of standardized capacity providing direct inter-stage connection between majority functional units of two adjacent stages, regrouping means for indirect inter-stage connection of minority functional units, said regrouping means having first connections including a multi-function connector to different blocks of a stage including connections pertaining to minority functional units of different types and second connections regrouping the first connections by functional type of minority unit and connected via said direct trunk connections of standardized capacity by stage-spanning portions to blocks of an adjacent stage specific to the respective types of functional unit, whereby the stage-spanning portion of the innerstage connections of minority functional units are provided by standardized trunks.

4,076,968

TELEPHONE RINGER INTENSITY CONTROL RESPONSIVE TO AMBIENT NOISE

Blake Lane Wattenbarger, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 2, 1976, Ser. No. 719,909
Int. Cl.² H04M *1/26*
U.S. Cl. 179—84 R **10 Claims**



1. A telephone set including means responsive to an incoming ringing signal for generating an audible alerting signal; characterized by:

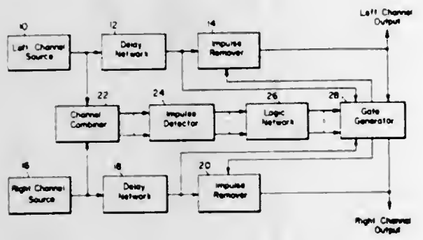
a loudness control responsive to audible sounds, external to said telephone set and occurring prior to the arrival of the ringing signal, for establishing a threshold amplitude level of the audible alerting signal and responsive to audible sounds including the contribution of the audible alerting signal to the level of the audible sounds, external to said telephone set and occurring subsequent to the arrival of the ringing signal, for increasing the level of the audible alerting signal above the threshold level.

4,076,969

IMPULSE NOISE REDUCTION SYSTEM

Jack Sacks, Thousand Oaks, Calif., assignor to Singer & Singer, Torrance, Calif., a part interest

Filed Apr. 7, 1975, Ser. No. 565,876
Int. Cl.² G11B *3/00*
U.S. Cl. 179—100.4 D **15 Claims**



1. A system for detecting undesired signals on a record medium having desired recorded signal information comprising:

means for generating a pair of correlated signals termed signal A and signal B from said desired recorded signal information on said record medium,

means for combining said pair of correlated signals A and B to attenuate said desired recorded signal information and enhance undesired signals,

means for generating a gating signal having a leading edge determined by said undesired signals and a trailing edge directly determined by said desired recorded signal information, and

means for generating at least one delayed output signal from said desired recorded signal information,

gating means for gating out undesired signals from said delayed output signal with said gating signal, and

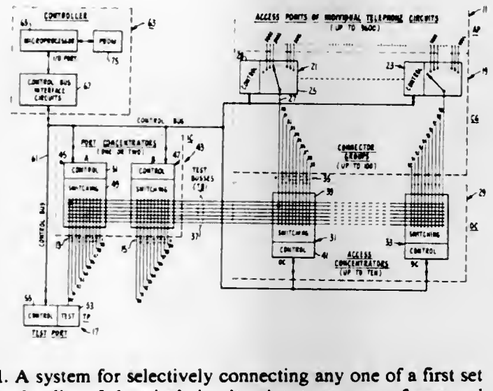
means for substituting information that is consistent with said desired recorded information during said gating signal.

4,076,970

SWITCHING SYSTEM HAVING A CENTRAL CONTROLLER FOR ACCESSING INDIVIDUAL TELEPHONE CIRCUITS FOR TESTING

Andre Lubarsky, Jr.; G. Scott Warner, and Goro R. Tahara, all of Sunnyvale, Calif., assignors to Telecommunications Technology, Inc., Sunnyvale, Calif.

Filed Oct. 4, 1976, Ser. No. 729,585
Int. Cl.² H04M *3/22*
U.S. Cl. 179—175.2 R **16 Claims**



1. A system for selectively connecting any one of a first set of a plurality of electrical circuit points to any one of a second set of a plurality of electrical circuit points, comprising:

means including a plurality of separately controllable switching units for selectively connecting any one of said first set of circuit points to any one of said second set of circuit points in response to control signals,

means for developing an electrical signal representative of two circuit points, one from each of said first and second sets, that are desired to be connected together,

means independent of said connecting means and connected between each of said switching units and said signal developing means for communicating control and status signals therebetween, and

means including programmed microprocessor connected to said control signal communicating means in a manner to communicate control and status signals in two directions between it and any of said signal developing means and switching units for making a connection between one circuit point of said first set of electrical circuit points and one circuit point of said second set of electrical circuit points as specified by said signal developing means.

4,076,971

SUBSCRIBER LINE TESTING SYSTEM

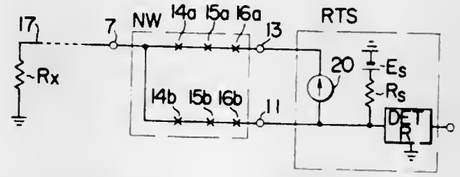
Takuji Mukaemachi, and Yutaka Fukushima, both of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 8, 1976, Ser. No. 721,216
Claims priority, application Japan, Sep. 12, 1975, 50-111489; Dec. 30, 1975, 50-158563; Dec. 30, 1975, 50-158564
Int. Cl.² H04B *3/46*
U.S. Cl. 179—175.3 R **8 Claims**

1. A subscriber line testing system comprising:

a. a channel network having a first channel including a line terminal, first and second trunk terminals and at least one current self-holding semiconductor switching device connecting said line terminal with said first trunk terminal, and a second channel including at least one current self-holding semiconductor switching device for connecting said line terminal with said second trunk terminal;

b. a subscriber line connected to said line terminal; and



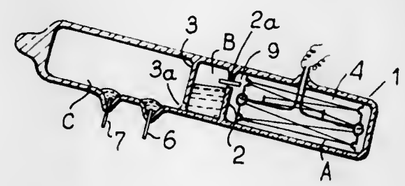
c. a line test trunk including a floating current source connected to said first and second trunk terminals and a test circuit connected to said second trunk terminal.

4,076,972

LIQUID CONTACT SWITCH HAVING PLURAL COMPARTMENTS AND ELECTRICAL HEATER

Jean Efther, 20, rue de l'Aubepine, Antony, France (92160), and Jean Denisselle, 43 B^{d} Victor, Paris, France (75015)

Filed May 10, 1976, Ser. No. 685,097
Int. Cl.² H01H *29/00*
U.S. Cl. 200—33 A **9 Claims**



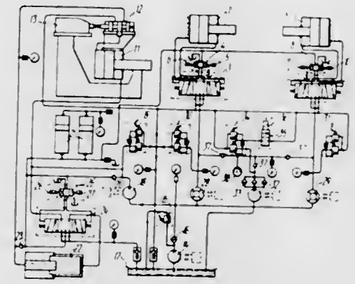
1. An electrical switch including a closed reservoir subdivided into three compartments comprising, a power compartment, a control compartment and an intermediate compartment, a body of electrically conductive liquid normally contained within said intermediate compartment, said power compartment and intermediate compartment being separated by a first impermeable wall provided with a first channel at the bottom thereof to allow the passage of said conductive liquid between the intermediate compartment and power compartment, the bottom wall of said power compartment being inclined to urge the return of liquid to the intermediate compartment and being provided with two spaced electrodes, said intermediate compartment and control compartment being separated by a second impermeable wall provided with a second channel above the normal level of the liquid conductor when contained in the intermediate compartment, and the electrical resistor in said control compartment for heating gas in said control compartment when energized, said second channel being provided with means to allow the passage of gas between compartments but to resist the passage of conductive liquid therethrough, whereby when the gas is heated by the energized resistor, pressure of the gas in the intermediate compartment is increased to displace conductive liquid into the power compartment to complete an electrical circuit between said two electrodes.

4,076,973

RESISTANCE TYPE FLASH BUTT WELDER

Viktor Senderovich Lifshits, Kavkazsky bulvar, 21, korpus 2, kv.41, Moscow; Alexandr Alexandrovich Sukhanov, prospekt Lenina, 10a, kv.67, Elektrostal Moskovskoi oblasti; Nikolai Makarovich Dergachev, prospekt Juzhny, 7, korpus 1, kv.178, Elektrostal Moskovskoi oblasti; Arkady Alexeevich Pevnev, Oktyabrskaya ulitsa, 13, kv. 44, Elektrostal Moskovskoi oblasti; Vladimir Nikitich Baranov, prospekt Lenina, 30/13, kv. 16, Elektrostal Moskovskoi oblasti, and Leonid Pavlovich Shklyanov, ulitsa Zhulyabina, 8, kv.14, Elektrostal Moskovskoi oblasti, all of U.S.S.R.

Filed Aug. 20, 1976, Ser. No. 716,257
Int. Cl.² B23K *11/04*
U.S. Cl. 219—97 **5 Claims**



1. A resistance type flash butt welding apparatus, comprising moving and stationary clamps adapted for gripping articles being welded; hydraulic drives controlling the clamping and releasing of said articles being welded and provided with slide valves ensuring individual control of said hydraulic drives; gear means for transferring the moving clamp with respect to the stationary one, said gear means comprising at least one hydraulic ram, pilot valve means for controlling said hydraulic ram, control means employing an actuator means for controlling said pilot valve, and first oil plant means feeding said hydraulic drives; said apparatus including: a second self-contained pumping accumulator plant having a relief valve in its delivery circuit, and second plant being associated hydraulically with said hydraulic ram of the moving clamp transfer gear means; a device for decreasing pressure in the hydraulic ram of said moving clamp transfer gear means and in the pilot valve during flashing of the articles being welded and for increasing said pressure during upsetting of said articles; said device being a differential circuit adapted for feeding said hydraulic ram of the moving clamp transfer gear means through said pilot valve means, being fitted with an additional slide valve and a nonreturn valve for switching a hydraulic ram drain from the differential ram feed circuit to free drain at the instant the flashing operation is at an end, said device being fed from said second self-contained pumping accumulator plant; a low-pressure high-capacity pump with a filter, a relief valve, a nonreturn valve and an unloading slide valve, said high capacity pump being adapted to feed said hydraulic drives of both the moving and stationary clamps; high-pressure, low-capacity pumps with relief valves, said pumps being associated hydraulically with said clamp hydraulic drives; a device for automatic switching over the clamp hydraulic ram feed circuit from the low-pressure pump operating during preliminary clamping of the articles being welded to the high-pressure pumps operating during final clamping of said articles; said device being adapted for switching over the oil pumps and comprising a low-pressure pump unloading slide valve being associated hydraulically with said low pressure pump and electrically with the high-pressure pump motors for switching them on at the moment the low-pressure pump is being unloaded; said second pumping accumulator plant and high-pressure pumps being connected to the first oil plant, with a hy-

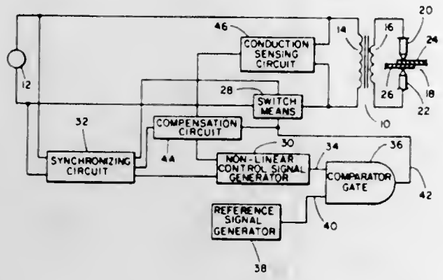
draulic control of the slide valves of the moving and stationary clamps being connected to the second pumping accumulator plant.

4,076,974

CURRENT CONTROL DEVICE AND METHOD

Edwin Gee, St. Charles, Ill., assignor to Technitron, Inc., Carol Stream, Ill.

Filed Dec. 17, 1975, Ser. No. 641,434
Int. Cl.² B23K *11/24*
U.S. Cl. 219—108 **7 Claims**



1. In a welding circuit having a transformer welding electrodes connected to the secondary of the transformer and an AC voltage source connected to the primary of the transformer, an improvement for regulating current in said primary winding comprising:

a synchronizing circuit means for generating a signal in fixed phase relationship with the zero crossings of the signal from said AC voltage source;

means for generating a nonlinear control signal in synchronism with the signal from said synchronizing circuit, said control signal having a decelerating negative slope during one portion thereof and an accelerating negative slope during a second portion thereof;

a conduction sensing circuit means for generating a conduction signal indicative of whether or not a voltage exists across said primary;

a compensation circuit means responsive to said synchronizing signal and said conduction signal for temporarily clamping the initial output level of said control signal during the times between the zero crossings of the voltage from said AC voltage source and the next interruption of current through said primary;

means for comparing said nonlinear control signal with a reference signal and for generating a switching signal indicative of whether or not said control signal is less than said reference signal; and

first switch means responsive to said switching signal for permitting current to flow between said AC voltage source and said primary in response to said switching signal.

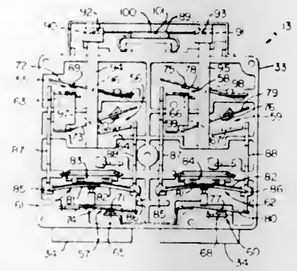
4,076,975

ELECTRICAL FURNACE AND PARTS THEREFOR

Hugh J. Tyler, and Denis G. Wolfe, both of Santa Ana, Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Feb. 25, 1976, Ser. No. 661,056
Int. Cl.² H05B *3/02*
U.S. Cl. 219—483 **20 Claims**

1. In combination, a frame means, a plurality of electrical heaters carried by said frame means and having terminal means, control means carried by said frame means for said heaters and having terminal means, and a rigid lead unit carried by said frame means and having rigid lead means directly and electrically interconnected to said terminal means of said heaters and said control means, said unit having terminal means for electrically interconnecting said rigid lead means to power source leads whereby said power source leads will be directly and electrically interconnected to said terminal means of said heaters and said control means by said rigid lead means, said rigid lead unit having a manually operated switch means for opening said rigid lead means to disconnect said power source leads from said heaters and said control means, said rigid lead unit having a removable section, said section carrying part of said rigid lead means and thereby defining a part of said switch means, said part of said rigid lead means of said section having connections for axially interconnecting with said terminal means of said heaters and said control means when said section is axially moved to one position relative to said unit and for axially disconnecting with said terminal means of said heaters



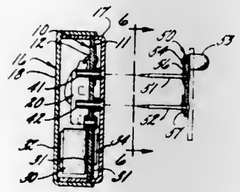
and said control means when said section is axially moved to another position relative to said unit, said section having other connections disposed intermediate said terminal means for said power leads and said connections for said terminal means of said heaters and said control device, said other connections axially interconnecting with said rigid lead means disposed between said section and said terminal means for said power source leads when said section is axially moved to said one position thereof and for axially disconnecting with said rigid lead means disposed between said section and said terminal means for said power source leads when said section is axially moved to said other position thereof.

4,076,976

FLASH ASSEMBLY FOR CLOTHING-SUPPORTED JEWELRY

Russell S. Fenton, 308 Eaton St., Northfield, Ill. 60062

Filed Nov. 26, 1976, Ser. No. 745,366
Int. Cl.² F21V *33/00*
U.S. Cl. 362—104 **5 Claims**



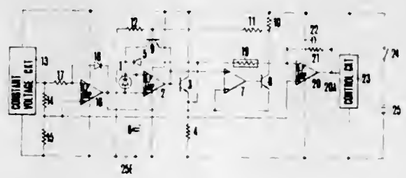
1. A flash assembly for clothing-supported jewelry comprising, in combination, a miniature circuit board having front and back surfaces, a pair of sockets arranged in parallel relation on the back surface and presenting spaced pin-receiving openings at the front surface, a jewelry mounting plate made of a flat piece of insulating material of a size substantially smaller than the circuit board and having a light-emitting diode projecting forwardly from the face thereof, the mounting plate having a pair of sharp, stiff pins of small diameter connected to the light-emitting diode, the pins being parallel to one another and spaced to coincide with the socket openings, the pins being in penetrating relation to the mounting plate and supported thereon cantilever fashion, a circuit module and battery on the back surface of the circuit board, the circuit module comprising an oscillator circuit having its input connected to the battery and its output connected to the sockets, a housing for the circuit board in the form of a flat box of plastic having a mated front and back closely fitted to the circuit board, the front of the box having clearance openings registering with the socket openings, the back of the box serving as a stop in the path of movement of the pins to preclude scratching of the user by the points of the pins, the sockets providing frictional retention for the pins so that upon entry of the pins into the sockets with a layer of clothing in between the housed circuit board and mounting plate are mutually captive and the light-emitting diode is electrically connected to the output of the oscillator for periodic flashing, the face of the mounting plate having sufficient surface to support a piece of jewelry in integrated relation with the light-emitting diode.

4,076,977

LIGHT MEASURING CIRCUIT WITH STRAY CAPACITANCE COMPENSATING MEANS

Tokuichi Tsunekawa, Yokohama, and Tetsuya Taguchi, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1975, Ser. No. 644,317
Claims priority, application Japan, Dec. 28, 1974, 49-2479; Jul. 2, 1975, 50-82116
Int. Cl.² H01J *39/12*; G01J *1/32*
U.S. Cl. 250—206 **31 Claims**



14. A light measuring system comprising:

(a) a photosensitive element having an output terminal;

(b) an amplifier connected to the output terminal of said photosensitive element;

(c) means for compensating the time-lag response of the amplifier caused by stray capacitance within at least said amplifier, said compensating means being connected to said amplifier at an output terminal thereof and provided with a switching element actuated in response to an operative condition of said amplifier upon starting of photometry; and

(d) an output circuit connected to an output terminal of said amplifier.

4,076,978

FIBER OPTIC BUNDLE BEAM EXPANDER WITH IMAGE INTENSIFIER

Thomas M. Brennan, Cambridge, and Robert M. Burley, Concord, both of Mass., assignors to Baird-Atomic, Inc., Bedford, Mass.

Continuation of Ser. No. 593,361, Jul. 7, 1975, abandoned, which is a continuation of Ser. No. 419,040, Nov. 26, 1973, abandoned. This application Oct. 14, 1976, Ser. No. 732,347
Int. Cl.² H01J *31/50*; G02B *5/16, 23/08*
U.S. Cl. 250—213 VT **5 Claims**

1. A biocular viewing system comprising:

a. a sealed housing in a periscope configuration having an input section and an output section, said input section and said output section at opposite ends of said housing;

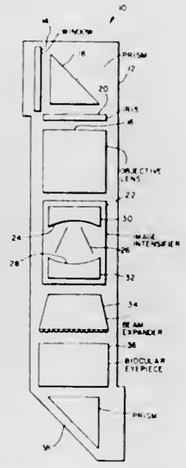
b. a right angle prism mounted within said housing adjacent said input section;

c. objective lens means;

d. an iris positioned between said right angle prism and said objective lens means, rays from an object to be viewed being directed to said objective lens means through said right angle prism and said iris, said rays forming an image at the focus of said objective lens means;

e. image intensifier means having input and output sections, an image focused on said input section by said objective lens means, an amplified image presented at said output section;

f. unidirectional fiber optic bundle beam expander means including fiber optic bundle means and unidirectional diffuser means, said fiber optic bundle means having input and output faces, said unidirectional diffuser means formed in said output face at an image plane of said fiber



optic bundle means, said fiber optic bundle means having a numerical aperture that is less than unity, said amplified image at said output section being directed towards said input face and being transmitted to said output face by said unidirectional fiber optic bundle means, said unidirectional diffuser means operative to spread unidirectionally the energy in the numerical aperture of said fiber optic bundle means for biocular viewing of said image; and

g. biocular eyepiece means in optical registration with said unidirectional fiber optic bundle beam expander means, said biocular eyepiece means presenting said unidirectionally spread image at said output face for biocular viewing.

4,076,979

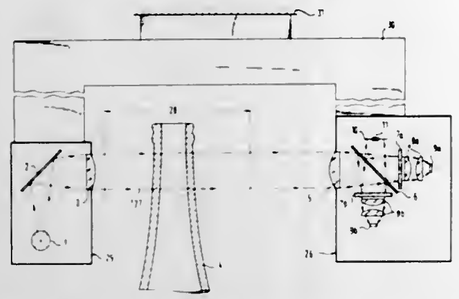
BOTTLE COLOR IDENTIFICATION APPARATUS

Arthur Walter, Denzlingen; Günter Fetzer, Gundelfingen, and Jurgen Erdmann, Buchholz, all of Germany, assignors to Erwin Sick Gesellschaft mit beschrankter Haftung Optik-Elektronik, Waldkirch, Germany

Filed Jun. 30, 1976, Ser. No. 701,341
Claims priority, application Germany, Jul. 29, 1975, 2533873
Int. Cl.² G01J *3/34, 3/50*
U.S. Cl. 250—226 **7 Claims**

1. An apparatus for the identification of bottle colors, comprising means for passing a light beam through the bottle, means for receiving the light beam passing through the bottle, said receiving means comprising a spectral decomposition arrangement which emits a signal characteristic of the bottle color, said spectral decomposition arrangement comprising two photoelectric cells with different filters, two comparators each having an input and an output, means for applying the output signals of said two photoelectric cells to the inputs of said two comparators, and means including three AND gates

for combining the outputs of said two comparators for forming a white, green and brown signal, and means for emitting both



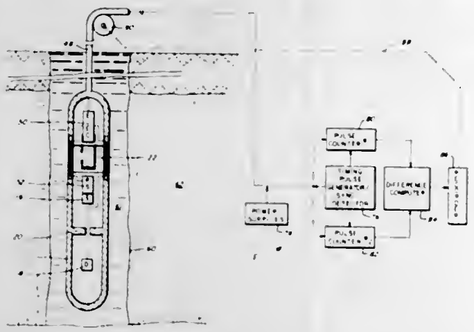
the single signals of the photoelectric cells and the signals combined from the single signals.

4,076,980

RADIOACTIVE WELL LOGGING TO MEASURE EARTH FORMATION FLUID PERMEABILITY BY ELECTROHYDRAULIC INDUCED FLOW OF RADIATION ACTIVATED FLUIDS

Dan M. Arnold; Donald J. Dowling, and Wayne F. Warren, all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Oct. 26, 1976, Ser. No. 735,670
Int. Cl.² G01V *5/00*
U.S. Cl. 250—270 **34 Claims**



1. A method of measuring the fluid permeability of subsurface earth formations in the vicinity of a well borehole, comprising the steps of:

(a) bombarding fluid in the borehole with high energy neutrons to activate the borehole fluid to thereby emit radiation;

(b) imparting a radially directed pressure pulse to the activated fluid to cause flow of the activated fluid;

(c) detecting the amount of radiation from activated fluid flowing vertically in the borehole in response to said pressure pulse to thereby obtain a measure of the fluid permeability of the formations.

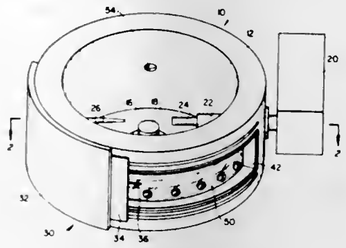
4,076,981

POSITION SENSITIVE AREA DETECTOR FOR USE WITH X-RAY DIFFRACTOMETER OR X-RAY CAMERA

Robert A. Sparks, Palo Alto; George B. Rothbart, Menlo Park, and Roger N. Samdahl, San Jose, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jul. 29, 1976, Ser. No. 709,691
Int. Cl.² G01M *23/20*
U.S. Cl. 250—272 **28 Claims**

1. A position-sensitive detector adapted, during operation thereof, to hold an ionizable gasuous medium and suitable for use in detecting x-rays diffracted over a wide angle from a sample under analysis; said detector comprising housing having a hollow detector chamber therein, said housing having a curved side wall having an elongate opening therein, a back cathode plane and at least one anode wire spaced therefrom disposed within said detector chamber in the path of x-rays entering said detector chamber through said elongate opening,



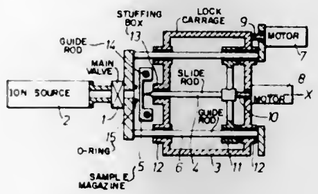
said back cathode plane comprising a plurality of spaced cathode conductors on an insulator support, each anode wire extending substantially transverse to the elongated dimension of said cathode conductors and being mechanically supported only at the ends thereof and otherwise being orientated in planar arcuate form, during operation of said detector, solely by electrostatic forces created by potential differences between each anode wire and said cathode conductors.

4,076,982

AUTOMATIC SAMPLE-CHANGER FOR MASS SPECTROMETERS

Hans-Peter Ritter, Cologne; Rainer Strewinsky, Leverkusen; Hans-Dieter Bulwien, Leverkusen; Engelbert Koch, Leverkusen; Hermann Bartholl, Leverkusen, and Walter Hupp, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 6, 1976, Ser. No. 729,929
Claims priority, application Germany, Oct. 31, 1975, 2548891
Int. Cl.² B01D *59/44*
U.S. Cl. 250—288 **10 Claims**



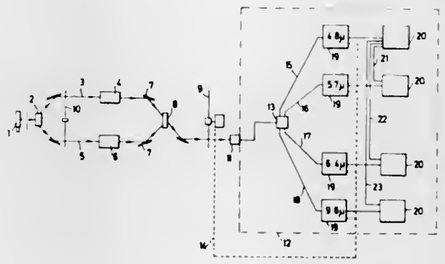
1. An automatic sample changer for a mass spectrometer having a vapourising device and a lock region, the changer comprising: a slide rod movable into and out of the vapourising device, a crucible holder mounted on one end of the slide rod and adapted to hold a crucible for the sample to be vapourised for insertion by the slide rod into the mass spectrometer; high vacuum lock means including a lock carriage in which the slide rod is mounted and which is capable of independent parallel movement relative to the slide rod, a stuffing box disposed on the end face of the lock carriage directed towards the mass spectrometer for effecting the vacuum tight passage of the slide rod and means for sealing the space between the end face of the lock carriage, the stuffing box and the lock region of the mass spectrometer when the lock carriage has moved into contact with that lock region, and a sample magazine adapted to move relative to the slide rod to allow sample crucibles to be taken selectively from the magazine by the crucible holder.

4,076,983

ANALYSIS OF EMULSIONS AND SUSPENSIONS

Joseph Hopkins, Cramlington, and David McKenna, Birtley, both of England, assignors to Sir Howard Grubb Parsons & Company Ltd., England

Filed Aug. 2, 1976, Ser. No. 710,704
Claims priority, application United Kingdom, Aug. 4, 1975, 32510/75
Int. Cl.² G01N *21/26*
U.S. Cl. 250—341 **3 Claims**



1. A method for the quantitative estimation of the dispersion medium and one or more components forming the disperse phase of an emulsion or suspension or mixture thereof, wherein the mean particle size of the disperse phase is less than a selected absorption wavelength of the dispersion medium and also less than a selected absorption wavelength for each of one or more components of the disperse phase, and the said selected absorption wavelength of the dispersion medium is at a wavelength differing substantially from the or each selected absorption wavelength for the disperse phase component or components and the absorption by the or each disperse phase component is stronger than the absorption by the dispersion medium at the selected absorption wavelength for the or each disperse phase component, said method comprising the steps of:

a. passing a first beam of radiation from a source of infra-red radiation through a sample of fixed path length of the dispersion medium only of an emulsion or suspension to be analysed, and a second beam of the radiation through a second reference sample of fixed path length of the dispersion medium only;

b. selecting a narrow range of wavelength of radiation from the two beams containing the selected absorption wavelength of the dispersion medium and effecting a balance in the resultant measured energy of the beams subsequent to their passage through the dispersion medium samples for this range of wavelength by way of backing-off means in one channel of multi-channel measuring circuitry reading this range of wavelength only;

c. successively repeating step (b) for different narrow ranges of wavelength of radiation for each selected absorption wavelength of the remaining components of the disperse phase using in each repetition of separate channel of the multi-channel measuring circuitry associated with the respective narrow range of wavelength chosen;

d. replacing the sample of dispersion medium in the first beam of radiation by a sample of the emulsion or suspension or mixture thereof to be analysed having the same fixed path length, selecting the same narrow range of wavelength of radiation from the two beams as in step (b) and measuring and storing the absorbance due to the disperse phase of the sample being analysed in terms of the imbalance in the resultant measured energy of the beams subsequent to their passage through the dispersion medium reference sample and the sample being analysed for this range of wavelength;

e. selecting a narrow range of wavelength of radiation from the two beams containing the selected absorption wavelength of a component of the disperse phase whilst maintaining the sample being analysed in the first beam of radiation and the reference sample of dispersion medium in the second beam of radiation and determining the absorbance due to this component in terms of the resultant absorbance indicated by the measured imbalance of energy in the two beams summated with the product of the stored value from step (d) and the ratio of the absorption coefficient of the dispersion medium at this selected narrow range of wavelength to the absorption coefficient of the dispersion medium at the narrow range of wavelength selected in step (b); and

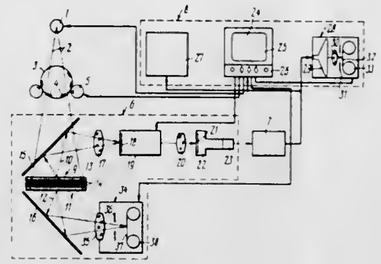
f. successively repeating step (e) using a different narrow range of wavelength of radiation for each selected absorption wavelength of the remaining components of the disperse phase whilst in each case using the product of the stored value from step (d) with the ratio of the absorption coefficient of the dispersion medium at the narrow range of wavelength selected for the particular disperse phase component determination to the absorption coefficient of the dispersion medium at the narrow range of wavelength selected in step (b).

4,076,984

INTROSCOPE

Jury Vasilievich Gromov, 9 ulitsa Sokolinoi gory, 3, kv. 61, Moscow; Boris Ivanovich Leonov, Oktyabrasky prospekt, 164, kv. 53; Oleg Petrovich Smirnov, 115 kvartal, ulitsa Jubileinaya, 17, kv. 48, both of Ljubertsy Moskovskoi oblasti; Nikolai Nikolaevich Smirnov, ulitsa Demyana Hednogo, 20, korpus 5, kv. 12, Moscow; Ljudmila Lavrentievna Nagornaya, ulitsa Danilevskogo, 31, kv. 6, and Yakov Abramovich Zakharin, ulitsa Ekonomicheskaya, 14, kv. 59, both of Kharkov, all of U.S.S.R.

Filed Jun. 23, 1976, Ser. No. 699,074
Int. Cl.² G03B *41/16*
U.S. Cl. 250—367 **37 Claims**



1. An introscope comprising:

a source of radiation generating a flow of penetrating radiation which passes through a tested object with reference marks set thereon;

a first fluoroscopic converter having a certain spectrum of luminescence which is positioned in the path of said penetrating radiation after said test object and which transforms said penetrating radiation into a first flux of visible light which contains information on the shadow interior of said test object;

a first mirror placed in relation to the first fluoroscopic converter so that it receives the first flux of visible light transmitted from said first fluoroscopic converter;

a lens positioned so that it receives the first flux of visible light reflected from the first mirror;

an image converter positioned so that the first flux of visible light reflected from the first mirror comes through said lens and into said image converter, said image converter amplifying said first flux of visible light;

a closed-circuit television system positioned so that it receives the first flux of visible light amplified in said image converter;

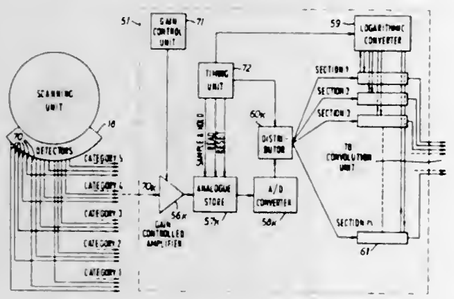
a pickup television tube of said closed-circuit television system having a photocathode, which is the input element of this system, said photocathode receives the first flux of visible light after it is amplified in the image converter and amplifies said flux;
a unit of intermediate video signal amplification and processing having an input and an output and being connected by its input to said pickup tube;
a monitor display unit of said closed-circuit television system having an input and a television screen and being connected by its input to said output of said unit of intermediate videosignal amplification and processing, said television screen records the shadow image of said interior of said test object;
a second fluoroscopic converter having a spectrum of luminescence other than said spectum of luminescence of the first fluoroscopic converter which is positioned in the path of said penetrating radiation after said test object parallel to the first fluoroscopic converter so that it also receives said penetrating radiation and which transforms said penetrating radiation into a second flux of visible light which contains information on the shadow interior of said test object;
a second mirror positioned in relation to the second fluoroscopic converter so that it receives the second flux of visible light transmitted from second fluoroscopic converter;
a cinema recorder having a film and being positioned so that it receives the second flux of visible light reflected from the second mirror, said film records the shadow image of the interior of said test object and serves to correct by said reference marks the shadow image of the interior of said test object obtained simultaneously on said television screen of said monitor display unit; and
a remote control unit for controlling said radiation source, said image converter and said cinema recorder.

4,076,985

COMPUTERIZED TOMOGRAPHIC SCANNER WITH BEAM DISTRIBUTION CONTROL

Christopher Archibald Gordon LeMay, Osterley, England, assignor to EMI Limited, Hayes, England

Division of Ser. No. 493,403, Jul. 31, 1974, Pat. No. 3,973,128. This application May 14, 1976, Ser. No. 686,493
Claims priority, application United Kingdom, Aug. 18, 1973, 39145/73
Int. Cl.² G01M *23/00*
U.S. Cl. 250—445 T **3 Claims**



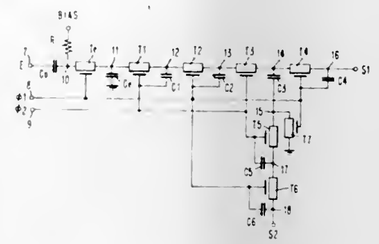
1. Apparatus for examining a body by means of penetrating radiation, such as x-radiation, comprising a source of said radiation arranged to project said radiation along at least one path through a substantially planar region of the body, means for scanning said source relative to said body to project said radiation through said region along further paths, detector means for providing output signals indicative of the amount of absorption suffered by said radiation on traversing said paths, said detector means including a plurality of detectors, adjacent ones of which are disposed to receive radiation along respective paths inclined to each other at a given angle, and means being provided for sampling said detectors in groups at interleaved times to derive therefrom output signals relating to sets of substantially parallel paths, corresponding paths in neighboring sets being inclined on each other at an angle greater than said given angle.

4,076,986

DEVICE FOR REPRODUCING THE CHARGE STORED IN AN INPUT CAPACITOR IN A PLURALITY OF OUTPUT CAPACITORS

Alain Croisier, and René Glaise, both of Cagnes-sur-Mer, France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 6, 1976, Ser. No. 730,057
Claims priority, application France, Oct. 31, 1975, 75 33884
Int. Cl.² H03K *17/02, 17/56*
U.S. Cl. 307—221 D **6 Claims**



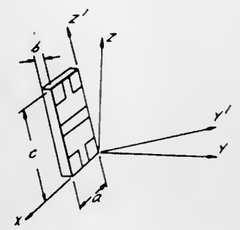
1. An N stage bucket brigade device (BBD) for reproducing in each of N output capacitors the same charge quantity stored in an input capacitor, wherein N is an integer, comprising
an input capacitor, N bucket brigade device stages, each stage including
a first field effect transistor having first and second controlled current carrying electrodes and a control electrode to which a first clock signal is applied, and a first capacitor having a first and a second terminals, said first terminal being connected to said second controlled electrode of said first transistor, a second field effect transistor having first and second controlled current carrying electrodes and a control electrode to which a second clock signal is applied, and a second capacitor having a first and a second terminals, said capacitor being connected between said second controlled electrode of said first transistor and the control electrode, said second controlled electrode of said first transistor being connected to said first controlled electrode of said second transistor,
means for connecting said input capacitor to said first controlled electrode of said first transistor in said first one of said N BBD stages,
means for causing said input capacitor and said first capacitors in each of said N stages to be connected in series when said first transistors in said N stages are in their conductive state, and
means for causing said second terminal of said first capacitors in each of said N stages to be connected to ground while said first transistors in said N stages are turned off and said second transistors in said N stages are turned on.

4,076,987

MULTIPLE RESONATOR OR FILTER VIBRATING IN A COUPLED MODE

Alphonse E. Zumsteg, Solothurn, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Bienne, Switzerland

Filed Dec. 10, 1976, Ser. No. 749,559
Int. Cl.² H01L *41/04*
U.S. Cl. 310—361 **10 Claims**



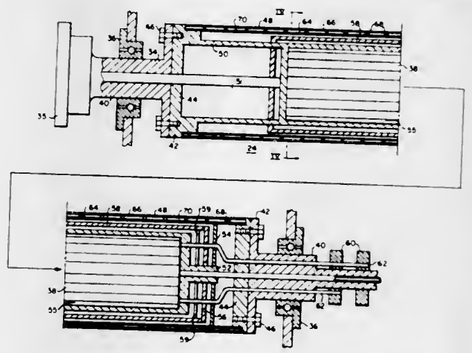
2. A multiple resonator or filter comprising a bar of Y cut quartz rotated approximately 35° and having its greatest dimension (length) arranged along the rotated optical (Z')axis, said bar being arranged and adapted to vibrate in a mode in which thickness shear vibrations are strongly coupled to even harmonic flexure vibrations, the width/thickness ratio where width is measured along the electric (X)axis having the following range of values
1.1 to 1.9 for coupling with the 2nd flexure harmonic
2.2 to 3.6 for coupling with the 4th flexure harmonic
3.6 to 5.3 for coupling with the 6th flexure harmonic
5.1 to 6.8 for coupling with the 8th flexure harmonic
6.5 to 8.4 for coupling with the 10th flexure harmonic
8 to 10.4 for coupling with the 12th flexure harmonic and wherein at least two energy trapping zones are provided on the bar said zones extending over the entire width of the bar.

4,076,988

SUPERCONDUCTING DYNAMOELECTRIC MACHINE HAVING A LIQUID METAL SHIELD

Donald C. Litz, Franklin Township, Cambria County, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 17, 1976, Ser. No. 715,259
Int. Cl.² H02K *9/00*
U.S. Cl. 310—52 **4 Claims**



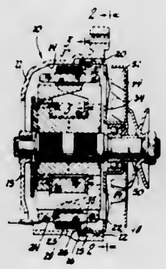
1. A superconducting dynamoelectric machine comprising a frame enclosing a stator having an armature winding therein, and a rotor supporting a superconducting dc field winding arranged for rotation in said stator,
means for supporting said rotor for rotation on bearings in said frame,
said rotor including a cylindrical member completely enclosing said field winding,
means on said cylindrical member supporting the field winding, said means being of sufficient structural strength to absorb torque forces imposed on said rotor during operation,
radiation shield means in said cylindrical member for absorbing thermal radiation from structural members operating in substantially ambient temperature,
said cylindrical member including damper shield means which contains an electrically conductive liquid which is effective in restoring torque to the rotor when load system changes and in shielding the superconductive field winding from ac fields generated in the stator during operation, and
means in said shaft for supplying excitation current to said winding and cooling means associated with said machine for furnishing a fluid coolant to said rotor for maintaining the field winding at about 4.2° K.

4,076,989

HOUSING AND STATOR ASSEMBLY FOR A DYNAMOELECTRIC MACHINE

Richard D. Watson, Chesterfield, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 2, 1976, Ser. No. 702,217
Int. Cl.² H02K *5/00*
U.S. Cl. 310—89 **3 Claims**



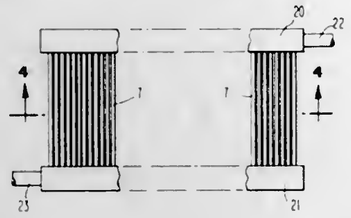
1. A housing and stator assembly for an easily assembled and disassembled dynamoelectric machine comprising, in combination:
a generally cylindrical case having an open axial end, the case having an inner surface defining first axial stop means adjacent and facing the open axial end and second axial stop means between the first axial stop means and the open axial end and facing the first axial stop means;
a stator in the cylindrical case, the stator having peripheral mounting means axially abutting the first axial stop means and one or more circumferentially extending, axially rising ramps facing the second axial stop means, the stator being adapted for insertion into the cylindrical case through the open axial end into abutment with the first axial stop means; and
an end cap for the cylindrical case, the end cap having one or more tabs wedged between the ramps and the second axial stop means to lock the end cap in the open end of the cylindrical case and the stator assembly within the cylindrical case, the end cap being adapted for axial insertion into the open end past the second axial stop means and subsequent rotation with the tabs moving circumferentially between the ramps and the second axial stop means into locking engagement therebetween.

4,076,990

TUBE TARGET FOR FUSION NEUTRON GENERATOR

George O. Hendry, Napa; John L. Hilton, Walnut Creek, both of Calif., and Jinchoon Kim, Oak Ridge, Tenn., assignors to The Trustees of the University of Pennsylvania, Philadelphia, Pa.

Filed Oct. 8, 1975, Ser. No. 620,715
Int. Cl.² H01J 7/24, 39/00
U.S. Cl. 313—61 S 14 Claims



1. A neutron-producing target for use with a fusion neutron generator comprising:
an array of closely-spaced parallel neutron generating tubes arranged in planar rows, the neutrons being generated in response to ions impinging upon said tubes;
a first, coolant input manifold connecting said tubes at respective first ends thereof;
a second, coolant withdrawal manifold connecting said tubes at respective ends thereof opposite said first ends;
a cooling liquid; and
means for coupling said liquid to said first manifold and for withdrawing fluid from said second manifold, whereby said liquid is passed through said tubes in parallel fashion with respect to one another.

4,076,991

SEALING MATERIALS FOR CERAMIC ENVELOPES

Ranajit K. Datta, Cleveland Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed May 6, 1977, Ser. No. 794,398
Int. Cl.² H01J 61/36; C04B 35/50
U.S. Cl. 313—220 9 Claims



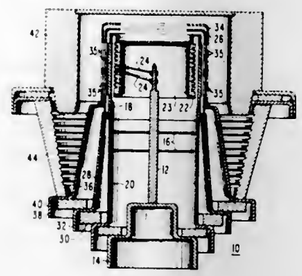
1. A sealing composition for sealing to ceramics comprising reacted material characterized by proportions of 20–80% by weight Dy_2O_3, 0–55% by weight Al_2O_3 and 5–45% by weight SiO_2.

4,076,992

VACUUM TUBE GRID STRUCTURES OF PHOSMIC BRONZE HAVING COPPER AND COPPER ALLOY CONICAL SUPPORTS

John Thomas Mark, Millersville, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 22, 1976, Ser. No. 698,368
Int. Cl.² H01J 1/46, 21/10
U.S. Cl. 313—296 7 Claims



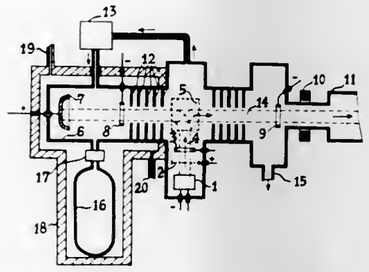
1. A vacuum tube comprising:
a cylindrical cathode;
a frusto-conical Phosmic bronze control grid extending coaxially around the cathode;
a first hollow truncated cone having it smaller diameter end attached to the larger diameter end of the control grid, the first cone being made of a copper;
a cylindrical Phosmic bronze screen grid extending coaxially around the control grid;
a second hollow truncated cone having its smaller diameter end attached to one end of the screen grid and extending around the first cone, the second cone being made of a copper clad alloy of cobalt, nickel and iron; and
an anode extending around the screen grid.

4,076,993

ION SOURCE FOR HIGH INTENSITY ION BEAM

Karl Nowak, Mollard gasse 8, A 1060 Vienna 6, Austria

Filed Aug. 1, 1974, Ser. No. 494,400
Claims priority, application Austria, Aug. 13, 1973, 7092/73
Int. Cl.² H05H 5/02
U.S. Cl. 313—360 5 Claims



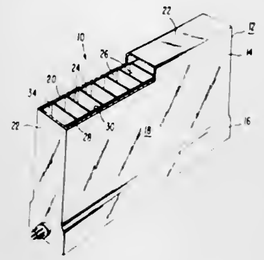
1. An ion source for producing a high intensity ion beam comprising an evacuable chamber, a hot cathode (1) and an anode (7) supported within said chamber in spaced relationship to each other, a plurality of spaced, perforated, dividing walls (12) supported within said chamber between said hot cathode and said anode and in spaced relationship to said cathode and said anode, a deflection magnet including magnetic pole pieces (5) adjacent said chamber near the space between said hot cathode and said plurality of walls and means for introducing a gas between said anode and said plurality of walls.

4,076,994

FLAT DISPLAY DEVICE WITH BEAM GUIDE

Charles Hammond Anderson, Rocky Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 9, 1976, Ser. No. 675,639
Int. Cl.² H01J 29/70, 31/00, 31/10
U.S. Cl. 313—422 25 Claims



1. In a display device which includes
an evacuated envelope having mutually spaced, substantially parallel front and back walls,
a phosphor screen adjacent to and substantially coextensive with the inner surface of said front wall,
means in said envelope for generating and directing electrons in a path between and substantially parallel to said front and back walls, and
guide means along said path for confining the electrons in a beam and deflecting the beam toward said phosphor screen at selected points along said path,
the improvement comprising said guide means including
a plurality of conductors adjacent to said back wall, said conductors being spaced along and extending transversely across said beam path, and
a plurality of electrodes along opposite sides of the beam path between and spaced from the front and back walls and disposed in planes extending between and substantially perpendicular to the front and back walls, said electrodes being adapted to provide an electrostatic field around the beam path which will confine the electrons in the beam as the electrons flow along the beam path.

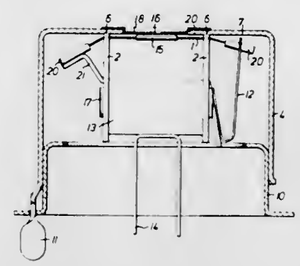
4,076,995

ELECTRON BEAM PRODUCING ARRANGEMENT FOR A CATHODE RAY TUBE

Rainer Kolbeck; Heinz Kuckenburg, both of Ulm (Danube), and Klaus Schaffernicht, Herrlingen, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Feb. 15, 1977, Ser. No. 768,706
Claims priority, application Germany, Feb. 20, 1976, 2606897; Feb. 20, 1976, 50947
Int. Cl.² H01J 29/02, 29/04
U.S. Cl. 313—446 23 Claims

23. An electron beam producing arrangement comprising a vessel-shaped control electrode, an end wall for said vessel-shaped control electrode defining an opening for passage of the electron beam, a cylindrical inner surface for said vessel-shaped control electrode and surrounding said end wall, two substantially rectangular insulating washers within said vessel-shaped control electrode abutting said cylindrical inner wall with opposite sides thereof, abutting said end wall with third sides thereof and defining notches in said third end walls and a straight line cathode wire supported in said notches substantially parallel to said end wall below said opening in said end wall.

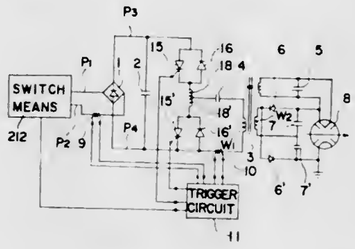


4,076,996

POWER SUPPLIER FOR MAGNETRON

Naoyoshi Machara, Nara; Hiroshi Fujieda, Kashiwara, and Tatsuo Saka, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Sep. 8, 1976, Ser. No. 721,548
Claims priority, application Japan, Sep. 12, 1975, 50-111439; Sep. 16, 1975, 50-112435; Dec. 23, 1975, 50-154182
Int. Cl.² H05B 41/36
U.S. Cl. 315—106 11 Claims



1. A power supplier which converts A.C. power supplied from a commercial A.C. power source to high voltage D.C. power to be supplied to a magnetron, comprising:
(a) a switch means for connecting said power supplier to said commercial A.C. power source;
(b) a first rectifying means connected to said switch means for producing a D.C. voltage from said commercial A.C. power source;
(c) a resonance circuit having an inductive element and a capacitive element connected in series;
(d) at least one thyristor switching circuit connected in series with said resonance circuit and further connected to said first rectifying means, for providing said D.C. voltage to said resonance circuit when triggered;
(e) a trigger circuit connected to said thyristor switching circuit for triggering said thyristor switching circuit and causing said thyristor switching circuit to conduct;
(f) a step-up transformer having the primary winding serving as the main part of said inductive element in said resonance circuit, at least one secondary winding generating high voltage energy and a nonsaturable core; and
(g) a second rectifying means connected to said secondary winding of said step-up transformer for producing a D.C. voltage to supply the magnetron.

7. A power supplier for a magnetron as claimed in claim 1, wherein said trigger circuit means comprises;
(a) an adjustable reference circuit including a capacitor for

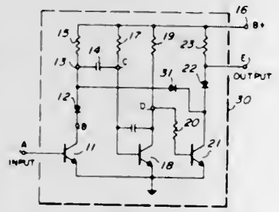
producing across said capacitor a reference signal having a preadjusted value;
(b) an oscillator circuit coupled to said reference circuit for producing said pulse signal upon receipt of said reference signal, said pulse signal having a frequency proportional to the magnitude of said reference signal; and
(c) a switching circuit coupled to said capacitor in said adjustable reference circuit, said switching circuit connecting when said magnetron is not to be operated, opposite ends of said capacitor to discharge the same thereby ending said reference signal across capacitor and preventing said oscillator circuit from producing said pulse signal, and said switching circuit disconnecting when said magnetron is to be operated, opposite ends of said capacitor to charge the same thereby establishing said reference signal across said capacitor and operating said oscillator circuit to produce said pulse signal, the frequency of said pulse signal gradually increasing during said establishment of said reference signal, whereby said converted A.C. power gradually increases in an initial stage to protect said magnetron from a sudden change in the input power thereto.

4,076,997

DIODE FEEDBACK MONOSTABLE MULTIVIBRATOR IN A TRANSISTOR IGNITION SYSTEM

John Richard Davidson, Crystal Lake, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 18, 1976, Ser. No. 697,512
Int. Cl.² H05B *37/02, 39/04, 41/14*
U.S. Cl. 315—209 T **22 Claims**



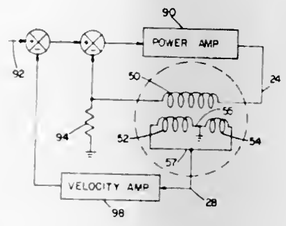
1. A diode feedback monostable multivibrator comprising:
a trigger input terminal adaptable for receiving a trigger signal having transitions of a predetermined polarity;
a first current source means coupled to said input terminal;
a capacitor having first and second terminals, said capacitor first terminal coupled to said input terminal;
a second current source means coupled to said capacitor second terminal;
said first and second current source means alternately charging said capacitor in response to the reception by said trigger input terminal of a trigger signal having a transition of a predetermined polarity;
first switch means having first and second output terminals and a control terminal, said control terminal coupled to said capacitor second terminal, said first switch means being switched on and off operative conditions in response to the reception of said trigger signal transition by said trigger input terminal;
a second switch means having a control terminal coupled to one of said first and second output terminals of said first switch means, said second switch means having first and second output terminals and providing an output signal at one of its output terminals having magnitudes corresponding to each of the operative conditions of said first switch means; and
means including a feedback diode coupled between said one of said first and second output terminals of said second switch means and said capacitor first terminal;
wherein an output pulse having a duration equal to a predetermined time is produced at said one of said first and second output terminals of said second switch means in response to a trigger signal transition of a predetermined polarity, and said diode including means provides a feedback path from said one of said first and second output terminals of said second switch means to said capacitor first terminal for maintaining said capacitor first terminal at a predetermined voltage level for a duration equal to said predetermined time after the reception of said trigger signal transition.

4,076,998

OSCILLATION MOTOR

Jean I. Montagu, Brookline, Mass., assignor to General Scanning, Inc., Watertown, Mass.

Filed Aug. 23, 1976, Ser. No. 716,535
Int. Cl.² H02K *33/12*
U.S. Cl. 318—132 **14 Claims**



1. A bearing free oscillation motor comprising
a stator defining a cylindrical cavity,
a rotor having a cylindrical portion disposed within said cavity, said cylindrical portion having a diameter that provides an axially extending annular gap between said cylindrical portion and said cylindrical cavity of radial width in the range of one-five percent of the diameter of said cylindrical portion,
a low viscosity liquid in said gap that provides essentially no viscous damping of said rotor,
an axially extending torsion shaft having one end secured to said stator, and its other end secured to said rotor for fixing the axial position of said cylindrical portion in said cylindrical cavity and permitting limited rotational oscillation of said rotor,
one of said stator and said rotor carrying a permanent magnet that provides a magnetic field transverse to the axis of rotation of said rotor, a drive winding on the other of said stator and said rotor for receiving an electric current flow that interacts with said magnetic field to produce a torque that rotationally deflects said rotor,
and a tachometer winding responsive to rotational deflection of said rotor for feeding back a velocity signal to electrically damp rotational motion of said rotor.

4,076,999

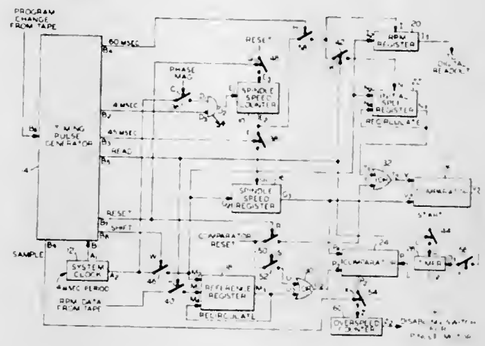
CIRCUIT FOR LIMITING THE SPINDLE SPEED OF A MACHINE

Clarence Roy Edwards, Stuartsdraft, and Ellwood Donald Fickes, Waynesboro, both of Va., assignors to General Electric Company, New York, N.Y.

Filed Feb. 19, 1976, Ser. No. 659,449
Int. Cl.² H02H *5/00*
U.S. Cl. 318—465 **3 Claims**

1. Apparatus for insuring that the rotational speed of a spindle on a machine is prevented from exceeding a selected speed, comprising:
a. means for continuously receiving pulsed signals indicative of the instantaneous rotational speed of the spindle over a timed cycle, wherein the cumulative signal within said receiving means at the end of each timed cycle is representative of the actual rotational speed of the spindle;
b. a first register for receiving a first signal representative of a selected desired rotational speed of the spindle;

c. a second register for receiving from said receiving means a second signal representative of a percentage of the actual rotational speed of the spindle after a lapse of the same percentage of the timed cycle;
d. means for comparing the first signal with the second signal at the end of each timed cycle, and for generating a third signal each time the second signal is greater than the first signal;



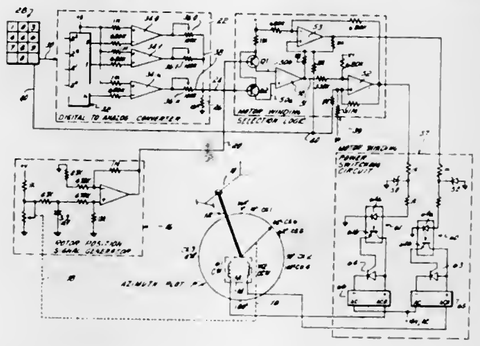
e. means for generating a fourth signal after receiving a predetermined number of third signals to disable a motor which drives the spindle; and
f. means for preventing generation of the fourth signal for a predetermined time after the first signal representative of the selected desired rotational speed of the spindle is received within said first register to avoid an unwanted disabling of the motor, which drives the spindle, within the predetermined time.

4,077,000

DIRECTIONAL ANTENNA AZIMUTH CONTROL SYSTEM

Jerry A. Grubbs, 678 Leland Drive, Taylor Mill, Ky. 41015

Filed Jan. 13, 1977, Ser. No. 759,249
Int. Cl.² G05B *19/30*
U.S. Cl. 318—604 **6 Claims**



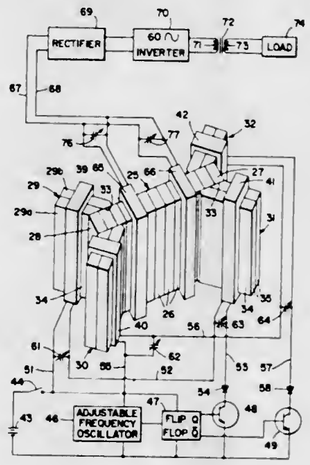
1. The apparatus comprising:
a directional antenna,
means mounting said antenna for rotation about a generally vertical axis to a plurality of predetermined different azimuthal directions respectively associated with different broadcast transmitters, each said transmitter being identified by a different decimal channel identification number,
a bidirectional motor drivingly connected to said antenna and having selectively alternatively energizable first winding and second winding for rotating said antenna in first and second opposite azimuthal directions, respectively, when said frst and second winidings are respectively selectively alternatively energized,
an encoder including
(a) a plurality of digital keys for sequentially entering the digits of transmitter identification numbers,
(b) a digital encoder connected to said keys and having a plurality of different output lines each uniquely associated with a different one of said plurality of different azimuthal directions associated with different broadcast transmitters, said digital encoder responsive to said keys for providing a signal on the output line thereof corresponding to the direction associated with the broadcast transmitter identification number entered into said keyboard, said signals on said different output lines corresponding to said different directions being substantially identical, and
(c) an analog encoder connected to said different output lines of said digital encoder and having a single output terminal for providing, in response to sequential identical signals on different ones of said output lines, sequential d.c. voltages of differing magnitude at said single output terminal,
an antenna azimuthal direction transducer responsive to said antenna direction for sequentially providing d.c. voltages of differing magnitude on the same output line, said differing magnitude voltages corresponding to sequential different azimuthal orientations of said antenna,
a comparator for comparing said voltages on said output lines of said antenna transducer and analog encoder, said comparator having a first output terminal and a second output terminal on which first and seocnd control signals are provided when the difference between said outputs of said antenna transducer and analog encoder bear first and second predetermined relationships in magnitude, and
motor drive means interconnecting said first and second comparator outputs and said first and second windings, respectively, for alternatively energizing said first and second windings in response to said first and second control signals, respectively, to alternatively rotate said antenna in said first and second directions, respectively.

4,077,001

ELECTROMAGNETIC CONVERTOR WITH STATIONARY VARIABLE-RELUCTANCE MEMBERS

Frank B. Richardson, 2610 San Gorgoino, Las Vegas, Nev. 89110

Filed Apr. 16, 1976, Ser. No. 677,731
Int. Cl.² G05F *7/00*
U.S. Cl. 323—92 **53 Claims**



1. A converter comprising:
a. permanent magnet means having spaced-apart poles of opposite polarity and having a permanent magnetic field externally of said magnet means, said field comprising

magnetic lines of force extending from pole to pole of said magnet means,

b. variable-reluctance means for shifting the pattern of said lines of force, said variable-reluctance means having a relatively low magnetic reluctance in one direction therethrough when electrically energized and a relatively high magnetic reluctance in said one direction therethrough when electrically de-energized, said variable-reluctance means being disposed in said permanent magnetic field and in fixed relation to said permanent magnet means, said variable-reluctance means comprising at least one unmagnetized but magnetizable core having spaced-apart faces and side edges extending between said faces, the distance between said faces being the least distance through said core, said core having a lamellar distribution of magnetism from face to face thereof when magnetized,

c. means for cyclically electrically energizing and de-energizing said variable-reluctance means and including an electrically conductive excitation coil means surrounding said core, the plane of said coil means being substantially inclined relative to the planes of said faces,

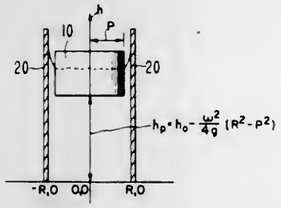
d. electrical conductor means disposed in said permanent magnetic field in fixed relation to said permanent magnet means and having at least one conductor positioned to be cut by lines of magnetic force in said field during a shift in the pattern of said lines of magnetic force.

4,077,002

METHOD AND APPARATUS FOR NMR SAMPLE TUBE VORTEX PLUG

Barbara L. Erwine, Palo Alto, and Stephen H. Smallcombe, Cupertino, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Nov. 22, 1976, Ser. No. 743,893
Int. Cl.² G01R *33/08*
U.S. Cl. 324—0.5 AH **10 Claims**



1. Method for conserving sample materials necessary for high resolution NMR spectroscopy comprising the steps of:

inserting a liquid including a sample for analysis in a substantially right, circular cylindrically shaped NMR sample tube;

inserting into said sample tube an inert body floatable on said liquid, said body having a substantially circular cross-section of less diameter than said tube;

inserting said tube including said liquid and floating body into an NMR spinner apparatus;

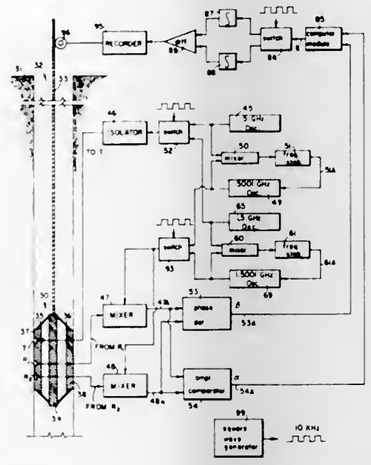
spinning said tube at high speed in a high magnetic field, whereby said body restricts the formation of a vortex on the surface of said liquid in said tube.

4,077,003

MICROWAVE METHOD AND APPARATUS UTILIZING DIELECTRIC LOSS FACTOR MEASUREMENTS FOR DETERMINATION OF ADSORBED FLUID IN SUBSURFACE FORMATIONS SURROUNDING A BOREHOLE

Rama N. Rau, League City, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Apr. 8, 1976, Ser. No. 674,792
Int. Cl.² G01V *3/12, 3/18*
U.S. Cl. 324—6 **24 Claims**



1. Apparatus for determining the amount of adsorbed fluid in formations surrounding a borehole, comprising:

means for deriving a first quantity which is a function of the dielectric loss factor of said formations as measured by passing electromagnetic energy of a first frequency through said formations;

means for deriving a second quantity which is a function of the dielectric loss factor of said formations as measured by passing electromagnetic energy of a second frequency through said formations; and

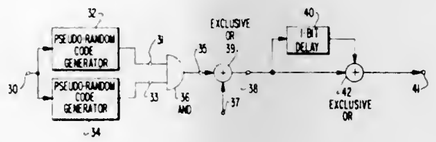
means for determining the amount of adsorbed fluid in said formations as a function of said first and second quantities.

4,077,004

FAULT LOCATION SYSTEM FOR A REPEATERED PCM TRANSMISSION SYSTEM

Yoshiki Higo, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Mar. 11, 1976, Ser. No. 665,760
Claims priority, application Japan, Mar. 18, 1975, 50-32756
Int. Cl.² H04N *17/02*
U.S. Cl. 325—2 **16 Claims**



9. In a fault location system for a repeatered PCM transmission system including a first means for transmitting through a repeatered transmission line fault location codes, said fault location codes being capable of code conversion into codes having their two states controllable in response to a repeater-designation frequency, a second means disposed at a designated repeater for receiving the fault location codes including repeater transmission errors, a third means for extracting a component of the repeater-designation frequency signal from the received fault location codes by means of a fault locating circuit built into the repeater and including an additional code-converter, and a fourth means for receiving said extracted repeater-designation frequency signal component at a transmitting point of the fault location codes, the improvement wherein the fault location codes are based on pseudo-random codes and one of said two states of said codes having the occurrence probability of the digit "1" equal to k sufficiently greater or smaller than 0.5 while the other of the two states has the occurrence probability of the digit "1" equal to $(1-k)$, said first means being a code generator comprising:

fifth means for generating the codes having the occurrence probability of the digit "1" equal to k by means of at least one series of pseudo-random codes;

sixth means for controlling the change of the digits of said codes to their complementary digits in response to the repeater-designation frequency signal; and

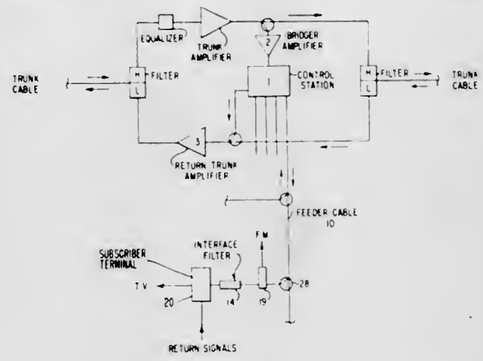
seventh means for performing differential code-conversion of the codes obtained by the second means.

4,077,006

BIDIRECTIONAL UNICABLE SWITCHING SYSTEM

Victor Nicholson, 4701 Willard Ave., Apt. 1033, Chevy Chase, Md. 20015

Continuation-in-part of Ser. No. 558,425, Mar. 14, 1975, abandoned, which is a continuation of Ser. No. 405,846, Oct. 12, 1973, abandoned. This application Mar. 30, 1976, Ser. No. 672,066
Int. Cl.² H04B *1/06*
U.S. Cl. 325—308 **5 Claims**



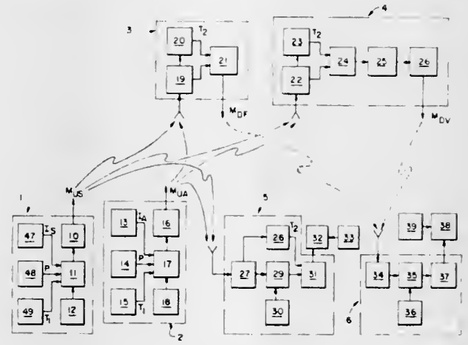
1. In a cable distribution system having a head end, means at said heat end for receiving multiple television channels, a coaxial cable having multiple channel capacity connected to said head end, a bridger amplifier connected to the coaxial cable for receiving and amplifying signals in the multiple television channels, a control station connected to the bridger amplifier, said control station including a switching network and channel converters connected to the bridger amplifier, a feeder cable having a plurality of subscriber allocated channels, said feeder cable connected to the switching network and channel converters, a plurality of subscriber drops connected to the feeder cable, each subscriber drop being connected to a single subscriber allocated channel in the feeder cable, thereby allocating one channel in the feeder cable to each subscriber drop, means at each subscriber drop for sending a control signal to the control station on the subscriber allocated channel allocated to that subscriber drop to control the switching network at the control station.

4,077,005

SECURE POSITION IDENTITY AND TIME REPORTING SYSTEM

Walton B. Bishop, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 18, 1971, Ser. No. 154,617
Int. Cl.² H04K *1/00*
U.S. Cl. 325—32 **5 Claims**



1. A cryptosecure identification system comprising:

a ship;

means aboard said ship for transmitting an enciphered identification code, position, and time of day signal;

an airborne relay station;

receiver means aboard said relay station;

clock means aboard said relay station for supplying the time of day of said received enciphered signal;

means aboard said relay station for retransmitting said enciphered signal and said satellite time of day signal;

ground receiving means including means for deciphering said retransmitted enciphered signal and comparing the two time of day signals; and

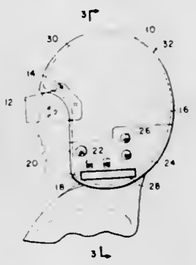
means for indicating said signal to be valid if the difference between said two time of day signals is less than a predetermined time.

4,077,007

RADIO MOUNTED IN A HELMET

Robert D. McKinney, Manhattan, Kans., assignor to The Raymond Lee Organization, New, York, N.Y.

Filed Apr. 5, 1976, Ser. No. 673,852
Int. Cl.² H04B *1/08*
U.S. Cl. 325—315 **1 Claim**



1. A radio mounted in a motorcycle helmet, comprising:

a helmet,

an insulating material mounted within the helmet,

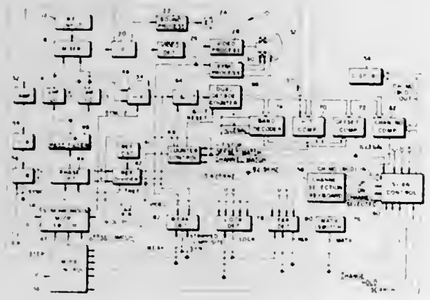
a set of electrical radio components mounted within the insulating material of the helmet,
an antenna mounted within the helmet and connected to the components,
a set of speakers each mounted in a portion of the helmet adjacent to a position for a user's ears and each speaker cushioned by the insulating material of the helmet,
the helmet forming a recessed panel on one exterior surface of the helmet,
an off switch mounted in the panel and connected to the electrical components,
a volume control mounted on the panel and connected to the electrical components,
an AM and FM switch mounted on the panel and connected to the electrical components,
a battery compartment mounted within the panel,
a battery removably mountable in the battery compartment and electrically connectable to the electronic components,
an AM control mounted on the panel and connected to the electrical components, and
an FM control mounted on the panel and connected to the electrical components, whereby a motorcyclist may listen to the radio while riding the motorcycle.

4,077,008

PHASE LOCKED LOOP TUNING SYSTEM WITH STATION SCANNING PROVISIONS

Robert Morgan Rast, Mercerville, and Juri Tults, Princeton Junction, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 18, 1976, Ser. No. 733,673
Int. Cl.² H04B *1/16*
U.S. Cl. 325—421 **12 Claims**



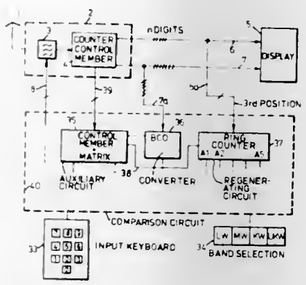
1. An apparatus for tuning a receiver capable of receiving a plurality of stations having station numbers associated therewith, comprising:
local oscillator means for generating a local oscillator signal;
mixer means for combining said local oscillator signal with a radio frequency carrier associated with a station being tuned to generate an intermediate frequency signal having at least one information bearing carrier;
intermediate frequency signal processing means having a predetermined passboard for processing said intermediate frequency signal;
first phase locked loop means for selectively controlling the frequency of said local oscillator signal in accordance with the station number associated with the station presently being tuned;
second phase locked loop means for selectively controlling the frequency of said local oscillator signal to reduce a frequency deviation between said information bearing carrier and a fixed frequency;
weak detector means for generating a weak signal representing the amplitude of said radio frequency carrier;
far detector means for generating a far signal representing the frequency deviation between the frequency of a dominant intermediate frequency signal component in said intermediate frequency passband and said fixed frequency;
switching means responsive to said far and weak signals for selectively enabling the operation of one of said first and second phase locked loop means; and
scanning means responsive to said far and said weak signals for successively changing the station number;
said scanning means being inhibited from changing the station number and said switching means enabling the operation of said second phase locked loop means when the amplitude of said radio frequency signal is greater than a predetermined threshold amplitude and the frequency of said dominant intermediate frequency signal component is within a predetermined frequency deviation from said fixed frequency determined by the expected range of a frequency offset between the frequency of said radio frequency carrier and its standard value.

4,077,009

TUNING CIRCUIT FOR HIGH FREQUENCY RECEIVERS

Otto Klank, Arpke, and Dieter Rottmann, Misburg, both of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt (Main), Germany

Filed Dec. 15, 1976, Ser. No. 750,635
Claims priority, application Germany, Dec. 16, 1975, 2556486
Int. Cl.² H04B *1/06*
U.S. Cl. 325—455 **22 Claims**



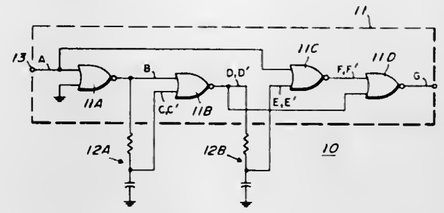
1. In a tuning circuit for a high frequency receiver, which circuit includes a voltage controllable superheterodyne oscillator whose frequency can be varied by a tuning control voltage to produce an oscillation which determines the broadcast frequency to which the receiver is tuned, an optical digital display means for displaying the broadcast frequency to which said receiver is tuned, a counting means for periodically counting the oscillations of said oscillator to produce a count state in the form of representations of the digits of a first decimal number identifying the broadcast frequency to which the receiver is tuned and for supplying same in time multiplex to said display means, input means for generating representations of the digits of a second decimal number identifying the broadcast frequency to which it is desired to tune the receiver, and a comparison circuit means for comparing said first and second decimal number representations and for producing a control voltage for said oscillator from the comparison to cause said first decimal number representation to coincide with said second decimal number representation, said comparison circuit means including a single comparator capable of comparing, at one time, only the representations of one digit of each of said first and second numbers, and a time multiplexing means, responsive to multiplex signals from said counting means, for delivering to said comparator in succession, each digit representation produced by said counting means, starting with the most significant digit, and simultaneously therewith, each digit representation of corresponding significance generated by said input means so that said display means and said comparator are controlled in synchronism; the improvement wherein said time multiplexing means comprises:
a regenerating circuit means for generating the multiplexing signals required for the multiplex operation of said comparison circuit means; first and second means, responsive to output signals from said counting means, for producing and supplying to said regenerating circuit means at least one clock pulse signal appearing per multiplex signal for said display means and a synchronizing signal, respectively, to control said regenerating circuit means; and an auxiliary circuit means, which is responsive to output signals from said counting means, for, together with said regenerating circuit means, controlling the sequence of operation of the entire said comparison circuit means; said comparison circuit means, including said regenerating circuit means, said auxiliary circuit means and said comparator, being designed as a single circuit unit.

4,077,010

DIGITAL PULSE DOUBLER WITH 50 PERCENT DUTY CYCLE

Donald Carroll Ryon, Carol Stream, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 8, 1976, Ser. No. 748,615
Int. Cl.² H03B *19/00*
U.S. Cl. 328—20 **5 Claims**



1. A frequency doubler having symmetrical duty cycle output comprising:
an input means having the first frequency signal applied thereto;
a first gate having a first input coupled to the input means and a second input coupled to a point of reference potential;
a first delay means coupled to the output of the first gate for providing a first delay period;
a second gate having a first input coupled to the output of the first gate and having a second input coupled to the output of the first delay means;
a second delay means coupled to the output of the second gate for providing a second delay period;
a third gate having one input coupled to the input means and having a second input coupled to the output of the second delay means; and
a fourth gate having a first input coupled to the output of the third gate and the second input coupled to the output of the second gate, whereby the output of the fourth gate is a second frequency signal, and the second frequency being twice the first frequency and having a symmetrical duty cycle.

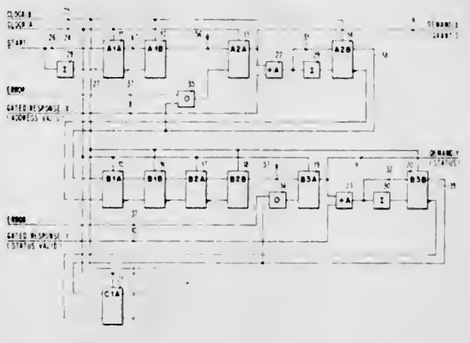
4,077,011

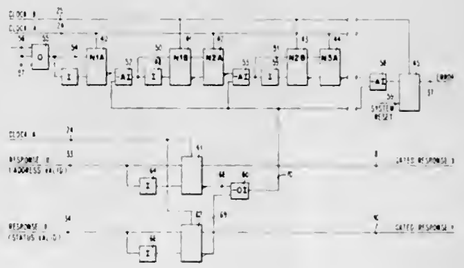
UNCERTAIN INTERVAL TIMER USING A VARIABLE LENGTH SHIFT REGISTER

Joseph Richard Mathis, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1976, Ser. No. 752,335
Int. Cl.² G04F *10/04*
U.S. Cl. 328—129 **8 Claims**

1. A composite shift register timer comprising:
a primary shift register,
a secondary shift register,
a source of first signals,
said primary shift register being coupled to receive said first signals and being divided into portions consisting of respective numbers of shift register elements,
said portions being selectively coupled together in successive pairs upon timely receipt of respective ones of said first signals,
the coupling together of said primary shift register portions being blocked upon receipt of a second signal,
means for inserting a first binary "1" into the input of the first portion of said primary shift register,
first means for clocking said first binary "1" through each said portion and between successive portions which are selectively coupled together,
said primary shift register producing a third signal each time said first binary "1" approaches the end of any portion of said primary shift register,





each said third signal being applied to said secondary shift register,
means for inserting a second binary "1" into the input of said secondary shift register in response to each said third signal, and
second means for clocking said second binary "1" through said secondary shift register,
said secondary shift register being coupled to receive said first signal and being reset upon the occurrence of each said first signal,
said secondary shift register producing said second signal each time said second binary "1" reaches the end of said secondary shift register,
said second signal being applied to said primary shift register.

4,077,012

AMPLIFIER DEVICES

Masayuki Iwamatsu, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Jan. 26, 1977, Ser. No. 762,926
Claims priority, application Japan, Jan. 28, 1976, 51-7590[U]
Int. Cl.² H03F *3/45*
U.S. Cl. 330—253 **5 Claims**



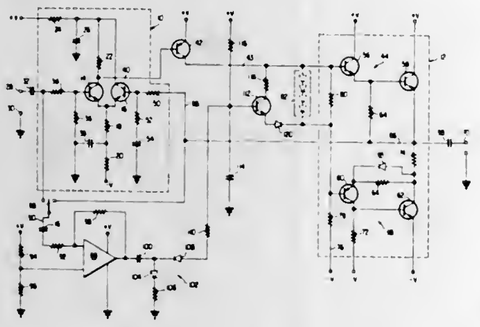
1. In an amplifier device comprising a differential amplifier including a pair of parallel-connected field effect transistors having commonly connected source electrodes, a transistor amplifier responsive to the output of said differential amplifier and acting as a class "A" amplifer, an output terminal connected to the output electrode of said transistor amplifier for producing an output signal which is in-phase with the input signal applied to the input of the differential amplifier, and a constant current drive circuit connected to the commonly connected source electrodes of said field effect transistors for supplying said differential amplifier as a constant current source, the improvement which comprises a passive impedance element connected directly between said output terminal and said constant current drive circuit for modulating the current supplied by said constant current drive circuit to the differential amplifier with a positive feedback signal according to the amplitude of the output signal.

4,077,013

AUDIO POWER AMPLIFIER WITH AUTOMATIC BIAS CONTROL

Gene S. Morez, Morton Groove, and James F. Griffin, Mount Prospect, both of Ill., assignors to Norlin Music, Incorporated, Lincolnwood, Ill.

Filed Jun. 4, 1976, Ser. No. 692,781
Int. Cl.² H03F *3/26*
U.S. Cl. 330—267 **10 Claims**



1. A power amplifier circuit including an automatic bias control comprising:

power amplifier means including an input terminal for amplifying signals applied to said input terminal; and

automatic bias control means coupled to said power amplifier for changing the state of said power amplifier from class B to class AB operation in response to an increasing signal level at said input terminal wherein said automatic bias control means includes

a high gain amplifier,

means for applying a signal which is a function of an input signal to said high gain amplifier,

detector means coupled to said high gain amplifier for converting the output signal thereof to a bias control signal; and

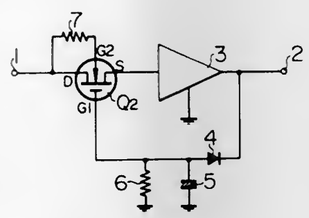
electronic switching means coupled to said detector circuit means for switching between conductive and non-conductive states in response to said bias control signal.

4,077,014

AUTOMATIC GAIN CONTROL CIRCUIT

Ken Satoh, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 12, 1976, Ser. No. 731,429
Claims priority, application Japan, Oct. 15, 1975, 50-140493[U]
Int. Cl.² H03G *3/30*
U.S. Cl. 330—278 **9 Claims**



1. An automatic gain control circuit comprising a field effect transistor having source and drain electrodes and first and second gate electrodes;

amplifier means having an output and an input, with the latter being coupled to one of said source and drain electrodes;

a portion of the output from said amplifier means being coupled through polarized diode means to said first gate electrode, forming a feedback path for obtaining automatic gain control;

an input terminal for receiving a signal to be amplified being coupled to the remaining one of said source and drain electrodes;

means for coupling said input terminal to said second gate electrode to assist in maintaining a constant voltage between said second gate electrode and said input terminal in order to minimize distortion which might otherwise occur in the amplification of a signal applied to the input terminal.

4,077,015

DUAL BANDWIDTH LOOP FILTER WITH SWEEP GENERATOR

Lansing McClain Carson, Tempe, Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 6, 1976, Ser. No. 646,784
Int. Cl.² H03B *3/04*
U.S. Cl. 331—4 **3 Claims**

1. In a phase locked loop including a voltage controlled oscillator, a phase comparator and a lock detector providing an output signal indicating a locked condition of the loop, dual bandwidth loop filter means and sweep acquisition circuitry comprising:

a. an acitive filter including an amplifier with a first resistor and capacitor in a feedback loop therearound and a second resistor in an input circuit thereof;

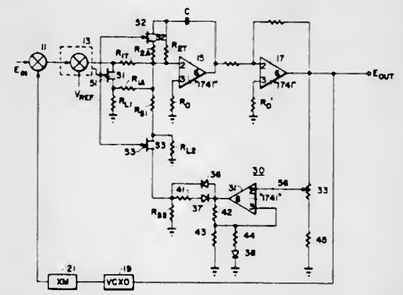
b. a regenerative comparator including a dual input amplifier with a feedback circuit from an output thereof to one of the inputs for providing a comparator reference signal and the other of the inputs connected to receive output signals from said active filter, said comparator including circuitry associated with the output thereof for making signals of a first polarity appearing at the output substantially larger than signals of a second polarity appearing at the output;

c. first, second and third switches each having control inputs connected to receive the output signal from the lock detector and operate in response thereto;

d. resistor means connected in conjunction with said first switch to the first resistor in the feedback loop of said active filter for altering the resistance in the feedback loop upon operation of said first switch;

e. resistor means connected in conjuction with said second switch to the second resistor in the input circuit of said active filter for altering the resistance in the input circuit upon operation of said second switch; and

f. said third switch coupling output signals from said comparator to said active filter upon operation of said third switch for providing a sweep forcing signal to said active filter, the sweep signal produced thereby having a substantially minimized retrace time.

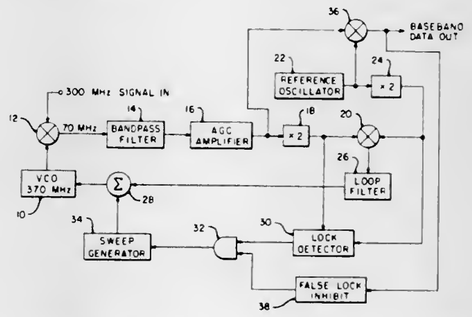


4,077,016

APPARATUS AND METHOD FOR INHIBITING FALSE LOCKING OF A PHASE-LOCKED LOOP

David E. Sanders, St. Petersburg; Ramon P. Chambers, Clearwater, and Robert S. Gordy, Largo, all of Fla., assignors to NCR Corporation, Dayton, Ohio

Filed Feb. 22, 1977, Ser. No. 770,557
Int. Cl.² H03B *3/04*; H03D *3/00*
U.S. Cl. 331—4 **21 Claims**



1. In a phase-locked loop circuit adapted to sweep a predetermined frequency range for an input signal within said range and lock on a detected input signal, said input signal being characterized in the frequency spectrum by a relatively high energy main lobe and relatively low energy side lobes, the improvement comprising a false lock inhibit circuit adapted to inhibit the loop from locking on a side lobe of an input signal, said inhibit circuit comprising:

circuit means for sensing the input signal energy at a test frequency within said frequency range and at a pair of second frequencies, said second frequencies being substantially equal increments respectively greater and less than the test frequency;

means for comparing the sensed energies; and

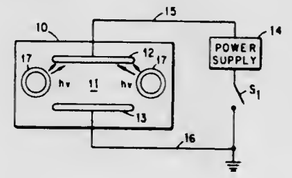
means for inhibiting locking of said loop circuit when the energy at the second frequencies exceeds the test frequency energy.

4,077,017

ULTRAVIOLET RADIATION INDUCED DISCHARGE LASER

Verle A. Gilson; Richard L. Schriever, and James W. Shearer, all of Livermore, Calif., assignors to The United States Government as represented by the U. S. Department of Energy, Washington, D.C.

Continuation of Ser. No. 600,242, Jul. 30, 1975, which is a continuation of Ser. No. 315,043, Dec. 14, 1972, abandoned. This application Apr. 4, 1977, Ser. No. 784,404
Int. Cl.² H01S *3/097*
U.S. Cl. 331—94.5 PE **3 Claims**



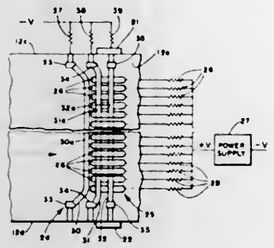
1. In a discharge device having cathode means and anode means disposed in spaced relation in a contained gaseous lasing media, means for producing an electrical discharge between the cathode means and the anode means through the gaseous lasing media, and means for electrically connecting said electrical discharge producing means to the cathode means and the anode means, the improvement comprising: the cathode means being provided with a plurality of spaced extending blade-like means, means including a source of ultraviolet radiation positioned adjacent the cathode means for producing preionization of substantially the entire volume of the gaseous lasing media between the cathode means and the anode means prior to the gas-exciting cathode-to-anode electrical discharge by photoelectric interaction between ultraviolet radiation produced by said source and the cathode means, said source of ultraviolet radiation comprising a plurality of discharge lamp mans producing ultraviolet light, said lamp means being positioned between said blade-like means of the cathode means, means separate from the gas-exciting cathode-to-anode electrical discharge producing means for activating said source of ultraviolet radiation prior to said gas-exciting cathode-to-anode electrical discharge, and means electrically separate from said first-mentioned electrically connecting means for electrically connecting said activating means to said source of ultraviolet radiation, said source of ultraviolet radiation producing an interaction in the gaseous lasing media composed of at least one effect comprised of the group consisting of cathode photoemission and volume ionization effects, whereby free electron production in the gaseous lasing media is achieved and an initial electron density is provided for the gaseous lasing media exciting electrical discharge between the cathode means and the anode means.

4,077,018

HIGH POWER GAS TRANSPORT LASER

Theodore S. Fahlen, San Jose, and Russell F. Kirk, Sunnyvale, both of Calif., assignors to GTE Sylvania Incorporated, Mountain View, Calif.

Filed Mar. 1, 1976, Ser. No. 662,941
Int. Cl.² H01S *3/097*
U.S. Cl. 331—94.5 PE **1 Claim**



1. High power gas transport laser apparatus comprising a channel having top and bottom walls and side walls, a gas mixture comprising carbon dioxide in said channel, means for moving said gas mixture through said channel at a predetermined velocity,

means for producing an electric discharge in said gas mixture transversely of the direction of flow comprising

three cylindrically tubular cathodes disposed between said top and bottom walls transversely of the direction of said gas flow and being spaced from each other in the direction of said gas flow,

a plane segmented anode adjacent to said bottom wall and extending substantially under and parallel to said cathodes,

said cathodes being spaced differently above said anode and having straight parallel spaced portions extending transversely of the direction of gas flow and coextensive with said anode,

a ballast resistor connected in series between each of said cathodes and said energizing means, the values of said ballast resistors being different, and

means for electrically energizing said cathodes and anode to establish therebetween a glow mode electric discharge through said flowing gas mixture, and

mirror means adjacent the side walls of the channel and optically aligned with said electric discharge for directing a beam of coherent light therethrough.

4,077,019

TRANSVERSE MODE CONTROL IN DOUBLE-HETEROSTRUCTURE LASERS UTILIZING SUBSTRATE LOSS

William Streifer, Palo Alto; Donald R. Scifres, and Robert D. Burnham, both of Los Altos, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 5, 1976, Ser. No. 655,323
Int. Cl.² H01S *3/19*
U.S. Cl. 331—94.5 H **4 Claims**

1. An electrically pumped, solid-state, diode laser comprising:

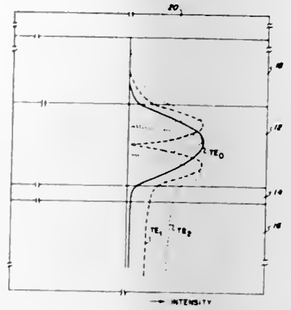
a semiconductor body including a radiation lossy portion and a plurality of layers adjacent said radiation lossy portion, one of said layers being an active region layer;

a rectifying junction within said body, said rectifying junction bordering said active region layer;

means for forward biasing said rectifying junction, carriers injected across said junction upon sufficient forward biasing of said junction undergoing radiative recombination in said active region layer to generate stimulated coherent radiation including ordered transverse electric modes;

said active region layer being separated from said radiation lossy portion of said body by at least another of said plurality of layers, said another layer being of a material having a bandgap higher than the bandgap of the material of said active region layer,

said active region layer being at least 0.8 micron thick and said another layer being not greater than about 0.5 micron thick, whereby the higher order transverse electric modes of said ordered transverse electric modes have substantial



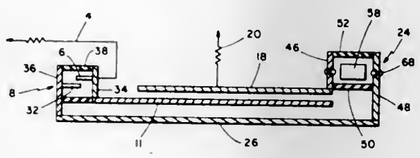
penetration into said radiation lossy portion of said body and the lowest order transverse electric mode of said ordered transverse electric modes has little penetration into said radiation lossy portion of said body such that the radiation losses of the higher order transverse electric modes are substantially greater than the radiation losses of the lowest order transverse electric mode providing lowest order transverse electric mode operation by the laser.

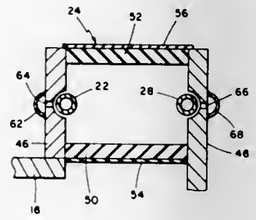
4,077,020

PULSED GAS LASER

Louis W. Anderson, and William A. Fitzsimmons, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed May 20, 1975, Ser. No. 579,268
Int. Cl.² H01S *3/097*
U.S. Cl. 331—94.5 PE **3 Claims**





1. In a lasing apparatus comprising a sealed laser tube having opposite spaced electrodes thereon, a switch for controlling the flow of electrical energy to said tube, and coupling means connected between said tube and said switch for coupling electrical energy from said switch to said tube, the improvement wherein each said electrode comprises an arcuate shaped elongated element mounted on opposite sides of said tube on the interior walls thereof, a gas inlet manifold coextensive with

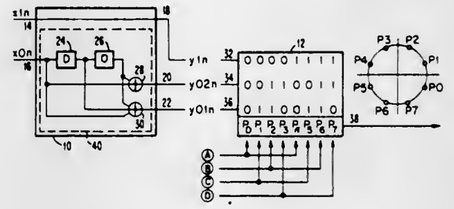
one of said electrodes along the outside of a first wall of said tube, a gas exhaust manifold coextensive with the other of said electrodes mounted along the outside of a second wall of said tube, each of said tube walls having openings extending therethrough from its associated manifold to the interior of said tube and wherein said switch comprises a sealed enclosure, a first flat electrode mounted on an interior wall of said enclosure and extending therefrom, a second flat electrode mounted on another interior wall of said enclosure and extending therefrom said first electrode and having a portion spaced a slight distance therefrom, side switch electrodes overlapping each other and wherein said switch electrodes are large compared to the distance between them and the area of overlap is great compared to the same distance.

4,077,021

METHOD AND ARRANGEMENT FOR CODING BINARY SIGNALS AND MODULATING A CARRIER SIGNAL

Istvan Peter Csajka, Mahopac, N.Y., and Gottfried Ungerboeck, Adliswil, Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 23, 1977, Ser. No. 799,405
Claims priority, application Switzerland, Jun. 18, 1976, 7800/76
Int. Cl.² H04L *27/12, 27/20*
U.S. Cl. 332—9 R **4 Claims**



1. A method for transmitting a bit sequence by modulating a carrier signal to sequentially assume one of a plurality of discrete signal values comprising the steps of:

subdividing the predetermined bit sequence into successive groups each containing r sequential bits,

expanding each r bit group into a group of $r+1$ bits by a sequential coding process utilizing four internal states,

selecting one out of 2^{r+1} discrete carrier signal values as a function of each $r+1$ expanded bit group, the selection being made so that 2^{r-1} carrier signal values correspond to each transition from one internal state of the coding process to one of two possible follower states and that the 2^{r-1} carrier signal values have a larger minimum distance from each other than the absolute minimum distance within the complete set of discrete carrier signal values, and

transmitting the selected discrete carrier signal values in sequence.

3. A modulation system for causing a carrier signal to assume one of a plurality of finite states as a function of the sequential application of a plurality of information bit signals comprising:

a sequential coder means including a plurality of terminals (r) for receiving in sequence r bit groups of signals each said r bit group having bits $x0_n$, $x1_n \ldots x(r-1)_n$, means responsive to the bits for providing coded bits according to the relations:

1) $y02_n = x0_n \oplus x0_{n-2}$, and

2) $y01_n = x0_n \oplus x0_{n-1} \oplus x0_{n-2}$, and

3) $y1_n = x1_n$, thru

4) $y(r-1)_n = x(r-1)_n$;

modulating means for modulating a carrier signal to assume in sequence one of 2^{r+1} discrete signal values in response to the output of the sequential coder means, the discrete signal values being separated from each other such that the complete set of signal values can be subdivided into two pairs of subsets (A, B and C, D), in which

$$d_{min\,I} > d_{min\,G} > d_{min\,M}$$

where,

$d_{min\,I}$ = minimum distance between signal values within a given subset,

$d_{min\,G}$ = minimum distance between signal values within a pair of subsets, and

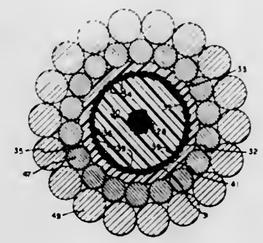
$d_{min\,M}$ = minimum distance between signal values within the complete set, the connections between the sequential coder outputs and the modulator inputs being arranged so that the outputs $y01_n$ and $y02_n$ selects the subset of signal values and the remaining outputs associated with the bit group select the assigned signal value within the selected subset.

4,077,022

WELL LOGGING METHOD AND MEANS USING AN ARMORED MULTICONDUCTOR COAXIAL CABLE

Robert W. Pitts, Jr., Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Division of Ser. No. 494,578, Aug. 5, 1974, abandoned, which is a division of Ser. No. 427,156, Dec. 21, 1973, Pat. No. 3,855,468.
This application Nov. 10, 1975, Ser. No. 630,242
Int. Cl.² H01P *3/06*; H03H *7/04*; H01B *11/18*; H04B *3/28*
U.S. Cl. 333—1 **4 Claims**

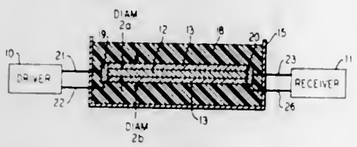


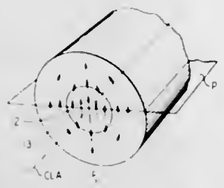
1. A shieldless cable comprising first means for conducting a high frequency signal; second means spatially arranged with said first means in a predetermined manner for a return path for the high frequency signal while conducting different low frequency or direct current signals, said second means including groups of conductors arranged in a predetermined relationship to said first means, means separating the groups of conductors for insulating each conductor group from any other conductor group, and means for passing the high frequency signal and for blocking the low frequency or direct current signals, so as to effectively couple the groups of conductors with each other for the high frequency signal and to decouple the groups of conductors from each other for the low frequency or direct current signals; and third means spatially arranged with said second means for providing protection to the first and second means and a return path for the low frequency or direct current signals.

4,077,023
ELASTIC WAVEGUIDE

Gary Delane Boyd, Rumson, and Robert Norton Thurston, Colts Neck, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 26, 1976, Ser. No. 745,097
Int. Cl.² H03H *9/00, 9/26, 9/30;* **H01L** *41/10*
U.S. Cl. 333—30 R **17 Claims**



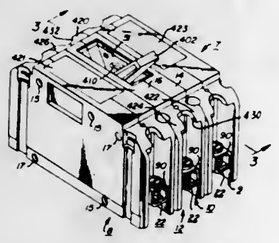


1. In combination,
a waveguide for elastic waves comprising, a core region having a central longitudinal axis, said core region being of a material in which bulk elastic waves can be propagated, and a cladding region enclosing all surfaces except end surfaces of said core region, said cladding region also being of a material in which bulk elastic waves can be propagated, at least one of said core and cladding regions including means for focusing elastic wave energy toward said core region, and
means for launching bulk elastic waves in said waveguide in a mode in which the principal particle displacement is substantially perpendicular to a plane through said axis, the diameter of said core region being at least twice the wavelength of the lowest frequency component of said elastic waves.

4,077,024
MULTI-POLE CIRCUIT BREAKER

Albert D. Lisnay, Sarasota, Fla., assignor to Heinemann Electric Company, Trenton, N.J.

Filed Jul. 22, 1976, Ser. No. 707,626
Int. Cl.² H01H *71/02*
U.S. Cl. 335—8 **5 Claims**

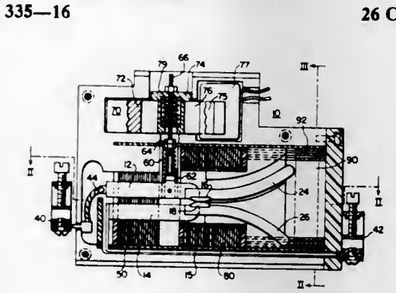


1. A multi-pole circuit breaker unit comprising
at least two poles in side-by side abutment, each pole including a case of electrical insulating material,
a linkage mechanism and an electromagnetic device for actuating said linkage mechanism on predetermined overloads,
a movable contact and a stationary contact, said linkage mechanism including a movable arm carrying said movable contact into and out of engagement with said stationary contact,
said case being divided longitudinally through its width into two approximate half cases,
said linkage mechanism including an actuator,
said case defining a compartment for said linkage mechanism and a V-shaped well separated by wall structure from said compartment,
said wall structure having an opening through which said actuator extends into said V-shaped well,
one of said actuators extending beyond said well to be manually grasped for manually opening and closing the contacts, and
interconnecting means extending through said actuators, through the V-shaped wells, and through the abutting half cases of abutting poles for joint movement of said actuators.

4,077,025
CURRENT LIMITING CIRCUIT INTERRUPTER

Paul G. Slade, Churchill Borough, and John A. Wafer, Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 577,518, May 15, 1975, abandoned.
This application Sep. 21, 1976, Ser. No. 725,080
Int. Cl.² H01H *75/10, 77/02*
U.S. Cl. 335—16 **26 Claims**

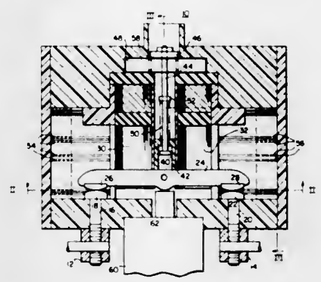


1. A circuit interrupter comprising:
a housing;
a fixed contact disposed within said housing;
a fixed elongated contact arm supporting said fixed contact;
a movable contact disposed within said housing;
a movable elongated contact arm supporting said movable contact being movable between a closed position wherein said fixed contact and said movable contact are in engagement and an open position wherein said fixed contact and said movable contact are separated;
magnetic drive means comprising magnetizable material having a slot with one open end formed therein and being disposed around a portion of said fixed elongated contact arm and said movable elongated contact arm, with said fixed elongated contact arm being disposed toward the closed end of the slot and said movable elongated contact arm being disposed towards the open end of the slot; and
means connected to said elongated contact arms for conducting circuit current therethrough, said circuit current flowing in opposite directions through said fixed elongated contact arm and said movable elongated contact arm.

4,077,026
INTEGRAL MOTOR CONTROLLER

Paul G. Slade, Pittsburgh, and John A. Wafer, Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 587,791, Jun. 16, 1975, abandoned.
This application Feb. 23, 1977, Ser. No. 771,288
Int. Cl.² H01H *77/10*
U.S. Cl. 335—195 **19 Claims**



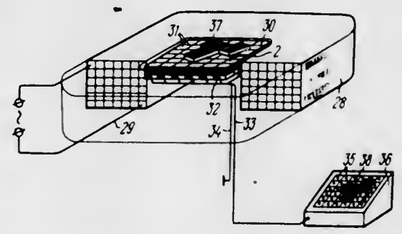
1. An integral motor controller comprising:
a housing;
a movable bridging contact arm;
means mounted within said housing for supporting said movable bridging contact arm in a manner so as to permit rectilinear movement thereof;
a pair of movable contacts spaced apart on said movable bridging contact arm;
a pair of stationary contacts spaced apart and supported by said housing in alignment with said pair of movable contacts;
electromagnetic actuator means associated with said movable contact arm to move said movable contact arm from a closed position wherein said pair of stationary contacts engage said pair of movable contacts, to a first open position wherein said pair of stationary contacts are spaced apart from said pair of movable contacts, and from said first open position to said closed position, said electromagnetic actuator being adapted for electrical operation when current flow through the integral motor controller is in the normal range or is in a lower overload range having a predetermined upper current limit; and,
magnetic driving means supported by said housing and coupled to said movable contact arm for moving said movable contact arm from the closed position to a second open position when current flow through the integral motor controller lies in an upper overload range overlapping the predetermined upper current limit of the lower overload range.

4,077,027
METHOD OF ORIENTED FEEDING OF NONMAGNETIC CURRENT-CONDUCTING COMPONENTS AND DEVICES FOR EFFECTING SAME

Benyamin Alexandrovich Ioffe, ulitsa Stirnu 37a, kv. 44; Robert Karlovich Kalnin, ulitsa Gorkogo 53, kv. 19; Jury Arvidovich Zommer, ulitsa Artilerias 52, kv. 25; Yanis Ekabovich Graubin, prospekt Mezha, 10, kv. 2; Eduard Prokofievich Davydenko, ulitsa Ierikju, 29, kv. 40, and Ivan Ivanovich Kern, ulitsa Augiju, 4, kv. 1, all of Riga, U.S.S.R.

Filed Jan. 17, 1977, Ser. No. 759,993
Int. Cl.² H01F *7/10*
U.S. Cl. 335—219 **16 Claims**

1. A method of oriented feeding of nonmagnetic current-conducting components, residing in that: an alternating magnetic field is set up, whose induction vector is normal to the desired direction of feeding; a component is introduced into said magnetic field; at least one closed current-conducting loop is secured in said magnetic field so that its plane is normal to the induction vector of said magnetic field and offset with respect to the geometrical centre of said component in the desired direction of feeding; said oriented feeding is effected under the action of the electrodynamic forces appearing in said

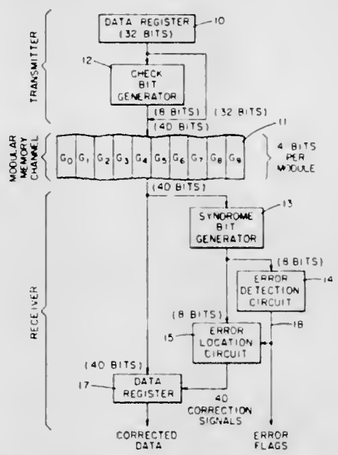


alternating magnetic field as a result of interaction of the overlapping current circuits induced by said magnetic field in said component and said closed current-conducting loop.

4,077,028
ERROR CHECKING AND CORRECTING DEVICE

Albert S. Lui, and Majid Arbab, both of San Diego, Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Jun. 14, 1976, Ser. No. 695,494
Int. Cl.² G06F *11/12*
U.S. Cl. 340—146.1 AL **10 Claims**



1. A system for providing single error correction, double error detection, and group error detection in a code word having plural groups of information and check bits, which comprises:
generator means receiving said code word for generating a plurality of syndrome bits,
first circuit means coupled to the output of said generator means for generating a first error signal if the informational content of said syndrome bits indicates a detection of any error in the transmission of said code word,
second circuit means coupled to the output of said generator means for generating a second error signal if the informational content of said syndrome bits indicates a detection of two random errors in said code word or an even number of errors in one of said plural groups,
third circuit means coupled to the output of said generator means for generating a third error signal if the informational content of said syndrome bits indicates a detection of an odd number of errors greater than one in one of said plural groups, and
error location circuit means in electrical communication with said generator means and said first, said second, and

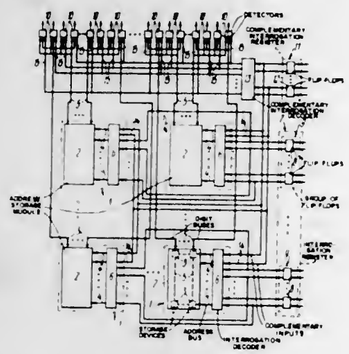
said third circuit means for providing an error correction in response to the detection of a single error in said code word.

4,077,029

ASSOCIATIVE MEMORY

Georgy Viktorovich Vitaliev, ulitsa Vavilova, 39, kv. 17, Moscow; Alexei Davidovich Gvinepadze, Ljubertsy, ulitsa Lva Tolstogo, 27, kv. 8, Moskovskaya oblast; Rem Vasilievich Smirnov, 3 mikroraion Teplogo Stana, korpus 32, kv. 36, and Gury Dmitrievich Sofiisky, ulitsa Kazakova, 18, kv. 67, both of Moscow, all of U.S.S.R.

Filed Feb. 11, 1976, Ser. No. 657,063
Claims priority, application U.S.S.R., Feb. 13, 1975, 2104774
Int. Cl.² G11C *15/00, 8/00*
U.S. Cl. 365—49 **7 Claims**



1. An associative memory to perform retrieval operations on descriptor data represented as multibit associative words that are sets of a given number of binary associative descriptors which comprises: a plurality of storage units arranged in a matrix to permit parallel retrieval operations on descriptor data, each storage unit including an address storage module to record, store and access descriptor data stored in said storage units; address and digit buses associated with each of said address storage modules, each of said address storage modules having a plurality of storage devices each of which is connected to one of said address and digit buses; an interrogation decoder in each storage unit to drive said address storage modules by means of said address buses; an interrogation register to receive and store the interrogation code represented by a given set of binary descriptors and having a plurality of flip-flops each having inputs and outputs, said outputs of said flip-flops being electrically connected to said inputs of said respective interrogation decoders; a plurality of detectors to indicate the position of data having the given set of binary descriptors;

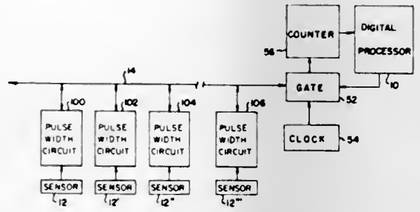
a complementary interrogation decoder to drive the respective detectors and having inputs and outputs, said inputs of said detectors being connected to said digit buses, and said detectors having complementary inputs electrically connected to said outputs of said complementary interrogation decoder; and a complementary interrogation register to receive and store the complementary interrogation code represented by a complementary set of binary descriptors and having a plurality of flip-flops having inputs and outputs, said outputs of said flip-flops being connected to the respective inputs of said complementary interrogation decoder and to complementary inputs of said interrogation decoders.

4,077,030

SENSOR DATA INPUT BY MEANS OF ANALOG TO PULSE WIDTH-TO DIGITAL CONVERTER

Uuno Vilho Helava, Southfield, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Feb. 19, 1976, Ser. No. 659,386
Int. Cl.² H03K *13/20*; G08C *15/06*
U.S. Cl. 340—183 **29 Claims**



1. A digital processing system comprising:

digital processor means for generating output signals in response to digital input signals, said digital processor means further including means for generating interrogation signals in the form of a transition between a pair of signal levels which are significantly different;

at least two sensor means disposed at remote locations for generating analog signals having a value indicative of sensed inputs;

first pulse width converter means disposed at one of said remote locations and receiving analog signals from one of said sensor means for generating a first pulse width signal in response to each of said interrogation signals, said first pulse width signal formed by a transition between said same pair of signal levels and having a pulse width indicative of the value of the analog signal received from said one sensor means;

second pulse width converter means disposed at the other remote locations and receiving analog signals from the other of said sensor means for generating second pulse width signal a predetermined time after the occurrence of each interrogation signal, said second pulse width signal formed by a transition between said same pair of signal levels and having a pulse width indicative of the value of the analog signal received from said other sensor means;

digital converter means interfacing said digital processor and receiving the pulse width signals from said first and second pulse width converter means and said interrogation signals for generating digital data for said digital processor means, said digital data indicative of the pulse width of the received pulse width signals; and

a single bi-directional data transmission line for transmitting said interrogation and said pulse width signals between said first and second pulse width converter means and said digital converter means;

wherein said first and second pulse width converter means each comprises:

bi-stable means switchable between two stable states for switching to a first state and generating a first signal having a signal level the same as one of said pair of signal levels in response to said interrogation signals and for switching to a second state and generating a second signal having a signal level the same as the other of said pair of signal levels in response to a reset signal, wherein said first signal is said pulse width signal;

means enabled by said first signal and disabled by said second signal for integrating the analog signal generated by said sensor means to generate an integrated signal having a value proportional to the value of said analog signal and the time of integration;

means enabled by said first signal for generating said reset signal each time said integrated signal exceeds a predetermined value; and

pulse width signal isolation means interfacing said bi-directional data transmission line for isolating said bi-stable means from the signals on said bi-directional data transmission line for a predetermined interval after receiving said interrogation signal; and

wherein said second pulse width converter means further includes:

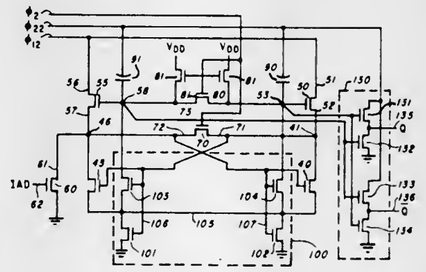
delay means for delaying for said predetermined time the switching of said bi-stable means to said first state in response to said interrogation signals.

4,077,031

HIGH SPEED ADDRESS BUFFER FOR SEMICONDUCTOR MEMORY

Norihisa Kitagawa, and Lionel Stuart White, Jr., both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 23, 1976, Ser. No. 716,843
Int. Cl.² G11C *8/00*
U.S. Cl. 365—205 **18 Claims**



1. A memory system of the type having an array of memory cells selectively addressed by row and column signals, said signals being generated from row and column address buffers, said buffers including a plurality of flip-flops, said flip-flops including a pair of cross-coupled transistors having set and reset nodes, said set node being coupled to a first load transistor for charging said set node at a rate proportional to the potential on a set control node, said reset node being coupled to a second load transistor for charging said reset node at a rate proportional to the potential on a reset control node, the improvement comprising:

a. equalizing means for equalizing the voltage of said set and reset nodes;

b. precharge means for applying a precharge to said set control node and said reset control node;

c. means for generating a voltage difference between said set node and said reset node in response to an input address signal; and

d. current sinking means for sensing a voltage difference between said set node and said reset node and for selectively sinking said precharge from one of said control nodes in response thereto.

4,077,032

ELECTRONIC DISPLAY APPARATUS

Alan Volkman, 5331 Baltimore Ave., Chevy Chase, Md. 20015

Filed Jan. 7, 1976, Ser. No. 647,186
Int. Cl.² G04C *17/02*
U.S. Cl. 340—324 R **16 Claims**

1. A display assembly, comprising:

a substrate;

a plurality of optically variable indicators on said substrate arranged in an array, said indicators being grouped in first and second sets in said array;

means for driving a first sub-set of said first set of indicators to form a visually discernable pointer having a first shape and representing a first measured parameter;

means for driving a second sub-set of said second set of indicators to form a visually discernable pointer having a second shape and representing a second measured parameter;

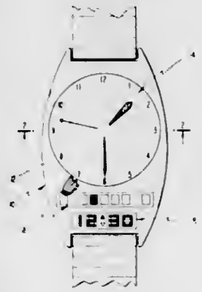
said first and second shapes being such that they are separately discernable when superimposed;

at least one but not all of said indicators of said first and second sets being common to both sets.

13. A day of the week display, comprising:

a rectilinear array of seven electro-optical indicators having no indicia;

five of said indicators being equally spaced apart from each other to form a group representing from left to right the days Monday, Tuesday, Wednesday, Thursday and Friday, respectively;



the remaining two indicators being disposed one on each side of said group, each at a distance from its next adjacent indicator greater than the distance between the indicators of said group such that said group may be separately discerned apart from said remaining two indicators, said remaining two indicators representing the days Sunday and Saturday, respectively; and

a clock circuit generating an electrical output each day and cooperating with said seven indicators for driving each of said indicators in timed sequence to effect an indication of the day of the week whereby the day of the week may be displayed without the use of indicia.

4,077,033

PLASMA DISPLAY DRIVE CIRCUIT AND METHOD

Richard Albert Strom, Eagan, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Sep. 13, 1976, Ser. No. 722,948
Int. Cl.² G06F *3/14*
U.S. Cl. 340—324 M **13 Claims**

1. Apparatus for driving a plasma display panel of a type having a plurality of drive electrodes comprising a first group and a second group of drive electrodes in generally orthogonal relationship to said first group in matrix arrangement and in which orthogonal pairs of said drive electrodes uniquely specify all display elements in the panel, said apparatus comprising:

selection control logic apparatus for producing selection signals for selectively addressing predetermined display elements,

first sustain drive apparatus for said first group of drive electrodes comprising switches for selectively applying either a sustain amplitude voltage or a dual-on-state erase amplitude voltage to a first output and switches for selectively applying either a write amplitude voltage or a ground return voltage to a second output,

second sustain drive apparatus for said second group of drive electrodes comprising switches for selectively applying either a sustain amplitude voltage or a dual-on-state erase amplitude voltage to a second output and switches for selectively applying either a write amplitude voltage or a ground return voltage to a second output,

means including a fast recovery diode, for connecting each

drive electrode of said first group to said second output of said first sustain drive apparatus,

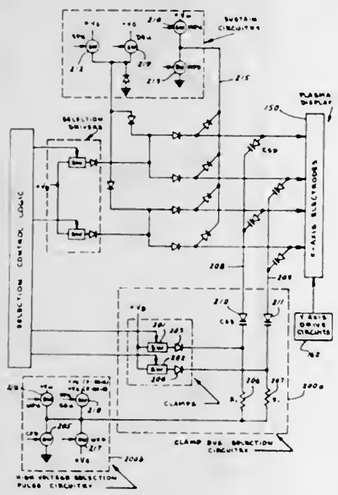
means including a fast recovery diode, for connecting each drive electrode of said second group to said second output of said second sustain drive apparatus,

first means, including selection drivers and fast recovery diodes in matrix interconnection, for selectively connecting each drive electrode of said first group to said first output of said first sustain drive apparatus,

second means, including selection drivers and fast recovery diodes in matrix interconnection, for selectively connecting each drive electrode of said second group to said first output of said second sustain drive apparatus,

a plurality of charge storage diodes, at least one connected to each drive electrode of said first group and of said second group,

a plurality of first clamp bus selection means for matrix interconnection to said charge storage diodes connected to the drive electrodes of said first group, each of said means being connected to at least two of said charge storage diodes, and wherein each of said clamp bus selection means comprises a charge storage diode and current limiting resistor connected in series with a low voltage



clamp connected to the junction of said charge storage diode and resistor.

a plurality of second clamp bus selection means for matrix interconnection to said charge storage diodes connected to the drive electrodes of said second group; each of said means being connected to at least two of said charge storage diodes and wherein each of said clamp bus selection means comprises a charge storage diode and current limiting resistor connected in series with a low voltage clamp connected to the junction of said charge storage diode and resistor,

a first high voltage selection pulse circuit means, connected to each of said current limiting resistors of said first clamp bus selection means, said selection pulse circuit means being selectively operable to have as an output a write amplitude voltage, a ground return voltage, or a sustain amplitude voltage, and

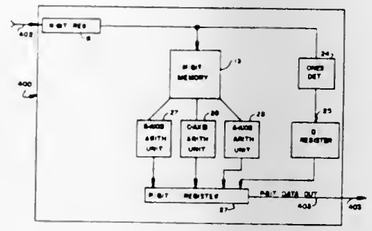
a second high voltage selection pulse circuit means, connected to each of said current limiting resistors of said second clamp bus selection means, said selection pulse circuit means being selectively operable to have as an output a write amplitude voltage, a ground return voltage, selective erase amplitude voltage, or a sustain amplitude voltage.

4,077,034

DATA COMPRESSION

Harold R. Dell, 4125 Sutherland Drive, Palo Alto, Calif. 94303

Filed Nov. 4, 1974, Ser. No. 520,431
Int. Cl.[2] H03K *13/24*
U.S. Cl. 340—347 DD **18 Claims**



1. A data compression apparatus comprising:

a first memory means having a plurality of memory cells;

means for storing an N-bit data message in said first memory means, where N is the number of bits in said N-bit data message;

means for providing a number Q corresponding to the total number of logical "one's" in said N-bit data message irrespective of their position in said first memory means;

means coupled to said memory cells in a first predetermined order for providing a number A corresponding to the total number of logical "one's" stored in said first memory means according to a first predetermined sequence;

means coupled to said memory cells in a second predetermined order which is different from said first predetermined order for providing a number B corresponding to the total number of logical "one's" stored in said first memory means according to a second predetermined sequence;

means coupled to said memory cells in a third predetermined order which is different from both said first and said second predetermined order for providing a number C corresponding to the total number of logical "one's" stored in said first memory according to a third predetermined sequence;

means for providing a P-bit message having an A, B, C and Q segment corresponding to said numbers A, B, C and Q, respectively, where P is the number of bits in said P-bits message;

a second memory means responsive to said Q segment of said P-bit data message for storing Q logical "one's" in said second memory means;

means for providing a number A′ corresponding to the total number of logical "one's" stored in said second memory means according to a first predetermined sequence;

means for providing a number B′ corresponding to the total number of logical "one's" stored in said second memory means according to a second predetermined sequence;

means for providing a number C′ corresponding to the total number of logical "one's" stored in said second memory means in a third predetermined sequence;

means for comparing predetermined pairs of said numbers, A′ and A, B′ and B and C′ and C, said comparing means including means for providing an output signal corresponding to the numerical relationship between each of said pairs; and

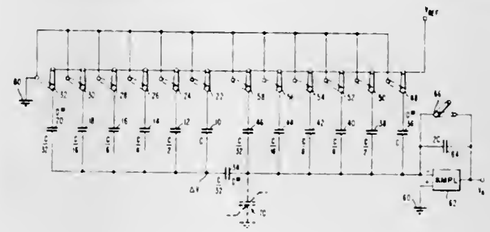
means responsive to said output signal, in the event said numerical relationship is one of inequality, for reordering the position of logical "one's" in said second memory means until said numerical relationship between each of said number pairs is one of equality.

4,077,035

TWO-STAGE WEIGHTED CAPACITOR CIRCUIT FOR ANALOG-TO-DIGITAL AND DIGITAL-TO-ANALOG CONVERTERS

Yen Sung Yee, White Plains, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 10, 1976, Ser. No. 685,201
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 DA **7 Claims**



1. A two-stage weighted capacitor signal conversion circuit comprising a first network of capacitors including a plurality of n/2 capacitors, said capacitors having decreasing fractional values from $C/2^{\circ}$ to $C/2^{(n/2-1)}$ where *n* is an integer,

an amplifier means including an input and output lead and a feedback capacitor connected between said input and output leads and wherein one side of each of said capacitors of said first network is connected to said amplifier input lead at a first node,

a second network of capacitors including a plurality of n/2 capacitors, said capacitors having decreasing fractional values from $C/2^{\circ}$ to $C/2^{(n/2-1)}$, one side of each of said capacitors of said second network being connected together at a second node,

a coupling capacitor of value $C/2^{(n/2-1)}$ connected between said first and second node,

a plurality of *n* switches, each switch connected to the other side of a separate one of said *n* capacitors of said first and second networks, said switches being adapted to be selectively connected to at least a first reference potential and a second reference potential,

wherein said amplifier means functions to maintain said first node constantly fixed at said second reference potential and wherein said plurality of switches are selectively actuated in accordance with a digital signal representation to establish electrical paths through said capacitors connected thereto to provide an analog signal on the otput lead of said amplifier means which is an analog representation of said digital signal representation.

4,077,036

DATA ENTRY DEVICES

Emik A. Avakian, 17 Stoney Brook Drive, Glastonbury, Conn. 06033, and David Laizerovich, West Hartford, Conn., assignors to Emik A. Avakian, Glastonbury, Conn.

Filed Aug. 30, 1976, Ser. No. 718,982
Int. Cl.[2] G08C *1/00*; H01H *9/00*
U.S. Cl. 340—365 S **26 Claims**

1. Manually operable apparatus for generating signals commensurate with information to be transmitted to other equipment, said signal generating apparatus comprising:

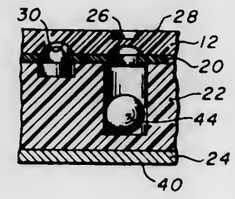
switch matrix means, said switch matrix means including:

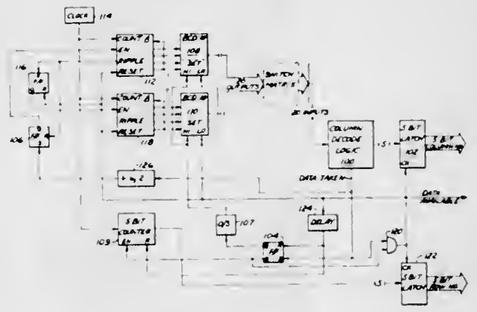
a circuit defining element, said circuit defining element being provided with a pattern of apertures and supporting a plurality of conductors, said conductors being arranged so as to at least in part intercept at least some of said apertures in pairs whereby each of said intercepted apertures may be identified by a unique pair of conductors;

base means, said base means defining a plurality of receptacles having a generally circular cross-section, said base means being juxtapositioned to a first side of said circuit defining element with said receptacles arranged coaxially with said apertures and facing said circuit defining element; and

a spherical conductive member disposed in each of said base means receptacles, said conductive members having a diameter less than the diameter of said receptacles whereby said conductive members are freely movable in said receptacles;

protective cover means, said cover means having a first surface juxtapositioned to and generally coplanar with the second side of said circuit defining element, said cover means having a second surface which defines a data input area, said cover means second surface forming at least part of an exposed face of said housing; and





means for actuating the switches of said matrix means, said conductive members being caused to move by magnetic attraction into contact with a pair of intercepting conductors to bridge said conductors when said actuating means is aligned with the circuit defining element aperture with which said conductors are associated.

23. The apparatus of claim 1 further comprising:

encoding means for generating a unique binary bit pattern for each unique pair of conductors on said switch matrix circuit defining element, said encoding means being electrically connected to said conductors on said circuit defining element.

4,077,037

VARIABLE RANGE MARKER

Joseph E. Bryden, Framingham, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Aug. 6, 1976, Ser. No. 712,428
Int. Cl.[2] G01S *7/22*
U.S. Cl. 343—5 EM **6 Claims**

4. A radar system comprising in combination:

means for producing digital representations of a radar return signal;

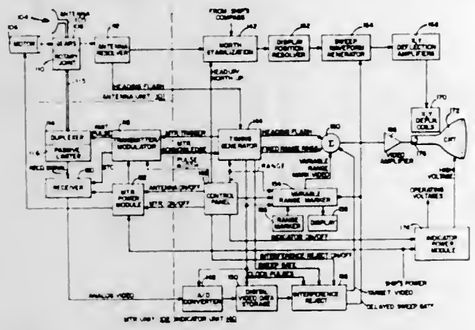
means for storing said representations;

means for reading out said representations from said storing means at a rate which is substantially constant among at least some settings of a radar range scale setting;

means for producing a video signal from the read out representations;

means for producing a variable position range mark signal, said range mark signal modifying said video signal;

means for producing a digital number to generate said variable range mark signal at a distance from the center of said manual display;



a continuously rotatable control; and

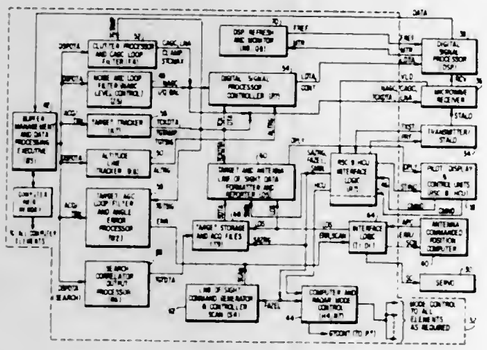
means for producing said digital number in response to manual rotation of said rotatable control.

4,077,038

DIGITAL RADAR CONTROL SYSTEM AND METHOD

Robert I. Heller, Baltimore; Larry C. Schafer, Linthicum, both of Md., and Stephen R. McCracken, Wichita, Kans., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 1, 1976, Ser. No. 672,891
Int. Cl.² G01S 7/44
U.S. Cl. 343—7 A 18 Claims



1. In an aircraft pulsed doppler radar system including a wave energy transmitter and a receiver for detecting the wave energy returned to the receiver by reflection, a digital system, including a programmed digital computer, for processing the returned energy comprising:

means for determining the range from which said return energy is reflected to provide digital range data, and for evaluating the width of said return energy in the time domain;

means for evaluating the amplitude of said return energy, and for designating said return energy as clutter and generating clutter AGC and blanking signals for control of the receiver in response to an evaluated width and amplitude of said return energy above predetermined minimum values;

means for designating said return energy as an altitude line and for tracking said altitude line designated return energy in response to a predetermined number of detections of said return energy at about the same range over a predetermined period of time, said altitude line designating and tracking means having a tracking loop response sufficient to account for changes in terrain beneath the aircraft and for sudden range changes of short duration; and,

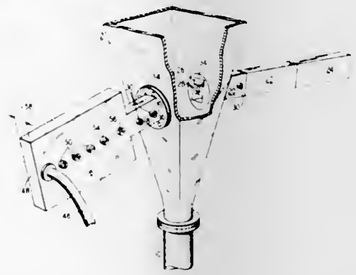
means for designating said return energy as a target and for tracking said target designated return energy in response to said range determining means, said amplitude determining means and an evaluated width of said return energy below said predetermined value.

4,077,039

LAUNCHING AND/OR RECEIVING NETWORK FOR AN ANTENNA FEEDHORN

Chung-Li Ren, and Han-Chiu Wang, both of Andover, Mass., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 20, 1976, Ser. No. 752,165
Int. Cl.² H01Q 13/00; H03H 9/00
U.S. Cl. 343—786 6 Claims



6. Apparatus for an antenna for either launching or receiving two orthogonally polarized signals in a first frequency band, the antenna comprising a flared feedhorn and a waveguide transmission line which will support signals in a second frequency band, the apparatus comprising:

a first network oriented to either launch or receive a first one of the two orthogonally polarized signals comprising

a first evanescent mode waveguide filter coupled at a first end thereof to a first sidewall of the flared portion of the feedhorn through a T-junction and at a second end thereof to a waveguide section capable of propagating signals at the first frequency band, said first waveguide filter being dimensioned and tunable to pass the first frequency band signals and to have a very broad stopband for the second frequency band signals, and

a second evanescent mode waveguide filter coupled at a first end thereof to a second sidewall of the flared portion of the feedhorn through a T-junction at a location directly opposite and facing said first waveguide filter and at a second end thereof to a load termination, said second waveguide filter having the same filter characteristics as said first waveguide filter; and

a second network oriented to either launch or receive a second one of the two orthogonally polarized signals comprising

a first evanescent mode waveguide filter coupled at a first end thereof to a third sidewall of the flared portion of the feedhorn through a T-junction and at a second end thereof to a waveguide section capable of propagating signals at the first frequency band, said first waveguide filter being dimensioned and tunable to pass the first frequency band signals and to have a very broad stopband for the second frequency band signals, and

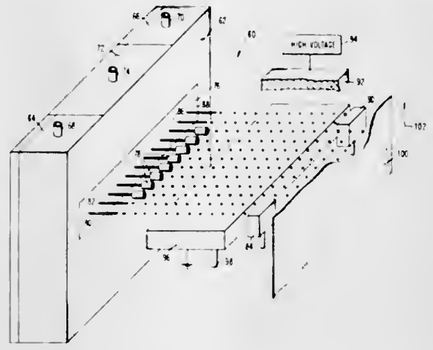
a second evanescent mode waveguide filter coupled at a first end thereof to a fourth sidewall of the flared portion of the feedhorn through a T-junction at a location directly opposite and facing said first waveguide filter and at a second end thereof to a load termination, said second waveguide filter having the same filter characteristics as said first waveguide filter.

4,077,040

GUARD JETS IN MULTIPLE NOZZLE PRINTING

Ferdinand Hendriks, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 591,984, Jun. 30, 1975, abandoned. This application Oct. 22, 1976, Ser. No. 734,780
Int. Cl.² G01D 15/18
U.S. Cl. 346—75 6 Claims



1. In a jet printer, the combination comprising:

a multiple nozzle array having at least one row of nozzles, with N nozzles in said one row; and

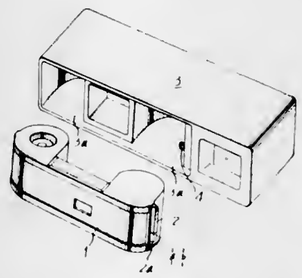
means for emitting a non-marking droplets stream from at least the first and Nth nozzles for creating a colinear airflow, including means for emitting a marking droplet stream from each of the other nozzles, with the airflow created by the emitted non-marking droplet streams being used to reduce the aerodynamic retardation of the emitted marking droplet streams.

4,077,041

PHOTOGRAPHIC CAMERA EMPLOYING A CARTRIDGE FILM

Toshinori Imura, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 24, 1976, Ser. No. 670,025
Claims priority, application Japan, Apr. 1, 1975, 50-40000
Int. Cl.² G03B 7/00
U.S. Cl. 354—21 11 Claims



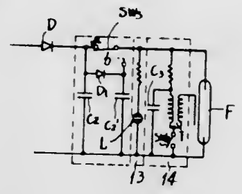
1. The combination comprising a camera having photographing parameters based on a film having a predetermined sensitivity and having a film cartridge housing cavity and a cavity cover movable between cavity open and cavity closed positions, a film cartridge insertable into said cavity and having index means in accordance with the sensitivity of the film carried by said cartridge, means for sensing said indexing means communicating with said cavity and control means responsive to the relationship between said sensing means and the index means of an inserted cartridge to alternatively permit or prevent the closing of said cover when said index means designates a film with a sensitivity range which covers or is outside said predetermined sensitivity respectively.

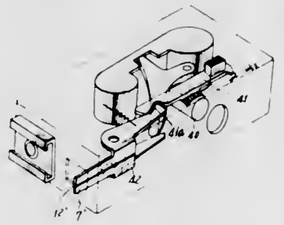
4,077,042

CONTROL MEANS FOR PHOTOFLASH PHOTOGRAPHY SYSTEM

Toshinori Imura, Sakai; Keisuke Maeda, Osaka, and Mikio Naya, Izumi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 8, 1976, Ser. No. 703,490
Claims priority, application Japan, Jul. 11, 1975, 50-85685
Int. Cl.² G03B 7/00, 15/05
U.S. Cl. 354—21 8 Claims





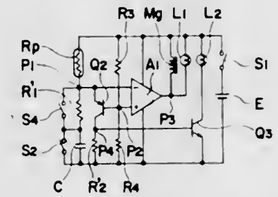
1. A photoflash photography apparatus comprising a camera having a film cartridge receiving chamber, a film cartridge replaceably housed in said chamber and having detectable indicia varying in accordance with the sensitivity of the film contained in said cartridge, a photoflash unit coupled to the camera and having a variable light output and including a photoflash tube and at least a pair of storage capacitors dischargable through said tube to effect the emission of said photoflash light therefrom and control means responsive to said indicia for varying the amount of the light emittted from said photoflash unit inversely of the sensitivity of said film contained in said cartridge and including means for alternatively connecting one and both of said capacitors across said tube in response to said indicia.

4,077,043

EXPOSURE INDICATING DEVICE

Yasuhiro Nanba, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 28, 1976, Ser. No. 709,528
Claims priority, application Japan, Aug. 2, 1975, 50-94524
Int. Cl.² G03B 7/08, 17/18
U.S. Cl. 354—51 22 Claims



1. In a photographic camera including an automatic expo-

sure control device having a photoelectric means for generating an output representative of the scene brightness, exposure control means connected to said photoelectric means for generating an exposure control voltage in accordance with the output of said photoelectric means, reference voltage means for generation of a reference voltage, a comparison means, having a first input terminal connectable to said exposure control means and a second terminal connected to said reference voltage means for generating an output when said exposure control voltage reaches said reference voltage, electromechanical means connected to said comparison means for control of film exposure in response to the output of said comparison means, and an exposure indicating means for indicating by actuation and deactuation of at least one indicator element what relation the exposure to be determined automatically will have with respect to a plurality of standards, an improved exposure indicating device comprising:

a light-representative means connected to said photoelectric means and connectable to said first input terminal of said comparison means for generating a light-representative voltage in accordance with the output of said photoelectric means and for causing said comparison means to generate an output when said light-representative voltage differs from the reference voltage in one predetermined direction;

a first transistor connected with its base and emitter between outputs of said light-representative means and said reference voltage means for generating an output when said light-representative voltage differs from said reference voltage by more than a predetermined amount in the opposite direction to said one predetermined direction; and

said exposure indicating means being connected to said comparison means and said first transistor for actuation of said at least one indicator element when said comparison means generates an output and for actuation of said at least one indicator element when said first transistor generates an output.

17. An improvement in an exposure indicating device for automatic exposure control photographic cameras comprising:

photoelectric means for generating an output representative of the scene brightness;

exposure control means for generating exposure control voltage when connected with said photoelectric means;

light-representative means for generating light-representative voltage when connected with said photoelectric means;

shutter control means for starting film exposure sequence;

selector means interconnected with said shutter control means, said photoelectric means, said exposure control means and said light-representative means, for alternatively connecting said exposure control means and said light-representative means to said photoelectric means in response to said shutter control means, whereby said exposure control means is connected to said photoelectric means when said shutter control means is activated and said light representative means is connected to said photoelectric means when said shutter control means is deactivated;

reference voltage means for generating a reference voltage;

first comparison means with a first input connected to said light-representative means and said exposure control means and a second input connected to said reference voltage means for generating an output when the voltage at said first input is less than the voltage on said second input, whereby when said shutter control is activated said first comparison means produces an output when said exposure control voltage is less than said reference voltage and when said shutter control is deactivated said first comparison means produces an output when said light-representative voltage is less than said reference voltage;

electromechanical means connected to said first comparison means and said shutter control means, for control of film exposure when said shutter control means is activated and said first comparison means generates an output;

second comparison means with a first input connected to said light-representative means and said exposure control means and a second input connected to said reference voltage, for generating an output when the voltage on said first input exceeds the voltage on the second input by more than a predetermined amount, whereby when said shutter control means is deactivated said second comparison means generates an output when said light-representative voltage exceeds said reference voltage by more than said predetermined amount; and

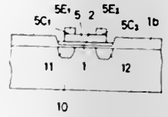
indicator means connected to said first and second comparison means for generating an indicator signal when said first comparison means generates an output and for generating an indicator signal when said second comparison means generates an output.

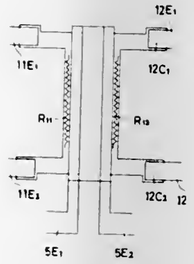
4,077,044

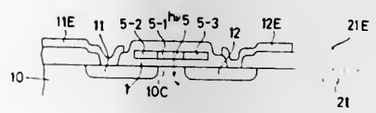
NONVOLATILE MEMORY SEMICONDUCTOR DEVICE

Yutaka Hayashi, Hoya, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Aug. 28, 1975, Ser. No. 608,676
Claims priority, application Japan, Aug. 29, 1974, 49-98418
Int. Cl.² H01L *29/78*
U.S. Cl. 357—23 **14 Claims**







1. A nonvolatile semiconductor memory device with analogue information storage capability, comprising:

a semiconductor substrate of a first conductivity type;

at least two spaced apart regions in the substrate and of opposite conductivity type to the substrate, the regions defining a channel-forming region in the substrate;

an insulating layer disposed on the substrate at least about the channel-forming region;

charge-storing means disposed in the insulating layer and at least above the channel-forming region;

a gate disposed on the insulating layer above the channel-forming region, the gate comprising an elongated resistive layer; and

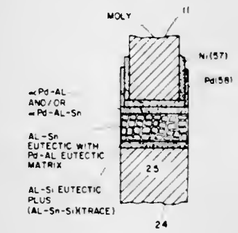
a first pair of electrodes, one of the electrodes contacting one side of the resistive layer for supplying a voltage varying according to analogue information to be stored in the device and the other electrode contacting the opposite side of the resistive layer.

4,077,045

METALLIZATION SYSTEM FOR SEMICONDUCTIVE DEVICES, DEVICES UTILIZING SUCH METALLIZATION SYSTEM AND METHOD FOR MAKING DEVICES AND METALLIZATION SYSTEM

Richard L. Greeson, Scottsdale, and Elliott M. Philofsky, Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 3, 1974, Ser. No. 430,431
Int. Cl.² H01L *23/48, 29/46*
U.S. Cl. 357—71 **6 Claims**



1. A semiconductor device having a metallurgical bond between the semiconductor die and the terminals attached thereto comprising a semiconductor die,

a metallization system on each side of said die comprising an aluminum layer on the die and a layer of aluminum and tin mixture on the aluminum layer,

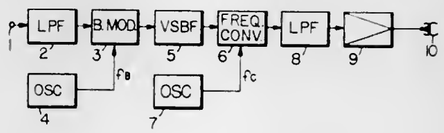
terminals each comprising a metal slug of a material selected from the group consisting of molybdenum, copper, nickel, silver, platinum, palladium, rhodium tungsten, and copper clad steel on each side of said die and metallurgically bonded thereto, and a glass preform sealed to each of said metal slugs.

4,077,046

SYSTEM FOR RECORDING AND/OR REPRODUCING A VIDEO SIGNAL

Minoru Morio, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 7, 1975, Ser. No. 630,077
Claims priority, application Japan, Nov. 9, 1974, 49-129231
Int. Cl.² H04N *5/76*
U.S. Cl. 358—4 **18 Claims**



5. A system for magnetically recording a color video signal comprised of frequency components over a video band that include a luminance portion and a chrominance portion, said system comprising:

filter means to separate said luminance portion from said chrominance portion; modulating means to modulate a carrier with said luminance portion from said filter means for producing an amplitude or phase modulated signal that includes not substantially more than one sideband signal;

frequency converting means receiving said one sideband signal and said chrominance portion;

a source of at least one frequency converting signal applied to said frequency converting means for causing the latter to convert said sideband signal to a frequency range such that the carrier frequency of the converted sideband signal is substantially at the low frequency end of said converted sideband signal and is a lower frequency than at least some of said frequency components of the video band and further for causing said frequency converting means to convert said chrominance portion to a frequency range below said frequency range of the converted sideband signal;

magnetic transducing means; and

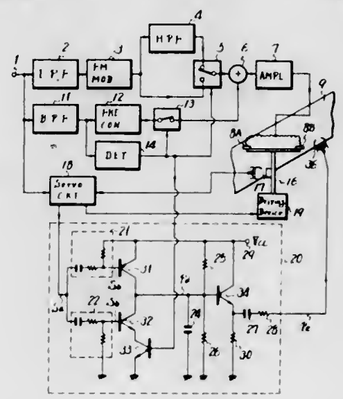
means applying said converted sideband signal and said converted chrominance portion to said magnetic transducing means for recording by the latter in parallel abutting or overlapping tracks on a magnetic recording medium with the carrier of said converted sideband signal, as recorded in each of said tracks, being substantially aligned with the carrier of the converted sideband signal recorded in the adjacent tracks.

4,077,047

COLOR KILLER ENHANCEMENT IN A VIDEO SIGNAL RECORDING/PLAYBACK SYSTEM

Kazuo Yamagiwa, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 16, 1976, Ser. No. 705,798
Claims priority, application Japan, Jul. 21, 1975, 50-101075[U]
Int. Cl.² H04N *5/76*
U.S. Cl. 358—4 **16 Claims**



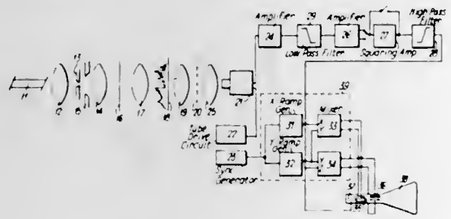
1. In an apparatus for recording and/or reproducing a video signal having a predetermined characteristic indicative of whether said video signal is a composite color video signal or a monochrome video signal, and in which said video signal is recorded on a magnetic medium by at least one rotary head; a mode control signal generating means for generating a mode control signal representative of said predetermined characteristic, and a fixed head receiving said mode control signal for recording the same on said magnetic medium.

4,077,048

OPTICAL DIFFRACTOMETERS

John Jungles, Thurmaston; David John Whitehouse, Melton Mowbray, and Eric Gordon Nightingale, Leicester, all of England, assignors to The Rank Organisation Limited, London, England

Continuation-in-part of Ser. No. 454,009, Mar. 22, 1969, Pat. No. 3,927,253. This application Apr. 24, 1975, Ser. No. 571,273
Claims priority, application United Kingdom, Mar. 22, 1973, 13831/73
Int. Cl.² H04M *5/72*
U.S. Cl. 358—89 **13 Claims**



1. In an optical diffractometer system of the type comprising:
a laser as light source,
holder means for supporting an object,
an image transformation unit for providing a Fourier transform of an object carried by said object holder means, and
an image reconstruction unit including means for focusing an image transform at a transform plane and a reconstructed image at an image plane,
the improvement wherein:
said laser is a multimode device,
said image transformation unit includes
a condenser lens,
a first adjustable aperture stop positioned in the focal plane of said condenser lens, such that adjustments to the size of said aperture stop effect adjustments to said image transform quality,
a collimator lens from which substantially plane parallel light is directed towards an object carried by said object holder means, and
a second adjustable aperture stop located at the entrance pupil of said collimator lens, between said first adjustable aperture stop at the rear focal plane of said condenser lens and said collimator whereby adjustments to the size of said further adjustable aperture stop effect adjustments to one or both of said transform image at said transform plane and said reconstructed image at said image plane,
and there is:
a television camera positioned to receive light from said image reconstruction unit,
means for modulating the line scan of said television camera by a Y signal repesentative of the television camera beam current,
means for modulating the line scan of said television camera to effect an X-shift in dependence on the line position, and
means for displaying the signal from the camera, whereby a pseudo three dimensional display of an image from said image reconstruction unit can be obtained.

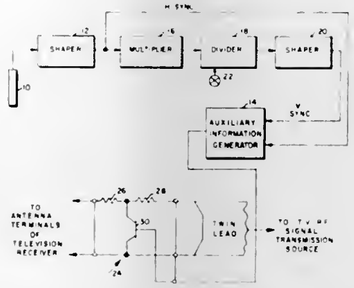
4,077,049

UNIVERSAL TELEVISION INTERFACE

Ralph H. Baer, Manchester, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Jan. 26, 1977, Ser. No. 762,539
Int. Cl.² H04N *7/18*
U.S. Cl. 358—93 **16 Claims**

1. Apparatus for generating synchronization signals from an ongoing program received at a television receiver from a TV r.f. signal transmission source, comprising:
means adapted to be positioned proximate a television receiver for extracting a signal in synchronism with the horizontal synchronization signal received by the television receiver from the TV r.f. signal transmission source;



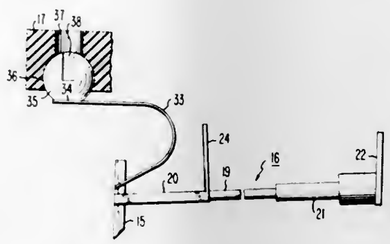
means electrically coupled to said extracting means for generating a signal at the vertical synchronization rate, including means for dividing the extracted signal by a predetermined number; and
means for changing the divisor of said dividing means.

4,077,050

VIDEO DISC PLAYER EMPLOYING A SPRING LOADED STYLUS APPARATUS

Anil Ramniklal Dholakia, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 16, 1976, Ser. No. 667,307
Claims priority, application United Kingdom, Sep. 15, 1975, 37848/75
Int. Cl.² G11B *17/06*
U.S. Cl. 358—128 **7 Claims**



1. In a system for playing back prerecorded signals from a spirally-grooved record rotatably mounted on a turntable by a groove-riding stylus secured to one end of a stylus arm; said system including a base plate; an apparatus comprising:
a carriage mounted for lateral motion relative to said base plate in correlation with lateral motion of said groove-riding stylus;
means for supporting the end of said stylus arm remote from said one end within said carriage;
a spring for urging said stylus into said record groove during playback; said spring having a first end and a second end; said first end of said spring being secured to said stylus; and
means for securing said second end of said spring within said carriage for movement therewith.

4,077,051

VIDEO DISC WITH A CONDUCTIVE LAYER HAVING AN OXYGEN CONTENT GRADIENT

John Louis Vossen, Jr., Bridgewater, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 4, 1977, Ser. No. 793,640
Int. Cl.² H04N *1/28*; B32B *3/02, 15/08, 15/20*
U.S. Cl. 358—128 **10 Claims**

1. A capacitive recording means comprising:
a. a disc having a spiral groove on a surface thereof with video information in the form of geometric variations in said groove;
b. a thin conductive bilayer film disposed on said surface of the disc having a first layer of copper and a second layer of an alloy of nickel and chromium which contains up to about 10% by weight of iron; and
c. a polymeric dielectric layer disposed on the conductive film
wherein the alloy layer contains from about 5 to about 20 average atomic percent of oxygen and the oxygen content forms a concentration gradient decreasing from the interface between the copper layer and the alloy layer to the interface between the alloy layer and the polymeric dielectric layer.

4,077,052

VIDEO DISC CAPACITIVE RECORDING MEANS WITH A CONDUCTIVE BILAYER

John Louis Vossen, Jr., Bridgewater, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 4, 1977, Ser. No. 793,644
Int. Cl.² H04N *1/28*; B32B *3/02, 15/08, 15/20*
U.S. Cl. 358—128 **11 Claims**

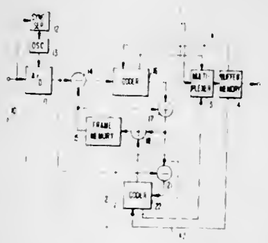
1. A capacitive recording means comprising:
a. a disc having a spiral groove on a face thereof with video information in the form of geometric variations in said groove;
b. A thin conductive bilayer film on said face having a first layer of copper and a second layer of an alloy of nickel and chromium which contains up to about 10% by weight of iron and contains from about 5 to about 25 average atomic percent of oxygen; and
c. an inorganic dielectric layer disposed on said conductive film.

4,077,053

TELEVISION SIGNAL ENCODER UTILIZING A CORRELATION BETWEEN FRAMES

Tatsuo Ishiguro, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Apr. 8, 1976, Ser. No. 674,998
Claims priority, application Japan, Apr. 9, 1975, 50-43591
Int. Cl.² H06N *7/12*
U.S. Cl. 358—136 **6 Claims**



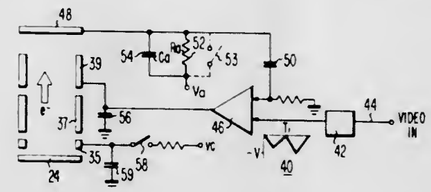
1. A system for coding a television signal by the use of a frame correlation technique, said television signal consisting of a series of frames each defined by horizontal and vertical synchronizing signals and each representing a number of two-dimensionally arranged picture elements of an optical image to be transmitted, said coding system comprising:
means for sequentially comparing every two successive frames to produce an interframe-coded signal;
means responsive to said interframe-coded signal and said television signal for obtaining an interframe-coding error signal caused in said comparing means;
means for coding said interframe-coding error signal to produce an intraframe-coded signal; and
means for multiplexing said intraframe-coded signal with said interframe-coded signal.

4,077,054

SYSTEM FOR MODULATING A FLAT PANEL IMAGE DISPLAY DEVICE

John Guiry Endriz, Trenton, NJ, assignor to RCA Corporation, New York, N.Y.

Filed Feb. 17, 1977, Ser. No. 769,653
Int. Cl.² H04N *5/68*
U.S. Cl. 358—242 **11 Claims**



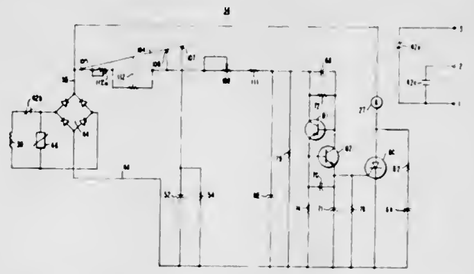
11. A method for modulating an electron beam in a display device having a cathodoluminescent screen, comprising:
generating a periodic waveform having a peak amplitude which varies proportionally with the incoming video signal;
sensing the electrical charge on the screen;
generating a voltage proportional to the sensed instantaneous charge;
comparing the voltage proportional to the sensed charge to the instantaneous voltage of the periodic waveform; and
regulating the electron flow proportionally in response to the comparison of the two voltages.

4,077,055

GROUND FAULT PROTECTIVE DEVICE

John T. Wilson, and James P. Ellsworth, both of Beaver, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jun. 15, 1976, Ser. No. 696,325
Int. Cl.² H02H *3/28*
U.S. Cl. 361—46 **7 Claims**



1. Apparatus for protecting power distribution circuits from ground fault damage, comprising:
a current monitor providing an output signal in response to ground fault current flow in a circuit being protected;

electrical switching means for controlling an associated circuit interrupter;

electronic circuit means connected to said current monitor and said electrical switching means for actuating said switching means upon receipt of an output signal from said current monitor, said circuit means comprising a mechanical switch for altering parameters of said circuit; and

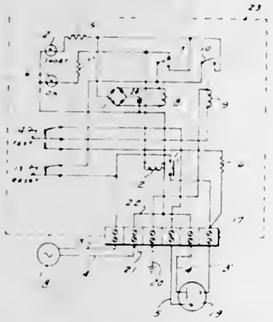
an interchangeable rating plug removably connected to said electronic circuit means, said plug determining the level of ground fault current required to actuate said switching means and comprising a resistor, means for electrically connecting said resistor to said electronic circuit means, and means for mechanically actuating said switch when said rating plug is connected to said electronic circuit means, whereby parameters of said electronic circuit are adjusted.

4,077,056

GROUND-FAULT CIRCUIT INTERRUPTER

Antonio Bou Galiana, Rambla del Caudillo, 54, San Baudilio de Llobregat (Barcelona), Spain

Filed Mar. 24, 1976, Ser. No. 669,987
Claims priority, application Spain, Mar. 26, 1975, 436102
Int. Cl.[2] H02H 3/16
U.S. Cl. 361—50 9 Claims



1. A ground-fault circuit interrupter for connection between incoming hot, cold, and ground lines and outgoing hot, cold, and ground lines, said interrupter comprising:

a test switch having a pair of test contacts and a pole normally lying against one of said test contacts, said one test contact being connected to said outgoing ground line;

a resistor between the other of said test contacts of said test switch and one of said hot lines;

a detector relay having a detector coil connected between said outgoing cold line and said pole and a pair of detector contacts actuatable on detection of a voltage differential between said outgoing cold and ground lines, whereby displacement of said pole against the other of said test contacts feeds current through said resistor to said detector coil;

a main switch connected in series between said incoming hot line and said outgoing hot line; and

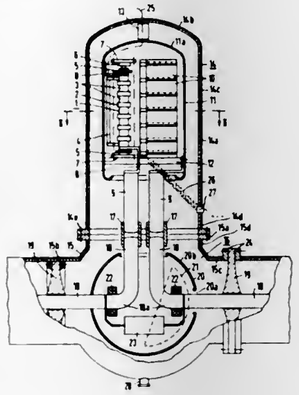
control means connected between said detector contacts of said detector relay and said main switch for opening said main switch on actuation of said detector contacts on detection of said voltage differential and on energization of said detector coil by a current through said resistor.

4,077,057

GAS-INSULATED THYRISTOR ARRANGEMENT COMPRISING A PRESSURE ENCAPSULATION FORMED IN THE MANNER OF A TANK

Wilfried Ramell; Manfred Schraudolph, and Gerd Thiele, all of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 28, 1977, Ser. No. 772,673
Claims priority, application Germany, Mar. 8, 1976, 2609512
Int. Cl.[2] H05K 7/20
U.S. Cl. 361—386 23 Claims



1. Apparatus comprising at least one gas insulated thyristor arrangement said arrangement including:

at least one thyristor column comprising disc-type thyristors stacked side by side and heat sinks each of which is disposed between an adjacent pair of thyristors and serves to conduct current;

driving modules and external circuit modules electrically connected to said one thyristor column;

a substantially rotationally symmetric shielding means, said shielding means being connected in an electrically conductive manner to and surrounding said one column, said driving modules and at least a portion of said external circuit modules;

an electrically conductive pressure encapsulation including a pressure tube and an end plate closing an end of said tube and integrally formed therewith so as to form a tank;

an electrically insulating post fastening said shielding means to said pressure encapsulation;

further means comprising at least one bulkhead formed from an electrically insulating material closing off the other end of said tube in a gas-tight manner;

and electrical connecting leads extending through said bulkhead for providing electrical connections to said one thyristor column.

4,077,058

METHOD AND APPARATUS FOR EXECUTING AN EXTENDED DECOR INSTRUCTION

Marc Appell; Jacques Michel Jean Bienvenu, both of Paris; Jean-Claude Marcel Cassonnet, Conflans-Ste-Honorine, and Georges Lepicard, Vaucresson, all of France, assignors to Compagnie Honeywell Bull, Paris, France

Filed Dec. 2, 1974, Ser. No. 529,257
Claims priority, application France, Nov. 30, 1973, 73 42695
Int. Cl.[2] G06F 9/18
U.S. Cl. 364—200 18 Claims

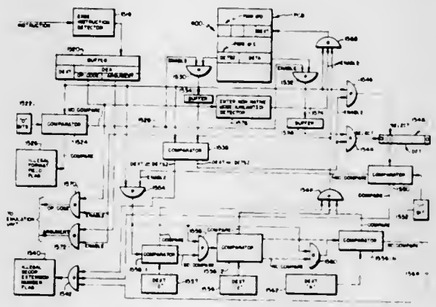
1. A data processing system comprising:

A. means for receiving an instruction designating the switching of the operating mode of a process from a first mode to a specified function in a second mode, wherein said first mode is the native mode of said system during which processes are executed in the normal manner intended by said system, and wherein said second mode is the non-native mode of said system;

B. a plurality of first means for indicating, the contents of each of which indicate the operational state of a said process at any specified time, said plurality of said first means for indicating equal in number to the number of processes included and capable of execution in said system;

C. a plurality of second means responsive to said means for receiving for indicating the executability of said specified function in said system, wherein each of said second means for indicating includes a plurality of indicia, each for indicating the executability of different specified functions in said system, wherein said specified function is indicated by a number in a first portion of said instruction;

D means for addressing said second means for indicating



with a first portion of the contents of said first means for indicating;

E. means coupled to said means for receiving for addressing one of said indicia in the addressed second means for indicating by the number indicated in said first portion of the contents of said instruction;

F. means for activating said specified function for said process in said second mode if said second means for indicating indicates that said specified function is executable in said system;

G. means for generating a first signal if the number indicated by said first portion of the contents of said instruction is greater than a number indicated by a portion of the contents of said first means for indicating; and

H. means, responsive to said first signal, for disabling said means for activating such that said specified function for said process in said non-native mode will not be executed in said system.

4,077,059

MULTI-PROCESSING SYSTEM WITH A HIERARCHIAL MEMORY HAVING JOURNALING AND COPYBACK

Vincent A. Cordi, 400 Fordham Road, Vestal, N.Y. 13850, and Bruce A. Edson, 16 Woodside Road East, Apalachin, N.Y. 13732

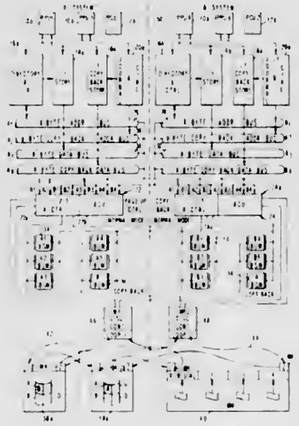
Filed Dec. 18, 1975, Ser. No. 642,035
Int. Cl.[2] G06F 13/08
U.S. Cl. 364—200 4 Claims

1. In a multi-level hierarchial memory system made up of a lowest level with a first data store means for storing data for the memory system and a plurality of sequentially higher levels each level with its own first data store means for storing data at that level which is a portion of the data contained in the first data store means at the next lower level in the hierarchy and for also storing changes of addition or modification to units of said portion of the data made by computer instruction from a processing unit, an improvement in the means of copying back from any given level of the sequentially higher levels into the next lower level said changes stored at said given level comprising:

a second data store means at said any given level that is coupled to the processing unit for the purpose of storing a duplicate copy of only those units of the data at said any given level that contain said changes to be copied back down to lower levels, said second data store means having the capacity to store only a small portion of the data units capable of being stored in the first data store means of said any given level;

a journal means coupled to the processing unit for recording the locations of data units at said any given level in the order in which data units stored in the second data store means at said given level were first altered at that given level by one of said changes that has not been copied back into any lower level;

copyback means coupled to the next lower level in the hierarchy and to the journal means for copying back said units of data at said any given level that contains said



changes made in the data at said given level into the next lower level in the hierarchy in said order recorded in the journal means;

counting means at said any given level for counting the number of data units at said any given level that have yet to be copied back to the next lower level at any given moment and,

forced copy back means coupled to the copyback means for starting the copy back means to copy back changes in the next lower level of the hierarchy when the count in the counting means reaches a count which is within a preselected number of counts of the data unit capacity of the second data store at said any given level so that the number of data units at said any given level that have yet to be copied back will not exceed the data unit capacity of the second data store.

4,077,060

ASYMMETRICAL MULTIPROCESSOR SYSTEM

Ronald Eugene Bodner, and Richard Craig Kiscaden, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

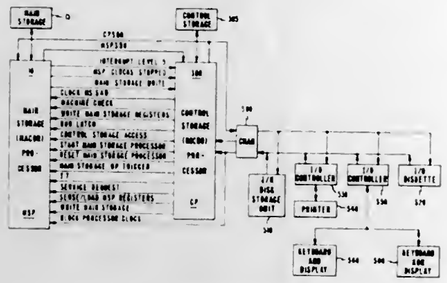
Filed Dec. 27, 1976, Ser. No. 754,390
Int. Cl.[2] G06F 15/16, 15/20
U.S. Cl. 364—200 15 Claims

1. In an asymmetrical multiprocessor system comprising:

an addressable control storage containing microinstructions including microinstructions for controlling initiation of operation of a macroprocessor, a microprocessor connected to address said control storage to fetch and execute microinstructions therefrom,

an addressable main storage containing macroprocessor instructions, and

a macroprocessor connected under control of said microprocessor for initiation of fetching and executing macroinstructions by microinstructions executed by said microprocessor.

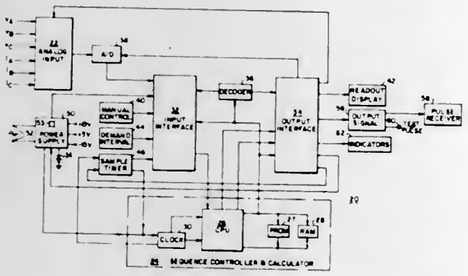


4,077,061

DIGITAL PROCESSING AND CALCULATING AC ELECTRIC ENERGY METERING SYSTEM

Paul M. Johnston, Hempfield Township, Allegheny County, and Andras I. Szabo, Murrysville Borough, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 25, 1977, Ser. No. 781,261
Int. Cl.[2] G01R *21/06*
U.S. Cl. 364—483 **30 Claims**



1. A digital processing and calculating AC electric energy metering system for measuring a parameter of an electric energy quantity occurring in an electric utility system, said metering system comprising:

signal sample means including inputs and outputs, said inputs receiving intput voltage and current signal components of said AC electric energy quantity, said outputs producing instantaneous values of the input voltage and current signals when said signal sample means is rendered to a sampling state;

sampler timer means producing pulse signals at randomly varying intervals, said pulse signals initiating the sampling state of said signal sample means at randomly occurring sampling times;

analog to digital converter means producing binary signal representations of each of the instantaneous signal values;

calculating means computing an incremental quantity of the input signals from said binary signal representations thereof occurring at each sampling time;

accumulator means receiving each incremental quantity computed so as to store totalized values thereof, said totalized values being a time integral of the sums of each computed incremental quantity received to produce measured values of said parameter; and

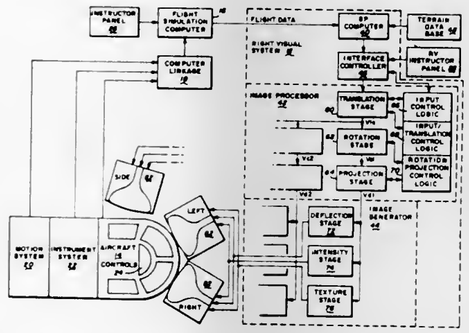
output means responsive to the stored totalized values of said accumulator means to produce data output signals representing the measured parameter values.

4,077,062

REAL-TIME SIMULATION OF A POINT SYSTEM WITH A CRT BLANK PERIOD TO SETTLE BEAM TRANSIENTS

Robert Gary Nielsen, Portola Valley, Calif., assignor to The Singer Company, Binghamton, N.Y.

Filed Dec. 19, 1975, Ser. No. 642,645
Int. Cl.[2] G09B *9/08*; H04N *7/00*
U.S. Cl. 364—521 **11 Claims**



1. A data processing system for displaying a perspective image based on an underlying collection of points within a coordinate system, comprising:

at least one image data base for providing image data and the coordinates of the underlying collection of points;

computer means for receiving the image data and the point coordinates for maintaining the perspective relationship of the points within the collection of points in response to changes in the axis of view relative to the coordinate system of the collection of points;

CRT display means responsive to the computer means for displaying the perspective image; and

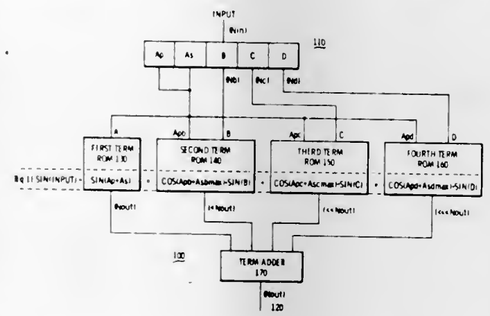
a CRT display control for providing interpoint blank periods and point display periods.

4,077,063

APPARATUS FOR RAPIDLY DETERMINING THE TRIGONOMETRIC FUNCTIONS OF AN INPUT ANGLE

Thomas Peter Lind, Santa Clara, Calif., assignor to The Singer Company, Binghamton, N.Y.

Filed Aug. 11, 1976, Ser. No. 713,562
Int. Cl.[2] G06F *15/34*
U.S. Cl. 364—729 **14 Claims**



1. Apparatus responsive to a signal representation of an input angle (INPUT) having N*in* binary places for providing a signal representation of an approximation of the function SIN(INPUT) having N*out* bits, comprising:

input means for receiving the N*in* binary places of INPUT and identifying a set of at least three progressively smaller subangles A, B, C . . . LAST-1, and LAST formed by consecutive groups of sequential binary places such that:

$$INPUT = A + B + C + \ldots LAST\text{-}1, + LAST,$$

and

$$INPUT > A > B > C \ldots LAST\text{-}1, > LAST;$$

a set of function generator means responsive to the input means, each of which provides a term of the approximate sine relationship:

$$SIN(INPUT) \approx SIN(A) + COS(A)SIN(B) + COS(A)SIN(C) + \ldots + COS(A)SIN(LAST-1) + COS(A)SIN(LAST);$$

and

adder means responsive to each function generator for combining the terms therefrom to form the approximate sine relationship.

DESIGN PATENTS

GRANTED FEBRUARY 28, 1978

ERRATA

For CLASS	See PATENT NO.
D23–42	247,378

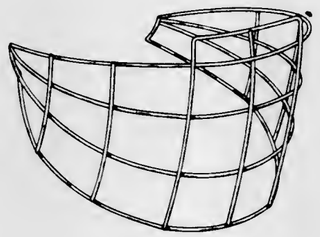
DESIGNS

FEBRUARY 28, 1978

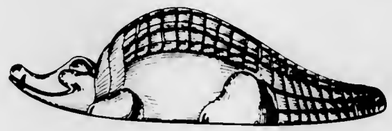
247,331
SWEATSHIRT
Phillip L. Nally, 302 W. Muir, Bardstown, Ky. 40004
Filed Feb. 4, 1975, Ser. No. 547,056
The portion of the term of this patent subsequent to Feb. 4, 1989, has been disclaimed.
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—215



247,332
HOCKEY FACE MASK
Edward Quan, 228 Berkshire Lane, Stockton, Calif. 95207
Filed May 28, 1976, Ser. No. 691,128
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—233



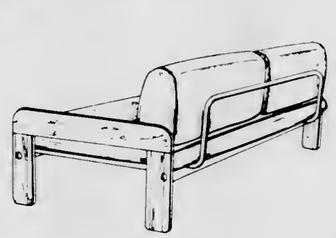
247,333
NOVELTY HAT
Ronald L. Dame, 740 Hoosier Ave., Evansville, Ind. 47715
Filed Sep. 7, 1976, Ser. No. 720,962
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—250



247,334
SPORTING SHOE
Kyozo Sasaki, No. 4-8, Rokurokuso-cho, Ashiya, Hyogo, Japan
Filed Jun. 4, 1976, Ser. No. 692,942
Claims priority, application Japan, Feb. 27, 1976, 51-7054
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—309



247,335
SOFA
Jan Dranger, and Johan Huldt, both of Stockholm, Sweden, assignors to Innovator Design AB, Stockholm, Sweden
Filed Jun. 14, 1976, Ser. No. 695,547
Claims priority, application Sweden, Dec. 16, 1975, 2503/75
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



247,336
CHAIR
Morris F. Fisher, Riveria Beach, Fla., assignor to Futorian Corporation, Amsterdam, N.Y.
Filed Sep. 27, 1976, Ser. No. 727,186
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—71



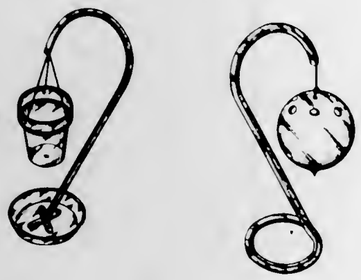
247,337
WALL MOUNTED STAND FOR POTTED PLANTS OR THE LIKE
Lee Richard Chasen, Port Chester, N.Y., assignor to Coats & Clark, Inc., Stamford, Conn.
Filed Aug. 12, 1976, Ser. No. 713,890
Term of patent 14 years
Int. Cl. D6—*06, 04*
U.S. Cl. D6—137



247,338
VASE
Edward A. Wagschal, 21 E. 62nd St., New York, N.Y. 10021
Filed Apr. 8, 1977, Ser. No. 785,939
Term of patent 14 years
Int. Cl. D6—*06;* D11—*02*
U.S. Cl. D6—137



247,339
COMBINED PLANT CONTAINER AND SUPPORT
Earl M. Relback, 20 E. Ninth St., New York, N.Y. 10003
Filed Apr. 8, 1976, Ser. No. 674,919
Term of patent 14 years
Int. Cl. D6—*04;* D11—*02*
U.S. Cl. D6—182

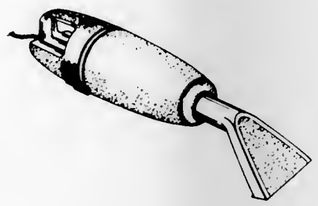


247,340
LAUNDRY BAG
Gerald M. Benstock, Lloyd Harbor, N.Y., assignor to Superior Surgical Mfg. Co., Inc., Huntington, N.Y.
Filed Dec. 17, 1975, Ser. No. 641,426
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—162

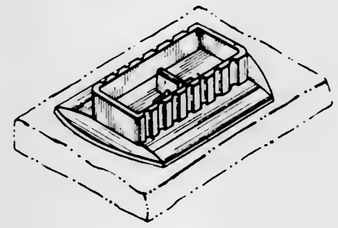




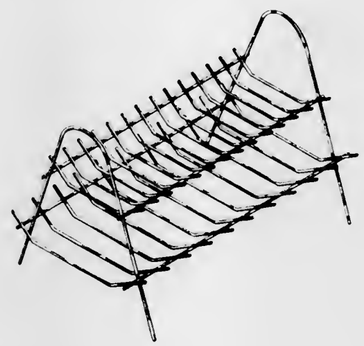
247,341
PORTABLE VACUUM CLEANER
Charles W. Pelly, Calabasas, Calif., assignor to Cal Custom Accessories, Inc.
Filed Aug. 9, 1976, Ser. No. 712,832
Term of patent 14 years
Int. Cl. D7—*05;* D15—*05*
U.S. Cl. D7—164



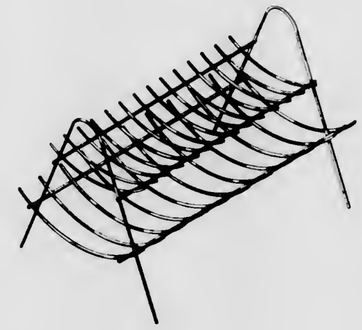
247,342
HOLDER FOR A SCOURING IMPLEMENT
Louis J. Silver, 3434 Baker St., San Francisco, Calif. 94123
Division of Ser. No. 638,345, Dec. 8, 1975, Pat. No. Des. 242,893. This application Aug. 4, 1976, Ser. No. 711,482
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—178



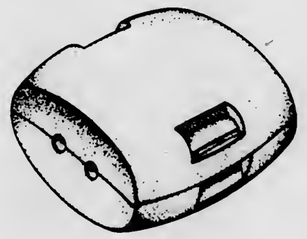
247,343
FIREPLACE GRATE
Edward J. Smith, 12559 Appaloosa Place, Broomfield, Colo. 80020
Filed Feb. 16, 1977, Ser. No. 768,947
Term of patent 14 years
Int. Cl. D7—*08*
U.S. Cl. D7—207



247,344
FIREPLACE GRATE
Edward J. Smith, 12559 Appaloosa Place, Broomfield, Colo. 80020
Filed Feb. 16, 1977, Ser. No. 768,948
Term of patent 14 years
Int. Cl. D7—*08*
U.S. Cl. D7—207



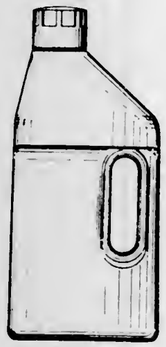
247,345
COUPLING FOR A LANYARD
Robert P. Mulholland, Centerville, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio
Filed Apr. 30, 1976, Ser. No. 681,877
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—383



247,346
BOTTLE PACKAGE
Adam J. Grodin, Forest Hills, N.Y., and Charles J. Tiboldo, Wayne, N.J., assignors to American Cyanamid Company, Stamford, Conn.
Filed Jul. 28, 1976, Ser. No. 709,481
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—12



247,347
COMBINED BOTTLE AND CAP
Richard James Klingaman, Darien, Conn., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Aug. 5, 1976, Ser. No. 711,913
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—40



247,348
DECANTER
Adam J. Grodin, Forest Hills, N.Y., assignor to American Cyanamid Company, Stamford, Conn.
Filed Jul. 31, 1975, Ser. No. 600,709
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—64



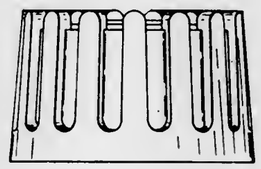
247,349
PACKAGING TRAY FOR CONTAINING AND DISPENSING RAZOR BLADE UNITS
Peter B. Carr, Morpeth, England, assignor to Wilkinson Sword Ltd., England
Filed Jan. 12, 1976, Ser. No. 648,524
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—186



247,350
COMBINED CLOSURE CAP AND BRAKE FLUID DISPENSER
John Edward Witt, 12 Manor Gradens, Hampton, Middlesex, England
Filed Oct. 10, 1975, Ser. No. 621,541
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—275



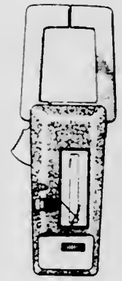
247,351
LIQUID CONTAINER CLOSURE CAP
Francis M. L. Barthropp, West Vancouver, Canada, assignor to Barton of Canada Ltd., Burnaby, Canada
Filed Aug. 23, 1976, Ser. No. 716,892
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—285



247,352
INFRA-RED RADIOMETER
Oskar Heininger, Framingham, Mass., assignor to Williamson Corporation, Concord, Mass.
Filed Oct. 28, 1975, Ser. No. 626,310
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—46



247,353
PORTABLE VOLT-OHM-AMMETER OR THE LIKE
Takeo Kuramoto, Yokohama, Japan, assignor to Kyoritsu Electrical Instruments Works, Ltd., Tokyo, Japan
Filed Oct. 8, 1975, Ser. No. 620,695
Claims priority, application Japan, Jul. 26, 1975, 50-30807
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—79



247,354
LINE MARKER BUOY
Robert Sinclair, Tangier Island, Va. 23440
Filed Mar. 22, 1977, Ser. No. 779,955
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—107



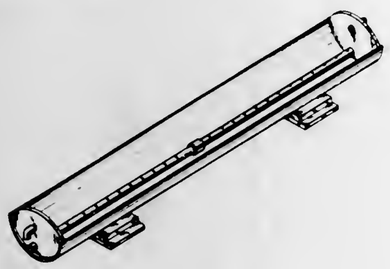
247,355
SCULPTURE
Donald R. Ditto, 4938 Sharp St., Dallas, Tex. 75247
Filed Dec. 22, 1975, Ser. No. 642,702
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—137



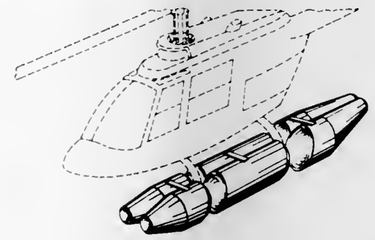
247,356
COMBINED LAMP AND PLANT SUPPORT OR THE LIKE
Herbert E. Wright, 504 E. Davie St., Raleigh, N.C. 27601
Filed Dec. 24, 1975, Ser. No. 644,023
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—144



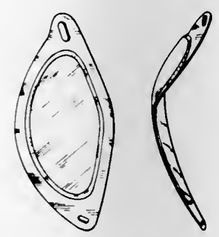
247,357
HYDROPONIC TANK
Michael Wade Gray, 3435 Tennyson, Denver, Colo. 80212
Filed Feb. 3, 1977, Ser. No. 765,338
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—156



247,358
SEGMENTED HELICOPTER FLOAT
Ralph A. Miller, Monmouth Beach, and Randall F. White, Bricktown, both of N.J., assignors to The Garrett Corporation
Filed May 21, 1976, Ser. No. 689,027
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—81



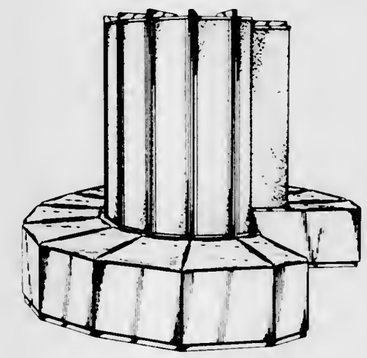
247,359
TRUCK BODY ROCK SHIELD
Warren Ewen, Jeffers, Minn. 56145
Filed May 21, 1976, Ser. No. 688,686
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—190



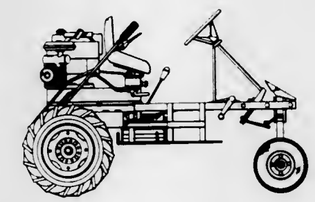
247,360
EXHAUST GAS DIFFUSER FOR AN AUTOMOBILE ENGINE
Kazuhiro Hamaguchi, and Yasuaki Oku, both of Yokohama, Japan, assignors to Kabushiki-Kaisha Taiyo, Yokohama, Japan
Filed May 21, 1976, Ser. No. 688,529
Claims priority, application Japan, Jan. 16, 1976, 51-534
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—194



247,361
COMPUTER CABINET
Seymour R. Cray, Jr., Lilydale, Minn., and Maurice Dean Roush, Chippewa Falls, Wis., assignors to Cray Research, Inc., Chippewa Falls, Wis.
Filed Jun. 30, 1976, Ser. No. 701,077
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—40

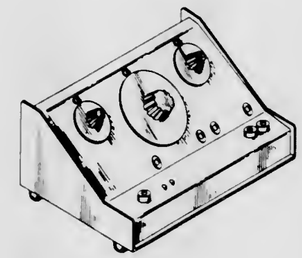


247,362
TRACTOR
J. D. Puckett, Rte. 3, Benedict Road, Cedartown, Ga. 30125
Filed Aug. 11, 1976, Ser. No. 713,291
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—23





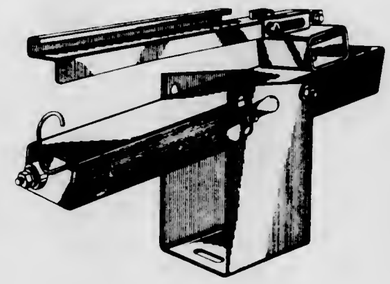
247,363
STUDENT-PROGRAMMABLE EDUCATIONAL INSTRUMENTATION DEVICE
Leonard Hughes, 1526 Mountain Blvd., Oakland, Calif. 94611
Filed May 7, 1976, Ser. No. 684,100
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—60



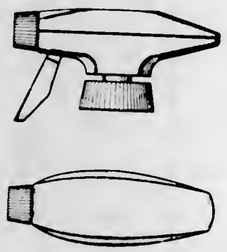
247,364
RETAINER FOR FISHING LINES
Robert E. Schulz, 2131 Fairview St., Oshkosh, Wis. 54901
Filed Jan. 31, 1977, Ser. No. 764,048
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25



247,365
MECHANICAL TRAP FOR THROWING CLAY TARGETS
Kenneth C. Rowlands, Utica; John P. Linde, and Kenneth W. Soucy, both of Richfield Springs, all of N.Y., assignors to Remington Arms Company, Inc., Bridgeport, Conn.
Filed Feb. 7, 1977, Ser. No. 766,605
Term of patent 14 years
Int. Cl. D22—*04*
U.S. Cl. D22—99



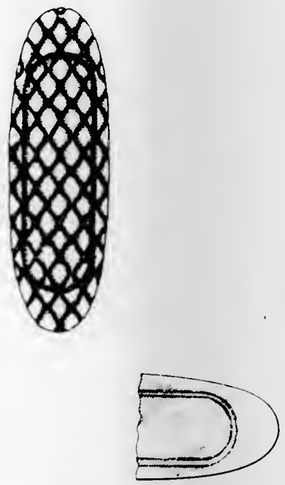
247,366
SPRAY PUMP
David A. Jones, Dayton, Ohio, and John Pardo, Yonkers, N.Y., assignors to Drackett Co.
Filed Oct. 12, 1976, Ser. No. 731,177
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—17



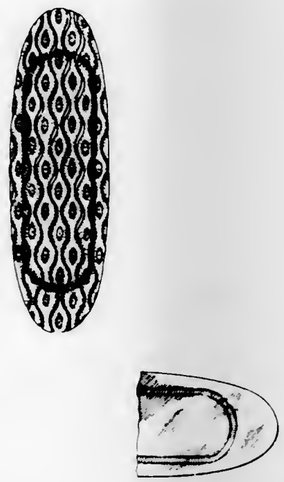
247,367
DENTAL FACE BOW BITE FORK
William B. Dragan, R.F.D. No. 1, Burr St., Fairfield, Conn. 06430
Filed Jan. 3, 1977, Ser. No. 756,174
Term of patent 14 years
Int. Cl. D24—*99, 02*
U.S. Cl. D24—10



247,368
CONTOURED SANITARY NAPKIN
Howard A. Whitehead, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Dec. 27, 1976, Ser. No. 754,343
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—51



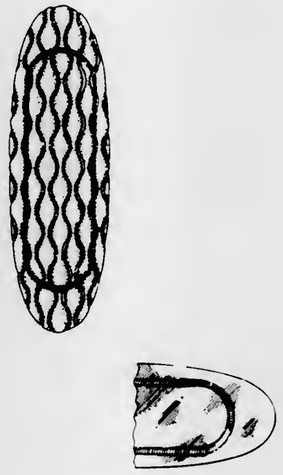
247,369
CONTOURED SANITARY NAPKIN
Howard A. Whitehead, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Dec. 27, 1976, Ser. No. 754,498
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—51



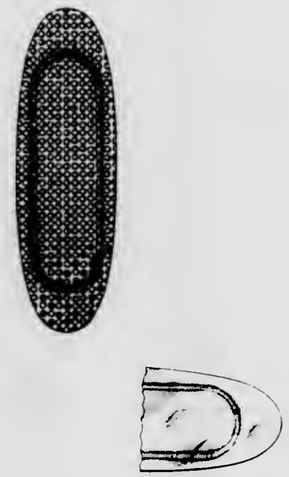
247,370
CONTOURED SANITARY NAPKIN
Howard A. Whitehead, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Dec. 27, 1976, Ser. No. 754,499
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—51



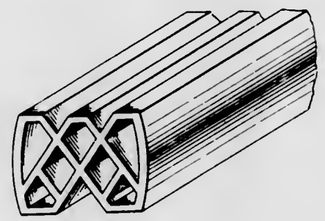
247,371
CONTOURED SANITARY NAPKIN
Howard A. Whitehead, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
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Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—51



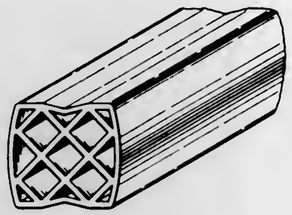
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CONTOURED SANITARY NAPKIN
Howard A. Whitehead, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Dec. 27, 1976, Ser. No. 754,638
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—51



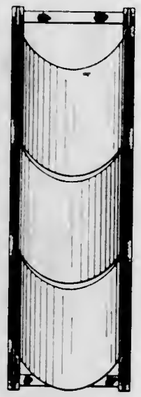
247,373
COMPRESSION SEAL
Guy S. Puccio, Snyder, N.Y., assignor to Acme Highway Products Corporation, Buffalo, N.Y.
Filed Jun. 21, 1976, Ser. No. 697,912
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—75



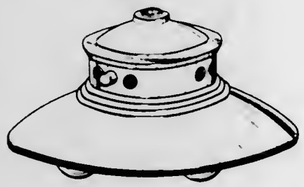
247,374
COMPRESSION SEAL
Guy S. Puccio, Snyder, N.Y., assignor to Acme Highway Products Corporation, Buffalo, N.Y.
Filed Jun. 21, 1976, Ser. No. 698,201
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—75



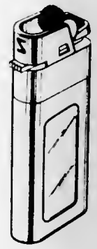
247,375
FACING PANEL FOR FACADES OR THE LIKE
Edward C. Hallock, Summit, and Michael Polifka, Spotswood, both of N.J., assignors to Construction Specialties, Inc., Cranford, N.J.
Filed Mar. 19, 1976, Ser. No. 668,603
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—87



247,376
CIGARETTE LIGHTER
Sadao Yoshinaga, Tokyo, Japan, assignor to Yoshinaga Prince Co., Ltd., Japan
Filed Jan. 6, 1977, Ser. No. 757,384
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—39



247,377
DISPOSABLE CIGARETTE GAS LIGHTER
Tomio Nitta, 2181-7, Enokiyato Kitahassaku-cho, Midori, Yokohama, Japan
Filed Aug. 31, 1976, Ser. No. 719,244
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42



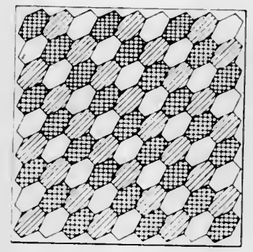
247,378
LIGHTER
Franz Alban Stuetzer, Muehlheim (Main), and Bernd Figur, Nieder-Roden, both of Germany, assignors to Rowenta-Werke, GmbH, Offenbach (Main), Germany
Filed Sep. 27, 1976, Ser. No. 727,315
Claims priority, application Germany, Apr. 2, 1976, 59941
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42



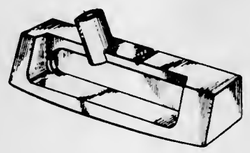
247,379
HAIR DRYER
Minoru Hashino, 17-12, Kita 3-chome, Ten'nohjicho, Abenoku, Osakashi, Osaka, Japan
Filed Jul. 29, 1976, Ser. No. 709,771
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—17



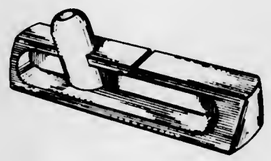
247,380
GAME BOARD
Casimir S. Strozewski, 2526 N. Santiago Ave., Santa Ana, Calif. 92706
Filed Mar. 31, 1976, Ser. No. 672,053
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



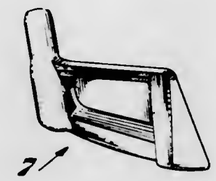
247,381
GOLF CLUB PUTTER HEAD
John S. Adkins, 2555 La Mesa Drive, Santa Monica, Calif. 90402
Filed Jun. 18, 1976, Ser. No. 697,695
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH



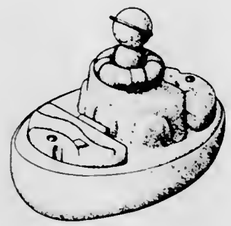
247,382
GOLF CLUB PUTTER HEAD
John S. Adkins, 2555 La Mesa Drive, Santa Monica, Calif. 90402
Filed Jun. 18, 1976, Ser. No. 697,696
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH



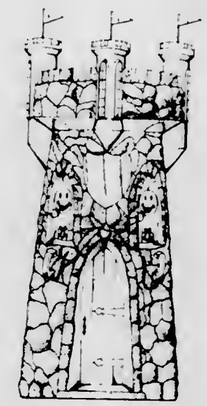
247,383
GOLF CLUB IRON HEAD
John S. Adkins, 2555 La Mesa Drive, Santa Monica, Calif. 90402
Filed Jun. 18, 1976, Ser. No. 697,697
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH



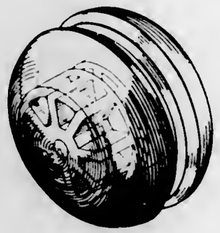
247,384
COMBINED TOY BOAT AND FIGURES THEREFOR
Shinroku Nakao, Yokohama, Japan, assignor to Combi Co., Ltd., Tokyo, Japan
Filed Jan. 5, 1976, Ser. No. 646,695
Claims priority, application Japan, Jul. 15, 1975, 50-29314
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 JJ



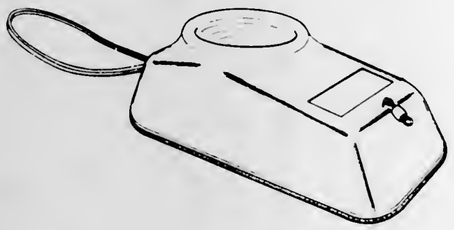
247,385
AUDIBLE AMUSEMENT CASTLE
Sidney N. Rideau, 1610 Monroe St., Gretna, La. 70053
Filed Feb. 9, 1976, Ser. No. 656,812
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 LL



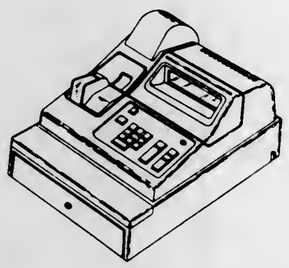
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RETURN TOP
Werner Hellman, Baraboo, Wis., assignor to Flambeau Products Corporation, Baraboo, Wis.
Filed May 19, 1976, Ser. No. 688,022
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AH



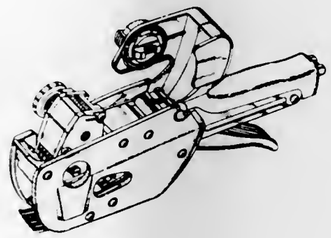
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TETHER BALL GAME BASE
Lindsey G. Spivey, II, Dallas, Tex., assignor to Jokari/U.S., Inc., Dallas, Tex.
Filed Sep. 29, 1976, Ser. No. 727,661
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 P



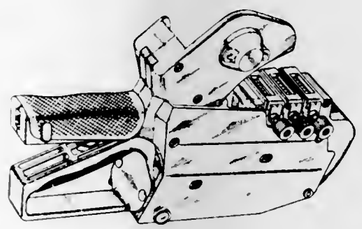
247,388
CASH REGISTER
Shigeru Kurozumi, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Dec. 17, 1975, Ser. No. 641,753
Claims priority, application Japan, Jun. 23, 1975, 50-26499
Term of patent 14 years
Int Cl. D18—*01*
U.S. Cl. D52—4 A



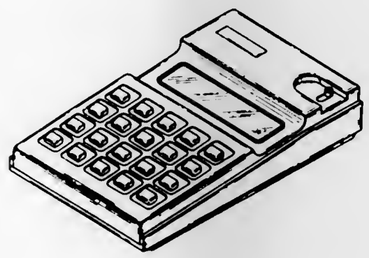
247,389
LABELING MACHINE
Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Tokyo, Japan
Filed Apr. 20, 1976, Ser. No. 678,725
Claims priority, application Japan, Dec. 13, 1975, 50-48864
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D64—10



247,390
PORTABLE LABELING MACHINE
Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Tokyo, Japan
Filed Jul. 12, 1976, Ser. No. 704,419
Claims priority, application Japan, Mar. 29, 1976, 51-10891
Term of patent 14 years
Int. Cl. D18—*79*
U.S. Cl. D64—10



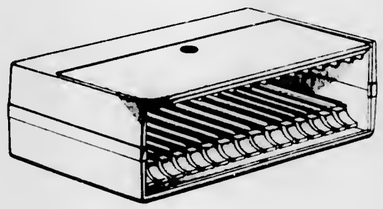
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ELECTRONIC CALCULATING MACHINE
Shigetoshi Hazama, and Masafumi Yamagami, both of Osaka, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Jun. 28, 1976, Ser. No. 700,147
Claims priority, application Japan, Jan. 14, 1976, 51-657
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 B



247,392
BOTTLE BAG
Gary W. Coleman, 400 N. 1223 West #55, Clearfield, Utah 84015
Filed May 14, 1976, Ser. No. 686,390
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



247,393
CASSETTE CABINET
Alan Lowry, Canton, Mass., assignor to Data Packaging Corporation, Cambridge, Mass.
Filed Jun. 1, 1976, Ser. No. 691,250
Term of patent 7 years
Int. Cl. D6—*04*
U.S. Cl. D87—1 D



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LUGGAGE CASE
Norbert H. J. Linke, Milan, Italy, assignor to S. T. Dupont, Paris, France
Filed Jun. 17, 1976, Ser. No. 696,968
Claims priority, application France, Dec. 23, 1975, 75.38805
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—5 F



247,395
COMBINED KEY RING AND COMB
Richard L. Earl, 14419 Montle, Clio, Mich. 48420
Filed Jul. 8, 1976, Ser. No. 703,411
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—8.1



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TO WHOM

PATENTS WERE ISSUED ON THE 28TH DAY OF FEBRUARY, 1978

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AB Bahco Ventilation: *See—*
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AB Bofors: *See—*
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Abrash, Muriel: *See—*
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Acheson, Richard M.; Cox, Ian R.; Stubbs, John K.; and Penrose, Alexander B., to Pfizer Inc. Certain thiazolo compounds as acaricidal agents. 4,076,817, Cl. 424-251.000.

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Ashmead, Harvey H. Synergistic combination of metal proteinates with beta-chlorovinyl dialkyl phosphates. 4,076,803, Cl. 424-177.000.

Aslund, Ivan: *See—*
Eriksson, Kjell Viktor; and Aslund, Ivan, 4,075,926, Cl. 89-16.000.

Astra Lakemedel Aktiebolag: *See—*
Carlsson, Per Arvid Emil; Lindberg, Per Lennart; and Wickberg, Borje Vilhelm, 4,076,840, Cl. 424-324.000.

Astra Plastique: *See—*
Perne, Raymond, 4,076,140, Cl. 215-256.000.

Atlantic Richfield Company: *See—*
Zehner, Lee R., 4,076,949, Cl. 560-204.000.

Atwood, John G.; DeMey, Charles F., III; Marshall, Hamilton W., Jr.; and Ducret, Lucien C., to Perkin-Elmer Corporation, The. Pipetting system for use in kinetic analysis apparatus and the like. 4,076,503, Cl. 23-259.000.

Audiophonics Corporation: *See—*
Molay, Ira, 4,076,957, Cl. 179-1.0AT.

August Thyssen-Hutte AG: *See—*
Groger, Rolf, 4,076,221, Cl. 266-44.000.

Austill, Robert J., to FMC Corporation. Roof for railway car and method of making same. 4,076,166, Cl. 228-157.000.

Austin, Forrest L., to Cornelius Company, The. Food mold. 4,076,207, Cl. 249-66.00R.

Automobiles Peugeot: *See—*
Lefebvre, Jean; and Pichouron, Jean-Claude, 4,076,070, Cl. 164-303.000.

Autrey, William L., to Autrey, William L. Mattress construction and method of making. 4,075,721, Cl. 5-345.00R.

Avakian, Emik A.; and Laizerovich, David, to Avakian, Emik A. Data entry devices. 4,077,036, Cl. 340-365.00S.

Avco Corporation: *See—*
Heckley, Warner M.; and Richards, Gerald F., 4,075,822, Cl. 56-1.000.

Avins Industrial Products Corporation: *See—*
Avins, Jules, 4,076,367, Cl. 339-177.00E.

Avins, Jules, to Avins Industrial Products Corporation. Solderless connector. 4,076,367, Cl. 339-177.00E.

Avis, Robert P., to Scott Paper Company. Method for increasing wet strength cure rate of paper. 4,076,581, Cl. 162-167.000.

Azcarate, Emilio. Board game apparatus. 4,076,250, Cl. 273-251.000.

Azuma, Tomisaburo; Ichimaru, Kazuto; Tateno, Kouichi; and Murakami, Takeru, to Matsushita Electric Works, Ltd. Process of producing calcium aluminate monosulfate hydrate. 4,076,545, Cl. 423-544.000.

Azzalin, Bruno; and Bettini, Francesco, to Ing. C. Olivetti & C., S.p.A. Paper and continuous-form feed system for a desk-top printing electronic calculating machine. 4,076,160, Cl. 226-82.000.

B. F. Goodrich Company, The: *See—*
Mikofalvy, Bela Kalman; and Doyle, Thomas Joseph, 4,076,920, Cl. 526-74.000.
Tolan, Peter John, 4,076,624, Cl. 210-96.00R.

B & W Loudspeakers Limited: *See—*
Ward, Dennis Charles, 4,076,098, Cl. 181-170.000.

Backer, Karl-Heinrich; and Schlachta, Hermann, to Varta Batterie Aktiengesellschaft. Pole bolt seal for storage batteries. 4,076,908, Cl. 429-184.000.

Baer, Ralph H., to Sanders Associates, Inc. Universal television interface. 4,077,049, Cl. 358-93.000.

Bailey, Frank C.: *See—*
Gibson, Harry W.; Bailey, Frank C.; and Mincer, Joseph L., 4,076,893, Cl. 428-407.000.

Baird-Atomic, Inc.: *See—*
Brennan, Thomas M.; and Burley, Robert M., 4,076,978, Cl. 250-213.0VT.

Baker International Corporation: *See—*
Evans, Robert W., 4,076,086, Cl. 175-297.000.

Banet, Joseph. Solar radiation collector. 4,076,024, Cl. 126-271.000.

Banker, William W.; and Lumbis, Anthony W., to General Signal Corporation. Electro-pneumatic brake system with valve actuating checking circuit. 4,076,322, Cl. 303-1.000.

Barannik, Ivan Andreevich; Kachurka, Alexandr Nikolaevich; Zharovsky, Ivan Vasilievich; Trukhin, Alexandr Fedorovich; Raskatov, Viktor Georgievich; and Mazurkevich, Alexandr Borisovich. Centrifugal pelletizer. 4,076,472, Cl. 425-8.000.

Baranov, Vladimir Nikitich: *See—*
Lifshits, Viktor Senderovich; Sukhanov, Alexandr Alexandrovich; Dergachev, Nikolai Makarovich; Pevnev, Arkady Alexeevich; Baranov, Vladimir Nikitich; and Shklyanov, Leonid Pavlovich, 4,076,973, Cl. 219-97.000.

Barbal, Andrew. Automatically disengagable safety buckle. 4,075,741, Cl. 24-201.0TR.

Bareis, Marvin A.; and Nisbet, George C., to Kellwood Company. Boat cover means. 4,075,723, Cl. 9-1.500.

Barker, Lynn M., to Reed Tool Company. Fracture toughness test method. 4,075,886, Cl. 73-88.00R.

Barker, Lynn Marshall, to Terra Tek, Inc. Fracture specimen loading machine. 4,075,884, Cl. 73-91.000.

Barlow, Alan, to Smiths Industries Limited. Mounting arrangements and units for use therein. 4,076,353, Cl. 312-350.000.

Baron, Seymour, to Hexcel Corporation. Production of N-alkylated amines and catalyst therefor. 4,076,649, Cl. 252-440.000.

Barr, Rolla W. Device for securing spare tires. 4,076,158, Cl. 224-42.250.

Barrington, Burchus Q.: *See—*
Nix, George J.; Barrington, Burchus Q.; Farley, David L.; and Hortman, Norman G., 4,076,077, Cl. 166-315.000.

Barter, Frederick William; and Brett, Peter James Douglas Victor, to Ciba-Geigy Corporation. Molds for encapsulating electrical components. 4,076,791, Cl. 264-272.000.

Bartholl, Hermann: *See—*
Ritter, Hans-Peter; Strewinsky, Rainer; Bulwien, Hans-Dieter; Koch, Engelbert; Bartholl, Hermann; and Hupp, Walter, 4,076,982, Cl. 250-288.000.

Bartholmey, Don S., to North Star Ice Equipment Company. Ice making machine with improved drip shield. 4,075,868, Cl. 62-347.000.

Bartholomew, Jack Leonard; and Bristow, Derek John. Operating mechanisms. 4,075,899, Cl. 74-102.000.

Bartko, John: *See—*
Chu, Chang K.; Bartko, John; and Felice, Patrick E., 4,076,555, Cl. 148-1.500.

Bartsch, Wolfgang: *See—*
Kampe, Wolfgang; Stach, Kurt; Thiel, Max; Bartsch, Wolfgang; Dietmann, Karl; Roesch, Egon; and Schaumann, Wolfgang, 4,076,829, Cl. 424-274.000.

BASF Aktiengesellschaft: *See—*
Buelow, Horst; Hohenschutz, Heinz; Schmidt, Johannes E.; and Sachsze, Werner, 4,076,594, Cl. 203-15.000.
Freyberg, Peter; Horn, Dieter; Oppenlaender, Knut; Wolf, Hans; and Distler, Dieter, 4,076,497, Cl. 8-21.00C.
Hoffmann, Werner; and von Fraunberg, Karl, 4,076,748, Cl. 260-586.00F.
Theysohn, Rainer, Wurmb, Rolf; Leutner, Bernd; and Schlimper, Hans-Ulrich, 4,076,682, Cl. 260-37.00N.
Urban, Friedrich; Buechner, Oskar; Hartig, Ulrich; and Gropper, Hans, 4,076,919, Cl. 526-64.000.

BASF Wyandotte Corporation: *See—*
Hetzel, Eckard; Koehler, Waldemar; Vock, Georg Friedrich; and Bittler, Rolf, 4,076,577, Cl. 159-47.00R.

Bass, Sidney; and St. Pierre, Raymond Marie, to Mattel, Inc. Machine for needlepoint or the like. 4,075,955, Cl. 112-79.00R.

Bates, A. Arthur; and Cook, Norman J., to Zaleboats, Incorporated. Spring biased snap hook and method. 4,075,966, Cl. 114-114.000.

Bates, Harry E. Optical coherence measuring device. 4,076,423, Cl. 356-114.000.

Bates, Richard L., to United States of America, Navy. Thermal stress-relieving coupling member and support. 4,076,393, Cl. 350-318.000.

Batha, Howard Dean; and Hazelet, Glenn John, to American Kynol, Inc. Process for manufacturing novaloid fiber. 4,076,692, Cl. 260-59.00R.

Battelle Pacific N. W. Laboratories: *See—*
Olesen, Douglas E.; and Shuckrow, Alan J., 4,076,615, Cl. 210-5.000.

Bauer, Hermann: *See—*
Wacker, Erich; Hofmann, Heinz; Kopp, Karl; Bauer, Hermann; von Ey, Volker; and Weiss, Franz, 4,075,934, Cl. 92-159.000.

Bauer, Ronald S., to Shell Oil Company. Epoxy resin composition having improved physical properties. 4,076,764, Cl. 260-834.000.

Baugh, Edward D.: *See—*
Moody, Warren L.; and Baugh, Edward D., 4,076,094, Cl. 180-108.000.

Baum, Werner; and Munding, German, to Messerschmitt-Bolkow-Blohm GmbH. Thermal drilling device. 4,076,082, Cl. 175-14.000.

Baxter, Bryan Henry, to British Aircraft Corporation Limited. Lubricants and their method of preparation. 4,076,635, Cl. 252-18.000.

Baxter Travenol Laboratories, Inc.: *See—*
Cammarata, Frank, III; Miller, Joe Alan; and Martin, Jerry D., 4,076,063, Cl. 150-.500.

Bayer Aktiengesellschaft: *See—*
Horstmann, Harald; Meng. Karl; and Wehinger, Egbert, 4,076,943, Cl. 548-360.000.
Lorenz, Walter; and Hammann, Ingeborg, 4,076,808, Cl. 424-211.000.
Lorenz, Walter, deceased; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 4,076,806, Cl. 424-200.000.
Naumann, Klaus; Sasse, Klaus; and Lurssen, Klaus, 4,076,517, Cl. 71-86.000.
Neukam, Theo; Reinehr, Ulrich; Bentz, Francis; and Nischk, Gunther, 4,076,925, Cl. 526-204.000.
Reubke, Karl-Julius; Bien, Hans-Samuel, deceased; Bien, Gabriele; and Bien, Dorothee, 4,076,736, Cl. 260-382.000.
Ritter, Hans-Peter; Strewinsky, Rainer; Bulwien, Hans-Dieter; Koch, Engelbert; Bartholl, Hermann; and Hupp, Walter, 4,076,982, Cl. 250-288.000.
Thom, Karl-Friedrich; and Schliebs, Reinhard, 4,076,763, Cl. 260-824.00R.
Zecher, Wilfried; Clarenz, Werner; and Merten, Rudolf, 4,076,694, Cl. 260-77.5MA.

Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., to Rohm and Haas Company. Herbicidal 4-trifluoromethyl-4-nitrodiphenyl ethers. 4,076,741, Cl. 260-465.00F.

Baylor, John Merlin, to J. I. Case Company. Track joint with combined thrust member and seal members. 4,076,333, Cl. 305-11.000.

Bean, Lloyd F.; and Gundlach, Robert W., to Xerox Corporation. Xerographic binder plate. 4,076,528, Cl. 96-105.00R.

Bearden, Roby, Jr., to Exxon Research & Engineering Co. Combined disulfurization and conversion with alkali metals. 4,076,613, Cl. 208-108.000.

Beaumont, Gerald P.; and Jones, William C., to Dow Chemical Company, The. Solvent soluble warp size. 4,076,629, Cl. 252-8.600.

Beck, Henry Nelson, to Dow Chemical Company, The. Nucleation of isotactic polystyrene. 4,076,910, Cl. 526-6.000.

Beck, Orville F.: *See—*
Theurer, John; Beck, Orville F.; and Doherty, James T., 4,075,814, Cl. 52-79.500.

Becker, Charles J., to American Videonetics Corporation. Film projection system. 4,076,397, Cl. 353-26.00R.

Beckman Instruments, Inc.: *See—*
Chulay, Steven John; and Grilli, Victor John, 4,076,170, Cl. 233-26.000.
Schwab, Christopher Morrison, 4,076,288, Cl. 292-113.000.

Beets, Roland H. C.: *See—*
Wijnhoven, Jan M. A.; Oancea, Alexandru; Vanhove, Henri C. J.; and Beets, Roland H. C., 4,076,276, Cl. 280-714.000.

Behne, Ernst-August; and Straihammer, Reinhard, to Siemens Aktiengesellschaft. Dental handpiece. 4,075,761, Cl. 32-27.000.
Behrends, Bertwin E.; Hoehn, Richard F.; and Poirot, James M., to Caterpillar Tractor Co. Fluid pressure-controlled winch mechanism. 4,076,219, Cl. 254-187.400.
Bekasova, Nina Ivanovna: *See—*
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Krasnov, Alexandr Petrovich; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradova, Olga Vladimirovna; Mamatsashvili, Georgy Viktorovich; Pavlova, Saga-Silviya Alexandrovna; Gribkova, Pelageya Nikolaevna; Bekasova, Nina Ivanovna; Komarova, Ljudmila Grigorievna; Vorobiev, Vladimir Dmitrievich; Vlasova, Irina Vladimirovna; and Vinogradov, Alexandr Vasilievich, 4,076,634, Cl. 252-12.000.
Belanger, Patrice C., to Merck Sharp & Dohme (I.A.) Corporation. 2-(4-Substituted-1,2,5-thiadiazole-3-yloxy)-acetaldehydes. 4,076,939, Cl. 544-134.000.
Bell & Howell Company: *See—*
Fleischman, Andor A., 4,076,390, Cl. 350-216.000.
Kim, Raymond W. H.; and Figge, Erwin E., 4,076,247, Cl. 273-105.600.
Persha, Thomas J.; and Jagielski, David, 4,076,400, Cl. 353-95.000.
Bell Telephone Laboratories, Incorporated: *See—*
Agraz-Guerena, Jorge; and Fulton, Alan William, 4,076,556, Cl. 148-1.500.
Boyd, Gary Delane; and Thurston, Robert Norton, 4,077,023, Cl. 333-30.00R.
DiMarcello, Frank Vincent; and Williams, John Charles, 4,076,380, Cl. 350-96.310.
Muska, Willis Martin; and Personick, Stewart David, 4,076,375, Cl. 350-96.150.
Ren, Chung-Li; and Wang, Han-Chiu, 4,077,039, Cl. 343-786.000.
Streisand, Kenneth, 4,076,962, Cl. 179-6.30R.
Tamburro, Peter James, 4,076,356, Cl. 339-17.00C.
Wattenbarger, Blake Lane, 4,076,968, Cl. 179-84.00R.
Beloit Corporation: *See—*
Sokolow, Nickolas N., 4,076,485, Cl. 425-562.000.
Bencini, Roberto. Dual friction clutch for motion-picture projectors. 4,076,109, Cl. 192-48.400.
Bendix Corporation, The: *See—*
Helava, Uuno Vilho, 4,077,030, Cl. 340-183.000.
Bennett, Harold F.; and Liu, Wai-Min, to Xerox Corporation. Zoom lens assembly. 4,076,388, Cl. 350-187.000.
Bennett, Ronald: *See—*
Field, Peter Graham Spencer; and Bennett, Ronald, 4,076,759, Cl. 260-621.00C.
Bentley, Terence James: *See—*
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Bentz, Erwin John Herman, to Caterpillar Tractor Co. Modular heat exchanger with pivotal cores. 4,076,072, Cl. 165-41.000.
Bentz, Francis: *See—*
Neukam, Theo; Reinehr, Ulrich; Bentz, Francis; and Nischk, Gunther, 4,076,925, Cl. 526-204.000.
Berberich, Joseph P.: *See—*
Bundy, Wayne M.; Berberich, Joseph P.; and Sastre, David, 4,076,548, Cl. 106-288.00B.
Bergen, Gerhard Stanley: *See—*
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Berger, Richard M., to American Filtrona Corporation. Method and apparatus for making tobacco smoke filter. 4,075,936, Cl. 93-1.00C.
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Kubat, Josef; and Berggren, Kenneth S., 4,076,568, Cl. 156-229.000.
Berkowitz, Irving L., to Kason Hardware Corporation. Convertible tube connecting system. 4,076,429, Cl. 403-2.000.
Berlin, Alfred Anisimovich; Brikenshtein, Khaim-Mordkhe Aronovich; Gavrjushenko, Nikolai Sviridovich; Dubovitsky, Fedor Ivanovich; Kefeli, Tamara Yakovlevna; Kronman, Raisa Vasilievna; Konkhina, Ljudmila Alexeevna; Marshavina, Natalya Lvovna; Popova, Galina Leonidovna; Radugina, Anna Alexandrovna; Sivergin, Jury Mikhailovich; Sumin, Iosif Grigorievich; Tvorogov, Nikolai Nikandrovich; Shilova, Galina Pavlovna; and Kardashov, David Alexeevich. Anaerobic composition comprising oligocarbonateacrylates benzoyl peroxide and ferrocene. 4,076,742, Cl. 260-47.0UA.
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Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Krasnov, Alexandr Petrovich; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradova, Olga Vladimirovna; Mamatsashvili, Georgy Viktorovich; Pavlova, Saga-Silviya Alexandrovna; Gribkova, Pelageya Nikolaevna; Bekasova, Nina Ivanovna; Komarova, Ljudmila Grigorievna; Vorobiev, Vladimir Dmitrievich; Vlasova, Irina Vladimirovna; and Vinogradov, Alexandr Vasilievich, 4,076,634, Cl. 252-12.000.
Bermingham, Peter D.; and Chin, Robert W., to Goodyear Aerospace Corporation. Snap fasteners for brake disk wear plates. 4,076,106, Cl. 188-250.00G.
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Ash, Edward B.; Bernath, Louis; and Facha, Joseph V., 4,076,583, Cl. 176-35.000.
Bernatt, Joseph; and Steegmueller, Alfred, to S&C Electric Company. High voltage fuse and method of attaching tubular members therein. 4,075,755, Cl. 29-623.000.
Bernhard, Horst; and Esselborn, Reiner, to Merck Patent Gesellschaft mit beschrankter Haftung. Carbon black-containing pigments and process for their preparation. 4,076,551, Cl. 106-291.000.
Bernier, Harold J.; and Daniels, Norman F. Flip top and platform. 4,076,252, Cl. 273-141.00R.
Bert, Walter J. Adjustable industrial paint sprayer. 4,076,175, Cl. 239-532.000.
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Bertling, Johannes-Gerhard, to Robert Bosch GmbH. Fuel mixture control apparatus. 4,075,993, Cl. 123-119.0EC.
Bertschmann, Silvio. Expansion joint bridging device. 4,076,440, Cl. 404-69.000.
Besenhardt, Jurgen: *See—*
Fritz, Heinz Peter; Besenhardt, Jurgen; and Rauschenbach, Gerhard, 4,076,901, Cl. 429-50.000.
Best, Walter E. Cable lock. 4,075,878, Cl. 70-49.000.
Bestard, Thomas L., to Eaton Yale Ltd. Energy saving tree harvester. 4,076,060, Cl. 144-3.00D.
Bethlehem Steel Corporation: *See—*
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Bette, Joseph A., to Universal Construction Industries, Inc. Solar heating system. 4,076,013, Cl. 126-270.000.
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Bharucha, Kekhusroo R.; Rubin, Leon J.; and Cross, Charles K., to Canada Packers Limited. Control of nitrosamine formation in nitrite cured meat. 4,076,849, Cl. 426-266.000.
BICC Limited: *See—*
Slaughter, Raymond Jeffrey, 4,076,376, Cl. 350-96.210.
Bideau, Jean; Levy, Jacques; and Viaud, Jean-Luc, to Commissariat a l'Energie Atomique. Nuclear reactor of the pressurized water type. 4,076,586, Cl. 176-78.000.
Bien, Dorothee: *See—*
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Bien, Else, nee Geriche, heiress: *See—*
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Bien, Gabriele: *See—*
Reubke, Karl-Julius; Bien, Hans-Samuel, deceased; Bien, Gabriele; and Bien, Dorothee, 4,076,736, Cl. 260-382.000.
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Reubke, Karl-Julius; Bien, Hans-Samuel, deceased; Bien, Gabriele; and Bien, Dorothee, 4,076,736, Cl. 260-382.000.
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Bill, Roland F.; Prohaska, Edward G.; and Wabel, Bernard A., to Caterpillar Tractor Co. Prepared joint for a tube fitting. 4,076,287, Cl. 285-382.400.
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Bilson, Edward A., to Inspiration Consolidated Copper Company. Dichromate leach of copper anode slimes. 4,076,605, Cl. 204-108.000.
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Binge, Derek Sidney, to RCA Corporation. Spacecraft component rotation means. 4,076,191, Cl. 244-173.000.
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Slator, Damon T.; Peil, Archie W.; and Bishop, Thomas R., 4,076,436, Cl. 403-343.000.
Bishop, Walton B., to United States of America, Navy. Secure position identity and time reporting system. 4,077,005, Cl. 325-32.000.
Bitonti, Paul A., to Ross Operating Valve Company. Safety valve for fluid systems. 4,075,928, Cl. 91-29.000.
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Hetzel, Eckard; Koehler, Waldemar; Vock, Georg Friedrich; and Bittler, Rolf, 4,076,577, Cl. 159-47.00R.
Bizzarri, Cesare, to Elettrocarbonium S.p.A. Cathode in cells for producing aluminium by electrolysis of smelted salts thereof. 4,076,610, Cl. 204-290.00R.
Blake, Charles H.; and Wood, Donald H., to Outboard Marine Corporation. Speed selection for a direct current permanent magnet motor. 4,075,970, Cl. 115-18.00E.
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Bleiler, Kenneth W.: *See—*
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Bloomfield, Jordan J.: *See—*
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BOC International Limited: *See—*
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Bock, Edward C., to Xerox Corporation. Zoom lens mount and mechanism. 4,076,389, Cl. 350-187.000.

Bodenseewerk Geratetechnik GmbH: *See—*
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Bodner, Ronald Eugene; and Kiscaden, Richard Craig, to International Business Machines Corporation. Asymmetrical multiprocessor system. 4,077,060, Cl. 364-200.000.
Boehme, Robert Emerson; and Murphy, Clarence Rhodes, to Gulf Oil Corporation. Process for dissolving high molecular weight olefin polymers in liquid hydrocarbons. 4,076,681, Cl. 260-33.6PQ.
Boehringer Mannheim GmbH: *See—*
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Boeing Company, The: *See—*
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Boger, Manfred; and Drabek, Jozef, to Ciba-Geigy Corporation. Pesticidal formamidine compounds. 4,076,837, Cl. 424-304.000.
Bohner, Beat; Dawes, Dag; and Meyer, Willy, to Ciba-Geigy Corporation. Process for the production of 3-hydroxy-1,2,4-triazole derivatives. 4,076,938, Cl. 544-132.000.
Bolleter, Ulrich; and Brugger, Marcel, to Sulzer Brothers Limited. Sley drive for a weaving machine. 4,076,048, Cl. 139-190.000.
Bolling, Donald Louis: *See—*
Power, George Edward; and Bolling, Donald Louis, 4,076,666, Cl. 260-22.0CB.
Bolon, Donald A.: *See—*
Schroeter, Siegfried H.; Bolon, Donald A.; and Lucas, Gary M., 4,076,489, Cl. 431-94.000.
Boltswitch Inc.: *See—*
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Bongiovanni, John P. Building panel with attached sealing means. 4,075,805, Cl. 52-309.120.
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Borg-Warner Corporation: *See—*
Fogelberg, Mark John, 4,076,108, Cl. 192-35.000.
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Born, Ellis H.: *See—*
Adams, Cecil E.; Dillon, Leo H.; Born, Ellis H.; and Thurston, David L., 4,076,459, Cl. 417-217.000.
Boroschewski, Gerhard; and Arndt, Friedrich, to Schering Aktiengesellschaft. Substituted phenyl thiocarbamates with herbicidal action and method for their production. 4,076,518, Cl. 71-100.000.
Bos, Andre, to Technal International S.A. Tie members for angled joints. 4,076,438, Cl. 403-402.000.
Bosch, Erhard: *See—*
Roth, Michael; and Bosch, Erhard, 4,076,868, Cl. 427-348.000.
Boszak, Ronald J.: *See—*
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Bottazzi, Andrea: *See—*
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Boutcher, Andrew Graham: *See—*
Ross, Milton Dean; Boutcher, Andrew Graham; and Shatto, Walter Clifton, 4,076,365, Cl. 339-107.000.
Bovo, Amilcare; and Valsecchi, Giuseppe, to Societa Italiana Telecomunicazioni Siemens S.p.A. Method of and system for handling conference calls in digital telephone exchange. 4,076,966, Cl. 179-18.0BC.
Bowen Tools, Inc.: *See—*
Slator, Damon T.; Peil, Archie W.; and Bishop, Thomas R., 4,076,436, Cl. 403-343.000.
Bowles, Alfred H. Foot tension relaxer. 4,076,876, Cl. 428-71.000.
Boxhorn, George R.: *See—*
Charchian, Loris J.; Marvin, Larry E.; and Boxhorn, George R., 4,075,902, Cl. 74-230.17C.
Boyd, Gary Delane; and Thurston, Robert Norton, to Bell Telephone Laboratories, Incorporated. Elastic waveguide. 4,077,023, Cl. 333-30.00R.
Brace, Neal O., to Ciba-Geigy Corporation. Perfluoroalkylthio norbornane compounds. 4,076,740, Cl. 260-455.00R.
Bradford Novelty Co., Inc.: *See—*
Burnbaum, Jack, 4,076,234, Cl. 272-15.000.
Bradley, Rex L. Method and apparatus for testing the effect of various antibiotics on a bacterial suspension. 4,076,592, Cl. 195-103.50K.
Brahm, Jacques; and Mulders, Julien, to Solvay & Cie. Pre-mixes intended to be added to detergent powders by post-addition. 4,076,643, Cl. 252-89.00R.
Brammall, Inc.: *See—*
Van Gompel, James, 4,075,877, Cl. 70-34.000.
Brammer, Hartmut; Ehrmann, Karl; Haug, Heinz; Issler, Jorg; Kas, Gunter; Kalippke, Harald; Magdefrau, Herbert; and Schneider, Karl-Heinz, to Robert Bosch GmbH. Method of making distributor assembly bearing structures and the like. 4,075,752, Cl. 29-434.000.
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Mohr, Walter, 4,076,491, Cl. 431-130.000.
Schlei, Rudolf, 4,076,399, Cl. 353-86.000.
Braun, Werner; Decker, Gernot; and Rohr, Horst, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Holographic recording material for infrared radiation. 4,076,371, Cl. 350-3.610.
Bray, Robert John, to Proven Environmental Products, Inc. Pneumatic braking system for tractor-trailer combinations. 4,076,325, Cl. 303-7.000.
Brems, John Henry. Drive mechanism for reciprocating and multiple step index devices. 4,075,911, Cl. 74-816.000.
Brennan, Thomas M.; and Burley, Robert M., to Baird-Atomic, Inc. Fiber optic bundle beam expander with image intensifier. 4,076,978, Cl. 250-213.0VT.
Breslow, Jeffrey D.; and Jaworski, Eugene, to Marvin Glass & Associates. Toy rocket with pneumatic launcher. 4,076,006, Cl. 124-64.000.
Brett, Peter James Douglas Victor: *See—*
Barter, Frederick William; and Brett, Peter James Douglas Victor, 4,076,791, Cl. 264-272.000.
Breuer, Oswald: *See—*
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Bridger, Robert F.; and Cier, Ronald J., to Mobil Oil Corporation. Lubricant compositions. 4,076,639, Cl. 252-47.500.
Bridgestone Tire Company Limited: *See—*
Nakashima, Katsutoshi; Kita, Toshio; Osawa, Ryuzo; and Hatanaka, Takashi, 4,076,220, Cl. 366-69.000.
Yukuta, Toshio; Ohashi, Takashi; Kojima, Minoru; and Suzuki, Akira, 4,076,654, Cl. 260-2.5AM.
Bright, Alan, to Rohm and Haas Company. Fast curing resinous compositions. 4,076,671, Cl. 260-28.5AV.
Bright Star Industries, Inc.: *See—*
Oswald, Anton H.; and Peters, John, 4,076,907, Cl. 429-133.000.
Brikenshtein, Khaim-Mordkhe Aronovich: *See—*
Berlin, Alfred Anisimovich; Brikenshtein, Khaim-Mordkhe Aronovich; Gavrjushenko, Nikolai Sviridovich; Dubovitsky, Fedor Ivanovich; Kefeli, Tamara Yakovlevna; Kronman, Raisa Vasilievna; Konkhina, Ljudmila Alexeevna; Marshavina, Natalya Lvovna; Popova, Galina Leonidovna; Radugina, Anna Alexandrovna; Sivergin, Jury Mikhailovich; Sumin, Iosif Grigorievich; Tvorogov, Nikolai Nikandrovich; Shilova, Galina Pavlovna; and Kardashov, David Alexeevich, 4,076,742, Cl. 260-47.0UA.
Brink, David L., to University of California, The Regents of the. Pulping of lignocellulosic material by sequential treatment thereof with nitric oxide and oxygen. 4,076,579, Cl. 162-53.000.
Bristow, Derek John: *See—*
Bartholomew, Jack Leonard; and Bristow, Derek John, 4,075,899, Cl. 74-102.000.
British Aircraft Corporation Limited: *See—*
Baxter, Bryan Henry, 4,076,635, Cl. 252-18.000.
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Sudworth, James L.; and Bird, John M., 4,076,903, Cl. 429-104.000.
British Steel Corporation: *See—*
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Brooks, Gerald Thomas, to National Research Development Corporation. Cyclodiene insecticides. 4,076,832, Cl. 424-278.000.
Brossel, Maurice; Laurent, Gilbert; and Bertannier, Daniel, to Holzstoff. S.A.; Viafrance S.A.; and Societe Nationale Elf Aquitaine (Production) - SNEA(P). Water proofing agent. 4,076,885, Cl. 428-286.000.
Brown, Boveri-Sulzer Turbomaschinen AG: *See—*
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Brown, David C.: *See—*
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Brown, Edmund W.: *See—*
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Browne, William G.: *See—*
Zavitsanos, Peter D.; West, Martin M.; and Browne, William G., 4,076,563, Cl. 149-37.000.
Brownlee, Robert Charles, to Chrysler Corporation. Lamp socket assembly affording variable bulb focal length positioning. 4,076,359, Cl. 339-32.00R.
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Taulier, Hubert Henri Leon; and Brugeille, Gerard, 4,076,587, Cl. 176-86.00R.
Brugger, Marcel: *See—*
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Bruins, Antonius Hermanus Nicolaas Maria: *See—*
Panneman, Harm Jan; and Bruins, Antonius Hermanus Nicolaas Maria, 4,076,726, Cl. 260-34.50R.
Bryden, Joseph E., to Raytheon Company. Variable range marker. 4,077,037, Cl. 343-5.0EM.
Buchbinder, Arnold. Process for upgrading plywood panels. 4,076,569, Cl. 156-242.000.
Buderus'sche Eisenwerke Aktiengesellschaft: *See—*
Schreiber, Jurgen, 4,075,792, Cl. 51-165.920.
Budzich, Tadeusz. Load responsive fluid control system. 4,075,842, Cl. 60-445.000.
Buechner, Oskar: *See—*
Urban, Friedrich; Buechner, Oskar; Hartig, Ulrich; and Gropper, Hans, 4,076,919, Cl. 526-64.000.
Buelow, Horst; Hohenschutz, Heinz; Schmidt, Johannes E.; and Sachsze, Werner, to BASF Aktiengesellschaft. Purification of formic acid by extractive distillation. 4,076,594, Cl. 203-15.000.
Buhler, Fritz, to Les Fils d'Auguste Scheuchzer S.A. Measurement of undulatory wear along railroad tracks. 4,075,888, Cl. 73-146.000.
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Bundy, Wayne M.; Berberich, Joseph P.; and Sastre, David, to Yara Engineering Corporation. High bulking clay pigments and method of making the same. 4,076,548, Cl. 106-288.00B.
Bunker Ramo Corporation: *See—*
Pechard, Lucien Leon; and Logerot, Bernard Andre, 4,076,363, Cl. 339-91.00R.
Bunkowski, Kenneth Dana, to Formica Corporation. Paper containing rapid curing melamine-formaldehyde resin composition. 4,076,896, Cl. 428-530.000.
Burckhardt, Manfred H., to Daimler-Benz Aktiengesellschaft. Indicating arrangement for a distance warning installation. 4,075,892, Cl. 73-495.000.
Burden, Ivor R.; and Reilly, George W., to Custom Chemicides, Inc. Bee attracting composition and method of use. 4,075,783, Cl. 47-1.410.
Burge, Ralph Clarence, to Du Pont de Nemours, E. I., and Company. Scissor-type slide gate opener. 4,075,952, Cl. 105-282.00R.
Burke, Harold J., to General Motors Corporation. Double Cardan joint with elastomeric centering means. 4,075,871, Cl. 64-17.00R.
Burkhart, James H., to Diamond International Corporation. Suction roll sealing strip cleaning structure. 4,076,582, Cl. 162-272.000.
Burkholder, Nelson D., Jr., to Dow Chemical Company, The. Absorbent articles and methods for their preparation. 4,076,673, Cl. 260-29.2EP.
Burlew, Leroy Ellery: *See—*
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Burley, Robert M.: *See—*
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Burlington Industries, Inc.: *See—*
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Field, Peter Graham Spencer; and Bennett, Ronald, 4,076,759, Cl. 260-621.00C.
Burmester, Kurt: *See—*
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Burnbaum, Jack, to Bradford Novelty Co., Inc. Artificial snow circulating apparatus. 4,076,234, Cl. 272-15.000.
Burnham, Robert D.: *See—*
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Burt, James Gordon; and Phillips, Howard Elliot, to Du Pont de Nemours, E. I., and Company. Storage stabile polyol-chlorofluoroalkane composition. 4,076,644, Cl. 252-182.000.
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Burton, Lawrence; and Friedman, Frank, to Immunology Research Foundation, Inc. Tumor complement fraction recovery method and product. 4,076,701, Cl. 260-112.00B.
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Burvall, Sten. Connecting element. 4,076,431, Cl. 403-171.000.
Buss, Dennis D.; and Hewes, Charles Robert, to Texas Instruments Incorporated. CCD speech processor. 4,076,960, Cl. 179-1.0SA.
Busse, Oswald; and Klesper, Hugo, to Passavant-Werke Michelbacher Hutte. Spraying apparatus for cleaning filter press plates. 4,076,033, Cl. 134-172.000.
Butterfield, Thomas T.: *See—*
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Buttriss, Albert T., to Eaton Corporation. Fastener emplacement mechanism. 4,075,748, Cl. 29-225.000.
Bybel, David; Furey, Richard F.; and Stahl, Donald P., to TII Corporation. Sonic cavitation and ozonation of waste material. 4,076,617, Cl. 210-19.000.
Byrnes, Joseph Edward, to General Electric Company. Annular cutting die, and method of circumferentially shaving away the surface portion of a rod. 4,076,441, Cl. 407-64.000.
Cachera, Pierre Charles, to Electricite de France (Service National). Method of continuous testing for leak-tightness and mechanical resistance of a reactor vessel jacket and a reactor in which said method is employed. 4,076,585, Cl. 176-38.000.
Caddock, Richard E. Apparatus for manufacturing cylindrical resistors by thick-film silk-screening. 4,075,968, Cl. 118-7.000.
Cailloux, Philippe, to Compagnie Industrielle des Telecommunications Cit-Alcatel S. A. Trunking procedure and arrangement for the connection of functional units. 4,076,967, Cl. 179-18.0AG.
Caldwell, Melvin R. Lift-jack fluid motor for hydraulic lift trucks. 4,075,931, Cl. 91-402.000.
Calkins, Thornton Ross, to General Electric Company. Heat stabilized polycarbonate resin. 4,076,686, Cl. 260-45.80A.
Calspan Corporation: *See—*
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Calvin, Evangeline M. Attachment for human figure form. 4,076,155, Cl. 223-68.000.
Cammarata, Frank, III; Miller, Joe Alan; and Martin, Jerry D., to Baxter Travenol Laboratories, Inc. Flexible, collapsible container for liquids with improved tail seal. 4,076,063, Cl. 150-.500.
Campbell, Robert F., to Gulton Industries, Inc. Electrical connector assembly for use with remote manipulator. 4,076,361, Cl. 339-75.00M.
Campion, Ernest. Trailer hitch. 4,076,273, Cl. 280-490.00R.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Mar, John; Garrett, Todd; and Jacques, Petrus, 4,075,725, Cl. 9-8.00R.
Canada Packers Limited: *See—*
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Canadian Patents and Development Limited: *See—*
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Komine, Yoshio; Furukawa, Hiroshi; Takahashi, Kiyoshi; Takigawa, Tomoshi; Ogiso, Mitsutoshi; and Ichiyanagi, Toshikazu, 4,076,396, Cl. 352-29.000.
Nagamatsu, Katsumi; and Saito, Takashi, 4,076,404, Cl. 355-4.000.
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Carbon, Fred S. Baker for waffles, pancakes and similar food items. 4,075,940, Cl. 99-377.000.
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Caricchio, Jerome Joseph, Jr.; and York, Edward Robert, to International Business Machines Corporation. Method and composition for plating palladium. 4,076,599, Cl. 204-47.000.
Carlson, William L., Jr., to General Signal Corporation. Scotch yoke. 4,075,898, Cl. 74-89.150.
Carlsson, Per Arvid Emil; Lindberg, Per Lennart; and Wickberg, Borje Vilhelm, to Astra Lakemedel Aktiebolag. Substituted cyclopropyl benzamides and pharmaceutical preparations and methods of use employing such compounds. 4,076,840, Cl. 424-324.000.
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Carrier Corporation: *See—*
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Carroll, Ronald L.; and Ziegler, John S., to American Hospital Supply Corporation. Cartridge for holding hemostatic clips. 4,076,120, Cl. 206-339.000.
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Carrow, Guy E.: *See—*
Scott, John N., Jr.; and Carrow, Guy E., 4,076,282, Cl. 285-156.000.
Carse, Clifford C. Multiple fluid dispenser with mechanical valve. 4,076,148, Cl. 222-144.500.
Carson, Lansing McClain; and Welter, Neil Evan, to Motorola, Inc. Dual bandwidth loop filter with sweep generator. 4,077,015, Cl. 331-4.000.
Caruso, Michael G.; and Eckert, Rene A., to Chas. S. Tanner Co. Antisoiling and antistatic textile treating composition. 4,076,631, Cl. 252-8.800.
Carver, Herbert K., Jr.; Chant, Albert H.; Hall, James F.; Hansen, Omar, Jr.; and Lord, John G., to Franklin Electric Subsidiaries, Inc. Automatic package wrapping machine. 4,075,815, Cl. 53-32.000.
Casey, Donald J.; and Gleckler, George C., to American Cyanamid Company. High molecular weight polyester resin, the method of making the same and the use thereof as a pharmaceutical composition. 4,076,798, Cl. 424-22.000.
Cassella Farbwerke Mainkur Aktiengesellschaft: *See—*
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Cassonnet, Jean-Claude Marcel: *See—*
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Bill, Roland F.; Prohaska, Edward G.; and Wabel, Bernard A., 4,076,287, Cl. 285-382.400.
Davis, Warren W.; and Thompson, Leroy R., 4,075,910, Cl. 74-785.000.
Feucht, Dennis D.; and Ryan, Terry W., 4,076,194, Cl. 248-9.000.
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Johnson, David G.; and Mueller, James P., 4,076,329, Cl. 303-56.000.
Kirchgessner, Edwin M.; and Krohn, Dennis G., 4,075,984, Cl. 123-41.540.
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Kroth, Neil W., 4,076,324, Cl. 303-6.00R.
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Celanese Corporation: *See—*
Zey, Edward G.; and Hoffmann, William A., III, 4,076,727, Cl. 260-340.700.
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Centralna Laboratoria Po Physiko-Chimicheska Mechanika pri Ban: *See—*
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Centronics Data Computer Corporation: *See—*
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Wichterle, Otto; and Coupek, Jiri, 4,076,691, Cl. 260-47.0UA.
Cha, Chang Yul; Ridley, Richard D.; and Burton, Robert S., III, to Occidental Oil Shale, Inc. Method and apparatus for retorting oil shale at subatmospheric pressure. 4,076,312, Cl. 299-2.000.
Chair-E-Yacht, Inc.: *See—*
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Chambley, Phillip W.: *See—*
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Champion International Corporation: *See—*
Norris, Alan H.; and Chambley, Phillip W., 4,075,745, Cl. 28-243.000.
Theno, Mark Henry, 4,076,895, Cl. 428-516.000.
Zimmerman, Herbert E., 4,075,804, Cl. 52-232.000.
Champion Products Inc.: *See—*
Geary, Joseph E.; Pelensky, Joseph; and Hart, John Peter, 4,075,973, Cl. 118-7.000.
Chan, Ka-Kong; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Synthesis of vitamin E. 4,076,739, Cl. 260-410.90R.
Chang, Clarence D.; and Silvestri, Anthony J., to Mobil Oil Corporation. Process for the manufacture of gasoline. 4,076,761, Cl. 260-668.00R.
Chang, Kenneth, to International Business Machines Corporation. Integrated fabrication method of forming connectors through insulative layers. 4,076,575, Cl. 156-656.000.
Chang, Mike F.; Anthony, Thomas R.; and Cline, Harvey E., to General Electric Company. Temperature gradient zone melting through an oxide layer. 4,076,559, Cl. 148-1.500.
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Charchian, Loris J.; Marvin, Larry E.; and Boxhorn, George R., to Dana Corporation. Variable speed pulley. 4,075,902, Cl. 74-230.17C.
Chas. S. Tanner Co.: *See—*
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Charney, William, to Schering Corporation. Process for the production of dihydroxyacetone. 4,076,589, Cl. 195-49.000.
Chateau, Georges M.; and Desai, Praful, to Societe Nationale Elf Aquitaine (Production). Laterally engageable flowline connector device. 4,076,278, Cl. 285-18.000.
Chatterley, James P., to General Motors Corporation. Self steering trailer arrangement. 4,076,264, Cl. 280-81.00A.
Chekirda, Russell F.; and Murphy, Randall T., to Lear Siegler, Inc. Seat recliner including adjustment mechanism and latch. 4,076,309, Cl. 297-363.000.
Chen, Schoen-nan, to Optel Corporation; and Grumman Aerospace Corporation. Solid state photogalvanic device utilizing sea water as an electrolyte. 4,076,904, Cl. 429-111.000.
Cherubim, Martin; Heinemann, Karl-Heinz; and Josten, Friedrich, to Deutsche Texaco Aktiengesellschaft. Molding compositions or masses suitable for manufacturing foundry molds and cores using the cold box method. 4,076,683, Cl. 260-37.00N.
Chevron Research Company: *See—*
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Chicago Lock Co.: *See—*
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Chierici, Osvaldo F.; and Murphy, Richard F., to Holland Company. Self lubricating center bearing liner. 4,075,951, Cl. 105-199.00C.
Childress, Ray. Drill steel holder. 4,076,337, Cl. 308-3.900.
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Chisso Corporation: *See—*
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Chizhikov, Anatoly Petrovich: *See—*
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Chloride Group Limited: *See—*
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Chouinard, Rene Joseph, to United Technologies Corporation. Fiber optic connector. 4,076,379, Cl. 350-96.220.
Christensen, Burton A.; Morin, Robert B.; and Walton, Edward, to Merck & Co., Inc. 3-(β-Hydroxyethylidene)-6-(α-Hydroxyethyl)-7-oxo-4-oxaazabicyclo[3.2.0]heptene-2-carboxylic acid and derivatives thereof. 4,076,826, Cl. 424-272.000.
Christensen, Frederich M. Debris separator for hot gas stream. 4,076,508, Cl. 55-309.000.
Christianson, Raymond A. Pilot valve operated demand regulator for a breathing apparatus. 4,076,041, Cl. 137-490.000.
Christopher, Walter S., to Chicago Lock Co. Multiple function plate tumbler-type cylinder lock mechanism. 4,075,879, Cl. 70-337.000.
Chrysler Corporation: *See—*
Brownlee, Robert Charles, 4,076,359, Cl. 339-32.00R.
Chu, Chang K.; Bartko, John; and Felice, Patrick E., to Westinghouse Electric Corporation. Irradiation for rapid turn-off reverse blocking diode thyristor. 4,076,555, Cl. 148-1.500.
Chulay, Steven John; and Grilli, Victor John, to Beckman Instruments, Inc. Tube cap assembly for preparative centrifuge rotors. 4,076,170, Cl. 233-26.000.
Chumley, David Charles Philip: *See—*
Daisley, Robert Thomas; and Chumley, David Charles Philip, 4,076,115, Cl. 198-487.000.
Chun, Alexander Hing Chinn: *See—*
Singiser, Robert E.; Chun, Alexander Hing Chinn; and Mehta, Shashi Pal, 4,076,804, Cl. 424-181.000.
Chuply, Vladimir Yakovlevich; Vojuta, Leonty Feofanovich; Kondratenko, Feofan Ilich; Poludnenko, Jury Zakharovich; Milach, Adam Arsentievich; Kobozev, Vladimir Nikolaevich; and Turchenko, Alexandr Vasilievich. Hole reamer. 4,076,087, Cl. 175-334.000.
Ciba-Geigy AG: *See—*
Lamb, Frank; Combey, Malcolm; and Cooper, Hugh Melvin, 4,076,678, Cl. 260-31.600.
Seha, Zdenek, 4,076,735, Cl. 260-378.000.
Smith, Norman Alfred, 4,076,538, Cl. 96-11.000.
Ciba-Geigy Corporation: *See—*
Allgeier, Hans; and Schmid, Erich, 4,076,812, Cl. 424-244.000.
Anner, Georg; and Meystre, Charles, 4,076,737, Cl. 260-397.450.
Barter, Frederick William; and Brett, Peter James Douglas Victor, 4,076,791, Cl. 264-272.000.
Boger, Manfred; and Drabek, Jozef, 4,076,837, Cl. 424-304.000.
Bohner, Beat; Dawes, Dag; and Meyer, Willy, 4,076,938, Cl. 544-132.000.
Brace, Neal O., 4,076,740, Cl. 260-455.00R.
Flynn, Robert, 4,076,869, Cl. 427-386.000.
Forgo, Imre; Renner, Alfred; and Schmitter, Andre, 4,076,697, Cl. 260-78.0UA.
Haas, Georges; and Rossi, Alberto, 4,076,822, Cl. 424-263.000.
Harris, Arthur; Burrows, John; and Hargreaves, James Roger, 4,076,501, Cl. 21-2.70A.
Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, 4,076,836, Cl. 424-285.000.
Rosenberger, Siegfried, 4,076,690, Cl. 260-45.95D.
Cier, Ronald J.: *See—*
Bridger, Robert F.; and Cier, Ronald J., 4,076,639, Cl. 252-47.500.
Ciganek, Engelbert, to Du Pont de Nemours, E. I., and Company. Alkylmethanodibenzocycloheptapyrroles. 4,076,830, Cl. 424-274.000.
Cimarusti, Christopher M.: *See—*
Hauck, Frederic Peter; Cimarusti, Christopher M.; and Sundeen, Joseph E., 4,076,843, Cl. 424-330.000.
Cincinnati Milacron, Inc.: *See—*
Cox, Joseph Henry, Jr.; and Haggerty, William Andrew, 4,076,442, Cl. 408-8.000.
Willer, Sharon Gail; Yust, Paul Ronald; and Kelly, Ralph, 4,076,799, Cl. 424-45.000.
Cistola, Anthony Bartholemew, to International Business Machines Corporation. Laminated programmable microstrip interconnector. 4,076,357, Cl. 339-17.00M.
Citizen Watch Co., Ltd.: *See—*
Murakami, Tomomi; Yoshida, Masaru; Kimura, Satoshi; Yasuda, Tetuya; and Iinuma, Yoshio, 4,075,825, Cl. 58-23.00R.
Yoshida, Makoto; Mochizuki, Yoshifumi; Yamauchi, Masamichi; and Kawashima, Hideyuki, 4,075,827, Cl. 58-23.0AC.
Clampitt, Richard L., to Phillips Petroleum Company. Drilling fluid compositions and methods of preparing same. 4,076,628, Cl. 252-8.50C.
Clarebout, Pierre M.: *See—*
Vanhoof, Pierre M.; and Clarebout, Pierre M., 4,076,833, Cl. 424-282.000.
Clarenz, Werner: *See—*
Zecher, Wilfried; Clarenz, Werner; and Merten, Rudolf, 4,076,694, Cl. 260-77.5MA.

Clark, Barry Frederick. Drill sampling diversion unit. 4,076,085, Cl. 175-210.000.
Clark Equipment Company: *See—*
Hushower, Richard R.; and Daresh, George M., 4,076,096, Cl. 180-133.000.
Jesswein, Ronald M., 4,075,840, Cl. 60-422.000.
Clark, Franklin D.: *See—*
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Clark, Gary T., to Eastman Kodak Company. Disperse dyes from 2-cyano-4,6-dinitroaniline and selected 2(2'-alkoxy-5'-acylamidoanilino)alkanes. 4,076,706, Cl. 260-207.000.
Clarke, John William, to Eli Lilly and Company. Packaging tray for a videodisc. 4,076,119, Cl. 206-309.000.
Clarke, Thomas Lowe. Augmented passive radiator loudspeaker. 4,076,097, Cl. 181-147.000.
Clarkson, Douglas Mel: *See—*
Zakrzewski, Andrew Steven; Eastman, Roderick William; Ashby, George Steven; and Clarkson, Douglas Mel, 4,075,810, Cl. 52-585.000.
Clay, Frank M.; Moran, Leland G.; and Lawyer, Russell R., to Owens-Corning Fiberglas Corporation. Method of making foam pipe insulation including controlling rate of product draw-off according to foam temperature. 4,076,781, Cl. 264-40.700.
Clayton, A. Wiley, to Clayton, A. Wiley. Apparatus for curtain coating objects. 4,075,976, Cl. 118-324.000.
Clayton, William J.; Olson, Robert H.; and Kutniewski, Donald F., to Mobil Oil Corporation. Reinforced thin wall plastic bag, and method and apparatus to make material for such bags. 4,076,121, Cl. 206-390.000.
Clegg, Gordon Alexander: *See—*
Culpin, Barry; and Clegg, Gordon Alexander, 4,076,058, Cl. 141-1.100.
Cline, Harvey E.: *See—*
Chang, Mike F.; Anthony, Thomas R.; and Cline, Harvey E., 4,076,559, Cl. 148-1.500.
Clouth Gummiwerke Aktiengesellschaft: *See—*
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Coats & Clark, Inc.: *See—*
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Coggin, Charles H., Jr., to Kaiser Glass Fiber Corporation. Precision winder for drawing and packaging synthetic fibers. 4,076,181, Cl. 242-18.00G.
Cole, Henry B., to American Optical Corporation. Tapered fiber optic array. 4,076,378, Cl. 350-96.240.
Coleman Company, Inc., The: *See—*
Tschoop, Lincoln Paul; and Steiner, Marcel Alfred, 4,075,751, Cl. 29-432.100.
Collins, Robert F., to Kendall Company, The. Disposable garment with retained belt assembly. 4,075,716, Cl. 2-114.000.
Collumber, Ronald E. Connector tool apparatus for ceiling clips. 4,075,750, Cl. 29-278.000.
Colly, Pierre. Double-acting jack having a position stop. 4,076,214, Cl. 254-93.00R.
Combey, Malcolm: *See—*
Lamb, Frank; Combey, Malcolm; and Cooper, Hugh Melvin, 4,076,678, Cl. 260-31.600.
Commissariat a l'Energie Atomique: *See—*
Bideau, Jean, Levy, Jacques; and Viaud, Jean-Luc, 4,076,586, Cl. 176-78.000.
Compagnie Generale d'Electricite S.A.: *See—*
Le Mehaute, Alain; and Bordet, Philippe, 4,076,900, Cl. 429-49.000.
Compagnie Generale des Etablissements Michelin: *See—*
Verdier, Henri, 4,076,066, Cl. 152-354.00R.
Compagnie Honeywell Bull: *See—*
Appell, Marc; Bienvenu, Jacques Michel Jean; Cassonnet, Jean-Claude Marcel; and Lepicard, Georges, 4,077,058, Cl. 364-200.000.
Compagnie Industrielle des Telecommunications Cit-Alcatel S. A.: *See—*
Cailloux, Philippe, 4,076,967, Cl. 179-18.0AG.
Concept Inc.: *See—*
Simmons, Raymond W., 4,076,028, Cl. 128-303.130.
Conley, Dwain D., to Primark Corporation. Self-indexing label marking gun. 4,075,944, Cl. 101-94.000.
Conner, John R. Lifting mechanism for a portable dockboard. 4,075,729, Cl. 14-72.500.
Connery, James Gerard; Muly, Emil Christopher; and Taylor, Robert Morgan, to Leeds & Northrup Company. Apparatus for electrolytically determining a species in a fluid and method of use. 4,076,596, Cl. 204-1.00T.
Connor, David T.; Young, Patricia A.; and von Strandtmann, Maximilian, to Warner-Lambert Company. Substituted 3-(2-pyridinyl)-4(1H)-quinolinone N-oxides. 4,076,716, Cl. 260-288.0CE.
Connor, David T.; Young, Patricia A.; and von Strandtmann, Maximilian, to Warner-Lambert Company. 1-Substituted-2-(2-pyridinyl)ethanone N-oxides. 4,076,720, Cl. 260-296.00R.
Connor, David T.; Young, Patricia A.; and von Strandtmann, Max, to Warner-Lambert Company. (4-Oxo-4H-1-benzopyran-3-yl)aminooxoacetic acids and their derivatives. 4,076,729, Cl. 260-345.200.
Connor, David T.; and von Strandtmann, Maximilian, to Warner-Lambert Company. Conversion of acid S, produced by the organism *Polyangium cellulosum* var. *fulvum* into acid F. 4,076,940, Cl. 542-447.000.
Conrad-Stork B.V.: *See—*
Hupkes, Leonard, 4,076,127, Cl. 212-10.000.
Control Data Corporation: *See—*
Strom, Richard Albert, 4,077,033, Cl. 340-324.00M.
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Krechel, Joseph L.; and Purvis, Michael J., 4,076,211, Cl. 251-286.000.
Controlex Corporation of America: *See—*
Schaaphok, Peter R. W., 4,075,905, Cl. 74-501.00R.
Cook, Koy B., Jr., to Harris Corporation. Self aligned gate for di-CMOS. 4,075,754, Cl. 29-571.000.
Cook, Norman J.: *See—*
Bates, A. Arthur; and Cook, Norman J., 4,075,966, Cl. 114-114.000.
Cooper, Hugh Melvin: *See—*
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Copeland, William Raeburn, to Reinforcing & Allied Industries (Proprietary) Limited. Machine for continuously cold working steel bar. 4,075,880, Cl. 72-64.000.
Copping, Bruce G. Solar heater. 4,076,026, Cl. 126-271.000.
Corain, Luciano: *See—*
Zabotin, Alexandr Alexandrovich; Loschilin, Evgeny Dmitrievich; Onikov, Eduard Arshakovich; Galperin, Alexandr Lvovich; Santucci, Nicola; and Corain, Luciano, 4,076,051, Cl. 139-436.000.
Corbin, Robert W., to Xerox Corporation. Illumination slit for and a process of use thereof in a reproducing machine. 4,076,416, Cl. 355-49.000.
Corbin, Robert W.: *See—*
Hayashi, Fujio; and Corbin, Robert W., 4,076,417, Cl. 355-60.000.
Corcoran, Jack C., to Sackner Products, Inc Structural laminate for seating. 4,076,886, Cl. 428-294.000.
Cordes, William F., III; and Diehl, Robert E., to American Cyanamid Company. Polycarbonate stabilizers. 4,076,688, Cl. 260-45.9QA.
Cordi, Vincent A.; and Edson, Bruce A. Multi-processing system with a hierarchial memory having journaling and copyback. 4,077,059, Cl. 364-200.000.
Cornelius Company, The: *See—*
Austin, Forrest L., 4,076,207, Cl. 249-66.00R.
Zygiel, Alfred E., deceased, 4,076,145, Cl. 222-1.000.
Cornell, Thomas G., to Eaton Corporation. Adjustable steering column. 4,075,903, Cl. 74-493.000.
Corning Glass Works: *See—*
Foster, Gordon F.; Meissner, Helmuth E.; and Stiles, Janice L., 4,076,792, Cl. 423-213.500.
Joly, Pascal Adrien Jean; and Prat, Jean-Claude Alphonse Henri, 4,076,543, Cl. 106-53.000.
Kerko, David J.; and Tick, Paul A., 4,076,544, Cl. 106-54.000.
Cosden Technology, Inc.: *See—*
Medley, Ronald D.; and Chapman, James R., 4,076,570, Cl. 156-244.000.
Costin, C. Richard, to Rohm and Haas Company. Microbiocidal macroreticular ion exchange resins, their method of preparation and use. 4,076,622, Cl. 210-64.000.
Coudray, Andre Lucien: *See—*
Henrion, Michel Andre Robert; and Coudray, Andre Lucien, 4,076,964, Cl. 179-15.0BS.
Coulter Information Systems, Inc.: *See—*
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Coupek, Jiri: *See—*
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Coventry Gauge & Tool Company Limited: *See—*
Palmer, Raymond Leslie, 4,075,790, Cl. 51-94.0CS.
Cowgill, Duane W., to Sierra Engineering Co. Helmet having anti-lift device. 4,075,715, Cl. 2-6.000.
Cox, Ian R.: *See—*
Acheson, Richard M.; Cox, Ian R.; Stubbs, John K.; and Penrose, Alexander B., 4,076,817, Cl. 424-251.000.
Cox, Joseph Henry, Jr.; and Haggerty, William Andrew, to Cincinnati Milacron, Inc. Apparatus for controlling coolant flow in accordance to external forces upon a cutting tool. 4,076,442, Cl. 408-8.000.
Crago, Terril M., to Standun, Inc. Skeleton discharge mechanism for use with cupmaker blank and draw presses and the like. 4,075,963, Cl. 113-113.00R.
Crates, Fredrick J.: *See—*
Alpers, Robert J.; Crates, Fredrick J.; Ott, Denis P.; and Schmunk, John D., 4,076,040, Cl. 137-371.000.
Crawford Fitting Co.: *See—*
Spontelli, Leonard P., 4,076,286, Cl. 285-341.000.
Crayton, Bruce E.; Wilson, James F.; and Zirngibl, Carl H., to Eastman Kodak Company. Apparatus and method for making prints. 4,076,411, Cl. 355-28.000.
Crist, Norman Benjamin. Universal recessed wall cabinet. 4,076,350, Cl. 312-242.000.
Croat, John J.: *See—*
Lee, Robert W.; and Croat, John J., 4,076,561, Cl. 148-103.000.
Croisier, Alain; and Glaise, Rene, to International Business Machines Corporation. Device for reproducing the charge stored in an input capacitor in a plurality of output capacitors. 4,076,986, Cl. 307-221.00D.
Crook, Edward J., Jr. Pin and locking collar connector for load bearing parts. 4,076,430, Cl. 403-154.000.
Cross, Charles K.: *See—*
Bharucha, Kekhusroo R.; Rubin, Leon J.; and Cross, Charles K., 4,076,849, Cl. 426-266.000.
Crowell, Richard T., to Du Pont de Nemours, E. I., and Company. Image anchorage in photographic films. 4,076,531, Cl. 96-35.000.

Cruchet, Claude: *See—*
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Haugwitz, Rudiger D.; and Cruthers, Larry R., 4,076,827, Cl. 424-273.00R.
Haugwitz, Rudiger D.; and Cruthers, Larry R., 4,076,828, Cl. 424-273.00R.
Csajka, Istvan Peter; and Ungerboeck, Gottfried, to International Business Machines Corporation. Method and arrangement for coding binary signals and modulating a carrier signal. 4,077,021, Cl. 332-9.00R.
CSELT - Centro Studi e Laboratori Telecomunicazioni: *See—*
Dogliotti, Renato; and Mazzei, Umberto, 4,076,956, Cl. 178-88.000.
Culpin, Barry; and Clegg, Gordon Alexander, to Chloride Group Limited. Electric storage batteries. 4,076,058, Cl. 141-1.100.
Cuozzo, Benjamin D. Adjustable height manhole with locking means. 4,075,796, Cl. 52-20.000.
Custom Chemicides, Inc.: *See—*
Burden, Ivor R.; and Reilly, George W., 4,075,783, Cl. 47-1.410.
Dahlgren, Stig Ake, to Carbos AG. Process for the preparation of furfural. 4,076,733, Cl. 260-347.900.
Dahlstrom, Lars; and Nilsson, Bengt, to Allmanna Svenska Elektriska Aktiebolaget. Industrial robot. 4,076,131, Cl. 214-1.0BC.
Daido-Maruta Finishing Co. Ltd.: *See—*
Yamamoto, Kazuhide, 4,076,870, Cl. 427-390.00C.
Daimler-Benz Aktiengesellschaft: *See—*
Burckhardt, Manfred H., 4,075,892, Cl. 73-495.000.
Daisley, Robert Thomas; and Chumley, David Charles Philip, to Molins Limited. Apparatus for handling rod-like articles. 4,076,115, Cl. 198-487.000.
Dalton, Robert D. Bait casting float. 4,075,777, Cl. 43-41.200.
Dalton, Thomas B., to Westran Corporation. Detachable truck body. 4,076,299, Cl. 296-35.00A.
Dana Corporation: *See—*
Charchian, Loris J.; Marvin, Larry E.; and Boxhorn, George R., 4,075,902, Cl. 74-230.17C.
Danfoss A/S: *See—*
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D'Angelo, Joe B. Automatic safety brake system. 4,076,326, Cl. 303-18.000.
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Danis, Louis J., to Eaton Corporation. Hard facing alloy for engine valves and the like. 4,075,999, Cl. 123-191.00A.
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Daresh, George M.: *See—*
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Dart Industries Inc.: *See—*
Rogan, John, 4,076,043, Cl. 137-539.500.
Daster, Oskar. Sheet-supporting device. 4,075,773, Cl. 40-11.00R.
Datta, Ranajit K., to General Electric Company. Sealing materials for ceramic envelopes. 4,076,991, Cl. 313-220.000.
Davidson, John Richard, to Motorola, Inc. Diode feedback monostable multivibrator in a transistor ignition system. 4,076,997, Cl. 315-209.00T.
Davies, Charles Bloor; Davies, James Francis; and Neillie, William Frederick Soutar, to Lever Brothers Company. Detergent compositions. 4,076,653, Cl. 252-532.000.
Davies, James Francis: *See—*
Davies, Charles Bloor; Davies, James Francis; and Neillie, William Frederick Soutar, 4,076,653, Cl. 252-532.000.
Davies, Ronald L.: *See—*
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Davis, David R. Table game. 4,076,243, Cl. 273-85.00E.
Davis, George G., to Frigitemp. Oil impervious acoustical board. 4,076,100, Cl. 181-290.000.
Davis, James E., to Procter & Gamble Company, The. Fabric softener. 4,076,632, Cl. 252-8.800.
Davis, Lynn M.: *See—*
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Davis, Noel; Haub, John T.; and Rustad, Stanley C., to General Mills, Inc. Cart pushing apparatus. 4,075,949, Cl. 104-162.000.
Davis, Paul, to Sweetheart Plastics, Inc. Disposable plastic lid. 4,076,123, Cl. 206-503.000.
Davis, Raymond Vincent, to Hoffmann-La Roche Inc. Radioimmunoassay. 4,076,797, Cl. 424-1.000.
Davis, Samuel H. Bell fitting and support assembly for pipe. 4,076,281, Cl. 285-64.000.
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Davis, Warren W.; and Thompson, Leroy R., to Caterpillar Tractor Co. Overload safety device for gas turbine engines. 4,075,910, Cl. 74-785.000.
Davydenko, Eduard Prokofievich: *See—*
Ioffe, Benyamin Alexandrovich; Kalnin, Robert Karlovich; Zommer, Jury Arvidovich; Graubin, Yanis Ekabovich; Davydenko, Eduard Prokofievich; and Kern, Ivan Ivanovich, 4,077,027, Cl. 335-219.000.
Dawes, Dag: *See—*
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Day, Bernard L. Perpetual calendar. 4,075,774, Cl. 40-109.000.
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Meek, Lennis E., 4,076,347, Cl. 308-238.000.
Deakin, James E. Automatic shaft balancer. 4,075,909, Cl. 74-573.00R.
Deaton, Guy W. Barbecue apparatus and method. 4,076,008, Cl. 126-25.00R.
DeBell & Richardson, Inc.: *See—*
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Decca Limited: *See—*
Plows, Graham Stuart; and Castle, Paul, 4,075,974, Cl. 118-52.000.
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Braun, Werner; Decker, Gernot; and Rohr, Horst, 4,076,371, Cl. 350-3.610.
Decombe, Robert; and Hugelin, Bernard, to Sublistatic Holding SA. Sulphurized paper supports. 4,076,495, Cl. 8-2.50A.
Deeg, Emil W.; and Krohn, David A., to American Optical Corporation. Preparation of photochromic gradient lenses of improved color. 4,076,395, Cl. 351-165.000.
Deeg, Emil W.; and Hoffman, Donald O., to American Optical Corporation. Process for producing photochromic silicate glass film containing silver halide particles. 4,076,542, Cl. 106-52.000.
Deere & Company: *See—*
Hengen, Edward John, 4,075,824, Cl. 56-14.600.
Deffayet, Jean; and Lamarque, Etienne, to Thomson-CSF. Armor piercing projectile. 4,075,946, Cl. 102-52.000.
de Larosiere de Champfeu, Pierre J., to International Synthetic Rubber Company, Ltd., The. Soil injection machine. 4,075,853, Cl. 61-36.00R.
de Limur, Eleanor. Encapsulated pulverized dehydrated fruit and vegetable product. 4,076,848, Cl. 426-89.000.
Dell, Harold R. Data compression. 4,077,034, Cl. 340-347.0DD.
Delong Corporation: *See—*
Hansen, John H., 4,075,860, Cl. 61-87.000.
De Maeyer, Leo C. M.; Rabl, Carl-Roland; Jovin, Thomas M.; Riesner, Detlev; Rigler, Rudolf; Veil, Lutz Bodo; and Lehrach, Hans, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Apparatus for investigating fast chemical reactions by optical detection. 4,076,420, Cl. 356-73.000.
Demerson, Christopher A.; Humber, Leslie G.; Dobson, Thomas A.; and Jirkovsky, Ivo L., to American Home Products Corporation. Pyrano[3,4-b]-indole derivatives, pharmaceutical compositions and methods of use. 4,076,831, Cl. 424-274.000.
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Atwood, John G.; DeMey, Charles F., III; Marshall, Hamilton W., Jr.; and Ducret, Lucien C., 4,076,503, Cl. 23-259.000.
Deml, Reinhold; Greis, Ulrich; Hofmann, Wilfried; and Rauffer, Walter, to AGFA-Gevaert, A.G. Rear-projection viewing screen. 4,076,384, Cl. 350-122.000.
Demuth, Hans; and Ferreira, Jose R. A., to Sulzer Brothers Limited. System for transferring a yarn from one part of a textile machine to another part. 4,076,052, Cl. 139-439.000.
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Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. Derivatives of pyrazolo[1,5-a]pyrido[2,3-d]pyrimidin-9(4H)-one. 4,076,712, Cl. 260-256.40F.
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Desarzens, Francis; and Cruchet, Claude, to Arcia SA. Trap door and folding ladder arrangement. 4,076,102, Cl. 182-81.000.
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Dessau, Ralph M., to Mobil Oil Corporation. Coal desulfurization process. 4,076,505, Cl. 44-1.00R.
Deucher, Conrad, to Valutec AG. Erecting seat structure to assist invalids from seated to standing, upright position, particularly erecting wheelchairs. 4,076,304, Cl. 297-45.000.
Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Thurn, Friedrich; Burmester, Kurt; Pochert, Johannes; and Wolff, Siegfried, 4,076,550, Cl. 106-288.00Q.
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DeVale, Donald P.: *See—*
Alms, Erhardt E.; DeVale, Donald P.; and Russell, William, 4,076,492, Cl. 432-43.000.
Deventer, Gert, to Deventer KG. Sliding seal. 4,076,262, Cl. 277-227.000.
Deventer KG: *See—*
Deventer, Gert, 4,076,262, Cl. 277-227.000.
DeVlieg, Garrett Howard, to Boeing Company, The. Aircraft automatic braking system. 4,076,331, Cl. 303-93.000.
De Witt, Carl S.: *See—*
Taysom, Dell A.; Taysom, Larry D.; De Witt, Robert J.; and De Witt, Carl S., 4,076,124, Cl. 209-75.000.

De Witt, Robert J.: *See—*
Taysom, Dell A.; Taysom, Larry D.; De Witt, Robert J.; and De Witt, Carl S., 4,076,124, Cl. 209-75.000.

Dholakia, Anil Ramniklal, to RCA Corporation. Video disc player employing a spring loaded stylus apparatus. 4,077,050, Cl. 358-128.000.

Diamond International Corporation: *See—*
Burkhart, James H., 4,076,582, Cl. 162-272.000.

Diamond Power Specialty Corporation: *See—*
Raas, Jean H.; and Schwartz, Joseph I., 4,076,144, Cl. 220-367.000.

Didrickson, Donald D. Rotary airlock having adjustable blades to maintain a seal. 4,076,150, Cl. 222-368.000.

Dieck, Ronald L.; and Quinn, Edwin J., to Armstrong Cork Company. Poly(aryloxyphosphazene) copolymer foams. 4,076,658, Cl. 260-2.50R.

Diehl, Francis L.: *See—*
Edwards, James B.; and Diehl, Francis L., 4,076,633, Cl. 252-8.750.

Diehl, Robert E.: *See—*
Cordes, William F., III; and Diehl, Robert E., 4,076,688, Cl. 260-45.9QA.

Diesinger, Walter Helmut; and Kosiolek, Klaus Peter, to Dynamit Nobel Aktiengesellschaft. Partition for rocket motors. 4,075,832, Cl. 60-245.000.

Dietmann, Karl: *See—*
Kampe, Wolfgang; Stach, Kurt; Thiel, Max; Bartsch, Wolfgang; Dietmann, Karl; Roesch, Egon; and Schaumann, Wolfgang, 4,076,829, Cl. 424-274.000.

Dietz, Klaus: *See—*
Vogel, Eberhard; Glaser, Herbert; Kleider, Albert; and Dietz, Klaus, 4,075,793, Cl. 51-170.0TL.

Dillon, Leo H.: *See—*
Adams, Cecil E.; Dillon, Leo H.; Born, Ellis H.; and Thurston, David L., 4,076,459, Cl. 417-217.000.

DiMarcello, Frank Vincent; and Williams, John Charles, to Bell Telephone Laboratories, Incorporated. Graded index optical fiber. 4,076,380, Cl. 350-96.310.

Dir, Gary A.: *See—*
Haas, Werner E. L.; and Dir, Gary A., 4,076,387, Cl. 350-362.000.

Dirigo Corporation: *See—*
Nickerson, John T. R.; and Darack, John R., 4,076,850, Cl. 426-332.000.

Distler, Dieter: *See—*
Freyberg, Peter; Horn, Dieter; Oppenlaender, Knut; Wolf, Hans; and Distler, Dieter, 4,076,497, Cl. 8-21.00C.

Ditto, Edwin D.; and Abu Akeel, A. Hadi Kobaisi, to General Motors Corporation. Energy absorbing bumper. 4,076,296, Cl. 293-71.00R.

Ditto, Edwin D., to General Motors Corporation. Programmable velocity and force control method for compression molding. 4,076,780, Cl. 264-40.500.

Ditto, Edwin D., to General Motors Corporation. Mold coating of freshly molded articles. 4,076,788, Cl. 264-255.000.

Dittrich, Ferdinand J.; and Weir, John D., to Metco, Inc. Flame-sprayable flexible wires. 4,076,883, Cl. 428-242.000.

Dively, Robert M., to Raymond Lee Organization, Inc., The, a part interest. Amusement device. 4,076,238, Cl. 273-1.00R.

Djabarov, Nikola Borissov: *See—*
Simeonov, Yordan Todorov; and Djabarov, Nikola Borissov, 4,076,546, Cl. 106-89.000.

Dobson, Thomas A.: *See—*
Demerson, Christopher A.; Humber, Leslie G.; Dobson, Thomas A.; and Jirkovsky, Ivo L., 4,076,831, Cl. 424-274.000.

Dochterman, Richard W., to General Electric Company. Torsional vibration isolating motor mounting arrangement and method of making the same. 4,076,197, Cl. 248-15.000.

Dodich, Nicholas Anthony, to Over-Lowe Company, Inc. Pavement cutting wheel mounting for earth moving equipment. 4,076,314, Cl. 299-40.000.

Dogliotti, Renato; and Mazzei, Umberto, to CSELT - Centro Studi e Laboratori Telecomunicazioni. Decision network for receiver of PSK digital signals. 4,076,956, Cl. 178-88.000.

Dohany, Julius Eugene, to Pennwalt Corporation. Vinylidene fluoride polymer having improved melt flow properties. 4,076,929, Cl. 526-255.000.

Doherty, James T.: *See—*
Theurer, John; Beck, Orville F.; and Doherty, James T., 4,075,814, Cl. 52-79.500.

Dolhyj, Serge R.; Milberger, Ernest C.; and White, James F., to Standard Oil Company, The. Process for preparing phthalic anhydride. 4,076,731, Cl. 260-346.400.

Dominion Foundries and Steel, Limited: *See—*
Zakrzewski, Andrew Steven; Eastman, Roderick William; Ashby, George Steven; and Clarkson, Douglas Mel, 4,075,810, Cl. 52-585.000.

Doncque, Pierre M., to Agence Nationale de Valorisation de la Recherche (ANVAR). Vehicle wheel suspension device. 4,076,271, Cl. 280-284.000.

Dorph, Thor, to Lie, Bjorn; and Lie, Gina, part interest to each. Duplex spool for an open face spinning reel. 4,076,185, Cl. 242-118.410.

Dow Chemical Company, The: *See—*
Beaumont, Gerald P.; and Jones, William C., 4,076,629, Cl. 252-8.600.
Beck, Henry Nelson, 4,076,910, Cl. 526-6.000.
Burkholder, Nelson D., Jr., 4,076,673, Cl. 260-29.2EP.
Gross, James R., 4,076,928, Cl. 526-240.000.
Gulbenk, Alin H., 4,076,719, Cl. 260-296.00R.
Moore, William G., 4,076,776, Cl. 264-13.000.
Olstowski, Franciszek; and Parrish, Donald Bob, 4,076,660, Cl. 260-9.000.
Saunders, Frank L.; and Pelletier, Ronald R., 4,076,768, Cl. 260-876.00B.
Turner, Robert B., 4,076,679, Cl. 260-31.20N.
Wagner, Eugene R.; and Mueller, Larry G., 4,076,841, Cl. 424-324.000.
Wright, Donald R.; and Swartz, Henry D., 4,075,818, Cl. 53-180.00R.

Dow Corning Corporation: *See—*
Keil, Joseph W., 4,076,695, Cl. 260-77.5AM.

Dowling, Donald J.: *See—*
Arnold, Dan M.; Dowling, Donald J.; and Warren, Wayne F., 4,076,980, Cl. 250-270.000.

Downton, Denys Edward: *See—*
Lausberg, Johannes Willebrordes; and Downton, Denys Edward, 4,076,146, Cl. 222-52.000.

Doyle, Keith Gilbert: *See—*
Zolman, Peter Martin; and Doyle, Keith Gilbert, 4,076,055, Cl. 140-92.200.

Doyle, Thomas Joseph: *See—*
Mikofalvy, Bela Kalman; and Doyle, Thomas Joseph, 4,076,920, Cl. 526-74.000.

Drabek, Jozef: *See—*
Boger, Manfred; and Drabek, Jozef, 4,076,837, Cl. 424-304.000.

Drahtmuller, Hans Dieter: *See—*
Krusche, Alfred; and Drahtmuller, Hans Dieter, 4,076,090, Cl. 180-6.480.

Dremann, George H. Abrasive blast system having a modulation function. 4,075,789, Cl. 51-436.000.

Dresser Industries, Inc.: *See—*
Bishop, Burton DeWolfe; and Murray, Lawrence E., 4,076,104, Cl. 187-8.500.

Drinkard, Gary; and McLaughlin, William A., to Shell Oil Company. Process for forming a coalate solution in-situ. 4,076,078, Cl. 166-271.000.

Drwiega, Bohdan. Arrangement and method for the storage of lantern slides and projector for viewing thereof. 4,076,401, Cl. 353-108.000.

Dubovitsky, Fedor Ivanovich: *See—*
Berlin, Alfred Anisimovich; Brikenshtein, Khaim-Mordkhe Aronovich; Gavrjushenko, Nikolai Sviridovich; Dubovitsky, Fedor Ivanovich; Kefeli, Tamara Yakovlevna; Kronman, Raisa Vasilievna; Konkhina, Ljudmila Alexeevna; Marshavina, Natalya Lvovna; Popova, Galina Leonidovna; Radugina, Anna Alexandrovna; Sivergin, Jury Mikhailovich; Sumin, Iosif Grigorievich; Tvorogov, Nikolai Nikandrovich; Shilova, Galina Pavlovna; and Kardashov, David Alexeevich, 4,076,742, Cl. 260-47.0UA.

Duchateau, Jean Louis, to Foseco Trading A.G. Tundishes. 4,076,224, Cl. 266-275.000.

Ducret, Lucien C.: *See—*
Atwood, John G.; DeMey, Charles F., III; Marshall, Hamilton W., Jr.; and Ducret, Lucien C., 4,076,503, Cl. 23-259.000.

Dudko, Daniil Andreevich: *See—*
Sur, Mikhail Danilovich; and Dudko, Daniil Andreevich, 4,076,470, Cl. 418-63.000.

Dugle, James B.; and Hager, C. Bradley, to Miles Laboratories, Inc. Method, composition, and device for determining the specific gravity of a liquid. 4,076,502, Cl. 23-230.00R.

Dummel. Fritz, to Siemens Aktiengesellschaft. Wire wrapping device for connecting an insulated electrical wire to an electrical contact pin. 4,076,056, Cl. 140-119.000.

Dunham-Bush, Inc.: *See—*
Moody, Harold W., Jr.; Bulkley, Clifford T.; Gagnon, Joseph A. L. N.; and Fraser, Grover, 4,076,461, Cl. 417-310.000.

Dunlop Limited: *See—*
Goodfellow, Anthony Gerald, 4,076,565, Cl. 156-125.000.
Yardley, James Frank; and Nightingale, Allen Frederick, 4,076,891, Cl. 428-517.000.

Du Pont de Nemours, E. I., and Company: *See—*
Anderson, Arthur William; and Stamatoff, Gelu Stoeff, 4,076,698, Cl. 260-88.20F.
Anolick, Colin; and Kutsch, Howard James, 4,076,226, Cl. 267-139.000.
Burge, Ralph Clarence, 4,075,952, Cl. 105-282.00R.
Burt, James Gordon; and Phillips, Howard Elliot, 4,076,644, Cl. 252-182.000.
Ciganek, Engelbert, 4,076,830, Cl. 424-274.000.
Crowell, Richard T., 4,076,531, Cl. 96-35.000.
Ganci, James Barry; and Mastrangelo, Sebastian V. R., 4,076,652, Cl. 252-504.000.
Ida, Edward Stanley, 4,076,424, Cl. 356-188.000.
Joiner, James Ray, Jr., 4,076,897, Cl. 428-539.000.
Kiser, Gary L.; and Hendricks, Bobby G., 4,076,754, Cl. 260-603.00C.
Kring, Elbert Victor, 4,076,899, Cl. 429-42.000.
Nazarenko, Nicholas; and Seidel, William Carl, 4,076,756, Cl. 260-606.50B.
Pagilagan, Rolando Umali, 4,076,664, Cl. 260-18.00N.
Pecoraro, Joseph Michael, 4,076,738, Cl. 260-406.000.
Simms, John Alvin, 4,076,766, Cl. 260-850.000.
Sommerfeld, Eugene G., 4,076,675, Cl. 260-29.4UA.
Sommerfeld, Eugene G., 4,076,676, Cl. 260-29.40R.
Valdsaar, Herbert, 4,076,506, Cl. 51-307.000.

Durst, David L., to Burton, Duane. Rotary internal combustion engine. 4,075,981, Cl. 123-8.310.

Durtsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Koch, Karlheinz; and Rutzen, Horst, 4,076,743, Cl. 260-501.130.

Dussia, Melvin A. Spring type back traction exerciser. 4,076,237, Cl. 272-136.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Diesinger, Walter Helmut; and Kosiolek, Klaus Peter, 4,075,832, Cl. 60-245.000.

E. D. Bullard Company: *See—*
Moretti, Anthony L., 4,076,373, Cl. 350-61.000.

E. R. Squibb & Sons, Inc.: *See—*
Denzel, Theodor; and Hoehn, Hans, 4,076,712, Cl. 260-256.40F.
Hauck, Frederic Peter; Cimarusti, Christopher M.; and Sundeen, Joseph E., 4,076,843, Cl. 424-330.000.
Haugwitz, Rudiger D.; and Cruthers, Larry R., 4,076,825, Cl. 424-273.00R.
Haugwitz, Rudiger D.; and Cruthers, Larry R., 4,076,827, Cl. 424-273.00R.
Haugwitz, Rudiger D.; and Cruthers, Larry R., 4,076,828, Cl. 424-273.00R.
Vogt, B. Richard, 4,076,818, Cl. 424-251.000.
Wade, Peter C.; Vogt, B. Richard; and Kissick, Thomas P., 4,076,823, Cl. 424-269.000.

E-Systems, Inc.: *See—*
Fulghum, Donald P., 4,076,958, Cl. 179-1.50A.

Eash, John William, II. Skateboard with longitudinally adjustable wheels. 4,076,265, Cl. 280-87.04A.

Eastern Cyclone Industries, Inc.: *See—*
Haight, Nicholas; and Madsen, Trygve T., 4,076,321, Cl. 302-27.000.

Easterwood, Richard L.: *See—*
Herricks, Herman H.; and Easterwood, Richard L., 4,076,079, Cl. 166-308.000.

Eastman Kodak Company: *See—*
Clark, Gary T., 4,076,706, Cl. 260-207.000.
Crayton, Bruce E.; Wilson, James F.; and Zirngibl, Carl H., 4,076,411, Cl. 355-28.000.
Fleckenstein, Lee J.; and Figueras, John, 4,076,529, Cl. 96-3.000.
Godfrey, Darryl A., 4,076,670, Cl. 260-27.00R.
Gottermeier, William F., 4,076,532, Cl. 96-48.0HD.
Irick, Gether, Jr.; Kelly, Charles A.; and Martin, James C., 4,076,687, Cl. 260-45.8NT.
Kasper, George Philip; and May, John Walter, 4,076,857, Cl. 427-18.000.
Reid, Michael Gerald; Burlew, Leroy Ellery; and Hogan, David Charles, 4,076,408, Cl. 355-14.000.
Williams, James Ora, 4,075,977, Cl. 118-658.000.

Eastman, Roderick William: *See—*
Zakrzewski, Andrew Steven; Eastman, Roderick William; Ashby, George Steven; and Clarkson, Douglas Mel, 4,075,810, Cl. 52-585.000.

Eaton Corporation: *See—*
Buttriss, Albert T., 4,075,748, Cl. 29-225.000.
Cornell, Thomas G., 4,075,903, Cl. 74-493.000.
Danis, Louis J., 4,075,999, Cl. 123-191.00A.
Tinholt, Thomas H., 4,076,110, Cl. 192-58.00B.

Eaton Yale Ltd.: *See—*
Bestard, Thomas L., 4,076,060, Cl. 144-3.00D.

Ebner, Heinrich; and Enenkel, Anton, to Heinrich Frings, Firma. Two stage process for the production of vinegar with high acetic acid concentration. 4,076,844, Cl. 426-17.000.

Eckert, Rene A.: *See—*
Caruso, Michael G.; and Eckert, Rene A., 4,076,631, Cl. 252-8.800.

Eckhardt, Wolfgang: *See—*
Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, 4,076,836, Cl. 424-285.000.

Edmunds, Donald L.: *See—*
Fulton, Robert C.; Edmunds, Donald L.; and Shields, George B., 4,076,511, Cl. 65-27.000.

Edson, Bruce A.: *See—*
Cordi, Vincent A.; and Edson, Bruce A., 4,077,059, Cl. 364-200.000.

Edwards, Clarence Roy; and Fickes, Ellwood Donald, to General Electric Company. Circuit for limiting the spindle speed of a machine. 4,076,999, Cl. 318-465.000.

Edwards, James B.; and Diehl, Francis L., to Procter & Gamble Company, The. Fabric treating articles with improved conditioning properties. 4,076,633, Cl. 252-8.750.

Effinger, Cecil S. Free platen typewriter. 4,076,112, Cl. 197-127.00R.

Efther, Jean; and Denisselle, Jean. Liquid contact switch having plural compartments and electrical heater. 4,076,972, Cl. 200-33.00A.

Egerer, Josef, to Staedtler & UHL. Circular comb for combing machines. 4,075,738, Cl. 19-234.000.

Ehrmann, Karl: *See—*
Brammer, Hartmut; Ehrmann, Karl; Haug, Heinz; Issler, Jorg; Kas, Gunter; Kalippke, Harald; Magdefrau, Herbert; and Schneider, Karl-Heinz, 4,075,752, Cl. 29-434.000.

Eichenseer, Franz; Steidl, Dieter; and Muller, Walter, to Hoechst Aktiengesellschaft. Grinding method for cellulose. 4,076,935, Cl. 536-86.000.

Eickmann, Karl. Rotor, pistons, piston shoes and associated means in fluid handling devices. 4,075,932, Cl. 91-488.000.

El Paso Products Company: *See—*
Mims, Samuel S., 4,076,948, Cl. 560-191.000.

Elco Corporation: *See—*
Sochor, Jerzy R., 4,075,759, Cl. 29-629.000.

Electricite de France (Service National): *See—*
Cachera, Pierre Charles, 4,076,585, Cl. 176-38.000.
Taulier, Hubert Henri Leon; and Brugeille, Gerard, 4,076,587, Cl. 176-86.00R.

Elettrocarbonium S.p.A.: *See—*
Bizzarri, Cesare, 4,076,610, Cl. 204-290.00R.

Eli Lilly and Company: *See—*
Clarke, John William, 4,076,119, Cl. 206-309.000.
Shields, James E., 4,076,659, Cl. 260-8.000.

Eliott, Barbara Ann: *See—*
Teiser, Sidney; and Eliott, Floyd H., 4,076,391, Cl. 350-241.000.

Eliott, Floyd H.: *See—*
Teiser, Sidney; and Eliott, Floyd H., 4,076,391, Cl. 350-241.000.

Ellingboe, James; Nystrom, Ernst Holger; and Sjovall, Jan Bertil. Polysaccharide polyols. 4,076,930, Cl. 536-1.000.

Ellsworth, James P.: *See—*
Wilson, John T.; and Ellsworth, James P., 4,077,055, Cl. 361-46.000.

Elmer, Otto C., to General Tire & Rubber Company, The. Method for making urethane-terminated polycarbodiimides and products thereof. 4,076,945, Cl. 560-25.000.

Elsner, Burckhardt; Lagodka, Gunter; Plevak, Lubomir; and Rosenberg, Harry, to Gewerkschaft Eisenhutte Westfalia. Shield-type support assemblies for mine workings. 4,075,857, Cl. 61-45.00D.

Eltra Corporation: *See—*
Jensen, Henry E., 4,076,906, Cl. 429-90.000.

Emhart Industries, Inc.: *See—*
Raudat, John L.; and Johnson, Lloyd D., 4,075,819, Cl. 53-248.000.

EMI Limited: *See—*
LeMay, Christopher Archibald Gordon, 4,076,985, Cl. 250-445.00T.

Empire Brushes, Inc.: *See—*
Misercola, Douglas, 4,076,032, Cl. 132-9.000.

Endriz, John Guiry, to RCA Corporation. System for modulating a flat panel image display device. 4,077,054, Cl. 358-242.000.

Enenkel, Anton: *See—*
Ebner, Heinrich; and Enenkel, Anton, 4,076,844, Cl. 426-17.000.

Energy Products of Idaho: *See—*
Sowards, Norman K., 4,075,953, Cl. 110-8.00F.

Engelhard Minerals & Chemicals Corporation: *See—*
Abramovici, Miron; and Stern, Eric W., 4,076,762, Cl. 260-676.00R.
Langley, Robert C.; and Abrash, Muriel, 4,076,894, Cl. 428-428.000.
Tiethof, Jack A., 4,076,795, Cl. 423-515.000.

English Clays Lovering Pochin & Co. Ltd.: *See—*
Jenkin, Royston Paul, 4,076,136, Cl. 214-340.000.

English, Edward: *See—*
Riley, Victor; Macnab, Ian; Timusk, John; and English, Edward, 4,076,884, Cl. 428-255.000.

Enidine Incorporated: *See—*
Houghton, Benjamin T., 4,076,225, Cl. 267-34.000.

Erdmann, Jurgen: *See—*
Walter, Arthur; Fetzer, Gunter; and Erdmann, Jurgen, 4,076,979, Cl. 250-226.000.

Erickson, John W., to Boltswitch Inc. Terminal fastener and instrument tap. 4,076,368, Cl. 339-214.00R.

Erika, Inc.: *See—*
Martinez, Felix Jesus, 4,076,023, Cl. 128-214.00R.
Martinez, Felix Jesus, 4,076,285, Cl. 285-332.000.

Eriksen, Diane W. Educational puzzle. 4,076,253, Cl. 273-157.00R.

Eriksson, Kjell Viktor; and Aslund, Ivan, to AB Bofors. Gun barrel. 4,075,926, Cl. 89-16.000.

Ervin, William W.; and Fleck, Lee A., to General Motors Corporation. Universal battery case having embossed intercell partitions and process for making same. 4,076,787, Cl. 264-250.000.

Erwin Sick Gesellschaft mit beschrankter Haftung Optik-Elektronik: *See—*
Walter, Arthur; Fetzer, Gunter; and Erdmann, Jurgen, 4,076,979, Cl. 250-226.000.

Erwine, Barbara L.; and Smallcombe, Stephen H., to Varian Associates, Inc. Method and apparatus for NMR sample tube vortex plug. 4,077,002, Cl. 324-0.5AH.

Esselborn, Reiner: *See—*
Bernhard, Horst; and Esselborn, Reiner, 4,076,551, Cl. 106-291.000.

Essex Group, Inc.: *See—*
Stoneking, Richard D., 4,076,487, Cl. 431-25.000.
Taormina, Anthony J.; Wyszynski, Artur; and Witek, Roman J., 4,076,358, Cl. 339-17.00D.

Evans, Robert W., to Baker International Corporation. Fishing jar for accommodation of excess tensile load. 4,076,086, Cl. 175-297.000.

Exxon Research & Engineering Co.: *See—*
Bearden, Roby, Jr., 4,076,613, Cl. 208-108.000.

Eyman, Krystian H., to Politechnika Warszawska. Method of obtaining periodical impacts in one direction. 4,075,895, Cl. 74-61.000.

F.lli Manea S.n.c. Costruzioni Meccaniche Accessori Tessili: *See—*
Manea, Antonio, 4,076,049, Cl. 139-434.000.

Fabian, Arthur C.; Genzer, Jerome D.; Kasulanis, Charles Francis; Shavel, John, Jr.; and Zinnes, Harold, to Warner-Lambert Company. Composition containing alkyl 2-{[({[(5-methyl-3-isoxazolyl)-amino]-carbonyl}methyl)amino]sulfonyl}benzoate and an alkali metal alkoxide of a lower alcohol in an inert solvent. 4,076,722, Cl. 260-307.00H.

Facha, Joseph V.: *See—*
Ash, Edward B.; Bernath, Louis; and Facha, Joseph V., 4,076,583, Cl. 176-35.000.

Fahlen, Theodore S.; and Kirk, Russell F., to GTE Sylvania Incorporated. High power gas transport laser. 4,077,018, Cl. 331-94.5PE.

Farag, Souly Atalla; and Norman, Lloyd Wendell, to U and I Incorporated. Process for decolorizing sugar solutions with peroxide. 4,076,552, Cl. 127-50.000.
Farley, David L.: *See—*
Nix, George J.; Barrington, Burchus Q.; Farley, David L.; and Hortman, Norman G., 4,076,077, Cl. 166-315.000.
Farragher, Joseph, to Pilkington Brothers Limited. Breaking flat glass into cullet. 4,076,159, Cl. 225-3.000.
Faulstich, Marga; and Reitmayer, Franz, to Jenaer Glaswerk Schott & Gen. Optical glass. 4,076,647, Cl. 252-301.40P.
Fauve, Robert, to Institut Pasteur. Immunostimulant agent, compositions thereof and methods for their preparation. 4,076,801, Cl. 424-92.000.
Fehr, Theodor; and Hauth, Hartmut, to Sandoz Ltd. 13-Bromo lysergic acid compounds. 4,076,715, Cl. 260-285.500.
Felice, Patrick E.: *See—*
Chu, Chang K.; Bartko, John; and Felice, Patrick E., 4,076,555, Cl. 148-1.500.
Fennimore, Jack; Ruder, Gary; and Simmonite, Donald, to T. J. Smith & Nephew Limited. Treatment of particulate carbon. 4,076,892, Cl. 428-407.000.
Fenster, Larry A.; and Fenster, Leo. Sharps disposal pads. 4,076,882, Cl. 428-215.000.
Fenster, Leo: *See—*
Fenster, Larry A.; and Fenster, Leo, 4,076,882, Cl. 428-215.000.
Fenton, Donald M., to Union Oil Company of California. Ethylene-carbon monoxide copolymers. 4,076,911, Cl. 526-11.100.
Fenton, Russell S. Flash assembly for clothing-supported jewelry. 4,076,976, Cl. 362-104.000.
Ferm, Bo Christer, to AB Bahco Ventilation. Apparatus for processing dust-carrying gas and bulk goods. 4,076,509, Cl. 55-320.000.
Feroy, Arne. Bearing ring for blade of a controllable pitch propeller. 4,076,453, Cl. 416-174.000.
Ferrari, William: *See—*
Garzia, Aldo; Ferrari, William; and Bottazzi, Andrea, 4,076,815, Cl. 424-251.000.
Ferreira, Jose R. A.: *See—*
Demuth, Hans; and Ferreira, Jose R. A., 4,076,052, Cl. 139-439.000.
Ferri, Luigi. Carton for food products. 4,076,168, Cl. 229-43.000.
Ferro Corporation: *See—*
Heasley, James H., 4,076,383, Cl. 350-103.000.
Fetzer, Gunter: *See—*
Walter, Arthur; Fetzer, Gunter; and Erdmann, Jurgen, 4,076,979, Cl. 250-226.000.
Feucht, Dennis D.; and Ryan, Terry W., to Caterpillar Tractor Co. Snubbed pad resilient mount. 4,076,194, Cl. 248-9.000.
Fiat Trattori S.p.A.: *See—*
Saetti, Renato, 4,076,334, Cl. 305-54.000.
Fiberglas Canada Ltd.: *See—*
Lacon, John W., 4,076,479, Cl. 425-301.000.
Fickes, Ellwood Donald: *See—*
Edwards, Clarence Roy; and Fickes, Ellwood Donald, 4,076,999, Cl. 318-465.000.
Fiebig, Robert J. Jigging pole. 4,075,776, Cl. 43-24.000.
Field, Peter Graham Spencer; and Bennett, Ronald, to Burmah Oil Trading Limited. Production of phenols. 4,076,759, Cl. 260-621.00C.
Figge, Erwin E.: *See—*
Kim, Raymond W. H.; and Figge, Erwin E., 4,076,247, Cl. 273-105.600.
Figueras, John: *See—*
Fleckenstein, Lee J.; and Figueras, John, 4,076,529, Cl. 96-3.000.
Finberg, Arne O., to Mobil Oil Corporation. Photodegradable atactic polystyrene compositions. 4,076,655, Cl. 260-2.5HB.
Fisher, Donald J., to Xerox Corporation. Roughened imaging surface for cleaning. 4,076,564, Cl. 156-664.000.
Fisher, Roy Jack, to Nipak, Inc. Pipe cut off saw. 4,075,916, Cl. 82-78.000.
Fissler Gesellschaft mit beschrankter Haftung: *See—*
Horn, Walter; and Fissler, Rudolf, 4,075,939, Cl. 99-345.000.
Fissler, Rudolf: *See—*
Horn, Walter; and Fissler, Rudolf, 4,075,939, Cl. 99-345.000.
Fitsall, Robert Alan, to BOC International Limited. Cooling or freezing articles. 4,075,869, Cl. 62-374.000.
Fitzsimmons, William A.: *See—*
Anderson, Louis W.; and Fitzsimmons, William A., 4,077,020, Cl. 331-94.5PE.
Fleck, Lee A.: *See—*
Ervin, William W.; and Fleck, Lee A., 4,076,787, Cl. 264-250.000.
Fleckenstein, Lee J.; and Figueras, John, to Eastman Kodak Company. Photographic diffusion transfer films, processes and compositions with color moiety releasing compound. 4,076,529, Cl. 96-3.000.
Fleischer, Henry. Support frames adapted for use with car seats and beds. 4,075,720, Cl. 5-94.000.
Fleischman, Andor A., to Bell & Howell Company. Objective for optical system. 4,076,390, Cl. 350-216.000.
Floyd, Middleton Brawner, Jr., to American Cyanamid Company. Derivatives of α-(6-carboxyhexyl) furfuryl alcohol. 4,076,732, Cl. 260-347.300.
Flynn, Robert, to Ciba-Geigy Corporation. Hardenable epoxy resin compositions and process for making the same. 4,076,869, Cl. 427-386.000.
FMC Corporation: *See—*
Ames, Thomas J., 4,075,862, Cl. 61-110.000.
Austill, Robert J., 4,076,166, Cl. 228-157.000.
Roberts, Thomas E., Jr., 4,075,891, Cl. 73-483.000.
Fogelberg, Mark John, to Borg-Warner Corporation. Two-way overrunning clutch mechanism. 4,076,108, Cl. 192-35.000.
Follows, James Samuel; and Bergen, Gerhard Stanley, to Vanguard Plastics Ltd. Lock for a slidable door. 4,076,289, Cl. 292-226.000.
Fontanel, Daniel; and Rampin, Jean, to Rhone-Poulenc Textile. Granules and pellets for the modification of polycondensates which can be shaped, as well as the process for obtaining these granules and pellets and shaped articles thus obtained. 4,076,667, Cl. 260-22.00A.
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Smith, William Novis, 4,076,794, Cl. 423-463.000.
Forgensi, Rudolph; and Hagenbach, Robert J., to Xerox Corporation. Preparation of spheroidized particles. 4,076,640, Cl. 252-62.10R.
Forgo, Imre; Renner, Alfred; and Schmitter, Andre, to Ciba-Geigy Corporation. Process for the manufacture of polyaddition products containing imide groups. 4,076,697, Cl. 260-78.0UA.
Formex Manufacturing, Inc.: *See—*
Alesi, John, Jr., 4,075,803, Cl. 52-220.000.
Formica Corporation: *See—*
Bunkowski, Kenneth Dana, 4,076,896, Cl. 428-530.000.
Power, George Edward, 4,076,566, Cl. 156-153.000.
Power, George Edward; and Bolling, Donald Louis, 4,076,666, Cl. 260-22.0CB.
Forster, Kevin George; and Reinsma, Harold Lawrence, to Caterpillar Tractor Co. Sealed joint construction. 4,076,345, Cl. 308-120.00A.
Forster, Larry G., to Chair-E-Yacht, Inc. Self-propelled vehicle. 4,076,091, Cl. 180-26.000.
Forsythe, Richard Wells. Explosive composition with adhered air entrapping material. 4,076,562, Cl. 149-7.000.
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Duchateau, Jean Louis, 4,076,224, Cl. 266-275.000.
Foster, Gordon F.; Meissner, Helmuth E.; and Stiles, Janice L., to Corning Glass Works. Catalyst systems for the reduction of the oxides of nitrogen. 4,076,792, Cl. 423-213.500.
Foster Wheeler Energy Corporation: *See—*
Friedrich, Jan L.; and Davies, Ronald L., 4,075,978, Cl. 122-33.000.
Franck, Klaus: *See—*
Slabon, Siegfried; and Franck, Klaus, 4,076,308, Cl. 297-313.000.
Frank, Dudley B.: *See—*
Garabedian, Arthur, 4,076,003, Cl. 123-198.00F.
Franklin Electric Subsidiaries, Inc.: *See—*
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Holt, Ronald; and Smith, Daniel J., 4,075,816, Cl. 53-74.000.
Fraser, Grover: *See—*
Moody, Harold W., Jr.; Bulkley, Clifford T.; Gagnon, Joseph A. L. N.; and Fraser, Grover, 4,076,461, Cl. 417-310.000.
Frazier, James L., to Houdaille Industries, Inc. Tool orienting and release mechanism for machine tool. 4,075,927, Cl. 90-11.00D.
Frederick, Leonard L. Hydraulic pile driving apparatus and method. 4,075,858, Cl. 61-53.500.
Freed, Meier E.; and Potoski, John R., to American Home Products Corporation. 1,3-Bridged amino tetralins. 4,076,953, Cl. 560-142.000.
Freshcorn, Ivan Gene, to United Aircraft Products, Inc. Pre-blistering of braze joints. 4,076,164, Cl. 228-103.000.
Frey, Harry Robert: *See—*
Gross, Harvey Andrew; Frey, Harry Robert; Messner, John David; and Walters, Raymond Frederick, 4,076,426, Cl. 356-239.000.
Freyberg, Peter; Horn, Dieter; Oppenlaender, Knut; Wolf, Hans; and Distler, Dieter, to BASF Aktiengesellschaft. Continuous dyeing of polyester fibers and cellulose fibers. 4,076,497, Cl. 8-21.00C.
Freyermuth, William J., to General Motors Corporation. Variable speed friction transmission. 4,075,901, Cl. 74-226.000.
Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Sedlacek, Hugo; and Sedlacek, Gerhard, 4,075,727, Cl. 14-14.000.
Friedman, Frank: *See—*
Burton, Lawrence; and Friedman, Frank, 4,076,701, Cl. 260-112.00B.
Friedrich, Jan L.; and Davies, Ronald L., to Foster Wheeler Energy Corporation. Apparatus for heating a contaminated feedwater for steam flooding. 4,075,978, Cl. 122-33.000.
Friedrichs, Dieter. Mesh weave filter. 4,076,627, Cl. 210-499.000.
Frigitemp: *See—*
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Frisch, Paul P., to Dayco Corporation. Valve construction. 4,076,035, Cl. 137-601.000.
Fritz, Heinz Peter; Besenhardt, Jurgen; and Rauschenbach, Gerhard, to Rheinisch-Westfalisches Elektrizitatswerk AG. High-temperature method of operating a lead-acid cell. 4,076,901, Cl. 429-50.000.
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Igarashi, Shunkichi; Okano, Takeshi; Takahama, Sho; and Hakamata, Yoshio, 4,076,412, Cl. 355-28.000.
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Noguchi, Yasuhiro; Sekikawa, Nobuyoshi; Sashihara, Kenji; and Masuda, Takao, 4,076,534, Cl. 96-63.000.
Oishi, Kengo; and Suzuki, Osamu, 4,076,186, Cl. 242-199.000.
Ota, Satoshi; Nakamura, Kotaro; Sakai, Nobuo; Furutachi, Nobuo; and Yokota, Yukio, 4,076,533, Cl. 96-56.500.
Takeda, Keiji; Matsumoto, Kenji; Tamura, Hiroshi; Nagata, Masayoshi; and Tsuboi, Masayoshi, 4,076,530, Cl. 96-29.00R.
Tsuboi, Masayoshi, 4,076,537, Cl. 96-88.000.
Tsuji, Nobuo; Ishige, Sadao; Miyamoto, Akio; and Kato, Hajime, 4,076,887, Cl. 428-307.000.

Yamada, Yasuyuki; Akashi, Goro; and Ogawa, Hiroshi, 4,076,890, Cl. 428-337.000.
Fujie, Seijiro; Yokoyama, Susumu, deceased; and by Yokoyama, Toshikazu, administrator, to Pioneer Electronic Corporation. Pilot signal cancelling circuit for FM multiplex demodulator. 4,076,963, Cl. 179-15.0BT.
Fujieda, Hiroshi: *See—*
Machara, Naoyoshi; Fujieda, Hiroshi; and Saka, Tatsuo, 4,076,996, Cl. 315-106.000.
Fujikawa, Yasuo: *See—*
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Fujimoto, Osamu: *See—*
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Fujishiro, Takeshi; and Kita, Toru, to Nissan Motor Company, Limited. Oxygen sensor. 4,076,608, Cl. 204-195.00S.
Fukuda, Makoto: *See—*
Murayama, Naohiro; Nakamura, Kenichi; Fukuda, Makoto; Sakagami, Teruo; and Suzuki, Shirou, 4,076,604, Cl. 204-98.000.
Fukushima, Yutaka: *See—*
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Fukuyama, Yoshiya: *See—*
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Fulghum, Donald P., to E-Systems, Inc. Signal synthesizer spectrum contour scaler. 4,076,958, Cl. 179-1.50A.
Fulton, Alan William: *See—*
Agraz-Guerena, Jorge; and Fulton, Alan William, 4,076,556, Cl. 148-1.500.
Fulton, Robert C.; Edmunds, Donald L.; and Shields, George B., to PPG Industries, Inc. Method of operating a glass sheet tempering line. 4,076,511, Cl. 65-27.000.
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Furey, Richard F.: *See—*
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Furukawa, Hiroshi: *See—*
Komine, Yoshio; Furukawa, Hiroshi; Takahashi, Kiyoshi; Takigawa, Tomoshi; Ogiso, Mitsutoshi; and Ichiyanagi, Toshikazu, 4,076,396, Cl. 352-29.000.
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Ota, Satoshi; Nakamura, Kotaro; Sakai, Nobuo; Furutachi, Nobuo; and Yokota, Yukio, 4,076,533, Cl. 96-56.500.
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Gagnon, Joseph A. L. N.: *See—*
Moody, Harold W., Jr.; Bulkley, Clifford T.; Gagnon, Joseph A. L. N.; and Fraser, Grover, 4,076,461, Cl. 417-310.000.
Gaines, Donald R.; Smallegan, Jon M.; and Trudeau, William H., to Gulf & Western Manufacturing Company. Bearing assembly for a ball and socket joint. 4,076,344, Cl. 308-72.000.
Galbraith, Charles L., to Ortho Pharmaceutical Corporation. Visual communications system. 4,076,398, Cl. 353-69.000.
Galiana, Antonio Bou. Ground-fault circuit interrupter. 4,077,056, Cl. 361-50.000.
Gallo, Mario, to Wirth, Gallo and Company. Mass and force meter. 4,075,887, Cl. 73-141.00R.
Gallo, Mario; and Wirth, Johannes, to Wirth, Gallo and Company. Balance with a digital and an analogue display. 4,076,088, Cl. 177-210.00R.
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Zabotin, Alexandr Alexandrovich; Loschilin, Evgeny Dmitrievich; Onikov, Eduard Arshakovich; Galperin, Alexandr Lvovich; Santucci, Nicola; and Corain, Luciano, 4,076,051, Cl. 139-436.000.
Ganci, James Barry; and Mastrangelo, Sebastian V. R., to Du Pont de Nemours, E. I., and Company. Elastic resistor compositions containing metallic-conductive particles and conductive lubricant particles. 4,076,652, Cl. 252-504.000.
Ganguly, Ashit K.; Peets, Edwin A.; and Saksena, Anil K., to Schering Corporation. Triazolo [4,5-d]-pyrimidines. 4,076,711, Cl. 260-256.40F.
Garabedian, Arthur, to Frank, Dudley B. Split engine vacuum control fuel metering system. 4,076,003, Cl. 123-198.00F.
Gardner-Denver Company: *See—*
Hisey, Robert W., 4,076,338, Cl. 308-4.00R.
Gardner, Frederick Basil, to Simon-Hartley Limited. Penstocks. 4,075,851, Cl. 61-22.00A.
Gardner, Kenneth L., to Kennedy Van Saun Corporation. Apparatus for cooling particulate material. 4,076,493, Cl. 432-77.000.
Garg, Vijay K.: *See—*
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Garrett Corporation, The: *See—*
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Richardson, Neil Ray, 4,075,849, Cl. 60-602.000.
Tree, Dennis Jack; and Tovey, F. Michael, 4,076,456, Cl. 416-241.00B.
Garrett, Deloris. Mobile home telephone stake. 4,076,198, Cl. 248-49.000.
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Mar, John; Garrett, Todd; and Jacques, Petrus, 4,075,725, Cl. 9-8.00R.
Garzia, Aldo; Ferrari, William; and Bottazzi, Andrea, to Istituto Chemioterapico Italiano, S.p.A. Quinoxaline compound and composition, process for preparing compound, and method of combatting cholera therewith. 4,076,815, Cl. 424-251.000.
Gas-Fired Products, Inc.: *See—*
MacIntosh, Frank W., 4,076,059, Cl. 141-390.000.
Gates, Louis E., Jr., to Hughes Aircraft Company. Package for hermetically sealing electronic circuits. 4,076,955, Cl. 174-52.0FP.
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Platakis, Nicolaos S.; and Gatos, Harry C., 4,076,866, Cl. 427-250.000.
Gaulliard, Jean-Michel: *See—*
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Gault, Robert H., to Bethlehem Steel Corporation. Longstroke pumping apparatus for oil wells. 4,076,218, Cl. 254-178.000.
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Berlin, Alfred Anisimovich; Brikenshtein, Khaim-Mordkhe Aronovich; Gavrjushenko, Nikolai Sviridovich; Dubovitsky, Fedor Ivanovich; Kefeli, Tamara Yakovlevna; Kronman, Raisa Vasilievna; Konkhina, Ljudmila Alexeevna; Marshavina, Natalya Lvovna; Popova, Galina Leonidovna; Radugina, Anna Alexandrovna; Sivergin, Jury Mikhailovich; Sumin, Iosif Grigorievich; Tvorogov, Nikolai Nikandrovich; Shilova, Galina Pavlovna; and Kardashov, David Alexeevich, 4,076,742, Cl. 260-47.0UA.
Geary, Joseph E.; Pelensky, Joseph; and Hart, John Peter, to Champion Products Inc. Apparatus for applying flock to a substrate. 4,075,973, Cl. 118-7.000.
Gee, Edwin, to Technitron, Inc. Current control device and method. 4,076,974, Cl. 219-108.000.
Geisthoff, Hubert, to Jean Walterscheid GmbH. Telescoping torque transmitting shaft. 4,075,872, Cl. 64-23.700.
Geisthoff, Hubert, to Jean Walterscheid GmbH. Free-wheeling overload coupling. 4,075,873, Cl. 64-29.000.
Geller, Rodger E.; Smith, Stanley E.; and Wilson, Wayne A., to General Motors Corporation. Method of forming an embossed and coated design on the surface of a formable plastic sheet. 4,076,789, Cl. 264-259.000.
General Cable Corporation: *See—*
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General Dynamics Corporation: *See—*
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General Electric Company: *See—*
Byrnes, Joseph Edward, 4,076,441, Cl. 407-64.000.
Calkins, Thornton Ross, 4,076,686, Cl. 260-45.80A.
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Datta, Ranajit K., 4,076,991, Cl. 313-220.000.
Dochterman, Richard W., 4,076,197, Cl. 248-15.000.
Edwards, Clarence Roy; and Fickes, Ellwood Donald, 4,076,999, Cl. 318-465.000.
Glover, Gary H., 4,075,883, Cl. 73-620.000.
Jenne, Frank, Jr.; and Tarnay, Denes, 4,076,143, Cl. 220-2.10R.
McVey, Charles I., 4,076,898, Cl. 428-553.000.
Sargisson, Donald Farley, 4,075,833, Cl. 60-262.000.
Schrader, Paul D., 4,075,864, Cl. 62-180.000.
Schroeter, Siegfried H.; Bolon, Donald A.; and Lucas, Gary M., 4,076,489, Cl. 431-94.000.
Zavitsanos, Peter D.; West, Martin M.; and Browne, William G., 4,076,563, Cl. 149-37.000.
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General Foods Corporation: *See—*
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Zeitlin, Benjamin R.; Pritchard, Alan B.; and Levenson, Harold S., 4,076,856, Cl. 426-594.000.
General Mills, Inc.: *See—*
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Chatterley, James P., 4,076,264, Cl. 280-81.00A.
Ditto, Edwin D.; and Abu Akeel, A. Hadi Kobaisi, 4,076,296, Cl. 293-71.00R.
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Ditto, Edwin D., 4,076,788, Cl. 264-255.000.
Ervin, William W.; and Fleck, Lee A., 4,076,787, Cl. 264-250.000.
Freyermuth, William J., 4,075,901, Cl. 74-226.000.
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Lee, Robert W.; and Croat, John J., 4,076,561, Cl. 148-103.000.
Marta, Henry A.; Mels, Kenneth D.; Garg, Vijay K.; and Miller, Albert J., 4,075,950, Cl. 105-197.00A.

Moody, Warren L.; and Baugh, Edward D., 4,076,094, Cl. 180-108.000.
Schaefer, Robert H., 4,075,912, Cl. 74-867.000.
Short, William T., 4,076,774, Cl. 264-4.000.
Taylor, David W.; and Peterson, Philip R., 4,076,332, Cl. 303-97.000.
Watson, Richard D., 4,076,989, Cl. 310-89.000.
Williamitis, Victor A., 4,075,866, Cl. 62-274.000.
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General Scanning, Inc.: *See—*
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General Signal Corporation: *See—*
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Carlson, William L., Jr., 4,075,898, Cl. 74-89.150.
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General Tire & Rubber Company, The: *See—*
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Genini, Graziano, to Albatex A.G. Means guiding the straps of the weft carrying grippers inside the shed. 4,076,053, Cl. 139-449.000.

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Gergoe, Bela, to General Motors Corporation. Vehicle tailgate. 4,076,301, Cl. 296-50.000.

Germain, Robert A., to True Temper Corporation. Battery operated shears. 4,075,760, Cl. 30-220.000.

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Geschwender, Robert C., to Lancaster Research and Development Corporation. Mastic composition and composite structural panels formed therefrom. 4,076,880, Cl. 428-116.000.

Gettleman, Ronald L.; and Stoner, Peter D., to Gettleman-Stoner, Inc. Mobile beverage dispensing cart. 4,076,349, Cl. 312-236.000.

Gettleman-Stoner, Inc.: *See—*
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Gewerkschaft Eisenhutte Westfalia: *See—*
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Gibson Chemicals International Pty. Limited: *See—*
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Gibson, Harry W.; Bailey, Frank C.; and Mincer, Joseph L., to Xerox Corporation. Tribo modified carrier materials via acylation. 4,076,893, Cl. 428-407.000.

Gidlof, Karl Gunnar: *See—*
Almer, Bengt Onnert; and Gidlof, Karl Gunnar, 4,076,205, Cl. 248-524.000.

Gieske, Edward T., Jr. Apparatus for baling compressible material. 4,075,817, Cl. 53-124.00A.

Giglia, Robert Domenico, to American Cyanamid Company. Segmented electrochromic display general. 4,076,386, Cl. 350-357.000.

Gilbert, William F.; Schertz, Burtron D.; and Wilkinson, Lester, to General Motors Corporation. Volume, tone and balance control for multi-channel audio systems. 4,076,959, Cl. 179-1.00D.

Gill, Michael L., to Goodyear Tire & Rubber Company, The. Elastic wheel well filler. 4,076,067, Cl. 152-381.600.

Gilmour, Richard C. Multipurpose display rack. 4,076,126, Cl. 211-59.100.

Gilson, Verle A.; Schriever, Richard L.; and Shearer, James W., to United States of America, Energy. Ultraviolet radiation induced discharge laser. 4,077,017, Cl. 331-94.5PE.

Giovanelli, Anton Alfred Arthur; and Schmidt, Eckhard Wolfgang, to Imperial Chemical Industries Limited. Tack spun pile surfaced products. 4,076,874, Cl. 428-35.000.

Girard, Leon E.: *See—*
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Girling Limited: *See—*
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GKN Sankey Limited: *See—*
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Glacier Metal Company Limited, The: *See—*
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Gladstone, Shaul; and Neumoyer, Clifton R., to Argus Chemical Corporation. Cellulose thiocyanate and process for preparing the same. 4,076,918, Cl. 536-59.000.

Glaise, Rene: *See—*
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Glaser, Harold, to James David Incorporated. Corner construction. 4,076,432, Cl. 403-176.000.

Glaser, Herbert: *See—*
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Glaxo Laboratories Limited: *See—*
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Walker, Derek; and Chapman, Philip Howard, 4,076,913, Cl. 526-19.000.

Gleckler, George C.: *See—*
Casey, Donald J.; and Gleckler, George C., 4,076,798, Cl. 424-22.000.

Global Marine, Inc.: *See—*
Sjogren, Charles Norman, 4,075,964, Cl. 114-40.000.

Glover, Gary H., to General Electric Company. Ultrasonic fan beam scanner for computerized time-of-flight tomography. 4,075,883, Cl. 73-620.000.

Go, Santos W., to Owens-Illinois, Inc. Terephthalic acid/p,p-sulfonyldibenzoic acid/ethylene glycol/neopentyl glycol polyester compositions and containers made therefrom. 4,076,693, Cl. 260-75.00S.

Godfrey, Darryl A., to Eastman Kodak Company. Hot-melt adhesives having improved properties at elevated temperatures. 4,076,670, Cl. 260-27.00R.

Goff, Mark D., to GRS Instruments, Inc. Self-contained miniature timer. 4,075,829, Cl. 58-152.00T.

Golden, Martin P.; and Govi, Aldo R., to United States of America, Energy. Rodded shutdown system for a nuclear reactor. 4,076,584, Cl. 176-36.00R.

Golston, Stefan, to Kamyr, Inc. Continuous oscillation of liquid separator. 4,076,623, Cl. 210-77.000.

Goodfellow, Anthony Gerald, to Dunlop Limited. Manufacture of moulded articles. 4,076,565, Cl. 156-125.000.

Goodyear Aerospace Corporation: *See—*
Bermingham, Peter D.; and Chin, Robert W., 4,076,106, Cl. 188-250.00G.

Goodyear Tire & Rubber Company, The: *See—*
Gill, Michael L., 4,076,067, Cl. 152-381.600.
Watts, William A., 4,076,769, Cl. 260-893.000.

Goos, Heinz: *See—*
Rosenkranz, Otto; Goos, Heinz; and Seifert, Karl-Heinrich, 4,076,071, Cl. 165-2.000.

Gordy, Robert S.: *See—*
Sanders, David E.; Chambers, Ramon P.; and Gordy, Robert S., 4,077,016, Cl. 331-4.000.

Goshi Kaisha Mizuno Kogeisha: *See—*
Mizuno, Akira, 4,076,093, Cl. 180-82.00R.

Goto, Kenji; and Tate, Takao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine having an auxiliary combustion chamber without an intake valve. 4,076,000. Cl. 123-191.00S.

Gottermeier, William F., to Eastman Kodak Company. Thermosensitive image-forming element and method of processing thereof. 4,076,532, Cl. 96-48.0HD.

Gould Inc.: *See—*
Subramanyan, Palliyil K.; Makowski, Mieczyslaw Paul; and Setele, Robert Joseph, 4,076,597, Cl. 204-13.000.

Goulet, Guy; and Goulet, John. Marble game with retractable playing surface. 4,076,248, Cl. 273-123.00R.

Goulet, John: *See—*
Goulet, Guy; and Goulet, John, 4,076,248, Cl. 273-123.00R.

Govi, Aldo R.: *See—*
Golden, Martin P.; and Govi, Aldo R., 4,076,584, Cl. 176-36.00R.

Granath, Alf: *See—*
Granath, Einar; and Granath, Alf, 4,076,447, Cl. 415-2.000.

Granath, Einar; and Granath, Alf. Water-power motor. 4,076,447, Cl. 415-2.000.

Grande, Edvard. Coupler device. 4,076,163, Cl. 228-56.000.

Grandview Industries Limited: *See—*
Hacke, Gerhard A., 4,076,477, Cl. 425-192.00R.

Granges Essem Aktiebolag: *See—*
Thyberger, Filip Bertil; and Lindstrom, Kurt Olle Ragnvald, 4,075,861, Cl. 61-105.000.

Graubin, Yanis Ekabovich: *See—*
Ioffe, Benyamin Alexandrovich; Kalnin, Robert Karlovich; Zommer, Jury Arvidovich; Graubin, Yanis Ekabovich; Davydenko, Eduard Prokofievich; and Kern, Ivan Ivanovich, 4,077,027, Cl. 335-219.000.

Gray, Thomas J., to Olin Corporation. Electrode with lanthanum-containing perovskite surface. 4,076,611, Cl. 204-290.00F.

Green, Harold A.: *See—*
Kaplan, Saul; Merianos, John J.; Green, Harold A.; and Petrocci, Alfonso N., 4,076,744, Cl. 260-501.190.

Green, Michael J.; Shue, Ho-Jane; Shapiro, Elliot L.; and Gentles, Margaret A., to Schering Corporation. Process for the preparation of 7α-halogeno-3-oxo-4-dehydro steroids and novel 7α-halogeno derivatives produced thereby. 4,076,708, Cl. 260-239.570.

Greeninger, Carroll D. Fireplace wood cutting machine. 4,076,061, Cl. 144-3.00K.

Greenview Manufacturing Company: *See—*
Siemund, Herbert A., 4,075,730, Cl. 15-245.000.

Greeson, Richard L.; and Philofsky, Elliott M., to Motorola, Inc. Metallization system for semiconductive devices, devices utilizing such metallization system and method for making devices and metallization system. 4,077,045, Cl. 357-71.000.

Greis, Ulrich: *See—*
Deml, Reinhold; Greis, Ulrich; Hofmann, Wilfried; and Rauffer, Walter, 4,076,384, Cl. 350-122.000.

Gresen Manufacturing Company: *See—*
Stephens, William T., 4,075,933, Cl. 91-506.000.

Gribkova, Pelageya Nikolaevna: *See—*
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Krasnov, Alexandr Petrovich; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradova, Olga Vladimirovna; Mamatsashvili, Georgy Viktorovich; Pavlova, Saga-Silviya Alexandrovna; Gribkova, Pelageya Nikolaevna; Bekasova, Nina Ivanovna; Komarova, Ljudmila Grigorievna; Vorobiev, Vladimir Dmitrievich; Vlasova, Irina Vladimirovna; and Vinogradov, Alexandr Vasilievich, 4,076,634, Cl. 252-12.000.

Gribova, Irina Alexandrovna: *See—*
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Krasnov, Alexandr Petrovich; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradova, Olga Vladimirovna; Mamatsashvili, Georgy Viktorovich; Pavlova, Saga-Silviya Alexandrovna; Gribkova, Pelageya Nikolaevna; Bekasova, Nina Ivanovna; Komarova, Ljudmila Grigorievna; Vorobiev, Vladimir Dmitrievich; Vlasova, Irina Vladimirovna; and Vinogradov, Alexandr Vasilievich, 4,076,634, Cl. 252-12.000.

Griffin, Edward R. Auxiliary water system for outboard motor. 4,075,969, Cl. 115-17.000.

Griffin, James F.: *See—*
Morez, Gene S.; and Griffin, James F., 4,077,013, Cl. 330-267.000.

Grilli, Victor John: *See—*
Chulay, Steven John; and Grilli, Victor John, 4,076,170, Cl. 233-26.000.

Grimaud, Edouard; and Koeppel, Robert, to Produits Chimiques Ugine Kuhlmann. Alkali salts of a sulphonated styrene polymer or copolymer as fluidizing agents and a process for preparing the same. 4,076,699, Cl. 260-79.50C.

Groger, Rolf, to August Thyssen-Hutte AG. Use of an acid-resisting cement for the protection against corrosion of steel surfaces exposed to hot gases. 4,076,221, Cl. 266-44.000.

Grognet, Jean-Claude: *See—*
Papantoniou, Christos; and Grognet, Jean-Claude, 4,076,912, Cl. 526-16.000.

Gromov, Jury Vasilievich; Leonov, Boris Ivanovich; Smirnov, Oleg Petrovich; Smirnov, Nikolai Nikolaevich; Nagornaya, Ljudmila Lavrentievna; and Zakharin, Yakov Abramovich. Introscope. 4,076,984, Cl. 250-367.000.

Gropper, Hans: *See—*
Urban, Friedrich; Buechner, Oskar; Hartig, Ulrich; and Gropper, Hans, 4,076,919, Cl. 526-64.000.

Gross, Harvey Andrew; Frey, Harry Robert; Messner, John David; and Walters, Raymond Frederick, to RCA Corporation. Method for inspecting cathode-ray-tube window for objectionable cord. 4,076,426, Cl. 356-239.000.

Gross, James R., to Dow Chemical Company, The. Substantially dry water swellable particulate polyelectrolyte. 4,076,928, Cl. 526-240.000.

Gross, Marvin H.; and Kolb, Alfred, to Transparent Glass Coatings Co., Inc. Burglar-proof window and like panes of glass. 4,075,802, Cl. 52-203.000.

Gross, William Joseph: *See—*
Landsinger, Edmund Emil; Chang, Richard Shih-Teng; and Gross, William Joseph, 4,075,771, Cl. 35-31.00R.

Grossman, Harold, to Montclair Research Corporation. Filter and cigarette including a filter. 4,076,031, Cl. 131-261.00A.

GRS Instruments, Inc.: *See—*
Goff, Mark D., 4,075,829, Cl. 58-152.00T.

Grubbs, Jerry A. Directional antenna azimuth control system. 4,077,000, Cl. 318-604.000.

Grumman Aerospace Corporation: *See—*
Chen, Schoen-nan, 4,076,904, Cl. 429-111.000.

GTE Sylvania Incorporated: *See—*
Fahlen, Theodore S.; and Kirk, Russell F., 4,077,018, Cl. 331-94.5PE.
Hall, Harold H., Jr., 4,076,488, Cl. 431-93.000.

Gueldner, Howard C. Mechanical decoupler. 4,076,435, Cl. 403-322.000.

Guild, Charles L. Composite pile and tapered concrete tip therefor. 4,075,859, Cl. 61-53.000.

Gulbenk, Alin H., to Dow Chemical Company, The. Substituted pyridinyl methoxy (or 1-methyl methoxy)benzeneamines. 4,076,719, Cl. 260-296.00R.

Gulf Oil Corporation: *See—*
Boehme, Robert Emerson; and Murphy, Clarence Rhodes, 4,076,681, Cl. 260-33.6PQ.

Gulf & Western Manufacturing Company: *See—*
Gaines, Donald R.; Smallegan, Jon M.; and Trudeau, William H., 4,076,344, Cl. 308-72.000.

Gulton Industries, Inc.: *See—*
Campbell, Robert F., 4,076,361, Cl. 339-75.00M.

Gundlach, Robert W.: *See—*
Bean, Lloyd F.; and Gundlach, Robert W., 4,076,528, Cl. 96-105.00R.

Gundlach, Theodore F.; and Hawthorne, Arthur L., to Rexnord, Inc. Dust abatement device and method of dust abatement. 4,076,315, Cl. 299-64.000.

Gusching, Nagle V.; and Kuck, Kermit T., to Monarch Machine Tool Company, The. Plural slide machine. 4,075,753, Cl. 29-568.000.

Gutman, David. Pedestrian contact guard. 4,076,295, Cl. 293-71.00R.

Gvinepadze, Alexei Davidovich: *See—*
Vitaliev, Georgy Viktorovich; Gvinepadze, Alexei Davidovich; Smirnov, Rem Vasilievich; and Sofiisky, Gury Dmitrievich, 4,077,029, Cl. 365-49.000.

H & G Industries, Inc.: *See—*
Mazzolla, Richard, 4,076,437, Cl. 403-350.000.

Haas, Georges; and Rossi, Alberto, to Ciba-Geigy Corporation. Certain pyridyl methanones and pharmaceutical compositions containing same. 4,076,822, Cl. 424-263.000.

Haas, Werner E. L.; and Dir, Gary A., to Xerox Corporation. Magnetic display. 4,076,387, Cl. 350-362.000.

Haas, Werner E. L.: *See—*
Keezer, Richard C.; and Haas, Werner E. L., 4,076,858, Cl. 427-19.000.

Haberle, Friedrich: *See—*
Kress, Dieter; and Haberle, Friedrich, 4,076,445, Cl. 408-226.000.

Hacke, Gerhard A., to Grandview Industries Limited. Multiple extrusion apparatus. 4,076,477, Cl. 425-192.00R.

Hackstein, Karl-Gerhard; Hrovat, Milan; and Wolff, Willi, to Nuken G.m.b.H. Block fuel elements for high temperature power reactors. 4,076,775, Cl. 264-0.500.

Haddad, Daniel G. Hockey stick. 4,076,240, Cl. 273-67.00A.

Hagenbach, Robert J.: *See—*
Forgensi, Rudolph; and Hagenbach, Robert J., 4,076,640, Cl. 252-62.10R.

Hager, C. Bradley: *See—*
Dugle, James B.; and Hager, C. Bradley, 4,076,502, Cl. 23-230.00R.

Haggerty, William Andrew: *See—*
Cox, Joseph Henry, Jr.; and Haggerty, William Andrew, 4,076,442, Cl. 408-8.000.

Hague, David P.; Malkani, Dalip T.; Middlemiss, Andrew; and Scholey, Stuart, to British Steel Corporation. Manufacture of metal strip. 4,075,747, Cl. 29-18.000.

Haigh, Harold Edward; and Hofmann, Dietrich Adolf, to Tioxide Group Limited. Supported vessel and means for support thereof. 4,076,200, Cl. 248-146.000.

Haight, Nicholas; and Madsen, Trygve T., to Eastern Cyclone Industries, Inc. Electronic control system for operating a pneumatic trash linen conveying network. 4,076,321, Cl. 302-27.000.

Hakamata, Yoshio: *See—*
Igarashi, Shunkichi; Okano, Takeshi; Takahama, Sho; and Hakamata, Yoshio, 4,076,412, Cl. 355-28.000.

Hale, Peter: *See—*
Marsh, Robert Anthony; Mackie, Gordon John; and Hale, Peter, 4,076,800, Cl. 424-70.000.

Hall, Charles O., to Plummer, Sherman R.; and Porter, Randall, part interest to each. Tennis teaching aid. 4,076,239, Cl. 273-29.00A.

Hall, Harold H., Jr., to GTE Sylvania Incorporated. Selective firing mechanism for array of percussive flashlamps. 4,076,488, Cl. 431-93.000.

Hall, James F.: *See—*
Carver, Herbert K., Jr.; Chant, Albert H.; Hall, James F.; Hansen, Omar, Jr.; and Lord, John G., 4,075,815, Cl. 53-32.000.

Hall, John B.: *See—*
Light, Kenneth K.; Sanders, James Milton; Vock, Manfred Hugo; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja Dulal; Tseng, Ching Y.; and Sprecker, Mark A., 4,076,853, Cl. 426-538.000.

Hall, Stanley Darwin, to W. R. Grace & Co. Package of bags. 4,076,122, Cl. 206-460.000.

Haller, George S.; and Uphoff, Theodore C. Apparatus for lifting a manhole cover. 4,076,217, Cl. 254-131.000.

Halliburton Company: *See—*
Nix, George J.; Barrington, Burchus Q.; Farley, David L.; and Hortman, Norman G., 4,076,077, Cl. 166-315.000.

Halm Instrument Co., Inc.: *See—*
Harrison, Henry, 4,076,076, Cl. 165-171.000.

Halopoff, William. Attachment for garage door spring. 4,076,433, Cl. 403-213.000.

Halpern, William. Cutting tool assembly. 4,076,443, Cl. 408-191.000.

Hamaguchi, Hiroshi; and Miyata, Shin, to Minolta Camera Kabushiki Kaisha. Belt type sensitive member unit. 4,076,409, Cl. 355-16.000.

Hamano, Tadashi, to Kabushiki Kaisha Daini Seikosha. Coloring method for synthetic resin. 4,076,496, Cl. 8-4.000.

Hamasaki, Toshio: *See—*
Tsuda, Yoshinao; Arita, Masafumi; Hamasaki, Toshio; Tsumagari, Tatsumi; and Kenjo, Takenori, 4,076,821, Cl. 424-263.000.

Hamilton, Willard C.: *See—*
Scouten, Charles G.; and Hamilton, Willard C., 4,076,641, Cl. 252-62.10P.

Hamma, Karlmann; and Holdenried, Willy, to Zahnradfabrik Friedrichshafen AG. Control system for hydrostatic transmission. 4,075,841, Cl. 60-444.000.

Hammann, Ingeborg: *See—*
Lorenz, Walter; and Hammann, Ingeborg, 4,076,808, Cl. 424-211.000.
Lorenz, Walter, deceased; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 4,076,806, Cl. 424-200.000.

Hammer, Jacob Meyer, to United States of America, Navy. On line electro-optic modulator. 4,076,381, Cl. 350-96.140.

Hammer, Richard Benjamin; Turbak, Albin Frank; Portnoy, Norman A.; and West, Arthur C., to International Telephone and Telegraph Corporation. Process for producing regenerated cellulosic articles. 4,076,932, Cl. 536-30.000.

Hammer, Richard Benjamin: *See—*
Turbak, Albin Frank; Hammer, Richard Benjamin; Portnoy, Norman A.; and West, Arthur C., 4,076,933, Cl. 536-30.000.

Hanaoka, Masanori, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas purifying system for an internal combustion engine. 4,075,837, Cl. 60-282.000.

Hancor, Inc.: *See—*
Alpers, Robert J.; Crates, Fredrick J.; Ott, Denis P.; and Schmunk, John D., 4,076,040, Cl. 137-371.000.

Handy, Richard L.; Girard, Leon E.; Roorda, Bruce R.; and Pitt, John M., to Iowa State University Research Foundation, Inc. Rock borehole shear tester. 4,075,885, Cl. 73-88.00E.

Hannebaum, Harold W., to Raymond Lee Organization, Inc., The, a part interest. Fireplace. 4,076,009, Cl. 126-120.000.

Hansen, John H., to Delong Corporation. Mobile ship loading and unloading facility. 4,075,860, Cl. 61-87.000.

Hansen, Omar, Jr.: *See—*
Carver, Herbert K., Jr.; Chant, Albert H.; Hall, James F.; Hansen, Omar, Jr.; and Lord, John G., 4,075,815, Cl. 53-32.000.

Hanzelka, Lubomir; Vidlar, Josef; and Neuman, Ladislav, to Tatra, narodni podnik. Vehicle side wall and method of making same. 4,076,298, Cl. 296-28.00R.

Hara, Kunihiko: *See—*
Yamawaki, Masao; Aoki, Katsuo; Ina, Osamu; Suzuki, Takao; Oka, Yoshio; and Hara, Kunihiko, 4,075,972, Cl. 118-6.000.

Harada, Masato: *See—*
Satoh, Akihiro; Takahashi, Akio; Masuda, Jun; Harada, Masato; and Yamada, Sadahiko, 4,076,922, Cl. 526-97.000.

Harada, Tetsuya; and Yumoto, Tunemasa, to Japan Synthetic Rubber Co., Ltd. Process for recovering high purity fatty acids and/or rosin acid and sterols. 4,076,700, Cl. 260-97.600.

Haralampiev, Georgi Alexandrov: *See—*
Jordanov, Jordan Todorov; Abrashev, Georgi Ivanov; Jekov, Velyu Dimitrov; Georgiev, Georgi Taney; Haralampiev, Georgi Alexandrov; Janev, Janco Hristov; and Prodanov, Velcho Angelov, 4,076,521, Cl. 75-24.000.

Harbison, William H.; Mohnach, Michael G.; and Plisky, John J., to Anderson Company, The. Windshield wiper refill unit. 4,075,731, Cl. 15-250.420.

Hardison, Leslie C., to Air Resources, Inc. Chelate oxidation of hydrogen sulfide in sour water. 4,076,621, Cl. 210-60.000.

Hardouin, Jean Claude Henri Raoul; and Vallette, Maurice Rene Jean, to Produits Chimiques Ugine Kuhlmann. Indanthrene dyes. 4,076,713, Cl. 260-263.000.

Hargraves, William J. Nozzle flush system. 4,075,718, Cl. 4-300.000.

Hargreaves, James Roger: *See—*
Harris, Arthur; Burrows, John; and Hargreaves, James Roger, 4,076,501, Cl. 21-2.70A.

Harper, Bobby R., to Phillips Petroleum Company. Amorphous polypropylene in hydrogenated rubbery block copolymers. 4,076,669, Cl. 260-23.70R.

Harrington, Joseph Kenneth; Kvam, Donald C.; Mendel, Arthur; and Robertson, Jerry E., to Minnesota Mining and Manufacturing Company. N-substituted perfluoroalkanesulfonamides as herbicides. 4,076,519, Cl. 71-103.000.

Harris, Arthur; Burrows, John; and Hargreaves, James Roger, to Ciba-Geigy Corporation. Corrosion inhibition of water systems with phosphonic acids. 4,076,501, Cl. 21-2.70A.

Harris Corporation: *See—*
Cook, Koy B., Jr., 4,075,754, Cl. 29-571.000.

Harris, William Donald, to Burlington Industries, Inc. Injury protection device for machinery. 4,075,961, Cl. 112-277.000.

Harrison, George W. Expansion joint and seal for sewer pipe. 4,076,283, Cl. 285-230.000.

Harrison, Henry, to Halm Instrument Co., Inc. Mechanical heat exchange joint. 4,076,076, Cl. 165-171.000.

Hart, Frederick Leslie, to GKN Sankey Limited. Securing means. 4,076,268, Cl. 280-179.00R.

Hart, John Peter: *See—*
Geary, Joseph E.; Pelensky, Joseph; and Hart, John Peter, 4,075,973, Cl. 118-7.000.

Hart, Maurice Wright, Jr.; and Hart, William Carlo. Process for color and surface stabilization in forming water-extendable polyester resin plastics and the like. 4,076,784, Cl. 264-102.000.

Hart, William Carlo: *See—*
Hart, Maurice Wright, Jr.; and Hart, William Carlo, 4,076,784, Cl. 264-102.000.

Hartig, Ulrich: *See—*
Urban, Friedrich; Buechner, Oskar; Hartig, Ulrich; and Gropper, Hans, 4,076,919, Cl. 526-64.000.

Hartmann, Max, to Brown, Boveri-Sulzer Turbomaschinen AG. Gas turbine plant. 4,076,452, Cl. 415-219.00R.

Hartsock, Robert E. Signal transmission and control system. 4,076,039, Cl. 137-344.000.

Hartwimmer, Robert, to Hoechst Aktiengesellschaft. Process for the preparation of fluorocarbon waxes. 4,076,760, Cl. 260-653.10R.

Haskell, Donald M., to Phillips Petroleum Company. Extractive distillation of C_4 hydrocarbons with an extractant mixture. 4,076,595, Cl. 203-51.000.

Haswell, John N. Postpartum fluid loss receptacle. 4,076,017, Cl. 128-2.00F.

Hatanaka, Takashi: *See—*
Nakashima, Katsutoshi; Kita, Toshio; Osawa, Ryuzo; and Hatanaka, Takashi, 4,076,220, Cl. 366-69.000.

Hattendorf, Henry John. Two-speed video recorder. 4,075,900, Cl. 74-217.00S.

Hattori, Tadashi; Nakase, Takamichi; and Yamaguchi, Hiroaki, to Nippon Soken, Inc. Additional air control device. 4,075,835, Cl. 60-276.000.

Haub, John T.: *See—*
Davis, Noel; Haub, John T.; and Rustad, Stanley C., 4,075,949, Cl. 104-162.000.

Hauberg, Georg Hans Henrik, to Aktieselskabet Niro Atomizer. Centrifugal separator for separating liquid and gas. 4,076,507, Cl. 55-1.000.

Hauck, Frederic Peter; Cimarusti, Christopher M.; and Sundeen, Joseph E., to E. R. Squibb & Sons, Inc. 5,6,7,8-Tetrahydronaphthalene hypotensive agents. 4,076,843, Cl. 424-330.000.

Haude, Friedhelm, to KHD Industrienlagen AG. Device for controlling flow from the discharge end of a tubular ball mill or the like. 4,076,178, Cl. 241-33.000.

Haug, Heinz: *See—*
Brammer, Hartmut; Ehrmann, Karl; Haug, Heinz; Issler, Jorg; Kas, Gunter; Kalippke, Harald; Magdefrau, Herbert; and Schneider, Karl-Heinz, 4,075,752, Cl. 29-434.000.

Haugwitz, Rudiger D.; and Cruthers, Larry R., to E. R. Squibb & Sons, Inc. Method of treating helminthiasis by parenteral or topical administration of sulfoxide derivatives of benzimidazoles. 4,076,825, Cl. 424-273.00R.

Haugwitz, Rudiger D.; and Cruthers, Larry R., to E. R. Squibb & Sons, Inc. Method of treating helminthiasis by parenteral administration of sulfoxide derivatives of benzimidazoles. 4,076,827, Cl. 424-273.00R.

Haugwitz, Rudiger D.; and Cruthers, Larry R., to E. R. Squibb & Sons, Inc. Method of treating helminthiasis by parenteral administration of sulfoxide derivatives of benzimidazoles. 4,076,828, Cl. 424-273.00R.

Hauschopp, Alois; and Breuer, Oswald, to Gewerkschaft Eisenhutte Westfalia. Cutter bit assemblies for coal ploughs. 4,076,318, Cl. 299-91.000.

Hauth, Hartmut: *See—*
Fehr, Theodor; and Hauth, Hartmut, 4,076,715, Cl. 260-285.500.

Hawthorne, Arthur L.: *See—*
Gundlach, Theodore F.; and Hawthorne, Arthur L., 4,076,315, Cl. 299-64.000.

Hayashi, Fujio; and Corbin, Robert W., to Xerox Corporation. Interlocking apparatus for an optical system and reproducing machine. 4,076,417, Cl. 355-60.000.

Hayashi, Yutaka, to Agency of Industrial Science & Technology. Nonvolatile memory semiconductor device. 4,077,044, Cl. 357-23.000.

Hazelet, Glenn John: *See—*
Batha, Howard Dean; and Hazelet, Glenn John, 4,076,692, Cl. 260-59.00R.

Heasley, James H., to Ferro Corporation. Multi-sided retroreflector. 4,076,383, Cl. 350-103.000.

Hechtl, Wolfgang: *See—*
Wohlfarth, Ernst; Hechtl, Wolfgang; Matejcek, Klaus; and Kleinschwarzer, Adolf, 4,076,684, Cl. 260-37.0SB.

Heckele, Helmut, to Richard Wolf GmbH. Endoscopes. 4,076,018, Cl. 128-6.000.

Heckley, Warner M.; and Richards, Gerald F., to Avco Corporation. Crop conditioner roll structure. 4,075,822, Cl. 56-1.000.

Heden, Carl-Goran. Method in microbiological analysis. 4,076,591, Cl. 195-103.50K.

Hedstrom, Robert E.; and Brown, Edmund W., to UPEC Corporation. Vehicle-top-carrier support means. 4,076,157, Cl. 224-42.10E.

Heet, Gregory S. String instrument vibration initiator and sustainer. 4,075,921, Cl. 84-1.160.

Heidan, Klaus. Apparatus for treating webs of textile goods with hot air or steam. 4,075,875, Cl. 68-5.00D.

Heidenreich & Harbeck Zweigniederlassung der Gildemeister AG: *See—*
Rosenkranz, Otto; Goos, Heinz; and Seifert, Karl-Heinrich, 4,076,071, Cl. 165-2.000.

Heim Universal Inc.: *See—*
McCloskey, Albert R., 4,076,343, Cl. 308-72.000.

Heimbach, Paul: *See—*
Wilke, Gunther; and Heimbach, Paul, 4,076,757, Cl. 260-611.00R.

Heimberger, Helmut, to Optilon W. Erich Heilmann GmbH. Slide-fastener stringer half with knitted-in coupling elements and method of making same. 4,075,874, Cl. 66-192.000.

Heinemann Electric Company: *See—*
Lisnay, Albert D., 4,077,024, Cl. 335-8.000.

Heinemann, Karl-Heinz: *See—*
Cherubim, Martin; Heinemann, Karl-Heinz; and Josten, Friedrich, 4,076,683, Cl. 260-37.00N.

Heinrich Frings, Firma: *See—*
Ebner, Heinrich; and Enenkel, Anton, 4,076,844, Cl. 426-17.000.

Helava, Uuno Vilho, to Bendix Corporation, The. Sensor data input by means of analog to pulse width-to digital converter. 4,077,030, Cl. 340-183.000.

Heller, Robert I.; Schafer, Larry C.; and McCracken, Stephen R., to Westinghouse Electric Corporation. Digital radar control system and method. 4,077,038, Cl. 343-7.00A.

Hendricks, Bobby G.: *See—*
Kiser, Gary L.; and Hendricks, Bobby G., 4,076,754, Cl. 260-603.00C.

Hendriks, Ferdinand, to International Business Machines Corporation. Guard jets in multiple nozzle printing. 4,077,040, Cl. 346-75.000.

Hendry, George O.; Hilton, John L.; and Kim, Jinchoon, to University of Pennsylvania, The Trustees of the. Tube target for fusion neutron generator. 4,076,990, Cl. 313-61.00S.

Hengen, Edward John, to Deere & Company. Harvesting machine feed mechanism. 4,075,824, Cl. 56-14.600.

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Koch, Karlheinz; and Rutzen, Horst, 4,076,743, Cl. 260-501.130.

Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA): *See—*
Kassner, Karl-Heinz, 4,076,661, Cl. 260-17.00R.

Henrion, Michel Andre Robert; and Coudray, Andre Lucien, to International Standard Electric Corporation. Time division system for synchronizing functions controlled by different clocks. 4,076,964, Cl. 179-15.0BS.

Herber, John F.; Richard, William R., Jr.; and Street, Robert W., to Monsanto Company. Novel monoepoxy compounds as acid scavengers in functional fluids. 4,076,642, Cl. 252-78.500.

Herbert, John T.; Kovitch, Frank J.; and Sullivan, Paul E., to Murdock Machine & Engineering Co. Ocean floor riser connection. 4,076,284, Cl. 285-263.000.

Hercofina: *See—*
Millick, William H., III, 4,076,946, Cl. 560-78.000.

Hercules Incorporated: *See—*
Armour, Donald F.; and Olmsted, Bernie A., 4,076,484, Cl. 425-525.000.
Rinard, James Franklin, 4,075,722, Cl. 5-351.000.

Hermann Hemscheidt Maschinenfabrik: *See—*
Klotz, Heinz; and Podszuck, Dietmar, 4,076,279, Cl. 285-26.000.

Herricks, Herman H.; and Easterwood, Richard L., to Shell Oil Company. Full bore fracture treating assembly. 4,076,079, Cl. 166-308.000.

Herrmann, Manfred: *See—*
Vigelius, Wolf-Dieter; Satzinger, Gerhard; and Herrmann, Manfred, 4,076,937, Cl. 544-171.000.

Hestermann, Klaus: *See—*
Lippsmeier, Bernd; and Hestermann, Klaus, 4,076,755 Cl. 260-606.50P.

Hetzel, Eckard; Koehler, Waldemar; Vock, Georg Friedrich; and Bittler, Rolf, to BASF Wyandotte Corporation. Process for the separation of residues of toluenediisocyanate production. 4,076,577, Cl. 159-47.00R.

Hewes, Charles Robert: *See—*
Buss, Dennis D.; and Hewes, Charles Robert, 4,076,960, Cl. 179-1.0SA.

Hexcel Corporation: *See—*
Baron, Seymour, 4,076,649, Cl. 252-440.000.

Hickman, Donald Price, to Inventec International Limited. Workbenches. 4,076,229, Cl. 269-139.000.

Hieronymus, Gerald Whitfield; Sendelweck, Michael Lynn; West, James Everett; and Woods, Joe William, to International Business Machines Corporation. Fast acting two-way valve. 4,076,046, Cl. 137-627.500.

Higo, Yoshiki, to Nippon Electric Company, Ltd. Fault location system for a repeatered PCM transmission system. 4,077,004, Cl. 325-2.000.

Hilker, Gloria D. Fireplace system. 4,076,490, Cl. 431-125.000.

Hill, James H. Archery bow. 4,076,005, Cl. 124-24.00R.

Hill, Richard D., II; and Mastronuzzi, Carl T., Jr. Flying disk. 4,075,781, Cl. 46-74.00D.

Hill, William Frank, to Lucas Electrical Co., Limited. Spark ignition systems for internal combustion engines. 4,075,997, Cl. 123-148.00E.

Hilton, John L.: *See—*
Hendry, George O.; Hilton, John L.; and Kim, Jinchoon, 4,076,990, Cl. 313-61.00S.

Himmelrich, Lew. Utility coat with seating harness. 4,076,101, Cl. 182-3.000.

Hintzen, Peter; and Willenbacher, Erich, to Pfaff Industriemaschinen GmbH. Device for making braid openings in cuts of garments. 4,075,954, Cl. 112-68.000.

Hirai, Kentaro; Ishiba, Teruyuki; Sasakura, Kazuyuki; and Sugimoto, Hirohiko, to Shionogi & Co., Ltd. Dipeptide derivatives and their production. 4,076,702, Cl. 260-112.50R.

Hirai, Kentaro; Ishiba, Teruyuki; Sasakura, Kazuyuki; and Sugimoto, Hirohiko, to Shionogi & Co., Ltd. Dipeptide derivatives and their production. 4,076,703, Cl. 260-112.50R.

Hirai, Kentaro; Ishiba, Teruyuki; Sasakura, Kazuyuki; and Sugimoto, Hirohiko, to Shionogi & Co., Ltd. Dipeptide derivatives and their production. 4,076,704, Cl. 260-112.50R.

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Hirayama, Yoshio; Ito, Kanichi; Takeuchi, Ryoichi; Nomoto, Masao; and Shiina, Tomoyuki, to Agency of Industrial Science & Technology. Pulverizing method and apparatus. 4,076,177, Cl. 241-32.000.

Hire, William Russell. Folding boat. 4,075,724, Cl. 9-2.00F.

Hiruma, Mituo. Vehicle hydropneumatic suspension system with vehicle body height control means. 4,076,275, Cl. 280-124.00F.

Hisey, Robert W., to Gardner-Denver Company. Castering roller for a drill pipe guide bushing. 4,076,338, Cl. 308-4.00R.

Hisserich, Charles A. External compression ignition system for internal combustion engines. 4,075,996, Cl. 123-143.00A.

Hitachi, Ltd.: *See—*
Mukaemachi, Takuji; and Fukushima, Yutaka, 4,076,971, Cl. 179-175.30R.
Nakano, Fumio; Yokokura, Hisao; and Murao, Kenji, 4,076,646, Cl. 252-299.000.

Hoechst Aktiengesellschaft: *See—*
Eichenseer, Franz; Steidl, Dieter; and Muller, Walter, 4,076,935, Cl. 536-86.000.
Hartwimmer, Robert, 4,076,760, Cl. 260-653.10R.
Lippsmeier, Bernd; and Hestermann, Klaus, 4,076,755, Cl. 260-606.50P.
Riegler, Ernst, 4,075,736, Cl. 17-42.000.
Schmidt, Willi Johann, 4,076,785, Cl. 264-146.000.

Hoehn, Hans: *See—*
Denzel, Theodor; and Hoehn, Hans, 4,076,712, Cl. 260-256.40F.

Hoehn, Richard F.: *See—*
Behrends, Bertwin E.; Hoehn, Richard F.; and Poirot, James M., 4,076,219, Cl. 254-187.400.

Hoffman, Donald O.: *See—*
Deeg, Emil W.; and Hoffman, Donald O., 4,076,542, Cl. 106-52.000.

Hoffmann-La Roche Inc.: *See—*
Chan, Ka-Kong; and Saucy, Gabriel, 4,076,739, Cl. 260-410.90R.
Davis, Raymond Vincent, 4,076,797, Cl. 424-1.000.
Hromatka, Otto; Binder, Dieter; Pfister, Rudolf; and Zeller, Paul, 4,076,709, Cl. 544-48.000.
Kompis, Ivan, 4,076,810, Cl. 424-229.000.
Rosen, Perry, 4,076,944, Cl. 560-5.000.
Westley, John, 4,076,802, Cl. 424-122.000.
Westley, John, 4,076,834, Cl. 424-283.000.

Hoffmann, Werner; and von Fraunberg, Karl, to BASF Aktiengesellschaft. Polycyclic scents. 4,076,748, Cl. 260-586.00F.

Hoffmann, William A., III: *See—*
Zey, Edward G.; and Hoffmann, William A., III, 4,076,727, Cl. 260-340.700.

Hofmann, Dietrich Adolf: *See—*
Haigh, Harold Edward; and Hofmann, Dietrich Adolf, 4,076,200, Cl. 248-146.000.

Hofmann, Heinz: *See—*
Wacker, Erich; Hofmann, Heinz; Kopp, Karl; Bauer, Hermann; von Ey, Volker; and Weiss, Franz, 4,075,934, Cl. 92-159.000.

Hofmann, Wilfried: *See—*
Deml, Reinhold; Greis, Ulrich; Hofmann, Wilfried; and Rauffer, Walter, 4,076,384, Cl. 350-122.000.

Hogan, David Charles: *See—*
Reid, Michael Gerald; Burlew, Leroy Ellery; and Hogan, David Charles, 4,076,408, Cl. 355-14.000.

Hoge, Myron W. Apparatus for detecting a high flange. 4,076,192, Cl. 246-247.000.

Hohenschutz, Heinz: *See—*
Buelow, Horst; Hohenschutz, Heinz; Schmidt, Johannes E.; and Sachsze, Werner, 4,076,594, Cl. 203-15.000.

Holdenried, Willy: *See—*
Hamma, Karlmann; and Holdenried, Willy, 4,075,841, Cl. 60-444.000.

Holland Company: *See—*
Chierici, Osvaldo F.; and Murphy, Richard F., 4,075,951, Cl. 105-199.00C.

Hollaway, John William, to Rio Tinto (Rhodesia) Limited. Process for obtaining liquid fuel-oil and/or gaseous hydrocarbons from solid carbonaceous feed stocks. 4,076,612, Cl. 208-8.000.

Holley, William H.: *See—*
White, LeRoy A.; and Holley, William H., 4,076,656, Cl. 260-2.50M.

Hollymatic Corporation: *See—*
Theis, James V., Jr.; Davis, Lynn M.; and Moss, Donald H., 4,076,449, Cl. 415-18.000.

Holmberg, Bradley C. Impact absorbing lock apparatus. 4,076,294, Cl. 292-340.000.

Holmes, Horace D. Locking thread construction. 4,076,064, Cl. 151-14.00R.

Holsinger, Jerry L.; and Williams, David E., to Intertel, Inc. Automatic switching unit for data communications network. 4,076,961, Cl. 179-2.0DP.

Holt, Ronald; and Smith, Daniel J., to Franklin Electric Subsidiaries, Inc. Wrapper sheet feed for wrapping machine. 4,075,816, Cl. 53-74.000.

Holzstoff, S.A.: *See—*
Brossel, Maurice; Laurent, Gilbert; and Bertannier, Daniel, 4,076,885, Cl. 428-286.000.

Homeyer, Bernhard: *See—*
Lorenz, Walter, deceased; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 4,076,806, Cl. 424-200.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Kuno, Tadashi; Abe, Akihiko; and Shoji, Akito, 4,076,001, Cl. 123-191.00S.
Yamazaki, Shuichi; Kajitani, Ikuo; and Kawamoto, Michio, 4,075,836, Cl. 60-282.000.

Honeywell Inc.: *See—*
Huang, Jack S. T.; and Kohyama, Susumu, 4,076,557, Cl. 148-1.500.

Honomichl, Ben K., Sr. Round bale loader and carrier. 4,076,138, Cl. 214-518.000.

Hopkins, Joseph; and McKenna, David, to Sir Howard Grubb Parsons & Company Ltd. Analysis of emulsions and suspensions. 4,076,983, Cl. 250-341.000.

Hori, Hironobu: *See—*
Otake, Nobuyuki; Ando, Kozo; and Hori, Hironobu, 4,076,428, Cl. 401-265.000.

Horn, Dieter: *See—*
Freyberg, Peter; Horn, Dieter; Oppenlaender, Knut; Wolf, Hans; and Distler, Dieter, 4,076,497, Cl. 8-21.00C.

Horn, Walter; and Fissler, Rudolf, to Fissler Gesellschaft mit beschrankter Haftung. Liquid feeding device for cooking containers. 4,075,939, Cl. 99-345.000.

Horne, Peter Nesbitt, to Patent Products Hydraulics (Proprietary) Limited. Decompression of pressure chambers, particularly the decompression of actuating pressure chambers of mine cage holding means. 4,075,839, Cl. 60-327.000.

Horrsby, James R., Jr. Amusement device incorporating simulated cheese and mice. 4,076,251, Cl. 273-138.00R.

Horowitz, Charles, to Sloan Valve Company. Tractor-trailer parking dash control valve with two-way check valve. 4,076,328, Cl. 303-50.000.

Horstmann, Harald; Meng, Karl; and Wehinger, Egbert, to Bayer Aktiengesellschaft. 1-Substituted-3-amino-pyrazol-5-ones. 4,076,943, Cl. 548-360.000.

Hortman, Norman G.: *See—*
Nix, George J.; Barrington, Burchus Q.; Farley, David L.; and Hortman, Norman G., 4,076,077, Cl. 166-315.000.

Hoshiden Electronics, Co., Ltd.: *See—*
Koide, Sakae; Aoki, Shigeo; and Uematsu, Tetsutaro, 4,075,791, Cl. 51-142.000.

Hosokawa, Takashi: *See—*
Nakajima, Hiroyuki; and Hosokawa, Takashi, 4,076,045, Cl. 137-625.650.

Houdaille Industries, Inc.: *See—*
Frazier, James L., 4,075,927, Cl. 90-11.00D.

Houghton, Benjamin T., to Enidine Incorporated. **Adjustable energy** absorbing device providing linear **deceleration. 4,076,225, Cl.** 267-34.000.

Housman, Richard J., to Westinghouse Air **Brake Company. Friction** mechanism for draft gear. 4,076,129, **Cl. 213-33.000.**

Houx, James R., Jr.; Landon, Richard D.; **and Lindahl, Paul A., Jr.,** to Marley Cooling Tower Company, **The. Bottom vented wet-dry** water cooling tower. 4,076,771, Cl. 261-159.000.

Howard, Charles R. Fishing lure. 4,075,778, **Cl. 43-42.310.**

Howell, Roy M. Hydrostatic bearings with **controlled lubricant** pressure. 4,076,336, Cl. 308-3.500.

Howery, Kenneth A., to Polymetrics International **Inc. Hydrophilic** acrylic polymers as marine filters, algae growth **catalysts, and breed**ing stimulus for fish and invertebrates. 4,076,619, Cl. 210-36.000.

Hoya Lens Corporation: *See—*
Onoki, Fumio; Namiki, Kazuo; and Osora, Tetsuo, 4,076,863, Cl. 427-165.000.

Hoyt, Joseph B., Jr.; and Shapiro, Eugene, to Olin Corporation. Wrought copper-silicon based alloys with enhanced elasticity and method of producing same. 4,076,560, Cl. 148-11.50C.

Hromatka, Otto; Binder, Dieter; Pfister, Rudolf; and Zeller, Paul, to Hoffmann-La Roche Inc. Thienothiazines. 4,076,709, Cl. 544-48.000.

Hrovat, Milan: *See—*
Hackstein. Karl-Gerhard; Hrovat, Milan; and Wolff, Willi, 4,076,775, Cl. 264-0.500.

Hruza, Denis E., Sr.: *See—*
Light, Kenneth K.; Sanders, James Milton; Vock, Manfred Hugo; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja Dulal; Tseng, Ching Y.; and Sprecker, Mark A., 4,076,853, Cl. 426-538.000.

Hsieh, Henry L.: *See—*
Moczygemba, George A.; and Hsieh, Henry L., 4,076,914, Cl. 526-25.000.

Huang, Jack S. T.; and Kohyama, Susumu, to Honeywell Inc. Method for providing semiconductor devices. 4,076,557, Cl. 148-1.500.

Hubbard, Harold C., to Motor Wheel Corporation. Remote control circuit for electric trailer brakes. 4,076,327, Cl. 303-20.000.

Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, to Ciba-Geigy Corporation. Acylated phenylamine thiopropionates useful in combatting plant fungi. 4,076,836, Cl. 424-285.000.

Hubeny, Jerry. Tool for closing a wall opening. 4,075,749, Cl. 29-268.000.

Huber, Peter; Lampelzammer, Helga; Pirson, Ewald; and Wimmer, Franz, to Wacker-Chemie GmbH. Lubricants for organic fibres. 4,076,672, Cl. 260-29.20M.

Huber, Wolfgang: *See—*
Meinke, Peter; and Huber, Wolfgang, 4,076,340, Cl. 308-10.000.

Hudnall, Walter E. Adjustable chair-spindle assembly. 4,076,201, Cl. 248-162.000.

Huebner, Karen, to R. O. Hull & Company, Inc. Leveling agent for acid zinc electroplating baths and method. 4,076,600, Cl. 204-55.00R.

Huelskamp, Urban A., to MTM Molded Products Co. Hand launcher for clay pigeons. 4,076,004, Cl. 124-5.000.

Huettemann, Richard E.: *See—*
Mateos, Jose Luis; Noriega, Luis; Huettemann, Richard E.; and Kanojia, Ramesh M., 4,076,805, Cl. 424-195.000.

Hugelin, Bernard: *See—*
Decombe, Robert; and Hugelin, Bernard, 4,076,495, Cl. 8-2.50A.

Hughes Aircraft Company: *See—*
Gates, Louis E., Jr., 4,076,955, Cl. 174-52.0FP.
Kimura, Hiroshi, 4,076,572, Cl. 156-603.000.
Moyer, Norman E., 4,075,826, Cl. 58-23.00R.
Pastor, Ricardo C.; and Pastor, Antonio C., 4,076,574, Cl. 156-616.00R.

Humber, Leslie G.: *See—*
Demerson, Christopher A.; Humber, Leslie G.; Dobson, Thomas A.; and Jirkovsky, Ivo L., 4,076,831, Cl. 424-274.000.

Hupkes, Leonard, to Conrad-Stork B.V. Device for the purpose of preventing a body depending from ropes from swinging. 4,076,127, Cl. 212-10.000.

Hupp, Walter: *See—*
Ritter, Hans-Peter; Strewinsky, Rainer; Bulwien, Hans-Dieter; Koch, Engelbert; Bartholl, Hermann; and Hupp, Walter, 4,076,982, Cl. 250-288.000.

Hurst, Gerald L., to Tyler Corporation. Metal dispersions and method for producing same. 4,076,637, Cl. 252-26.000.

Hushower, Richard R.; and Daresh, George M., to Clark Equipment Company. Hydraulic steering system. 4,076,096, Cl. 180-133.000.

Hydril Company: *See—*
Olson, Richard A., 4,076,208, Cl. 251-1.00A.

HydroTech International, Inc.: *See—*
Sumner, Glen R., 4,076,130, Cl. 214-1.0PA.

Ichii, Takao: *See—*
Sasaki, Tohru; Terasaki, Syuuzi; and Ichii, Takao, 4,076,889, Cl. 428-333.000.

Ichimaru, Kazuto: *See—*
Azuma, Tomisaburo; Ichimaru, Kazuto; Tateno, Kouichi; and Murakami, Takeru, 4,076,545, Cl. 423-544.000.

Ichimura, Yoshiaki, to Japan Aviation Electronics Industry Ltd. Contact driver. 4,076,362, Cl. 339-75.0MP.

Ichiyanagi, Toshikazu: *See—*
Komine, Yoshio; Furukawa, Hiroshi; Takahashi, Kiyoshi; Takigawa, Tomoshi; Ogiso, Mitsutoshi; and Ichiyanagi, Toshikazu, 4,076,396, Cl. 352-29.000.

ICI Americas Inc.: *See—*
Rearick, William A., 4,076,500, Cl. 8-139.100.

ICOS Corporation of America: *See—*
Tamaro, George John, 4,075,852, Cl. 61-35.000.

Ida, Edward Stanley, to Du Pont de Nemours, E. I., and Company. Multi-channel implicit ratio computer for sequential signals. 4,076,424, Cl. 356-188.000.

Ideal Toy Corporation: *See—*
Ventura, Frank D., 4,076,476, Cl. 425-183.000.

Igarashi, Masaaki: *See—*
Furukawa, Masahiko; Ogawa, Hiroshi; Aonuma, Masashi; Tamai, Yasuo; Nakahara, Hiromi; and Igarashi, Masaaki, 4,076,861, Cl. 427-132.000.

Igarashi, Shunkichi; Okano, Takeshi; Takahama, Sho; and Hakamata, Yoshio, to Fuji Photo Film Co., Ltd. Process for producing microfilm copies and apparatus therefor. 4,076,412, Cl. 355-28.000.

Ihara Chemical Industry Co., Ltd.: *See—*
Koike, Wataro; Kimoto, Takahiro; and Matsui, Sadayoshi, 4,076,721, Cl. 260-301.000.

Iida, Kosuke: *See—*
Yoshikawa, Yoshinobu; Iida, Kosuke; Morikawa, Tadayuki; and Satomi, Akinori, 4,076,567, Cl. 156-219.000.

Iinuma, Yoshio: *See—*
Murakami, Tomomi; Yoshida, Masaru; Kimura, Satoshi; Yasuda, Tetuya; and Iinuma, Yoshio, 4,075,825, Cl. 58-23.00R.

Ikeda, Sunao: *See—*
Kanno, Tadaaki; and Ikeda, Sunao, 4,076,402, Cl. 355-3.0DR.

Ikenoue, Shinpei; and Masuda, Takao, to Fuji Photo Film Co., Ltd. Process for preparing silver halide dispersions. 4,076,539, Cl. 96-114.500.

Illinois Railway Equipment Co.: *See—*
Sweger, Theodore J., 4,076,290, Cl. 292-256.500.

Immunology Research Foundation, Inc.: *See—*
Burton, Lawrence; and Friedman, Frank, 4,076,701, Cl. 260-112.00B.

Imperial Chemical Industries Limited: *See—*
Giovanelli, Anton Alfred Arthur; and Schmidt, Eckhard Wolfgang, 4,076,874, Cl. 428-35.000.
Milner, David Lee; and Ripley, Ian Stanley, 4,076,926, Cl. 526-209.000.

Imura, Toshinori, to Minolta Camera Kabushiki Kaisha. Photographic camera employing a cartridge film. 4,077,041, Cl. 354-21.000.

Imura, Toshinori; Maeda, Keisuke; and Naya, Mikio, to Minolta Camera Kabushiki Kaisha. Control means for photoflash photography system. 4,077,042, Cl. 354-21.000.

Ina, Osamu: *See—*
Yamawaki, Masao; Aoki, Katsuo; Ina, Osamu; Suzuki, Takao; Oka, Yoshio; and Hara, Kunihiko, 4,075,972, Cl. 118-6.000.

Inada, Masami; and Kitamura, Kazuhiko, to Aisin Seiki Kabushiki Kaisha. Temperature responsive valve assembly. 4,076,172, Cl. 236-48.00R.

Incom International Inc.: *See—*
Irwin, Steve; and Moser, Dick, 4,075,904, Cl. 74-501.00P.

Industrial Grain Products, Limited: *See—*
Johannson, Harold P., 4,076,845, Cl. 426-19.000.

Ing. C. Olivetti & C., S.p.A.: *See—*
Azzalin, Bruno; and Bettini, Francesco, 4,076,160, Cl. 226-82.000.

Inmont Corporation: *See—*
Suskind, Stuart Paul; and Sova, Stanley George, 4,076,879, Cl. 428-113.000.

Inouye, Shigeharu; Shomura, Takashi; Kojima, Michio; Ogawa, Yasuaki; Watanabe, Hiroshi; Kondo, Yasumitsu; Saito, Kazuo, deceased (by Saito, Nobuko, administrator); Yamada, Yujiro; and Niida, Taro, to Meiji Seika Kaisha, Ltd. Antibiotic SF-1623 substance and the production thereof. 4,076,588, Cl. 195-36.00C.

Inspiration Consolidated Copper Company: *See—*
Bilson, Edward A., 4,076,605, Cl. 204-108.000.

Institut Pasteur: *See—*
Fauve, Robert, 4,076,801, Cl. 424-92.000.

Interlake, Inc.: *See—*
McConnell, Kennedy, 4,076,202, Cl. 248-188.200.

International Business Machines Corporation: *See—*
Bodner, Ronald Eugene; and Kiscaden, Richard Craig, 4,077,060, Cl. 364-200.000.
Caricchio, Jerome Joseph, Jr.; and York, Edward Robert, 4,076,599, Cl. 204-47.000.
Chang, Kenneth, 4,076,575, Cl. 156-656.000.
Cistola, Anthony Bartholemew, 4,076,357, Cl. 339-17.00M.
Croisier, Alain; and Glaise, Rene, 4,076,986, Cl. 307-221.00D.

Csajka, Istvan Peter; and Ungerboeck, Gottfried, 4,077,021, Cl. 332-9.00R.

Hendriks, Ferdinand, 4,077,040, Cl. 346-75.000.

Hieronymus, Gerald Whitfield; Sendelweck, Michael Lynn; West, James Everett; and Woods, Joe William, 4,076,046, Cl. 137-627.500.

Kircher, Charles John; and Zappe, Hans Helmut, 4,075,756, Cl. 29-625.000.

Mathis, Joseph Richard, 4,077,011, Cl. 328-129.000.

Pole, Robert Vladimir; and Wollenmann, Hans Peter, 4,076,372, Cl. 350-6.900.

Rupprecht, Hans Stephen; and Schwenker, Robert Otto, 4,076,558, Cl. 148-1.500.

Yee, Yen Sung, 4,077,035, Cl. 340-347.0DA.

International Flavors & Fragrances Inc.: *See—*
Light, Kenneth K.; Sanders, James Milton; Vock, Manfred Hugo; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja Dulal; Tseng, Ching Y.; and Sprecker, Mark A., 4,076,853, Cl. 426-538.000.
Light, Kenneth K.; Spencer, Bette M.; Vinals, Joaquin F.; Kiwala, Jacob; Vock, Manfred Hugo; and Shuster, Edward J., 4,076,854, Cl. 426-538.000.
Schreiber, William L.; Siano, James N.; and Shuster, Edward J., 4,076,749, Cl. 260-586.00R.
Van Delft, Andries; and Giacino, Christopher, 4,076,852, Cl. 426-533.000.

International Standard Electric Corporation: *See—*
Henrion, Michel Andre Robert; and Coudray, Andre Lucien, 4,076,964, Cl. 179-15.0BS.

International Synthetic Rubber Company, Ltd., The: *See—*
de Larosiere de Champfeu, Pierre J., 4,075,853, Cl. 61-36.00R.

International Telephone and Telegraph Corporation: *See—*
Hammer, Richard Benjamin; Turbak, Albin Frank; Portnoy, Norman A.; and West, Arthur C., 4,076,932, Cl. 536-30.000.
Turbak, Albin Frank; Hammer, Richard Benjamin; Portnoy, Norman A.; and West, Arthur C., 4,076,933, Cl. 536-30.000.

Intertel, Inc.: *See—*
Holsinger, Jerry L.; and Williams, David E., 4,076,961, Cl. 179-2.0DP.

Inventec International Limited: *See—*
Hickman, Donald Price, 4,076,229, Cl. 269-139.000.

Inventing S.A.: *See—*
Wallsten, Hans Ivar, 4,076,864, Cl. 427-209.000.
Wallsten, Hans Ivar, 4,076,865, Cl. 427-209.000.

Ioffe, Benyamin Alexandrovich; Kalnin, Robert Karlovich; Zommer, Jury Arvidovich; Graubin, Yanis Ekabovich; Davydenko, Eduard Prokofievich; and Kern, Ivan Ivanovich. Method of oriented feeding of nonmagnetic current-conducting components and devices for effecting same. 4,077,027, Cl. 335-219.000.

Ionel, Stefan. Bar-bell type exercising device. 4,076,236, Cl. 272-123.000.

Iowa State University Research Foundation, Inc.: *See—*
Handy, Richard L.; Girard, Leon E.; Roorda, Bruce R.; and Pitt, John M., 4,075,885, Cl. 73-88.00E.

Ippolitov, Vladimir Vasilievich: *See—*
Kapitanov, Nikolai Nikolaevich; Ippolitov, Vladimir Vasilievich; Andreeva, Galina Dmitrievna; Petrova, Natalyd Petrovna; and Rabotnikov, Vladimir Semenovich, 4,076,162, Cl. 227-019.000.

Irick, Gether, Jr.; Kelly, Charles A.; and Martin, James C., to Eastman Kodak Company. Bichromophoric benzotriazole-benzoxazole ultraviolet stabilizers and their use in organic compositions. 4,076,687, Cl. 260-45.8NT.

Irwin, Steve; and Moser, Dick, to Incom International Inc. Adapter for push-pull control cables. 4,075,904, Cl. 74-501.00P.

Ishiba, Teruyuki: *See—*
Hirai, Kentaro; Ishiba, Teruyuki; Sasakura, Kazuyuki; and Sugimoto, Hirohiko, 4,076,702, Cl. 260-112.50R.
Hirai, Kentaro; Ishiba, Teruyuki; Sasakura, Kazuyuki; and Sugimoto, Hirohiko, 4,076,703, Cl. 260-112.50R.
Hirai, Kentaro; Ishiba, Teruyuki; Sasakura, Kazuyuki; and Sugimoto, Hirohiko, 4,076,704, Cl. 260-112.50R.
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Ishiguro, Tatsuo, to Nippon Electric Company, Ltd. Television signal encoder utilizing a correlation between frames. 4,077,053, Cl. 358-136.000.

Ishioka, Yozo: *See—*
Kai, Fumindo; Kumazawa, Eitaro; and Ishioka, Yozo, 4,075,767, Cl. 34-92.000.

Issler, Jorg: *See—*
Brammer, Hartmut; Ehrmann, Karl; Haug, Heinz; Issler, Jorg; Kas, Gunter; Kalippke, Harald; Magdefrau, Herbert; and Schneider, Karl-Heinz, 4,075,752, Cl. 29-434.000.

Istituto Chemioterapico Italiano, S.p.A.: *See—*
Garzia, Aldo; Ferrari, William; and Bottazzi, Andrea, 4,076,815, Cl. 424-251.000.

Ito, Kanichi: *See—*
Hirayama, Yoshio; Ito, Kanichi; Takeuchi, Ryoichi; Nomoto, Masao; and Shiina, Tomoyuki, 4,076,177, Cl. 241-32.000.

Iwai, Tomio, to Yamaha Hatsudoki Kabushiki Kaisha. Two cycle internal combustion engines. 4,075,985, Cl. 123-73.00A.

Iwamatsu, Masayuki, to Nippon Gakki Seizo Kabushiki Kaisha. Amplifier devices. 4,077,012, Cl. 330-253.000.

Iwasaki, Takeshi; Fujikawa, Yasuo; and Sasaki, Kunimasa, to Mitsubishi Jukogyo Kabushiki Kaisha. Device for detecting level of molten metal surface within a continuous casting mold. 4,075,890, Cl. 73-295.000.

Iyeta, Motoi, to Nippon Gakki Seizo Kabushiki Kaisha. Apparatus for supporting phonographic tone arms. 4,076,257, Cl. 274-23.00A.

Izon Corporation: *See—*
Waly, Adnan, 4,076,415, Cl. 355-45.000.

J. I. Case Company: *See—*
Baylor, John Merlin, 4,076,333, Cl. 305-11.000.

J. M. Huber Corporation: *See—*
Wason, Satish K., 4,076,549, Cl. 106-288.00B.

J. T. Baker Chemical Company: *See—*
Seidenberger, James W., 4,076,553, Cl. 134-6.000.

Jackson, John Lambert: *See—*
Archibald, John Leheup; and Jackson, John Lambert, 4,076,820, Cl. 424-258.000.

Jacques, Petrus: *See—*
Mar, John; Garrett, Todd; and Jacques, Petrus, 4,075,725, Cl. 9-8.00R.

Jacques, Roland, to Rhone-Poulenc Industries. Agglomerated siliceous bodies. 4,076,651, Cl. 252-451.000.

Jagielski, David: *See—*
Persha, Thomas J.; and Jagielski, David, 4,076,400, Cl. 353-95.000.

James David Incorporated: *See—*
Glaser, Harold, 4,076,432, Cl. 403-176.000.

Janev, Janco Hristov: *See—*
Jordanov, Jordan Todorov; Abrashev, Georgi Ivanov; Jekov, Velyu Dimitrov; Georgiev, Georgi Taney; Haralampiev, Georgi Alexandrov; Janev, Janco Hristov; and Prodanov, Velcho Angelov, 4,076,521, Cl. 75-24.000.

Jankot, Alan Lewis, to United Technologies Corporation. Ceramic turbine stator. 4,076,451, Cl. 415-217.000.

Japan Aviation Electronics Industry Ltd.: *See—*
Ichimura, Yoshiaki, 4,076,362, Cl. 339-75.0MP.

Japan Synthetic Rubber Co., Ltd.: *See—*
Harada, Tetsuya; and Yumoto, Tunemasa, 4,076,700, Cl. 260-97.600.

Jaworski, Eugene: *See—*
Breslow, Jeffrey D.; and Jaworski, Eugene, 4,076,006, Cl. 124-64.000.

Jean Walterscheid GmbH: *See—*
Geisthoff, Hubert, 4,075,872, Cl. 64-23.700.
Geisthoff, Hubert, 4,075,873, Cl. 64-29.000.

Jekov, Velyu Dimitrov: *See—*
Jordanov, Jordan Todorov; Abrashev, Georgi Ivanov; Jekov, Velyu Dimitrov; Georgiev, Georgi Taney; Haralampiev, Georgi Alexandrov; Janev, Janco Hristov; and Prodanov, Velcho Angelov, 4,076,521, Cl. 75-24.000.

Jenaer Glaswerk Schott & Gen.: *See—*
Faulstich, Marga; and Reitmayer, Franz, 4,076,647, Cl. 252-301.40P.

Jenkin, Royston Paul, to English Clays Lovering Pochin & Co. Ltd. Pipe straightening and spinning method and apparatus. 4,076,136, Cl. 214-340.000.

Jenne, Frank, Jr.; and Tarnay, Denes, to General Electric Company. Rectangular seal beam lamp unit. 4,076,143, Cl. 220-2.10R.

Jensen, Aksel Johannes: *See—*
Remark, Preben Michael; and Jensen, Aksel Johannes, 4,075,742, Cl. 24-211.00R.

Jensen, Henry E., to Eltra Corporation. Apparatus for indicating battery cell condition. 4,076,906, Cl. 429-90.000.

Jesswein, Ronald M., to Clark Equipment Company. Brake and steering system. 4,075,840, Cl. 60-422.000.

Jirkovsky, Ivo L.: *See—*
Demerson, Christopher A.; Humber, Leslie G.; Dobson, Thomas A.; and Jirkovsky, Ivo L., 4,076,831, Cl. 424-274.000.

Johannson, Harold P., to Industrial Grain Products, Limited. Process for using a powdered gluten composition in baking. 4,076,845, Cl. 426-19.000.

John Morgan Printing Machinery Ltd.: *See—*
Morgan, John Henry, 4,076,184, Cl. 242-75.300.

John Wyeth & Brother, Limited: *See—*
Archibald, John Leheup; and Jackson, John Lambert, 4,076,820, Cl. 424-258.000.

Johns, Robert W. Hydraulic mining from tunnel by reciprocated pipes. 4,076,311, Cl. 299-2.000.

Johnson, David G.; and Mueller, James P., to Caterpillar Tractor Co. Brake modulation valve for pedal-applied brakes. 4,076,329, Cl. 303-56.000.

Johnson, Joe, Jr., to Coats & Clark, Inc. Method and apparatus for feeding a bale press. 4,075,942, Cl. 100-42.000.

Johnson, Lloyd D.: *See—*
Raudat, John L.; and Johnson, Lloyd D., 4,075,819, Cl. 53-248.000.

Johnson, Richard Shaw; and Potter, John Kenneth, to Thomas J. Lipton, Inc. Tea-colored flavor granules. 4,076,847, Cl. 426-78.000.

Johnston, Paul M.; and Szabo, Andras I., to Westinghouse Electric Corporation. Digital processing and calculating AC electric energy metering system. 4,077,061, Cl. 364-483.000.

Johnston, Ross W., to Sperry Rand Corporation. High speed actuator for impact line printers. 4,075,943, Cl. 101-93.480.

Joiner, James Ray, Jr., to Du Pont de Nemours, E. I., and Company. Low lag luminescent phosphors and X-ray screen containing the same. 4,076,897, Cl. 428-539.000.

Joly, Pascal Adrien Jean; and Prat, Jean-Claude Alphonse Henri, to Corning Glass Works. Glass for encapsulation of diodes. 4,076,543, Cl. 106-53.000.

Jones, John L., to CanDu, Inc. Method for hydroponic growing of lettuce. 4,075,785, Cl. 47-64.000.

Jones, Paul T. Recorder for measuring movement of railroad track rails under load. 4,075,889, Cl. 73-146.000.

Jones, Ray L., to Whittaker Corporation. Automatic pump speed controller. 4,076,458, Cl. 417-46.000.

Jones, William C.: *See*—
Beaumont, Gerald P.; and Jones, William C., 4,076,629, Cl. 252-8.600.

Jordanov, Jordan Todorov; Abrashev, Georgi Ivanov; Jekov, Velyu Dimitrov; Georgiev, Georgi Taney; Haralampiev, Georgi Alexandrov; Janev, Janco Hristov; and Prodanov, Velcho Angelov, to Kombinat Za Zventi Metali "Dimiter Blagoev". Method for continuously blowing materials into molten slags. 4,076,521, Cl. 75-24.000.

Joseph, Mark. Game device with a playing surface of pressurized air. 4,076,242, Cl. 273-85.00B.

Josten, Friedrich: *See*—
Cherubim, Martin; Heinemann, Karl-Heinz; and Josten, Friedrich, 4,076,683, Cl. 260-37.00N.

Jovin, Thomas M.: *See*—
De Maeyer, Leo C. M.; Rabl, Carl-Roland; Jovin, Thomas M.; Riesner, Detlev; Rigler, Rudolf; Veil, Lutz Bodo; and Lehrach, Hans, 4,076,420, Cl. 356-73.000.

Julius Blum Gesellschaft m.b.H.: *See*—
Rock, Erich; and Mages, Bernhard, 4,075,735, Cl. 16-145.000.

Jungles, John; Whitehouse, David John; and Nightingale, Eric Gordon, to Rank Organisation Limited, The. Optical diffractometers. 4,077,048, Cl. 358-89.000.

Justus, Marvin W.: *See*—
Skinner, David R.; Sowell, Miles L.; and Justus, Marvin W., 4,076,457, Cl. 417-45.000.

Juttner, Willi: *See*—
Weidner, Hans Jurgen; and Juttner, Willi, 4,076,352, Cl. 312-330.00R.

Kabushiki Kaisha Daini Seikosha: *See*—
Hamano, Tadashi, 4,076,496, Cl. 8-4.000.
Kondo, Kenichi, 4,076,385, Cl. 350-332.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Yasoshima, Kazuo, 4,076,107, Cl. 192-4.00A.

Kabushiki Kaisha Mitutoyo Seisakusho: *See*—
Yamaryo, Yasuyuki, 4,075,763, Cl. 33-172.00R.

Kabushiki Kaisha Pollution Preventing Research Laboratory: *See*—
Suzuki, Shin; Matsumoto, Kazuo; and Nakaoka, Ichiro, 4,076,606, Cl. 204-157.10R.

Kabushiki Kaisha Sato Gijutsu Kenkyusho: *See*—
Oshida, Naoichi; and Ando, Eiichi, 4,076,504, Cl. 23-277.00C.

Kabushiki Kaisha Sogo Pump Seisakusho: *See*—
Tsukube, Syozo, 4,076,179, Cl. 241-46.110.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Araki, Hidejiro; and Otani, Susumu, 4,075,732, Cl. 15-301.000.
Komura, Ikuo; Tamai, Hideo; and Morita, Takayuki, 4,075,919, Cl. 83-676.000.

Kachurka, Alexandr Nikolaevich: *See*—
Barannik, Ivan Andreevich; Kachurka, Alexandr Nikolaevich; Zharovsky, Ivan Vasilievich; Trukhin, Alexandr Fedorovich; Raskatov, Viktor Georgievich; and Mazurkevich, Alexandr Borisovich, 4,076,472, Cl. 425-8.000.

Kagerhuber, Franz: *See*—
Scheurecker, Werner; and Kagerhuber, Franz, 4,076,341, Cl. 308-20.000.

Kai, Fumindo; Kumazawa, Eitaro; and Ishioka, Yozo, to Snow Brand Milk Products Co., Ltd. Powder producing apparatus. 4,075,767, Cl. 34-92.000.

Kaido, Hiroyuki: *See*—
Kaneda, Kunihiro; Kida, Masashi; Nakayama, Akihiko; Kanazawa, Atsushi; Kaido, Hiroyuki; Mizumoto, Yasuhiro; and Koyama, Tsuneo, 4,076,668, Cl. 260-23.70M.

Kaiser Aluminum & Chemical Corporation: *See*—
Andersen, John N., 4,076,603, Cl. 204-98.000.
Panusch, Erwin; Sobolev, Igor; and Carniglia, Stephen C., 4,076,580, Cl. 162-159.000.

Kaiser Glass Fiber Corporation: *See*—
Coggin, Charles H., Jr., 4,076,181, Cl. 242-18.00G.

Kaiser Steel Corporation: *See*—
Oswald, Donald E., 4,075,975, Cl. 118-318.000.

Kajitani, Ikuo: *See*—
Yamazaki, Shuichi; Kajitani, Ikuo; and Kawamoto, Michio, 4,075,836, Cl. 60-282.000.

Kalippke, Harald: *See*—
Brammer, Hartmut; Ehrmann, Karl; Haug, Heinz; Issler, Jorg; Kas, Gunter; Kalippke, Harald; Magdefrau, Herbert; and Schneider, Karl-Heinz, 4,075,752, Cl. 29-434.000.

Kalka, James C., to Minnesota Mining and Manufacturing Company. Retaining clip. 4,076,204, Cl. 248-500.000.

Kalnin, Robert Karlovich: *See*—
Ioffe, Benyamin Alexandrovich; Kalnin, Robert Karlovich; Zommer, Jury Arvidovich; Graubin, Yanis Ekabovich; Davydenko, Eduard Prokofievich; and Kern, Ivan Ivanovich, 4,077,027, Cl. 335-219.000.

Kamata, Jyoji: *See*—
Yamamoto, Toshio; Kamata, Jyoji; Murase, Shigeo; and Yamaguchi, Kouichirou, 4,076,073, Cl. 165-53.000.

Kamath, Venkatesh: *See*—
Light, Kenneth K.; Sanders, James Milton; Vock, Manfred Hugo; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja Dulal; Tseng, Ching Y.; and Sprecker, Mark A., 4,076,853, Cl. 426-538.000.

Kampe, Wolfgang; Stach, Kurt; Thiel, Max; Bartsch, Wolfgang; Dietmann, Karl; Roesch, Egon; and Schaumann, Wolfgang, to Boehringer Mannheim GmbH. Aminopropanol compounds and compositions for the treatment of cardiac and circulatory diseases. 4,076,829, Cl. 424-274.000.

Kamyr, Inc.: *See*—
Golston, Stefan, 4,076,623, Cl. 210-77.000.

Kanazawa, Atsushi: *See*—
Kaneda, Kunihiro; Kida, Masashi; Nakayama, Akihiko; Kanazawa, Atsushi; Kaido, Hiroyuki; Mizumoto, Yasuhiro; and Koyama, Tsuneo, 4,076,668, Cl. 260-23.70M.

Kaneda, Kunihiro; Kida, Masashi; Nakayama, Akihiko; Kanazawa, Atsushi; Kaido, Hiroyuki; Mizumoto, Yasuhiro; and Koyama, Tsuneo, to Yokohama Rubber Co., Ltd., The. Rubber composition. 4,076,668, Cl. 260-23.70M.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Katayama, Kazuhiko; Nishigaki, Masahiko; Ohtani, Akira; Tani, Nobutaka; Nishizawa, Minoru; and Nakanishi, Hirokazu, 4,076,951, Cl. 526-62.000.

Kanik, Robert W., to R. Kanik Sales, Ltd. Power driven log splitter. 4,076,062, Cl. 144-193.00A.

Kanno, Tadaaki; and Ikeda, Sunao, to Ricoh Company, Ltd. Electrophotographic apparatus with detachable photoconductive drum. 4,076,402, Cl. 355-3.0DR.

Kanojia, Ramesh M.: *See*—
Mateos, Jose Luis; Noriega, Luis; Huettemann, Richard E.; and Kanojia, Ramesh M., 4,076,805, Cl. 424-195.000.

Kantor, Ilya Solomonovich: *See*—
Soschenko, Evgeny Maximovich; Zonenko, Ivan Timofeevich; Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Tsimbler, Jury Abramovich; Kantor, Ilya Solomonovich; Topolyansky, Jury Arnoldovich; Chizhikov, Anatoly Petrovich; and Volyansky, Igor Igorievich, 4,075,947, Cl. 104-23.0FS.

Kapitanov, Nikolai Nikolaevich; Ippolitov, Vladimir Vasilievich; Andreeva, Galina Dmitrievna; Petrova, Natalyd Petrovna; and Rabotnikov, Vladimir Semenovich. Surgical instrument for suturing vessels with metal staples. 4,076,162, Cl. 227-019.000.

Kaplan, Saul; Merianos, John J.; Green, Harold A.; and Petrocci, Alfonso N., to Kewanne Industries, Inc. Amphoteric surfactants. 4,076,744, Cl. 260-501.190.

Kardashov, David Alexeevich: *See*—
Berlin, Alfred Anisimovich; Brikenshtein, Khaim-Mordkhe Aronovich; Gavrjushenko, Nikolai Sviridovich; Dubovitsky, Fedor Ivanovich; Kefeli, Tamara Yakovlevna; Kronman, Raisa Vasilievna; Konkhina, Ljudmila Alexeevna; Marshavina, Natalya Lvovna; Popova, Galina Leonidovna; Radugina, Anna Alexandrovna; Sivergin, Jury Mikhailovich; Sumin, Iosif Grigorievich; Tvorogov, Nikolai Nikandrovich; Shilova, Galina Pavlovna; and Kardashov, David Alexeevich, 4,076,742, Cl. 260-47.0UA.

Karl Mayer Textilmaschinenfabrik GmbH: *See*—
Mista, Kresimir; and Gerstner-Stevens, Ditmar, 4,075,744, Cl. 28-224.000.

Karl Schmidt GmbH: *See*—
Wacker, Erich; Hofmann, Heinz; Kopp, Karl; Bauer, Hermann; von Ey, Volker; and Weiss, Franz, 4,075,934, Cl. 92-159.000.

Karlsson, Jack. Device for limiting the consumption of objects in a container. 4,076,118, Cl. 206-268.000.

Karrer, Friedrich Wilhelm Johann; and Mellgren, Per Gustaf, to Karrer System AG. Process and device for drying fibrous material. 4,075,765, Cl. 34-20.000.

Karrer System AG: *See*—
Karrer, Friedrich Wilhelm Johann; and Mellgren, Per Gustaf, 4,075,765, Cl. 34-20.000.

Kas, Gunter: *See*—
Brammer, Hartmut; Ehrmann, Karl; Haug, Heinz; Issler, Jorg; Kas, Gunter; Kalippke, Harald; Magdefrau, Herbert; and Schneider, Karl-Heinz, 4,075,752, Cl. 29-434.000.

Kasagi, Takao: *See*—
Kuwakado, Satosi; Kasagi, Takao; and Takei, Toshihiro, 4,076,277, Cl. 280-738.000.

Kashiwa, Norio: *See*—
Toyota, Akinori; Odawara, Kiyoshi; and Kashiwa, Norio, 4,076,924, Cl. 526-125.000.

Kason Hardware Corporation: *See*—
Berkowitz, Irving L., 4,076,429, Cl. 403-2.000.

Kasper, George Philip; and May, John Walter, to Eastman Kodak Company. Process for developing electrographic images by causing electrical breakdown in the developer. 4,076,857, Cl. 427-18.000.

Kassner, Karl-Heinz, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Adhesives based on aqueous dispersions of butadiene copolymers, polyvinylpyrrolidones and anionic macromolecular compounds. 4,076,661, Cl. 260-17.00R.

Kasulanis, Charles Francis: *See*—
Fabian, Arthur C.; Genzer, Jerome D.; Kasulanis, Charles Francis; Shavel, John, Jr.; and Zinnes, Harold, 4,076,722, Cl. 260-307.00H.

Katayama, Kazuhiko; Nishigaki, Masahiko; Ohtani, Akira; Tani, Nobutaka; Nishizawa, Minoru; and Nakanishi, Hirokazu, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Method of polymerizing vinyl chloride. 4,076,951, Cl. 526-62.000.

Kato, Hajime: *See*—
Tsuji, Nobuo; Ishige, Sadao; Miyamoto, Akio; and Kato, Hajime, 4,076,887, Cl. 428-307.000.

Kato, Takashi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Apparatus for controlling supply of fuel to internal combustion engine. 4,075,988, Cl. 123-97.00B.

Katz, Menasha Emanuel. Safety holster. 4,076,156, Cl. 224-2.00B.

Kauhl, Gunther: *See*—
Krauss, Heinz; Kauhl, Gunther; and Steinke, Leo, 4,075,998, Cl. 123-179.00H.

Kawamoto, Michio: *See*—
Yamazaki, Shuichi; Kajitani, Ikuo; and Kawamoto, Michio, 4,075,836, Cl. 60-282.000.

Kawamoto, Toshiaki: *See*—
Ohsaki, Mikio; Kawamoto, Toshiaki; and Fujimoto, Osamu, 4,076,125, Cl. 209-80.500.

Kawashima, Hideyuki: *See*—
Yoshida, Makoto; Mochizuki, Yoshifumi; Yamauchi, Masamichi; and Kawashima, Hideyuki, 4,075,827, Cl. 58-23.0AC.

Keck, Mark. Rotary-poppet valve internal combustion engine. 4,075,986, Cl. 123-79.00R.

Keezer, Richard C.; and Haas, Werner E. L., to Xerox Corporation. Electrostatic copying process with charging of the original. 4,076,858, Cl. 427-19.000.

Kefeli, Tamara Yakovlevna: *See*—
Berlin, Alfred Anisimovich; Brikenshtein, Khaim-Mordkhe Aronovich; Gavrjushenko, Nikolai Sviridovich; Dubovitsky, Fedor Ivanovich; Kefeli, Tamara Yakovlevna; Kronman, Raisa Vasilievna; Konkhina, Ljudmila Alexeevna; Marshavina, Natalya Lvovna; Popova, Galina Leonidovna; Radugina, Anna Alexandrovna; Sivergin, Jury Mikhailovich; Sumin, Iosif Grigorievich; Tvorogov, Nikolai Nikandrovich; Shilova, Galina Pavlovna; and Kardashov, David Alexeevich, 4,076,742, Cl. 260-47.0UA.

Keil, Joseph W., to Dow Corning Corporation. Silicone containing reaction injection molded polyurethanes. 4,076,695, Cl. 260-77.5AM.

Keith, Donald B., to Nordam. Building roof panel. 4,075,811, Cl. 52-395.000.

Kellwood Company: *See*—
Bareis, Marvin A.; and Nisbet, George C., 4,075,723, Cl. 9-1.500.

Kelly, Charles A.: *See*—
Irick, Gether, Jr.; Kelly, Charles A.; and Martin, James C., 4,076,687, Cl. 260-45.8NT.

Kelly, Joseph B., to PPG Industries, Inc. Insulated tongs for supporting glass sheets during press bending to V shapes and process of use. 4,076,514, Cl. 65-106.000.

Kelly, Ralph: *See*—
Willer, Sharon Gail; Yust, Paul Ronald; and Kelly, Ralph, 4,076,799, Cl. 424-45.000.

Kendall Company, The: *See*—
Collins, Robert F., 4,075,716, Cl. 2-114.000.

Kenjo, Takenori: *See*—
Tsuda, Yoshinao; Arita, Masafumi; Hamasaki, Toshio; Tsumagari, Tatsumi; and Kenjo, Takenori, 4,076,821, Cl. 424-263.000.

Kennedy Van Saun Corporation: *See*—
Gardner, Kenneth L., 4,076,493, Cl. 432-77.000.

Kerko, David J.; and Tick, Paul A., to Corning Glass Works. Copper-cadmium-silver photochromic glass. 4,076,544, Cl. 106-54.000.

Kern, Ivan Ivanovich: *See*—
Ioffe, Benyamin Alexandrovich; Kalnin, Robert Karlovich; Zommer, Jury Arvidovich; Graubin, Yanis Ekabovich; Davydenko, Eduard Prokofievich; and Kern, Ivan Ivanovich, 4,077,027, Cl. 335-219.000.

Kewanne Industries, Inc.: *See*—
Kaplan, Saul; Merianos, John J.; Green, Harold A.; and Petrocci, Alfonso N., 4,076,744, Cl. 260-501.190.

KHD Industrienlagen AG: *See*—
Haude, Friedhelm, 4,076,178, Cl. 241-33.000.

Kida, Masashi: *See*—
Kaneda, Kunihiro; Kida, Masashi; Nakayama, Akihiko; Kanazawa, Atsushi; Kaido, Hiroyuki; Mizumoto, Yasuhiro; and Koyama, Tsuneo, 4,076,668, Cl. 260-23.70M.

Kilbourn, Edward E.: *See*—
Weir, W. David; and Kilbourn, Edward E., 4,076,809, Cl. 424-211.000.

Kilgariff Holdings Pty. Ltd.: *See*—
Kilgariff, Thomas A., 4,076,209, Cl. 251-251.000.

Kilgariff, Thomas A., to Kilgariff Holdings Pty. Ltd. Improved tap. 4,076,209, Cl. 251-251.000.

Kim, Jinchoon: *See*—
Hendry, George O.; Hilton, John L.; and Kim, Jinchoon, 4,076,990, Cl. 313-61.00S.

Kim, Raymond W. H.; and Figge, Erwin E., to Bell & Howell Company. Moving target assembly and control. 4,076,247, Cl. 273-105.600.

Kimoto, Takahiro: *See*—
Koike, Wataro; Kimoto, Takahiro; and Matsui, Sadayoshi, 4,076,721, Cl. 260-301.000.

Kimura, Hiroshi, to Hughes Aircraft Company. Crystal growth and anneal of lead tin telluride by recrystallization from a heterogeneous system. 4,076,572, Cl. 156-603.000.

Kimura, Satoshi: *See*—
Murakami, Tomomi; Yoshida, Masaru; Kimura, Satoshi; Yasuda, Tetuya; and Iinuma, Yoshio, 4,075,825, Cl. 58-23.00R.

King Nutronics Corporation: *See*—
Waldron, Bradley C., 4,075,882, Cl. 73-1.00F.

Kingsley, William, to Xerox Corporation. Photoconductor incrementing apparatus. 4,076,183, Cl. 242-67.30R.

Kircher, Charles John; and Zappe, Hans Helmut, to International Business Machines Corporation. Process for fabricating above and below ground plane wiring on one side of a supporting substrate and the resulting circuit configuration. 4,075,756, Cl. 29-625.000.

Kirchgessner, Edwin M.; and Krohn, Dennis G., to Caterpillar Tractor Co. Gas-liquid separators. 4,075,984, Cl. 123-41.540.

Kirk, Russell F.: *See*—
Fahlen, Theodore S.; and Kirk, Russell F., 4,077,018, Cl. 331-94.5PE.

Kiscaden, Richard Craig: *See*—
Bodner, Ronald Eugene; and Kiscaden, Richard Craig, 4,077,060, Cl. 364-200.000.

Kiser, Gary L.; and Hendricks, Bobby G., to Du Pont de Nemours, E. I., and Company. Formaldehyde manufacturing process. 4,076,754, Cl. 260-603.00C.

Kishner, Stanley J., to Kollmorgen Technologies Corporation. Spectrophotometer with parallel sensing. 4,076,421, Cl. 356-96.000.

Kissick, Thomas P.: *See*—
Wade, Peter C.; Vogt, B. Richard; and Kissick, Thomas P., 4,076,823, Cl. 424-269.000.

Kistner, Hermann; and Lehmann, Gunthart, to Maschinenbau Oppenweiler GmbH. Device for cutting a pile of sheets with a disk-knife. 4,075,917, Cl. 83-422.000.

Kistner, Hermann; and Lehmann, Gunthart, to Maschinenbau Oppenweiler GmbH. Apparatus for lifting and conveying a signature fed on a wedge-shaped saddle. 4,076,232, Cl. 270-54.000.

Kita, Atsushi: *See*—
Shimizu, Akihiko; and Kita, Atsushi, 4,076,927, Cl. 526-217.000.

Kita, Toru: *See*—
Fujishiro, Takeshi; and Kita, Toru, 4,076,608, Cl. 204-195.00S.

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Nakashima, Katsutoshi; Kita, Toshio; Osawa, Ryuzo; and Hatanaka, Takashi, 4,076,220, Cl. 366-69.000.

Kitagawa, Norihisa; and White, Lionel Stuart, Jr., to Texas Instruments Incorporated. High speed address buffer for semiconductor memory. 4,077,031, Cl. 365-205.000.

Kitamura, Kazuhiko: *See*—
Inada, Masami; and Kitamura, Kazuhiko, 4,076,172, Cl. 236-48.00R.

Kitani, Fukuichi: *See*—
Koyama, Yasujiro; Kitani, Fukuichi; and Nishi, Masaaki, 4,075,812, Cl. 52-747.000.

Kitano, Noritoshi: *See*—
Seki, Isao; Kitano, Noritoshi; and Kondo, Fusao, 4,076,814, Cl. 424-248.500.

Kiwala, Jacob: *See*—
Light, Kenneth K.; Spencer, Bette M.; Vinals, Joaquin F.; Kiwala, Jacob; Vock, Manfred Hugo; and Shuster, Edward J., 4,076,854, Cl. 426-538.000.

Klank, Otto; and Rottmann, Dieter, to Licentia Patent-Verwaltungs-G.m.b.H. Tuning circuit for high frequency receivers. 4,077,009, Cl. 325-455.000.

Klaubert, Dieter H.: *See*—
Sellstedt, John H.; and Klaubert, Dieter H., 4,076,718, Cl. 260-295.0PA.

Kleider, Albert: *See*—
Vogel, Eberhard; Glaser, Herbert; Kleider, Albert; and Dietz, Klaus, 4,075,793, Cl. 51-170.0TL.

Kleinschwarzer, Adolf: *See*—
Wohlfarth, Ernst; Hechtl, Wolfgang; Matejcek, Klaus; and Kleinschwarzer, Adolf, 4,076,684, Cl. 260-37.0SB.

Kleker, Richard G. Method and apparatus for hematology. 4,076,419, Cl. 356-39.000.

Klesper, Hugo: *See*—
Busse, Oswald; and Klesper, Hugo, 4,076,033, Cl. 134-172.000.

Kling-Tecs, Inc.: *See*—
Roberts, John S., 4,075,743, Cl. 28-263.000.
Roberts, John S., 4,075,746, Cl. 28-264.000.

Klingenberg, Hans Ulrich, to Century Time Limited. Four-sided water-resistant watch-case. 4,075,828, Cl. 58-90.00R.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Mettig, Hermann; and Medenus, Bernhard, 4,075,991, Cl. 123-119.0CD.

Klose, Klaus, to AGFA-Gevaert, A.G. Apparatus for processing cassettes containing exposed photographic films. 4,076,135, Cl. 214-300.000.

Klotz, Heinz; and Podszuck, Dietmar, to Hermann Hemscheidt Maschinenfabrik. Plug-in coupling. 4,076,279, Cl. 285-26.000.

Klundt, Kurt, to Pfaff Industriemaschinen GmbH. Lubricating oil sealing device for a sewing machine. 4,075,960, Cl. 112-256.000.

Knight, Clifford; and Thorp, Peter M., to Xerox Corporation. Document handling apparatus. 4,076,233, Cl. 271-233.000.

Kobeski, Walter Dan; Srocki, Sigismund Walter; Blosser, William Ivan; and Needham, James Joseph, to United States Gypsum Company. Method of treating earthen areas. 4,076,862, Cl. 427-136.000.

Kobozev, Vladimir Nikolaevich: *See*—
Chuply, Vladimir Yakovlevich; Vojuta, Leonty Feofanovich; Kondratenko, Feofan Ilich; Poludnenko, Jury Zakharovich; Milach, Adam Arsentievich; Kobozev, Vladimir Nikolaevich; and Turchenko, Alexandr Vasilievich, 4,076,087, Cl. 175-334.000.

Koch, Engelbert: *See*—
Ritter, Hans-Peter; Strewinsky, Rainer; Bulwien, Hans-Dieter; Koch, Engelbert; Bartholl, Hermann; and Hupp, Walter, 4,076,982, Cl. 250-288.000.

Koch, Franklin O., Jr., to Caterpillar Tractor Co. Radially moving trigger mechanism and transmission overspeed inhibitor using same. 4,075,893, Cl. 74-3.000.

Koch, Karlheinz; and Rutzen, Horst, to Henkel KGaA; and Durtsche Gold- und Silber-Scheideanstalt vormals Roessler. Novel betaines, processes for the preparation thereof and recovery of underground petroleum therewith. 4,076,743, Cl. 260-501.130.

Koehler, Waldemar: *See—*
Hetzel, Eckard; Koehler, Waldemar; Vock, Georg Friedrich; and Bittler, Rolf, 4,076,577, Cl. 159-47.00R.

Koenig & Bauer Aktiengesellschaft: *See—*
Kutzner, Willi Albert Peter; and Schneider, Georg, 4,076,231, Cl. 270-21.000.

Koenig, Elmer A., to Sherwood Medical Industries Inc. Fluid transfer device. 4,076,027, Cl. 128-272.000.

Koeppel, Robert: *See—*
Grimaud, Edouard; and Koeppel, Robert, 4,076,699, Cl. 260-79.50C.

Koestering, Ernest J.: *See—*
Alper, Marc H.; and Koestering, Ernest J., 4,075,801, Cl. 52-196.000.

Kogler, Hubert P., to Ashland Oil, Inc. Cyanoacrylate foundry binders and process. 4,076,685, Cl. 260-42.530.

Kohno, Tsuguo, to Agency of Industrial Science & Technology. Fabry-Perot interference spectrometer. 4,076,422, Cl. 356-106.00S.

Kohyama, Susumu: *See—*
Huang, Jack S. T.; and Kohyama, Susumu, 4,076,557, Cl. 148-1.500.

Koide, Sakae; Aoki, Shigeo; and Uematsu, Tetsutaro, to Tahara Shoyei Kiko K.K.; and Hoshiden Electronics, Co., Ltd. Automatic copying belt grinding machine. 4,075,791, Cl. 51-142.000.

Koike, Wataro; Kimoto, Takahiro; and Matsui, Sadayoshi, to Ihara Chemical Industry Co., Ltd. Process for producing saccharin. 4,076,721, Cl. 260-301.000.

Koizumi, Kunihei; Ueda, Takeshi; and Otani, Tatu, to Nippon Kokan Kabushiki Kaisha. Method and apparatus for controlling heat input to a waste heat boiler by use of bleeder gas from a coke dry quenching station. 4,076,593, Cl. 201-39.000.

Kojima, Michio: *See—*
Inouye, Shigeharu; Shomura, Takashi; Kojima, Michio; Ogawa, Yasuaki; Watanabe, Hiroshi; Kondo, Yasumitsu; Saito, Kazuo, deceased; Yamada, Yujiro; and Niida, Taro, 4,076,588, Cl. 195-36.00C.

Kojima, Minoru: *See—*
Yukuta, Toshio; Ohashi, Takashi; Kojima, Minoru; and Suzuki, Akira, 4,076,654, Cl. 260-2.5AM.

Kolb, Alfred: *See—*
Gross, Marvin H.; and Kolb, Alfred, 4,075,802, Cl. 52-203.000.

Kolbeck, Rainer; Kuckenburg, Heinz; and Schaffernicht, Klaus, to Licentia Patent-Verwaltungs-G.m.b.H. Electron beam producing arrangement for a cathode ray tube. 4,076,995, Cl. 313-446.000.

Koleske, Joseph Victor; and Smith, Oliver Wendell, to Union Carbide Corporation. Blends of aqueous acrylic latex and water soluble carboxyl modified polycaprolactone adduct. 4,076,674, Cl. 260-29.4UA.

Kollmorgen Technologies Corporation: *See—*
Kishner, Stanley J., 4,076,421, Cl. 356-96.000.

Komarova, Ljudmila Grigorievna: *See—*
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Krasnov, Alexandr Petrovich; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradova, Olga Vladimirovna; Mamatsashvili, Georgy Viktorovich; Pavlova, Saga-Silviya Alexandrovna; Gribkova, Pelageya Nikolaevna; Bekasova, Nina Ivanovna; Komarova, Ljudmila Grigorievna; Vorobiev, Vladimir Dmitrievich; Vlasova, Irina Vladimirovna; and Vinogradov, Alexandr Vasilievich, 4,076,634, Cl. 252-12.000.

Kombinat Za Zventi Metali "Dimiter Blagoev": *See—*
Jordanov, Jordan Todorov; Abrashev, Georgi Ivanov; Jekov, Velyu Dimitrov; Georgiev, Georgi Taney; Haralampiev, Georgi Alexandrov; Janev, Janco Hristov; and Prodanov, Velcho Angelov, 4,076,521, Cl. 75-24.000.

Komine, Yoshio; Furukawa, Hiroshi; Takahashi, Kiyoshi; Takigawa, Tomoshi; Ogiso, Mitsutoshi; and Ichiyanagi, Toshikazu, to Canon Kabushiki Kaisha. Cinecamera equipment capable of synchronous sound recording. 4,076,396, Cl. 352-29.000.

Kompis, Ivan, to Hoffmann-La Roche Inc. Benzylpyrimidine antibacterial composition. 4,076,810, Cl. 424-229.000.

Komura, Ikuo; Tamai, Hideo; and Morita, Takayuki, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Cutting blade of a device for cutting a yarn in a textile machine. 4,075,919, Cl. 83-676.000.

Konan Electric Co., Ltd.: *See—*
Nakajima, Hiroyuki; and Hosokawa, Takashi, 4,076,045, Cl. 137-625.650.

Kondo, Fusao: *See—*
Seki, Isao; Kitano, Noritoshi; and Kondo, Fusao, 4,076,814, Cl. 424-248.500.

Kondo, Kenichi, to Kabushiki Kaisha Daini Seikosha. Liquid crystal display device. 4,076,385, Cl. 350-332.000.

Kondo, Yasumitsu: *See—*
Inouye, Shigeharu; Shomura, Takashi; Kojima, Michio; Ogawa, Yasuaki; Watanabe, Hiroshi; Kondo, Yasumitsu; Saito, Kazuo, deceased; Yamada, Yujiro; and Niida, Taro, 4,076,588, Cl. 195-36.00C.

Kondratenko, Feofan Ilich: *See—*
Chuply, Vladimir Yakovlevich; Vojuta, Leonty Feofanovich; Kondratenko, Feofan Ilich; Poludnenko, Jury Zakharovich; Milach, Adam Arsentievich; Kobozev, Vladimir Nikolaevich; and Turchenko, Alexandr Vasilievich, 4,076,087, Cl. 175-334.000.

Konicek, Jiri K.: *See—*
Malm, Hans R.; Nilsson, Peter J.; and Konicek, Jiri K., 4,075,757, Cl. 29-625.000.

Konishi Co., Ltd.: *See—*
Nagasawa, Shigeru; and Okitsu, Toshinao, 4,075,830, Cl. 260-18.00N.

Konkhina, Ljudmila Alexeevna: *See—*
Berlin, Alfred Anisimovich; Brikenshtein, Khaim-Mordkhe Aronovich; Gavrjushenko, Nikolai Sviridovich; Dubovitsky, Fedor Ivanovich; Kefeli, Tamara Yakovlevna; Kronman, Raisa Vasilievna; Konkhina, Ljudmila Alexeevna; Marshavina, Natalya Lvovna; Popova, Galina Leonidovna; Radugina, Anna Alexandrovna; Sivergin, Jury Mikhailovich; Sumin, Iosif Grigorievich; Tvorogov, Nikolai Nikandrovich; Shilova, Galina Pavlovna; and Kardashov, David Alexeevich, 4,076,742, Cl. 260-47.0UA.

Kono, Tateomi; and Kuwako, Takashi, to Minolta Camera Kabushiki Kaisha. Photoreceptor drum for use in electrophotographic copying apparatus. 4,076,410, Cl. 355-16.000.

Koponen, Martti: *See—*
Koski, Erkki; Veijonen, Lassi; and Koponen, Martti, 4,075,768, Cl. 34-116.000.

Kopp, Karl: *See—*
Wacker, Erich; Hofmann, Heinz; Kopp, Karl; Bauer, Hermann; von Ey, Volker; and Weiss, Franz, 4,075,934, Cl. 92-159.000.

Korenblit, Shalom. Easy chairs. 4,076,303, Cl. 297-30.000.

Korsgaard, Jens. Method and apparatus for binding a book. 4,075,726, Cl. 11-1.00R.

Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Krasnov, Alexandr Petrovich; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradova, Olga Vladimirovna; Mamatsashvili, Georgy Viktorovich; Pavlova, Saga-Silviya Alexandrovna; Gribkova, Pelageya Nikolaevna; Bekasova, Nina Ivanovna; Komarova, Ljudmila Grigorievna; Vorobiev, Vladimir Dmitrievich; Vlasova, Irina Vladimirovna; and Vinogradov, Alexandr Vasilievich. Composition for antifriction material. 4,076,634, Cl. 252-12.000.

Kosiolek, Klaus Peter: *See—*
Diesinger, Walter Helmut; and Kosiolek, Klaus Peter, 4,075,832, Cl. 60-245.000.

Koski, Erkki; Veijonen, Lassi; and Koponen, Martti, to Valmet Oy. Multicylinder dryer. 4,075,768, Cl. 34-116.000.

Kotten Machine Co. of Calif. Inc.: *See—*
Marano, John Francis, 4,076,480, Cl. 425-364.00B.

Kovitch, Frank J.: *See—*
Herbert, John T.; Kovitch, Frank J.; and Sullivan, Paul E., 4,076,284, Cl. 285-263.000.

Koyama, Tsuneo: *See—*
Kaneda, Kunihiro; Kida, Masashi; Nakayama, Akihiko; Kanazawa, Atsushi; Kaido, Hiroyuki; Mizumoto, Yasuhiro; and Koyama, Tsuneo, 4,076,668, Cl. 260-23.70M.

Koyama, Yasujiro; Kitani, Fukuichi; and Nishi, Masaaki, to Nippon Kokan Kabushiki Kaisha. Refractory checkerwork. 4,075,812, Cl. 52-747.000.

Kracklauer, John J., to Syntex (U.S.A.) Inc. Polyurethane smoke suppression additive. 4,076,657, Cl. 260-2.5AJ.

Kraftwerk Union Aktiengesellschaft: *See—*
Michel, Rupprecht, 4,075,979, Cl. 122-235.00A.

Krahe, James B., to American Sterilizer Company. Inflatable pouch to seal. 4,075,787, Cl. 49-209.000.

Kramer, Manfred, to Robert Bosch GmbH. Fuel injection system. 4,075,995, Cl. 123-139.0AW.

Krasnov, Alexandr Petrovich: *See—*
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Krasnov, Alexandr Petrovich; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradova, Olga Vladimirovna; Mamatsashvili, Georgy Viktorovich; Pavlova, Saga-Silviya Alexandrovna; Gribkova, Pelageya Nikolaevna; Bekasova, Nina Ivanovna; Komarova, Ljudmila Grigorievna; Vorobiev, Vladimir Dmitrievich; Vlasova, Irina Vladimirovna; and Vinogradov, Alexandr Vasilievich, 4,076,634, Cl. 252-12.000.

Krauss, Heinz; Kauhl, Gunther; and Steinke, Leo, to Robert Bosch GmbH. Electrical on-off-starting operation control system for engines requiring pre-heat time, such as automotive Diesel engines. 4,075,998, Cl. 123-179.00H.

Krausz, Howard I. Brake assembly for skateboard. 4,076,266, Cl. 280-87.04A.

Krechel, Joseph L.; and Purvis, Michael J., to Control Devices, Incorporated. Ball valve. 4,076,211, Cl. 251-286.000.

Kreider, Eunice M., to G. D. Searle & Co. Derivatives of 1-(3-cyano-3,3-diphenylpropyl)-4-phenylpiperidine-4-carboxylic acid. 4,076,717, Cl. 260-293.750.

Kreidler, Alfred, to Metall-Invent S.A. Method of and device for making rods, tubes and profiled articles. 4,075,881, Cl. 72-270.000.

Kress, Dieter; and Haberle, Friedrich, to MAPAL Fabrik fur Prazisionswerkzeuge Dr. Kress KG. Multiple blade reamer. 4,076,445, Cl. 408-226.000.

Kring, Elbert Victor, to Du Pont de Nemours, E. I., and Company. Electrochemical gas electrode. 4,076,899, Cl. 429-42.000.

Krogmann, Uwe; and Wurditsch, Uwe, to Bodenseewerk Geratetechnik GmbH. Device for determining the north direction. 4,075,764, Cl. 33-324.000.

Krohn, David A.: *See—*
Deeg, Emil W.; and Krohn, David A., 4,076,395, Cl. 351-165.000.

Krohn, Dennis G.: *See—*
Kirchgessner, Edwin M.; and Krohn, Dennis G., 4,075,984, Cl. 123-41.540.

Krongauz, Evgenia Semenovna: *See—*
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Krasnov, Alexandr Petrovich; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradova, Olga Vladimirovna; Mamatsashvili, Georgy Viktorovich; Pavlova, Saga-Silviya Alexandrovna; Gribkova, Pelageya Nikolaevna; Bekasova, Nina Ivanovna; Komarova, Ljudmila Grigorievna; Vorobiev, Vladimir Dmitrievich; Vlasova, Irina Vladimirovna; and Vinogradov, Alexandr Vasilievich, 4,076,634, Cl. 252-12.000.

Kronman, Raisa Vasilievna: *See—*
Berlin, Alfred Anisimovich; Brikenshtein, Khaim-Mordkhe Aronovich; Gavrjushenko, Nikolai Sviridovich; Dubovitsky, Fedor Ivanovich; Kefeli, Tamara Yakovlevna; Kronman, Raisa Vasilievna; Konkhina, Ljudmila Alexeevna; Marshavina, Natalya Lvovna; Popova, Galina Leonidovna; Radugina, Anna Alexandrovna; Sivergin, Jury Mikhailovich; Sumin, Iosif Grigorievich; Tvorogov, Nikolai Nikandrovich; Shilova, Galina Pavlovna; and Kardashov, David Alexeevich, 4,076,742, Cl. 260-47.0UA.

Kroth, Neil W., to Caterpillar Tractor Co. Fluid brake system for a vehicle. 4,076,323, Cl. 303-6.00R.

Kroth, Neil W., to Caterpillar Tractor Co. Brake system. 4,076,324, Cl. 303-6.00R.

Krusche, Alfred; and Drahtmuller, Hans Dieter, to Linde Aktiengesellschaft. Drive and steering arrangement for a vehicle with differential-speed steering. 4,076,090, Cl. 180-6.480.

Kubat, Josef; and Berggren, Kenneth S. Process for the preparation of a multilayer film. 4,076,568, Cl. 156-229.000.

Kubo, Teruo: *See—*
Yazawa, Masahide; Kubo, Teruo; and Suzuki, Kunio, 4,076,782, Cl. 264-51.000.

Kucera, Joseph Benedict, to Lowell, Rudolph L., a part interest. Large round bale handling apparatus. 4,076,137, Cl. 214-394.000.

Kuck, Kermit T.: *See—*
Gusching, Nagle V.; and Kuck, Kermit T., 4,075,753, Cl. 29-568.000.

Kuckenburg, Heinz: *See—*
Kolbeck, Rainer; Kuckenburg, Heinz; and Schaffernicht, Klaus, 4,076,995, Cl. 313-446.000.

Kuehnle, Manfred Rudolf: *See—*
Talmage, Peter Guy; and Kuehnle, Manfred Rudolf, 4,076,406, Cl. 355-10.000.

Kuhn, Ernst: *See—*
Landert, Heinrich; Radau, Wolfgang; and Kuhn, Ernst, 4,076,215, Cl. 254-93.00R.

Kumazawa, Eitaro: *See—*
Kai, Fumindo; Kumazawa, Eitaro; and Ishioka, Yozo, 4,075,767, Cl. 34-92.000.

Kunkle, John Philip: *See—*
Olsson, Billy Erik; and Kunkle, John Philip, 4,076,355, Cl. 339-17.00C.

Kuno, Tadashi; Abe, Akihiko; and Shoji, Akito, to Honda Giken Kogyo Kabushiki Kaisha. Prechamber mounting for internal combustion engine. 4,076,001, Cl. 123-191.00S.

Kunz, Walter: *See—*
Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, 4,076,836, Cl. 424-285.000.

Kuo, Ted L. C., to Thomas & Betts Corporation. Wiring device. 4,076,364, Cl. 339-103.00R.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Murayama, Naohiro; Nakamura, Kenichi; Fukuda, Makoto; Sakagami, Teruo; and Suzuki, Shirou, 4,076,604, Cl. 204-98.000.
Sasaki, Tohru; Terasaki, Syuuzi; and Ichii, Takao, 4,076,889, Cl. 428-333.000.

Kuroda, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Method of forming electrode wirings in semiconductor devices. 4,076,860, Cl. 427-91.000.

Kuroda, Nobuyuki: *See—*
Matsuura, Kazuo; Matsuzaki, Masaomi; Oshimi, Fumiaki; Kuroda, Nobuyuki; and Miyoshi, Mituji, 4,076,923, Cl. 526-97.000.

Kutniewski, Donald F.: *See—*
Clayton, William J.; Olson, Robert H.; and Kutniewski, Donald F., 4,076,121, Cl. 206-390.000.

Kutsch, Howard James: *See—*
Anolick, Colin; and Kutsch, Howard James, 4,076,226, Cl. 267-139.000.

Kutzner, Willi Albert Peter; and Schneider, Georg, to Koenig & Bauer Aktiengesellschaft. Apparatus for trimming signatures. 4,076,231, Cl. 270-21.000.

Kuwakado, Satosi; Kasagi, Takao; and Takei, Toshihiro, to Nippon Soken, Inc.; and Arakawa Autobody Co., Ltd. Gas column type air bag system. 4,076,277, Cl. 280-738.000.

Kuwako, Takashi: *See—*
Kono, Tateomi; and Kuwako, Takashi, 4,076,410, Cl. 355-16.000.

Kvam, Donald C.: *See—*
Harrington, Joseph Kenneth; Kvam, Donald C.; Mendel, Arthur; and Robertson, Jerry E., 4,076,519, Cl. 71-103.000.

L. E. Sauer Machine Company: *See—*
Sauer, Louis E., 4,075,918, Cl. 83-659.000.

Lachnit-Fixson, Ursula; and Neumann, Friedmund, to Schering Aktiengesellschaft. Novel agents and methods for treatment of climacteric disturbances. 4,076,811, Cl. 424-239.000.

Lacon, John W., to Fiberglas Canada Ltd. Apparatus for forming articles of fibrous materials. 4,076,479, Cl. 425-301.000.

L'Agence Nationale de Valorisation de la Recherech (ANVAR): *See—*
Lehn, Jean-Marie, 4,076,724, Cl. 260-338.000.

Lagodka, Gunter: *See—*
Elsner, Burckhardt; Lagodka, Gunter; Plevak, Lubomir; and Rosenberg, Harry, 4,075,857, Cl. 61-45.00D.

Lagow, Richard J., to Massachusetts Institute of Technology. Fluorinated functionalized polymers. 4,076,916, Cl. 526-43.000.

Laizerovich, David: *See—*
Avakian, Emik A.; and Laizerovich, David, 4,077,036, Cl. 340-365.00S.

Lamarque, Etienne: *See—*
Deffayet, Jean; and Lamarque, Etienne, 4,075,946, Cl. 102-52.000.

Lamb, Frank; Combey, Malcolm; and Cooper, Hugh Melvin, to Ciba-Geigy AG. Plasticized polymers of vinyl acetate. 4,076,678, Cl. 260-31.600.

Lampelzammer, Helga: *See—*
Huber, Peter; Lampelzammer, Helga; Pirson, Ewald; and Wimmer, Franz, 4,076,672, Cl. 260-29.20M.

Lancaster Research and Development Corporation: *See—*
Geschwender, Robert C., 4,076,880, Cl. 428-116.000.

Landau, Frederick W.: *See—*
Stewart, Thomas; and Landau, Frederick W., 4,076,950, Cl. 560-218.000.

Landert, Heinrich; Radau, Wolfgang; and Kuhn, Ernst, to Landert - Motoren A.G. Electrohydraulic drawing apparatus, particularly a hoist. 4,076,215, Cl. 254-93.00R.

Landert - Motoren A.G.: *See—*
Landert, Heinrich; Radau, Wolfgang; and Kuhn, Ernst, 4,076,215, Cl. 254-93.00R.

Landon, Richard D.: *See—*
Houx, James R., Jr.; Landon, Richard D.; and Lindahl, Paul A., Jr., 4,076,771, Cl. 261-159.000.

Landow Consulting Associates, Inc.: *See—*
Landow, Herbert T., 4,076,134, Cl. 214-38.00B.

Landow, Herbert T., to Landow Consulting Associates, Inc. Wheeled ramp loading and unloading apparatus. 4,076,134, Cl. 214-38.00B.

Landsinger, Edmund Emil; Chang, Richard Shih-Teng; and Gross, William Joseph, to Mattel, Inc. Toy simulating a calculator. 4,075,771, Cl. 35-31.00R.

Langley, Robert C.; and Abrash, Muriel, to Engelhard Minerals & Chemicals Corporation. Electrical circuit element comprising thick film resistor bonded to conductor. 4,076,894, Cl. 428-428.000.

LaRos Equipment Company, Inc.: *See—*
Rossio, John H., 4,076,478, Cl. 425-215.000.

Larsen, Peder, to Danfoss A/S. Cut-off valve for oil firing installations. 4,076,042, Cl. 137-494.000.

Larson, Milton I.: *See—*
Anderson, Walter J., 4,076,080, Cl. 172-804.000.

Larson, Scott E. Insulated bottle container having a bottle support as one part. 4,076,139, Cl. 215-11.00C.

Larsson, Hans Folke: *See—*
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Lasch, Frank J. System for rendering a moored hull self-bailing. 4,075,965, Cl. 114-49.000.

Latasiewicz, Leonard; and Stultz, Peter Franklin, to Motorola, Inc. Mounting arrangement for chassis and printed circuit board with method of assembly. 4,076,165, Cl. 228-136.000.

Latham, Raymond E. Fastener tensioning apparatus. 4,075,923, Cl. 85-1.00T.

Laundon, Brian, to Glaxo Laboratories Limited. 7β-(2-Aryl-2-hydroxyiminoacetamido)ceph-3-em-4-carboxylic acids carrying a 7α-lower alkoxy substituent. 4,076,936, Cl. 544-21.000.

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Brossel, Maurice; Laurent, Gilbert; and Bertannier, Daniel, 4,076,885, Cl. 428-286.000.

Lausberg, Johannes Willebrordes; and Downton, Denys Edward, to Gibson Chemicals International Pty. Limited. Dishwashers and detergent dispensers. 4,076,146, Cl. 222-52.000.

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Sullivan, Dwayne, 4,076,305, Cl. 297-157.000.

Lawson, Nelson E., to Union Camp Corporation. Polyacrylate reaction products. 4,076,665, Cl. 260-22.0CB.

Lawyer, Russell R.: *See—*
Clay, Frank M.; Moran, Leland G.; and Lawyer, Russell R., 4,076,781, Cl. 264-40.700.

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Chekirda, Russell F.; and Murphy, Randall T., 4,076,309, Cl. 297-363.000.

LeBegue, Maurice K., to National Mine Service Company. Continuous mining machine with laterally movable cutter drum member. 4,076,316, Cl. 299-64.000.

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Smith, Robert L.; and Lee, Ta-Jyh, 4,076,942, Cl. 548-336.000.

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Connery, James Gerard; Muly, Emil Christopher; and Taylor, Robert Morgan, 4,076,596, Cl. 204-1.00T.

Lefebvre, Jean; and Pichouron, Jean-Claude, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Low-pressure diecasting machine. 4,076,070, Cl. 164-303.000.

Legoy, Auguste; and Legoy, Claude. Sealing device for rotary machines containing hydraulic fluid. 4,076,260, Cl. 277-25.000.

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Legoy, Auguste; and Legoy, Claude, 4,076,260, Cl. 277-25.000.
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Kistner, Hermann; and Lehmann, Gunthart, 4,075,917, Cl. 83-422.000.
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Lehn, Jean-Marie, to L'Agence Nationale de Valorisation de la Recherech (ANVAR). Polycyclic macrocyclic compounds. 4,076,724, Cl. 260-338.000.
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Leiber, Heinz, to Robert Bosch GmbH. Detecting apparatus for a lock prevention system for detecting wear of vehicle brakes. 4,076,330, Cl. 303-92.000.
Leker, Richard E. Hydraulic transmission. 4,075,843, Cl. 60-487.000.
Leman, Arthur L. Stretch seal valve. 4,076,212, Cl. 251-332.000.
LeMay, Christopher Archibald Gordon, to EMI Limited. Computerized tomographic scanner with beam distribution control. 4,076,985, Cl. 250-445.00T.
Le Mehaute, Alain; and Bordet, Philippe, to Compagnie Generale d'Electricite S.A. Sodium-sulphur type electric cell. 4,076,900, Cl. 429-49.000.
Lemelson, Jerome H. Helmate. 4,075,717, Cl. 2-412.000.
Lemelson, Jerome H. Building insulation system and method. 4,075,799, Cl. 52-169.500.
Leo Pharmaceutical Products Ltd. A/S: *See—*
Tybring, Leif, 4,076,816, Cl. 424-251.000.
Leonov, Boris Ivanovich: *See—*
Gromov, Jury Vasilievich; Leonov, Boris Ivanovich; Smirnov, Oleg Petrovich; Smirnov, Nikolai Nikolaevich; Nagornaya, Ljudmila Lavrentievna; and Zakharin, Yakov Abramovich, 4,076,984, Cl. 250-367.000.
Lepicard, Georges: *See—*
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Lerich, Lester, to Wej-It Expansion Products, Inc. Spring action expansion bolt. 4,075,925, Cl. 85-64.000.
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Les Fils d'Auguste Scheuchzer S.A.: *See—*
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Lester, David; and Alexander, Robert R., to Polymerics, Inc. Polymeric molding composition. 4,076,547, Cl. 106-109.000.
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Levenson, Harold S.: *See—*
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Davies, Charles Bloor; Davies, James Francis; and Neillie, William Frederick Soutar, 4,076,653, Cl. 252-532.000.
Levine, Fred. Multi-use motor mount. 4,076,196, Cl. 248-14.000.
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Lewicki, Stephen; Lewicki, Gregory David; and Lewicki, Stephen Jon, 4,076,872, Cl. 428-12.000.
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Lewicki, Walter J., Jr.; and McQuate, William M., to Armstrong Cork Company. Multilevel embossing of foamed-sheet materials. 4,076,867, Cl. 427-264.000.
Lewis, Paul R., to Aluminum Company of America. Tear-off closure with entrapped pull-ring. 4,076,141, Cl. 215-254.000.
Li, Yao Tzu, to Massachusetts Institute of Technology. Thermal engine with entrapped working medium. 4,075,846, Cl. 60-527.000.
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Klank, Otto; and Rottmann, Dieter, 4,077,009, Cl. 325-455.000.
Kolbeck, Rainer; Kuckenburg, Heinz; and Schaffernicht, Klaus, 4,076,995, Cl. 313-446.000.
Lie, Bjorn: *See—*
Dorph, Thor, 4,076,185, Cl. 242-118.410.
Lie, Gina: *See—*
Dorph, Thor, 4,076,185, Cl. 242-118.410.
Lifshits, Viktor Senderovich; Sukhanov, Alexandr Alexandrovich; Dergachev, Nikolai Makarovich; Pevnev, Arkady Alexeevich; Baranov, Vladimir Nikitich; and Shklyanov, Leonid Pavlovich. Resistance type flash butt welder. 4,076,973, Cl. 219-97.000.
Light, Kenneth K.; Sanders, James Milton; Vock, Manfred Hugo; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja Dulal; Tseng, Ching Y.; and Sprecker, Mark A., to International Flavors & Fragrances Inc. Flavoring with substituted norbornane derivatives. 4,076,853, Cl. 426-538.000.
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Lill, Deryl L. Metric system teaching and measuring device. 4,075,770, Cl. 35-30.000.
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Lind, Thomas Peter, to Singer Company, The. Apparatus for rapidly determining the trigonometric functions of an input angle. 4,077,063, Cl. 364-729.000.
Lindahl, Paul A., Jr.: *See—*
Houx, James R., Jr.; Landon, Richard D.; and Lindahl, Paul A., Jr., 4,076,771, Cl. 261-159.000.
Lindberg, Per Lennart: *See—*
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Linde Aktiengesellschaft: *See—*
Krusche, Alfred; and Drahtmuller, Hans Dieter, 4,076,090, Cl. 180-6.480.
Linder, Ernst; Wossner, Gunter; Maurer, Helmut; and Rieger, Franz, to Robert Bosch GmbH. Method and apparatus for reducing the toxic components in exhaust gas. 4,075,992, Cl. 123-119.00A.
Linder, Rolf. Method and an electrically heated device for producing molten metal from powders or lumps of metal oxides. 4,076,954, Cl. 13-9.00R.
Lindstaedt, Robert F. Conduit reamer. 4,076,446, Cl. 408-227.000.
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Thyberger, Filip Bertil; and Lindstrom, Kurt Olle Ragnvald, 4,075,861, Cl. 61-105.000.
Lindstrom, Olle B., to AB Olle Lindstrom. Alkaline lead battery. 4,076,909, Cl. 429-207.000.
Linebaugh, David T. Marionette actuation. 4,075,780, Cl. 46-13.000.
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Lipscomb, Willis Leonard. Articulated skateboard. 4,076,267, Cl. 280-87.04A.
Lisnay, Albert D., to Heinemann Electric Company. Multi-pole circuit breaker. 4,077,024, Cl. 335-8.000.
Little, Clayton D.; and Machmeier, Paul M., to General Dynamics Corporation. High strength fracture resistant weldable steels. 4,076,525, Cl. 75-128.00B.
Littlefield, Herrick B., to Polyproducts Corporation. Combined sealing and pouring spout assembly. 4,076,151, Cl. 222-525.000.
Litz, Donald C., to Westinghouse Electric Corporation. Superconducting dynamoelectric machine having a liquid metal shield. 4,076,988, Cl. 310-52.000.
Liu, Wai-Min: *See—*
Bennett, Harold F.; and Liu, Wai-Min, 4,076,388, Cl. 350-187.000.
Liu, William Y. Food shredding and dicing machine. 4,076,180, Cl. 241-154.000.
Lodewyk, Eric, to Syntex (U.S.A.) Inc. Process for calcium salts α-ketocarboxylic acids. 4,076,745, Cl. 260-526.00R.
Logerot, Bernard Andre: *See—*
Pechard, Lucien Leon; and Logerot, Bernard Andre, 4,076,363, Cl. 339-91.00R.
Lois, Lambros. Apparatus for extracting energy from winds at significant height above the surface. 4,076,190, Cl. 244-153.00R.
Lord, John G.: *See—*
Carver, Herbert K., Jr.; Chant, Albert H.; Hall, James F.; Hansen, Omar, Jr.; and Lord, John G., 4,075,815, Cl. 53-32.000.
L'Oreal: *See—*
Papantoniou, Christos; and Grognet, Jean-Claude, 4,076,912, Cl. 526-16.000.
Lorenz, Erika, heiress: *See—*
Lorenz, Walter, deceased; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 4,076,806, Cl. 424-200.000.
Lorenz, Leo J.; and Stanek, Gary C., to Massey-Ferguson Inc. Grille mounting apparatus. 4,076,092, Cl. 180-68.00P.
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Loschilin, Evgeny Dmitrievich: *See—*
Zabotin, Alexandr Alexandrovich; Loschilin, Evgeny Dmitrievich; Onikov, Eduard Arshakovich; Galperin, Alexandr Lvovich; Santucci, Nicola; and Corain, Luciano, 4,076,051, Cl. 139-436.000.
Lovick, James S. Veterinary appliance. 4,076,020, Cl. 128-98.000.
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Lubarsky, Andre, Jr.; Warner, G. Scott; and Tahara, Goro R., to Telecommunications Technology, Inc. Switching system having a central controller for accessing individual telephone circuits for testing. 4,076,970, Cl. 179-175.20R.
Lucas Electrical Co., Limited: *See—*
Hill, William Frank, 4,075,997, Cl. 123-148.00E.

Lucas, Gary M.: *See—*
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Lui, Albert S.; and Arbab, Majid, to NCR Corporation. Error checking and correcting device. 4,077,028, Cl. 340-146.1AL.
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Maass, Alfred Roland, to SmithKline Corporation. Uricosuric composition and method of producing uricosuria and hypouricemia. 4,076,839, Cl. 424-317.000.
Mabry, Patricia D. Needlework technique using ribbon. 4,075,962, Cl. 112-439.000.
Machmeier, Paul M.: *See—*
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Macmillan, Kenneth T. Retread mold with locking means. 4,076,473, Cl. 425-19.000.
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Madsen, Trygve T.: *See—*
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Maehara, Naoyoshi; Fujieda, Hiroshi; and Saka, Tatsuo, to Matsushita Electric Industrial Co., Ltd. Power supplier for magnetron. 4,076,996, Cl. 315-106.000.
Maffrand, Jean-Pierre, to Parcor. Thieno-pyridine derivatives and therapeutic composition containing same. 4,076,819, Cl. 424-256.000.
Magdefrau, Herbert: *See—*
Brammer, Hartmut; Ehrmann, Karl; Haug, Heinz; Issler, Jorg; Kas, Gunter; Kalippke, Harald; Magdefrau, Herbert; and Schneider, Karl-Heinz, 4,075,752, Cl. 29-434.000.
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Mahl, Harry L., Jr.; and Clark, Franklin D., to W. R. Grace & Co. Process for prilling ammonium nitrate. 4,076,773, Cl. 264-3.00E.
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Malm, Hans R.; Nilsson, Peter J.; and Konicek, Jiri K., to Perstorp AB. Process in the production of a multilayer printed board. 4,075,757, Cl. 29-625.000.
Mamatsashvili, Georgy Viktorovich: *See—*
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Krasnov, Alexandr Petrovich; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradova, Olga Vladimirovna; Mamatsashvili, Georgy Viktorovich; Pavlova, Saga-Silviya Alexandrovna; Gribkova, Pelageya Nikolaevna; Bekasova, Nina Ivanovna; Komarova, Ljudmila Grigorievna; Vorobiev, Vladimir Dmitrievich; Vlasova, Irina Vladimirovna; and Vinogradov, Alexandr Vasilievich, 4,076,634, Cl. 252-12.000.
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MAPAL Fabrik fur Prazisionswerkzeuge Dr. Kress KG: *See—*
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Mar, John; Garrett, Todd; and Jacques, Petrus, to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Sonobuoy casing. 4,075,725, Cl. 9-8.00R.
Marano, John Francis, to Kotten Machine Co. of Calif. Inc. Mandrel design for bagel making machine. 4,076,480, Cl. 425-364.00B.
Marcaccioli, Enzo: *See—*
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Marforio, Nerino, to Rockwell-Rimoldi S.p.A. Workpiece guide for sewing machines. 4,075,957, Cl. 112-153.000.
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Mark, John Thomas, to RCA Corporation. Vacuum tube grid structures of phosmic bronze having copper and copper alloy conical supports. 4,076,992, Cl. 313-296.000.
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Houx, James R., Jr.; Landon, Richard D.; and Lindahl, Paul A., Jr., 4,076,771, Cl. 261-159.000.
Marseillan, Jorge. Panel forms having panel reinforcing means. 4,076,206, Cl. 249-44.000.
Marsh, Robert Anthony; Mackie, Gordon John; and Hale, Peter, to Procter & Gamble Company, The. Protein-containing detergent compositions for protecting keratinous materials. 4,076,800, Cl. 424-70.000.
Marshall, Hamilton W., Jr.: *See—*
Atwood, John G.; DeMey, Charles F., III; Marshall, Hamilton W., Jr.; and Ducret, Lucien C., 4,076,503, Cl. 23-259.000.
Marshavina, Natalya Lvovna: *See—*
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Marta, Henry A.; Mels, Kenneth D.; Garg, Vijay K.; and Miller, Albert J., to General Motors Corporation. Railway locomotive truck with resilient suspension. 4,075,950, Cl. 105-197.00A.
Martin, James C.: *See—*
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Cammarata, Frank, III; Miller, Joe Alan; and Martin, Jerry D., 4,076,063, Cl. 150-.500.
Martin Marietta Corporation: *See—*
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Martinek, Thomas W., to Teepak, Inc. Method and apparatus for making end closures for shirred casing sticks. 4,075,938, Cl. 9.3-84.0TW.
Martinez, Felix Jesus, to Erika, Inc. Resealable device for repeated access to conduit lumens. 4,076,023, Cl. 128-214.00R.
Martinez, Felix Jesus, to Erika, Inc. Laminar flow connector for conduits. 4,076,285, Cl. 285-332.000.
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Marvin Glass & Associates: *See—*
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Marvin, Larry E.: *See—*
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Mas, Louis, to Societe de Recherches Techniques et Industrielles. Electrolysis apparatus. 4,076,609, Cl. 204-258.000.
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Kistner, Hermann; and Lehmann, Gunthart, 4,075,917, Cl. 83-422.000.
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Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
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Masonite Corporation: *See—*
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Mastrangelo, Sebastian V. R.: *See—*
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Mastronuzzi, Carl T., Jr.: *See—*
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Masuda, Jun: *See—*
Satoh, Akihiro; Takahashi, Akio; Masuda, Jun; Harada, Masato; and Yamada, Sadahiko, 4,076,922, Cl. 526-97.000.
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Mateos, Jose Luis; Noriega, Luis; Huettemann, Richard E.; and Kanojia, Ramesh M., to Ortho Pharmaceutical Corporation. Uteroevacuant extracts from plant substances. 4,076,805, Cl. 424-195.000.
Mathis, Joseph Richard, to International Business Machines Corporation. Uncertain interval timer using a variable length shift register. 4,077,011, Cl. 328-129.000.
Matsuda, Ken; and Tsu, Kin Hsueh-Yuan, to American Cyanamid Company. Process for hydration of acrylonitrile to produce acrylamide. 4,076,747, Cl. 260-561.00N.
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Matsushita Electric Works, Ltd.: *See—*
Azuma, Tomisaburo; Ichimaru, Kazuto; Tateno, Kouichi; and Murakami, Takeru, 4,076,545, Cl. 423-544.000.
Matsuura, Kazuo; Matsuzaki, Masaomi; Oshimi, Fumiaki; Kuroda, Nobuyuki; and Miyoshi, Mituji, to Nippon Oil Company, Limited. Process for preparing polyolefins. 4,076,923, Cl. 526-97.000.
Matsuzaki, Masaomi: *See—*
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Bass, Sidney; and St. Pierre, Raymond Marie, 4,075,955, Cl. 112-79.00R.
Landsinger, Edmund Emil; Chang, Richard Shih-Teng; and Gross, William Joseph, 4,075,771, Cl. 35-31.00R.
Mattson, John P. Solar energy collector. 4,076,015, Cl. 126-271.000.
Maulding, Donald Roy, to American Cyanamid Company. Process for manufacturing crystal violet lactone. 4,076,728, Cl. 260-343.400.
Maurer, Helmut: *See—*
Linder, Ernst; Wossner, Gunter; Maurer, Helmut; and Rieger, Franz, 4,075,992, Cl. 123-119.00A.
Max Co., Ltd.: *See—*
Nakazato, Takashi; Sawada, Chikamitsu; Umino, Shigeyuki; and Takatsuru, Mitsuhiro, 4,075,850, Cl. 60-633.000.
Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See—*
Braun, Werner; Decker, Gernot; and Rohr, Horst, 4,076,371, Cl. 350-3.610.
De Maeyer, Leo C. M.; Rabl, Carl-Roland; Jovin, Thomas M.; Riesner, Detlev; Rigler, Rudolf; Veil, Lutz Bodo; and Lehrach, Hans, 4,076,420, Cl. 356-73.000.
May, John Walter: *See—*
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Mayer, Edward A.; and Plungis, Donald W., to Texaco Inc. Internal combustion engine operation utilizing exhaust gas recirculation. 4,075,994, Cl. 123-119.00A.
Mazurkevich, Alexandr Borisovich: *See—*
Barannik, Ivan Andreevich; Kachurka, Alexandr Nikolaevich; Zharovsky, Ivan Vasilievich; Trukhin, Alexandr Fedorovich; Raskatov, Viktor Georgievich; and Mazurkevich, Alexandr Borisovich, 4,076,472, Cl. 425-8.000.
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Mazzolla, Richard, to H & G Industries, Inc. Positive cam lock for extension pole. 4,076,437, Cl. 403-350.000.
McCloskey, Albert R., to Heim Universal Inc. Spherical bearing assembly with insert member. 4,076,343, Cl. 308-72.000.
McClure, Troy A. Rotary engine with separable abutment and adjustable valve cam. 4,076,471, Cl. 418-143.000.
McConnell, Kennedy, to Interlake, Inc. Shim for rack column. 4,076,202, Cl. 248-188.200.
McCracken, Stephen R.: *See—*
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McDonald, Harold, to Stauffer Chemical Company. Catalyst system for flame retardant finishing. 4,076,650, Cl. 252-440.000.
McDonnell, Thomas M. Wall shelf arrangement. 4,076,203, Cl. 248-247.000.
McFarland, Paula M. Device for handling cake layers. 4,076,297, Cl. 294-7.000.
McGann, Rodney, to Texaco Inc. Process for production of purified and humidified fuel gas. 4,075,831, Cl. 60-39.050.
McKenna, David: *See—*
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McMahan, Roy F., Jr.: *See—*
McMahan, Roy F., Sr., 4,076,346, Cl. 308-237.00R.
McMahan, Roy F., Sr., to McMahan, Roy F., Jr.; and McMahan, William L. Face-to-face plate-type swivel. 4,076,346, Cl. 308-237.00R.
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McQuate, William M.: *See—*
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McSherry, Thomas W.; and Thaw, Allan, to Mechanical Plastics Corporation. Anchor assembly for fastener. 4,075,924, Cl. 85-3.00R.
McVey, Charles I., to General Electric Company. Nb or Ta coated with fired Zr-Mo for metal-ceramic seals. 4,076,898, Cl. 428-553.000.
Mechanical Plastics Corporation: *See—*
McSherry, Thomas W.; and Thaw, Allan, 4,075,924, Cl. 85-3.00R.
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Medley, Ronald D.; and Chapman, James R., to Cosden Technology, Inc. Process for the production of a multiple layer laminate. 4,076,570, Cl. 156-244.000.
Meek, Lennis E., to Dayco Corporation. Antifriction nylon member. 4,076,347, Cl. 308-238.000.
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Meier, Joseph F.; and Smith, James D. B., to Union Carbide Corporation. High strength cast modules for supporting reverse osmosis membranes. 4,076,626, Cl. 210-496.000.
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Inouye, Shigeharu; Shomura, Takashi; Kojima, Michio; Ogawa, Yasuaki; Watanabe, Hiroshi; Kondo, Yasumitsu; Saito, Kazuo, deceased; Yamada, Yujiro; and Niida, Taro, 4,076,588, Cl. 195-36.00C.
Meinke, Peter; and Huber, Wolfgang, to SKF Kugessagerfabriken GmbH; and Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Drive and bearing support for a disc-shaped rotor. 4,076,340, Cl. 308-10.000.
Meissner, Helmuth E.: *See—*
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Meldner, Volker Otto, to Wayss & Freytag Aktiengesellschaft. Tunnel construction and tunnel tubbing. 4,075,855, Cl. 61-45.00R.
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Mellqvist, Allan; and Anderberg, Thorild Nils Kristian Ewald. Apparatus for the supply of liquids in finely-divided form to an internal combustion engine. 4,076,002, Cl. 123-198.00A.
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Anderson, Paul S.; and Remy, David C., 4,076,714, Cl. 424-267.000.
Christensen, Burton A.; Morin, Robert B.; and Walton, Edward, 4,076,826, Cl. 424-272.000.
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Kaplan, Saul; Merianos, John J.; Green, Harold A.; and Petrocci, Alfonso N., 4,076,744, Cl. 260-501.190.
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Messner, John David: *See—*
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Meszaros, Laszlo A., to Martin Marietta Corporation. Dyed polyethylene terephthalate textile fibers with greenish blue shade. 4,076,498, Cl. 8-41.00C.
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Tinnes, Bernhard, 4,076,154, Cl. 222-600.000.
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Reh, Lothar; Schmidt, Hans-Werner; and Plass, Ludolf, 4,076,796, Cl. 423-659.000.
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Metco, Inc.: *See—*
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Mettig, Hermann; and Medenus, Bernhard, to Klockner-Humboldt-Deutz Aktiengesellschaft. Supercharged water cooled internal combustion engine. 4,075,991, Cl. 123-119.0CD.
Metz, Pierre, to Thomson-Brandt. Attitude-controlling system and a missile equipped with such a system. 4,076,187, Cl. 244-3.230.
Meyer, Leonard S. Target particularly for archery. 4,076,246, Cl. 273-102.00B.
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Michel, Basil J.; Morse, Gary P.; and Wilcox, Alfred L., to General Signal Corporation. Apparatus for the treatment of divided solid material. 4,075,766, Cl. 34-57.00D.
Michel, Rupprecht, to Kraftwerk Union Aktiengesellschaft. Assembly of a combustion chamber nose in a continuous-flow boiler having a two-section construction with gas-tightly welded walls. 4,075,979, Cl. 122-235.00A.
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Midrex Corporation: *See—*
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Milach, Adam Arsentievich: *See—*
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Milberger, Ernest C.: *See—*
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Miller, Joe Alan: *See—*
Cammarata, Frank, III; Miller, Joe Alan; and Martin, Jerry D., 4,076,063, Cl. 150-.500.
Millett, Dennis A., to Garrett Corporation, The. Pneumatic actuator system and method. 4,075,930, Cl. 91-361.000.
Millick, William H., III, to Hercofina. Hydrogenation of molten aldehydic dimethyl terephthalate. 4,076,946, Cl. 560-78.000.
Mills, Gordon D., to Olin Corporation. Method for controlling oxygen level during continuous xanthation of alkali cellulose. 4,076,934, Cl. 536-60.000.
Mills, Kenneth R., to Phillips Petroleum Company. Ultraviolet light stabilizer combination for polymers. 4,076,689, Cl. 260-45.75W.
Milner, David Lee; and Ripley, Ian Stanley, to Imperial Chemical Industries Limited. Polymerization catalyst comprising aluminum halide and an alcohol or ether. 4,076,926, Cl. 526-209.000.
Mims, Samuel S., to El Paso Products Company. Process for treatment of adipic acid mother liquor. 4,076,948, Cl. 560-191.000.
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Minnesota Mining and Manufacturing Company: *See—*
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Imura, Toshinori; Maeda, Keisuke; and Naya, Mikio, 4,077,042, Cl. 354-21.000.
Kono, Tateomi; and Kuwako, Takashi, 4,076,410, Cl. 355-16.000.
Nanba, Yasuhiro, 4,077,043, Cl. 354-51.000.
Minovitch, Michael A. Rapid transit system. 4,075,948, Cl. 104-138.00R.
Misercola, Douglas, to Empire Brushes, Inc. Vented hair brush. 4,076,032, Cl. 132-9.000.
Mista, Kresimir; and Gerstner-Stevens, Ditmar, to Karl Mayer Textilmaschinenfabrik GmbH. Thread testing apparatus for textile machines. 4,075,744, Cl. 28-224.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
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Iwasaki, Takeshi; Fujikawa, Yasuo; and Sasaki, Kunimasa, 4,075,890, Cl. 73-295.000.
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Clayton, William J.; Olson, Robert H.; and Kutniewski, Donald F., 4,076,121, Cl. 206-390.000.
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Finberg, Arne O., 4,076,655, Cl. 260-2.5HB.
Nnadi, John C., 4,076,636, Cl. 252-25.000.
Plank, Charles J.; Rosinski, Edward J.; and Rubin, Mae K., 4,076,842, Cl. 423-328.000.
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Moczygemba, George A.; and Hsieh, Henry L., to Phillips Petroleum Company. Treatment of coupled polymers prior to hydrogenation. 4,076,914, Cl. 526-25.000.
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Mohnach, Michael G.: *See—*
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Mohr, Walter, to Braun Aktiengesellschaft. Lighter with swingable actuator. 4,076,491, Cl. 431-130.000.
Molay, Ira, to Audiophonics Corporation. Portable sound device for public address. 4,076,957, Cl. 179-1.0AT.
Molick, Medea. Foundation aquaduct and expansion joint. 4,075,800, Cl. 52-169.500.
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Daisley, Robert Thomas; and Chumley, David Charles Philip, 4,076,115, Cl. 198-487.000.
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Owsley, Dennis C.; and Bloomfield, Jordan J., 4,076,758, Cl. 260-618.00R.
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Monsanto Research Corporation: *See—*
Opferkuch, Robert E., Jr.; and Wong-Chong, George M., 4,076,620, Cl. 210-45.000.
Montagu, Jean I., to General Scanning, Inc. Oscillation motor. 4,076,998, Cl. 318-132.000.
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Moody, Harold W., Jr.; Bulkley, Clifford T.; Gagnon, Joseph A. L. N.; and Fraser, Grover, to Dunham-Bush, Inc. Feedback control system for helical screw rotary compressors. 4,076,461, Cl. 417-310.000.
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Moore, Travis; and Niblock, Hugh David, to Uniroyal Limited. Golf balls. 4,076,255, Cl. 273-226.000.
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Moraschetti, Nando, to Volpi AG. Fiber-optic device with curved sleeve and filler matrix. 4,076,377, Cl. 350-96.250.
Moretti, Anthony L., to E. D. Bullard Company. Method of and means for shielding the lens of a face mask. 4,076,373, Cl. 350-61.000.
Morez, Gene S.; and Griffin, James F., to Norlin Music, Incorporated.

Audio power amplifier with automatic bias control. 4,077,013, Cl. 330-267.000.

Morgan, John Henry, to John Morgan Printing Machinery Ltd. Apparatus for reeling web- or strand-like material. 4,076,184, Cl. 242-75.300.

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Morikawa, Tadayuki: *See—*
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Morin, Robert B.: *See—*
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Morita, Takayuki: *See—*
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Morse, Gary P.: *See—*
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Motor Wheel Corporation: *See—*
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Davidson, John Richard, 4,076,997, Cl. 315-209.00T.
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Latasiewicz, Leonard; and Stultz, Peter Franklin, 4,076,165, Cl. 228-136.000.
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Moyer, Norman E., to Hughes Aircraft Company. Timing circuit for digital wristwatch. 4,075,826, Cl. 58-23.00R.

Mracek, Jaroslav; and Paek, Un-Chul, to Western Electric Co., Inc. Methods and apparatus for coating a filament. 4,076,510, Cl. 65-3.00A.

MTM Molded Products Co.: *See—*
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Mueller, James P.: *See—*
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Mueller, Larry G.: *See—*
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Muguruma, Yoshikata, to Shinpo Kogyo Kabushiki Kaisha. Swing-drive-vehicle. 4,076,269, Cl. 280-218.000.

Mukaemachi, Takuji; and Fukushima, Yutaka, to Hitachi, Ltd. Subscriber line testing system. 4,076,971, Cl. 179-175.30R.

Mulders, Julien: *See—*
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Muller, Walter: *See—*
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Mulvaney, James E.; and Rupp, Raymond W., to Sherwin-Williams Company, The. Photoconductive N-vinyl carbazole copolymers and process for preparing same. 4,076,526, Cl. 96-1.50R.

Muly, Emil Christopher: *See—*
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Murakami Kaimedio Co., Ltd.: *See—*
Suzuki, Toshiyuki; and Yamauchi, Fumio, 4,076,392, Cl. 350-289.000.

Murakami, Takeru: *See—*
Azuma, Tomisaburo; Ichimaru, Kazuto; Tateno, Kouichi; and Murakami, Takeru, 4,076,545, Cl. 423-544.000.

Murakami, Tomomi; Yoshida, Masaru; Kimura, Satoshi; Yasuda, Tetuya; and Iinuma, Yoshio, to Citizen Watch Co., Ltd. Electronic timepiece substratum. 4,075,825, Cl. 58-23.00R.

Murao, Kenji: *See—*
Nakano, Fumio; Yokokura, Hisao; and Murao, Kenji, 4,076,646, Cl. 252-299.000.

Murase, Shigeo: *See—*
Yamamoto, Toshio; Kamata, Jyoji; Murase, Shigeo; and Yamaguchi, Kouichirou, 4,076,073, Cl. 165-53.000.

Murayama, Keisuke; Asai, Motoji; and Tsuji, Hideakira, to Sankyo Company Limited. Ester of chrysanthemic acid, process for the preparation thereof and insecticidal compositions containing them. 4,076,835, Cl. 424-285.000.

Murayama, Naohiro; Nakamura, Kenichi; Fukuda, Makoto; Sakagami, Teruo; and Suzuki, Shirou, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for the electrolytic treatment of alkali halide. 4,076,604, Cl. 204-98.000.

Murbach, Warren J.; and Adicoff, Arnold, to United States of America, Navy. Large, nonplanar poly(methyl methacrylate) pre-holographic element. 4,076,772, Cl. 264-2.000.

Murdock Machine & Engineering Co.: *See—*
Herbert, John T.; Kovitch, Frank J.; and Sullivan, Paul E., 4,076,284, Cl. 285-263.000.

Murphy, Clarence Rhodes: *See—*
Boehme, Robert Emerson; and Murphy, Clarence Rhodes, 4,076,681, Cl. 260-33.6PQ.

Murphy, Randall T.: *See—*
Chekirda, Russell F.; and Murphy, Randall T., 4,076,309, Cl. 297-363.000.

Murphy, Richard F.: *See—*
Chierici, Osvaldo F.; and Murphy, Richard F., 4,075,951, Cl. 105-199.00C.

Murray, Lawrence E.: *See—*
Bishop, Burton DeWolfe; and Murray, Lawrence E., 4,076,104, Cl. 187-8.500.

Muska, Willis Martin; and Personick, Stewart David, to Bell Telephone Laboratories, Incorporated. Directional optical waveguide coupler and power tap arrangement. 4,076,375, Cl. 350-96.150.

Nagamatsu, Katsumi; and Saito, Takashi, to Canon Kabushiki Kaisha. Method of and apparatus for electronic color photography and photosensitive member used for the same. 4,076,404, Cl. 355-4.000.

Nagasawa, Masao, to Nippondenso Co., Ltd. Method for operating 2-cycle internal combustion engine. 4,075,989, Cl. 123-117.00R.

Nagasawa, Shigeru; and Okitsu, Toshinao, to Konishi Co., Ltd. Solid adhesive compositions. 4,075,830, Cl. 260-18.00N.

Nagase, Tosiro, to Tokico Ltd. Door closer. 4,075,734, Cl. 16-58.000.

Nagata, Masayoshi: *See—*
Takeda, Keiji; Matsumoto, Kenji; Tamura, Hiroshi; Nagata, Masayoshi; and Tsuboi, Masayoshi, 4,076,530, Cl. 96-29.00R.

Nagornaya, Ljudmila Lavrentievna: *See—*
Gromov, Jury Vasilievich; Leonov, Boris Ivanovich; Smirnov, Oleg Petrovich; Smirnov, Nikolai Nikolaevich; Nagornaya, Ljudmila Lavrentievna; and Zakharin, Yakov Abramovich, 4,076,984, Cl. 250-367.000.

Nakagawa, Isamu: *See—*
Wada, Masamichi; Nakagawa, Isamu; and Mizoguchi, Hiroshi, 4,076,354, Cl. 316-1.000.

Nakahara, Hiromi: *See—*
Furukawa, Masahiko; Ogawa, Hiroshi; Aonuma, Masashi; Tamai, Yasuo; Nakahara, Hiromi; and Igarashi, Masaaki, 4,076,861, Cl. 427-132.000.

Nakahara, Makoto; Fukuyama, Yoshiya; Sumiyoshi, Kazuo; and Akagane, Katsuo, to Sumitomo Chemical Company, Limited. Unsaturated epoxy ester resin. 4,076,765, Cl. 260-835.000.

Nakajima, Hiroyuki; and Hosokawa, Takashi, to Konan Electric Co., Ltd.; and Hosokawa, Takashi. Solenoid operated valve. 4,076,045, Cl. 137-625.650.

Nakamura, Akira: *See—*
Masuda, Fusayoshi; Nishida, Kazuo; and Nakamura, Akira, 4,076,663, Cl. 260-17.4GC.

Nakamura, Iwao, to Taiko Optical Kyogyo Kumiai. Hinges for a spectacle frame. 4,076,394, Cl. 351-153.000.

Nakamura, Kenichi: *See—*
Murayama, Naohiro; Nakamura, Kenichi; Fukuda, Makoto; Sakagami, Teruo; and Suzuki, Shirou, 4,076,604, Cl. 204-98.000.

Nakamura, Kotaro: *See—*
Ota, Satoshi; Nakamura, Kotaro; Sakai, Nobuo; Furutachi, Nobuo; and Yokota, Yukio, 4,076,533, Cl. 96-56.500.

Nakanishi, Hirokazu: *See—*
Katayama, Kazuhiko; Nishigaki, Masahiko; Ohtani, Akira; Tani, Nobutaka; Nishizawa, Minoru; and Nakanishi, Hirokazu, 4,076,951, Cl. 526-62.000.

Nakano, Fumio; Yokokura, Hisao; and Murao, Kenji, to Hitachi, Ltd. Liquid crystal composition for field effect display devices. 4,076,646, Cl. 252-299.000.

Nakaoka, Ichiro: *See—*
Suzuki, Shin; Matsumoto, Kazuo; and Nakaoka, Ichiro, 4,076,606, Cl. 204-157.10R.

Nakase, Takamichi: *See—*
Hattori, Tadashi; Nakase, Takamichi; and Yamaguchi, Hiroaki, 4,075,835, Cl. 60-276.000.

Nakashima, Katsutoshi; Kita, Toshio; Osawa, Ryuzo; and Hatanaka, Takashi, to Bridgestone Tire Company Limited. Method of mixing and kneading control of a rubber kneader. 4,076,220, Cl. 366-69.000.

Nakatsuka, Ryuzo; Suzuki, Setsuo; Tanimoto, Shinichi; and Funatsu, Eiji, to Sumitomo Bakelite Company Limited. Protein-starch binary molding composition and shaped articles obtained therefor. 4,076,846, Cl. 426-62.000.

Nakayama, Akihiko: *See—*
Kaneda, Kunihiro; Kida, Masashi; Nakayama, Akihiko; Kanazawa, Atsushi; Kaido, Hiroyuki; Mizumoto, Yasuhiro; and Koyama, Tsuneo, 4,076,668, Cl. 260-23.70M.

Nakazato, Takashi; Sawada, Chikamitsu; Umino, Shigeyuki; and Takatsuru, Mitsuhiro, to Max Co., Ltd. Striking tool. 4,075,850, Cl. 60-633.000.

Nalco Chemical Company: *See—*
Vartiak, Joseph F.; and Wortley, George E., 4,076,516, Cl. 71-66.000.

Nalick, David L. Dome construction method. 4,075,813, Cl. 52-747.000.

Namba Press Kogyo Kabushiki Kaisha: *See—*
Nanba, Kunio; and Ogawa, Taro, 4,076,307, Cl. 297-250.000.

Namiki, Kazuo: *See—*
Onoki, Fumio; Namiki, Kazuo; and Osora, Tetsuo, 4,076,863, Cl. 427-165.000.

Nanba, Kunio; and Ogawa, Taro, to Namba Press Kogyo Kabushiki Kaisha. Safety chair for a child for use in motor vehicles. 4,076,307, Cl. 297-250.000.

Nanba, Yasuhiro, to Minolta Camera Kabushiki Kaisha. Exposure indicating device. 4,077,043, Cl. 354-51.000.

National Automatic Tool Company, Inc.: *See—*
Schrolucke, Virgil H., 4,076,339, Cl. 308-9.000.

National Mine Service Company: *See—*
LeBegue, Maurice K., 4,076,316, Cl. 299-64.000.

National Research Development Corporation: *See—*
Brooks, Gerald Thomas, 4,076,832, Cl. 424-278.000.

Naumann, Klaus; Sasse, Klaus; and Lurssen, Klaus, to Bayer Aktiengesellschaft. Method of inhibiting the growth of plants with phosphonium salts. 4,076,517, Cl. 71-86.000.

Naya, Mikio: *See—*
Imura, Toshinori; Maeda, Keisuke; and Naya, Mikio, 4,077,042, Cl. 354-21.000.

Naz, John F. Self-venting bottle closure. 4,076,142, Cl. 215-307.000.

Nazarenko, Nicholas; and Seidel, William Carl, to Du Pont de Nemours, E. I., and Company. Process for the preparation of triarylborane. 4,076,756, Cl. 260-606.50B.

NCR Corporation: *See—*
Lui, Albert S.; and Arbab, Majid, 4,077,028, Cl. 340-146.1AL.
Sanders, David E.; Chambers, Ramon P.; and Gordy, Robert S., 4,077,016, Cl. 331-4.000.

Neafsey, James D., to Chevron Research Company. Extrusion of polypyrrolidone. 4,076,696, Cl. 260-78.00P.

Neal, Edwin S. Power saw cutting guide. 4,075,920, Cl. 83-745.000.

Nealy, Richard H., to Xerox Corporation. Photosensitive composition useful in photoelectrophoretic imaging. 4,076,527, Cl. 96-1.0PE.

Needham, James Joseph: *See—*
Kobeski, Walter Dan; Srocki, Sigismund Walter; Blosser, William Ivan; and Needham, James Joseph, 4,076,862, Cl. 427-136.000.

Neillie, William Frederick Soutar: *See—*
Davies, Charles Bloor; Davies, James Francis; and Neillie, William Frederick Soutar, 4,076,653, Cl. 252-532.000.

Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-3,7-inter-m-phenylene-3-oxa-9-deoxy-PGD$_1$ compounds. 4,076,750, Cl. 260-590.00C.

Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-3,7-inter-m-phenylene-3-oxa-PGE$_1$ compounds. 4,076,751, Cl. 260-590.00C.

Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-3,7-inter-m-phenylene-3-oxa-9-deoxy-9,10-didehydro-PGD$_1$ compounds. 4,076,752, Cl. 260-590.00C.

Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-3,7-inter-m-phenylene-PGE$_1$ compounds. 4,076,753, Cl. 260-590.00C.

Nesters Housing Company, Inc.: *See—*
Theurer, John; Beck, Orville F.; and Doherty, James T., 4,075,814, Cl. 52-79.500.

Neukam, Theo; Reinehr, Ulrich; Bentz, Francis; and Nischk, Gunther, to Bayer Aktiengesellschaft. Stabilizing crosslinkable copolymers comprising acrylonitrile, N-methylol alkyl ether of unsaturated carboxylic acid amide with (a) amide (b) lactam or (c) urea compounds. 4,076,925, Cl. 526-204.000.

Neuman, Ladislav: *See—*
Hanzelka, Lubomir; Vidlar, Josef; and Neuman, Ladislav, 4,076,298, Cl. 296-28.00R.

Neumann, Friedmund: *See—*
Lachnit-Fixson, Ursula; and Neumann, Friedmund, 4,076,811, Cl. 424-239.000.

Neumoyer, Clifton R.: *See—*
Gladstone, Shaul; and Neumoyer, Clifton R., 4,076,918, Cl. 536-59.000.

Neuschatz, Joseph J. Doll showing sickness, and means for "curing". 4,075,782, Cl. 46-118.000.

Newsome, Ernest L. Sports racket. 4,076,241, Cl. 273-73.00D.

Niblock, Hugh David: *See—*
Moore, Travis; and Niblock, Hugh David, 4,076,255, Cl. 273-226.000.

Nicholson, Victor. Bidirectional unicable switching system. 4,077,006, Cl. 325-308.000.

Nickerson, John T. R.; and Darack, John R., to Dirigo Corporation. Composition and method for safely extending storage life of foods. 4,076,850, Cl. 426-332.000.

Nielsen, Robert Gary, to Singer Company, The. Real-time simulation of a point system with a CRT blank period to settle beam transients. 4,077,062, Cl. 364-521.000.

Nightingale, Allen Frederick: *See—*
Yardley, James Frank; and Nightingale, Allen Frederick, 4,076,891, Cl. 428-517.000.

Nightingale, Eric Gordon. *See—*
Jungles, John; Whitehouse, David John; and Nightingale, Eric Gordon, 4,077,048, Cl. 358-89.000.

Nihon Kogyo Kabushiki Kaisha: *See—*
Yuki, Toshihiro, 4,076,523, Cl. 75-77.000.

Niida, Taro: *See—*
Inouye, Shigeharu; Shomura, Takashi; Kojima, Michio; Ogawa, Yasuaki; Watanabe, Hiroshi; Kondo, Yasumitsu; Saito, Kazuo, deceased; Yamada, Yujiro; and Niida, Taro, 4,076,588, Cl. 195-36.00C.

Nikolai, William L. Method for sulfur dioxide control. 4,076,793, Cl. 423-242.000.

Nilsson, Bengt: *See—*
Dahlstrom, Lars; and Nilsson, Bengt, 4,076,131, Cl. 214-1.0BC.

Nilsson, Peter J.: *See—*
Malm, Hans R.; Nilsson, Peter J.; and Konicek, Jiri K., 4,075,757, Cl. 29-625.000.

Nipak, Inc.: *See—*
Fisher, Roy Jack, 4,075,916, Cl. 82-78.000.

Nippon Electric Company, Ltd.: *See—*
Higo, Yoshiki, 4,077,004, Cl. 325-2.000.
Ishiguro, Tatsuo, 4,077,053, Cl. 358-136.000.

Nippon Electric Glass Company, Limited: *See—*
Wada, Masamichi; Nakagawa, Isamu; and Mizoguchi, Hiroshi, 4,076,354, Cl. 316-1.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Iwamatsu, Masayuki, 4,077,012, Cl. 330-253.000.
Iyeta, Motoi, 4,076,257, Cl. 274-23.00A.

Nippon Kokan Kabushiki Kaisha: *See—*
Koizumi, Kunihei; Ueda, Takeshi; and Otani, Tatu, 4,076,593, Cl. 201-39.000.
Koyama, Yasujiro; Kitani, Fukuichi; and Nishi, Masaaki, 4,075,812, Cl. 52-747.000.

Nippon Oil Company, Limited: *See—*
Matsuura, Kazuo; Matsuzaki, Masaomi; Oshimi, Fumiaki; Kuroda, Nobuyuki; and Miyoshi, Mituji, 4,076,923, Cl. 526-97.000.

Nippon Oil Seal Industry Co., Ltd.: *See—*
Akahori, Masami, 4,076,047, Cl. 137-856.000.

Nippon Soken, Inc.: *See—*
Hattori, Tadashi; Nakase, Takamichi; and Yamaguchi, Hiroaki, 4,075,835, Cl. 60-276.000.
Kuwakado, Satosi; Kasagi, Takao; and Takei, Toshihiro, 4,076,277, Cl. 280-738.000.

Nippondenso Co., Ltd.: *See—*
Nagasawa, Masao, 4,075,989, Cl. 123-117.00R.
Yamawaki, Masao; Aoki, Katsuo; Ina, Osamu; Suzuki, Takao; Oka, Yoshio; and Hara, Kunihiko, 4,075,972, Cl. 118-6.000.

Nisbet, George C.: *See—*
Bareis, Marvin A.; and Nisbet, George C., 4,075,723, Cl. 9-1.500.

Nischk, Gunther: *See—*
Neukam, Theo; Reinehr, Ulrich; Bentz, Francis; and Nischk, Gunther, 4,076,925, Cl. 526-204.000.

Nishi, Masaaki: *See—*
Koyama, Yasujiro; Kitani, Fukuichi; and Nishi, Masaaki, 4,075,812, Cl. 52-747.000.

Nishida, Kazuo: *See—*
Masuda, Fusayoshi; Nishida, Kazuo; and Nakamura, Akira, 4,076,663, Cl. 260-17.4GC.

Nishigaki, Masahiko: *See—*
Katayama, Kazuhiko; Nishigaki, Masahiko; Ohtani, Akira; Tani, Nobutaka; Nishizawa, Minoru; and Nakanishi, Hirokazu, 4,076,951, Cl. 526-62.000.

Nishikawa, Masaji; and Sato, Eiichi, to Olympus Optical Co., Ltd. Electrographic process. 4,076,403, Cl. 355-35.00C.

Nishizawa, Minoru: *See—*
Katayama, Kazuhiko; Nishigaki, Masahiko; Ohtani, Akira; Tani, Nobutaka; Nishizawa, Minoru; and Nakanishi, Hirokazu, 4,076,951, Cl. 526-62.000.

Nissan Motor Company, Limited: *See—*
Fujishiro, Takeshi; and Kita, Toru, 4,076,608, Cl. 204-195.00S.
Saito, Masaaki; and Minami, Hidehiro, 4,075,834, Cl. 60-276.000.

Nix, George J.; Barrington, Burchus Q.; Farley, David L.; and Hortman, Norman G., to Halliburton Company. Weight and pressure operated well testing apparatus and its method of operation. 4,076,077, Cl. 166-315.000.

Nnadi, John C., to Mobil Oil Corporation. Overbased polyarylamine-arylhydroxy (alkoxy) sulfides and lubricant compositions containing same. 4,076,636, Cl. 252-25.000.

Nobuoka, Kazuyuki: *See—*
Yamada, Eiji; Yamada, Mutuo; and Nobuoka, Kazuyuki, 4,076,734, Cl. 260-369.000.

Noguchi, Yasuhiro; Sekikawa, Nobuyoshi; Sashihara, Kenji; and Masuda, Takao, to Fuji Photo Film Co., Ltd. Heat developable light-sensitive material. 4,076,534, Cl. 96-63.000.

Nomoto, Masao: *See—*
Hirayama, Yoshio; Ito, Kanichi; Takeuchi, Ryoichi; Nomoto, Masao; and Shiina, Tomoyuki, 4,076,177, Cl. 241-32.000.

Norby, Llaney C., to West Point-Pepperell, Inc. Flame-retardant flocked fabric. 4,076,878, Cl. 428-90.000.

Nordam: *See—*
Keith, Donald B., 4,075,811, Cl. 52-395.000.

Noriega, Luis: *See—*
Mateos, Jose Luis; Noriega, Luis; Huettemann, Richard E.; and Kanojia, Ramesh M., 4,076,805, Cl. 424-195.000.

Norlin Music, Incorporated: *See—*
Morez, Gene S.; and Griffin, James F., 4,077,013, Cl. 330-267.000.

Norman, Lloyd Wendell: *See—*
Farag, Souly Atalla; and Norman, Lloyd Wendell, 4,076,552, Cl. 127-50.000.

Norris, Alan H.; and Chambley, Phillip W., to Champion International Corporation. Apparatus for manufacturing filaments of varying denier. 4,075,745, Cl. 28-243.000.

North Star Ice Equipment Company: *See—*
Bartholmey, Don S., 4,075,868, Cl. 62-347.000.

Northern Telecom Limited: *See—*
Olsen, Rolf Einar; and Munter, Ernst August, 4,076,965, Cl. 179-16.0EC.
Ostapovitch, Harold Joseph, 4,076,369, Cl. 339-258.00R.
Nowak, Karl. Ion source for high intensity ion beam. 4,076,993, Cl. 313-360.000.
Nuken G.m.b.H.: *See—*
Hackstein, Karl-Gerhard; Hrovat, Milan; and Wolff, Willi, 4,076,775, Cl. 264-0.500.
Nussbaum, Hans. Hoist mechanism. 4,076,216, Cl. 254-98.000.
Nygren, Gordon W. Golf club with low density and high inertia head. 4,076,254, Cl. 273-173.000.
Nystrom, Ernst Holger: *See—*
Ellingboe, James; Nystrom, Ernst Holger; and Sjovall, Jan Bertil, 4,076,930, Cl. 536-1.000.
Oancea, Alexandru: *See—*
Wijnhoven, Jan M. A.; Oancea, Alexandru; Vanhove, Henri C. J.; and Beets, Roland H. C., 4,076,276, Cl. 280-714.000.
Obermoller, Douglas B., to Raven Industries, Inc. Blower and burner to produce superpressure in a thermal airship. 4,076,188, Cl. 244-98.000.
O'Brien, Edward F., to United States of America, Air Force. Film slewing device for drum type contact printer. 4,076,418, Cl. 355-104.000.
Occidental Oil Shale, Inc.: *See—*
Cha, Chang Yul; Ridley, Richard D.; and Burton, Robert S., III, 4,076,312, Cl. 299-2.000.
Ochiai, Kokichi: *See—*
Asano, Masaharu; and Ochiai, Kokichi, 4,075,982, Cl. 123-32.0EH.
Odawara, Kiyoshi: *See—*
Toyota, Akinori; Odawara, Kiyoshi; and Kashiwa, Norio, 4,076,924, Cl. 526-125.000.
O'Donnell, James Kevin: *See—*
Ahmed, Nazeer; O'Donnell, James Kevin; and Schmehl, Glenn Lewis, 4,076,335, Cl. 308-3.500.
Oestreich, Ulrich, to Siemens Aktiengesellschaft. Optical cable with plastic multilayer sheath. 4,076,382, Cl. 350-96.230.
Ogawa, Hiroshi: *See—*
Furukawa, Masahiko; Ogawa, Hiroshi; Aonuma, Masashi; Tamai, Yasuo; Nakahara, Hiromi; and Igarashi, Masaaki, 4,076,861, Cl. 427-132.000.
Yamada, Yasuyuki; Akashi, Goro; and Ogawa, Hiroshi, 4,076,890, Cl. 428-337.000.
Ogawa, Taro: *See—*
Nanba, Kunio; and Ogawa, Taro, 4,076,307, Cl. 297-250.000.
Ogawa, Yasuaki: *See—*
Inouye, Shigeharu; Shomura, Takashi; Kojima, Michio; Ogawa, Yasuaki; Watanabe, Hiroshi; Kondo, Yasumitsu; Saito, Kazuo, deceased; Yamada, Yujiro; and Niida, Taro, 4,076,588, Cl. 195-36.00C.
Ogiso, Mitsutoshi: *See—*
Komine, Yoshio; Furukawa, Hiroshi; Takahashi, Kiyoshi; Takigawa, Tomoshi; Ogiso, Mitsutoshi; and Ichiyanagi, Toshikazu, 4,076,396, Cl. 352-29.000.
Ohashi, Takashi: *See—*
Yukuta, Toshio; Ohashi, Takashi; Kojima, Minoru; and Suzuki, Akira, 4,076,654, Cl. 260-2.5AM.
Ohsaki, Mikio; Kawamoto, Toshiaki; and Fujimoto, Osamu, to Sharp Kabushiki Kaisha. Card retrieval system. 4,076,125, Cl. 209-80.500.
Ohtake, Kazuomi. Instrument for making perspective drawing. 4,075,762, Cl. 33-77.000.
Ohtani, Akira: *See—*
Katayama, Kazuhiko; Nishigaki, Masahiko; Ohtani, Akira; Tani, Nobutaka; Nishizawa, Minoru; and Nakanishi, Hirokazu, 4,076,951, Cl. 526-62.000.
Oishi, Kengo; and Suzuki, Osamu, to Fuji Photo Film Co., Ltd. Magnetic tape cassettes. 4,076,186, Cl. 242-199.000.
Oka, Yoshio: *See—*
Yamawaki, Masao; Aoki, Katsuo; Ina, Osamu; Suzuki, Takao; Oka, Yoshio; and Hara, Kunihiko, 4,075,972, Cl. 118-6.000.
Okano, Takeshi: *See—*
Igarashi, Shunkichi; Okano, Takeshi; Takahama, Sho; and Hakamata, Yoshio, 4,076,412, Cl. 355-28.000.
Okitsu, Toshinao: *See—*
Nagasawa, Shigeru; and Okitsu, Toshinao, 4,075,830, Cl. 260-18.00N.
Olafson, Theodore T. Crab pot. 4,075,779, Cl. 43-100.000.
Olesen, Douglas E.; and Shuckrow, Alan J., to Battelle Pacific N. W. Laboratories. Process and system for treating waste water. 4,076,615, Cl. 210-5.000.
Olin Corporation: *See—*
Gray, Thomas J., 4,076,611, Cl. 204-290.00F.
Hoyt, Joseph B., Jr.; and Shapiro, Eugene, 4,076,560, Cl. 148-11.50C.
Mills, Gordon D., 4,076,934, Cl. 536-60.000.
Specht, Steven J.; and Adams, John O., 4,076,571, Cl. 156-305.000.
Olmsted, Bernie A.: *See—*
Armour, Donald F.; and Olmsted, Bernie A., 4,076,484, Cl. 425-525.000.
Olsen, Rolf Einar; and Munter, Ernst August, to Northern Telecom Limited. Universal receiver/sender. 4,076,965, Cl. 179-16.0EC.
Olson, Richard A., to Hydril Company. Blowout preventer ram lock. 4,076,208, Cl. 251-1.00A.
Olson, Robert H.: *See—*
Clayton, William J.; Olson, Robert H.; and Kutniewski, Donald F., 4,076,121, Cl. 206-390.000.
Olsson, Billy Erik; and Kunkle, John Philip, to AMP Incorporated. Connector for connecting together opposite sides of a printed circuit board. 4,076,355, Cl. 339-17.00C.
Olstowski, Franciszek; and Parrish, Donald Bob, to Dow Chemical Company, The. Non-elastomeric rapid-setting polyurethanes. 4,076,660, Cl. 260-9.000.
Olympus Optical Co., Ltd.: *See—*
Nishikawa, Masaji; and Sato, Eiichi, 4,076,403, Cl. 355-35.00C.
Satoh, Ken, 4,077,014, Cl. 330-278.000.
Omori, Susumu: *See—*
Yasuda, Hiroshi; and Omori, Susumu, 4,076,783, Cl. 264-78.000.
Onikov, Eduard Arshakovich: *See—*
Zabotin, Alexandr Alexandrovich; Loschilin, Evgeny Dmitrievich; Onikov, Eduard Arshakovich; Galperin, Alexandr Lvovich; Santucci, Nicola; and Corain, Luciano, 4,076,051, Cl. 139-436.000.
Onoki, Fumio; Namiki, Kazuo; and Osora, Tetsuo, to Hoya Lens Corporation. Process for cutting and edging chemically pre-strengthened finished uncut lens blanks without loss of impact resistance. 4,076,863, Cl. 427-165.000.
Ontario Paper Company Ltd., The: *See—*
Puddington, Ira E.; Sparks, Bryan D.; and Sexton, Ernest A., 4,076,578, Cl. 162-5.000.
Ooba, Yasumi. Apex seal device for use in rotary piston engine. 4,076,261, Cl. 277-81.00P.
Opferkuch, Robert E., Jr.; and Wong-Chong, George M., to Monsanto Research Corporation. Process for the disposal of sewage. 4,076,620, Cl. 210-45.000.
Oppenlaender, Knut: *See—*
Freyberg, Peter; Horn, Dieter; Oppenlaender, Knut; Wolf, Hans; and Distler, Dieter, 4,076,497, Cl. 8-21.00C.
Optel Corporation: *See—*
Chen, Schoen-nan, 4,076,904, Cl. 429-111.000.
Optilon W. Erich Heilmann GmbH: *See—*
Heimberger, Helmut, 4,075,874, Cl. 66-192.000.
Ortho Pharmaceutical Corporation: *See—*
Galbraith, Charles L., 4,076,398, Cl. 353-69.000.
Mateos, Jose Luis; Noriega, Luis; Huettemann, Richard E.; and Kanojia, Ramesh M., 4,076,805, Cl. 424-195.000.
Osawa, Ryuzo: *See—*
Nakashima, Katsutoshi; Kita, Toshio; Osawa, Ryuzo; and Hatanaka, Takashi, 4,076,220, Cl. 366-69.000.
Oshida, Naoichi; and Ando, Eiichi, to Kabushiki Kaisha Sato Gijutsu Kenkyusho; and Shinagawa Furnace Co., Ltd. Waste gas purification apparatus. 4,076,504, Cl. 23-277.00C.
Oshimi, Fumiaki: *See—*
Matsuura, Kazuo; Matsuzaki, Masaomi; Oshimi, Fumiaki; Kuroda, Nobuyuki; and Miyoshi, Mituji, 4,076,923, Cl. 526-97.000.
Osora, Tetsuo: *See—*
Onoki, Fumio; Namiki, Kazuo; and Osora, Tetsuo, 4,076,863, Cl. 427-165.000.
Ostapovitch, Harold Joseph, to Northern Telecom Limited. Box terminal for card edge receptacles in telecommunications systems and the like. 4,076,369, Cl. 339-258.00R.
Oswald, Anton H.; and Peters, John, to Bright Star Industries, Inc. Paper-lined dry cell batteries without smears. 4,076,907, Cl. 429-133.000.
Oswald, Donald E., to Kaiser Steel Corporation. Rotator and coater system for drum shells. 4,075,975, Cl. 118-318.000.
Ota, Satoshi; Nakamura, Kotaro; Sakai, Nobuo; Furutachi, Nobuo; and Yokota, Yukio, to Fuji Photo Film Co., Ltd. Silver halide emulsion containing two-equivalent coupler. 4,076,533, Cl. 96-56.500.
Otake, Nobuyuki; Ando, Kozo; and Hori, Hironobu, to Tokyo Boshi Kabushiki Kaisha. Pen points for writing instruments. 4,076,428, Cl. 401-265.000.
Otani, Susumu: *See—*
Araki, Hidejiro; and Otani, Susumu, 4,075,732, Cl. 15-301.000.
Otani, Tatu: *See—*
Koizumi, Kunihei; Ueda, Takeshi; and Otani, Tatu, 4,076,593, Cl. 201-39.000.
Otis Engineering Corporation: *See—*
Sizer, Philip S., 4,076,083, Cl. 175-65.000.
Ott, Denis P.: *See—*
Alpers, Robert J.; Crates, Fredrick J.; Ott, Denis P.; and Schmunk, John D., 4,076,040, Cl. 137-371.000.
Outboard Marine Corporation: *See—*
Blake, Charles H.; and Wood, Donald H., 4,075,970, Cl. 115-18.00E.
Over-Lowe Company, Inc.: *See—*
Dodich, Nicholas Anthony, 4,076,314, Cl. 299-40.000.
Owens-Corning Fiberglas Corporation: *See—*
Clay, Frank M.; Moran, Leland G.; and Lawyer, Russell R., 4,076,781, Cl. 264-40.700.
Owens-Illinois, Inc.: *See—*
Amberg, Stephen W., 4,076,786, Cl. 264-146.000.
Go, Santos W., 4,076,693, Cl. 260-75.00S.
Mumford, George V., 4,076,152, Cl. 222-545.000.
Pei, Yu K., 4,076,513, Cl. 65-33.000.
Rapp, Charles F., 4,076,541, Cl. 106-47.00Q.
Owsley, Dennis C.; and Bloomfield, Jordan J., to Monsanto Company. Synthesis of vicinal glycols. 4,076,758, Cl. 260-618.00R.
Ozen Co., Ltd.: *See—*
Watanabe, Katsumi, 4,076,256, Cl. 274-1.00R.
Paek, Un-Chul: *See—*
Mracek, Jaroslav; and Paek, Un-Chul, 4,076,510, Cl. 65-3.00A.
Pagilagan, Rolando Umali, to Du Pont de Nemours, E. I., and Company. 612 or 610/61 or 6T/636 Polyamide terpolymer. 4,076,664, Cl. 260-18.00N.
Palmer, Raymond Leslie, to Coventry Gauge & Tool Company Limited. Screw thread tap grinding with automatic loading means. 4,075,790, Cl. 51-94.0CS.
Panamera, A.G.: *See—*
Adams, Horst, 4,076,034, Cl. 137-15.000.
Panigati, Pier Luigi. Piston for pressure fluid operated cylinders. 4,075,935, Cl. 92-243.000.
Panneman, Harm Jan; and Bruins, Antonius Hermanus Nicolaas Maria, to Akzona Incorporated. Amidino-hydrazone derivatives. 4,076,726, Cl. 260-34.50R.
Panusch, Erwin; Sobolev, Igor; and Carniglia, Stephen C., to Kaiser Aluminum & Chemical Corporation. Flame retardant cellulosic boards. 4,076,580, Cl. 162-159.000.
Papantoniou, Christos; and Grognet, Jean-Claude, to L'Oreal. Tetrapolymers comprising (a) unsaturated acids (b) vinyl esters (c) branched allyl or methallyl esters and (d) vinyl ether or vinyl fatty ester or linear allyl or methallyl esters. 4,076,912, Cl. 526-16.000.
Parcor: *See—*
Maffrand, Jean-Pierre, 4,076,819, Cl. 424-256.000.
Parise, Carl; and Wimsatt, James M., to Parise & Sons, Inc. Cleaning head. 4,075,733, Cl. 15-322.000.
Parise & Sons, Inc.: *See—*
Parise, Carl; and Wimsatt, James M., 4,075,733, Cl. 15-322.000.
Parish, Harold Cheney: *See—*
Spulgis, Ivars Sigurds; Pettit, Jack Leland; Allard, Michael Duane; and Parish, Harold Cheney, 4,076,057, Cl. 141-1.000.
Parker, Louis W. Solar steam boiler. 4,076,025, Cl. 126-271.000.
Parrish, Donald Bob: *See—*
Olstowski, Franciszek; and Parrish, Donald Bob, 4,076,660, Cl. 260-9.000.
Parsons, Stuart L.; and Vigeant, George Henry, deceased (by Vigeant, Mrs. George Henry, heir), to AMP Incorporated. Method for terminating sheath covered cable and for providing a wiring system. 4,075,758, Cl. 29-628.000.
Passavant-Werke Michelbacher Hutte: *See—*
Busse, Oswald; and Klesper, Hugo, 4,076,033, Cl. 134-172.000.
Pastor, Antonio C.: *See—*
Pastor, Ricardo C.; and Pastor, Antonio C., 4,076,574, Cl. 156-616.00R.
Pastor, Ricardo C.; and Pastor, Antonio C., to Hughes Aircraft Company. Reactive atmosphere crystal growth method. 4,076,574, Cl. 156-616.00R.
Patent Products Hydraulics (Proprietary) Limited: *See—*
Horne, Peter Nesbitt, 4,075,839, Cl. 60-327.000.
Pauliukonis, Richard S. Volumetric proportioning diluter. 4,076,465, Cl. 417-339.000.
Paulsen, George T. Cable support method and apparatus. 4,076,199, Cl. 248-68.00R.
Pavlova, Saga-Silviya Alexandrovna: *See—*
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Krasnov, Alexandr Petrovich; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradova, Olga Vladimirovna; Mamatsashvili, Georgy Viktorovich; Pavlova, Saga-Silviya Alexandrovna; Gribkova, Pelageya Nikolaevna; Bekasova, Nina Ivanovna; Komarova, Ljudmila Grigorievna; Vorobiev, Vladimir Dmitrievich; Vlasova, Irina Vladimirovna; and Vinogradov, Alexandr Vasilievich, 4,076,634, Cl. 252-12.000.
Payne, Trevor Glyn, to Sandoz Ltd. Benzocycloheptene-2-acetic acids. 4,076,838, Cl. 424-317.000.
Payson, Buford L., to Strauss, Robert A., a part interest. Locking tube assembly. 4,076,213, Cl. 254-60.000.
Pearlman, Sanford. Building construction system using mortar-less modular building block elements. 4,075,808, Cl. 52-439.000.
Pechard, Lucien Leon; and Logerot, Bernard Andre, to Bunker Ramo Corporation. Fastening and locking device. 4,076,363, Cl. 339-91.00R.
Pecoraro, Joseph Michael, to Du Pont de Nemours, E. I., and Company. Polyisobutylene oxidation process. 4,076,738, Cl. 260-406.000.
Peets, Edwin A.: *See—*
Ganguly, Ashit K.; Peets, Edwin A.; and Saksena, Anil K., 4,076,711, Cl. 260-256.40F.
Pei, Yu K., to Owens-Illinois, Inc. Method for making transverse tube recuperator. 4,076,513, Cl. 65-33.000.
Peil, Archie W.: *See—*
Slator, Damon T.; Peil, Archie W.; and Bishop, Thomas R., 4,076,436, Cl. 403-343.000.
Pelensky, Joseph: *See—*
Geary, Joseph E.; Pelensky, Joseph; and Hart, John Peter, 4,075,973, Cl. 118-7.000.
Pelin, Charles. Closed system, standpipe operated hydroelectric power plant. 4,075,838, Cl. 60-325.000.
Pelletier, Ronald R.: *See—*
Saunders, Frank L.; and Pelletier, Ronald R., 4,076,768, Cl. 260-876.00B.
Pennsylvania Engineering Corporation: *See—*
Schempp, Eberhard G., 4,076,223, Cl. 266-158.000.
Pennwalt Corporation: *See—*
Dohany, Julius Eugene, 4,076,929, Cl. 526-255.000.
Spulgis, Ivars Sigurds; Pettit, Jack Leland; Allard, Michael Duane; and Parish, Harold Cheney, 4,076,057, Cl. 141-1.000.
Penrose, Alexander B.: *See—*
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Penton Hose Protection Systems, Inc.: *See—*
Penton, Michael O., 4,076,272, Cl. 280-421.000.
Penton, Michael O., to Penton Hose Protection Systems, Inc. Retractable conduit system. 4,076,272, Cl. 280-421.000.
Penzias, Rolf, to Molins Limited. Method and apparatus for feeding rod-like articles. 4,075,937, Cl. 93-77.0FT.
Peppard, Eugene Lee. Playing piece for table soccer. 4,076,244, Cl. 273-85.00D.
Perez, Jose R. Safety valve cap for inflatable bodies. 4,076,037, Cl. 137-230.000.
Perkin-Elmer Corporation, The: *See—*
Atwood, John G.; DeMey, Charles F., III; Marshall, Hamilton W., Jr.; and Ducret, Lucien C., 4,076,503, Cl. 23-259.000.
Perne, Raymond, to Astra Plastique. Tamperproof closure element. 4,076,140, Cl. 215-256.000.
Perobelli, Aldo Euclide: *See—*
Pessina, Giorgio; and Perobelli, Aldo Euclide, 4,075,896, Cl. 74-69.000.
Persha, Thomas J.; and Jagielski, David, to Bell & Howell Company. Microfilm transport with automatic threading. 4,076,400, Cl. 353-95.000.
Personick, Stewart David: *See—*
Muska, Willis Martin; and Personick, Stewart David, 4,076,375, Cl. 350-96.150.
Persson, Jan Edvard. Specially reinforced flexible tube pumping chamber. 4,076,467, Cl. 417-478.000.
Persson, Walther; and Schibbye, Lauritz Benedictus, to Svenska Rotor Maskiner Aktiebolag. Multi-stage screw compressor interconnected via communication channel in common end plate. 4,076,468, Cl. 418-9.000.
Perstorp AB: *See—*
Malm, Hans R.; Nilsson, Peter J.; and Konicek, Jiri K., 4,075,757, Cl. 29-625.000.
Perugini, Giancarlo; and Marcaccioli, Enzo, to Montedison S.p.A. Process for the preparation of metallic and/or metal-ceramic and/or ceramic sponges. 4,076,888, Cl. 428-313.000.
Pessina, Giorgio; and Perobelli, Aldo Euclide. Mechanism for the variable-speed drive of the automatic sheet feeder drum. 4,075,896, Cl. 74-69.000.
Peter Powell International Limited: *See—*
Powell, Peter Trevor, 4,076,189, Cl. 244-153.00R.
Peters, John: *See—*
Oswald, Anton H.; and Peters, John, 4,076,907, Cl. 429-133.000.
Peterson, Paul F., to United States of America, Air Force. Three stage thrusting device. 4,075,929, Cl. 91-168.000.
Peterson, Philip R.: *See—*
Taylor, David W.; and Peterson, Philip R., 4,076,332, Cl. 303-97.000.
Petrocci, Alfonso N.: *See—*
Kaplan, Saul; Merianos, John J.; Green, Harold A.; and Petrocci, Alfonso N., 4,076,744, Cl. 260-501.190.
Petrolite Corporation: *See—*
Redmore, Derek; and Welge, Frederick T., 4,076,638, Cl. 252-33.200.
Petrova, Natalyd Petrovna: *See—*
Kapitanov, Nikolai Nikolaevich; Ippolitov, Vladimir Vasilievich; Andreeva, Galina Dmitrievna; Petrova, Natalyd Petrovna; and Rabotnikov, Vladimir Semenovich, 4,076,162, Cl. 227-019.000.
Petrovitch, Vladimir. Method and apparatus for forming a concrete roof. 4,076,777, Cl. 264-32.000.
Petrzelka, Miloslav, to Uni-Cardan AG. Variable transmission ratio brake actuating device. 4,075,907, Cl. 74-523.000.
Pettit, Jack Leland: *See—*
Spulgis, Ivars Sigurds; Pettit, Jack Leland; Allard, Michael Duane; and Parish, Harold Cheney, 4,076,057, Cl. 141-1.000.
Pevnev, Arkady Alexeevich: *See—*
Lifshits, Viktor Senderovich; Sukhanov, Alexandr Alexandrovich; Dergachev, Nikolai Makarovich; Pevnev, Arkady Alexeevich; Baranov, Vladimir Nikitich; and Shklyanov, Leonid Pavlovich, 4,076,973, Cl. 219-97.000.
Pfaff Industriemaschinen GmbH: *See—*
Hintzen, Peter; and Willenbacher, Erich, 4,075,954, Cl. 112-68.000.
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Pfister, Rudolf: *See—*
Hromatka, Otto; Binder, Dieter; Pfister, Rudolf; and Zeller, Paul, 4,076,709, Cl. 544-48.000.
Pfizer Inc.: *See—*
Acheson, Richard M.; Cox, Ian R.; Stubbs, John K.; and Penrose, Alexander B., 4,076,817, Cl. 424-251.000.
Philagro: *See—*
Sauli, Michel, 4,076,941, Cl. 548-312.000.
Philagro S.A.: *See—*
Trinh, Stephane; Moraly, Alain; and Gaulliard, Jean-Michel, 4,076,807, Cl. 424-209.000.
Phillips, Howard Elliot: *See—*
Burt, James Gordon; and Phillips, Howard Elliot, 4,076,644, Cl. 252-182.000.
Phillips, Maurice E. Apparatus for the utilization of solar heat. 4,076,016, Cl. 126-271.000.
Phillips Petroleum Company: *See—*
Clampitt, Richard L., 4,076,628, Cl. 252-8.50C.
Harper, Bobby R., 4,076,669, Cl. 260-23.70R.
Haskell, Donald M., 4,076,595, Cl. 203-51.000.
Mills, Kenneth R., 4,076,689, Cl. 260-45.75W.
Moczygemba, George A.; and Hsieh, Henry L., 4,076,914, Cl. 526-25.000.

Scott, John N., Jr.; and Carrow, Guy E., 4,076,282, Cl. 285-156.000.
Trepka, William J., 4,076,915, Cl. 526-25.000.
Wynne, Ralph A., 4,076,038, Cl. 137-318.000.

Philofsky, Elliott M.: *See—*
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Photocircuits Division of Kollmorgen Corporation: *See—*
Zeblisky, Rudolph J., 4,076,618, Cl. 210-30.00R.

Pichouron, Jean-Claude: *See—*
Lefebvre, Jean; and Pichouron, Jean-Claude, 4,076,070, Cl. 164-303.000.

Pied, Jean-Philippe, to Societe des Plastiques de Carmaux Scasar. Method for increasing the productive yield of crops with polyolefin films. 4,075,784, Cl. 47-9.000.

Piesch, Steffen: *See—*
Schnee, Karl; Piesch, Steffen; and Tichy, Dieter, 4,076,662, Cl. 260-17.300.

Pietsch, Wolfgang B., to Midrex Corporation. Method for continuous passivation of sponge iron material. 4,076,520, Cl. 75-5.000.

Pike, Allan R., to Marger, Jerome S., a part interest. Portable, readily storable patient treatment table. 4,076,230, Cl. 269-328.000.

Pilkington Brothers Limited: *See—*
Farragher, Joseph, 4,076,159, Cl. 225-3.000.
Mellor, James Robert; and Billington, Colin, 4,076,512, Cl. 65-29.000.

Pinney, Paul E. Dual wave motion pump. 4,076,464, Cl. 417-332.000.

Pioneer Electronic Corporation: *See—*
Fujie, Seijiro; Yokoyama, Susumu, deceased; and Yokoyama, Toshikazu, administrator, 4,076,963, Cl. 179-15.0BT.

Pippenger, John J., to W. H. Nichols Company. Combined distributor and bypass valve for fluid actuated pump or motor. 4,076,462, Cl. 417-310.000.

Pirson, Ewald: *See—*
Huber, Peter; Lampelzammer, Helga; Pirson, Ewald; and Wimmer, Franz, 4,076,672, Cl. 260-29.20M.

Pitt, John M.: *See—*
Handy, Richard L.; Girard, Leon E.; Roorda, Bruce R.; and Pitt, John M., 4,075,885, Cl. 73-88.00E.

Pitts, Robert W., Jr., to Texaco Inc. Well logging method and means using an armored multiconductor coaxial cable. 4,077,022, Cl. 333-1.000.

Place, George H., Jr., to Xerox Corporation. Duplex copying transfer system. 4,076,407, Cl. 355-14.000.

Plank, Charles J.; Rosinski, Edward J.; and Rubin, Mae K., to Mobil Oil Corporation. Crystalline zeolite ZSM-23 and synthesis thereof. 4,076,842, Cl. 423-328.000.

Plass, Ludolf: *See—*
Reh, Lothar; Schmidt, Hans-Werner; and Plass, Ludolf, 4,076,796, Cl. 423-659.000.

Platakis, Nicolaos S.; and Gatos, Harry C., to Massachusetts Institute of Technology. Method of growing films by flash vaporization. 4,076,866, Cl. 427-250.000.

Platt, Clark I., to Whirlpool Corporation. Filter system for washing machine. 4,075,876, Cl. 68-18.00F.

Plessey Handel und Investments A.G.: *See—*
Silvey, Trevor Ian, 4,075,967, Cl. 114-243.000.
Wren, John Pelham, 4,076,258, Cl. 274-23.00R.

Plevak, Lubomir: *See—*
Elsner, Burckhardt; Lagodka, Gunter; Plevak, Lubomir; and Rosenberg, Harry, 4,075,857, Cl. 61-45.00D.

Plisky, John J.: *See—*
Harbison, William H.; Mohnach, Michael G.; and Plisky, John J., 4,075,731, Cl. 15-250.420.

Plows, Graham Stuart; and Castle, Paul, to Decca Limited. Apparatus for depositing uniform films. 4,075,974, Cl. 118-52.000.

Plummer, Sherman R.: *See—*
Hall, Charles O., 4,076,239, Cl. 273-29.00A.

Plungis, Donald W.: *See—*
Mayer, Edward A.; and Plungis, Donald W., 4,075,994, Cl. 123-119.00A.

Pochert, Johannes: *See—*
Thurn, Friedrich; Burmester, Kurt; Pochert, Johannes; and Wolff, Siegfried, 4,076,550, Cl. 106-288.00Q.

Podszuck, Dietmar: *See—*
Klotz, Heinz; and Podszuck, Dietmar, 4,076,279, Cl. 285-26.000.

Poirot, James M.: *See—*
Behrends, Bertwin E.; Hoehn, Richard F.; and Poirot, James M., 4,076,219, Cl. 254-187.400.

Pole, Robert Vladimir; and Wollenmann, Hans Peter, to International Business Machines Corporation. Two-dimensional light deflector apparatus. 4,076,372, Cl. 350-6.900.

Politechnika Warszawska: *See—*
Eyman, Krystian H., 4,075,895, Cl. 74-61.000.

Poludnenko, Jury Zakharovich: *See—*
Chuply, Vladimir Yakovlevich; Vojuta, Leonty Feofanovich; Kondratenko, Feofan Ilich; Poludnenko, Jury Zakharovich; Milach, Adam Arsentievich; Kobozev, Vladimir Nikolaevich; and Turchenko, Alexandr Vasilievich, 4,076,087, Cl. 175-334.000.

Polymer Processing Research Institute Ltd: *See—*
Yazawa, Masahide; Kubo, Teruo; and Suzuki, Kunio, 4,076,782, Cl. 264-51.000.

Polymerics, Inc.: *See—*
Lester, David; and Alexander, Robert R., 4,076,547, Cl. 106-109.000.

Polymetrics International Inc.: *See—*
Howery, Kenneth A., 4,076,619, Cl. 210-36.000.

Polyproducts Corporation: *See—*
Littlefield, Herrick B., 4,076,151, Cl. 222-525.000.

Pope, William M.; and Pope, William M., Jr. Tamper-resistant electric meter sealing ring. 4,076,291, Cl. 292-256.670.

Pope, William M., Jr.: *See—*
Pope, William M.; and Pope, William M., Jr., 4,076,291, Cl. 292-256.670.

Popova, Galina Leonidovna: *See—*
Berlin, Alfred Anisimovich; Brikenshtein, Khaini-Mordkhe Aronovich; Gavrjusherko, Nikolai Sviridovich; Dubovitsky, Fedor Ivanovich; Kefeli, Tamara Yakovlevna; Kronman, Raisa Vasilievna; Konkhina, Ljudmila Alexeevna; Marshavina, Natalya Lvovna; Popova, Galina Leonidovna; Radugina, Anna Alexandrovna; Sivergin, Jury Mikhailovich; Sumin, Iosif Grigorievich; Tvorogov, Nikolai Nikandrovich; Shilova, Galina Pavlovna; and Kardashov, David Alexeevich, 4,076,742, Cl. 260-47.0UA.

Porter, Randall: *See—*
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Portnoy, Norman A.: *See—*
Hammer, Richard Benjamin; Turbak, Albin Frank; Portnoy, Norman A.; and West, Arthur C., 4,076,932, Cl. 536-30.000.
Turbak, Albin Frank; Hammer, Richard Benjamin; Portnoy, Norman A.; and West, Arthur C., 4,076,933, Cl. 536-30.000.

Potoski, John R.: *See—*
Freed, Meier E.; and Potoski, John R., 4,076,953, Cl. 560-142.000.

Potter, John Kenneth: *See—*
Johnson, Richard Shaw; and Potter, John Kenneth, 4,076,847, Cl. 426-78.000.

Powell, James E.: *See—*
Roman, Steven A.; and Powell, James E., 4,076,813, Cl. 424-246.000.

Powell, Peter Trevor, to Peter Powell International Limited. Kites. 4,076,189, Cl. 244-153.00R.

Power, George Edward, to Formica Corporation. Method of preparing decorative textured laminates. 4,076,566, Cl. 156-153.000.

Power, George Edward; and Bolling, Donald Louis, to Formica Corporation. Release composition. 4,076,666, Cl. 260-22.0CB.

PPG Industries, Inc.: *See—*
Fulton, Robert C.; Edmunds, Donald L.; and Shields, George B., 4,076,511, Cl. 65-27.000.
Kelly, Joseph B., 4,076,514, Cl. 65-106.000.

Prat, Jean-Claude Alphonse Henri: *See—*
Joly, Pascal Adrien Jean; and Prat, Jean-Claude Alphonse Henri, 4,076,543, Cl. 106-53.000.

Primark Corporation: *See—*
Conley, Dwain D., 4,075,944, Cl. 101-94.000.

Pritchard, Alan B.: *See—*
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Procter & Gamble Company, The: *See—*
Davis, James E., 4,076,632, Cl. 252-8.800.
Edwards, James B.; and Diehl, Francis L., 4,076,633, Cl. 252-8.750.
Marsh, Robert Anthony; Mackie, Gordon John; and Hale, Peter, 4,076,800, Cl. 424-70.000.

Prodanov, Velcho Angelov: *See—*
Jordanov, Jordan Todorov; Abrashev, Georgi Ivanov; Jekov, Velyu Dimitrov; Georgiev, Georgi Taney; Haralampiev, Georgi Alexandrov; Janev, Janco Hristov; and Prodanov, Velcho Angelov, 4,076,521, Cl. 75-24.000.

Produits Chimiques Ugine Kuhlmann: *See—*
Grimaud, Edouard; and Koeppel, Robert, 4,076,699, Cl. 260-79.50C.
Hardouin, Jean Claude Henri Raoul; and Vallette, Maurice Rene Jean, 4,076,713, Cl. 260-263.000.

Prohaska, Edward G.: *See—*
Bill, Roland F.; Prohaska, Edward G.; and Wabel, Bernard A., 4,076,287, Cl. 285-382.400.

Proksch, Frederick D., to Caterpillar Tractor Co. Device for reducing engine exhaust noise. 4,076,099, Cl. 181-264.000.

Proulx, Roger. Warm air heating and fire-place system. 4,076,011, Cl. 126-121.000.

Proven Environmental Products, Inc.: *See—*
Bray, Robert John, 4,076,325, Cl. 303-7.000.

Puccio, Guy S., to Acme Highway Products Corporation. Adjustable embossment connector for a composite expansion joint assembly. 4,075,728, Cl. 14-16.500.

Pucher, Richard A.: *See—*
Young, Robert G.; and Pucher, Richard A., 4,075,941, Cl. 100-19.00R.

Puddington, Ira E.; Sparks, Bryan D.; and Sexton, Ernest A., to Canadian Patents and Development Limited; and Ontario Paper Company Ltd., The. Ink removal from waste paper. 4,076,578, Cl. 162-5.000.

Purvis, Michael J.: *See—*
Krechel, Joseph L.; and Purvis, Michael J., 4,076,211, Cl. 251-286.000.

Quinn, Edwin J.: *See—*
Dieck, Ronald L.; and Quinn, Edwin J., 4,076,658, Cl. 260-2.50R.

R. J. Reynolds Tobacco Company: *See—*
Smith, Ezra Thomas, 4,076,030, Cl. 131-17.00R.

R. Kanik Sales, Ltd.: *See—*
Kanik, Robert W., 4,076,062, Cl. 144-193.00A.

R. O. Hull & Company, Inc.: *See—*
Huebner, Karen, 4,076,600, Cl. 204-55.00R.

Raas, Jean H.; and Schwartz, Joseph I., to Diamond Power Specialty Corporation. Top closure for control rod drive for nuclear reactor. 4,076,144, Cl. 220-367.000.

Rabl, Carl-Roland: *See—*
De Maeyer, Leo C. M.; Rabl, Carl-Roland; Jovin, Thomas M.; Riesner, Detlev; Rigler, Rudolf; Veil, Lutz Bodo; and Lehrach, Hans, 4,076,420, Cl. 356-73.000.

Rabotnikov, Vladimir Semenovich: *See—*
Kapitanov, Nikolai Nikolaevich; Ippolitov, Vladimir Vasilievich; Andreeva, Galina Dmitrievna; Petrova, Natalyd Petrovna; and Rabotnikov, Vladimir Semenovich, 4,076,162, Cl. 227-019.000.

Radau, Wolfgang: *See—*
Landert, Heinrich; Radau, Wolfgang; and Kuhn, Ernst, 4,076,215, Cl. 254-93.00R.

Radugina, Anna Alexandrovna: *See—*
Berlin, Alfred Anisimovich; Brikenshtein, Khaim-Mordkhe Aronovich; Gavrjushenko, Nikolai Sviridovich; Dubovitsky, Fedor Ivanovich; Kefeli, Tamara Yakovlevna; Kronman, Raisa Vasilievna; Konkhina, Ljudmila Alexeevna; Marshavina, Natalya Lvovna; Popova, Galina Leonidovna; Radugina, Anna Alexandrovna; Sivergin, Jury Mikhailovich; Sumin, Iosif Grigorievich; Tvorogov, Nikolai Nikandrovich; Shilova, Galina Pavlovna; and Kardashov, David Alexeevich, 4,076,742, Cl. 260-47.0UA.

Raimondi, Albert A., to Westinghouse Electric Corporation. Static sealing mechanism for liquid natural gas compressors and hydrogen cooled generators. 4,076,259, Cl. 277-3.000.

Rameil, Wilfried; Schraudolph, Manfred; and Thiele, Gerd, to Siemens Aktiengesellschaft. Gas-insulated thyristor arrangement comprising a pressure encapsulation formed in the manner of a tank. 4,077,057, Cl. 361-386.000.

Rameson, William W., to TRW Inc. Self-aligning work holding clamp. 4,076,227, Cl. 269-25.000.

Rampin, Jean: *See—*
Fontanel, Daniel; and Rampin, Jean, 4,076,667, Cl. 260-22.00A.

Rand, Robert K. Ball skate. 4,076,263, Cl. 280-11.1BR.

Rank Organisation Limited, The: *See—*
Jungles, John; Whitehouse, David John; and Nightingale, Eric Gordon, 4,077,048, Cl. 358-89.000.

Rapp, Charles F., to Owens-Illinois, Inc. Glasses suitable for laser application, glass lasers, and method for making same. 4,076,541, Cl. 106-47.00Q.

Raskatov, Viktor Georgievich: *See—*
Barannik, Ivan Andreevich; Kachurka, Alexandr Nikolaevich; Zharovsky, Ivan Vasilievich; Trukhin, Alexandr Fedorovich; Raskatov, Viktor Georgievich; and Mazurkevich, Alexandr Borisovich, 4,076,472, Cl. 425-8.000.

Rast, Robert Morgan; and Tults, Juri, to RCA Corporation. Phase locked loop tuning system with station scanning provisions. 4,077,008, Cl. 325-421.000.

Rau, Rama N., to Schlumberger Technology Corporation. Microwave method and apparatus utilizing dielectric loss factor measurements for determination of adsorbed fluid in subsurface formations surrounding a borehole. 4,077,003, Cl. 324-6.000.

Raudat, John L.; and Johnson, Lloyd D., to Emhart Industries, Inc. Finger assembly for packer grid. 4,075,819, Cl. 53-248.000.

Rauffer, Walter: *See—*
Deml, Reinhold; Greis, Ulrich; Hofmann, Wilfried; and Rauffer, Walter, 4,076,384, Cl. 350-122.000.

Rauschenbach, Gerhard: *See—*
Fritz, Heinz Peter; Besenhardt, Jurgen; and Rauschenbach, Gerhard, 4,076,901, Cl. 429-50.000.

Raven Industries, Inc.: *See—*
Obermoller, Douglas B., 4,076,188, Cl. 244-98.000.

Ray, Edward D. Direct conversion of solar energy to mechanical energy. 4,075,847, Cl. 60-527.000.

Rayfield, Jerry W.: *See—*
Short, Buddy M.; and Rayfield, Jerry W., 4,076,871, Cl. 427-397.000.

Raymond Lee Organization, Inc., The: *See—*
Allison, Harvey W., 4,076,348, Cl. 312-231.000.
Dively, Robert M., 4,076,238, Cl. 273-1.00R.
Hannebaum, Harold W., 4,076,009, Cl. 126-120.000.
McKinney, Robert D., 4,077,007, Cl. 325-315.000.
Singh, Dharam Dev, 4,076,360, Cl. 339-36.000.
Sneathen, James, Jr., 4,076,249, Cl. 273-256.000.

Raytheon Company: *See—*
Bryden, Joseph E., 4,077,037, Cl. 343-5.0EM.

RCA Corporation: *See—*
Anderson, Charles Hammond, 4,076,994, Cl. 313-422.000.
Binge, Derek Sidney, 4,076,191, Cl. 244-173.000.
Dholakia, Anil Ramniklal, 4,077,050, Cl. 358-128.000.
Endriz, John Guiry, 4,077,054, Cl. 358-242.000.
Gross, Harvey Andrew; Frey, Harry Robert; Messner, John David; and Walters, Raymond Frederick, 4,076,426, Cl. 356-239.000.
Mark, John Thomas, 4,076,992, Cl. 313-296.000.
Rast, Robert Morgan; and Tults, Juri, 4,077,008, Cl. 325-421.000.
Shaw, Joseph Michael; and Zaininger, Karl Heinz, 4,076,573, Cl. 156-613.000.
Vossen, John Louis, Jr., 4,077,051, Cl. 358-128.000.
Vossen, John Louis, Jr., 4,077,052, Cl. 358-128.000.
Wardell, Myron Henry, Jr.; and Marks, Bruce George, 4,076,366, Cl. 339-144.00T.

Rearick, William A., to ICI Americas Inc. Treatment of textile materials. 4,076,500, Cl. 8-139.100.

Rederiaktiebolaget Nordstjernan: *See—*
Archer, John Neville; and Larsson, Hans Folke, 4,076,068, Cl. 160-107.000.

Redlin, Eugene E. Gemstone drill. 4,076,007, Cl. 125-30.00R.

Redmore, Derek; and Welge, Frederick T., to Petrolite Corporation. Oil-soluble aluminum compositions. 4,076,638, Cl. 252-33.200.

Redo, Dennis M.: *See—*
Thompson, Walter F.; and Redo, Dennis M., 4,076,132, Cl. 214-16.40A.

Reed Tool Company: *See—*
Barker, Lynn M., 4,075,886, Cl. 73-88.00R.

Regie Nationale des Usines Renault: *See—*
Lefebvre, Jean; and Pichouron, Jean-Claude, 4,076,070, Cl. 164-303.000.

Reginensi, Jean-Pierre; and Slack, Peter, to Alsthom-Atlantique S.A. Motor housing for a retractable propulsion unit for boats. 4,075,971, Cl. 115-41.00R.

Reh, Lothar; Schmidt, Hans-Werner; and Plass, Ludolf, to Metallgesellschaft Aktiengesellschaft. Carrying out endothermic processes in fast fluidized reactor with conventionally fluidized holding reactor. 4,076,796, Cl. 423-659.000.

Reid, Michael Gerald; Burlew, Leroy Ellery; and Hogan, David Charles, to Eastman Kodak Company. Collating document feeder with multiple feed detector. 4,076,408, Cl. 355-14.000.

Reilly, George W.: *See—*
Burden, Ivor R.; and Reilly, George W., 4,075,783, Cl. 47-1.410.

Reimschuessel, Herbert K.: *See—*
Akkapeddi, Murali K.; and Reimschuessel, Herbert K., 4,076,680, Cl. 260-32.60R.

Reinehr, Ulrich: *See—*
Neukam, Theo; Reinehr, Ulrich; Bentz, Francis; and Nischk, Gunther, 4,076,925, Cl. 526-204.000.

Reinforcing & Allied Industries (Proprietary) Limited: *See—*
Copeland, William Raeburn, 4,075,880, Cl. 72-64.000.

Reinsma, Harold Lawrence: *See—*
Forster, Kevin George; and Reinsma, Harold Lawrence, 4,076,345, Cl. 308-120.00A.

Reiss, David. Down filling machine. 4,076,320, Cl. 302-3.000.

Reitmayer, Franz: *See—*
Faulstich, Marga; and Reitmayer, Franz, 4,076,647, Cl. 252-301.40P.

Remark, Preben Michael; and Jensen, Aksel Johannes, to Remark, Preben Michael. Engagement lock having two stages of engagement and associated method. 4,075,742, Cl. 24-211.00R.

Remy, David C.: *See—*
Anderson, Paul S.; and Remy, David C., 4,076,714, Cl. 424-267.000.

Ren, Chung-Li; and Wang, Han-Chiu, to Bell Telephone Laboratories, Incorporated. Launching and/or receiving network for an antenna feedhorn. 4,077,039, Cl. 343-786.000.

Rengo Co., Ltd.: *See—*
Tokuno, Masateru, 4,076,114, Cl. 198-425.000.

Renner, Alfred: *See—*
Forgo, Imre; Renner, Alfred; and Schmitter, Andre, 4,076,697, Cl. 260-78.0UA.

Reubke, Karl-Julius; Bien, Hans-Samuel, deceased (by Bien, Else, nee Geriche, heiress); Bien, Gabriele; and Bien, Dorothee, to Bayer Aktiengesellschaft. Preparation of aminoanthraquinones from nitroanthraquinones. 4,076,736, Cl. 260-382.000.

Rexnord, Inc.: *See—*
Gundlach, Theodore F.; and Hawthorne, Arthur L., 4,076,315, Cl. 299-64.000.

Rheinisch-Westfalisches Elektrizitatswerk AG: *See—*
Fritz, Heinz Peter; Besenhardt, Jurgen; and Rauschenbach, Gerhard, 4,076,901, Cl. 429-50.000.

Rhone-Poulenc Industries: *See—*
Boesch, Roger, 4,076,824, Cl. 424-272.000.
Jacques, Roland, 4,076,651, Cl. 252-451.000.

Rhone-Poulenc Textile: *See—*
Fontanel, Daniel; and Rampin, Jean, 4,076,667, Cl. 260-22.00A.

Ribeton, Jean Marie, to Societe Alsa Clienne de Constructions Mecaniques de Mulhouse. Diesel engines. 4,075,990, Cl. 123-119.00C.

Richard, William R., Jr.: *See—*
Herber, John F.; Richard, William R., Jr.; and Street, Robert W., 4,076,642, Cl. 252-78.500.

Richard Wolf GmbH: *See—*
Heckele, Helmut, 4,076,018, Cl. 128-6.000.

Richards, Gerald F.: *See—*
Heckley, Warner M.; and Richards, Gerald F., 4,075,822, Cl. 56-1.000.

Richardson, Frank B. Electromagnetic convertor with stationary variable-reluctance members. 4,077,001, Cl. 323-92.000.

Richardson, Neil Ray, to Garrett Corporation, The. Turbocharger regulator. 4,075,849, Cl. 60-602.000.

Rickard, M. David. Method for treatment of digester supernatant and other streams in wastewater treatment facilities. 4,076,515, Cl. 71-10.000.

Ricoh Company, Ltd.: *See—*
Kanno, Tadaaki; and Ikeda, Sunao, 4,076,402, Cl. 355-3.0DR.

Ridley, Richard D.: *See—*
Cha, Chang Yul; Ridley, Richard D.; and Burton, Robert S., III, 4,076,312, Cl. 299-2.000.

Rieger, Franz: *See—*
Linder, Ernst; Wossner, Gunter; Maurer, Helmut; and Rieger, Franz, 4,075,992, Cl. 123-119.00A.

Riegler, Ernst, to Hoechst Aktiengesellschaft. Process and apparatus for shirring tubular casings. 4,075,736, Cl. 17-42.000.

Riesner, Detlev: *See—*
De Maeyer, Leo C. M.; Rabl, Carl-Roland; Jovin, Thomas M.; Riesner, Detlev; Rigler, Rudolf; Veil, Lutz Bodo; and Lehrach, Hans, 4,076,420, Cl. 356-73.000.

Rieter Machine Works, Ltd.: *See—*
Staheli, Paul, 4,075,739, Cl. 19-240.000.

Rigler, Rudolf: *See—*
De Maeyer, Leo C. M.; Rabl, Carl-Roland; Jovin, Thomas M.; Riesner, Detlev; Rigler, Rudolf; Veil, Lutz Bodo; and Lehrach, Hans, 4,076,420, Cl. 356-73.000.

Riley, Victor; Macnab, Ian; Timusk, John; and English, Edward, to University of Toronto, The Governing Council of the. Fibre reinforcing composites. 4,076,884, Cl. 428-255.000.

Rinard, James Franklin, to Hercules Incorporated. Space frame seat assembly. 4,075,722, Cl. 5-351.000.

Rinehart, Kenneth L., Jr.; Antosz, Frederick J.; and Sasaki, Kazuya, to University of Illinois Foundation. Derivatives of streptovaricin ansamycins. 4,076,725, Cl. 260-340.300.

Rio Tinto (Rhodesia) Limited: *See—*
Hollaway, John William, 4,076,612, Cl. 208-8.000.

Ripley, Ian Stanley: *See—*
Milner, David Lee; and Ripley, Ian Stanley, 4,076,926, Cl. 526-209.000.

Risberg, Carl, Jr. Entertainment and exercise device. 4,076,235, Cl. 272-33.00A.

Ritter, Hans-Peter; Strewinsky, Rainer; Bulwien, Hans-Dieter; Koch, Engelbert; Bartholl, Hermann; and Hupp, Walter, to Bayer Aktiengesellschaft. Automatic sample-changer for mass spectrometers. 4,076,982, Cl. 250-288.000.

Robert Bosch GmbH: *See—*
Bertling, Johannes-Gerhard, 4,075,993, Cl. 123-119.0EC.
Brammer, Hartmut; Ehrmann, Karl; Haug, Heinz; Issler, Jorg; Kas, Gunter; Kalippke, Harald; Magdefrau, Herbert; and Schneider, Karl-Heinz, 4,075,752, Cl. 29-434.000.
Kramer, Manfred, 4,075,995, Cl. 123-139.0AW.
Krauss, Heinz; Kauhl, Gunther; and Steinke, Leo, 4,075,998, Cl. 123-179.00H.
Leiber, Heinz, 4,076,330, Cl. 303-92.000.
Linder, Ernst; Wossner, Gunter; Maurer, Helmut; and Rieger, Franz, 4,075,992, Cl. 123-119.00A.
Vogel, Eberhard; Glaser, Herbert; Kleider, Albert; and Dietz, Klaus, 4,075,793, Cl. 51-170.0TL.

Roberts, John S., to Kling-Tecs, Inc. Compression crimping apparatus. 4,075,743, Cl. 28-263.000.

Roberts, John S., to Kling-Tecs, Inc. Compression crimping apparatus. 4,075,746, Cl. 28-264.000.

Roberts, Thomas E., Jr., to FMC Corporation. Self-leveling static wheel balancer. 4,075,891, Cl. 73-483.000.

Robertshaw Controls Company: *See—*
Tyler, Hugh J.; and Wolfe, Denis G., 4,076,975, Cl. 219-483.000.

Robertson, Jerry E.: *See—*
Harrington, Joseph Kenneth; Kvam, Donald C.; Mendel, Arthur; and Robertson, Jerry E., 4,076,519, Cl. 71-103.000.

Robinson, Harold R., to United States of America, Army. Electronic circuitry for maintaining constant engine speed fuel injection. 4,075,983, Cl. 123-32.0EA.

Robinson, Prentice I.; and Butterfield, Thomas T., to Centronics Data Computer Corporation. Registration means for printers and the like. 4,076,111, Cl. 197-1.00R.

Robroy Industries: *See—*
Young, James M., 4,076,280, Cl. 285-39.000.

Rock, Erich; and Mages, Bernhard, to Julius Blum Gesellschaft m.b.H. Snap-toggle hinge. 4,075,735, Cl. 16-145.000.

Rockwell International Corporation: *See—*
Ash, Edward B.; Bernath, Louis; and Facha, Joseph V., 4,076,583, Cl. 176-35.000.
Sammells, Anthony F., 4,076,905, Cl. 429-112.000.

Rockwell-Rimoldi S.p.A.: *See—*
Marforio, Nerino, 4,075,957, Cl. 112-153.000.

Roesch, Egon: *See—*
Kampe, Wolfgang; Stach, Kurt; Thiel, Max; Bartsch, Wolfgang; Dietmann, Karl; Roesch, Egon; and Schaumann, Wolfgang, 4,076,829, Cl. 424-274.000.

Rogan, John, to Dart Industries Inc. High fatigue strength check valve. 4,076,043, Cl. 137-539.500.

Rohm and Haas Company: *See—*
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,076,741, Cl. 260-465.00F.
Bright, Alan, 4,076,671, Cl. 260-28.5AV.
Costin, C. Richard, 4,076,622, Cl. 210-64.000.
Stewart, Thomas; and Landau, Frederick W., 4,076,950, Cl. 560-218.000.
Swift, Graham; and Cenci, Harry J., 4,076,917, Cl. 526-49.000.
Weir, W. David; and Kilbourn, Edward E., 4,076,809, Cl. 424-211.000.

Rohr, Horst: *See—*
Braun, Werner; Decker, Gernot; and Rohr, Horst, 4,076,371, Cl. 350-3.610.

Roman, Steven A.; and Powell, James E., to Shell Oil Company. Derivatives of 3-oxomethyl-2-(1-nitro-2-oxoethylidene)-tetrahydro-2H-1,3-thiazines as insecticides. 4,076,813, Cl. 424-246.000.

Roof, Earl O. Convertible lawn care apparatus. 4,076,460, Cl. 417-236.000.

Roorda, Bruce R.: *See—*
Handy, Richard L.; Girard, Leon E.; Roorda, Bruce R.; and Pitt, John M., 4,075,885, Cl. 73-88.00E.

Rosen, Meyer Robert, to Union Carbide Corporation. Self-dispersible antifoam compositions. 4,076,648, Cl. 252-358.000.

Rosen, Perry, to Hoffmann-La Roche Inc. 3β,14β-Dihydroxy-14,17-seco-D-bisnorandrostan-17-oic acid derivatives. 4,076,944, Cl. 560-5.000.

Rosenberg, Harry: *See—*
Elsner, Burckhardt; Lagodka, Gunter; Plevak, Lubomir; and Rosenberg, Harry, 4,075,857, Cl. 61-45.00D.

Rosenberger, Siegfried, to Ciba-Geigy Corporation. Phosphonates, process for their manufacture and organic materials stabilized therewith. 4,076,690, Cl. 260-45.95D.

Rosenkranz, Otto; Goos, Heinz; and Seifert, Karl-Heinrich, to Heidenreich & Harbeck Zweigniederlassung der Gildemeister AG. Method for heating plastics materials. 4,076,071, Cl. 165-2.000.

Rosinski, Edward J.: *See—*
Plank, Charles J.; Rosinski, Edward J.; and Rubin, Mae K., 4,076,842, Cl. 423-328.000.

Ross, Milton Dean; Boutcher, Andrew Graham; and Shatto, Walter Clifton, to AMP Incorporated. Electrical connector having conductor spreading means. 4,076,365, Cl. 339-107.000.

Ross Operating Valve Company: *See—*
Bitonti, Paul A., 4,075,928, Cl. 91-29.000.

Ross, Robert R., to United Centrifugal Pumps. Double volute pump with replaceable lips. 4,076,450, Cl. 415-197.000.

Rossi, Alberto: *See—*
Haas, Georges; and Rossi, Alberto, 4,076,822, Cl. 424-263.000.

Rossio, John H., to LaRos Equipment Company, Inc. Means for removing a molded component from a molding machine. 4,076,478, Cl. 425-215.000.

Roth, Michael; and Bosch, Erhard, to Wacker-Chemie GmbH. Rendering building materials hydrophobic. 4,076,868, Cl. 427-348.000.

Rothbart, George B.: *See—*
Sparks, Robert A.; Rothbart, George B.; and Samdahl, Roger N., 4,076,981, Cl. 250-272.000.

Rottmann, Dieter: *See—*
Klank, Otto; and Rottmann, Dieter, 4,077,009, Cl. 325-455.000.

Rowland-Hill, Edward W., to Sperry Rand Corporation. Combine harvester. 4,075,823, Cl. 56-14.600.

Rubin, Leon J.: *See—*
Bharucha, Kekhusroo R.; Rubin, Leon J.; and Cross, Charles K., 4,076,849, Cl. 426-266.000.

Rubin, Mae K.: *See—*
Plank, Charles J.; Rosinski, Edward J.; and Rubin, Mae K., 4,076,842, Cl. 423-328.000.

Ruder, Gary: *See—*
Fennimore, Jack; Ruder, Gary; and Simmonite, Donald, 4,076,892, Cl. 428-407.000.

Rupp, Raymond W.: *See—*
Mulvaney, James E.; and Rupp, Raymond W., 4,076,526, Cl. 96-1.50R.

Rupprecht, Hans Stephen; and Schwenker, Robert Otto, to International Business Machines Corporation. Method of high current ion implantation and charge reduction by simultaneous kerf implant. 4,076,558, Cl. 148-1.500.

Russell, William: *See—*
Alms, Erhardt E.; DeVale, Donald P.; and Russell, William, 4,076,492, Cl. 432-43.000.

Rustad, Stanley C.: *See—*
Davis, Noel; Haub, John T.; and Rustad, Stanley C., 4,075,949, Cl. 104-162.000.

Ruti Machinery Works Ltd: *See—*
Strauss, Edgar, 4,076,050, Cl. 139-436.000.

Rutzen, Horst: *See—*
Koch, Karlheinz; and Rutzen, Horst, 4,076,743, Cl. 260-501.130.

Ryan, Terry W.: *See—*
Feucht, Dennis D.; and Ryan, Terry W., 4,076,194, Cl. 248-9.000.

Ryder, James H.; Brown, David C.; and Van Haastert, Johannes A., to Sierra Engineering Co. Helmet characterized by negative lift. 4,075,714, Cl. 2-6.000.

Ryder, William S.; and Mezzino, Joseph F., to General Foods Corporation. Soluble coffee process. 4,076,855, Cl. 426-594.000.

Ryon, Donald Carroll, to Motorola, Inc. Digital pulse doubler with 50 percent duty cycle. 4,077,010, Cl. 328-20.000.

S&C Electric Company: *See—*
Bernatt, Joseph; and Steegmueller, Alfred, 4,075,755, Cl. 29-623.000.

Sable, Frank Robert, to Towmotor Corporation. Operator's seat assembly. 4,076,302, Cl. 296-65.00R.

Sacchetti, Alfred D. Sewing machine automatic thread changer. 4,075,958, Cl. 112-163.000.

Sachsze, Werner: *See—*
Buelow, Horst; Hohenschutz, Heinz; Schmidt, Johannes E.; and Sachsze, Werner, 4,076,594, Cl. 203-15.000.

Sackner Products, Inc.: *See—*
Corcoran, Jack C., 4,076,886, Cl. 428-294.000.

Sacks, Jack, to Singer & Singer, a part interest. Impulse noise reduction system. 4,076,969, Cl. 179-100.40D.

Saetti, Renato, to Fiat Trattori S.p.A. Track for track laying agricultural tractors and like vehicles. 4,076,334, Cl. 305-54.000.

Sain, Bernard S. Orthopedic cast construction. 4,076,019, Cl. 128-83.000.

St. Pierre, Raymond Marie: *See—*
Bass, Sidney; and St. Pierre, Raymond Marie, 4,075,955, Cl. 112-79.00R.

Saito, Haruhiko; and Morishita, Michio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Carburetor with auxiliary accelerator-pump system. 4,076,770, Cl. 261-34.00A.

Saito, Kazuo, deceased: *See—*
Inouye, Shigeharu; Shomura, Takashi; Kojima, Michio; Ogawa, Yasuaki; Watanabe, Hiroshi; Kondo, Yasumitsu; Saito, Kazuo, deceased; Yamada, Yujiro; and Niida, Taro, 4,076,588, Cl. 195-36.00C.

Saito, Masaaki; and Minami, Hidehiro, to Nissan Motor Company, Limited. Air-fuel ratio control adjusting system in an internal combustion engine. 4,075,834, Cl. 60-276.000.

Saito, Nobuko, administrator: *See—*
Inouye, Shigeharu; Shomura, Takashi; Kojima, Michio; Ogawa, Yasuaki; Watanabe, Hiroshi; Kondo, Yasumitsu; Saito, Kazuo, deceased; Yamada, Yujiro; and Niida, Taro, 4,076,588, Cl. 195-36.00C.

Saito, Takashi: *See—*
Nagamatsu, Katsumi; and Saito, Takashi, 4,076,404, Cl. 355-4.000.

Saka, Tatsuo: *See—*
Machara, Naoyoshi; Fujieda, Hiroshi; and Saka, Tatsuo, 4,076,996, Cl. 315-106.000.

Sakagami, Teruo: *See—*
Murayama, Naohiro; Nakamura, Kenichi; Fukuda, Makoto; Sakagami, Teruo; and Suzuki, Shirou, 4,076,604, Cl. 204-98.000.

Sakai, Nobuo: *See—*
Ota, Satoshi; Nakamura, Kotaro; Sakai, Nobuo; Furutachi, Nobuo; and Yokota, Yukio, 4,076,533, Cl. 96-56.500.

Sakashita, Masami, to Yoshida Kogyo K.K. Corner piece for miter joint. 4,076,439, Cl. 403-402.000.

Saksena, Anil K.: *See—*
Ganguly, Ashit K.; Peets, Edwin A.; and Saksena, Anil K., 4,076,711, Cl. 260-256.40F.

Salomon, Georges Pierre Joseph, to Societe Anonyme des Etablissements Francois Salomon & Fils. Ski brakes. 4,076,274, Cl. 280-605.000.

Saltz, Julian. Opacity measuring apparatus. 4,076,425, Cl. 356-205.000.

Samdahl, Roger N.: *See—*
Sparks, Robert A.; Rothbart, George B.; and Samdahl, Roger N., 4,076,981, Cl. 250-272.000.

Samejima, Hiroshi, to Mitsubishi Petrochemical Co., Ltd. Curable mixed polyester resin compositions. 4,076,767, Cl. 260-862.000.

Sammells, Anthony F., to Rockwell International Corporation. Electrode for electrical energy storage device. 4,076,905, Cl. 429-112.000.

Sanders Associates, Inc.: *See—*
Baer, Ralph H., 4,077,049, Cl. 358-93.000.

Sanders, David E.; Chambers, Ramon P.; and Gordy, Robert S., to NCR Corporation. Apparatus and method for inhibiting false locking of a phase-locked loop. 4,077,016, Cl. 331-4.000.

Sanders, David Leonard. Device for lubricating the slide rails on snowmobiles traveling over packed snow. 4,076,089, Cl. 180-5.00R.

Sanders, Davis A., Jr. Power generating water turbine. 4,076,448, Cl. 415-2.000.

Sanders, James Milton: *See—*
Light, Kenneth K.; Sanders, James Milton; Vock, Manfred Hugo; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja Dulal; Tseng, Ching Y.; and Sprecker, Mark A., 4,076,853, Cl. 426-538.000.

Sandoz Ltd.: *See—*
Fehr, Theodor; and Hauth, Hartmut, 4,076,715, Cl. 260-285.500.
Payne, Trevor Glyn, 4,076,838, Cl. 424-317.000.
Schuster, Johann; and Taubert, Karl, 4,076,494, Cl. 8-2.50A.

Sankyo Company Limited: *See—*
Murayama, Keisuke; Asai, Motoji; and Tsuji, Hideakira, 4,076,835, Cl. 424-285.000.
Seki, Isao; Kitano, Noritoshi; and Kondo, Fusao, 4,076,814, Cl. 424-248.500.

Sansone, Leonard F., to Sussex Plastics Engineering, Inc. Annular extrusion die. 4,076,481, Cl. 425-376.00B.

Santucci, Nicola: *See—*
Zabotin, Alexandr Alexandrovich; Loschilin, Evgeny Dmitrievich; Onikov, Eduard Arshakovich; Galperin, Alexandr Lvovich; Santucci, Nicola; and Corain, Luciano, 4,076,051, Cl. 139-436.000.

Sanyo Chemical Industries, Ltd.: *See—*
Masuda, Fusayoshi; Nishida, Kazuo; and Nakamura, Akira, 4,076,663, Cl. 260-17.4GC.

Sanyo Shokai Ltd.: *See—*
Sato, Koichi, 4,076,881, Cl. 428-195.000.

Sargisson, Donald Farley, to General Electric Company. Variable area inlet for a gas turbine engine. 4,075,833, Cl. 60-262.000.

Sasaki, Kazuya: *See—*
Rinehart, Kenneth L., Jr.; Antosz, Frederick J.; and Sasaki, Kazuya, 4,076,725, Cl. 260-340.300.

Sasaki, Kunimasa: *See—*
Iwasaki, Takeshi; Fujikawa, Yasuo; and Sasaki, Kunimasa, 4,075,890, Cl. 73-295.000.

Sasaki, Tohru; Terasaki, Syuuzi; and Ichii, Takao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Heat-insulation material. 4,076,889, Cl. 428-333.000.

Sasakura, Kazuyuki: *See—*
Hirai, Kentaro; Ishiba, Teruyuki; Sasakura, Kazuyuki; and Sugimoto, Hirohiko, 4,076,702, Cl. 260-112.50R.
Hirai, Kentaro; Ishiba, Teruyuki; Sasakura, Kazuyuki; and Sugimoto, Hirohiko, 4,076,703, Cl. 260-112.50R.
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Hirai, Kentaro; Ishiba, Teruyuki; Sasakura, Kazuyuki; and Sugimoto, Hirohiko, 4,076,705, Cl. 260-112.50R.

Sashihara, Kenji: *See—*
Noguchi, Yasuhiro; Sekikawa, Nobuyoshi; Sashihara, Kenji; and Masuda, Takao, 4,076,534, Cl. 96-63.000.

Sasse, Klaus: *See—*
Naumann, Klaus; Sasse, Klaus; and Lurssen, Klaus, 4,076,517, Cl. 71-86.000.

Sastre, David: *See—*
Bundy, Wayne M.; Berberich, Joseph P.; and Sastre, David, 4,076,548, Cl. 106-288.00B.

Sato, Eiichi: *See—*
Nishikawa, Masaji; and Sato, Eiichi, 4,076,403, Cl. 355-35.00C.

Sato, Koichi, to Sanyo Shokai Ltd. Interlining structure for apparel and method for its production. 4,076,881, Cl. 428-195.000.

Satoh, Akihiro; Takahashi, Akio; Masuda, Jun; Harada, Masato; and Yamada, Sadahiko, to Chisso Corporation. Method for producing ethylene polymers. 4,076,922, Cl. 526-97.000.

Satoh, Ken, to Olympus Optical Co., Ltd. Automatic gain control circuit. 4,077,014, Cl. 330-278.000.

Satomi, Akinori: *See—*
Yoshikawa, Yoshinobu; Iida, Kosuke; Morikawa, Tadayuki; and Satomi, Akinori, 4,076,567, Cl. 156-219.000.

Satzinger, Gerhard: *See—*
Stoss, Peter; and Satzinger, Gerhard, 4,076,723, Cl. 260-327.00B.
Vigelius, Wolf-Dieter; Satzinger, Gerhard; and Herrmann, Manfred, 4,076,937, Cl. 544-171.000.

Satzinger, Roland. Vehicle seat rest. 4,076,306, Cl. 297-216.000.

Saucy, Gabriel: *See—*
Chan, Ka-Kong; and Saucy, Gabriel, 4,076,739, Cl. 260-410.90R.

Sauer, Louis E., to L. E. Sauer Machine Company. Rotary anvil cover. 4,075,918, Cl. 83-659.000.

Sauli, Michel, to Philagro. Process for the preparation of 1-carbamoyl-3-(3,5-dichlorophenyl)-hydantoins. 4,076,941, Cl. 548-312.000.

Saunders, Frank L.; and Pelletier, Ronald R., to Dow Chemical Company, The. Cross-linked block copolymer blends with improved impact resistance. 4,076,768, Cl. 260-876.00B.

Sawada, Chikamitsu: *See—*
Nakazato, Takashi; Sawada, Chikamitsu; Umino, Shigeyuki; and Takatsuru, Mitsuhiro, 4,075,850, Cl. 60-633.000.

Saxinger, Allan L., to Xerox Corporation. Slave drive for toner dispenser with striker. 4,076,149, Cl. 222-202.000.

Schaaphok, Peter R. W., to Controlex Corporation of America. Stabilized flexible remote control with spaced ball bearings. 4,075,905, Cl. 74-501.00R.

Schaefer, Robert H., to General Motors Corporation. Transmission with sump oil level responsive controls. 4,075,912, Cl. 74-867.000.

Schafer, Larry C.: *See—*
Heller, Robert I.; Schafer, Larry C.; and McCracken, Stephen R., 4,077,038, Cl. 343-7.00A.

Schaffernicht, Klaus: *See—*
Kolbeck, Rainer; Kuckenburg, Heinz; and Schaffernicht, Klaus, 4,076,995, Cl. 313-446.000.

Schaming, Edward J. Runout cooling method and apparatus for metal rolling mills. 4,076,222, Cl. 266-111.000.

Schaub, Robert Eugene; and Weiss, Martin Joseph, to American Cyanamid Company. Cycloalkyl and cycloalkenyl prostaglandin congeners. 4,076,947, Cl. 560-121.000.

Schaumann, Wolfgang: *See—*
Kampe, Wolfgang; Stach, Kurt; Thiel, Max; Bartsch, Wolfgang; Dietmann, Karl; Roesch, Egon; and Schaumann, Wolfgang, 4,076,829, Cl. 424-274.000.

Scheinecker, Alois; and Scheurecker, Werner, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Strand guide to be used in a continuous casting plant. 4,076,069, Cl. 164-448.000.

Schempp, Eberhard G., to Pennsylvania Engineering Corporation. Enclosure for steel converting apparatus. 4,076,223, Cl. 266-158.000.

Schering Aktiengesellschaft: *See—*
Boroschewski, Gerhard; and Arndt, Friedrich, 4,076,518, Cl. 71-100.000.
Lachnit-Fixson, Ursula; and Neumann, Friedmund, 4,076,811, Cl. 424-239.000.

Schering Corporation: *See—*
Charney, William, 4,076,589, Cl. 195-49.000.
Ganguly, Ashit K.; Peets, Edwin A.; and Saksena, Anil K., 4,076,711, Cl. 260-256.40F.
Green, Michael J.; Shue, Ho-Jane; Shapiro, Elliot L.; and Gentles, Margaret A., 4,076,708, Cl. 260-239.570.

Schertz, Burtron D.: *See—*
Gilbert, William F.; Schertz, Burtron D.; and Wilkinson, Lester, 4,076,959, Cl. 179-1.00D.

Scheurecker, Werner; and Kagerhuber, Franz, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Fastening arrangement for a longitudinally multiply divided roller to be used in continuous casting plants. 4,076,341, Cl. 308-20.000.

Scheurecker, Werner: *See—*
Scheinecker, Alois; and Scheurecker, Werner, 4,076,069, Cl. 164-448.000.

Schibbye, Lauritz Benedictus: *See—*
Persson, Walther; and Schibbye, Lauritz Benedictus, 4,076,468, Cl. 418-9.000.

Schiferli, Johannes W., to U.S. Philips Corporation. Hot-gas reciprocating engine having controlled coupling of a combustion air fan. 4,075,844, Cl. 60-524.000.

Schimpf, James E.; and Shuler, Lucien B., to Caterpillar Tractor Co. Variable speed governor. 4,075,906, Cl. 74-513.000.
Schindling, Josef Franz, to Metallgesellschaft Aktiengesellschaft. Lock chamber for discharging dust. 4,076,044, Cl. 137-614.110.
Schlachta, Hermann: *See*—
Backer, Karl-Heinrich; and Schlachta, Hermann, 4,076,908, Cl. 429-184.000.
Schladitz, Hermann Johannes, to Schladitz-Whiskers AG. Process for metallizing strips, sheets or the like. 4,076,859, Cl. 427-55.000.
Schladitz-Whiskers AG: *See*—
Schladitz, Hermann Johannes, 4,076,859, Cl. 427-55.000.
Schlei, Rudolf, to Braun Aktiengesellschaft. Control mechanism for a plurality of slide projectors. 4,076,399, Cl. 353-86.000.
Schlesinger, Sheldon Irwin; and Boszak, Ronald J., to American Can Company. Dry photopolymer imaging article having a diazonium salt and epoxide copolymer. 4,076,536, Cl. 96-75.000.
Schliebs, Reinhard: *See*—
Thom, Karl-Friedrich; and Schliebs, Reinhard, 4,076,763, Cl. 260-824.00R.
Schlimper, Hans-Ulrich: *See*—
Theysohn, Rainer; Wurmb, Rolf; Leutner, Bernd; and Schlimper, Hans-Ulrich, 4,076,682, Cl. 260-37.00N.
Schloemann-Siemag Aktiengesellschaft: *See*—
Spielvogel, Harry, 4,076,210, Cl. 251-285.000.
Schlumberger Technology Corporation: *See*—
Rau, Rama N., 4,077,003, Cl. 324-6.000.
Schlutz, Charles A. Centrifuge separation and washing device and method. 4,076,169, Cl. 233-14.00R.
Schmehl, Glenn Lewis: *See*—
Ahmed, Nazeer; O'Donnell, James Kevin; and Schmehl, Glenn Lewis, 4,076,335, Cl. 308-3.500.
Schmid, Erich: *See*—
Allgeier, Hans; and Schmid, Erich, 4,076,812, Cl. 424-244.000.
Schmidt, Eckhard Wolfgang: *See*—
Giovanelli, Anton Alfred Arthur; and Schmidt, Eckhard Wolfgang, 4,076,874, Cl. 428-35.000.
Schmidt, Fred, to Triangle Tool Company. Apparatus for obtaining relative orbital movement in electrical discharge machining. 4,075,897, Cl. 74-86.000.
Schmidt, Hans-Werner: *See*—
Reh, Lothar; Schmidt, Hans-Werner; and Plass, Ludolf, 4,076,796, Cl. 423-659.000.
Schmidt, Johannes E.: *See*—
Buelow, Horst; Hohenschutz, Heinz; Schmidt, Johannes E.; and Sachsze, Werner, 4,076,594, Cl. 203-15.000.
Schmidt, Willi Johann, to Hoechst Aktiengesellschaft. Method of and apparatus for increasing the production output of stretched flat film webs composed of thermoplastic material. 4,076,785, Cl. 264-146.000.
Schmit, Justin M. Liquid container having a plastic film pouch and a piercing element to open the plastic film pouch. 4,076,147, Cl. 222-89.000.
Schmitter, Andre: *See*—
Forgo, Imre; Renner, Alfred; and Schmitter, Andre, 4,076,697, Cl. 260-78.0UA.
Schmunk, John D.: *See*—
Alpers, Robert J.; Crates, Fredrick J.; Ott, Denis P.; and Schmunk, John D., 4,076,040, Cl. 137-371.000.
Schnee, Karl; Piesch, Steffen; and Tichy, Dieter, to Cassella Farbwerke Mainkur Aktiengesellschaft. Modified aminoplast compositions. 4,076,662, Cl. 260-17.300.
Schneider, Georg: *See*—
Kutzner, Willi Albert Peter; and Schneider, Georg, 4,076,231, Cl. 270-21.000.
Schneider, Karl-Heinz: *See*—
Brammer, Hartmut; Ehrmann, Karl; Haug, Heinz; Issler, Jorg; Kas, Gunter; Kalippke, Harald; Magdefrau, Herbert; and Schneider, Karl-Heinz, 4,075,752, Cl. 29-434.000.
Schnell, Hans Gunther, to Van Kooten B.V. Pile driving device. 4,076,081, Cl. 173-137.000.
Scholey, Stuart: *See*—
Hague, David P.; Malkani, Dalip T.; Middlemiss, Andrew; and Scholey, Stuart, 4,075,747, Cl. 29-18.000.
Scholten, John James; and Young, James Clinton, to General Filter Company. Baffle and wash trough assembly for granular-media filters. 4,076,625, Cl. 210-274.000.
Schrader, Paul D., to General Electric Company. Air conditioning fan control. 4,075,864, Cl. 62-180.000.
Schraudolph, Manfred: *See*—
Rameil, Wilfried; Schraudolph, Manfred; and Thiele, Gerd, 4,077,057, Cl. 361-386.000.
Schreiber, Jurgen, to Buderus'sche Eisenwerke Aktiengesellschaft. System for controlling the advance of a rotary machine tool. 4,075,792, Cl. 51-165.920.
Schreiber, William L.; Siano, James N.; and Shuster, Edward J., to International Flavors & Fragrances Inc. Substituted acetonaphthones, processes for preparing same, uses of same in perfumery, and intermediates used in said processes. 4,076,749, Cl. 260-586.00R.
Schreiber, William L.: *See*—
Light, Kenneth K.; Sanders, James Milton; Vock, Manfred Hugo; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja Dulal; Tseng, Ching Y.; and Sprecker, Mark A., 4,076,853, Cl. 426-538.000.
Schriever, Richard L.: *See*—
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Schroeter, Siegfried H.; Bolon, Donald A.; and Lucas, Gary M., to General Electric Company. Method for coating photoflash lamps. 4,076,489, Cl. 431-94.000.
Schrolucke, Virgil H., to National Automatic Tool Company, Inc. Air bearing assembly for rotational table. 4,076,339, Cl. 308-9.000.
Schuster, Johann; and Taubert, Karl, to Sandoz Ltd. Organic compounds. 4,076,494, Cl. 8-2.50A.
Schwab, Christopher Morrison, to Beckman Instruments, Inc. Zero speed sensing safety latch apparatus. 4,076,288, Cl. 292-113.000.
Schwab, Robert E. Means for maintaining visibility in the use of mirrors subject to aqueous deposits. 4,076,374, Cl. 350-63.000.
Schwalm, Howard G. Lift for truck gate. 4,076,310, Cl. 298-23.0MD.
Schwartz, Joseph I.: *See*—
Raas, Jean H.; and Schwartz, Joseph I., 4,076,144, Cl. 220-367.000.
Schweer, Wilhelm, to Th. Kieserling & Albrecht. Method for rotary peeling elongated workpieces. 4,075,914, Cl. 82-1.00C.
Schwender, Charles F.; and Sunday, Brooks R., to Warner-Lambert Company. Benzo[g]pyrido[2,1-b]-quinazolinones. 4,076,710, Cl. 260-256.40F.
Schwenker, Robert Otto: *See*—
Rupprecht, Hans Stephen; and Schwenker, Robert Otto, 4,076,558, Cl. 148-1.500.
Scifres, Donald R.: *See*—
Streifer, William; Scifres, Donald R.; and Burnham, Robert D., 4,077,019, Cl. 331-94.50H.
Scott, John N., Jr.; and Carrow, Guy E., to Phillips Petroleum Company. Molded plastic article. 4,076,282, Cl. 285-156.000.
Scott Paper Company: *See*—
Avis, Robert P., 4,076,581, Cl. 162-167.000.
Scouten, Charles G.; and Hamilton, Willard C., to Xerox Corporation. ω-and cis Alkenoic acid amides in electrostatographic developers. 4,076,641, Cl. 252-62.10P.
Scribner, Albert W. Stock feeder for punch presses and the like. 4,076,161, Cl. 226-146.000.
Sedlacek, Gerhard: *See*—
Sedlacek, Hugo; and Sedlacek, Gerhard, 4,075,727, Cl. 14-14.000.
Sedlacek, Hugo; and Sedlacek, Gerhard, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Frame structure, especially for a portable bridge. 4,075,727, Cl. 14-14.000.
Seha, Zdenek, to Ciba-Geigy AG. Process for the manufacture of aminoanthraquinones. 4,076,735, Cl. 260-378.000.
Seidel, William Carl: *See*—
Nazarenko, Nicholas; and Seidel, William Carl, 4,076,756, Cl. 260-606.50B.
Seidenberger, James W., to J. T. Baker Chemical Company. Spill control composition and use thereof. 4,076,553, Cl. 134-6.000.
Seifert, Karl-Heinrich: *See*—
Rosenkranz, Otto; Goos, Heinz; and Seifert, Karl-Heinrich, 4,076,071, Cl. 165-2.000.
Seifried, Alfred, to Zahnradfabrik Friedrichshafen AG. Radially shiftable gear for speed-changing mechanism. 4,075,870, Cl. 64-9.00R.
Seipp, Ronald W., to Thermo King Corporation. Compact refrigeration unit. 4,075,867, Cl. 62-323.000.
Seki, Isao; Kitano, Noritoshi; and Kondo, Fusao, to Sankyo Company Limited. Preventive and curative compositions against mycoplasmosis. 4,076,814, Cl. 424-248.500.
Sekikawa, Nobuyoshi: *See*—
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Sekmakas, Kazys, to DeSoto, Inc. Aqueous copolymer dispersions and method of producing the same. 4,076,677, Cl. 260-29.60E.
Sellstedt, John H.; and Klaubert, Dieter H., to American Home Products Corporation. 2,6-Pyridinediyl-bis-tetrazol-5-carboxamides. 4,076,718, Cl. 260-295.0PA.
Sendelweck, Michael Lynn: *See*—
Hieronymus, Gerald Whitfield; Sendelweck, Michael Lynn; West, James Everett; and Woods, Joe William, 4,076,046, Cl. 137-627.500.
Senoo, Keizi, to Agency of Industrial Science & Technology. Sodium-sulfur storage battery. 4,076,902, Cl. 429-104.000.
Setele, Robert Joseph: *See*—
Subramanyan, Palliyil K.; Makowski, Mieczyslaw Paul; and Setele, Robert Joseph, 4,076,597, Cl. 204-13.000.
Sexton, Ernest A.: *See*—
Puddington, Ira E.; Sparks, Bryan D.; and Sexton, Ernest A., 4,076,578, Cl. 162-5.000.
Shakespeare of Arkansas, Inc.: *See*—
Weaver, Lester C., 4,076,193, Cl. 248-4.000.
Shapiro, Elliot L.: *See*—
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Shapiro, Eugene: *See*—
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Sharp Kabushiki Kaisha: *See*—
Ohsaki, Mikio; Kawamoto, Toshiaki; and Fujimoto, Osamu, 4,076,125, Cl. 209-80.500.
Shatto, Walter Clifton: *See*—
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Shavel, John, Jr.: *See*—
Fabian, Arthur C.; Genzer, Jerome D.; Kasulanis, Charles Francis; Shavel, John, Jr.; and Zinnes, Harold, 4,076,722, Cl. 260-307.00H.
Shaw, James E., to White Advertising Company. Shelter construction. 4,075,797, Cl. 52-36.000.
Shaw, Joseph Michael; and Zaininger, Karl Heinz, to RCA Corporation. Method of making planar silicon-on-sapphire composite. 4,076,573, Cl. 156-613.000.
Shea, Lawrence E. Resorcinol-aldehyde resins used to bind reinforcing materials such as glass fibers in shaped object form. 4,076,873, Cl. 428-35.000.
Shearer, James W.: *See*—
Gilson, Verle A.; Schriever, Richard L.; and Shearer, James W., 4,077,017, Cl. 331-94.5PE.
Sheldon, Harold S., to Adjustable Clamp Company. Kerf clamp. 4,076,228, Cl. 269-49.000.
Shell Oil Company: *See*—
Bauer, Ronald S., 4,076,764, Cl. 260-834.000.
Drinkard, Gary; and McLaughlin, William A., 4,076,078, Cl. 166-271.000.
Herricks, Herman H.; and Easterwood, Richard L., 4,076,079, Cl. 166-308.000.
Roman, Steven A.; and Powell, James E., 4,076,813, Cl. 424-246.000.
Sherwin-Williams Company, The: *See*—
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Sherwood Medical Industries Inc.: *See*—
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Shields, George B.: *See*—
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Shields, James E., to Eli Lilly and Company. L-Val^{10}-somatostatin and intermediates thereto. 4,076,659, Cl. 260-8.000.
Shields, Walter A. Apparatus for simultaneously reorienting and transporting articles. 4,076,113, Cl. 198-403.000.
Shiina, Tomoyuki: *See*—
Hirayama, Yoshio; Ito, Kanichi; Takeuchi, Ryoichi; Nomoto, Masao; and Shiina, Tomoyuki, 4,076,177, Cl. 241-32.000.
Shilova, Galina Pavlovna: *See*—
Berlin, Alfred Anisimovich; Brikenshtein, Khaim-Mordkhe Aronovich; Gavrjushenko, Nikolai Sviridovich; Dubovitsky, Fedor Ivanovich; Kefeli, Tamara Yakovlevna; Kronman, Raisa Vasilievna; Konkhina, Ljudmila Alexeevna; Marshavina, Natalya Lvovna; Popova, Galina Leonidovna; Radugina, Anna Alexandrovna; Sivergin, Jury Mikhailovich; Sumin, Iosif Grigorievich; Tvorogov, Nikolai Nikandrovich; Shilova, Galina Pavlovna; and Kardashov, David Alexeevich, 4,076,742, Cl. 260-47.0UA.
Shimizu, Akihiko; and Kita, Atsushi, to Toyo Soda Manufacturing Co., Ltd. Process for producing sulfur modified polychloroprene. 4,076,927, Cl. 526-217.000.
Shinagawa Furnace Co., Ltd.: *See*—
Oshida, Naoichi; and Ando, Eiichi, 4,076,504, Cl. 23-277.00C.
Shinpo Kogyo Kabushiki Kaisha: *See*—
Muguruma, Yoshikata, 4,076,269, Cl. 280-218.000.
Shionogi & Co., Ltd.: *See*—
Hirai, Kentaro; Ishiba, Teruyuki; Sasakura, Kazuyuki; and Sugimoto, Hirohiko, 4,076,702, Cl. 260-112.50R.
Hirai, Kentaro; Ishiba, Teruyuki; Sasakura, Kazuyuki; and Sugimoto, Hirohiko, 4,076,703, Cl. 260-112.50R.
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Shklyanov, Leonid Pavlovich: *See*—
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Shomura, Takashi: *See*—
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Shorette, Richard A. Light diffuser and illuminating ceiling display. 4,075,775, Cl. 40-553.000.
Short, Buddy M.; and Rayfield, Jerry W., to Masonite Corporation. Method of impregnating wood with boric acid. 4,076,871, Cl. 427-397.000.
Short, William T., to General Motors Corporation. Dual-walled microcapsules and a method of forming same. 4,076,774, Cl. 264-4.000.
Shuckrow, Alan J.: *See*—
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Shue, Ho-Jane: *See*—
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Shuler, Lucien B.: *See*—
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Shuster, Edward J.: *See*—
Light, Kenneth K.; Sanders, James Milton; Vock, Manfred Hugo; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja Dulal; Tseng, Ching Y.; and Sprecker, Mark A., 4,076,853, Cl. 426-538.000.
Light, Kenneth K.; Spencer, Bette M.; Vinals, Joaquin F.; Kiwala, Jacob; Vock, Manfred Hugo; and Shuster, Edward J., 4,076,854, Cl. 426-538.000.
Schreiber, William L.; Siano, James N.; and Shuster, Edward J., 4,076,749, Cl. 260-586.00R.
Siano, James N.: *See*—
Schreiber, William L.; Siano, James N.; and Shuster, Edward J., 4,076,749, Cl. 260-586.00R.
Sicurella, MariaRosa, to Cavalieri, Amilcare. Insole for footwears. 4,075,772, Cl. 36-43.000.
Siebrecht, Gary L. Drill bit extension. 4,076,444, Cl. 408-226.000.
Siemens Aktiengesellschaft: *See*—
Behne, Ernst-August; and Straihammer, Reinhard, 4,075,761, Cl. 32-27.000.
Dummel, Fritz, 4,076,056, Cl. 140-119.000.
Oestreich, Ulrich, 4,076,382, Cl. 350-96.230.
Rameil, Wilfried; Schraudolph, Manfred; and Thiele, Gerd, 4,077,057, Cl. 361-386.000.
Siemund, Herbert A., to Greenview Manufacturing Company. Nonmetallic squeegee for showerbath surfaces and the like. 4,075,730, Cl. 15-245.000.
Sierra Engineering Co.: *See*—
Cowgill, Duane W., 4,075,715, Cl. 2-6.000.
Ryder, James H.; Brown, David C.; and Van Haastert, Johannes A., 4,075,714, Cl. 2-6.000.
Sigismondo Piva S.p.A.: *See*—
Manetti, Orlando, 4,075,956, Cl. 112-121.270.
Sigott, Siegfried; Zitz, Alfred; Althaler, Wilhelm; and Wlach, Helmut, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Device for consecutively supporting a drift. 4,075,856, Cl. 61-45.00C.
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Silvey, Trevor Ian, to Plessey Handel und Investments A.G. Hydrodynamic cable fairing. 4,075,967, Cl. 114-243.000.
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Simmons, Raymond W., to Concept Inc. Forceps spacing device. 4,076,028, Cl. 128-303.130.
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Singer Company, The: *See*—
Lind, Thomas Peter, 4,077,063, Cl. 364-729.000.
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Singiser, Robert E.; Chun, Alexander Hing Chinn; and Mehta, Shashi Pal, to Abbott Laboratories. Erythromycin therapy. 4,076,804, Cl. 424-181.000.
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Berlin, Alfred Anisimovich; Brikenshtein, Khaim-Mordkhe Aronovich; Gavrjushenko, Nikolai Sviridovich; Dubovitsky, Fedor Ivanovich; Kefeli, Tamara Yakovlevna; Kronman, Raisa Vasilievna; Konkhina, Ljudmila Alexeevna; Marshavina, Natalya Lvovna; Popova, Galina Leonidovna; Radugina, Anna Alexandrovna; Sivergin, Jury Mikhailovich; Sumin, Iosif Grigorievich; Tvorogov, Nikolai Nikandrovich; Shilova, Galina Pavlovna; and Kardashov, David Alexeevich, 4,076,742, Cl. 260-47.0UA.
Sizer, Philip S., to Otis Engineering Corporation. Method and apparatus for controlling a well during drilling operations. 4,076,083, Cl. 175-65.000.
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Skinner, David R.; Sowell, Miles L.; and Justus, Marvin W., to Standard Oil Company (Indiana). Downhole pump speed control. 4,076,457, Cl. 417-45.000.
Skriletz, Rudolph A., to Wallace-Murray Corporation. Method of restoring the fluid permeability of a used, ceramic fluid-release mold. 4,076,779, Cl. 264-39.000.
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Slade, Paul G.; and Wafer, John A., to Westinghouse Electric Corporation. Current limiting circuit interrupter. 4,077,025, Cl. 335-16.000.
Slade, Paul G.; and Wafer, John A., to Westinghouse Electric Corporation. Integral motor controller. 4,077,026, Cl. 335-195.000.

Slator, Damon T.; Peil, Archie W.; and Bishop, Thomas R., to Bowen Tools, Inc. Stress relieved tool elements. 4,076,436, Cl. 403-343.000.
Slaughter, Raymond Jeffrey, to BICC Limited. Optical transmission systems. 4,076,376, Cl. 350-96.210.
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Smeaton, John Ronald, to Tioxide Group Limited. Apparatus and method for producing colored reproductions of black and white negatives. 4,076,413, Cl. 355-32.000.
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Smith, Robert L.; and Lee, Ta-Jyh, to Merck & Co., Inc. Crystalline dipilocarpinium pamoate. 4,076,942, Cl. 548-336.000.
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Smith, Thomas R. Decorative percussion rhythm instrument and noisemaker. 4,075,922, Cl. 84-402.000.
Smith, William Novis, to Foote Mineral Company. Process for the production of high purity alkali metal tetrahaloaluminates and products produced thereby. 4,076,794, Cl. 423-463.000.
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Sommerfeld, Eugene G., to Du Pont de Nemours, E. I., and Company. Aqueous coating composition from aminoplast and reaction product of tertiary amine and polymer containing randomly distributed epoxy groups. 4,076,675, Cl. 260-29.4UA.
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Sparks, Robert A.; Rothbart, George B.; and Samdahl, Roger N., to Syntex (U.S.A.) Inc. Position sensitive area detector for use with X-ray diffractometer or X-ray camera. 4,076,981, Cl. 250-272.000.
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Young, Robert G.; and Pucher, Richard A., 4,075,941, Cl. 100-19.00R.
Spielvogel, Harry, to Schloemann-Siemag Aktiengesellschaft. Hydraulic valve. 4,076,210, Cl. 251-285.000.
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Stossel, Ernest. Fire extinguishing composition. 4,076,540, Cl. 106-15.0FP.
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Sur, Mikhail Danilovich; and Dudko, Daniil Andreevich. Planetary air motor with two internal gearings. 4,076,470, Cl. 418-63.000.
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Suzuki, Shoji, to ALPS, Motorola, Inc. Control lever locking mechanism. 4,075,908, Cl. 74-527.000.
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Yamawaki, Masao; Aoki, Katsuo; Ina, Osamu; Suzuki, Takao; Oka, Yoshio; and Hara, Kunihiko, 4,075,972, Cl. 118-6.000.
Suzuki, Toshiyuki; and Yamauchi, Fumio, to Murakami Kaimedio Co., Ltd. Remotely controllable rear view mirror. 4,076,392, Cl. 350-289.000.
Svenska Rotor Maskiner Aktiebolag: *See—*
Persson, Walther; and Schibbye, Lauritz Benedictus, 4,076,468, Cl. 418-9.000.
Svensson, Einar Gustav Vilhelm. Wire cloth joint and a method and means for making the same. 4,075,740, Cl. 24-31.00B.
Swanson Engineering, Inc.: *See—*
Swanson, Floyd R., Jr., 4,076,466, Cl. 417-390.000.

Swanson, Floyd R., Jr., to Swanson Engineering, Inc. Fluid pump for use in explosive bore holes. 4,076,466, Cl. 417-390.000.
Swartz, Henry D.: *See—*
Wright, Donald R.; and Swartz, Henry D., 4,075,818, Cl. 53-180.00R.
Sweetheart Plastics, Inc.: *See—*
Davis, Paul, 4,076,123, Cl. 206-503.000.
Sweger, Theodore J., to Illinois Railway Equipment Co. Hatch cover locking means. 4,076,290, Cl. 292-256.500.
Swenson, Paul F. Damper control apparatus. 4,076,171, Cl. 236-1.00G.
Swift, Graham; and Cenci, Harry J., to Rohm and Haas Company. Method for curing polymers containing one or more carboxy or anhydride functions and compositions. 4,076,917, Cl. 526-49.000.
Swithenbank, Colin: *See—*
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,076,741, Cl. 260-465.00F.
Syntex (U.S.A.) Inc.: *See—*
Kracklauer, John J., 4,076,657, Cl. 260-2.5AJ.
Lodewyk, Eric, 4,076,745, Cl. 260-526.00R.
Sparks, Robert A.; Rothbart, George B.; and Samdahl, Roger N., 4,076,981, Cl. 250-272.000.
Szabo, Andras I.: *See—*
Johnston, Paul M.; and Szabo, Andras I., 4,077,061, Cl. 364-483.000.
T. J. Smith & Nephew Limited: *See—*
Fennimore, Jack; Ruder, Gary; and Simmonite, Donald, 4,076,892, Cl. 428-407.000.
Taccon, Danizzo; and Taccon, Gloriano. Atomizer. 4,076,173, Cl. 239-411.000.
Taccon, Gloriano: *See—*
Taccon, Danizzo; and Taccon, Gloriano, 4,076,173, Cl. 239-411.000.
Taft, Philip Augustus, to Girling Limited. Hydraulic flow control valve assemblies. 4,076,036, Cl. 137-118.000.
Taguchi, Tetsuya: *See—*
Tsunekawa, Tokuichi; and Taguchi, Tetsuya, 4,076,977, Cl. 250-206.000.
Tahara, Goro R.: *See—*
Lubarsky, Andre, Jr.; Warner, G. Scott; and Tahara, Goro R., 4,076,970, Cl. 179-175.20R.
Tahara Shoyei Kiko K.K.: *See—*
Koide, Sakae; Aoki, Shigeo; and Uematsu, Tetsutaro, 4,075,791, Cl. 51-142.000.
Taiko Optical Kyogyo Kumiai: *See—*
Nakamura, Iwao, 4,076,394, Cl. 351-153.000.
Takahama, Sho: *See—*
Igarashi, Shunkichi; Okano, Takeshi; Takahama, Sho; and Hakamata, Yoshio, 4,076,412, Cl. 355-28.000.
Takahashi, Akio: *See—*
Satoh, Akihiro; Takahashi, Akio; Masuda, Jun; Harada, Masato; and Yamada, Sadahiko, 4,076,922, Cl. 526-97.000.
Takahashi, Kiyoshi: *See—*
Komine, Yoshio; Furukawa, Hiroshi; Takahashi, Kiyoshi; Takigawa, Tomoshi; Ogiso, Mitsutoshi; and Ichiyanagi, Toshikazu, 4,076,396, Cl. 352-29.000.
Takatsuru, Mitsuhiro: *See—*
Nakazato, Takashi; Sawada, Chikamitsu; Umino, Shigeyuki; and Takatsuru, Mitsuhiro, 4,075,850, Cl. 60-633.000.
Takeda, Keiji; Matsumoto, Kenji; Tamura, Hiroshi; Nagata, Masayoshi; and Tsuboi, Masayoshi, to Fuji Photo Film Co., Ltd. Dry photographic copying method for producing Te images. 4,076,530, Cl. 96-29.00R.
Takei, Toshihiro: *See—*
Kuwakado, Satosi; Kasagi, Takao; and Takei, Toshihiro, 4,076,277, Cl. 280-738.000.
Takeuchi, Ryoichi: *See—*
Hirayama, Yoshio; Ito, Kanichi; Takeuchi, Ryoichi; Nomoto, Masao; and Shiina, Tomoyuki, 4,076,177, Cl. 241-32.000.
Takigawa, Tomoshi: *See—*
Komine, Yoshio; Furukawa, Hiroshi; Takahashi, Kiyoshi; Takigawa, Tomoshi; Ogiso, Mitsutoshi; and Ichiyanagi, Toshikazu, 4,076,396, Cl. 352-29.000.
Takiron Co., Ltd.: *See—*
Yoshikawa, Yoshinobu; Iida, Kosuke; Morikawa, Tadayuki; and Satomi, Akinori, 4,076,567, Cl. 156-219.000.
Talmage, Peter Guy; and Kuehnle, Manfred Rudolf, to Coulter Information Systems, Inc. Method of and apparatus for toning electrophotographic film. 4,076,406, Cl. 355-10.000.
Tamai, Hideo: *See—*
Komura, Ikuo; Tamai, Hideo; and Morita, Takayuki, 4,075,919, Cl. 83-676.000.
Tamai, Yasuo: *See—*
Furukawa, Masahiko; Ogawa, Hiroshi; Aonuma, Masashi; Tamai, Yasuo; Nakahara, Hiromi; and Igarashi, Masaaki, 4,076,861, Cl. 427-132.000.
Tamaro, George John, to ICOS Corporation of America. Steel reinforced underground wall. 4,075,852, Cl. 61-35.000.
Tamburro, Peter James, to Bell Telephone Laboratories, Incorporated. Interconnection pin for multilayer printed circuit boards. 4,076,356, Cl. 339-17.00C.
Tamura, Hiroshi: *See—*
Takeda, Keiji; Matsumoto, Kenji; Tamura, Hiroshi; Nagata, Masayoshi; and Tsuboi, Masayoshi, 4,076,530, Cl. 96-29.00R.
Tani, Nobutaka: *See—*
Katayama, Kazuhiko; Nishigaki, Masahiko; Ohtani, Akira; Tani, Nobutaka; Nishizawa, Minoru; and Nakanishi, Hirokazu, 4,076,951, Cl. 526-62.000.
Tanimoto, Shinichi: *See—*
Nakatsuka, Ryuzo; Suzuki, Setsuo; Tanimoto, Shinichi; and Funatsu, Eiji, 4,076,846, Cl. 426-62.000.
Tanzen, Wilhelm, to Vereinigte Flugtechnische Werke - Fokker GmbH. Cellular structure plate. 4,076,877, Cl. 428-73.000.
Taormina, Anthony J.; Wyszynski, Artur; and Witek, Roman J., to Essex Group, Inc. Lamp socket for printed circuit. 4,076,358, Cl. 339-17.00D.
Tarnay, Denes: *See—*
Jenne, Frank, Jr.; and Tarnay, Denes, 4,076,143, Cl. 220-2.10R.
Tate, Takao: *See—*
Goto, Kenji; and Tate, Takao, 4,076,000, Cl. 123-191.00S.
Tateno, Kouichi: *See—*
Azuma, Tomisaburo; Ichimaru, Kazuto; Tateno, Kouichi; and Murakami, Takeru, 4,076,545, Cl. 423-544.000.
Tatra, narodni podnik: *See—*
Hanzelka, Lubomir; Vidlar, Josef; and Neuman, Ladislav, 4,076,298, Cl. 296-28.00R.
Taubert, Karl: *See—*
Schuster, Johann; and Taubert, Karl, 4,076,494, Cl. 8-2.50A.
Taulier, Hubert Henri Leon; and Brugeille, Gerard, to Electricite de France (Service National). Fuse and application of said fuse to the construction of an emergency shutdown system for a nuclear reactor. 4,076,587, Cl. 176-86.00R.
Tauschek, Max J.; and Michaels, William A., to TRW Inc. Valve rotator. 4,075,987, Cl. 123-90.300.
Tax, Hans. Rotary crane. 4,076,128, Cl. 212-48.000.
Taylor, David W.; and Peterson, Philip R., to General Motors Corporation. Wheel lock control circuit. 4,076,332, Cl. 303-97.000.
Taylor, Robert Morgan: *See—*
Connery, James Gerard; Muly, Emil Christopher; and Taylor, Robert Morgan, 4,076,596, Cl. 204-1.00T.
Taysom, Dell A.; Taysom, Larry D.; De Witt, Robert J.; and De Witt, Carl S., to Carroll S. Mohr. Mechanical earthworm harvester. 4,076,124, Cl. 209-75.000.
Taysom, Larry D.: *See—*
Taysom, Dell A.; Taysom, Larry D.; De Witt, Robert J.; and De Witt, Carl S., 4,076,124, Cl. 209-75.000.
Tazaki, Michiji. Water cooling jacket for fire. 4,075,798, Cl. 52-168.000.
Technal International S.A.: *See—*
Bos, Andre, 4,076,438, Cl. 403-402.000.
Technitron, Inc.: *See—*
Gee, Edwin, 4,076,974, Cl. 219-108.000.
Teepak, Inc.: *See—*
Martinek, Thomas W., 4,075,938, Cl. 9.3-84.0TW.
Story, Alfred Donald, 4,075,737, Cl. 17-45.000.
Teiser, Sidney; and Eliott, Floyd H., to Eliott, Floyd H.; and Eliott, Barbara Ann. Magnifying reading device and viewer. 4,076,391, Cl. 350-241.000.
Telecommunications Technology, Inc.: *See—*
Lubarsky, Andre, Jr.; Warner, G. Scott; and Tahara, Goro R., 4,076,970, Cl. 179-175.20R.
Terasaki, Syuuzi: *See—*
Sasaki, Tohru; Terasaki, Syuuzi; and Ichii, Takao, 4,076,889, Cl. 428-333.000.
Terra Tek, Inc.: *See—*
Barker, Lynn Marshall, 4,075,884, Cl. 73-91.000.
Texaco Inc.: *See—*
Arnold, Dan M.; Dowling, Donald J.; and Warren, Wayne F., 4,076,980, Cl. 250-270.000.
Mayer, Edward A.; and Plungis, Donald W., 4,075,994, Cl. 123-119.00A.
McGann, Rodney, 4,075,831, Cl. 60-39.050.
Pitts, Robert W., Jr., 4,077,022, Cl. 333-1.000.
Texas Instruments Incorporated: *See—*
Buss, Dennis D.; and Hewes, Charles Robert, 4,076,960, Cl. 179-1.0SA.
Kitagawa, Norihisa; and White, Lionel Stuart, Jr., 4,077,031, Cl. 365-205.000.
Th. Kieserling & Albrecht: *See—*
Schweer, Wilhelm, 4,075,914, Cl. 82-1.00C.
Thaw, Allan: *See—*
McSherry, Thomas W.; and Thaw, Allan, 4,075,924, Cl. 85-3.00R.
Theis, James V., Jr.; Davis, Lynn M.; and Moss, Donald H., to Hollymatic Corporation. Pressure gas engine. 4,076,449, Cl. 415-18.000.
Theno, Mark Henry, to Champion International Corporation. Transparent multi-layered film and processes therefor. 4,076,895, Cl. 428-516.000.
Therkildsen, Henry T., to Caterpillar Tractor Co. Winch drum hydraulic disconnect. 4,075,894, Cl. 74-15.690.
Thermo King Corporation: *See—*
Seipp, Ronald W., 4,075,867, Cl. 62-323.000.
Theurer, John; Beck, Orville F.; and Doherty, James T., to Nesters Housing Company, Inc. Modular housing system with part of the module serving as a shipping container for the remainder of the module. 4,075,814, Cl. 52-79.500.
Theysohn, Rainer; Wurmb, Rolf; Leutner, Bernd; and Schlimper, Hans-Ulrich, to BASF Aktiengesellschaft. Flameproof nylon molding compositions. 4,076,682, Cl. 260-37.00N.

Thiel, Max: *See—*
Kampe, Wolfgang; Stach, Kurt; Thiel, Max; Bartsch, Wolfgang; Dietmann, Karl; Roesch, Egon; and Schaumann, Wolfgang, 4,076,829, Cl. 424-274.000.
Thiele, Gerd: *See—*
Rameil, Wilfried; Schraudolph, Manfred; and Thiele, Gerd, 4,077,057, Cl. 361-386.000.
Thom, Karl-Friedrich; and Schliebs, Reinhard, to Bayer Aktiengesellschaft. Polysiloxane/polycarbodiimide copolymers. 4,076,763, Cl. 260-824.00R.
Thomas, Anthony. Theater structure. 4,075,795, Cl. 52-8.000.
Thomas & Betts Corporation: *See—*
Kuo, Ted L. C., 4,076,364, Cl. 339-103.00R.
Thomas J. Lipton, Inc.: *See—*
Johnson, Richard Shaw; and Potter, John Kenneth, 4,076,847, Cl. 426-78.000.
Thompson, Harris A. Positive pressure respiratory apparatus. 4,076,021, Cl. 128-145.600.
Thompson, Leroy R.: *See—*
Davis, Warren W.; and Thompson, Leroy R., 4,075,910, Cl. 74-785.000.
Thompson, Walter F.; and Redo, Dennis M., to General Cable Corporation. Bobbin transporting and storage system. 4,076,132, Cl. 214-16.40A.
Thomson-Brandt: *See—*
Metz, Pierre, 4,076,187, Cl. 244-3.230.
Thomson-CSF: *See—*
Deffayet, Jean; and Lamarque, Etienne, 4,075,946, Cl. 102-52.000.
Thorp, Peter M.: *See—*
Knight, Clifford; and Thorp, Peter M., 4,076,233, Cl. 271-233.000.
Thorpe, Ernest John, to Glacier Metal Company Limited, The. Bearings. 4,076,342, Cl. 308-36.000.
Thurn, Friedrich; Burmester, Kurt; Pochert, Johannes; and Wolff, Siegfried, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Reinforcing additive. 4,076,550, Cl. 106-288.00Q.
Thurston, David L.: *See—*
Adams, Cecil E.; Dillon, Leo H.; Born, Ellis H.; and Thurston, David L., 4,076,459, Cl. 417-217.000.
Thurston, Robert Norton: *See—*
Boyd, Gary Delane; and Thurston, Robert Norton, 4,077,023, Cl. 333-30.00R.
Thyberger, Filip Bertil; and Lindstrom, Kurt Olle Ragnvald, to Granges Essem Aktiebolag. Method of laying pipes or conduits in the ground and pipe arrangement produced thereby. 4,075,861, Cl. 61-105.000.
Tichy, Dieter: *See—*
Schnee, Karl; Piesch, Steffen; and Tichy, Dieter, 4,076,662, Cl. 260-17.300.
Tick, Paul A.: *See—*
Kerko, David J.; and Tick, Paul A., 4,076,544, Cl. 106-54.000.
Tiethof, Jack A., to Engelhard Minerals & Chemicals Corporation. Hydrosulfite production. 4,076,795, Cl. 423-515.000.
Tighe, Robert E. Oriented drilling tool. 4,076,084, Cl. 175-73.000.
TII Corporation: *See—*
Bybel, David; Furey, Richard F.; and Stahl, Donald P., 4,076,617, Cl. 210-19.000.
Timusk, John: *See—*
Riley, Victor; Macnab, Ian; Timusk, John; and English, Edward, 4,076,884, Cl. 428-255.000.
Tinholt, Thomas H., to Eaton Corporation. Quick disengagement viscous drive coupling. 4,076,110, Cl. 192-58.00B.
Tinnes, Bernhard, to Metacon AG. Plate structure for a liquid metal container closure. 4,076,153, Cl. 222-600.000.
Tinnes, Bernhard, to Metacon AG. Sealing means for the joint of a casting ladle closure. 4,076,154, Cl. 222-600.000.
Tioxide Group Limited: *See—*
Haigh, Harold Edward; and Hofmann, Dietrich Adolf, 4,076,200, Cl. 248-146.000.
Smeaton, John Ronald, 4,076,413, Cl. 355-32.000.
Todd, Edmond F. Inclined, vibrated, sifter and stratifier with gates. 4,076,614, Cl. 209-13.000.
Tokico Ltd.: *See—*
Aono, Masami, 4,076,105, Cl. 188-106.00A.
Nagase, Tosiro, 4,075,734, Cl. 16-58.000.
Tokuno, Masateru, to Rengo Co., Ltd. Board grouping apparatus. 4,076,114, Cl. 198-425.000.
Tokyo Boshi Kabushiki Kaisha: *See—*
Otake, Nobuyuki; Ando, Kozo; and Hori, Hironobu, 4,076,428, Cl. 401-265.000.
Tolan, Peter John, to B. F. Goodrich Company, The. Self-deploying boom. 4,076,624, Cl. 210-96.00R.
Tomioka, Shinji; and Mori, Yasuki, to Abbott Laboratories. Derivatives of an antibiotic XK-62-2 and the process for the production thereof. 4,076,931, Cl. 536-17.000.
Tompkins, Leo L., to Xenco, Inc. High efficiency natural convection heating and cooling system for home dwellings. 4,076,074, Cl. 165-53.000.
Topolyansky, Jury Arnoldovich: *See—*
Soschenko, Evgeny Maximovich; Zonenko, Ivan Timofeevich; Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Tsimbler, Jury Abramovich; Kantor, Ilya Solomonovich; Topolyansky, Jury Arnoldovich; Chizhikov, Anatoly Petrovich; and Volyansky, Igor Igorievich, 4,075,947, Cl. 104-23.0FS.
Torrence, James D., to Allis-Chalmers Corporation. Gas distribution manifold arrangement and methods for use with plurality of hydropneumatic hydraulic accumulators. 4,076,176, Cl. 241-30.000.
Tovey, F. Michael: *See—*
Tree, Dennis Jack; and Tovey, F. Michael, 4,076,456, Cl. 416-241.00B.
Towmotor Corporation: *See—*
Sable, Frank Robert, 4,076,302, Cl. 296-65.00R.
Uhler, Douglas Lester, 4,076,195, Cl. 248-9.000.
Toy, Arthur D. F.; and Uhing, Eugene H., to Stauffer Chemical Company. Process for preparing dialkyl and diaryl phosphonothioic halides. 4,076,746, Cl. 260-543.00P.
Toyo Soda Manufacturing Co., Ltd.: *See—*
Shimizu, Akihiko; and Kita, Atsushi, 4,076,927, Cl. 526-217.000.
Toyobo Co., Ltd.: *See—*
Yasuda, Hiroshi; and Omori, Susumu, 4,076,783, Cl. 264-78.000.
Toyota, Akinori; Odawara, Kiyoshi; and Kashiwa, Norio, to Mitsui Petrochemical Industries Ltd. Process for polymerization or copolymerizing olefins containing at least 3 carbon atoms. 4,076,924, Cl. 526-125.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Goto, Kenji; and Tate, Takao, 4,076,000, Cl. 123-191.00S.
Hanaoka, Masanori, 4,075,837, Cl. 60-282.000.
Kato, Takashi, 4,075,988, Cl. 123-97.00B.
Saito, Haruhiko; and Morishita, Michio, 4,076,770, Cl. 261-34.00A.
Transparent Glass Coatings Co., Inc.: *See—*
Gross, Marvin H.; and Kolb, Alfred, 4,075,802, Cl. 52-203.000.
Tree, Dennis Jack; and Tovey, F. Michael, to Garrett Corporation, The. Ceramic rotor for gas turbine engine. 4,076,456, Cl. 416-241.00B.
Trepka, William J., to Phillips Petroleum Company. Treatment of coupled polymers prior to hydrogenation. 4,076,915, Cl. 526-25.000.
Triangle Tool Company: *See—*
Schmidt, Fred, 4,075,897, Cl. 74-86.000.
Trinh, Stephane; Moraly, Alain; and Gaulliard, Jean-Michel, to Philagro S.A. Phosphite-based fungicide compositions. 4,076,807, Cl. 424-209.000.
Trudeau, William H.: *See—*
Gaines, Donald R.; Smallegan, Jon M.; and Trudeau, William H., 4,076,344, Cl. 308-72.000.
True Temper Corporation: *See—*
Germain, Robert A., 4,075,760, Cl. 30-220.000.
Trueblood, Inc.: *See—*
Trueblood, Raymond L., 4,076,475, Cl. 425-159.000.
Trueblood, Raymond L., to Trueblood, Inc. Pressure injection machine and method. 4,076,475, Cl. 425-159.000.
Trukhin, Alexandr Fedorovich: *See—*
Barannik, Ivan Andreevich; Kachurka, Alexandr Nikolaevich; Zharovsky, Ivan Vasilievich; Trukhin, Alexandr Fedorovich; Raskatov, Viktor Georgievich; and Mazurkevich, Alexandr Borisovich, 4,076,472, Cl. 425-8.000.
TRW Inc.: *See—*
Rameson, William W., 4,076,227, Cl. 269-25.000.
Tauschek, Max J.; and Michaels, William A., 4,075,987, Cl. 123-90.300.
Tschoop, Lincoln Paul; and Steiner, Marcel Alfred, to Coleman Company, Inc., The. Method of securing sheet metal to plastic. 4,075,751, Cl. 29-432.100.
Tseng, Ching Y.: *See—*
Light, Kenneth K.; Sanders, James Milton; Vock, Manfred Hugo; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja Dulal; Tseng, Ching Y.; and Sprecker, Mark A., 4,076,853, Cl. 426-538.000.
Tsimbler, Jury Abramovich: *See—*
Soschenko, Evgeny Maximovich; Zonenko, Ivan Timofeevich; Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Tsimbler, Jury Abramovich; Kantor, Ilya Solomonovich; Topolyansky, Jury Arnoldovich; Chizhikov, Anatoly Petrovich; and Volyansky, Igor Igorievich, 4,075,947, Cl. 104-23.0FS.
Tsu, Kin Hsueh-Yuan: *See—*
Matsuda, Ken; and Tsu, Kin Hsueh-Yuan, 4,076,747, Cl. 260-561.00N.
Tsuboi, Masayoshi, to Fuji Photo Film Co., Ltd. Light-sensitive materials containing organo tellurium or selenium compounds and sensitizers. 4,076,537, Cl. 96-88.000.
Tsuboi, Masayoshi: *See—*
Takeda, Keiji; Matsumoto, Kenji; Tamura, Hiroshi; Nagata, Masayoshi; and Tsuboi, Masayoshi, 4,076,530, Cl. 96-29.00R.
Tsuda, Yoshinao; Arita, Masafumi; Hamasaki, Toshio; Tsumagari, Tatsumi; and Kenjo, Takenori, to Yoshitomi Pharmaceutical Industries, Ltd. 4,4-Diphenylcycloalkylpiperidines and psychotropic compositions thereof. 4,076,821, Cl. 424-263.000.
Tsuji, Hideakira: *See—*
Murayama, Keisuke; Asai, Motoji; and Tsuji, Hideakira, 4,076,835, Cl. 424-285.000.
Tsuji, Nobuo; Ishige, Sadao; Miyamoto, Akio; and Kato, Hajime, to Fuji Photo Film Co., Ltd. Recording sheets. 4,076,887, Cl. 428-307.000.
Tsukube, Syozo, to Kabushiki Kaisha Sogo Pump Seisakusho. Centrifugal sewage pump. 4,076,179, Cl. 241-46.110.
Tsumagari, Tatsumi: *See—*
Tsuda, Yoshinao; Arita, Masafumi; Hamasaki, Toshio; Tsumagari, Tatsumi; and Kenjo, Takenori, 4,076,821, Cl. 424-263.000.
Tsunekawa, Tokuichi; and Taguchi, Tetsuya, to Canon Kabushiki Kaisha. Light measuring circuit with stray capacitance compensating means. 4,076,977, Cl. 250-206.000.
Tulbert, David J. Motion picture printing apparatus. 4,076,414, Cl. 355-38.000.

Tults, Juri: *See—*
Rast, Robert Morgan; and Tults, Juri, 4,077,008, Cl. 325-421.000.
Tunoda, Tutae. Method and apparatus for producing fine deodorized soybean powder. 4,076,851, Cl. 426-431.000.
Turbak, Albin Frank; Hammer, Richard Benjamin; Portnoy, Norman A.; and West, Arthur C., to International Telephone and Telegraph Corporation. Process for producing a regenerated shaped cellulosic fiber. 4,076,933, Cl. 536-30.000.
Turbak, Albin Frank: *See—*
Hammer, Richard Benjamin; Turbak, Albin Frank; Portnoy, Norman A.; and West, Arthur C., 4,076,932, Cl. 536-30.000.
Turchenko, Alexandr Vasilievich: *See—*
Chuply, Vladimir Yakovlevich; Vojuta, Leonty Feofanovich; Kondratenko, Feofan Ilich; Poludnenko, Jury Zakharovich; Milach, Adam Arsentievich; Kobozev, Vladimir Nikolaevich; and Turchenko, Alexandr Vasilievich, 4,076,087, Cl. 175-334.000.
Turner, Robert B., to Dow Chemical Company, The. Rapid setting polyurethane elastomers and process of preparation. 4,076,679, Cl. 260-31.20N.
Tuzar, Zdenek: *See—*
Stol, Miroslav; Stoy, Vladimir; and Tuzar, Zdenek, 4,076,921, Cl. 526-89.000.
Tvorogov, Nikolai Nikandrovich: *See—*
Berlin, Alfred Anisimovich; Brikenshtein, Khaim-Mordkhe Aronovich; Gavrjushenko, Nikolai Sviridovich; Dubovitsky, Fedor Ivanovich; Kefeli, Tamara Yakovlevna; Kronman, Raisa Vasilievna; Konkhina, Ljudmila Alexeevna; Marshavina, Natalya Lvovna; Popova, Galina Leonidovna; Radugina, Anna Alexandrovna; Sivergin, Jury Mikhailovich; Sumin, Iosif Grigorievich; Tvorogov, Nikolai Nikandrovich; Shilova, Galina Pavlovna; and Kardashov, David Alexeevich, 4,076,742, Cl. 260-47.0UA.
Tybring, Leif, to Leo Pharmaceutical Products Ltd. A/S. Antibiotic mixture. 4,076,816, Cl. 424-251.000.
Tye, Dennis W., to Superior Concrete Accessories, Inc. Remotely operable mechanism for disconnecting a pickup unit from a tilt-up concrete wall slab. 4,075,913, Cl. 81-177.0UJ.
Tyler Corporation: *See—*
Hurst, Gerald L., 4,076,637, Cl. 252-26.000.
Tyler, Hugh J.; and Wolfe, Denis G., to Robertshaw Controls Company. Electrical furnace and parts therefor. 4,076,975, Cl. 219-483.000.
U and I Incorporated. *See—*
Farag, Souly Atalla; and Norman, Lloyd Wendell, 4,076,552, Cl. 127-50.000.
Ueda, Atsumi, to Aisin Seiki Kabushiki Kaisha. Hydraulic brake booster. 4,075,848, Cl. 60-548.000.
Ueda, Takeshi: *See—*
Koizumi, Kunihei; Ueda, Takeshi; and Otani, Tatu, 4,076,593, Cl. 201-39.000.
Uematsu, Tetsutaro: *See—*
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Meier, Joseph F.; and Smith, James D. B., 4,076,626, Cl. 210-496.000.
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Hammer, Jacob Meyer, 4,076,381, Cl. 350-96.140.
Murbach, Warren J.; and Adicoff, Arnold, 4,076,772, Cl. 264-2.000.
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Urban, Friedrich; Buechner, Oskar; Hartig, Ulrich; and Gropper, Hans, to BASF Aktiengesellschaft. Manufacture of ethylene polymers in a two-zone tubular reactor at pressure above 500 bars. 4,076,919, Cl. 526-64.000.
Valdsaar, Herbert, to Du Pont de Nemours, E. I., and Company. Transition metal carbide and boride abrasive particles. 4,076,506, Cl. 51-307.000.
Valles, Joel. Door security strut. 4,076,293, Cl. 292-338.000.
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Van Kooten B.V.: *See—*
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Van Delft, Andries; and Giacino, Christopher, to International Flavors & Fragrances Inc. Edible compositions having a meat flavor and processes for making same. 4,076,852, Cl. 426-533.000.
Vander Putten, Paul R., to Carnation Company. Method of preparing screens for screen printing. 4,076,535, Cl. 96-67.000.
Van Gasse, Rene L. E., to All Decostone, N.V. Ornamental design. 4,076,875, Cl. 428-44.000.
Van Gompel, James, to Brammall, Inc. Lock assembly. 4,075,877, Cl. 70-34.000.
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Vanhoof, Pierre M.; and Clarebout, Pierre M., to A. Christiaens Societe Anonyme. Derivatives of 1,3-benzodioxole, the preparation and use thereof. 4,076,833, Cl. 424-282.000.
Vanhove, Henri C. J.: *See—*
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van Zyl, Bernard. Container for safely retaining a living plant during transit and display. 4,075,786, Cl. 47-84.000.
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Varta Batterie Aktiengesellschaft: *See—*
Backer, Karl-Heinrich; and Schlachta, Hermann, 4,076,908, Cl. 429-184.000.
Vartiak, Joseph F.; and Wortley, George E., to Nalco Chemical Company. Aquatic herbicides. 4,076,516, Cl. 71-66.000.

Vega Industries, Inc.: *See—*
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Vega, Mary-Louise, to American Cyanamid Company. Chemical lighting process and composition. 4,076,645, Cl. 252-188.3CL.
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Ventura, Frank D., to Ideal Toy Corporation. Dough mold press. 4,076,476, Cl. 425-183.000.
Verde, Luigi. Process for the biological purification of sewage. 4,076,616, Cl. 210-17.000.
Verdier, Henri, to Compagnie Generale des Etablissements Michelin. Pneumatic tire. 4,076,066, Cl. 152-354.00R.
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Volkman, S. Alan. Electronic display apparatus. 4,077,032, Cl. 340-324.00R.
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Vossen, John Louis, Jr., to RCA Corporation. Video disc capacitive recording means with a conductive bilayer. 4,077,052, Cl. 358-128.000.
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Wohlfarth, Ernst; Hechtl, Wolfgang; Matejcek, Klaus; and Kleinschwarzer, Adolf, 4,076,684, Cl. 260-37.0SB.
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Wade, Peter C.; Vogt, B. Richard; and Kissick, Thomas P., to E. R. Squibb & Sons, Inc. Triazolo-2,4-benzodiazepines. 4,076,823, Cl. 424-269.000.
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Wagner, Eugene R.; and Mueller, Larry G., to Dow Chemical Com-

pany, The. Hypolipidemic 2-(3,5-di-tert-butyl-4-hydroxyphenyl)thio carboxamides. 4,076,841, Cl. 424-324.000.
Wako, Shoji, to Xerox Corporation. Optical memory having serially stocked hologram plates. 4,076,370, Cl. 350-3.750.
Waldron, Bradley C., to King Nutronics Corporation. Temperature calibration system. 4,075,882, Cl. 73-1.00F.
Walker, Brooks. Key actuated auxiliary door lock. 4,076,292, Cl. 292-262.000.
Walker, Brooks. Nested wheel assembly. 4,076,319, Cl. 301-1.000.
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Walker, James. Therapeutic foot and leg protector. 4,076,022, Cl. 128-149.000.
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Wallis, Bernard J. Lubricating means for gas-operated cylinders. 4,076,103, Cl. 184-25.000.
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Wallsten, Hans Ivar, to Inventing S.A. Method and apparatus for coating both sides of a moving web, using blades. 4,076,865, Cl. 427-209.000.
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Ward, Dennis Charles, to B & W Loudspeakers Limited. Loudspeaker diaphragm. 4,076,098, Cl. 181-170.000.
Wardell, Myron Henry, Jr.; and Marks, Bruce George, to RCA Corporation. High voltage electron tube base with separate dielectric fill-hole. 4,076,366, Cl. 339-144.00T.
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Watanabe, Katsumi, to Ozen Co., Ltd. Stylus shift mechanism for a phonograph having two concentric records. 4,076,256, Cl. 274-1.00R.
Watson, Richard D., to General Motors Corporation. Housing and stator assembly for a dynamoelectric machine. 4,076,989, Cl. 310-89.000.
Wattenbarger, Blake Lane, to Bell Telephone Laboratories, Incorporated. Telephone ringer intensity control responsive to ambient noise. 4,076,968, Cl. 179-84.00R.
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Weaver, Lester C., to Shakespeare of Arkansas, Inc. Transom mount for fishing motor. 4,076,193, Cl. 248-4.000.
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Redmore, Derek; and Welge, Frederick T., 4,076,638, Cl. 252-33.200.
Welter, Neil Evan: *See—*
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Wennerstrom, Arthur J., to United States of America, Air Force. Vortex generators in axial flow compressor. 4,076,454, Cl. 415-208.000.
West, Arthur C.: *See—*
Hammer, Richard Benjamin; Turbak, Albin Frank; Portnoy, Norman A.; and West, Arthur C., 4,076,932, Cl. 536-30.000.
Turbak, Albin Frank; Hammer, Richard Benjamin; Portnoy, Norman A.; and West, Arthur C., 4,076,933, Cl. 536-30.000.
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Western Electric Co., Inc.: *See—*
Ahmed, Nazeer; O'Donnell, James Kevin; and Schmehl, Glenn Lewis, 4,076,335, Cl. 308-3.500.
Mracek, Jaroslav; and Paek, Un-Chul, 4,076,510, Cl. 65-3.00A.
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Westinghouse Electric Corporation: *See—*
Chu, Chang K.; Bartko, John; and Felice, Patrick E., 4,076,555, Cl. 148-1.500.
Heller, Robert I.; Schafer, Larry C.; and McCracken, Stephen R., 4,077,038, Cl. 343-7.00A.
Johnston, Paul M.; and Szabo, Andras I., 4,077,061, Cl. 364-483.000.
Litz, Donald C., 4,076,988, Cl. 310-52.000.
Raimondi, Albert A., 4,076,259, Cl. 277-3.000.
Slade, Paul G.; and Wafer, John A., 4,077,025, Cl. 335-16.000.
Slade, Paul G.; and Wafer, John A., 4,077,026, Cl. 335-195.000.
Wilson, John T.; and Ellsworth, James P., 4,077,055, Cl. 361-46.000.
Westley, John, to Hoffmann-La Roche Inc. Antibiotic X-4357B. 4,076,802, Cl. 424-122.000.
Westley, John, to Hoffmann-La Roche Inc. Therapeutic agents for improving cardiovascular function. 4,076,834, Cl. 424-283.000.
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Dalton, Thomas B., 4,076,299, Cl. 296-35.00A.
Wheeler, Roger M. Method of producing magnesium metal and chlorine from $MgCl_2$ containing brine. 4,076,602, Cl. 204-70.000.
Whelan, James M., to University of Southern California. Method of burning a fossil fuel. 4,076,486, Cl. 431-5.000.
Whetstone, Henry M. Charge forming and depositing machine. 4,076,482, Cl. 425-437.000.
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Platt, Clark I., 4,075,876, Cl. 68-18.00F.
White Advertising Company: *See—*
Shaw, James E., 4,075,797, Cl. 52-36.000.
White, Donald A., to Monsanto Company. Electrolytic process for the preparation of ethane-1,1,2,2-tetracarboxylate esters and related cyclic tetracarboxylate esters. 4,076,601, Cl. 204-59.00R.
White, James F.: *See—*
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Jones, Ray L., 4,076,458, Cl. 417-46.000.
Whitting, Alan Charles. Climbing formwork. 4,076,778, Cl. 264-33.000.
Wichterle, Otto; and Coupek, Jiri, to Ceskoslovenska akademie ved. Polyacrylates containing primary amino groups. 4,076,691, Cl. 260-47.0UA.

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Williamitis, Victor A., to General Motors Corporation. Refrigerator defroster-humidifier. 4,075,866, Cl. 62-274.000.
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Williams, Lionel. Centering apparatus. 4,075,915, Cl. 82-33.00R.
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Wilson, John T.; and Ellsworth, James P., to Westinghouse Electric Corporation. Ground fault protective device. 4,077,055, Cl. 361-46.000.
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Wright, William E., to Carrier Corporation. Ultrasonic dip soldering process. 4,076,167, Cl. 228-173.00F.
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Yamamoto, Toshio; Kamata, Jyoji; Murase, Shigeo; and Yamaguchi, Kouichirou, to Matsushita Electric Industrial Co., Ltd. Combination

re-conditioning unit and illuminating appliance for use with central air conditioning system. 4,076,073, Cl. 165-53.000.

Yamanaka, Akira, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Motor truck. 4,076,300, Cl. 296-35.00R.

Yamaryo, Yasuyuki, to Kabushiki Kaisha Mitutoyo Seisakusho. Dial indicator gauge. 4,075,763, Cl. 33-172.00R.

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Yamawaki, Masao; Aoki, Katsuo; Ina, Osamu; Suzuki, Takao; Oka, Yoshio; and Hara, Kunihiko, to Nippondenso Co., Ltd. Apparatus for thermal diffusion of semiconductor devices. 4,075,972, Cl. 118-6.000.

Yamazaki, Shuichi; Kajitani, Ikuo; and Kawamoto, Michio, to Honda Giken Kogyo Kabushiki Kaisha. Exhaust manifold for internal combustion engine. 4,075,836, Cl. 60-282.000.

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Yardley, James Frank; and Nightingale, Allen Frederick, to Dunlop Limited. Product and method of molding plastic-rubber composites. 4,076,891, Cl. 428-517.000.

Yasoshima, Kazuo, to Kabushiki Kaisha Komatsu Seisakusho. Vehicle clutch brake steering controls with transmission neutralizer. 4,076,107, Cl. 192-4.00A.

Yasuda, Hiroshi; and Omori, Susumu, to Toyobo Co., Ltd. Method for producing polyester fibers. 4,076,783, Cl. 264-78.000.

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Yazawa, Masahide; Kubo, Teruo; and Suzuki, Kunio, to Polymer Processing Research Institute Ltd. Supplying method for preliminarily expanded polystyrene beads in a thin and uniform layer. 4,076,782, Cl. 264-51.000.

Yee, Yen Sung, to International Business Machines Corporation. Two-stage weighted capacitor circuit for analog-to-digital and digital-to-analog converters. 4,077,035, Cl. 340-347.0DA.

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Yokohama Rubber Co., Ltd., The: *See*—
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Yoshida, Hiroshi, to Aikoh Co., Ltd. Method for the desulfurization of molten iron. 4,076,522, Cl. 75-58.000.

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Yoshikawa, Yoshinobu; Iida, Kosuke; Morikawa, Tadayuki; and Satomi, Akinori, to Takiron Co., Ltd. Method of producing plastic sheets with integrated geometric decorative patterns. 4,076,567, Cl. 156-219.000.

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Young, James M., to Robroy Industries. Conduit coupling. 4,076,280, Cl. 285-39.000.

Young, Julius. Method and article for weight reduction. 4,075,769, Cl. 35-1.000.

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Young, Robert G.; and Pucher, Richard A., to Sperry Rand Corporation. Linkage for controlling a needle safety latch on a baler. 4,075,941, Cl. 100-19.00R.

Yuki, Toshihiro, to Nihon Kogyo Kabushiki Kaisha. Pyrometallurgical process for lead refining. 4,076,523, Cl. 75-77.000.

Yukuta, Toshio; Ohashi, Takashi; Kojima, Minoru; and Suzuki, Akira, to Bridgestone Tire Company Limited. Process for producing a flame- and smoke-retarded, non-shrinkable, flexible polyurethane foam. 4,076,654, Cl. 260-2.5AM.

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Zabotin, Alexandr Alexandrovich; Loschilin, Evgeny Dmitrievich; Onikov, Eduard Arshakovich; Galperin, Alexandr Lvovich; Santucci, Nicola; and Corain, Luciano. Apparatus for charging weft thread carriers. 4,076,051, Cl. 139-436.000.

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Zakrzewski, Andrew Steven; Eastman, Roderick William; Ashby, George Steven; and Clarkson, Douglas Mel, to Dominion Foundries and Steel, Limited. Metal wall construction for buildings. 4,075,810, Cl. 52-585.000.

Zaleboats, Incorporated: *See*—
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Zavitsanos, Peter D.; West, Martin M.; and Browne, William G., to General Electric Company. Explosive composition for high temperature applications. 4,076,563, Cl. 149-37.000.

Zavitsanos, Peter D.; and Bleiler, Kenneth W. Process for coal desulfurization. 4,076,607, Cl. 204-162.00R.

Zeblisky, Rudolph J., to Photocircuits Division of Kollmorgen Corporation. Treatment of liquids containing complexed heavy metals and complexing agents. 4,076,618, Cl. 210-30.00R.

Zecher, Wilfried; Clarenz, Werner; and Merten, Rudolf, to Bayer Aktiengesellschaft. Process for the production of polycondensates containing imide groups. 4,076,694, Cl. 260-77.5MA.

Zehner, Lee R., to Atlantic Richfield Company. Process for the preparation of oxalate esters. 4,076,949, Cl. 560-204.000.

Zeitlin, Benjamin R.; Pritchard, Alan B.; and Levenson, Harold S., to General Foods Corporation. Methyl xanthine antagonism. 4,076,856, Cl. 426-594.000.

Zeller, Paul: *See*—
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Zey, Edward G.; and Hoffmann, William A., III, to Celanese Corporation. Cyclic acetal acrylates or methacrylates and processes for preparing same. 4,076,727, Cl. 260-340.700.

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Zimmerman, Herbert E., to Champion International Corporation. Fire resistant asbestos-free door, panel or building elements, and method of manufacture using unique compositions. 4,075,804, Cl. 52-232.000.

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Zirngibl, Carl H.: *See*—
Crayton, Bruce E.; Wilson, James F.; and Zirngibl, Carl H., 4,076,411, Cl. 355-28.000.

Zitz, Alfred; and Wrulich, Herwig, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Device for guying a movable cutting machine. 4,076,317, Cl. 299-75.000.

Zitz, Alfred: *See*—
Sigott, Siegfried; Zitz, Alfred; Althaler, Wilhelm; and Wlach, Helmut, 4,075,856, Cl. 61-45.00C.

Zocher, Josef, to Singer Company, The. Pneumatic thread and fiber feeding devices. 4,075,959, Cl. 112-225.000.

Zolman, Peter Martin; and Doyle, Keith Gilbert, to Alfred Bader Limited. Winding machine. 4,076,055, Cl. 140-92.200.

Zommer, Jury Arvidovich: *See*—
Ioffe, Benyamin Alexandrovich; Kalnin, Robert Karlovich; Zommer, Jury Arvidovich; Graubin, Yanis Ekabovich; Davydenko, Eduard Prokofievich; and Kern, Ivan Ivanovich, 4,077,027, Cl. 335-219.000.

Zonenko, Ivan Timofeevich: *See*—
Soschenko, Evgeny Maximovich; Zonenko, Ivan Timofeevich; Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Tsimbler, Jury Abramovich; Kantor, Ilya Solomonovich; Topolyansky, Jury Arnoldovich; Chizhikov, Anatoly Petrovich; and Volyansky, Igor Igorievich, 4,075,947, Cl. 104-23.0FS.

Zumsteg, Alphonse E., to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Multiple resonator or filter vibrating in a coupled mode. 4,076,987, Cl. 310-361.000.

Zygiel, Alfred E., deceased (by Zygiel, Mary E., heir), to Cornelius Company, The. Method and apparatus for dispensing a beverage. 4,076,145, Cl. 222-1.000.

Zygiel, Mary E., heir: *See*—
Zygiel, Alfred E., deceased, 4,076,145, Cl. 222-1.000.

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 24,017	3,914,140	Oct. 21, 1975	B 287,275	3,925,141	Dec. 9, 1975
B 24,018	3,914,206	Oct. 21, 1975	B 287,373	3,918,568	Nov. 11, 1975
B 64,868	3,914,141	Oct. 21, 1975	B 288,018	3,925,239	Dec. 9, 1975
B 78,331	3,914,142	Oct. 21, 1975	B 288,627	3,916,179	Oct. 28, 1975
B 112,422	3,913,484	Oct. 21, 1975	B 288,638	3,925,132	Dec. 9, 1975
B 150,560	3,913,654	Oct. 21, 1975	B 289,175	3,924,309	Dec. 9, 1975
B 176,995	3,915,773	Oct. 28, 1975	B 289,471	3,917,184	Nov. 4, 1975
B 178,475	3,944,602	Mar. 16, 1976	B 289,523	3,921,166	Nov. 18, 1975
B 189,772	3,925,367	Dec. 9, 1975	B 289,883	3,925,063	Dec. 9, 1975
B 189,773	3,925,405	Dec. 9, 1975	B 290,328	3,924,838	Dec. 9, 1975
B 190,679	3,925,346	Dec. 9, 1975	B 291,104	3,925,007	Dec. 9, 1975
B 198,810	3,916,043	Oct. 28, 1975	B 291,694	3,925,339	Dec. 9, 1975
B 204,161	3,924,605	Dec. 9, 1975	B 292,054	3,915,877	Oct. 28, 1975
B 207,272	3,914,123	Oct. 21, 1975	B 292,126	3,914,465	Oct. 21, 1975
B 211,786	3,914,300	Oct. 21, 1975	B 292,140	3,914,340	Oct. 21, 1975
B 213,211	3,925,269	Dec. 9, 1975	B 292,300	3,927,167	Dec. 16, 1975
B 220,683	3,914,471	Oct. 21, 1975	B 292,563	3,923,653	Dec. 2, 1975
B 222,188	3,914,739	Oct. 21, 1975	B 293,378	3,923,725	Dec. 2, 1975
B 223,621	3,925,526	Dec. 9, 1975	B 293,437	3,913,414	Oct. 21, 1975
B 224,323	3,925,476	Dec. 9, 1975	B 294,103	3,924,396	Dec. 9, 1975
B 233,383	3,925,424	Dec. 9, 1975	B 294,579	3,916,737	Nov. 4, 1975
B 233,741	3,925,326	Dec. 9, 1975	B 294,673	3,916,023	Oct. 28, 1975
B 235,011	3,925,086	Dec. 9, 1975	B 295,481	3,921,593	Nov. 25, 1975
B 235,925	3,924,949	Dec. 9, 1975	B 295,674	3,916,107	Oct. 28, 1975
B 236,609	3,925,187	Dec. 9, 1975	B 295,860	3,923,880	Dec. 2, 1975
B 237,953	3,924,051	Dec. 2, 1975	B 299,267	3,917,106	Nov. 4, 1975
B 239,289	3,922,711	Nov. 25, 1975	B 300,353	3,921,734	Nov. 25, 1975
B 241,433	3,923,711	Dec. 2, 1975	B 302,271	3,929,130	Dec. 30, 1975
B 245,194	3,919,179	Nov. 11, 1975	B 302,692	3,924,598	Dec. 9, 1975
B 248,916	3,920,862	Nov. 18, 1975	B 302,836	3,923,573	Dec. 2, 1975
B 251,109	3,914,148	Oct. 21, 1975	B 302,998	3,928,233	Dec. 23, 1975
B 251,635	3,914,149	Oct. 21, 1975	B 303,011	3,930,188	Dec. 30, 1975
B 252,947	3,923,803	Dec. 2, 1975	B 303,702	3,914,131	Oct. 21, 1975
B 254,211	3,917,677	Nov. 4, 1975	B 304,687	3,924,783	Dec. 9, 1975
B 254,708	3,923,878	Dec. 2, 1975	B 305,417	3,915,882	Oct. 28, 1975
B 255,756	3,923,781	Dec. 2, 1975	B 305,868	3,921,463	Nov. 25, 1975
B 256,334	3,924,988	Dec. 9, 1975	B 305,881	3,923,478	Dec. 2, 1975
B 256,936	3,925,513	Dec. 9, 1975	B 306,655	3,924,642	Dec. 9,1975
B 258,687	3,914,221	Oct. 21, 1975	B 306,829	3,925,411	Dec. 9, 1975
B 259,236	3,924,874	Dec. 9, 1975	B 306,938	3,916,050	Oct. 28, 1975
B 259,274	3,928,688	Dec. 23, 1975	B 307,677	3,915,276	Oct. 28, 1975
B 260,455	3,925,634	Dec. 9, 1975	B 308,661	3,924,349	Dec. 9, 1975
B 260,945	3,925,250	Dec. 9, 1975	B 308,892	3,919,624	Nov. 11, 1975
B 261,378	3,913,468	Oct. 21, 1975	B 309,207	3,914,743	Oct. 21, 1975
B 261,828	3,925,551	Dec. 9, 1975	B 309,499	3,922,002	Nov. 25, 1975
B 262,241	3,925,528	Dec. 9, 1975	B 309,681	3,927,374	Dec. 16, 1975
B 262,287	3,921,209	Nov. 18, 1975	B 309,755	3,919,468	Nov. 11, 1975
B 262,378	3,914,410	Oct. 21, 1975	B 309,756	3,914,136	Oct. 21, 1975
B 262,599	3,925,323	Dec. 9, 1975	B 309,860	3,922,485	Nov. 25, 1975
B 264,257	3,928,665	Dec. 23, 1975	B 310,149	3,924,705	Dec. 9, 1975
B 264,833	3,923,566	Dec. 2, 1975	B 310,271	3,923,689	Dec. 2, 1975
B 265,369	3,925,245	Dec. 9, 1975	B 310,740	3,985,686	Oct. 12, 1976
B 265,727	3,914,479	Oct. 21, 1975	B 311,313	3,925,142	Dec. 9, 1975
B 265,862	3,915,915	Oct. 28, 1975	B 311,317	3,918,975	Nov. 11, 1975
B 266,195	3,923,599	Dec. 2, 1975	B 311,413	3,925,515	Dec. 9, 1975
B 269,673	3,914,377	Oct. 21, 1975	B 311,910	3,924,357	Dec. 9, 1975
B 270,089	3,923,875	Dec. 2, 1975	B 311,977	3,925,233	Dec. 9,1975
B 271,104	3,925,400	Dec. 9, 1975	B 312,139	3,925,530	Dec. 9, 1975
B 274,945	3,924,992	Dec. 9, 1975	B 312,477	3,923,714	Dec. 2, 1975
B 275,426	3,925,168	Dec. 9, 1975	B 313,029	4,072,769	Jan. 28, 1975
B 276,271	3,916,028	Oct. 28, 1975	B 313,098	3,925,045	Dec. 9, 1975
B 276,560	3,916,030	Oct. 28, 1975	B 313,531	3,925,548	Dec. 9, 1975
B 276,993	3,948,823	Apr. 6, 1976	B 313,594	3,924,626	Dec. 9, 1975
B 277,449	3,924,048	Dec. 2, 1975	B 313,900	3,915,932	Oct. 28, 1975
B 278,491	3,921,170	Nov. 18, 1975	B 314,049	3,920,588	Nov. 18, 1975
B 278,991	3,914,469	Oct. 21, 1975	B 314,255	3,923,764	Dec. 2, 1975
B 279,583	3,923,749	Dec. 2, 1975	B 314,271	3,921,845	Nov. 25, 1975
B 280,015	3,925,378	Dec. 9, 1975	B 314,489	3,925,016	Dec. 9, 1975
B 280,395	3,919,604	Nov. 11, 1975	B 314,800	3,930,087	Dec. 30, 1975
B 281,341	3,920,643	Nov. 18, 1975	B 314,977	3,923,459	Dec. 2, 1975
B 281,943	3,924,013	Dec. 2, 1975	B 315,363	3,920,673	Nov. 18, 1975
B 282,081	3,913,483	Oct. 21, 1975	B 315,397	3,923,963	Dec. 2, 1975
B 282,252	3,924,997	Dec. 9, 1975	B 315,731	3,914,108	Oct. 21, 1975
B 282,390	3,924,576	Dec. 9,1975	B 316,014	3,920,861	Nov. 18, 1975
B 282,819	3,982,932	Sep. 28, 1976	B 316,239	3,913,546	Oct. 21, 1975
B 283,124	3,923,512	Dec. 2, 1975	B 316,422	4,016,206	Apr. 19, 1977
B 283,300	3,925,011	Dec. 9, 1975	B 316,917	3,925,494	Dec. 9, 1975
B 284,297	3,913,722	Oct. 21, 1975	B 317,080	3,925,324	Dec. 9, 1975
B 284,427	3,952,812	Apr. 27, 1976	B 317,347	3,923,552	Dec. 2, 1975
B 285,200	3,923,680	Dec. 2, 1975	B 317,624	3,925,167	Dec. 9, 1975
B 285,796	3,914,303	Oct. 21, 1975	B 318,122	4,026,905	May 31, 1977
B 286,499	3,914,129	Oct. 21, 1975	B 318,195	3,915,699	Oct. 28, 1975
B 286,614	3,924,696	Dec. 9, 1975	B 318,618	3,915,365	Oct. 28, 1975
B 286,913	3,928,696	Dec. 23, 1975	B 318,640	3,925,186	Dec. 9, 1975
B 287,164	3,914,139	Oct. 21, 1975	B 318,745	3,916,571	Nov. 4, 1975
B 287,270	3,924,825	Dec. 9, 1975	B 319,226	3,925,082	Dec. 9, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 319,339	3,916,056	Oct. 28, 1975	B 344,479	3,924,042	Dec. 2, 1975
B 319,402	3,919,568	Nov. 11, 1975	B 345,060	3,916,018	Oct. 28, 1975
B 319,414	3,928,666	Dec. 23, 1975	B 345,384	3,916,146	Oct. 28, 1975
B 320,261	3,924,033	Dec. 2, 1975	B 345,390	3,940,343	Feb. 24, 1976
B 320,452	3,925,083	Dec. 9, 1975	B 345,422	3,914,392	Oct. 21, 1975
B 320,603	3,915,571	Oct. 28, 1975	B 345,527	3,927,365	Dec. 16, 1975
B 321,018	3,921,623	Nov. 25, 1975	B 345,567	3,913,985	Oct. 21, 1975
B 321,101	3,917,163	Nov. 4, 1975	B 346,044	3,988,405	Oct. 26, 1976
B 321,938	3,923,889	Dec. 2, 1975	B 346,145	3,913,293	Oct. 21, 1975
B 322,182	3,925,390	Dec. 9, 1975	B 346,210	3,916,142	Oct. 28, 1975
B 322,239	3,920,973	Nov. 18, 1975	B 346,350	3,915,824	Oct. 28, 1975
B 322,564	3,914,373	Oct. 21, 1975	B 346,487	3,927,406	Dec. 16, 1975
B 322,621	3,920,863	Nov. 18,1975	B 346,585	3,913,820	Oct. 21, 1975
B 322,777	3,924,382	Dec. 9, 1975	B 346,613	3,923,545	Dec. 2, 1975
B 323,127	3,923,967	Dec. 2, 1975	B 346,901	3,915,583	Oct. 28, 1975
B 323,191	3,914,566	Oct. 21, 1975	B 348,083	3,923,774	Dec. 2, 1975
B 323,203	3,916,165	Oct. 28, 1975	B 348,383	3,923,452	Dec. 2, 1975
B 323,568	3,920,536	Nov. 18, 1975	B 348,495	3,914,654	Oct. 21, 1975
B 323,666	3,924,568	Dec. 9, 1975	B 348,558	3,914,109	Oct. 21, 1975
B 324,495	3,928,664	Dec. 23, 1975	B 349,141	3,915,363	Oct. 28, 1975
B 324,503	3,928,524	Dec. 23, 1975	B 349,177	3,914,033	Oct. 21, 1975
B 324,505	3,925,294	Dec. 9, 1975	B 349,231	3,915,831	Oct. 28, 1975
B 324,739	3,924,990	Dec. 9, 1975	B 349,321	3,916,103	Oct. 28, 1975
B 324,879	3,923,538	Dec. 2, 1975	B 349,948	3,914,557	Oct. 21, 1975
B 325,102	3,924,355	Dec. 9, 1975	B 350,025	3,927,415	Dec. 16, 1975
B 325,261	3,921,304	Nov. 25,1975	B 350,143	3,924,419	Dec. 9, 1975
B 326,514	3,925,080	Dec. 9, 1975	B 350,219	3,917,802	Nov. 4, 1975
B 327,109	3,925,350	Dec. 9, 1975	B 350,245	3,914,331	Oct. 21, 1975
B 327,363	3,923,504	Dec. 2, 1975	B 350,523	3,924,726	Dec. 9, 1975
B 327,612	3,925,620	Dec. 9, 1975	B 350,589	3,927,419	Dec. 16, 1975
B 327,674	3,918,540	Nov. 11, 1975	B 350,708	3,923,871	Dec. 2, 1975
B 327,899	3,925,674	Dec. 9, 1975	B 350,843	3,915,461	Oct. 28, 1975
B 328,164	3,914,703	Oct. 21, 1975	B 351,055	3,914,074	Oct. 21, 1975
B 328,200	3,916,031	Oct. 28, 1975	B 351,218	3,914,186	Oct. 21, 1975
B 328,205	3,914,106	Oct. 21, 1975	B 351,222	3,921,179	Nov. 18, 1975
B 328,210	3,914,275	Oct. 21, 1975	B 351,348	3,923,563	Dec. 2, 1975
B 328,391	4,039,888	Aug. 2, 1977	B 351,421	3,914,733	Oct. 21, 1975
B 328,870	3,916,486	Nov. 4, 1975	B 351,493	3,914,758	Oct. 21, 1975
B 329,115	3,924,727	Dec. 9, 1975	B 351,535	3,915,239	Oct. 28, 1975
B 329,476	3,920,562	Nov. 18, 1975	B 351,665	3,919,701	Nov. 11, 1975
B 329,612	3,925,128	Dec. 9, 1975	B 351,672	3,914,000	Oct. 21, 1975
B 329,787	3,920,688	Nov. 18, 1975	B 351,673	4,076,529	Jan. 28, 1975
B 329,816	3,923,947	Dec. 2, 1975	B 351,735	3,913,385	Oct. 21, 1975
B 330,536	3,925,452	Dec. 9, 1975	B 351,863	3,914,700	Oct. 21, 1975
B 330,828	3,913,589	Oct. 21, 1975	B 351,883	3,924,657	Dec. 9, 1975
B 331,417	3,914,157	Oct. 21, 1975	B 351,926	3,914,133	Oct. 21, 1975
B 331,557	3,916,577	Nov. 4, 1975	B 351,939	3,913,480	Oct. 21, 1975
B 331,895	3,916,403	Oct. 28, 1975	B 352,445	3,928,746	Dec. 23, 1975
B 332,527	3,924,017	Dec. 2, 1975	B 352,934	3,913,692	Oct. 21, 1975
B 332,811	3,924,359	Dec. 9, 1975	B 352,950	3,922,590	Nov. 25, 1975
B 333,876	3,921,208	Nov. 18, 1975	B 352,965	3,921,926	Nov. 25, 1975
B 333,928	3,927,172	Dec. 16, 1975	B 353,317	3,916,446	Nov. 4, 1975
B 334,251	3,924,719	Dec. 9, 1975	B 353,387	3,924,404	Dec. 9, 1975
B 334,868	3,919,469	Nov. 11, 1975	B 353,546	3,913,273	Oct. 21, 1975
B 334,985	3,923,912	Dec. 2, 1975	B 354,008	3,925,081	Dec. 9, 1975
B 335,670	3,928,686	Dec. 23, 1975	B 354,098	3,925,547	Dec. 9, 1975
B 335,741	3,925,615	Dec. 9, 1975	B 354,145	3,927,279	Dec. 16, 1975
B 335,773	3,920,953	Nov. 18, 1975	B 354,296	3,914,580	Oct. 21, 1975
B 336,129	3,923,606	Dec. 2, 1975	B 354,510	3,928,658	Dec. 23, 1975
B 336,243	3,925,422	Dec. 9, 1975	B 354,889	3,913,204	Oct. 21, 1975
B 336,345	3,925,179	Dec. 9, 1975	B 354,979	3,914,251	Oct. 21, 1975
B 336,652	3,914,211	Oct. 21, 1975	B 355,095	3,925,656	Dec. 9, 1975
B 336,902	3,918,897	Nov. 11, 1975	B 355,269	3,914,561	Oct. 21, 1975
B 336,946	3,919,425	Nov. 11, 1975	B 355,510	3,913,704	Oct. 21, 1975
B 336,978	3,923,968	Dec. 2, 1975	B 355,595	3,925,649	Dec. 9, 1975
B 337,235	3,919,386	Nov. 11, 1975	B 355,876	3,925,685	Dec. 9, 1975
B 337,409	3,925,258	Dec. 9, 1975	B 356,032	3,928,636	Dec. 23, 1975
B 337,442	3,913,658	Oct. 21, 1975	B 356,253	3,925,025	Dec. 9, 1975
B 337,703	3,914,690	Oct. 21, 1975	B 356,602	3,927,393	Dec. 16, 1975
B 337,787	3,923,506	Dec. 2, 1975	B 356,724	3,924,586	Dec. 9, 1975
B 339,059	3,924,822	Dec. 9, 1975	B 357,039	3,924,406	Dec. 9, 1975
B 339,218	3,925,121	Dec. 9, 1975	B 357,057	3,913,738	Oct. 21, 1975
B 339,699	3,933,527	Jan. 20, 1976	B 357,131	3,924,453	Dec. 9, 1975
B 339,838	3,930,221	Dec. 30, 1975	B 357,402	3,914,180	Oct. 21, 1975
B 340,212	3,922,645	Nov. 25, 1975	B 357,682	3,924,973	Dec. 9, 1975
B 340,833	3,925,208	Dec. 9, 1975	B 357,803	3,919,470	Nov. 11, 1975
B 341,579	3,913,363	Oct. 21, 1975	B 358,174	3,924,958	Dec. 9, 1975
B 342,084	3,928,694	Dec. 23, 1975	B 358,244	3,913,411	Oct. 21, 1975
B 342,423	3,925,334	Dec. 9, 1975	B 358,311	3,923,561	Dec. 2, 1975
B 342,763	4,051,920	Oct. 4, 1977	B 358,939	3,924,713	Dec. 9, 1975
B 342,886	3,923,507	Dec. 2, 1975	B 359,174	3,914,117	Oct. 21, 1975
B 343,136	3,919,453	Nov. 11, 1975	B 359,187	3,924,525	Dec. 9, 1975
B 343,240	3,925,693	Dec. 9, 1975	B 359,540	3,915,235	Oct. 28, 1975
B 343,506	3,916,021	Oct. 28, 1975	B 359,740	3,936,212	Feb. 3, 1976
B 343,577	3,921,165	Nov. 18, 1975	B 359,791	3,929,430	Dec. 30, 1975
B 344,203	3,928,719	Dec. 23, 1975	B 359,825	3,921,344	Nov. 25, 1975

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JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 359,946	3,914,132	Oct. 21, 1975	B 381,847	3,921,152	Nov. 18, 1975
B 359,947	3,914,653	Oct. 21, 1975	B 382,018	3,929,742	Dec. 30, 1975
B 360,208	3,923,750	Dec. 2, 1975	B 382,021	3,913,212	Oct. 21, 1975
B 360,296	3,916,720	Nov. 4, 1975	B 382,261	3,914,991	Oct. 28, 1975
B 360,719	3,915,715	Oct. 28, 1975	B 382,290	3,924,717	Dec. 9, 1975
B 360,910	3,925,696	Dec. 9, 1975	B 382,783	3,919,527	Nov. 11, 1975
B 361,265	3,923,569	Dec. 2, 1975	B 382,798	3,924,435	Dec. 9, 1975
B 361,347	3,914,642	Oct. 21, 1975	B 382,840	3,922,007	Nov. 25, 1975
B 361,443	3,927,405	Dec. 16, 1975	B 383,465	3,927,412	Dec. 16, 1975
B 361,569	3,914,554	Oct. 21, 1975	B 383,581	3,925,318	Dec. 9, 1975
B 361,604	3,922,702	Nov. 25, 1975	B 383,852	3,914,246	Oct. 21, 1975
B 361,734	3,915,764	Oct. 28, 1975	B 384,499	3,925,135	Dec. 9, 1975
B 361,743	4,035,255	July 12, 1977	B 384,658	3,913,452	Oct. 21, 1975
B 361,744	4,035,254	July 12, 1977	B 384,773	3,915,416	Oct. 28, 1975
B 362,589	3,914,012	Oct. 21, 1975	B 385,210	3,913,406	Oct. 21, 1975
B 363,205	3,923,744	Dec. 2, 1975	B 386,403	3,924,895	Dec. 9, 1975
B 363,337	3,928,639	Dec. 23, 1975	B 386,592	3,925,305	Dec. 9, 1975
B 363,457	3,922,595	Nov. 25, 1975	B 387,039	3,924,510	Dec. 9, 1975
B 363,674	3,929,716	Dec. 30, 1975	B 387,331	3,913,701	Oct. 21, 1975
B 363,892	3,913,395	Oct. 21, 1975	B 387,363	3,927,378	Dec. 16, 1975
B 363,962	3,921,826	Nov. 25, 1975	B 387,687	3,918,151	Nov. 11, 1975
B 364,022	3,913,499	Oct. 21, 1975	B 387,761	3,914,245	Oct. 21, 1975
B 364,163	3,916,092	Oct. 28, 1975	B 387,790	3,925,380	Dec. 9, 1975
B 364,241	3,916,668	Nov. 4, 1975	B 387,818	3,918,935	Nov. 11, 1975
B 364,334	3,924,670	Dec. 9, 1975	B 388,580	3,923,712	Dec. 2, 1975
B 364,528	3,919,510	Nov. 11, 1975	B 389,070	3,914,171	Oct. 21, 1975
B 364,786	3,921,673	Nov. 25, 1975	B 389,295	3,914,631	Oct. 21, 1975
B 364,910	3,925,335	Dec. 9, 1975	B 389,327	3,924,504	Dec. 9, 1975
B 365,371	3,988,181	Oct. 26, 1976	B 389,639	3,914,626	Oct. 21, 1975
B 365,490	3,918,527	Nov. 11, 1975	B 389,726	3,921,010	Nov. 18, 1975
B 365,834	3,914,702	Oct. 21, 1975	B 389,807	3,922,623	Nov. 25, 1975
B 365,841	3,925,628	Dec. 9, 1975	B 389,932	3,913,268	Oct. 21, 1975
B 365,855	3,917,258	Nov. 4, 1975	B 389,933	3,913,267	Oct. 21, 1975
B 366,287	3,924,946	Dec. 9, 1975	B 390,679	3,913,668	Oct. 21, 1975
B 366,402	3,928,053	Dec. 23, 1975	B 390,732	3,913,878	Oct. 21, 1975
B 366,589	3,914,719	Oct. 21, 1975	B 390,738	4,035,343	July 12, 1977
B 367,021	3,914,752	Oct. 21, 1975	B 391,184	3,914,214	Oct. 21, 1975
B 367,040	3,924,775	Dec. 9, 1975	B 391,210	3,914,220	Oct. 21, 1975
B 367,661	3,914,158	Oct. 21, 1975	B 391,437	3,915,416	Oct. 28, 1975
B 367,739	3,923,648	Dec. 2, 1975	B 391,509	3,925,175	Dec. 9, 1975
B 367,812	3,924,789	Dec. 9, 1975	B 391,675	3,916,017	Oct. 28, 1975
B 368,081	3,924,691	Dec. 9, 1975	B 392,154	3,923,809	Dec. 2, 1975
B 368,387	3,924,923	Dec. 9, 1975	B 392,242	3,926,636	Dec. 16, 1975
B 368,392	3,913,812	Oct. 21, 1975	B 392,696	3,916,175	Oct. 28, 1975
B 368,397	3,914,677	Oct. 21, 1975	B 392,732	3,914,903	Oct. 21, 1975
B 368,862	3,925,549	Dec. 9, 1975	B 392,753	3,916,341	Oct. 28, 1975
B 369,563	3,924,449	Dec. 9, 1975	B 392,894	3,914,763	Oct. 21, 1975
B 369,607	3,923,786	Dec. 2, 1975	B 393,163	3,914,535	Oct. 21, 1975
B 369,997	3,913,533	Oct. 21, 1975	B 393,347	3,985,800	Oct. 12, 1976
B 370,453	3,964,101	Jun. 15, 1976	B 393,970	3,914,638	Oct. 21, 1975
B 370,706	3,925,242	Dec. 9, 1975	B 394,088	3,914,740	Oct. 21, 1975
B 371,073	3,930,135	Dec. 30, 1975	B 394,188	3,924,591	Dec. 9, 1975
B 371,085	3,923,783	Dec. 2, 1975	B 394,300	3,914,159	Oct. 21, 1975
B 371,787	3,921,217	Nov. 18, 1975	B 394,712	3,916,306	Oct. 28, 1975
B 371,805	3,914,433	Oct. 21, 1975	B 395,478	3,922,577	Nov. 25, 1975
B 371,836	3,923,541	Dec. 2, 1975	B 395,496	3,919,435	Nov. 11, 1975
B 372,823	3,924,660	Dec. 9, 1975	B 395,671	3,920,418	Nov. 18, 1975
B 373,051	3,914,162	Oct. 21, 1975	B 395,889	3,913,190	Oct. 21, 1975
B 373,297	3,924,436	Dec. 9, 1975	B 396,025	3,913,869	Oct. 21, 1975
B 373,326	3,920,433	Nov. 18, 1975	B 396,551	3,921,929	Nov. 25, 1975
B 373,428	3,915,511	Oct. 28, 1975	B 397,027	3,923,736	Dec. 2, 1975
B 375,220	3,920,417	Nov. 18, 1975	B 397,527	3,913,488	Oct. 21, 1975
B 375,652	3,921,303	Nov. 25, 1975	B 397,990	3,914,848	Oct. 28, 1975
B 376,504	3,914,570	Oct. 21, 1975	B 398,262	3,913,481	Oct. 21, 1975
B 376,654	3,922,513	Nov. 25, 1975	B 398,551	3,924,924	Dec. 9, 1975
B 376,742	3,924,392	Dec. 9, 1975	B 398,597	3,913,743	Oct. 21, 1975
B 376,799	3,913,955	Oct. 21, 1975	B 398,625	3,920,996	Nov. 18, 1975
B 377,172	3,918,255	Nov. 11, 1975	B 399,292	3,914,810	Oct. 28, 1975
B 377,683	3,924,433	Dec. 9, 1975	B 399,304	3,919,567	Nov. 11, 1975
B 377,833	3,913,884	Oct. 21, 1975	B 399,349	3,925,694	Dec. 9, 1975
B 377,869	3,917,002	Nov. 4, 1975	B 399,766	3,915,667	Oct. 28, 1975
B 378,621	3,923,840	Dec. 2, 1975	B 400,080	3,925,163	Dec. 9, 1975
B 379,038	3,923,994	Dec. 2, 1975	B 400,293	3,923,719	Dec. 2, 1975
B 379,172	3,914,379	Oct. 21, 1975	B 400,310	3,915,507	Oct. 28, 1975
B 379,282	3,913,462	Oct. 21, 1975	B 401,133	3,924,443	Dec. 9, 1975
B 379,955	3,913,157	Oct. 21, 1975	B 401,992	3,924,898	Dec. 9, 1975
B 380,014	3,921,915	Nov. 25, 1975	B 402,065	3,925,413	Dec. 9, 1975
B 380,141	3,925,161	Dec. 9, 1975	B 402,555	3,914,688	Oct. 21, 1975
B 380,310	3,921,048	Nov. 18, 1975	B 403,140	3,913,486	Oct. 21, 1975
B 380,312	3,913,953	Oct. 21, 1975	B 403,355	3,913,352	Oct. 21, 1975
B 380,338	3,924,873	Dec. 9, 1975	B 403,990	3,914,684	Oct. 21, 1975
B 380,446	3,923,836	Dec. 2, 1975	B 403,996	3,916,016	Oct. 28, 1975
B 380,900	3,913,307	Oct. 21, 1975	B 404,290	3,924,918	Dec. 9, 1975
B 380,926	3,925,095	Dec. 9, 1975	B 404,437	3,915,200	Oct. 28, 1975
B 381,074	3,919,583	Nov. 11, 1975	B 405,136	3,915,565	Oct. 28, 1975
B 381,632	3,914,732	Oct. 21, 1975	B 405,137	3,915,566	Oct. 28, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 405,160	3,924,821	Dec. 9, 1975	B 422,467	3,924,804	Dec. 9, 1975
B 405,248	3,926,294	Dec. 16, 1975	B 422,949	3,921,873	Nov. 25, 1975
B 405,305	3,922,111	Nov 25, 1975	B 424,415	3,919,458	Nov. 11, 1975
B 405,360	3,913,403	Oct. 21, 1975	B 424,462	3,920,522	Nov. 18, 1975
B 405,495	3,924,577	Dec. 9, 1975	B 424,572	3,924,979	Dec. 9, 1975
B 405,938	3,920,109	Nov. 18, 1975	B 424,748	3,924,395	Dec. 9, 1975
B 406,065	3,914,199	Oct. 21, 1975	B 425,035	3,914,025	Oct. 21, 1975
B 406,357	3,924,529	Dec. 9, 1975	B 425,345	3,922,015	Nov. 25, 1975
B 406,800	3,952,708	Apr. 27, 1976	B 425,470	3,923,796	Dec. 2, 1975
B 407,357	3,924,614	Dec. 9, 1975	B 425,539	3,916,742	Nov. 4, 1975
B 407,728	3,925,240	Dec. 9, 1975	B 425,541	3,914,051	Oct. 21, 1975
B 407,736	3,924,463	Dec. 9, 1975	B 425,572	3,923,822	Dec. 2, 1975
B 408,380	3,984,172	Oct. 5, 1976	B 425,770	3,989,817	Nov. 2, 1976
B 408,487	3,924,046	Dec. 2, 1975	B 427,631	3,921,433	Nov. 25, 1975
B 408,749	3,914,116	Oct. 21, 1975	B 428,177	3,914,624	Oct. 21, 1975
B 409,026	3,925,497	Dec. 9, 1975	B 428,795	3,921,056	Nov. 18, 1975
B 409,220	3,915,648	Oct. 28, 1975	B 429,442	3,923,485	Dec. 2, 1975
B 409,251	3,922,620	Nov. 25, 1975	B 430,106	3,918,941	Nov. 11, 1975
B 409,657	3,927,362	Dec. 16, 1975	B 430,140	3,922,084	Nov. 25, 1975
B 409,816	3,921,317	Nov. 25, 1975	B 430,149	4,037,175	July 19, 1977
B 410,062	3,923,855	Dec. 2, 1975	B 430,385	4,001,104	Jan. 4, 1977
B 410,168	3,914,717	Oct. 21, 1975	B 430,798	3,918,204	Nov. 11, 1975
B 411,145	3,914,168	Oct. 21, 1975	B 430,944	3,922,096	Nov. 25, 1975
B 411,356	3,919,649	Nov. 11, 1975	B 432,373	3,919,670	Nov. 11, 1975
B 411,483	3,925,196	Dec. 9, 1975	B 433,587	3,914,567	Oct. 21, 1975
B 411,633	3,914,741	Oct. 21, 1975	B 435,343	3,919,244	Nov. 11, 1975
B 412,516	3,927,417	Dec. 16, 1975	B 435,844	3,925,170	Dec. 9, 1975
B 412,619	3,925,292	Dec. 9, 1975	B 437,172	3,913,251	Oct. 21, 1975
B 412,867	3,924,587	Dec. 9, 1975	B 437,173	3,924,627	Dec. 9, 1975
B 413,006	3,914,850	Oct. 28, 1975	B 437,195	3,914,618	Oct. 21, 1975
B 413,546	3,924,314	Dec. 9, 1975	B 437,450	3,922,479	Nov. 25, 1975
B 414,129	3,925,484	Dec. 9, 1975	B 438,053	3,916,013	Oct. 28, 1975
B 414,288	3,923,537	Dec. 9, 1975	B 438,706	3,925,050	Dec. 9, 1975
B 415,113	3,915,717	Oct. 28, 1975	B 439,168	3,919,676	Nov. 11, 1975
B 415,124	3,915,944	Oct. 28, 1975	B 439,669	3,921,499	Nov. 25, 1975
B 415,845	3,925,076	Dec. 9, 1975	B 440,898	3,921,789	Nov. 25, 1975
B 415,847	3,914,208	Oct. 21, 1975	B 441,024	3,913,629	Oct. 21, 1975
B 415,957	3,925,635	Dec. 9, 1975	B 441,416	3,913,851	Oct. 21, 1975
B 415,977	3,927,359	Dec. 16, 1975	B 442,280	3,914,054	Oct. 21, 1975
B 416,598	3,923,473	Dec. 2, 1975	B 442,859	3,918,570	Nov. 11, 1975
B 416,710	3,923,746	Dec. 2, 1975	B 442,919	3,925,483	Dec. 9, 1975
B 416,832	3,924,975	Dec. 9, 1975	B 444,614	3,927,996	Dec. 23, 1975
B 416,933	3,924,968	Dec. 9, 1975	B 445,471	3,914,711	Oct. 21, 1975
B 417,299	3,918,235	Nov. 11, 1975	B 445,740	3,923,612	Dec. 2, 1975
B 418,121	3,925,023	Dec. 9, 1975	B 447,417	4,024,727	May 24, 1977
B 418,153	3,925,251	Dec. 9, 1975	B 448,571	3,924,760	Dec. 9, 1975
B 418,302	3,913,252	Oct. 21, 1975	B 449,647	3,916,797	Nov. 4, 1975
B 419,327	3,921,197	Nov. 18, 1975	B 450,499	3,920,526	Nov. 18, 1975
B 419,481	3,924,970	Dec. 9, 1975	B 450,546	3,924,417	Dec. 9, 1975
B 420,016	3,914,572	Oct. 21, 1975	B 450,927	3,913,844	Oct. 21, 1975
B 420,148	3,927,414	Dec. 16, 1975	B 455,520	3,922,543	Nov. 25, 1975
B 420,514	3,923,929	Dec. 2, 1975	B 455,775	3,914,356	Oct. 21, 1975
B 420,568	3,925,069	Dec. 9, 1975	B 456,346	3,914,531	Oct. 21, 1975
B 421,026	3,914,785	Oct. 21, 1975	B 459,425	3,928,773	Dec. 23, 1975
B 421,362	3,924,817	Dec. 9, 1975	B 461,872	3,919,586	Nov. 11, 1975
B 421,383	3,925,047	Dec. 9, 1975	B 467,684	3,915,119	Oct. 28, 1975
B 421,797	3,914,023	Oct. 21, 1975	B 468,198	3,925,340	Dec. 9, 1975
B 422,399	3,928,656	Dec. 23, 1975			

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 48,560	4,002,772	Mar. 30, 1976	Jan. 11, 1977	B 371,912	3,995,738	Mar. 2, 1976	Dec. 7, 1976
B 54,859	4,000,101	Feb. 17, 1976	Dec. 28, 1976	B 372,016	3,989,685	Mar. 9, 1976	Nov. 2, 1976
B 59,512	3,999,216	Mar. 16, 1976	Dec. 21, 1976	B 372,232	4,000,967	Mar. 16, 1976	Jan. 4, 1977
B 66,272	4,014,978	Feb. 24, 1976	Mar. 29, 1977	B 372,722	3,998,925	Mar. 9, 1976	Dec. 21, 1976
B 71,613	4,008,393	Mar. 16, 1976	Feb. 15, 1977	B 373,344	4,053,067	Feb. 3, 1976	Oct. 11, 1977
B 73,017	4,001,879	Mar. 9, 1976	Jan. 4, 1977	B 373,354	3,989,870	Jan. 27, 1976	Nov. 2, 1976
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976	B 374,553	4,008,394	Mar. 30, 1976	Feb. 15, 1977
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976	B 374,588	3,985,899	Jan. 27, 1976	Oct. 12, 1976
B 97,259	3,999,614	Mar. 9, 1976	Dec. 28, 1976	B 376,749	4,014,856	Mar. 30, 1976	Mar. 29, 1977
B 105,006	4,007,074	Mar. 23, 1976	Feb. 8, 1977	B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976
B 111,130	4,001,380	Mar. 16, 1976	Jan. 4, 1977	B 378,760	4,001,477	Mar. 9, 1976	Jan. 4, 1977
B 141,968	4,013,442	Mar. 30, 1976	Mar. 22, 1977	B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976	B 380,137	4,014,802	Mar. 23, 1976	Mar. 29, 1977
B 159,570	4,036,870	Mar. 23, 1976	July 19, 1977	B 381,006	4,009,447	Apr. 6, 1976	Feb. 22, 1977
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976	B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976
B 160,099	3,987,221	Jan. 13, 1976	Oct. 19, 1976	B 381,985	3,990,775	Feb. 3, 1976	Nov. 9, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976	B 382,120	4,013,639	Mar. 23, 1976	Mar. 22, 1977
B 167,470	4,001,101	Mar. 2, 1976	Jan. 4, 1977	B 383,697	4,008,211	Feb. 17, 1976	Feb. 15, 1977
B 181,208	4,001,391	Mar. 9, 1976	Jan. 4, 1977	B 384,225	3,998,523	Mar. 16, 1976	Dec. 21, 1976
B 200,759	3,986,872	Feb. 3, 1976	Oct. 19, 1976	B 384,330	3,985,613	Jan. 27, 1976	Oct. 12, 1976
B 208,916	3,987,106	Jan. 13, 1976	Oct. 19, 1976	B 384,654	3,992,681	Feb. 24, 1976	Nov. 16, 1976
B 214,925	3,997,648	Mar. 9, 1976	Dec. 14, 1976	B 385,024	3,994,911	Feb. 10, 1976	Nov. 30, 1976
B 231,416	4,000,054	Mar. 30, 1976	Dec. 28, 1976	B 385,483	3,993,684	Feb. 17, 1976	Nov. 23, 1976
B 236,266	4,013,624	Mar. 23, 1976	Mar. 22, 1977	B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976
B 236,342	4,001,182	Feb. 10, 1976	Jan. 4, 1977	B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976	B 386,673	3,993,717	Feb. 3, 1976	Nov. 23, 1976
B 257,143	4,000,111	Mar. 16, 1976	Dec. 28, 1976	B 386,828	3,992,440	Feb. 3, 1976	Nov. 16, 1976
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976	B 387,337	D 243,157	Mar. 16, 1976	Jan. 25, 1977
B 270,351	3,997,893	Mar. 30, 1976	Dec. 14, 1976	B 388,675	4,012,459	Mar. 30, 1976	Mar. 15, 1977
B 271,743	4,001,195	Mar. 16, 1976	Jan. 4, 1977	B 389,155	4,000,970	Mar. 30, 1976	Jan. 4, 1977
B 276,026	3,992,405	Feb. 3, 1976	Nov. 16, 1976	B 389,304	3,986,829	Jan. 27, 1976	Oct. 19, 1976
B 279,415	4,000,697	Mar. 16, 1976	Jan. 4, 1977	B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976
B 279,969	3,986,073	Jan. 13, 1976	Oct. 12, 1976	B 390,408	3,992,426	Feb. 3, 1976	Nov. 16, 1976
B 281,162	4,009,481	Mar. 23, 1976	Feb. 22, 1977	B 390,979	4,003,850	Mar. 23, 1976	Jan. 18, 1977
B 283,941	3,995,313	Feb. 3, 1976	Nov. 30, 1976	B 391,473	3,988,370	Mar. 2, 1976	Oct. 26, 1976
B 288,757	4,001,072	Mar. 30, 1976	Jan. 4, 1977	B 391,797	3,988,046	Mar. 9, 1976	Oct. 26, 1976
B 301,143	3,991,107	Jan. 27, 1976	Nov. 9, 1976	B 391,828	4,014,933	Apr. 6, 1976	Mar. 29, 1977
B 302,160	3,985,774	Feb. 3, 1976	Oct. 12, 1976	B 391,844	3,999,165	Mar. 16, 1976	Dec. 21, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct. 12, 1976	B 392,798	3,996,249	Mar. 30, 1976	Dec. 7, 1976
B 307,698	3,993,763	Feb. 3, 1976	Nov. 23, 1976	B 394,248	3,989,764	Jan. 27, 1976	Nov. 2, 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976	B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 311,450	3,988,976	Mar. 9, 1976	Nov. 2, 1976	B 394,742	4,009,285	Apr. 13, 1976	Feb. 22, 1977
B 311,779	4,013,481	Feb. 10, 1976	Mar. 22, 1977	B 395,554	3,998,156-	Mar. 9, 1976	Dec. 21, 1976
B 313,280	4,003,591	Apr. 6, 1976	Jan. 18, 1977	B 395,975	4,001,085	Mar. 2, 1976	Jan. 4, 1977
B 326,211	3,988,272	Mar. 23, 1976	Oct. 26, 1976	B 396,164	3,989,590	Feb. 3, 1976	Nov. 2, 1976
B 328,065	4,014,752	Mar. 30, 1976	Mar. 29, 1977	B 396,377	D 243,148	Apr. 6, 1976	Jan. 25, 1977
B 328,077	4,014,860	Apr. 13, 1976	Mar. 29, 1977	B 397,674	3,998,438	Mar. 16, 1976	Dec. 21, 1976
B 328,116	4,000,774	Mar. 9, 1976	Jan. 4, 1977	B 398,084	3,996,239	Feb. 3, 1976	Dec. 7, 1976
B 330,719	4,001,121	Mar. 16, 1976	Jan. 4, 1977	B 398,220	3,990,834	Feb. 3, 1976	Nov. 9, 1976
B 330,736	3,996,299	Feb. 3, 1976	Dec. 7, 1976	B 398,488	3,987,991	Feb. 24, 1976	Oct. 26, 1976
B 332,442	4,001,231	Mar. 30, 1976	Jan. 4, 1977	B 399,098	3,997,665	Feb. 24, 1976	Dec. 14, 1976
B 333,110	3,989,867	Mar. 16, 1976	Nov. 2, 1976	B 399,632	4,001,046	Mar. 9, 1976	Jan. 4, 1977
B 333,247	4,001,201	Mar. 16, 1976	Jan. 4, 1977	B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 333,838	4,006,263	Mar. 23, 1976	Feb. 1, 1977	B 400,871	3,988,893	Feb. 17, 1976	Nov. 2, 1976
B 335,783	4,013,744	Mar. 30, 1976	Mar. 22, 1977	B 401,042	D 242,197	Mar. 16, 1976	Nov. 9, 1976
B 336,754	3,989,805	Mar. 16, 1976	Nov. 2, 1976	B 401,221	4,014,791	Apr. 6, 1976	Mar. 29, 1977
B 337,023	4,013,188	Mar. 30, 1976	Mar. 22, 1977	B 402,162	3,994,902	Mar. 2, 1976	Nov. 30, 1976
B 337,823	4,002,746	Mar. 23, 1976	Jan. 11, 1977	B 402,328	3,995,545	Apr. 6, 1976	Dec. 7, 1976
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976	B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 339,446	4,001,067	Feb. 24, 1976	Jan. 4, 1977	B 402,657	4,013,665	Apr. 6, 1976	Mar. 22, 1977
B 340,170	4,000,444	Mar. 30, 1976	Dec. 28, 1976	B 402,929	3,991,251	Feb. 3, 1976	Nov. 9, 1976
B 344,669	4,013,655	Mar. 16, 1976	Mar. 22, 1977	B 403,076	4,014,917	Apr. 20, 1976	Mar. 29, 1977
B 347,661	3,999,218	Mar. 16, 1976	Dec. 21, 1976	B 403,243	3,996,232	Mar. 30, 1976	Dec. 7, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976	B 403,326	4,001,212	Mar. 23, 1976	Jan. 4, 1977
B 349,370	3,989,684	Jan. 27, 1976	Nov. 2, 1976	B 403,477	3,995,315	Feb. 3, 1976	Nov. 30, 1976
B 351,455	4,001,309	Feb. 24, 1976	Jan. 4, 1977	B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 354,222	4,012,305	Mar. 23, 1976	Mar. 15, 1977	B 403,766	3,994,834	Feb. 10, 1976	Nov. 30, 1976
B 354,959	3,995,996	Feb. 17, 1976	Dec. 7, 1976	B 403,883	4,001,481	Mar. 23, 1976	Jan. 4, 1977
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976	B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 356,470	4,014,789	Mar. 23, 1976	Mar. 29, 1977	B 406,546	D 242,966	Mar. 16, 1976	Jan. 11, 1977
B 357,526	4,001,319	Mar. 23, 1976	Jan. 4, 1977	B 407,205	4,000,966	Mar. 16, 1976	Jan. 4, 1977
B 358,260	3,989,661	Mar. 30, 1976	Nov. 2, 1976	B 407,737	3,992,546	Feb. 3, 1976	Nov. 16, 1976
B 358,427	3,989,896	Feb. 3, 1976	Nov. 2, 1976	B 407,812	4,010,006	Mar. 23, 1976	Mar. 1, 1977
B 359,768	4,013,684	Mar. 30, 1976	Mar. 22, 1977	B 408,123	4,014,887	Apr. 13, 1976	Mar. 29, 1977
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976	B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976
B 361,954	4,014,753	Apr. 6, 1976	Mar. 29, 1977	B 410,074	4,001,303	Feb. 24, 1976	Jan. 4, 1977
B 363,565	4,004,821	Mar. 30, 1976	Jan. 25, 1977	B 410,694	3,995,530	Mar. 23, 1976	Dec. 7, 1976
B 364,797	3,996,131	Feb. 17, 1976	Dec. 7, 1976	B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976
B 367,092	4,014,920	Apr. 13, 1976	Mar. 29, 1977	B 411,624	4,001,205	Mar. 16, 1976	Jan. 4, 1977
B 367,305	3,998,640	Mar. 2, 1976	Dec. 21, 1976	B 411,765	3,993,428	Feb. 24, 1976	Nov. 23, 1976
B 367,621	3,989,589	Feb. 3, 1976	Nov. 2, 1976	B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976	B 412,124	4,007,000	Mar. 23, 1976	Feb. 8, 1977
B 369,373	4,013,683	Mar. 23, 1976	Mar. 22, 1977	B 413,379	4,001,325	Mar. 9, 1976	Jan. 4, 1977
B 369,379	4,013,754	Mar. 30, 1976	Mar. 22, 1977	B 414,028	3,993,738	Feb. 17, 1976	Nov. 23, 1976
B 370,309	3,989,640	Jan. 20, 1976	Nov. 2, 1976	B 414,266	3,993,614	Feb. 10, 1976	Nov. 23, 1976
B 371,095	4,005,074	Mar. 23, 1976	Jan. 25, 1977	B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976
B 371,635	4,010,290	Mar. 23, 1976	Mar. 1, 1977	B 414,971	D 242,208	Feb. 10, 1976	Nov. 9, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 415,021	3,994,173	Mar. 2, 1976	Nov. 30, 1976	B 439,778	4,001,455	Feb. 3, 1976	Jan. 4, 1977
B 415,122	3,997,503	Feb. 10, 1976	Dec. 14, 1976	B 440,548	4,001,271	Mar. 16, 1976	Jan. 4, 1977
B 415,590	4,009,317	Mar. 23, 1976	Feb. 22, 1977	B 440,632	4,014,955	Apr. 13, 1976	Mar. 29, 1977
B 416,257	4,001,335	Mar. 16, 1976	Jan. 4, 1977	B 440,633	4,000,116	Feb. 10, 1976	Dec. 28, 1976
B 416,589	3,990,363	Jan. 27, 1976	Nov. 9, 1976	B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976
B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976	B 441,543	4,014,755	Mar. 23, 1976	Mar. 29, 1977
B 417,164	4,001,360	Mar. 2, 1976	Jan. 4, 1977	B 441,605	4,026,862	Feb. 3, 1976	May 31, 1977
B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976	B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976
B 417,498	4,013,471	Mar. 23, 1976	Mar. 22, 1977	B 441,789	4,001,449	Mar. 30, 1976	Jan. 4, 1977
B 418,489	3,989,592	Jan. 13, 1976	Nov. 2, 1976	B 442,163	D 242,192	Mar. 16, 1976	Nov. 9, 1976
B 419,173	3,999,728	Mar. 9, 1976	Dec. 28, 1976	B 442,295	4,000,477	Mar. 16, 1976	Dec. 28, 1976
B 419,582	3,989,681	Mar. 2, 1976	Nov. 2, 1976	B 442,431	4,011,260	Mar. 23, 1976	Mar. 8, 1977
B 420,176	4,001,017	Mar. 16, 1976	Jan. 4, 1977	B 442,810	3,997,533	Feb. 24, 1976	Dec. 14, 1976
B 420,321	3,990,645	Mar. 30, 1976	Nov. 9, 1976	B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976
B 420,472	3,993,934	Feb. 24, 1976	Nov. 23, 1976	B 442,953	4,002,657	Mar. 23, 1976	Jan. 11, 1977
B 421,373	4,001,326	Mar. 23, 1976	Jan. 4, 1977	B 442,970	3,989,890	Feb. 3, 1976	Nov. 2, 1976
B 421,608	4,013,806	Mar. 23, 1976	Mar. 22, 1977	B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976
B 421,975	3,994,693	Mar. 2, 1976	Nov. 30, 1976	B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976
B 422,063	3,994,835	Feb. 3, 1976	Nov. 30, 1976	B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976
B 422,156	4,010,401	Mar. 23, 1976	Mar. 1, 1977	B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976
B 423,365	3,996,186	Feb. 17, 1976	Dec. 7, 1976	B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976
B 423,404	3,990,958	Mar. 2, 1976	Nov. 9, 1976	B 444,078	4,014,854	Mar. 23, 1976	Mar. 29, 1977
B 423,441	3,997,137	Feb. 17, 1976	Dec. 14, 1976	B 444,294	4,013,634	Mar. 30, 1976	Mar. 22, 1977
B 423,867	3,990,844	Feb. 3, 1976	Nov. 9, 1976	B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976
B 423,883	3,986,871	Jan. 27, 1976	Oct. 19, 1976	B 445,166	4,001,252	Mar. 2, 1976	Jan. 4, 1977
B 424,354	D 242,416	Feb. 10, 1976	Nov. 23, 1976	B 445,459	3,988,889	Feb. 3, 1976	Nov. 2, 1976
B 424,410	4,021,196	Mar. 30, 1976	May 3, 1977	B 445,493	3,994,903	Mar. 2, 1976	Nov. 30, 1976
B 424,989	3,990,569	Feb. 3, 1976	Nov. 9, 1976	B 445,690	3,999,584	Feb. 3, 1976	Dec. 28, 1976
B 425,193	4,002,107	Mar. 23, 1976	Jan. 11, 1977	B 446,107	4,001,276	Mar. 9, 1976	Jan. 4, 1977
B 425,285	4,014,676	Apr. 13, 1976	Mar. 29, 1977	B 446,956	4,014,765	Apr. 13, 1976	Mar. 29, 1977
B 425,462	3,998,396	Mar. 9, 1976	Dec. 21, 1976	B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976
B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976	B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976
B 426,157	4,013,714	Mar. 23, 1976	Mar. 22, 1977	B 449,892	3,997,919	Mar. 23, 1976	Dec. 14, 1976
B 426,227	3,999,028	Mar. 2, 1976	Dec. 21, 1976	B 449,988	4,014,794	Mar. 30, 1976	Mar. 29, 1977
B 426,266	3,998,839	Mar. 2, 1976	Dec. 21, 1976	B 449,989	4,061,572	Mar. 30, 1976	Dec. 6, 1977
B 426,274	4,014,949	Jan. 20, 1976	Mar. 29, 1977	B 450,196	3,997,701	Feb. 10, 1976	Dec. 14, 1976
B 426,424	3,993,742	Feb. 3, 1976	Nov. 23, 1976	B 450,413	4,007,463	Mar. 23, 1976	Feb. 8, 1977
B 426,639	3,992,539	Feb. 3, 1976	Nov. 16, 1976	B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976
B 426,819	3,995,868	Feb. 17, 1976	Dec. 7, 1976	B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976
B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976	B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976
B 427,946	4,006,161	Mar. 23, 1976	Feb. 1, 1977	B 450,870	3,998,951	Mar. 16, 1976	Dec. 21, 1976
B 428,103	4,000,211	Feb. 10, 1976	Dec. 28, 1976	B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976
B 428,271	3,987,415	Mar. 23, 1976	Oct. 19, 1976	B 451,248	3,997,758	Mar. 2, 1976	Dec. 14, 1976
B 428,408	3,995,252	Mar. 2, 1976	Nov. 30, 1976	B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976	B 451,396	4,000,450	Apr. 13, 1976	Dec. 28, 1976
B 429,018	3,990,061	Feb. 10, 1976	Nov. 2, 1976	B 451,438	Re. 29,066	Mar. 2, 1976	Dec. 7, 1976
B 429,027	4,001,260	Mar. 23, 1976	Jan. 4, 1977	B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976
B 429,157	3,990,628	Jan. 27, 1976	Nov. 9, 1976	B 452,034	4,002,367	Mar. 23, 1976	Jan. 11, 1977
B 429,434	3,989,223	Feb. 17, 1976	Nov. 2, 1976	B 452,138	4,004,278	Mar. 23, 1976	Jan. 18, 1977
B 430,157	3,992,465	Feb. 17, 1976	Nov. 16, 1976	B 452,293	4,014,726	Mar. 30, 1976	Mar. 29, 1977
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976	B 452,501	4,001,111	Mar. 16, 1976	Jan. 4, 1977
B 430,213	4,013,514	Mar. 30, 1976	Mar. 22, 1977	B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976	B 452,879	4,001,089	Mar. 16, 1976	Jan. 4, 1977
B 430,287	D 242,489	Feb. 10, 1976	Nov. 23, 1976	B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976
B 430,326	4,003,581	Mar. 23, 1976	Jan. 18, 1977	B 452,915	4,013,933	Mar. 30, 1976	Mar. 22, 1977
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976	B 452,938	3,994,719	Feb. 17, 1976	Nov. 30, 1976
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976	B 452,944	4,009,773	Mar. 30, 1976	Mar. 1, 1977
B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976	B 453,031	3,998,678	Mar. 16, 1976	Dec. 21, 1976
B 431,713	4,000,167	Feb. 10, 1976	Dec. 28, 1976	B 453,067	4,005,394	Mar. 23, 1976	Jan. 25, 1977
B 431,785	3,999,950	Feb. 24, 1976	Dec. 28, 1976	B 453,238	3,997,063	Mar. 2, 1976	Dec. 14, 1976
B 431,797	4,007,290	Mar. 30, 1976	Feb. 8, 1977	B 453,432	4,000,514	Mar. 16, 1976	Dec. 28, 1976
B 432,049	3,995,123	Mar. 23, 1976	Nov. 30, 1976	B 453,533	3,997,744	Feb. 17, 1976	Dec. 14, 1976
B 432,140	3,999,163	Mar. 23, 1976	Dec. 21, 1976	B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 432,265	4,013,480	Mar. 23, 1976	Mar. 22, 1977	B 453,759	3,989,790	Jan. 27, 1976	Nov. 2, 1976
B 432,594	4,003,404	Mar. 30, 1976	Jan. 18, 1977	B 453,960	4,014,701	Apr. 13, 1976	Mar. 29, 1977
B 432,969	3,997,017	Mar. 2, 1976	Dec. 14, 1976	B 454,283	3,995,153	Feb. 3, 1976	Nov. 30, 1976
B 432,991	3,991,669	Mar. 2, 1976	Nov. 16, 1976	B 454,833	4,008,733	Mar. 30, 1976	Feb. 22, 1977
B 433,094	3,987,768	Jan. 27, 1976	Oct. 26, 1976	B 455,425	3,990,060	Feb. 3, 1976	Nov. 2, 1976
B 433,707	4,013,594	Mar. 23, 1976	Mar. 22, 1977	B 455,481	3,991,092	Feb. 24, 1976	Nov. 9, 1976
B 433,892	4,016,061	Apr. 6, 1976	Apr. 5, 1977	B 455,486	4,001,353	Mar. 16, 1976	Jan. 4, 1977
B 433,930	4,012,324	Mar. 23, 1976	Mar. 15, 1977	B 455,686	4,001,156	Mar. 2, 1976	Jan. 4, 1977
B 434,206	3,994,610	Feb. 3, 1976	Nov. 30, 1976	B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 434,441	D 242,849	Mar. 16, 1976	Dec. 28, 1976	B 455,806	3,998,919	Mar. 23, 1976	Dec. 21, 1976
B 435,481	4,000,892	Mar. 9, 1976	Jan. 4, 1977	B 456,069	3,998,991	Mar. 9, 1976	Dec. 21, 1976
B 435,570	4,000,908	Mar. 16, 1976	Jan. 4, 1977	B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 435,617	4,001,234	Mar. 16, 1976	Jan. 4, 1977	B 456,153	3,997,992	Mar. 9, 1976	Dec. 21, 1976
B 436,724	3,991,856	Feb. 24, 1976	Nov. 16, 1976	B 456,384	4,014,859	Apr. 6, 1976	Mar. 29, 1977
B 437,209	4,001,193	Feb. 3, 1976	Jan. 4, 1977	B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 437,559	3,993,287	Feb. 3, 1976	Nov. 23, 1976	B 456,869	4,001,277	Mar. 9, 1976	Jan. 4, 1977
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976	B 456,900	3,996,262	Feb. 3, 1976	Dec. 7, 1976
B 437,894	4,001,015	Mar. 2, 1976	Jan. 4, 1977	B 456,905	4,013,431	Mar. 23, 1976	Mar. 22, 1977
B 437,986	4,011,399	Apr. 20, 1976	Mar. 8, 1977	B 457,547	3,996,397	Feb. 17, 1976	Dec. 7, 1976
B 438,048	4,001,394	Mar. 23, 1976	Jan. 4, 1977	B 457,850	3,993,586	Feb. 10, 1976	Nov. 23, 1976
B 438,484	3,992,451	Feb. 17, 1976	Nov. 16, 1976	B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976	B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976	B 457,931	4,001,229	Mar. 16, 1976	Jan. 4, 1977
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976	B 458,500	3,997,805	Feb. 24, 1976	Dec. 14, 1976

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976	B 473,813	3,989,071	Mar. 9, 1976	Nov. 2, 1976
B 458,964	3,996,615	Mar. 2, 1976	Dec. 7, 1976	B 473,972	3,984,043	Jan. 13, 1976	Oct. 5, 1976
B 459,190	4,010,786	Mar. 30, 1976	Mar. 8, 1977	B 474,573	3,988,375	Jan. 20, 1976	Oct. 26, 1976
B 459,381	4,000,017	Mar. 9, 1976	Dec. 28, 1976	B 474,747	3,997,704	Feb. 24, 1976	Dec. 14, 1976
B 459,408	4,018,890	Mar. 23, 1976	Apr. 19, 1977	B 475,236	3,989,990	Feb. 3, 1976	Nov. 2, 1976
B 459,597	3,996,711	Feb. 17, 1976	Dec. 14, 1976	B 475,385	4,001,071	Mar. 9, 1976	Jan. 4, 1977
B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976	B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976
B 459,821	4,005,954	Mar. 30, 1976	Feb. 1, 1977	B 475,801	4,056,759	Mar. 30, 1976	Nov. 1, 1977
B 460,388	3,989,448	Jan. 27, 1976	Nov. 2, 1976	B 476,267	4,005,068	Apr. 6, 1976	Jan. 25, 1977
B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976	B 476,372	3,985,771	Feb. 24, 1976	Oct. 12, 1976
B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976	B 476,542	4,013,549	Mar. 30, 1976	Mar. 22, 1977
B 461,184	3,992,482	Feb. 17, 1976	Nov. 16, 1976	B 476,568	3,999,456	Mar. 16, 1976	Dec. 28, 1976
B 461,250	4,000,768	Mar. 16, 1976	Jan. 4, 1977	B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976
B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976	B 476,681	3,986,181	Jan. 13, 1976	Oct. 12, 1976
B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976	B 476,776	3,998,715	Mar 23, 1976	Dec. 21, 1976
B 461,685	4,013,661	Mar. 30, 1976	Mar. 22, 1977	B 476,967	3,995,206	Mar. 9, 1976	Nov. 30, 1976
B 461,752	4,016,541	Apr. 20, 1976	Apr. 5, 1977	B 477,252	3,985,759	Jan. 13, 1976	Oct. 12, 1976
B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976	B 477,481	3,991,076	Feb. 3, 1976	Nov. 9, 1976
B 462,030	4,009,342	Mar. 23, 1976	Feb. 22, 1977	B 477,584	D 242,855	Apr. 6, 1976	Dec. 28, 1976
B 462,386	3,988,188	Jan. 13, 1976	Oct. 26, 1976	B 477,597	3,993,912	Feb. 17, 1976	Nov. 23, 1976
B 462,424	3,989,602	Feb. 24, 1976	Nov. 2, 1976	B 477,892	4,010,355	Mar. 30, 1976	Mar. 1, 1977
B 462,828	3,998,395	Mar. 9, 1976	Dec. 21, 1976	B 478,234	4,010,421	Mar. 30, 1976	Mar. 1, 1977
B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976	B 478,739	3,992,253	Feb. 17, 1976	Nov. 16, 1976
B 463,322	3,989,982	Jan. 20, 1976	Nov. 2, 1976	B 478,759	4,055,681	Mar. 16, 1976	Oct. 25, 1977
B 463,388	3,992,605	Feb. 10, 1976	Nov. 16, 1976	B 479,175	3,985,700	Feb. 17, 1976	Oct. 12, 1976
B 463,473	4,002,068	Mar. 23, 1976	Jan. 11, 1977	B 479,242	3,983,074	Feb. 17, 1976	Sep. 28, 1976
B 463,591	4,015,051	Mar. 30, 1976	Mar. 29, 1977	B 479,502	3,999,030	Mar. 16, 1976	Dec. 21, 1976
B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976	B 479,681	D 242,672	Mar. 16, 1976	Dec. 14, 1976
B 464,027	3,999,390	Mar. 16, 1976	Dec. 28, 1976	B 479,969	4,001,132	Mar. 9, 1976	Jan. 4, 1977
B 464,290	3,990,307	Feb. 3, 1976	Nov. 9, 1976	B 480,114	4,001,327	Mar. 2, 1976	Jan. 4, 1977
B 464,491	4,015,612	Mar. 30, 1976	Apr. 5, 1977	B 480,251	4,008,700	Mar. 23, 1976	Feb. 22, 1977
B 464,587	3,991,091	Feb. 3, 1976	Nov. 9, 1976	B 480,287	4,006,029	Mar. 30, 1976	Feb. 1, 1977
B 464,593	3,997,659	Mar. 9, 1976	Dec. 14, 1976	B 480,292	3,994,011	Mar. 16, 1976	Nov. 23, 1976
D 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976	B 480,350	3,994,164	Feb. 10, 1976	Nov. 30, 1976
B 465,202	3,989,757	Feb. 24, 1976	Nov. 2, 1976	B 480,384	3,999,737	Mar. 23, 1976	Dec. 28, 1976
B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976	B 480,452	3,994,923	Feb. 10, 1976	Nov. 30, 1976
B 465,688	3,989,770	Jan. 27, 1976	Nov. 2, 1976	B 480,473	3,995,608	Mar. 2, 1976	Dec. 7, 1976
B 465,955	3,997,502	Feb. 3, 1976	Dec. 14, 1976	B 480,604	3,985,251	Jan. 13, 1976	Oct. 12, 1976
B 466,304	4,007,095	Mar. 23, 1976	Feb. 8, 1977	B 480,625	3,996,227	Feb. 24, 1976	Dec. 7, 1976
B 466,318	3,999,115	Mar. 9, 1976	Dec. 21, 1976	B 480,662	3,988,382	Mar. 2, 1976	Oct. 26, 1976
B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976	B 480,740	3,996,431	Mar. 2, 1976	Dec. 7, 1976
B 466,419	4,011,087	Mar. 23, 1976	Mar. 8, 1977	B 480,749	3,999,207	Mar 9, 1976	Dec. 21, 1976
B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976	B 480,987	4,001,459	Mar. 30, 1976	Jan. 4, 1977
B 466,906	3,993,037	Mar. 16, 1976	Nov. 23, 1976	B 481,048	3,998,542	Mar. 16, 1976	Dec. 21, 1976
B 466,929	3,991,195	Jan. 27, 1976	Nov. 9, 1976	B 481,190	4,013,468	Mar. 30, 1976	Mar. 22, 1977
B 467,250	3,997,428	Feb. 3, 1976	Dec. 14, 1976	B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976
B 467,328	3,997,599	Mar. 9, 1976	Dec. 14, 1976	B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976
B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976	B 481,778	4,001,385	Mar. 30, 1976	Jan. 4, 1977
B 467,486	3,991,725	Mar. 16, 1976	Nov. 16, 1976	B 481,930	3,992,717	Feb. 24, 1976	Nov. 16, 1976
B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976	B 481,989	4,008,337	Mar. 23, 1976	Feb. 15, 1977
B 468,052	3,988,335	Feb. 10, 1976	Oct. 26, 1976	B 482,058	4,001,398	Mar. 2, 1976	Jan. 4, 1977
B 468,100	3,995,107	Mar. 9, 1976	Nov. 30, 1976	B 482,660	3,995,026	Feb. 10, 1976	Nov 30, 1976
B 468,330	4,001,475	Mar. 16, 1976	Jan. 4, 1977	B 482,709	3,985,733	Feb. 24, 1976	Oct. 12, 1976
B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976	B 482,907	3,984,811	Jan. 20, 1976	Oct. 5, 1976
B 468,421	4,014,739	Mar. 30, 1976	Mar. 29, 1977	B 483,247	4,001,889	Apr. 13, 1976	Jan 4, 1977
B 468,603	4,003,839	Mar. 23, 1976	Jan. 18, 1977	B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976
B 469,036	4,005,926	Mar. 16, 1976	Feb. 1, 1977	B 483,268	3,995,215	Mar. 9, 1976	Nov. 30, 1976
B 469,228	4,052,954	Feb. 17, 1976	Oct. 11, 1977	B 483,606	3,986,990	Jan. 27, 1976	Oct. 19, 1976
B 469,468	4,000,220	Mar. 16, 1976	Dec. 28, 1976	B 483,615	3,988,637	Jan. 27, 1976	Oct. 26, 1976
B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976	B 483,746	4,014,923	Mar. 23, 1976	Mar. 29, 1977
B 470,170	3,986,410	Jan. 13, 1976	Oct. 19, 1976	B 483,762	3,993,608	Feb. 10, 1976	Nov. 23, 1976
B 470,305	4,014,043	Apr. 6, 1976	Mar. 22, 1977	B 483,865	3,985,693	Jan. 13, 1976	Oct. 12, 1976
B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976	B 484,029	3,983,558	Feb 10, 1976	Sep. 28, 1976
B 470,576	3,997,507	Feb. 24, 1976	Dec. 14, 1976	B 484,067	3,992,374	Feb. 17, 1976	Nov. 16, 1976
B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976	B 484,068	3,994,937	Mar. 2, 1976	Nov. 30, 1976
B 470,798	3,987,480	Jan. 20, 1976	Oct. 19, 1976	B 484,121	3,997,770	Mar. 16, 1976	Dec. 14, 1976
B 470,853	4,002,101	Mar. 23, 1976	Jan. 11, 1977	B 484,269	4,000,159	Feb. 10, 1976	Dec. 28, 1976
B 470,899	3,996,441	Mar. 2, 1976	Dec. 7, 1976	B 484,332	3,986,540	Mar. 2, 1976	Oct. 19, 1976
B 470,900	4,001,213	Mar. 2, 1976	Jan. 4, 1977	B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976
B 470,945	4,014,848	Apr. 13, 1976	Mar. 29, 1977	B 484,419	4,001,292	Mar. 9, 1976	Jan. 4, 1977
B 471,116	4,001,318	Feb. 17, 1976	Jan. 4, 1977	B 484,437	4,013,740	Mar. 30, 1976	Mar. 22, 1977
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976	B 484,482	3,994,017	Mar. 23, 1976	Nov. 23, 1976
B 471,405	3,993,576	Feb. 10, 1976	Nov. 23, 1976	B 484,769	3,999,498	Mar. 16, 1976	Dec. 28, 1976
B 471,494	3,993,660	Mar. 16, 1976	Nov. 23, 1976	B 485,051	3,992,418	Feb. 17, 1976	Nov. 16, 1976
B 471,579	3,985,689	Jan. 13, 1976	Oct. 12, 1976	B 485,060	3,983,067	Feb. 17, 1976	Sep. 28, 1976
B 471,617	3,994,871	Feb. 10, 1976	Nov. 30, 1976	B 485,169	3,989,791	Mar. 16, 1976	Nov. 2, 1976
B 471,681	4,012,844	Apr. 13, 1976	Mar. 22, 1977	B 485,188	4,001,170	Mar. 16, 1976	Jan. 4, 1977
B 471,706	4,076,275	Mar. 16, 1976	Feb. 28, 1978	B 485,401	3,985,859	Jan. 27, 1976	Oct. 12, 1976
B 471,735	3,989,408	Feb. 3, 1976	Nov. 2, 1976	B 485,575	3,996,565	Feb. 24, 1976	Dec. 7, 1976
B 471,836	4,000,150	Feb. 24, 1976	Dec. 28, 1976	B 485,926	4,006,357	Mar. 23, 1976	Feb. 1, 1977
B 472,241	3,992,453	Feb. 17, 1976	Nov. 16, 1976	B 485,972	4,017,472	Mar. 23, 1976	Apr. 12, 1977
B 472,256	3,985,789	Jan. 13, 1976	Oct. 12, 1976	B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976
B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976	B 486,614	3,995,835	Feb. 17, 1976	Dec. 7, 1976
B 472,591	4,013,029	Apr. 6, 1976	Mar. 22, 1977	B 486,678	4,001,273	Mar. 2, 1976	Jan. 4, 1977
B 472,760	4,001,330	Apr. 13, 1976	Jan. 4, 1977	B 486,828	3,989,651	Mar. 2, 1976	Nov. 2, 1976
B 473,039	3,985,747	Feb. 10, 1976	Oct. 12, 1976	B 487,062	D 241,256	Feb. 10, 1976	Nov. 9, 1976
B 473,040	3,985,738	Feb. 10, 1976	Oct. 12, 1976	B 487,078	4,012,895	Mar. 30, 1976	Mar. 22, 1977

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 487,133	3,989,826	Jan. 27, 1976	Nov. 2, 1976
B 487,260	3,990,610	Jan. 27, 1976	Nov. 9, 1976
B 487,411	3,983,579	Feb. 24, 1976	Sep. 28, 1976
B 487,423	3,998,810	Mar. 2, 1976	Dec. 21, 1976
B 487,427	3,995,788	Mar. 2, 1976	Dec. 7, 1976
B 487,467	4,014,847	Apr. 13, 1976	Mar. 29, 1977
B 487,529	4,022,750	Mar. 30, 1976	May 10, 1977
B 488,111	3,985,765	Jan. 13, 1976	Oct. 12, 1976
B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976
B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976
B 488,756	3,991,810	Mar. 16, 1976	Nov. 16, 1976
B 488,836	4,013,121	Mar. 30, 1976	Mar. 22, 1977
B 489,290	3,998,081	Feb. 17, 1976	Dec. 21, 1976
B 489,328	3,990,088	Jan. 20, 1976	Nov. 2, 1976
B 489,331	3,996,175	Feb. 17, 1976	Dec. 7, 1976
B 489,485	D 243,266	Apr. 13, 1976	Feb. 1, 1977
B 489,550	4,000,710	Mar. 16, 1976	Jan. 4, 1977
B 489,685	3,984,085	Feb. 24, 1976	Oct. 5, 1976
B 490,067	3,986,600	Jan. 27, 1976	Oct. 19, 1976
B 490,547	3,999,439	Feb. 24, 1976	Dec. 28, 1976
B 490,551	D 243,168	Apr. 6, 1976	Jan. 25, 1977
B 490,589	3,990,680	Feb. 3, 1976	Nov. 9, 1976
B 490,623	3,996,964	Mar. 2, 1976	Dec. 14, 1976
B 490,647	3,985,196	Feb. 24, 1976	Oct. 12, 1976
B 490,806	3,989,486	Feb. 3, 1976	Nov. 2, 1976
B 490,812	3,998,842	Mar. 30, 1976	Dec. 21, 1976
B 490,946	3,993,652	Feb. 17, 1976	Nov. 23, 1976
B 490,995	3,995,031	Feb. 3, 1976	Nov. 30, 1976
B 491,032	3,981,892	Feb. 10, 1976	Sep. 21, 1976
B 491,052	3,985,790	Mar. 2, 1976	Oct. 12, 1976
B 491,111	3,997,916	Feb. 17, 1976	Dec. 14, 1976
B 491,455	3,991,167	Feb. 3, 1976	Nov. 9, 1976
B 491,501	3,984,914	Jan. 13, 1976	Oct. 12, 1976
B 491,618	4,007,950	Mar. 16, 1976	Feb. 15, 1977
B 491,650	3,999,044	Mar. 9, 1976	Dec. 21, 1976
B 491,673	3,994,770	Feb. 17, 1976	Nov. 30, 1976
B 491,711	4,053,467	Mar. 23, 1976	Oct. 11, 1977
B 491,776	3,986,298	Mar. 16, 1976	Oct. 19, 1976
B 491,883	3,984,412	Feb. 3, 1976	Oct. 5, 1976
B 491,906	D 242,223	Feb. 10, 1976	Nov. 9, 1976
B 492,039	3,997,541	Feb. 24, 1976	Dec. 14, 1976
B 492,093	4,003,658	Mar. 23, 1976	Jan. 18, 1977
B 492,120	3,995,692	Feb. 24, 1976	Dec. 7, 1976
B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976
B 492,373	4,010,908	Mar. 30, 1976	Mar. 8, 1977
B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976
B 492,716	3,998,739	Mar. 2, 1976	Dec. 21, 1976
B 492,774	4,001,843	Mar. 9, 1976	Jan. 4, 1977
B 492,902	3,993,859	Feb. 24, 1976	Nov. 23, 1976
B 492,946	3,991,303	Jan. 27, 1976	Nov. 9, 1976
B 493,254	D 243,267	Apr. 13, 1976	Feb. 1, 1977
B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976
B 493,463	4,013,510	Mar. 23, 1976	Mar. 22, 1977
B 493,474	4,013,565	Mar. 23, 1976	Mar. 22, 1977
B 493,501	3,988,061	Feb. 3, 1976	Oct. 26, 1976
B 493,686	4,008,338	Mar. 23, 1976	Feb. 15, 1977
B 493,955	3,989,830	Mar. 9, 1976	Nov. 2, 1976
B 493,981	3,990,165	Mar. 9, 1976	Nov. 9, 1976
B 494,138	4,034,002	Mar. 23, 1976	July 5, 1977
B 494,234	3,983,808	Feb. 10, 1976	Oct. 5, 1976
B 494,339	4,001,255	Mar. 16, 1976	Jan. 4, 1977
B 494,383	3,991,289	Feb. 3, 1976	Nov. 9, 1976
B 494,439	4,057,521	Apr. 13, 1976	Nov. 8, 1977
B 494,440	4,056,502	Feb. 17, 1976	Nov. 1, 1977
B 494,669	3,991,104	Feb. 3, 1976	Nov. 9, 1976
B 494,691	3,987,457	Mar. 16, 1976	Oct. 19, 1976
B 494,806	3,989,210	Feb. 3, 1976	Nov. 2, 1976
B 494,944	3,992,469	Feb. 17, 1976	Nov. 16, 1976
B 495,124	4,060,968	Mar. 9, 1976	Dec. 6, 1977
B 495,185	3,999,166	Mar. 9, 1976	Dec. 21, 1976
B 495,331	4,000,456	Mar. 16, 1976	Dec. 28, 1976
B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976
B 495,408	4,000,222	Feb. 3, 1976	Dec. 28, 1976
B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976
B 495,550	3,993,666	Feb. 3, 1976	Nov. 23, 1976
B 495,554	3,993,665	Feb. 3, 1976	Nov. 23, 1976
B 495,759	3,989,998	Feb. 3, 1976	Nov. 2, 1976
B 495,781	4,013,699	Mar. 23, 1976	Mar. 22, 1977
B 495,903	3,995,997	Feb. 17, 1976	Dec. 7, 1976
B 496,430	3,991,140	Feb. 10, 1976	Nov. 9, 1976
B 496,431	3,985,894	Jan. 13, 1976	Oct. 12, 1976
B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976
B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976
B 496,502	3,987,444	Jan. 20, 1976	Oct. 19, 1976
B 496,792	3,999,959	Feb. 17, 1976	Dec. 28, 1976
B 496,964	3,999,219	Apr. 20, 1976	Dec. 21, 1976
B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976
B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976
B 497,194	3,988,267	Feb. 3, 1976	Oct. 26, 1976
B 497,292	3,994,052	Feb. 3, 1976	Nov. 30, 1976
B 497,293	4,011,412	Mar. 30, 1976	Mar. 8, 1977
B 497,473	3,990,839	Feb. 3, 1976	Nov. 9, 1976
B 497,571	4,009,997	Mar. 23, 1976	Mar. 1, 1977
B 497,584	3,988,184	Feb. 24, 1976	Oct. 26, 1976
B 497,702	3,996,589	Mar. 2, 1976	Dec. 7, 1976
B 497,780	3,997,500	Feb. 24, 1976	Dec. 14, 1976
B 497,853	3,987,934	Feb. 17, 1976	Oct. 26, 1976
B 497,896	D 243,091	Apr. 6, 1976	Jan. 18, 1977
B 497,960	3,991,325	Jan. 20, 1976	Nov. 9, 1976
B 498,208	4,001,480	Apr. 13, 1976	Jan. 4, 1977
B 498,288	4,013,657	Mar. 23, 1976	Mar. 22, 1977
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 498,205	3,989,611	Feb. 10, 1976	Nov. 2, 1976
B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 498,820	3,996,670	Mar. 9, 1976	Dec. 14, 1976
B 498,951	3,996,907	Mar. 2, 1976	Dec. 14, 1976
B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976
B 499,209	3,995,907	Feb. 24, 1976	Dec. 7, 1976
B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976
B 499,324	4,001,375	Mar. 16, 1976	Jan. 4, 1977
B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976
B 499,370	4,013,544	Mar. 30, 1976	Mar. 22, 1977
B 499,718	3,990,058	Jan. 27, 1976	Nov. 2, 1976
B 499,786	4,000,663	Mar. 16, 1976	Jan. 4, 1977
B 500,171	3,997,262	Mar. 30, 1976	Dec. 14, 1976
B 500,176	3,995,316	Feb. 3, 1976	Nov. 30, 1976
B 500,408	D 242,721	Mar. 16, 1976	Dec. 14, 1976
B 500,945	3,996,817	Feb. 24, 1976	Dec. 14, 1976
B 500,959	4,014,853	Apr. 13, 1976	Mar. 29, 1977
B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976
B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976
B 501,128	4,072,723	Feb. 24, 1976	Feb. 7, 1978
B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976
B 501,253	3,994,015	Feb. 3, 1976	Nov. 23, 1976
B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976
B 501,379	4,013,696	Mar. 30, 1976	Mar. 22, 1977
B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976
B 501,482	4,012,650	Jan. 13, 1976	Mar. 15, 1977
B 501,503	4,001,640	Mar. 2, 1976	Jan. 4, 1977
B 501,540	3,985,694	Jan. 13, 1976	Oct. 12, 1976
B 501,975	3,998,466	Mar. 2, 1976	Dec. 21, 1976
B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976
B 502,151	3,998,614	Mar. 23, 1976	Dec. 21, 1976
B 502,161	4,000,500	Mar. 2, 1976	Dec. 28, 1976
B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976
B 502,381	D 242,231	Mar. 16, 1976	Nov. 9, 1976
B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976
B 502,571	D 242,433	Apr. 6, 1976	Nov. 23, 1976
B 502,589	3,989,652	Jan. 27, 1976	Nov. 2, 1976
B 502,652	3,989,186	Feb. 24, 1976	Nov. 2, 1976
B 502,667	3,991,431	Feb. 24, 1976	Nov. 16, 1976
B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976
B 502,993	3,992,489	Feb. 17, 1976	Nov. 16, 1976
B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976
B 503,345	4,001,235	Feb. 24, 1976	Jan. 4, 1977
B 503,371	4,009,401	Mar. 30, 1976	Feb. 22, 1977
B 503,436	3,988,819	Feb. 24, 1976	Nov. 2, 1976
B 503,456	4,007,702	Mar. 23, 1976	Feb. 15, 1977
B 503,521	3,999,646	Mar. 16, 1976	Dec. 28, 1976
B 503,579	3,989,680	Feb. 10, 1976	Nov. 2, 1976
B 503,618	3,997,782	Mar. 9, 1976	Dec. 14, 1976
B 503,742	3,989,756	Feb. 17, 1976	Nov. 2, 1976
B 503,776	4,016,000	Mar. 23, 1976	Apr. 5, 1977
B 503,780	3,990,055	Mar. 16, 1976	Nov. 2, 1976
B 503,817	3,988,307	Jan. 13, 1976	Oct. 26, 1976
B 504,056	3,993,923	Feb. 24, 1976	Nov. 23, 1976
B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976
B 504,156	3,999,048	Mar. 23, 1976	Dec. 21, 1976
B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976
B 504,404	3,996,499	Feb. 24, 1976	Dec. 7, 1976
B 504,405	4,007,401	Apr. 13, 1976	Feb. 8, 1977
B 504,439	3,999,398	Mar. 16, 1976	Dec. 28, 1976
B 504,503	3,999,210	Mar. 9, 1976	Dec. 21, 1976
B 504,582	4,005,138	Mar. 30, 1976	Jan. 25, 1977
B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976
B 504,877	3,997,564	Feb. 24, 1976	Dec. 14, 1976
B 504,899	3,991,273	Mar. 9, 1976	Nov. 9, 1976
B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976
B 505,221	4,013,627	Mar. 30, 1976	Mar. 22, 1977
B 505,582	4,001,659	Mar. 23, 1976	Jan. 4, 1977
B 505,689	3,987,631	Mar. 2, 1976	Oct. 26, 1976
B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976
B 506,144	3,991,147	Feb. 10, 1976	Nov. 9, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 506,148	3,988,319	Feb. 3, 1976	Oct. 26, 1976
B 506,167	3,990,652	Feb. 10, 1976	Nov. 9, 1976
B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976
B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976
B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976
B 506,624	3,999,695	Mar. 9, 1976	Dec. 28, 1976
B 506,648	3,994,857	Feb. 3, 1976	Nov. 30, 1976
B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976
B 506,760	4,012,835	Apr. 13, 1976	Mar. 22, 1977
B 506,839	4,005,389	Mar. 23, 1976	Jan. 25, 1977
B 506,840	4,002,928	Mar. 23, 1976	Jan. 11, 1977
B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976
B 506,926	3,993,232	Feb. 17, 1976	Nov. 23, 1976
B 507,087	3,991,389	Feb. 17, 1976	Nov. 9, 1976
B 507,131	4,000,499	Mar. 2, 1976	Dec. 28, 1976
B 507,166	4,014,738	Apr. 13, 1976	Mar. 29, 1977
B 507,396	3,995,167	Feb. 10, 1976	Nov. 30, 1976
B 507,476	3,994,680	Feb. 10, 1976	Nov. 30, 1976
B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976
B 508,118	3,992,283	Feb. 17, 1976	Nov. 16, 1976
B 508,119	3,992,285	Feb. 17, 1976	Nov. 16, 1976
B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976
B 508,639	4,004,194	Mar. 23, 1976	Jan. 18, 1977
B 508,817	3,989,891	Feb. 3, 1976	Nov. 2, 1976
B 508,878	3,994,117	Feb. 3, 1976	Nov. 30, 1976
B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976
B 508,961	3,987,477	Feb. 3, 1976	Oct. 19, 1976
B 509,043	3,996,767	Feb. 24, 1976	Dec. 14, 1976
B 509,165	3,999,155	Mar. 2, 1976	Dec. 21, 1976
B 509,185	3,989,996	Feb. 3, 1976	Nov. 2, 1976
B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976
B 509,474	3,997,260	Feb. 17, 1976	Dec. 14, 1976
B 509,586	4,006,645	Feb. 3, 1976	Feb. 8, 1977
B 509,606	3,989,986	Feb. 3, 1976	Nov. 2, 1976
B 509,772	3,999,004	Mar. 16, 1976	Dec. 21, 1976
B 509,819	4,014,712	Apr. 13, 1976	Mar. 29, 1977
B 510,026	4,016,763	Apr. 13, 1976	Apr. 12, 1977
B 510,184	D 242,784	Apr. 6, 1976	Dec. 21, 1976
B 510,278	4,008,972	Mar. 30, 1976	Feb. 22, 1977
B 510,281	3,993,215	Mar. 9, 1976	Nov. 23, 1976
B 510,346	D 242,207	Feb. 10, 1976	Nov. 9, 1976
B 510,458	4,000,221	Feb. 10, 1976	Dec. 28, 1976
B 510,521	3,990,656	Mar. 2, 1976	Nov. 9, 1976
B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976
B 510,677	3,989,541	Feb. 24, 1976	Nov. 2, 1976
B 510,682	4,000,978	Mar. 30, 1976	Jan. 4, 1977
B 510,836	4,013,795	Mar. 23, 1976	Mar. 22, 1977
B 510,850	3,989,841	Feb. 3, 1976	Nov. 2, 1976
B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976
B 511,907	3,999,622	Mar. 30, 1976	Dec. 28, 1976
B 510,998	3,992,336	Feb. 10, 1976	Nov. 16, 1976
B 511,002	3,998,717	Mar. 2, 1976	Dec. 21, 1976
B 511,099	3,990,162	Feb. 3, 1976	Nov. 9, 1976
B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976
B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976
B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976
B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976
B 511,665	4,001,037	Mar. 2, 1976	Jan. 4, 1977
B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976
B 511,886	3,989,991	Feb. 3, 1976	Nov. 2, 1976
B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976
B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976
B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976
B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976
B 512,779	4,014,897	Apr. 13, 1976	Mar. 29, 1977
B 512,818	3,997,363	Apr. 6, 1976	Dec. 14, 1976
B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976
B 512,964	3,995,279	Feb. 10, 1976	Nov. 30, 1976
B 513,014	3,991,113	Feb. 10, 1976	Nov. 9, 1976
B 513,027	3,995,143	Feb. 17, 1976	Nov. 30, 1976
B 513,134	4,006,764	Mar. 23, 1976	Feb. 8, 1977
B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976
B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976
B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976
B 513,756	3,993,869	Feb. 3, 1976	Nov. 23, 1976
B 513,781	4,001,324	Feb. 24, 1976	Jan. 4, 1977
B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976
B 513,791	4,008,608	Mar. 30, 1976	Feb. 22, 1977
B 514,259	4,013,649	Mar. 23, 1976	Mar. 22, 1977
B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976
B 514,839	4,033,816	Mar. 2, 1976	July 5, 1977
B 515,135	3,990,085	Feb. 17, 1976	Nov. 2, 1976
B 515,216	4,076,261	Feb. 17, 1976	Feb. 28, 1978
B 515,303	3,987,939	Jan. 20, 1976	Oct. 26, 1976
B 515,368	4,014,733	Apr. 6, 1976	Mar. 29, 1977
B 515,452	3,995,243	Feb. 10, 1976	Nov. 30, 1976
B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976
B 515,642	4,001,258	Feb. 24, 1976	Jan. 4, 1977
B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976
B 516,002	3,988,638	Jan. 13, 1976	Oct. 26, 1976
B 516,032	3,986,634	Jan. 27, 1976	Oct. 19, 1976
B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976
B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976
B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976
B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976
B 516,537	3,996,784	Feb. 17, 1976	Dec. 14, 1976
B 516,564	3,993,931	Feb. 17, 1976	Nov. 23, 1976
B 516,609	3,994,486	Feb. 24, 1976	Nov. 30, 1976
B 516,625	4,013,542	Mar. 30, 1976	Mar. 22, 1977
B 516,804	3,991,209	Mar. 23, 1976	Nov. 9, 1976
B 516,825	3,988,885	Feb. 3, 1976	Nov. 2, 1976
B 517,273	D 242,798	Mar. 16, 1976	Dec. 21, 1976
B 517,504	3,999,855	Mar. 9, 1976	Dec. 28, 1976
B 517,668	4,013,423	Apr. 6, 1976	Mar. 22, 1977
B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976
B 517,858	4,000,999	Feb. 17, 1976	Jan. 4, 1977
B 517,956	D 243,088	Apr. 6, 1976	Jan. 18, 1977
B 517,957	D 243,089	Apr. 6, 1976	Jan. 18, 1977
B 518,076	4,014,914	Mar. 30, 1976	Mar. 29, 1977
B 518,226	3,993,509	Feb. 10, 1976	Nov. 23, 1976
B 518,326	4,008,282	Mar. 23, 1976	Feb. 15, 1977
B 518,656	3,989,732	Feb. 17, 1976	Nov. 2, 1976
B 518,859	3,989,971	Feb. 3, 1976	Nov. 2, 1976
B 518,999	3,990,323	Feb. 3, 1976	Nov. 9, 1976
B 519,095	3,993,621	Feb. 24, 1976	Nov. 23, 1976
B 519,355	4,014,829	Apr. 13, 1976	Mar. 29, 1977
B 519,377	3,987,223	Jan. 27, 1976	Oct. 19, 1976
B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976
B 519,485	3,991,134	Feb. 10, 1976	Nov. 9, 1976
B 519,486	3,992,481	Feb. 17, 1976	Nov. 16, 1976
B 519,487	3,992,337	Feb. 17, 1976	Nov. 16, 1976
B 519,599	3,995,350	Feb. 17, 1976	Dec. 7, 1976
B 519,623	4,012,049	Apr. 6, 1976	Mar. 15, 1977
B 519,680	4,014,660	Mar. 30, 1976	Mar. 29, 1977
B 519,932	3,988,618	Feb. 3, 1976	Oct. 26, 1976
B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976
B 520,063	3,989,934	Mar. 2, 1976	Nov. 2, 1976
B 520,075	3,989,935	Feb. 24, 1976	Nov. 2, 1976
B 520,076	3,989,936	Mar. 2, 1976	Nov. 2, 1976
B 520,082	3,989,937	Mar. 23, 1976	Nov. 2, 1976
B 520,115	4,003,072	Mar. 23, 1976	Jan. 11, 1977
B 520,227	4,002,823	Mar. 30, 1976	Jan. 11, 1977
B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976
B 520,277	3,995,635	Feb. 17, 1976	Dec. 7, 1976
B 520,341	3,992,028	Mar. 16, 1976	Nov. 16, 1976
B 520,384	3,986,592	Jan. 27, 1976	Oct. 19, 1976
B 520,514	3,988,308	Mar. 9, 1976	Oct. 26, 1976
B 520,534	3,997,119	Feb. 17, 1976	Dec. 14, 1976
B 520,543	3,986,768	Jan. 27, 1976	Oct. 19, 1976
B 520,546	4,001,133	Mar. 2, 1976	Jan. 4, 1977
B 520,613	3,991,341	Mar. 16, 1976	Nov. 9, 1976
B 520,658	3,998,778	Mar. 9, 1976	Dec. 21, 1976
B 520,878	4,014,849	Apr. 6, 1976	Mar. 29, 1977
B 520,884	4,000,433	Mar. 16, 1976	Dec. 28, 1976
B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976
B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976
B 520,952	4,000,876	Mar. 16, 1976	Jan. 4, 1977
B 520,995	4,009,996	Mar. 23, 1976	Mar. 1, 1977
B 521,025	3,998,838	Mar. 23, 1976	Dec. 21, 1976
B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976
B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976
B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976
B 521,125	3,994,865	Feb. 10, 1976	Nov. 30, 1976
B 521,126	3,997,510	Feb. 10, 1976	Dec. 14, 1976
B 521,127	3,996,201	Feb. 17, 1976	Dec. 7, 1976
B 521,128	3,997,511	Feb. 10, 1976	Dec. 14, 1976
B 521,324	3,983,143	Jan. 27, 1976	Sep. 28, 1976
B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976
B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976
B 521,612	4,000,251	Mar. 9, 1976	Dec. 28, 1976
B 521,620	3,983,749	Jan. 27, 1976	Oct. 5, 1976
B 521,643	3,997,567	Mar. 2, 1976	Dec. 14, 1976
B 521,711	3,989,835	Feb. 10, 1976	Nov. 2, 1976
B 521,793	3,996,981	Feb. 24, 1976	Dec. 14, 1976
B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976
B 521,985	4,012,404	Mar. 23, 1976	Mar. 15, 1977
B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976
B 522,009	3,995,444	Feb. 17, 1976	Dec. 7, 1976
B 522,038	3,993,119	Feb. 3, 1976	Nov. 23, 1976
B 522,227	3,992,904	Mar. 30, 1976	Nov. 23, 1976
B 522,309	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 522,354	3,984,959	Jan. 20, 1976	Oct. 12, 1976
B 522,446	4,001,194	Mar. 30, 1976	Jan. 4, 1977
B 522,537	3,999,587	Mar. 30, 1976	Dec. 28, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 522,567	3,996,238	Feb. 17, 1976	Dec. 7, 1976
B 522,568	D 242,785	Apr. 6, 1976	Dec. 21, 1976
B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976
B 522,629	4,001,155	Mar. 16, 1976	Jan. 4, 1977
B 523,226	4,006,367	Mar. 23, 1976	Feb. 1, 1977
B 523,696	3,986,071	Jan. 13, 1976	Oct. 12, 1976
B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976
B 523,952	3,988,707	Mar. 23, 1976	Oct. 26, 1976
B 524,026	3,992,206	Feb. 10, 1976	Nov. 16, 1976
B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976
B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976
B 524,806	4,000,065	Mar. 2, 1976	Dec. 28, 1976
B 524,849	4,014,938	Mar. 23, 1976	Mar. 29, 1977
B 525,133	3,996,481	Mar. 23, 1976	Dec. 7, 1976
B 525,204	4,001,109	Mar. 16, 1976	Jan. 4, 1977
B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976
B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976
B 526,106	3,990,073	Jan. 27, 1976	Nov. 2, 1976
B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976
B 526,279	4,013,138	Apr. 13, 1976	Mar. 22, 1977
B 526,289	3,992,641	Feb. 24, 1976	Nov. 16, 1976
B 526,388	3,992,017	Feb. 3, 1976	Nov. 16, 1976
B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976
B 526,447	4,000,052	Feb. 24, 1976	Dec. 28, 1976
B 526,510	3,989,708	Jan. 20, 1976	Nov. 2, 1976
B 526,654	4,011,534	Mar. 23, 1976	Mar. 8, 1977
B 526,942	4,013,700	Mar. 30, 1976	Mar. 22, 1977
B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976
B 527,040	4,013,515	Mar. 23, 1976	Mar. 22, 1977
B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976
B 527,171	3,998,248	Mar. 9, 1976	Dec. 21, 1976
B 527,187	3,995,202	Feb. 17, 1976	Nov. 30, 1976
B 527,333	3,999,732	Mar. 23, 1976	Dec. 28, 1976
B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976
B 527,693	3,995,233	Feb. 3, 1976	Nov. 30, 1976
B 527,788	D 242,337	Feb. 10, 1976	Nov. 16, 1976
B 527,972	4,000,016	Mar. 9, 1976	Dec. 28, 1976
B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976
B 528,297	4,001,138	Mar. 16, 1976	Jan. 4, 1977
B 528,303	3,991,023	Feb. 10, 1976	Nov. 9, 1976
B 528,401	3,991,619	Feb. 3, 1976	Nov. 16, 1976
B 528,756	3,990,476	Feb. 3, 1976	Nov. 9, 1976
B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976
B 528,962	3,989,666	Feb. 24, 1976	Nov. 2, 1976
B 528,966	3,989,667	Feb. 24, 1976	Nov. 2, 1976
B 529,156	3,989,158	Jan. 13, 1976	Nov. 2, 1976
B 529,194	4,000,776	Mar. 23, 1976	Jan. 4, 1977
B 529,214	4,013,004	Apr. 20, 1976	Mar. 22, 1977
B 529,659	3,996,875	Feb 24, 1976	Dec. 14, 1976
B 529,836	3,994,345	Feb. 3, 1976	Nov. 30, 1976
B 529,925	4,014,003	Mar. 30, 1976	Mar. 22, 1977
B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976
B 530,174	3,993,635	Feb 24, 1976	Nov. 23, 1976
B 530,255	3,996,103	Mar. 2, 1976	Dec. 7, 1976
B 530,263	4,009,736	Mar. 30, 1976	Mar. 1, 1977
B 530,285	4,013,903	Apr. 6, 1976	Mar. 22, 1977
B 530,303	4,006,029	Mar. 23, 1976	Feb. 1, 1977
B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976
B 530,437	4,014,857	Apr. 13, 1976	Mar. 29, 1977
B 530,569	3,999,865	Mar 16, 1976	Dec. 28, 1976
B 530,580	4,001,151	Mar. 2, 1976	Jan. 4, 1977
B 530,605	3,989,064	Feb 3, 1976	Nov. 2, 1976
B 530,709	4,012,944	Apr. 6, 1976	Mar. 22, 1977
B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976
B 530,873	4,001,016	Feb. 17, 1976	Jan. 4, 1977
B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976
B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976
B 531,267	3,997,040	Feb. 24, 1976	Dec. 14, 1976
B 531,425	3,992,595	Feb. 3, 1976	Nov. 16, 1976
B 531,566	3,997,820	Mar. 16, 1976	Dec. 14, 1976
B 531,686	3,990,017	Mar 23, 1976	Nov 2, 1976
B 531,753	3,988,843	Mar. 2, 1976	Nov. 2, 1976
B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976
B 532,005	3,992,397	Feb. 24, 1976	Nov. 16, 1976
B 532,140	4,001,299	Mar. 2, 1976	Jan. 4, 1977
B 532,319	3,990,292	Feb. 3, 1976	Nov. 9, 1976
B 532,326	3,993,959	Mar. 23, 1976	Nov. 23, 1976
B 532,424	D 242,292	Feb. 10, 1976	Nov. 9, 1976
B 532,476	3,992,756	Feb. 3, 1976	Nov. 23, 1976
B 532,477	4,014,895	Apr. 13, 1976	Mar. 29, 1977
B 532,679	4,010,706	Apr. 6, 1976	Mar. 8, 1977
B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976
B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976
B 532,976	4,000,837	Mar 23, 1976	Jan. 4, 1977
B 533,056	3,983,969	Jan. 13, 1976	Oct. 5, 1976
B 533,259	3,999,556	Feb 24, 1976	Dec. 28, 1976
B 533,454	3,996,566	Mar. 2, 1976	Dec. 7, 1976
B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976
B 533,652	4,000,196	Mar. 23, 1976	Dec. 28, 1976
B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976
B 533,968	3,986,576	Jan. 27, 1976	Oct. 19, 1976
B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976
B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976
B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976
B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976
B 534,334	D 242,722	Mar. 16, 1976	Dec. 14, 1976
B 534,443	3,989,970	Jan. 27, 1976	Nov. 2, 1976
B 534,574	3,995,624	Feb. 24, 1976	Dec. 7, 1976
B 534,591	3,991,141	Feb. 17, 1976	Nov. 9, 1976
B 534,680	4,014,904	Apr. 20, 1976	Mar. 29, 1977
B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976
B 534,915	4,012,668	Mar. 23, 1976	Mar. 15, 1977
B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976
B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976
B 535,209	4,001,873	Mar. 16, 1976	Jan. 4, 1977
B 535,256	3,999,150	Mar. 23, 1976	Dec. 21, 1976
B 535,268	3,999,045	Mar. 30, 1976	Dec. 21, 1976
B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976
B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976
B 535,411	3,990,543	Feb. 24, 1976	Nov. 9, 1976
B 535,437	3,997,555	Feb. 24, 1976	Dec. 14, 1976
B 535,448	3,997,123	Mar. 16, 1976	Dec. 14, 1976
B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976
B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976
B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976
B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976
B 536,082	3,997,783	Mar. 16, 1976	Dec. 14, 1976
B 536,322	4,001,272	Mar. 23, 1976	Jan. 4, 1977
B 536,403	3,998,341	Mar. 23, 1976	Dec. 21, 1976
B 536,511	3,995,989	Mar. 9, 1976	Dec. 7, 1976
B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976
B 536,923	4,007,828	Mar. 30, 1976	Feb. 15, 1977
B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976
B 537,058	4,000,969	Mar. 23, 1976	Jan. 4, 1977
B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976
B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976
B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976
B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976
B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976
B 537,990	4,057,651	Jan. 13, 1976	Nov. 8, 1977
B 538,472	3,992,884	Feb. 3, 1976	Nov. 23, 1976
B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976
B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 538,753	3,993,642	Feb. 10, 1976	Nov. 23, 1976
B 539,374	3,996,229	Mar. 9, 1976	Dec. 7, 1976
B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976
B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976
B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976
B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976
B 540,703	4,013,206	Apr. 13, 1976	Mar. 22, 1977
B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976
B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976
B 540,888	4,005,528	Mar. 30, 1976	Feb. 1, 1977
B 541,015	3,993,208	Jan. 27, 1976	Nov. 23, 1976
B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976
B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976
B 541,464	3,995,424	Feb. 17, 1976	Dec. 7, 1976
B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976
B 541,501	4,005,826	Apr. 13, 1976	Feb. 1, 1977
B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976
B 541,710	3,994,472	Feb. 24, 1976	Nov. 30, 1976
B 542,135	3,986,939	Feb. 10, 1976	Oct. 19, 1976
B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976
B 542,226	3,993,748	Feb. 24, 1976	Nov. 23, 1976
B 542,258	4,013,536	Mar. 23, 1976	Mar. 22, 1977
B 543,078	3,995,687	Feb. 17, 1976	Dec. 7, 1976
B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976
B 544,034	3,997,175	Feb. 17, 1976	Dec. 14, 1976
B 544,476	3,993,585	Feb. 24, 1976	Nov. 23, 1976
B 544,899	3,994,962	Feb. 17, 1976	Nov. 30, 1976
B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976
B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976
B 545,265	D 243,090	Apr. 13, 1976	Jan. 18, 1977
B 545,299	4,001,259	Feb. 24, 1976	Jan. 4, 1977
B 545,344	4,012,746	Mar. 30, 1976	Mar. 15, 1977
B 545,464	3,992,387	Feb. 10, 1976	Nov. 16, 1976
B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976
B 545,777	4,004,906	Jan. 27, 1976	Jan. 25, 1977
B 545,856	4,006,939	Mar. 30, 1976	Feb. 8, 1977
B 545,935	3,990,337	Jan. 27, 1976	Nov. 9, 1976
B 545,945	3,995,260	Jan. 27, 1976	Nov. 30, 1976
B 546,097	3,999,309	Mar. 23, 1976	Dec. 28, 1976
B 546,295	3,987,070	Jan 20, 1976	Oct. 19, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976
B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976
B 546,665	3,990,062	Jan. 20, 1976	Nov 2, 1976
B 546,677	4,015,654	Apr. 6, 1976	Apr. 5, 1977
B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976
B 546,922	3,987,742	Mar. 16, 1976	Oct. 26, 1976
B 547,016	3,999,741	Mar. 23, 1976	Dec. 28, 1976
B 547,208	4,001,218	Feb. 24, 1976	Jan. 4, 1977
B 547,547	3,997,670	Feb. 24, 1976	Dec. 14, 1976
B 547,994	3,990,081	Jan. 20, 1976	Nov. 2, 1976
B 548,028	3,991,517	Feb. 3, 1976	Nov. 16, 1976
B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976
B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976
B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976
B 548,462	D 242,283	Feb. 10, 1976	Nov. 9, 1976
B 548,688	3,995,984	Mar. 9, 1976	Dec. 7, 1976
B 548,719	3,990,553	Feb. 17, 1976	Nov. 9, 1976
B 548,978	3,998,139	Mar. 9, 1976	Dec. 21, 1976
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976
B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976
B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976
B 549,964	3,995,899	Feb. 24, 1976	Dec. 7, 1976
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976
B 550,744	3,993,550	Feb. 17, 1976	Nov. 23, 1976
B 550,810	4,000,910	Mar. 23, 1976	Jan. 4, 1977
B 551,133	3,996,740	Mar. 2, 1976	Dec. 14, 1976
B 551,463	3,996,254	Feb. 17, 1976	Dec. 7, 1976
B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976
B 551,809	3,996,743	Feb. 24, 1976	Dec. 14, 1976
B 551,952	Re. 29,059	Mar. 2, 1976	Dec. 7, 1976
B 552,006	3,992,129	Feb. 3, 1976	Nov. 16, 1976
B 552,489	3,994,864	Feb. 10, 1976	Nov. 30, 1976
B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976
B 552,508	4,001,250	Mar. 16, 1976	Jan. 4, 1977
B 552,629	3,994,773	Mar. 23, 1976	Nov. 30, 1976
B 552,709	4,001,467	Mar. 23, 1976	Jan. 4, 1977
B 552,932	3,989,292	Feb. 3, 1976	Nov. 2, 1976
B 553,421	4,001,146	Mar. 23, 1976	Jan. 4, 1977
B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976
B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976
B 553,629	3,999,242	Feb. 24, 1976	Dec. 28, 1976
B 554,039	3,999,944	Feb. 24, 1976	Dec. 28, 1976
B 554,164	4,001,465	Mar. 9, 1976	Jan. 4, 1977
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976
B 554,291	4,001,209	Mar. 9, 1976	Jan. 4, 1977
B 554,380	4,001,147	Mar. 9, 1976	Jan. 4, 1977
B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976
B 554,655	4,015,048	Feb. 24, 1976	Mar. 29, 1977
B 554,848	4,001,265	Feb. 24, 1976	Jan. 4, 1977
B 554,939	3,994,013	Feb. 10, 1976	Nov. 23, 1976
B 555,146	4,007,636	Apr. 20, 1976	Feb. 15, 1977
B 555,437	3,991,152	Feb. 3, 1976	Nov. 9, 1976
B 555,456	3,993,423	Mar. 30, 1976	Nov. 23, 1976
B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976
B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976
B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976
B 556,897	3,992,972	Feb. 3, 1976	Nov. 23, 1976
B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 557,274	4,016,375	Mar. 23, 1976	Apr. 5, 1977
B 557,299	3,990,357	Feb. 3, 1976	Nov. 9, 1976
B 557,621	3,990,800	Feb. 3, 1976	Nov. 9, 1976
B 557,721	4,013,435	Mar. 23, 1976	Mar. 22, 1977
B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976
B 558,220	3,990,009	Jan. 27, 1976	Nov. 2, 1976
B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976
B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976
B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976
B 558,819	3,990,160	Feb. 3, 1976	Nov. 9, 1976
B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976
B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976
B 559,142	4,001,124	Mar. 2, 1976	Jan. 4, 1977
B 559,394	4,016,094	Apr. 20, 1976	Apr. 5, 1977
B 559,441	4,013,609	Mar. 23, 1976	Mar. 22, 1977
B 559,631	4,011,406	Mar. 23, 1976	Mar. 8, 1977
B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976
B 559,700	4,001,189	Mar. 23, 1976	Jan. 4, 1977
B 559,701	4,001,190	Mar. 23, 1976	Jan. 4, 1977
B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976
B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976
B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976
B 560,488	3,989,940	Mar. 16, 1976	Nov 2, 1976
B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976
B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976
B 561,062	D 242,248	Feb. 10, 1976	Nov. 9, 1976
B 561,165	4,013,002	Mar. 30, 1976	Mar. 22, 1977
B 561,166	4,011,809	Mar. 30, 1976	Mar. 15, 1977
B 561,365	4,005,078	Apr. 13, 1976	Jan. 25, 1977
B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976
B 561,405	4,003,770	Mar. 30, 1976	Jan. 18, 1977
B 561,712	3,992,126	Feb. 17, 1976	Nov. 16, 1976
B 561,732	3,991,460	Feb. 3, 1976	Nov. 16, 1976
B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976
B 561,770	4,000,366	Mar. 16, 1976	Dec. 28, 1976
B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976
B 562,413	4,000,930	Mar. 16, 1976	Jan. 4, 1977
B 562,462	3,985,836	Jan 13, 1976	Oct. 12, 1976
B 562,519	4,013,125	Mar. 30, 1976	Mar. 22, 1977
B 562,601	3,998,360	Mar. 16, 1976	Dec. 21, 1976
B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976
B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976
B 563,070	3,996,230	Mar. 9, 1976	Dec. 7, 1976
B 563,165	4,000,977	Mar. 9, 1976	Jan. 4, 1977
B 563,244	3,983,562	Jan 27, 1976	Sep. 28, 1976
B 563,301	3,995,589	Feb. 17, 1976	Dec 7, 1976
B 563,412	3,992,127	Feb. 24, 1976	Nov 16, 1976
B 563,419	3,999,051	Mar. 23, 1976	Dec 21, 1976
B 563,722	3,990,925	Jan. 13, 1976	Nov. 9, 1976
B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976
B 563,932	4,000,638	Mar 23, 1976	Jan. 4, 1977
B 564,252	4,001,293	Mar. 2, 1976	Jan. 4, 1977
B 564,255	4,015,996	Mar 30, 1976	Apr. 5, 1977
B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 564,902	4,001,351	Mar. 23, 1976	Jan. 4, 1977
B 565,180	3,981,685	Jan 27, 1976	Sep. 21, 1976
B 565,275	3,990,299	Apr. 6, 1976	Nov 9, 1976
B 565,717	3,999,138	Apr. 13, 1976	Dec. 21, 1976
B 565,754	4,011,626	Mar 30, 1976	Mar. 15, 1977
B 566,464	3,996,367	Feb. 3, 1976	Dec. 7, 1976
B 566,556	3,998,511	Mar. 23, 1976	Dec. 21, 1976
B 566,572	3,988,590	Mar. 16, 1976	Oct. 26, 1976
B 566,585	4,001,083	Mar 2, 1976	Jan 4, 1977
B 567,058	3,985,188	Jan 13, 1976	Oct. 12, 1976
B 567,076	4,011,187	Mar. 23, 1976	Mar. 8, 1977
B 567,158	3,988,073	Mar 23, 1976	Oct. 26, 1976
B 567,207	3,991,689	Apr. 13, 1976	Nov 16, 1976
B 567,435	3,995,724	Feb 3, 1976	Dec. 7, 1976
B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 567,892	4,000,855	Mar. 16, 1976	Jan. 4, 1977
B 568,226	3,992,698	Feb. 24, 1976	Nov 16, 1976
B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 569,125	3,986,980	Feb. 24, 1976	Oct 19, 1976
B 569,293	4,004,149	Mar. 30, 1976	Jan. 18, 1977
B 569,501	3,999,250	Mar. 9, 1976	Dec. 28, 1976
B 569,519	3,993,133	Feb. 3, 1976	Nov 23, 1976
B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 569,859	3,994,160	Mar 9, 1976	Nov. 30, 1976
B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976
B 570,615	3,998,570	Mar. 23, 1976	Dec. 21, 1976
B 570,862	3,991,639	Feb. 24, 1976	Nov. 16, 1976
B 570,925	4,040,802	Mar. 23, 1976	Aug. 9, 1977
B 571,219	3,991,388	Feb. 24, 1976	Nov. 9, 1976
B 571,638	4,001,244	Mar. 9, 1976	Jan. 4, 1977
B 571,659	3,995,186	Apr. 13, 1976	Nov 30, 1976
B 572,642	3,990,715	Feb 10, 1976	Nov. 9, 1976
B 572,726	4,015,020	Feb. 24, 1976	Mar. 29, 1977
B 573,033	3,995,224	Mar. 23, 1976	Nov. 30, 1976
B 573,114	4,014,843	Apr 6, 1976	Mar. 29, 1977
B 573,991	4,013,704	Mar. 30, 1976	Mar. 22, 1977
B 573,994	4,000,641	Mar 23, 1976	Jan. 4, 1977
B 574,128	3,982,961	Feb. 17, 1976	Sep 28, 1976
B 574,616	4,000,424	Mar. 2, 1976	Dec. 28, 1976
B 574,996	3,989,718	Feb. 17, 1976	Nov. 2, 1976
B 575,583	4,000,928	Mar. 16, 1976	Jan. 4, 1977
B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 575,761	4,013,123	Apr. 13, 1976	Mar 22, 1977
B 575,776	4,013,124	Apr. 20, 1976	Mar. 22, 1977
B 575,851	3,985,826	Feb. 10, 1976	Oct 12, 1976
B 576,385	4,009,498	Mar. 30, 1976	Mar. 1, 1977
B 576,859	3,991,526	Feb. 24, 1976	Nov. 16, 1976
B 576,903	3,995,032	Feb. 3, 1976	Nov. 30, 1976
B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976
B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 1976
B 579,116	3,986,227	Feb 3, 1976	Oct 19, 1976
B 579,153	4,013,745	Mar. 30, 1976	Mar. 22, 1977
B 579,806	3,995,318	Feb. 3, 1976	Nov. 30, 1976
B 580,379	4,000,796	Apr 6, 1976	Jan. 4, 1977
B 580,826	3,988,391	Feb. 17, 1976	Oct 26, 1976
B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976
B 581,564	4,036,653	Mar 23, 1976	July 19, 1977
B 581,843	4,000,562	Mar. 16, 1976	Jan 4, 1977
B 583,051	3,990,714	Feb 3, 1976	Nov. 9, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976	B 590,502	4,001,171	Mar. 23, 1976	Jan. 4, 1977
B 583,712	3,995,064	Feb. 10, 1976	Nov. 30, 1976	B 591,141	4,013,631	Mar. 23, 1976	Mar. 22, 1977
B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976	B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976
B 584,997	4,000,030	Mar. 9, 1976	Dec. 28, 1976	B 592,146	4,001,084	Mar. 2, 1976	Jan. 4, 1977
B 585,247	3,989,914	Feb. 3, 1976	Nov. 2, 1976	B 592,658	4,001,164	Mar. 23, 1976	Jan. 4, 1977
B 585,731	3,993,603	Feb. 3, 1976	Nov. 23, 1976	B 593,781	4,015,953	Mar. 16, 1976	Apr. 5, 1977
B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976	B 594,871	3,999,245	Mar. 16, 1976	Dec. 28, 1976
B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976	B 596,692	3,992,349	Feb. 17, 1976	Nov. 16, 1976
B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976	B 597,410	4,000,925	Mar. 30, 1976	Jan. 4, 1977
B 586,663	3,992,080	Feb. 3, 1976	Nov. 16, 1976	B 632,416	4,076,698	Mar. 9, 1976	Feb. 28, 1978
B 587,118	Re. 29,067	Mar. 2, 1976	Dec. 7, 1976	B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 587,786	3,991,204	Feb. 17, 1976	Nov. 9, 1976	B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 587,936	3,999,052	Mar. 23, 1976	Dec. 21, 1976	B 750,679	4,007,049	Mar. 23, 1976	Feb. 8, 1977
B 589,179	4,001,102	Mar. 23, 1976	Jan. 4, 1977	B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976
B 589,687	3,995,349	Mar. 23, 1976	Dec. 7, 1976	B 845,044	4,001,338	Mar. 30, 1976	Jan. 4, 1977
B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976	B 848,336	3,993,752	Mar. 30, 1976	Nov. 23, 1976
B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976				
B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976				

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 28TH DAY OF FEBRUARY, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Addressograph-Multigraph Corporation: *See—*
Baltazzi, Evan S., Re. 29,554, Cl. 96-1.50R.

Adelstein, Gilbert W., to G. D. Searle & Co. 1,1-Diaryl-1-oxadiazol-alkylamines. Re. 29,556, Cl. 260-293.540.

ASEA Aktiebolag: *See—*
Frank, Kjell; and Thorborg, Kjeld, Re. 29,560, Cl. 363-71.000.

Baltazzi, Evan S., to Addressograph-Multigraph Corporation. Organic photoconductive members comprising dicyanomethylene substituted fluorene sensitizers. Re. 29,554, Cl. 96-1.50R.

Bannister, Brian, to Upjohn Company, The. Lincomycin analogs. Re. 29,558, Cl. 536-11.000.

Becton, Dickinson Electronics Company: *See—*
Epstein, Howard C., Re. 29,559, Cl. 310-360.000.

Bolton, Douglas R., to Cadaco, Inc. Magnetic game structure. Re. 29,552, Cl. 273-95.00R.

Burton, Robert S., III; and French, Gordon B., to Occidental Oil Shale, Inc. Oil shale retort flue gas cooling and cleaning. Re. 29,553, Cl. 299-2.000.

Cadaco, Inc.: *See—*
Bolton, Douglas R., Re. 29,552, Cl. 273-95.00R.

Canning, John L.; and Lottig, Robert W., to SCM Corporation. Low shrink thermosetting polyesters. Re. 29,555, Cl. 260-22.0CB.

Epstein, Howard C., to Becton, Dickinson Electronics Company. Compression accelerometer utilizing a lithium niobate piezoelectric crystal. Re. 29,559, Cl. 310-360.000.

Feichtner, John D.: *See—*
Isaacs, Thelma J.; Gottlieb, Milton S.; Feichtner, John D.; and Price, Andrea A., Re. 29,557, Cl. 423-299.000.

Frank, Kjell; and Thorborg, Kjeld, to ASEA Aktiebolag. Peak load levelling system. Re. 29,560, Cl. 363-71.000.

French, Gordon B.: *See—*
Burton, Robert S., III; and French, Gordon B., Re. 29,553, Cl. 299-2.000.

G. D. Searle & Co.: *See—*
Adelstein, Gilbert W., Re. 29,556, Cl. 260-293.540.

Gottlieb, Milton S.: *See—*
Isaacs, Thelma J.; Gottlieb, Milton S.; Feichtner, John D.; and Price, Andrea A., Re. 29,557, Cl. 423-299.000.

Hughes Aircraft Company: *See—*
Zurcher, Rudolf F.; and Merles, I. Benjamin, Re. 29,551, Cl. 58-88.00C.

Isaacs, Thelma J.; Gottlieb, Milton S.; Feichtner, John D.; and Price, Andrea A., to Westinghouse Electric Corporation. Tl_3PSe_4 Compound, single crystals, and acousto-optical devices. Re. 29,557, Cl. 423-299.000.

Lottig, Robert W.: *See—*
Canning, John L.; and Lottig, Robert W., Re. 29,555, Cl. 260-22.0CB.

Merles, I. Benjamin: *See—*
Zurcher, Rudolf F.; and Merles, I. Benjamin, Re. 29,551, Cl. 58-88.00C.

Occidental Oil Shale, Inc.: *See—*
Burton, Robert S., III; and French, Gordon B., Re. 29,553, Cl. 299-2.000.

Price, Andrea A.: *See—*
Isaacs, Thelma J.; Gottlieb, Milton S.; Feichtner, John D.; and Price, Andrea A., Re. 29,557, Cl. 423-299.000.

SCM Corporation: *See—*
Canning, John L; and Lottig, Robert W., Re. 29,555, Cl. 260-22.0CB.

Thorborg, Kjeld: *See—*
Frank, Kjell; and Thorborg, Kjeld, Re. 29,560, Cl. 363-71.000.

Upjohn Company, The: *See—*
Bannister, Brian, Re. 29,558, Cl. 536-11.000.

Westinghouse Electric Corporation: *See—*
Isaacs, Thelma J.; Gottlieb, Milton S.; Feichtner, John D.; and Price, Andrea A., Re. 29,557, Cl. 423-299.000.

Zurcher, Rudolf F.; and Merles, I. Benjamin, to Hughes Aircraft Company. Electronic watch movement mounting and connection. Re. 29,551, Cl. 58-88.00C.

LIST OF DESIGN PATENTEES

Acme Highway Products Corporation: *See—*
Puccio, Guy S., 247,373, Cl. D25-75.000.
Puccio, Guy S., 247,374, Cl. D25-75.000.

Adkins, John S. Golf club putter head. 247,381, 2-28-78, Cl. D34-5.0GH.

Adkins, John S. Golf club putter head. 247,382, 2-28-78, Cl. D34-5.0GH.

Adkins, John S. Golf club iron head. 247,383, 2-28-78, Cl. D34-5.0GH.

American Cyanamid Company: *See—*
Grodin, Adam J.; and Tiboldo, Charles J., 247,346, Cl. D9-12.000.
Grodin, Adam J., 247,348, Cl. D9-64.000.

Barthropp, Francis M. L., to Barton of Canada Ltd. Liquid container closure cap. 247,351, 2-28-78, Cl. D9-285.000.

Barton of Canada Ltd.: *See—*
Barthropp, Francis M. L., 247,351, Cl. D9-285.000.

Benstock, Gerald M., to Superior Surgical Mfg. Co., Inc. Laundry bag. 247,340, 2-28-78, Cl. D7-162.000.

Cal Custom Accessories, Inc.: *See—*
Pelly, Charles W., 247,341, Cl. D7-164.000.

Carr, Peter B., to Wilkinson Sword Ltd. Packaging tray for containing and dispensing razor blade units. 247,349, 2-28-78, Cl. D9-186.000.

Chasen, Lee Richard, to Coats & Clark, Inc. Wall mounted stand for potted plants or the like. 247,337, 2-28-78, Cl. D6-137.000.

Coats & Clark, Inc.: *See—*
Chasen, Lee Richard, 247,337, Cl. D6-137.000.

Coleman, Gary W. Bottle bag. 247,392, 2-28-78, Cl. D87-1.00R.

Colgate-Palmolive Company: *See—*
Klingaman, Richard James, 247,347, Cl. D9-40.000.

Combi Co., Ltd.: *See—*
Nakao, Shinroku, 247,384, Cl. D34-15.0JJ.

Construction Specialties, Inc.: *See—*
Hallock, Edward C.; and Polifka, Michael, 247,375, Cl. D25-87.000.

Cray Research, Inc.: *See—*
Cray, Seymour R., Jr.; and Roush, Maurice Dean, 247,361, Cl. D14-40.000.

Cray, Seymour R., Jr.; and Roush, Maurice Dean, to Cray Research, Inc. Computer cabinet. 247,361, 2-28-78, Cl. D14-40.000.

Dame, Ronald L. Novelty hat. 247,333, 2-28-78, Cl. D2-250.000.

Data Packaging Corporation: *See—*
Lowry, Alan, 247,393, Cl. D87-1.00D.

Ditto, Donald R. Sculpture. 247,355, 2-28-78, Cl. D11-137.000.

Drackett Co.: *See—*
Jones, David A.; and Pardo, John, 247,366, Cl. D23-17.000.

Dragan, William B. Dental face bow bite fork. 247,367, 2-28-78, Cl. D24-10.000.

Dranger, Jan; and Huldt, Johan, to Innovator Design AB. Sofa. 247,335, 2-28-78, Cl. D6-63.000.

Earl, Richard L. Combined key ring and comb. 247,395, 2-28-78, Cl. D87-8.100.

Ewen, Warren. Truck body rock shield. 247,359, 2-28-78, Cl. D12-190.000.

Figur, Bernd: *See—*
Stuetzer, Franz Alban; and Figur, Bernd, 247,378, Cl. D27-42.000.

Fisher, Morris F., to Futorian Corporation. Chair. 247,336, 2-28-78, Cl. D6-71.000.

Flambeau Products Corporation: *See—*
Hellman, Werner, 247,386, Cl. D34-15.0AH.

Futorian Corporation: *See—*
Fisher, Morris F., 247,336, Cl. D6-71.000.

Garrett Corporation, The: *See—*
Miller, Ralph A.; and White, Randall F., 247,358, Cl. D12-81.000.

Gray, Michael Wade. Hydroponic tank. 247,357, 2-28-78, Cl. D11-156.000.

Grodin, Adam J.; and Tiboldo, Charles J., to American Cyanamid Company. Bottle package. 247,346, 2-28-78, Cl. D9-12.000.

Grodin, Adam J., to American Cyanamid Company. Decanter. 247,348, 2-28-78, Cl. D9-64.000.

Hallock, Edward C.; and Polifka, Michael, to Construction Specialties, Inc. Facing panel for facades or the like. 247,375, 2-28-78, Cl. D25-87.000.

Hamaguchi, Kazuhiro; and Oku, Yasuaki, to Kabushiki-Kaisha Taiyo. Exhaust gas diffuser for an automobile engine. 247,360, 2-28-78, Cl. D12-194.000.

Hashino, Minoru. Hair dryer. 247,379, 2-28-78, Cl. D28-17.000.

Hazama, Shigetoshi; and Yamagami, Masafumi, to Sharp Kabushiki

Kaisha. Electronic calculating machine. 247,391, 2-28-78, Cl. D64-11.00B.
Heininger, Oskar, to Williamson Corporation. Infra-red radiometer. 247,352, 2-28-78, Cl. D10-46.000.
Hellman, Werner, to Flambeau Products Corporation. Return top. 247,386, 2-28-78, Cl. D34-15.0AH.
Hughes, Leonard. Student-programmable educational instrumentation device. 247,363, 2-28-78, Cl. D19-60.000.
Huldt, Johan: *See—*
Dranger, Jan; and Huldt, Johan, 247,335, Cl. D6-63.000.
Innovator Design AB: *See—*
Dranger, Jan; and Huldt, Johan, 247,335, Cl. D6-63.000.
Jokari/U.S., Inc.: *See—*
Spivey, Lindsey G., II, 247,387, Cl. D34-15.00P.
Jones, David A.; and Pardo, John, to Drackett Co. Spray pump. 247,366, 2-28-78, Cl. D23-17.000.
Kabushiki Kaisha Sato Kenkyusho: *See—*
Sato, Yo, 247,389, Cl. D64-10.000.
Sato, Yo, 247,390, Cl. D64-10.000.
Kabushiki-Kaisha Taiyo: *See—*
Hamaguchi, Kazuhiro; and Oku, Yasuaki, 247,360, Cl. D12-194.000.
Kimberly-Clark Corporation: *See—*
Whitehead, Howard A., 247,368, Cl. D24-51.000.
Whitehead, Howard A., 247,369, Cl. D24-51.000.
Whitehead, Howard A., 247,370, Cl. D24-51.000.
Whitehead, Howard A., 247,371, Cl. D24-51.000.
Whitehead, Howard A., 247,372, Cl. D24-51.000.
Klingaman, Richard James, to Colgate-Palmolive Company. Combined bottle and cap. 247,347, 2-28-78, Cl. D9-40.000.
Kuramoto, Takeo, to Kyoritsu Electrical Instruments Works, Ltd. Portable volt-ohm-ammeter or the like. 247,353, 2-28-78, Cl. D10-79.000.
Kurozumi, Shigeru, to Sharp Kabushiki Kaisha. Cash register. 247,388, 2-28-78, Cl. D52-4.00A.
Kyoritsu Electrical Instruments Works, Ltd.: *See—*
Kuramoto, Takeo, 247,353, Cl. D10-79.000.
Linde, John P.: *See—*
Rowlands, Kenneth C.; Linde, John P.; and Soucy, Kenneth W., 247,365, Cl. D22-99.000.
Linke, Norbert H. J., to S. T. Dupont. Luggage case. 247,394, 2-28-78, Cl. D87-5.00F.
Lowry, Alan, to Data Packaging Corporation. Cassette cabinet. 247,393, 2-28-78, Cl. D87-1.00D.
Miller, Ralph A.; and White, Randall F., to Garrett Corporation, The. Segmented helicopter float. 247,358, 2-28-78, Cl. D12-81.000.
Monarch Marking Systems, Inc.: *See—*
Mulholland, Robert P., 247,345, Cl. D8-383.000.
Mulholland, Robert P., to Monarch Marking Systems, Inc. Coupling for a lanyard. 247,345, 2-28-78, Cl. D8-383.000.
Nakao, Shinroku, to Combi Co., Ltd. Combined toy boat and figures therefor. 247,384, 2-28-78, Cl. D34-15.0JJ.
Nally, Phillip L. Sweatshirt. 247,331, 2-28-78, Cl. D2-215.000.
Nitta, Tomio. Disposable cigarette gas lighter. 247,377, 2-28-78, Cl. D27-42.000.
Oku, Yasuaki: *See—*
Hamaguchi, Kazuhiro; and Oku, Yasuaki, 247,360, Cl. D12-194.000.
Pardo, John: *See—*
Jones, David A.; and Pardo, John, 247,366, Cl. D23-17.000.
Pelly, Charles W., to Cal Custom Accessories, Inc. Portable vacuum cleaner. 247,341, 2-28-78, Cl. D7-164.000.
Polifka, Michael: *See—*
Hallock, Edward C.; and Polifka, Michael, 247,375, Cl. D25-87.000.
Puccio, Guy S., to Acme Highway Products Corporation. Compression seal. 247,373, 2-28-78, Cl. D25-75.000.
Puccio, Guy S., to Acme Highway Products Corporation. Compression seal. 247,374, 2-28-78, Cl. D25-75.000.
Puckett, J. D. Tractor. 247,362, 2-28-78, Cl. D15-23.000.
Quan, Edward. Hockey face mask. 247,332, 2-28-78, Cl. D2-233.000.
Reiback, Earl M. Combined plant container and support. 247,339, 2-28-78, Cl. D6-182.000.
Remington Arms Company, Inc.: *See—*
Rowlands, Kenneth C.; Linde, John P.; and Soucy, Kenneth W., 247,365, Cl. D22-99.000.
Rideau, Sidney N. Audible amusement castle. 247,385, 2-28-78, Cl. D34-15.0LL.
Roush, Maurice Dean: *See—*
Cray, Seymour R., Jr.; and Roush, Maurice Dean, 247,361, Cl. D14-40.000.
Rowenta-Werke, GmbH: *See—*
Stuetzer, Franz Alban; and Figur, Bernd, 247,378, Cl. D27-42.000.
Rowlands, Kenneth C.; Linde, John P.; and Soucy, Kenneth W., to Remington Arms Company, Inc. Mechanical trap for throwing clay targets. 247,365, 2-28-78, Cl. D22-99.000.
S. T. Dupont: *See—*
Linke, Norbert H. J., 247,394, Cl. D87-5.00F.
Sasaki, Kyozo. Sporting shoe. 247,334, 2-28-78, Cl. D2-309.000.
Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Labeling machine. 247,389, 2-28-78, Cl. D64-10.000.
Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Portable labeling machine. 247,390, 2-28-78, Cl. D64-10.000.
Schulz, Robert E. Retainer for fishing lines. 247,364, 2-28-78, Cl. D22-25.000.
Sharp Kabushiki Kaisha: *See—*
Hazama, Shigetoshi; and Yamagami, Masafumi, 247,391, Cl. D64-11.00B.
Kurozumi, Shigeru, 247,388, Cl. D52-4.00A.
Silver, Louis J. Scouring implement. 247,342, 2-28-78, Cl. D7-178.000.
Sinclair, Robert. Line marker buoy. 247,354, 2-28-78, Cl. D10-107.000.
Smith, Edward J. Fireplace grate. 247,343, 2-28-78, Cl. D7-207.000.
Smith, Edward J. Fireplace grate. 247,344, 2-28-78, Cl. D7-207.000.
Soucy, Kenneth W.: *See—*
Rowlands, Kenneth C.; Linde, John P.; and Soucy, Kenneth W., 247,365, Cl. D22-99.000.
Spivey, Lindsey G., II, to Jokari/U.S., Inc. Tether ball game base. 247,387, 2-28-78, Cl. D34-15.00P.
Strozewski, Casimir S. Game board. 247,380, 2-28-78, Cl. D34-5.0SS.
Stuetzer, Franz Alban; and Figur, Bernd, to Rowenta-Werke, GmbH. Lighter. 247,378, 2-28-78, Cl. D27-42.000.
Superior Surgical Mfg. Co., Inc.: *See—*
Benstock, Gerald M., 247,340, Cl. D7-162.000.
Tiboldo, Charles J.: *See—*
Grodin, Adam J.; and Tiboldo, Charles J., 247,346, Cl. D9-12.000.
Wagschal, Edward A. Vase. 247,338, 2-28-78, Cl. D6-137.000.
White, Randall F.: *See—*
Miller, Ralph A.; and White, Randall F., 247,358, Cl. D12-81.000.
Whitehead, Howard A., to Kimberly-Clark Corporation. Contoured sanitary napkin. 247,368, 2-28-78, Cl. D24-51.000.
Whitehead, Howard A., to Kimberly-Clark Corporation. Contoured sanitary napkin. 247,369, 2-28-78, Cl. D24-51.000.
Whitehead, Howard A., to Kimberly-Clark Corporation. Contoured sanitary napkin. 247,370, 2-28-78, Cl. D24-51.000.
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Wilkinson Sword Ltd.: *See—*
Carr, Peter B., 247,349, Cl. D9-186.000.
Williamson Corporation: *See—*
Heininger, Oskar, 247,352, Cl. D10-46.000.
Witt, John Edward. Combined closure cap and brake fluid dispenser. 247,350, 2-28-78, Cl. D9-275.000.
Wright, Herbert E. Combined lamp and plant support or the like. 247,356, 2-28-78, Cl. D11-144.000.
Yamagami, Masafumi: *See—*
Hazama, Shigetoshi; and Yamagami, Masafumi, 247,391, Cl. D64-11.00B.
Yoshinaga Prince Co., Ltd.: *See—*
Yoshinaga, Sadao, 247,376, Cl. D27-39.000.
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CLASSIFICATION OF PATENTS

ISSUED FEBRUARY 28, 1978

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2
6 4,075,714
4,075,715
114 4,075,716
412 4,075,717

CLASS 4
300 4,075,718

CLASS 5
81 R 4,075,719
94 4,075,720
345 R 4,075,721
351 4,075,722

CLASS 8
2.5 A 4,076,494
4,076,495
4 4,076,496
21 C 4,076,497
41 C 4,076,498
137.5 4,076,499
139.1 4,076,500

CLASS 9
1.5 4,075,723
2 F 4,075,724
8 R 4,075,725

CLASS 11
1 R 4,075,726

CLASS 13
9 R 4,076,954

CLASS 14
14 4,075,727
16.5 4,075,728
72.5 4,075,729

CLASS 15
245 4,075,730
250.42 4,075,731
301 4,075,732
322 4,075,733

CLASS 16
58 4,075,734
145 4,075,735

CLASS 17
42 4,075,736
45 4,075,737

CLASS 19
234 4,075,738
240 4,075,739

CLASS 21
2.7 A 4,076,501

CLASS 23
230 R 4,076,502
259 4,076,503
277 C 4,076,504

CLASS 24
31 B 4,075,740
201 TR 4,075,741
211 R 4,075,742

CLASS 28
224 4,075,744
243 4,075,745
263 4,075,743
264 4,075,746

CLASS 29
18 4,075,747
225 4,075,748
268 4,075,749
278 4,075,750
432.1 4,075,751
434 4,075,752
568 4,075,753
571 4,075,754
623 4,075,755
625 4,075,756
4,075,757
628 4,075,758
629 4,075,759

CLASS 30
220 4,075,760

CLASS 32
27 4,075,761

CLASS 33
77 4,075,762
172 R 4,075,763
324 4,075,764

CLASS 34
20 4,075,765
57 D 4,075,766
92 4,075,767
116 4,075,768

CLASS 35
1 4,075,769
30 4,075,770
31 R 4,075,771

CLASS 36
43 4,075,772

CLASS 40
11 R 4,075,773
109 4,075,774
553 4,075,775

CLASS 43
24 4,075,776
41.2 4,075,777
42.31 4,075,778
100 4,075,779

CLASS 44
1 R 4,076,505

CLASS 46
13 4,075,780
74 D 4,075,781
118 4,075,782

CLASS 47
1.41 4,075,783
9 4,075,784
64 4,075,785
84 4,075,786

CLASS 49
209 4,075,787
324 4,075,788

CLASS 51
94 CS 4,075,790
142 4,075,791
165.92 4,075,792
170 TL 4,075,793
307 4,076,506
340 4,075,794
436 4,075,789

CLASS 52
8 4,075,795
20 4,075,796
36 4,075,797
79.5 4,075,814
168 4,075,798
169.5 4,075,799
4,075,800
196 4,075,801
203 4,075,802
220 4,075,803
232 4,075,804
309.12 4,075,805
395 4,075,811
403 4,075,806
407 4,075,807
439 4,075,808
514 4,075,809
585 4,075,810
747 4,075,812
4,075,813

CLASS 53
32 4,075,815
74 4,075,816
124 A 4,075,817
180 R 4,075,818
248 4,075,819
329 4,075,820
376 4,075,821

CLASS 55
1 4,076,507
309 4,076,508
320 4,076,509

CLASS 56
1 4,075,822
14.6 4,075,823
4,075,824

CLASS 58
23 AC 4,075,827
23 R 4,075,825
4,075,826
88 C Re.29,551
90 R 4,075,828
152 T 4,075,829

CLASS 60
39.05 4,075,831
245 4,075,832
262 4,075,833
276 4,075,834
4,075,835
282 4,075,836
4,075,837
325 4,075,838
327 4,075,839
422 4,075,840
444 4,075,841
445 4,075,842
487 4,075,843
524 4,075,844
527 4,075,845
4,075,846
4,075,847
548 4,075,848
602 4,075,849
633 4,075,850

CLASS 61
22 A 4,075,851
35 4,075,852
36 R 4,075,853
45 C 4,075,856
45 D 4,075,857
45 R 4,075,855
53 4,075,859
53.5 4,075,858
87 4,075,860
105 4,075,861
110 4,075,862

CLASS 62
138 4,075,863
180 4,075,864
183 4,075,865
274 4,075,866
323 4,075,867
347 4,075,868
374 4,075,869

CLASS 64
9 R 4,075,870
17 R 4,075,871
23.7 4,075,872
29 4,075,873

CLASS 65
3 A 4,076,510
27 4,076,511
29 4,076,512
33 4,076,513
106 4,076,514

CLASS 66
192 4,075,874

CLASS 68
5 D 4,075,875
18 F 4,075,876

CLASS 70
34 4,075,877
49 4,075,878
337 4,075,879

CLASS 71
10 4,076,515
66 4,076,516
86 4,076,517
100 4,076,518
103 4,076,519

CLASS 72
64 4,075,880
270 4,075,881

CLASS 73
1 F 4,075,882
88 E 4,075,885
88 R 4,075,886
91 4,075,884
141 R 4,075,887
146 4,075,888
4,075,889
295 4,075,890
483 4,075,891
495 4,075,892
620 4,075,883

CLASS 74
3 4,075,893
15.69 4,075,894
61 4,075,895
69 4,075,896
86 4,075,897
89.15 4,075,898
102 4,075,899
217 S 4,075,900
226 4,075,901
230.17 C 4,075,902
493 4,075,903
501 P 4,075,904
501 R 4,075,905
513 4,075,906
523 4,075,907
527 4,075,908
573 R 4,075,909
785 4,075,910
816 4,075,911
867 4,075,912

CLASS 75
5 4,076,520
24 4,076,521
58 4,076,522
77 4,076,523
123 J 4,076,524
128 B 4,076,525

CLASS 81
177 UJ 4,075,913

CLASS 82
1 C 4,075,914
33 R 4,075,915
78 4,075,916

CLASS 83
422 4,075,917
659 4,075,918
676 4,075,919
745 4,075,920

CLASS 84
1.16 4,075,921
402 4,075,922

CLASS 85
1 T 4,075,923
3 R 4,075,924
64 4,075,925

CLASS 89
16 4,075,926

CLASS 90
11 D 4,075,927

CLASS 91
29 4,075,928
168 4,075,929
361 4,075,930
402 4,075,931
488 4,075,932
506 4,075,933

CLASS 92
159 4,075,934
243 4,075,935

CLASS 93
1 C 4,075,936
77 FT 4,075,937

CLASS 96
1 PE 4,076,527
1.5 R Re.29,554
4,076,526
3 4,076,529
11 4,076,538
29 R 4,076,530
35 4,076,531
48 HD 4,076,532
56.5 4,076,533
63 4,076,534
67 4,076,535
75 4,076,536
88 4,076,537
105 R 4,076,528
114.5 4,076,539

CLASS 99
345 4,075,939
377 4,075,940

CLASS 100
19 R 4,075,941
42 4,075,942

CLASS 101
93.48 4,075,943
94 4,075,944
111 4,075,945

CLASS 102
52 4,075,946

CLASS 104
23 FS 4,075,947
138 R 4,075,948
162 4,075,949

CLASS 105
197 A 4,075,950
199 C 4,075,951
282 R 4,075,952

CLASS 106
15 FP 4,076,540
47 Q 4,076,541
52 4,076,542
53 4,076,543
54 4,076,544
89 4,076,546
109 4,076,547
288 B 4,076,548
4,076,549
288 Q 4,076,550
291 4,076,551

CLASS 110
8 F 4,075,953

CLASS 112
68 4,075,954
79 R 4,075,955
121.27 4,075,956
153 4,075,957
163 4,075,958
225 4,075,959
256 4,075,960
277 4,075,961
439 4,075,962

CLASS 113
113 R 4,075,963

CLASS 114
40 4,075,964
49 4,075,965
114 4,075,966
243 4,075,967

CLASS 115
17 4,075,969
18 E 4,075,970
41 R 4,075,971

CLASS 118
6 4,075,972
7 4,075,968
4,075,973
52 4,075,974
318 4,075,975
324 4,075,976
658 4,075,977

CLASS 122
33 4,075,978
235 A 4,075,979

CLASS 123
1 R 4,075,980
8.31 4,075,981
32 EA 4,075,983
32 EH 4,075,982
41.54 4,075,984
73 A 4,075,985
79 R 4,075,986
90.3 4,075,987
97 B 4,075,988
117 R 4,075,989
119 A 4,075,992
4,075,994
119 C 4,075,990
119 CD 4,075,991
119 EC 4,075,993
139 AW 4,075,995
143 A 4,075,996
148 E 4,075,997
179 H 4,075,998
191 A 4,075,999
191 S 4,076,000
4,076,001
198 A 4,076,002
198 F 4,076,003

CLASS 124
5 4,076,004
24 R 4,076,005
64 4,076,006

CLASS 125
30 R 4,076,007

CLASS 126
25 R 4,076,008
120 4,076,009
4,076,010
121 4,076,011
164 4,076,012
270 4,076,013
4,076,014
271 4,076,015
4,076,016
4,076,024
4,076,025
4,076,026

CLASS 127
50 4,076,552

CLASS 128
2 F 4,076,017
6 4,076,018
83 4,076,019
98 4,076,020
145.6 4,076,021
149 4,076,022
214 R 4,076,023
272 4,076,027
303.13 4,076,028
425 4,076,029

CLASS 131
17 R 4,076,030
261 A 4,076,031

CLASS 132
9 4,076,032

CLASS 134
6 4,076,553
10 4,076,554
172 4,076,033

CLASS 137
15 4,076,034
118 4,076,036
230 4,076,037
318 4,076,038
344 4,076,039
371 4,076,040
490 4,076,041
494 4,076,042
539.5 4,076,043
601 4,076,035
614.11 4,076,044
625.65 4,076,045
627.5 4,076,046
856 4,076,047

CLASS 139
190 4,076,048
434 4,076,049
436 4,076,050
4,076,051
439 4,076,052

449 4,076,053
453 4,076,054

CLASS 140

92.2 4,076,055
119 4,076,056

CLASS 141

1 4,076,057
1.1 4,076,058
390 4,076,059

CLASS 144

3 D 4,076,060
3 K 4,076,061
193 A 4,076,062

CLASS 148

1.5 4,076,555
4,076,556
4,076,557
4,076,558
4,076,559
11.5 C 4,076,560
103 4,076,561

CLASS 149

7 4,076,562
37 4,076,563

CLASS 150

.5 4,076,063

CLASS 151

14 R 4,076,064

CLASS 152

210 4,076,065
354 R 4,076,066
381.6 4,076,067

CLASS 156

125 4,076,565
153 4,076,566
219 4,076,567
229 4,076,568
242 4,076,569
244 4,076,570
305 4,076,571
603 4,076,572
613 4,076,573
616 R 4,076,574
656 4,076,575
664 4,076,564

CLASS 159

13 B 4,076,576
47 R 4,076,577

CLASS 160

107 4,076,068

CLASS 162

5 4,076,578
53 4,076,579
159 4,076,580
167 4,076,581
272 4,076,582

CLASS 164

303 4,076,070
448 4,076,069

CLASS 165

2 4,076,071
41 4,076,072
53 4,076,073
4,076,074
105 4,076,075
171 4,076,076

CLASS 166

271 4,076,078
308 4,076,079
315 4,076,077

CLASS 172

804 4,076,080

CLASS 173

137 4,076,081

CLASS 174

52 FP 4,076,955

CLASS 175

14 4,076,082
65 4,076,083
73 4,076,084
210 4,076,085
297 4,076,086
334 4,076,087

CLASS 176

35 4,076,583
36 R 4,076,584
38 4,076,585
78 4,076,586
86 R 4,076,587

CLASS 177

210 R 4,076,088

CLASS 178

88 4,076,956

CLASS 179

1 AT 4,076,957
1 D 4,076,959
1 SA 4,076,960
1.5 A 4,076,958
2 DP 4,076,961
6.3 R 4,076,962
15 BS 4,076,964
15 BT 4,076,963
16 EC 4,076,965
18 AG 4,076,967
18 BC 4,076,966
84 R 4,076,968
100.4 D 4,076,969
175.2 R 4,076,970
175.3 R 4,076,971

CLASS 180

5 R 4,076,089
6.48 4,076,090
26 4,076,091
68 P 4,076,092
82 R 4,076,093
108 4,076,094
114 4,076,095
133 4,076,096

CLASS 181

147 4,076,097
170 4,076,098
264 4,076,099
290 4,076,100

CLASS 182

3 4,076,101
81 4,076,102

CLASS 184

25 4,076,103

CLASS 187

8.5 4,076,104

CLASS 188

106 A 4,076,105
250 G 4,076,106

CLASS 192

4 A 4,076,107
35 4,076,108
48.4 4,076,109
58 B 4,076,110

CLASS 195

36 C 4,076,588
49 4,076,589
96 4,076,590
103.5 K 4,076,591
4,076,592

CLASS 197

1 R 4,076,111
127 R 4,076,112

CLASS 198

403 4,076,113
425 4,076,114
487 4,076,115

CLASS 200

33 A 4,076,972

CLASS 201

39 4,076,593

CLASS 203

15 4,076,594
51 4,076,595

CLASS 204

1 T 4,076,596
13 4,076,597
43 G 4,076,598
47 4,076,599
55 R 4,076,600
59 R 4,076,601
70 4,076,602
98 4,076,603
4,076,604
108 4,076,605
157.1 R 4,076,606
162 R 4,076,607
195 S 4,076,608
258 4,076,609
290 F 4,076,611
290 R 4,076,610

CLASS 206

45.19 4,076,116
106 4,076,117
268 4,076,118
309 4,076,119
339 4,076,120
390 4,076,121
460 4,076,122
503 4,076,123

CLASS 208

8 4,076,612
108 4,076,613

CLASS 209

13 4,076,614
75 4,076,124
80.5 4,076,125

CLASS 210

5 4,076,615
17 4,076,616
19 4,076,617
30 R 4,076,618
36 4,076,619
45 4,076,620
60 4,076,621
64 4,076,622
77 4,076,623
96 R 4,076,624
274 4,076,625
496 4,076,626
499 4,076,627

CLASS 211

59.1 4,076,126

CLASS 212

10 4,076,127
48 4,076,128

CLASS 213

33 4,076,129

CLASS 214

1 BC 4,076,131
1 PA 4,076,130
16.4 A 4,076,132
17 DA 4,076,133
38 B 4,076,134
300 4,076,135
340 4,076,136
394 4,076,137
518 4,076,138

CLASS 215

11 C 4,076,139
254 4,076,141
256 4,076,140
307 4,076,142

CLASS 219

97 4,076,973
108 4,076,974
483 4,076,975

CLASS 220

2.1 R 4,076,143
367 4,076,144

CLASS 222

1 4,076,145
52 4,076,146
89 4,076,147
144.5 4,076,148
202 4,076,149
368 4,076,150
525 4,076,151
545 4,076,152
600 4,076,153
4,076,154

CLASS 223

68 4,076,155

CLASS 224

2 B 4,076,156
42.1 E 4,076,157
42.25 4,076,158

CLASS 225

3 4,076,159

CLASS 226

82 4,076,160
146 4,076,161

CLASS 227

019 4,076,162

CLASS 228

56 4,076,163
103 4,076,164
136 4,076,165
157 4,076,166
173 F 4,076,167

CLASS 229

43 4,076,168

CLASS 233

14 R 4,076,169
26 4,076,170

CLASS 236

1 G 4,076,171
48 R 4,076,172

CLASS 239

411 4,076,173
492 4,076,174
532 4,076,175

CLASS 241

30 4,076,176
32 4,076,177
33 4,076,178
46.11 4,076,179
154 4,076,180

CLASS 242

18 G 4,076,181
45 4,076,182
67.3 R 4,076,183
75.3 4,076,184
118.41 4,076,185
199 4,076,186

CLASS 244

3.23 4,076,187
98 4,076,188
153 R 4,076,189
4,076,190
173 4,076,191

CLASS 246

247 4,076,192

CLASS 248

4 4,076,193
9 4,076,194
4,076,195
14 4,076,196
15 4,076,197
49 4,076,198
68 R 4,076,199
146 4,076,200
162 4,076,201
188.2 4,076,202
247 4,076,203
500 4,076,204
524 4,076,205

CLASS 249

44 4,076,206
66 R 4,076,207

CLASS 250

206 4,076,977
213 VT 4,076,978
226 4,076,979
270 4,076,980
272 4,076,981
288 4,076,982
341 4,076,983
367 4,076,984
445 T 4,076,985

CLASS 251

1 A 4,076,208
4,076,209
285 4,076,210
286 4,076,211
332 4,076,212

CLASS 252

8.1 4,076,630
8.5 C 4,076,628
8.6 4,076,629
8.75 4,076,633
8.8 4,076,631
4,076,632
12 4,076,634
18 4,076,635
25 4,076,636
26 4,076,637
33.2 4,076,638
47.5 4,076,639
62.1 P 4,076,641
62.1 R 4,076,640
78.5 4,076,642
89 R 4,076,643
182 4,076,644
188.3 CL 4,076,645
299 4,076,646
301.4 P 4,076,647
358 4,076,648
440 4,076,649
4,076,650
451 4,076,651
504 4,076,652
532 4,076,653

CLASS 254

60 4,076,213
93 R 4,076,214
4,076,215
98 4,076,216
131 4,076,217
178 4,076,218
187.4 4,076,219

CLASS 260

2.5 AJ 4,076,657
2.5 AM 4,076,654
2.5 HB 4,076,655
2.5 M 4,076,656
2.5 R 4,076,658
8 4,076,659
9 4,076,660
17 R 4,076,661
17.3 4,076,662
17.4 GC 4,076,663
18 N 4,075,830
4,076,664
22 A 4,076,667
22 CB Re.29,555
4,076,665
4,076,666
23.7 M 4,076,668
23.7 R 4,076,669
27 R 4,076,670
28.5 AV 4,076,671
29.2 EP 4,076,673
29.2 M 4,076,672
29.4 R 4,076,676
29.4 UA 4,076,674
4,076,675
29.6 E 4,076,677
31.2 N 4,076,679
31.6 4,076,678
32.6 R 4,076,680
33.6 PQ 4,076,681
34.5 R 4,076,726
37 N 4,076,682
4,076,683
37 SB 4,076,684
42.53 4,076,685
45.75 W 4,076,689
45.8 A 4,076,686
45.8 NT 4,076,687
45.9 QA 4,076,688
45.95 D 4,076,690
47 UA 4,076,691
4,076,742
59 R 4,076,692
75 S 4,076,693
77.5 AM 4,076,695
77.5 MA 4,076,694
78 P 4,076,696
78 UA 4,076,697
79.5 C 4,076,699
88.2 F 4,076,698
97.6 4,076,700
112 B 4,076,701
112.5 R 4,076,702
4,076,703
4,076,704
207 4,076,705
239 D 4,076,706
239.57 4,076,707
256.4 F 4,076,708
4,076,710
4,076,711
4,076,712
263 4,076,713
285.5 4,076,715
288 CE 4,076,716
293.54 Re.29,556
293.75 4,076,717
295 PA 4,076,718
296 R 4,076,719
4,076,720
301 4,076,721
307 H 4,076,722
327 B 4,076,723
338 4,076,724
340.3 4,076,725
340.7 4,076,727
343.4 4,076,728
345.2 4,076,729
345.7 P 4,076,730
346.4 4,076,731
347.3 4,076,732
347.9 4,076,733
369 4,076,734
378 4,076,735
382 4,076,736
397.45 4,076,737
406 4,076,738
410.9 R 4,076,739
455 R 4,076,740
465 F 4,076,741
501.13 4,076,743
501.19 4,076,744
526 R 4,076,745
543 P 4,076,746
561 N 4,076,747
586 F 4,076,748
586 R 4,076,749
590 C 4,076,750
4,076,751
4,076,752
4,076,753
603 C 4,076,754
606.5 B 4,076,756
606.5 P 4,076,755
611 R 4,076,757
618 R 4,076,758
621 C 4,076,759
653.1 R 4,076,760
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824 R 4,076,763
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835 4,076,765
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102 4,076,784
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21 4,076,231
54 4,076,232

CLASS 271

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360 4,076,993
422 4,076,994
446 4,076,995

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209 T 4,076,997

CLASS 316

1 4,076,354

CLASS 318

132 4,076,998
465 4,076,999
604 4,077,000

CLASS 323

92 4,077,001

CLASS 324

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6 4,077,003

CLASS 325

2 4,077,004
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20 4,077,010
129 4,077,011

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9 R 4,077,021

CLASS 333

1 4,077,022
30 R 4,077,023

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195 4,077,026
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347 DD 4,077,034
365 S 4,077,036

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5 EM 4,077,037
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CLASS 350

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96.25 4,076,377
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CLASS 352

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71 4,077,045

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CLASS 361

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50 4,077,056
386 4,077,057

CLASS 362

104 4,076,976

CLASS 363

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483 4,077,061
521 4,077,062
729 4,077,063

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CLASS 407

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CLASS 408

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191 4,076,443
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18 4,076,449
197 4,076,450
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CLASS 416

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241 B 4,076,456

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242 4,076,793
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294 4,076,886
307 4,076,887
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333 4,076,889
337 4,076,890
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49 4,076,900
50 4,076,901
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133 4,076,907
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	233	247,332		207	247,343		107	247,354		99	247,365	D27—	39	247,376		15 P	247,387
	250	247,333			247,344	D11—	137	247,355	D23—	17	247,366		42	247,377	D52—	4 A	247,388
	309	247,334	D8—	383	247,345		144	247,356	D24—	10	247,367			247,378	D64—	10	247,389
D6—	63	247,335	D9—	12	247,346		156	247,357		51	247,368	D28—	17	247,379			247,390
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D7—	162	247,340		285	247,351	D15—	23	247,362	D25—	75	247,373		15 AH	247,386		8.1	247,395
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2 :	4,075,779		4,076,185		4,077,028		4,075,758		4,076,063		4,076,502
4 :	4,075,930		4,076,201		4,077,034		4,075,786		4,076,072		4,076,659
	4,076,213		4,076,227		4,077,062		4,075,806		4,076,099		4,076,934
	4,076,237		4,076,239		4,077,063		4,075,807		4,076,120		4,076,959
	4,076,456		4,076,265	8 :	Re.29,553		4,076,025		4,076,129		4,076,989
	4,076,526		4,076,267		4,075,925		4,076,026		4,076,150	19 :	4,075,824
	4,076,605		4,076,272		4,075,981		4,076,028		4,076,165		4,075,885
	4,076,787		4,076,288		4,076,021		4,076,037		4,076,175		4,076,137
	4,077,015		4,076,292		4,076,112		4,076,097		4,076,194		4,076,333
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5 :	4,076,193		4,076,319		4,076,314		4,076,169		4,076,203		4,076,625
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	4,075,714		4,076,388		4,075,819		4,076,290		4,076,287		4,076,348
	4,075,715		4,076,393		4,075,922		4,076,339		4,076,293		4,076,351
	4,075,721		4,076,397		4,076,013		4,076,423		4,076,297		4,076,771
	4,075,754		4,076,419		4,076,022		4,076,449		4,076,315		4,077,007
	4,075,759		4,076,433		4,076,100		4,076,482		4,076,323	21 :	4,075,864
	4,075,771		4,076,446		4,076,151		4,076,784		4,076,324		4,075,903
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	4,075,813		4,076,515		4,076,415		4,075,942		4,076,444		4,076,448
	4,075,826		4,076,569		4,076,441		4,076,008		4,076,460		4,076,613
	4,075,831		4,076,572		4,076,451		4,076,473		4,076,492	23 :	4,076,878
	4,075,849		4,076,574		4,076,455	16 :	4,075,953		4,076,516	24 :	4,075,743
	4,075,882		4,076,579		4,076,461		4,076,009		4,076,621		4,075,746
	4,075,891		4,076,580		4,076,484	17 :	Re.29,552		4,076,677		4,075,817
	4,075,913		4,076,583		4,076,503		Re.29,556		4,076,707		4,076,104
	4,075,921		4,076,603		4,076,542		4,075,716		4,076,717		4,076,156
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	4,075,948		4,076,813		4,076,746		4,075,749		4,076,804		4,076,549
	4,075,955		4,076,848		4,076,747		4,075,755		4,076,974		4,076,696
	4,075,963		4,076,858		4,076,777		4,075,788		4,076,976		4,077,005
	4,075,964		4,076,866		4,076,798		4,075,800		4,076,997		4,077,006
	4,075,968		4,076,873		4,077,036		4,075,820		4,077,010		4,077,032
	4,075,975		4,076,905	10 :	4,075,722		4,075,879		4,077,013		4,077,038
	4,075,976		4,076,910		4,075,952		4,075,889	18 :	4,075,731	25 :	4,075,775
	4,075,986		4,076,911		4,076,226		4,075,893		4,075,797		4,075,846
	4,075,996		4,076,955		4,076,424		4,075,894		4,075,877		4,076,015
	4,076,003		4,076,969		4,076,506		4,075,906		4,075,878		4,076,123
	4,076,007		4,076,970		4,076,652		4,075,910		4,075,912		4,076,234
	4,076,039		4,076,975		4,076,698		4,075,915		4,075,938		4,076,240
	4,076,041		4,076,981		4,076,766		4,075,950		4,076,017		4,076,349
	4,076,101		4,076,990		4,076,897		4,075,951		4,076,108		4,076,406
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